Qualification Results Summary	y of AD8210 Die Revision
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QUALIFICATION PLAN/STATUS					
Теѕт	SPECIFICATION	Sample Size	RESULTS		
Temperature Cycle (TC)*	JEDEC JESD22-A104	3 x 77	Pass		
ESD - HBM	ESDA/JEDEC JS-001 2011	1 x 18	Pass		
ESD - FICDM	JESD22-C101	1 x 24	Pass		
ESD - MM	JESD22-A115	1 x 9	Pass		
Latch Up	JESD78	1 x 12	Pass		
SHR	MIL-STD883, M2007	1 x 29	Pass		
Wirebond Pull	MIL-STD883, M2001	1 x 5	Pass		

*Preconditioning (per J-STD-020)



Data Sheet

FEATURES

±4000 V HBM ESD High common-mode voltage range -2 V to +65 V operating -5 V to +68 V survival Buffered output voltage 5 mA output drive capability Wide operating temperature range: -40°C to +125°C Ratiometric half-scale output offset Excellent ac and dc performance 1 μV/°C typical offset drift 10 ppm/°C typical gain drift 120 dB typical CMRR at dc 80 dB typical CMRR at 100 kHz Available in 8-lead SOIC Qualified for automotive applications

APPLICATIONS

Current sensing Motor controls Transmission controls Diesel injection controls Engine management Suspension controls Vehicle dynamic controls DC-to-dc converters

GENERAL DESCRIPTION

The AD8210 is a single-supply, difference amplifier ideal for amplifying small differential voltages in the presence of large common-mode voltages. The operating input common-mode voltage range extends from -2 V to +65 V. The typical supply voltage is 5 V.

The AD8210 is offered in a SOIC package. The operating temperature range is -40° C to $+125^{\circ}$ C.

Excellent ac and dc performance over temperature keep errors in the measurement loop to a minimum. Offset drift and gain drift are guaranteed to a maximum of 8 μ V/°C and 20 ppm/°C, respectively.

High Voltage, Bidirectional Current Shunt Monitor

AD8210

FUNCTIONAL BLOCK DIAGRAM



The output offset can be adjusted from 0.05 V to 4.9 V with a 5 V supply by using the $V_{REF}1$ pin and the $V_{REF}2$ pin. With the $V_{REF}1$ pin attached to the V+ pin and the $V_{REF}2$ pin attached to the GND pin, the output is set at half scale. Attaching both $V_{REF}1$ and $V_{REF}2$ to GND causes the output to be unipolar, starting near ground. Attaching both $V_{REF}1$ and $V_{REF}2$ to V+ causes the output to be unipolar, starting near V+. Other offsets can be obtained by applying an external voltage to $V_{REF}1$ and $V_{REF}2$.

Rev. F

Document Feedback

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REVISION HISTORY

10/2018-Rev. E to Rev. F

Change to Table 2	. 4
Deleted Figure 3, Renumbered Sequentially	. 5
Changes to Table 3	. 5
Changes to Figure 7 and Figure 8	. 6
Changes to Figure 9 to Figure 14	. 7
Changes to Figure 15	. 8
Added Figure 16 and Figure 17	. 8

9/2017—Rev. D to Rev. E

6/2013-Rev. C to Rev. D

Added Automotive Information (Throughout)	1
Changes to Equation 1	13
Added Automotive Products Section	15

2/2012-Rev. B to Rev. C

Changes to Ordering Guide 1		5
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5/2009—Rev. A to Rev. B

Changes to Ordering Guide 1	1	5	,
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4/2007—Rev. 0 to Rev. A

Changes to Features	1
Changes to Input Section	3
Updated Outline Dimensions 1	15

4/2006—Revision 0: Initial Version

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SPECIFICATIONS

 T_{A} = operating temperature range, V_{S} = 5 V, unless otherwise noted.

Table 1.

	AD8210 SOIC ¹				
Parameter	Min	Тур	Max	Unit	Conditions
GAIN					
Initial		20		V/V	
Accuracy			±0.5	%	25° C, V ₀ \geq 0.1 V dc
Accuracy Over Temperature			±0.7	%	T _A
Gain Drift			20	ppm/°C	
VOLTAGE OFFSET					
Offset Voltage (RTI)			±1.0	mV	25°C
Over Temperature (RTI)			±1.8	mV	T _A
Offset Drift			±8.0	μV/°C	
INPUT					
Input Impedance					
Differential		2		kΩ	
Common Mode		5		MΩ	V common mode > 5 V
		1.5		kΩ	V common mode < 5 V
Common-Mode Input Voltage Range	-2		+65	V	Common mode, continuous
Differential Input Voltage Range		250		mV	Differential ²
Common-Mode Rejection	100	120		dB	T_A , $f = dc$, $V_{CM} > 5 V$
	80	95		dB	T_{A} , f = dc to 100 kHz ³ , $V_{CM} < 5 V$
		80		dB	T_{A} , f = 100 kHz ³ , V _{CM} > 5 V
	80			dB	T_{A} , f = 40 kHz ³ , V_{CM} > 5 V
OUTPUT					
Output Voltage Range	0.05		4.9	V	$R_L = 25 \ k\Omega$
Output Impedance		2		Ω	
DYNAMIC RESPONSE					
Small Signal –3 dB Bandwidth		450		kHz	
Slew Rate		3		V/µs	
NOISE					
0.1 Hz to 10 Hz, RTI		7		μV p-p	
Spectral Density, 1 kHz, RTI		70		nV/√Hz	
OFFSET ADJUSTMENT					
Ratiometric Accuracy ⁴	0.499		0.501	V/V	Divider to supplies
Accuracy, RTO			±0.6	mV/V	Voltage applied to $V_{REF}1$ and $V_{REF}2$ in parallel
Output Offset Adjustment Range	0.05		4.9	V	$V_S = 5 V$
V _{REF} Input Voltage Range	0.0		Vs	V	
V _{REF} Divider Resistor Values	24	32	40	kΩ	
POWER SUPPLY, Vs					
Operating Range	4.5	5.0	5.5	V	
Quiescent Current Over Temperature			2	mA	$V_{CM} > 5 V^5$
Power Supply Rejection Ratio	80			dB	
TEMPERATURE RANGE					
For Specified Performance	-40		+125	°C	

 1 T_{MIN} to T_{MAX} = -40°C to +125°C. 2 Differential input voltage range = ±125 mV with half-scale output offset.

³ Source imbalance < 2 Ω .

⁴ The offset adjustment is ratiometric to the power supply when V_{REF} 1 and V_{REF} 2 are used as a divider between the supplies. ⁵ When the input common mode is less than 5 V, the supply current increases. This can be calculated with the following formula: $I_S = -0.7 (V_{CM}) + 4.2$ (see Figure 22).

ABSOLUTE MAXIMUM RATINGS

Table 2.

Parameter	Rating
Supply Voltage	12.5 V
Continuous Input Voltage (V _{CM})	–5 V to +68 V
Reverse Supply Voltage	0.3 V
ESD Rating	
HBM (Human Body Model)	±4000 V
CDM (Charged Device Model)	±1250 V
Operating Temperature Range	-40°C to +125°C
Storage Temperature Range	-65°C to +150°C
Output Short-Circuit Duration	Indefinite

Stresses at or above those listed under Absolute Maximum Ratings may cause permanent damage to the product. This is a stress rating only; functional operation of the product at these or any other conditions above those indicated in the operational section of this specification is not implied. Operation beyond the maximum operating conditions for extended periods may affect product reliability.

ESD CAUTION



ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

PIN CONFIGURATION AND FUNCTION DESCRIPTIONS



Figure 2. Pin Configuration

Table 3. Pin Function Descriptions

Pin No.	Mnemonic
1	-IN
2	GND
3	V _{REF} 2
4	NC
5	OUT
6	V+
7	V _{REF} 1
8	+IN

AD8210

TYPICAL PERFORMANCE CHARACTERISTICS





Data Sheet

AD8210



Figure 14. Common-Mode Response (Falling)

AD8210



Figure 15. Common-Mode Response (Rising)

















Data Sheet



Figure 21. Output Voltage Range from GND vs. Output Sink Current









THEORY OF OPERATION

In typical applications, the AD8210 amplifies a small differential input voltage generated by the load current flowing through a shunt resistor. The AD8210 rejects high common-mode voltages (up to 65 V) and provides a ground referenced buffered output that interfaces with an analog-to-digital converter (ADC). Figure 27 shows a simplified schematic of the AD8210.

The AD8210 is comprised of two main blocks, a differential amplifier and an instrumentation amplifier. A load current flowing through the external shunt resistor produces a voltage at the input terminals of the AD8210. The input terminals are connected to the differential amplifier (A1) by R1 and R2. A1 nulls the voltage appearing across its own input terminals by adjusting the current through R1 and R2 with Q1 and Q2. When the input signal to the AD8210 is 0 V, the currents in R1 and R2 are equal. When the differential signal is nonzero, the current increases through one of the resistors and decreases in the other. The current difference is proportional to the size and polarity of the input signal. The differential currents through Q1 and Q2 are converted into a differential voltage by R3 and R4. A2 is configured as an instrumentation amplifier. The differential voltage is converted into a single-ended output voltage by A2. The gain is internally set with precision-trimmed, thin film resistors to 20 V/V.

The output reference voltage is easily adjusted by the $V_{\text{REF}1}$ pin and the $V_{\text{REF}2}$ pin. In a typical configuration, $V_{\text{REF}1}$ is connected to V_{CC} while $V_{\text{REF}2}$ is connected to GND. In this case, the output is centered at $V_{\text{CC}}/2$ when the input signal is 0 V.



MODES OF OPERATION

The AD8210 can be adjusted for unidirectional or bidirectional operation.

UNIDIRECTIONAL OPERATION

Unidirectional operation allows the AD8210 to measure currents through a resistive shunt in one direction. The basic modes for unidirectional operation are ground referenced output mode and V+ referenced output mode.

In unidirectional operation, the output can be set at the negative rail (near ground) or at the positive rail (near V+) when the differential input is 0 V. The output moves to the opposite rail when a correct polarity differential input voltage is applied. In this case, full scale is approximately 250 mV. The required polarity of the differential input depends on the output voltage setting. If the output is set at ground, the polarity needs to be positive to move the output up (see Table 5). If the output is set at the positive rail, the input polarity needs to be negative to move the output down (see Table 6).

Ground Referenced Output

When using the AD8210 in this mode, both reference inputs are tied to ground, which causes the output to sit at the negative rail when the differential input voltage is zero (see Figure 28 and Table 4).



Table 4. V+ = 5 V

V _{IN} (Referred to −IN)	Vo
0 V	0.05 V
250 mV	4.9 V

V+ Referenced Output

This mode is set when both reference pins are tied to the positive supply. It is typically used when the diagnostic scheme requires detection of the amplifier and wiring before power is applied to the load (see Figure 29 and Table 5).



Table 5. V + = 5 V

V™ (Referred to –IN)	Vo
0 V	4.9 V
–250 mV	0.05 V

BIDIRECTIONAL OPERATION

Bidirectional operation allows the AD8210 to measure currents through a resistive shunt in two directions. The output offset can be set anywhere within the output range. Typically, it is set at half scale for equal measurement range in both directions. In some cases, however, it is set at a voltage other than half scale when the bidirectional current is nonsymmetrical.

Table 6. V+ = 5 V, $V_0 = 2.5$ V with $V_{IN} = 0$ V

V _{IN} (Referred to -IN)	Vo
+125 mV	4.9 V
–125 mV	0.05 V

Adjusting the output can also be accomplished by applying voltage(s) to the reference inputs.

External Referenced Output

Tying both V_{REF} pins together to an external reference produces an output offset at the reference voltage when there is no differential input (see Figure 30). When the input is negative relative to the –IN pin, the output moves down from the reference voltage. When the input is positive relative to the –IN pin, the output increases.



Splitting an External Reference

In this case, an external reference is divided by two with an accuracy of approximately 0.2% by connecting one V_{REF} pin to ground and the other V_{REF} pin to the reference voltage (see Figure 31).

Note that Pin $V_{REF}1$ and Pin $V_{REF}2$ are tied to internal precision resistors that connect to an internal offset node. There is no operational difference between the pins.

For proper operation, the AD8210 output offset must not be set with a resistor voltage divider. Any additional external resistance could create a gain error. A low impedance voltage source must be used to set the output offset of the AD8210.



Splitting the Supply

By tying one reference pin to V+ and the other to the GND pin, the output is set at midsupply when there is no differential input (see Figure 32). This mode is beneficial because no external reference is required to offset the output for bidirectional current measurement. This creates a midscale offset that is ratiometric to the supply, meaning that if the supply increases or decreases, the output still remains at half scale. For example, if the supply is 5.0 V, the output is at half scale or 2.5 V. If the supply increases by 10% (to 5.5 V), the output also increases by 10% (2.75 V).



INPUT FILTERING

In typical applications, such as motor and solenoid current sensing, filtering at the input of the AD8210 can be beneficial in reducing differential noise, as well as transients and current ripples flowing through the input shunt resistor. An input lowpass filter can be implemented as shown in Figure 33.

The 3 dB frequency for this filter can be calculated by

$$f_{3} dB = \frac{1}{2\pi \times 2 \times R_{FILTER} \times C_{FILTER}}$$
(1)

Adding outside components, such as R_{FILTER} and C_{FILTER}, introduces additional errors to the system. To minimize these errors as much as possible, it is recommended that R_{FILTER} be 10 Ω or lower. By adding the R_{FILTER} in series with the 2 k Ω internal input resistors of the AD8210, a gain error is introduced. This can be calculated by

$$Gain Error(\%) = 100 - \left(100 \times \frac{2 \,\mathrm{k}\Omega}{2 \,\mathrm{k}\Omega - R_{FILTER}}\right)$$
(2)



APPLICATIONS INFORMATION

The AD8210 is ideal for high-side or low-side current sensing. Its accuracy and performance benefits applications, such as 3-phase and H-bridge motor control, solenoid control, and power supply current monitoring.

For solenoid control, two typical circuit configurations are used: high-side current sense with a low-side switch, and high-side current sense with a high-side switch.

HIGH-SIDE CURRENT SENSE WITH A LOW-SIDE SWITCH

In this case, the PWM control switch is ground referenced. An inductive load (solenoid) is tied to a power supply. A resistive shunt is placed between the switch and the load (see Figure 34). An advantage of placing the shunt on the high side is that the entire current, including the recirculation current, can be measured because the shunt remains in the loop when the switch is off. In addition, diagnostics can be enhanced because short circuits to ground can be detected with the shunt on the high side.



In this circuit configuration, when the switch is closed, the common-mode voltage moves down to the negative rail. When the switch is opened, the voltage reversal across the inductive load causes the common-mode voltage to be held one diode drop above the battery by the clamp diode.

HIGH-SIDE CURRENT SENSE WITH A HIGH-SIDE SWITCH

This configuration minimizes the possibility of unexpected solenoid activation and excessive corrosion (see Figure 35). In this case, both the switch and the shunt are on the high side. When the switch is off, the battery is removed from the load, which prevents damage from potential short circuits to ground, while still allowing the recirculation current to be measured and diagnostics to be performed. Removing the power supply from the load for the majority of the time minimizes the corrosive effects that could be caused by the differential voltage between the load and ground.



Using a high-side switch connects the battery voltage to the load when the switch is closed. This causes the common-mode voltage to increase to the battery voltage. In this case, when the switch is opened, the voltage reversal across the inductive load causes the common-mode voltage to be held one diode drop below ground by the clamp diode.

H-BRIDGE MOTOR CONTROL

Another typical application for the AD8210 is as part of the control loop in H-bridge motor control. In this case, the AD8210 is placed in the middle of the H-bridge (see Figure 36) so that it can accurately measure current in both directions by using the shunt available at the motor. This configuration is beneficial for measuring the recirculation current to further enhance the control loop diagnostics.



Figure 36. Motor Control Application

The AD8210 measures current in both directions as the H-bridge switches and the motor changes direction. The output of the AD8210 is configured in an external reference bidirectional mode (see the Modes of Operation section).

OUTLINE DIMENSIONS



ORDERING GUIDE

Model ^{1, 2}	Temperature Range	Package Description	Package Option
AD8210YRZ	-40°C to +125°C	8-Lead [SOIC_N]	R-8
AD8210YRZ-REEL	-40°C to +125°C	8-Lead [SOIC_N], 13"Tape and Reel	R-8
AD8210YRZ-REEL7	-40°C to +125°C	8-Lead [SOIC_N], 7"Tape and Reel	R-8
AD8210WYRZ	-40°C to +125°C	8-Lead [SOIC_N]	R-8
AD8210WYRZ-RL	-40°C to +125°C	8-Lead [SOIC_N], 13"Tape and Reel	R-8
AD8210WYRZ-R7	-40°C to +125°C	8-Lead [SOIC_N], 7"Tape and Reel	R-8

 1 Z = RoHS Compliant Part.

² W = Qualified for Automotive Applications.

AUTOMOTIVE PRODUCTS

The AD8210W models are available with controlled manufacturing to support the quality and reliability requirements of automotive applications. Note that these automotive models may have specifications that differ from the commercial models; therefore, designers should review the Specifications section of this data sheet carefully. Only the automotive grade products shown are available for use in automotive applications. Contact your local Analog Devices account representative for specific product ordering information and to obtain the specific Automotive Reliability reports for these models.

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x SEM-DE-02	Design changes in routing . ²)	РР	Any change of wiring between elements in chip design / layout with effect on data sheet. ²) Not included: Modification to adjust product parameter within specified design rules.	e.g. mask changes in metal fix for corrective action (based on external 8D report)	c	A: Impact on EMC behavior cannot be evaluated / excluded on component level. A: If impact on electrical function is not excluded on component level. Please check if data sheet is affected (SEM-DS-D1).		•		- A	м					- - -	• ••	• • •					•	
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SEM-DE-04	Firmane modification	I P	Integrated activate by design or memory as defined by suppler. (1): Firmware modification or update without effect of functional performance at the scansore (bag file). (P): Firmware modification or update with effect of functional performance at the customer.	$(0;\alpha,g,$ addition of Firmware opportunities $(P);\alpha,g,$ bug fit with impact on functional performance	A		-		-							·								
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SEM-PW-02	New wafer diamater	РР	Change of wafer clameter resulting in equipment an process changes.	rnateriaf) d	c	Impact on changes in SEM-PW-99 and/or SEM-EQ-91.	•	• •	-	- е	м.	• -	ЕЕ			- Е I	Е Е •						•	EC-Q100. "For broad changes that involve multiple attributes (e.g., site, materials, roceases), refer to auction A13 of this appendix and auction 23 of Q103, which allows for he selection of wont-case test vehicles to cover all the possible permutations."
SEM-PW-03	New final wafer thickness	РР	Change in final wafer thickness.	e.g. change in final chipidie thickness	c	A: If thermal conductivity is affected (like MOSFET; ISBT, BGA package, stacked disa,) A: If impact on EMG or ESD behavior cannot be evaluated / excluded on component level.		• •	-	- E	м.	• .	ЕЕ			· Е 1	Е Е •						•	
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SEM-PW-05	Charge of gate material / delectrics	P P	Change of gate material and / or gate dielectric material.		A			•	-		м - •	- D,J	1					•					•	
SEM-PW-OS	New / change of backaide operation (grinding / metallization)	P P	Change of bottom layer of die (between die and leadframe). Change in process, material, or dimensions necessary. Alternative see SEM-PW-00	e.g. change from Cr.NIV/Ku to Cr.NIV/Kg	с	Ac If thermal conductivity is affected (like MOSFET; IZBT; BCA package, stacked dise,) Ac If impact on EMC or ESD behavior cannot be evaluated / sexhaded on component level.		•	-	- •	м - •					- M P	4.	•		н.	н		• •	EQ-Q102: Applicable to all ament power devices
SEM-PW-07	New / change of mutalization / viss / contacts	P P	Change in metallization of bondpads, material, layer Bickness specifically for chip frontialde and internal layers.	e.g. change from AlSiCu to AlCu e.g. change in over pad metalization	c	In case of Cu wire product please consider AEC-Q005.		•	•	• •	м - •		• • • •			•	· •	• - •	· ·				•	
SEM-PW-05	New / change of pasalvation or die coating (elthout base die)	P P	Change of top layer on die (between mold compoun and die).	d e.g. addition of polyimide	с	Charge of intrinaic mechanical ateas might influence electrical function. In case of Cu wire product please consider AEC-0005.		•	•	• •	м - •	#,N D,J			• •	•••	• • •	•					•	
SEM-PW-09	Change in process technology (e. g. process changes like lithography, etch, oxide deposition, diffusion, die back surface preparation/backgrind,)	P	(-): If the change in process lectrology does not influence the integrity of the final product. (P): If the change in process technology can influence the integrity of the final product.	(-): e.g. change from wet to dry elching, e.g. change from horizontal to vertical oven for oxidation (₱): e.g. change of layer thickness	A	Please also check changes described under EQUIPMENT. Please check if change is described by specific type of change in this multix.	•	•	-														•	Qualification effort depends on type of change.
SEM-PW-10	Prosess integrity funing within specification	P	Variation within process specification (-): If saving within process specification does not influence the integrity of the final product. (P): If remaining mix on product specification is articipated.	(): e.g. procesa control	с	Please check f DATA SHEET is affected. Please check f SEM-PW-09 is affected.	•		-														•	
SEM-PW-11	Change of wafer supplier.	P	(): If no remaining tak in supply chain solat (P): If the change of wafer suppler can influence th integrity of the final product.	(-): «.g. change of wafer supplier with same material composition. « g. same medical composition and does not influence electrical behavior. (Φ): «.g. new supplier with impact on substatute material and / or electrical behavior.	c	Not on component, lealed on leat structure (typical for IC). Interaction on component level for discrete components expected. In case of SOI substate HP properties have to be qualified. Please check if SEM-PW-01 and SEM-D6-01 is affected.																	•	Sufficients for IC & p-Controller difficult on product level. Characterisation on water level of one statisticates. Color 2010: The brand changes that involve multiple attribution (e.g., site, materials, CO-2010: The brand changes that involve multiple attribution (e.g., site, materials, eds.) (CO-2010): The brand changes that involve multiple attribution (e.g., site, materials, attribution of worst-case test whicks to cover all the possible parentations."
SEM-PW-12	Charge of specified wolfer process sequence (deletion and/or additional process step)	P	Any change which is not covered by another type of change. Plak is to be assessed. (-1; No Risk for Supply chain. (P): Risk for Supply chain (influence on product integrity)	(-): e.g. change of cleaning process in wafer production (P): e.g. additional sinker implantation after standard implantation (to protect circuit against interference impulses).	с		•																-	
SEM-PW-13	Move of all or part of water fab to a different location/laite/subcontractor	РР	Water fab transition with additional changes (described above).	e.g. dual source / fab strategy	A	In case of Cu wire product please consider AEC-Q005.	•	•	•	•••	м - •	• J	••		•••	• • •	• •••			н.	н		•	EC-Q102: "For bread changes that involve multiple attributes (e.g., site, materials, roosase), refer to section A1.3 of this appendix and section 2.3 of Q102, which allows for he selection of wont-case test whickes to cover all the possible permutations."

SEM-PW-14	Lithography	-	P (Change in process technique for lithographic process and material (-): If the change in process technology does not influence the integrity of the final product. (P): If the change in process technology can influence the integrity of the final involved	(): e.g. exchange of defect mask (P): e.g. change from E-beam process to X-ray process e.g. change from contact into projection mode	с	Please also check changes described under EQUIPMENT.	•	•	•	- •	м -	•	i -	••			•							-	•	
SEM-PW-15	Calde / Horrsyer Dielectric	-	P	Change in process technique for oxide / interlayer distantie process technique for oxide / interlayer distantie process technology does not influence the integrity of the final product. (P) If the change in process technology can influence the integrity of the final product.		A	Please also check changes described under EQUIPMENT .		• •			м -	• #,	N D,J				• •	•••	• • •	• •				-	•	
	BARE DIE					_				_				-													
SEM-BD-01	New final wafer thickness	Р	P	Change in final wafer thickness.	Charge in final chip/die thickness	A	In case of Cu wire product please consider AEC-Q005.		•	1.1	- E	м -	•		EE			•	- E	E E •					-	•	
SEM-BD-02	New / change of frontaide metallization	Р	P	Change in bondpads, material, pad pitch, surface changes, layer thickness	e. g. change from AlSiCu to AlCu e. g. change in over pad metalization	в	In case of Cu wire product please consider AEC-Q005.		•	•	••	м -	•	-				· ·		· · •	• •	• • •			-		
SEM BD //3	New / charge of backside metallization			Change of bottom layer of die (between die and leafframe). Change in process material or	e a change from Colivities to Colivities							м.									• •						
		· -		dimensions.	-,,								-	-	$\left \right $							-		-			
SEM-BD-04	Charge of wafer setup or number of possible good dea on wafer.	I.	P (Needed information for pick & place machine. (I): amount of possible good dies on wafer (P): influence on wafer setup and wafer mapping	(i): e.g. change from 350 to 240 good dies on water (P): e.g. information change for pick & place machine.	в				-															-		
SEM-BD-05	Change of optical appearance of water edge region (like inide coverage or edge eaclusion)	ı.	P (Selection of dies in water edge region which have full electrical functionality. (1): in case of water edge is affected only (P): in case of single die is affected	(I): e.g. appearance of water edge (rounded instead of square) (P): e.g. polyimide as new costing on die	в				-				-				• •							-	•	
SEM-BD-05	Die softe or separation	ı.	P (Needed information for aswing and pick & place machine. (1): If the change in aswing process does not influence the integrity of the final product. (P): In case if product is delivered on wafer	(I): e.g. if product is delivered as known good die (in tapa and real) (P): e.g. information change for pick & place machine. e.g. information change for saving machine.	в	Please check if SEM-BD-04 is affected.		•	•	• •	м -		-											-		
SEM-BD-07	Die Preparation / Clean	-	P (Change in process technique for die preparation / cleaning (-): If the change in process does not influence the integrity of the final product. (P): If impact on product integrity is anticipated.	(): e.g. change of deaming time. (P): e.g. change in cleaning procedure after change of sawing equipment.	в	Please check if SEM-BD-05 is affected.		• •	•	• .	м -	•	-	••			• •						. н.	-	-	
SEM-BD-08	New / change of pasalvation or die coating	Р	Р	Change of top layer on die.	e.g. addition of polyimide e.g. change of polyimide thickness	в	In case of Cu wire product please consider AEC-Q005.			1.1				-											-	•	
	PROCESS - ASSEMBLY																										
SEM-PA-01	Change in critical dimensions of package	Р	Р	Change in dimensions of existing package.	e. g. changes in package dimensions (further development).	в				•	•••	м •	•		••	• • T •			•	• • •		• • •	н.	- H H	-		
SEM-PA-02	Charge of leadharne base material	Р	р ,	New leadframe material in new composition.	e.g. change from alloy42 to copper e.g. change between two different copper alloys	в	In case of Cu wire product please consider AEC-Q005.		• •		••	м •		-	. •	• • • •		-				• • •	н.	-н-	G		
SEM-PA-03	Change in leadhane dimensions	Р	P	Change in leastframe dimensions which has impact to the specified electrical parameter acc. data sheet or specification (e.g., heat sink, pin dimensions, die padde size,) Not included: Variation within specification.	e.g. change in lead frame geometry.	в	ESD investigations are only necessary if internal ground and power supply correction of lead/same is affected. Ar: If impact on EMC behavior cannot be evaluated / encluded on compresent level. In case of Cu wire product please consider AEC-Q006.		• •	-	•••	м -		-		• • - •	•					• • •	н.		-		
SEM-PA-04	Charge of lead frame finishing material / area (internal)	Р	P	Change of surface material of die attach pad and second bond area (e.g. influence in adhesion to mold compound, wedge bond reliability)	e.g. change from Ag flash to NP protection layer e.g. change from Ag spot to As spot e.g. increase of silver plating area	с	In case of Cu wire product please consider AEC-Q005.		• •	٠	• •	м •			- c	• •		• •				· · ı	н.	•н•	-		For wire bond strengh test: Pre-& Post-process change comparison to evaluate process change robustness (AEC-Q101).
SEM-PA-05	Change of lead and heat slug plating material/plating thickness (esternal)	Р	P	Change in material and / or process resulting in a new technology (e.g. pure tin).	e.g. change in heat alug stack e.g. change from Sn into NIPd/Au	в			• •	•	••	м •			- c	• •						· · I	н.	-н-			
SFM.PA.OS	Parene Matarial / Matal Restarce (internal)	Р	Р	Stack die or die In webstrate (Ein chin)	e.g. change of layer thickness e.g. change to Pb-free material	с					. .	м.															
			-	(+ -+)	e.g. change of copper pilars		A: If impact on EMC behavior cannot be evaluated / excluded on						-														
SEM-PA-07	Die allach material	Р	P	Change of die attach material and / or process resulting in a new technology (e.g. soft solder, epoxy, etc.)		с	component level (if die attach has impact on electrical conductivity). In case of Cu wire product please consider AEC-Q005.		•••	·	•••	м -	•	-	• •		• •		•	· · •		• • •	н.	- н н	-	•	
SEM-PA-05	Changa of wire bonding	Р	P	Material, dismeter, change in bonding diagram and / or change in process resulting in a new technology.	e.g. change from Au to Co material e.g. change from 25pm to 20pm diarmeter e.g. change from single to double bond e.g. change from single to double bond e.g. change from sitch bond to stich on ball bond.	c	A: In case of bond diagram change and EMC cannot be evaluated on component level. Please also check changes described under SEM-EQ-41. In case of Cu whe bonding please consider AEC-Q006.		• •	•	•••	۹.			••		•			N		•	н.		-	•	Persmette Analysis: Strictly required only for Power devices. Is general: Stratulat for material durings with instant on foundprocess (e.g. from Au Io Cu) (ECC102): The transmission durings is stratulated as the strategiest stratulated and processars, first for section A1 a of this appendix and sections 2.3 of 2020, which allows for the sections' of uncertain A1 and the strategiest stratulated as the strategiest and the strategiest and the strategiest and the section A1 and the section A1 and the strategiest and the
SEM-PA-09	Substrate / Interposer	Р	P	Change of BGA substrate	e.g. changes in routing	в	A: Impact on EMC behavior cannot be evaluated / excluded on component leval. A: Il impact on electrical function is not excluded on component leval. In case of Cu wire product please consider AEC-Q006.		• •	•	••	м •	•		••	т .	•					L	. н -	- н н	-		
SEM-PA-10	Die Overcost / Underfit	-	P (Supporting layers for complex packages like flip chip and / or change in process nearling in a new technology. —): If change does not influence the integrity of the final product. (P): If impact on product integrity is anticipated.	(): e.g. change of sispensing speed (P): e.g. change of underfill material	c			• •	•	••	м •	•					• •						н	-		
SEM-PA-11	Charge of mold compound / ercopsulation material	Р	P	Change of mold compound / encapsulation material.	e.g. change to green mold compound e.g. change of filler particles	в	At impact on theme-exclusion atems caused by mismatch of mole company, it interconnecting lackholding and cameries is evident by its cause of hips housing signal (a 2004) at should be assessed if possible changes in permeability of mole compound could affect signal housing (e.g. dight signal processor), his case of Cu wire product please comister AEC-0005.			•		м •				• • - •						. • I			-		
SEM-PA-12	Charge of hernetic sealing	Р	P	Affected areas are material and process of hermetic (e.g. caramic) packages, capped die and sealed devices (e.g. pressure sensors)	e.g. change of sealing material for RoHS	в	A: impact on EMC behavior cannot be evaluated / excluded on component level (if encapsulation / sealing has impact on electrical conductivity).		• •	-	••			-			• - •							• - •	-		
SEM-PA-13	Change of product marking	ı	P	Change of marking on device and / or change in process resulting in a new technology (1): If change does not influence the integrity of the final product. (P): If impact on product integrity is anticipated.	(I); e.g. change of appearance (additional marking) (P); e.g. change from inked marking to baser marking e.g. marking of pin 1	в			•						1	в									-		
SEM-PA-14	Charge in process lectrology (cg. saving, de attach, bonding, plating, ten and form, lead frame preparation,)	-	P	(): If the change is process technology does not influence the integrity of the final product. (P): If the change is process technology can influence the integrity of the final product.	(P): e.g. change from ball bond to stitch	в	Please also check changes described under 558-50-61. Please check if change is described by specific type of change in this matrix.		•	-				-				-							-		
SEM-PA-15	Process integrity: turing within specification	-	P (Variation within process specification (-): If turing within process specification does not influence the integrity of the final product. (P): If impact on product specification is anticipated.	(): e.g. process control	c																			-		
SEM-PA-15	Charge of direct material supplier	-	P (Change of suppliers for direct materials which are used in assembly process (BOM). (): If change does not influence the integrity of the final product. (P): If impact on product integrity is anticipated.	(-): «.g. change of wire material supplier. (P): «.g. change to new mold compound supplier «.g. additional leadhare suppler with specific leadhare manufacturing technology	с	Please check if malarial is changed!			-				-											-		See change of matarial.
SEM-PA-17	Change of specified-assembly process sequence (deleton and/or additional process step)	-	P ((): no influence in final product integrity or specified sequence (P): influence in final product integrity or specified sequence	(): e.g. additional cleaning step e.g. detelion of optical impection (P): e.g. change lead finishing pre trim & form to post trim & form	c				-				-											-	-	Qualification depends on specific charge.
SEM-PA-18	Move of all or part of assembly to a different location/site/subcontractor.	Р	Р /	Assembly transfer or relocation	e.g. dual acurce / fab strategy	с	A or B: impact on other type of changes described under PROCESS ASSEMBLY and SEM-EQ-01. In case of Ca wire product please consider AEC-Q005.		•	•	•••	м -	•	• -	••	• т						L	н.	• н н	G	•	Whisher tests have to be done on monitoring basis! AEC-0100-17to bread charges that invoke multiple attributes (e.g., site, materials, processes), effect outcomestion AI of this spendik and lactices 2.3 of 0100, which allows for the selection of wont-case test whiches to cover all the possible permutations.*
SEM-PA-19	Die scribe or separation	-	P (Separation process from single wafer to dies. (): If the change in process does not influence the integrity of the final product. (P): If impact on product integrity is anticipated.	(): e.g. change of kerf width (P): e.g. change from saving to laser cut	c			•	•		м -															

SEM-PA-20	Die Prepandon / Ciean	-	P	Change in process technique for die preparation / cleaning (-): If the change in process does not influence the integrity of the final product. (P): If impact on product integrity is anticipated.	(-): e.g. change of cleaning time.	c	-	• •	•	• -	м -	• .	-	••		 		-					- н			
SEM-PA-21	Molding / Encapsulation process	-	Р	Change in process technique for molding / encapsulation. (): If the change in process does not influence the integrity of the final product. (P): If impact on product integrity is anticipated.	(-): e.g. tuning within process specification	c	-	• •	•	••	м •	• -	-		• . •	 		-			· г				-	
	PACKING/SHIPPING																									
SEM-PS-01	Packing/ahipping apecification change	Ρ	Ρ	Packing/shipping specification change.		•			1							 		-								
SEM-PS-02	Dry pack requirements change	Р	Р	Change of dry pack requirements (e.g. change of MSL)		•			1.0				-			 		-							•	
SEM-PS-03	Change of carrier (tray, reel)	Р	Р	Change of carrier (tray, reel)		В										 		-								
SEM-PS-04	Charge of labeling	ı	Р	Change of labeling also on rest. (I): Change of material label without impact on bercode. (P): Changes of material label information which affects data processing at customer.	(i) = g. additional information (RoHS stamp) (P) = g. change of defined nonvenciature for data processing	в							-			 		-							-	
	EQUIPMENT						 																			
SEM-EQ-01	Production from a new equipmentitool which uses a different basic technology or which due to its unique form or function can be expected to influence the integrity of the final product.	Р	Р	Change in process technique which is not already covered above.	Change from single wafer to batch process (e.g. over pad metalization) e.g. dambar cutting (mechanical to laser cutting)	A	-									 		-	• .							Affected process change is to check.
SEM-EQ-02	Production from a new equipmentitod which uses the same basic technology (replacement equipment or extension of exailing equipment pool) without change of process.	-	Р	PCN required for decicated equipment for sensitive component production. (): if change does not influence the integrity of the final product. (P): if impact on product integrity is anticipated.	(-): e.g. extension of existing equipment pool (P): e.g. extension of dedicated equipment in case basic technology still need to be proven	c							-			 		-							•	
SEM-EQ-03	Change in final text equipment type that uses a different technology.	Р	Р	Change of tester (only in case of bare dis: final test means wafer test.)	e.g. change tester equipment from LTX to Teradyne	с	-		-				-			 		-	• •						•	Gage R&R / delta correlation
	TEST FLOW																									
SEM-TF-01	Move of all or part of electrical wafer test and/or final test to a different location/site/subcontractor	Р	Ρ	Tester transfer or relocation. Check impact on SEM-AN-01	Dual source strategy	с	•	· · ·	1.0				-			 -		-	• •						•	Gage R&R / delta correlation
	Q-GATE	-			1				_		_					 _				_						
SEM-QG-01	Ourge of the test convergelineating process free used by the supplet is ensure data sheet compliance is a site individual of identical measurement that free block, individual individual of exclusion procedure or sampling)	-	Р	 e.g. test flow block, reduction from three temperature measurements to two temperature measurements, change in born in / run in process. (-): If change does not influence the integrity of the final product. (P): If impact on product integrity is anticipated. 	(-): e.g. last implemented without customer requirement (P): e.g. reduction from inner imperature measuremented to two innyerature measurements e.g. change in burn in / cus in process.	с	•					. •						-	• •						•	Parameter Analysis: Della convestion * For "turn tri' changes ELFR recommended
j	Tests, which should be considered for the appropriate process change.					Α	-	•		- A	M -					 		•							•	
		-	-													_							_			
ļ	Tests, which should be considered for the appropriate process change after selectic	on of co	ondition	a table.			-	• •		- A	м -	• •				 	- •	•	•••	• •	• •	• •		• •	•	-
1	Suppliers performed tests (mark with an 'X' for done or 'G' for generic)									×				x			x	x	xx	x				1	x	

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Assessment of impa- - contractual agreem - sechnical interface - - form, fit, function, s	t on Supply Chain regarding following aspects res res for consensibility/manufacturability of customer S ality performance, reliability C	imaining laks on Supply Chain? Understanding of component experts	Examples to explain	Further applicable conditions	ation at using by data or surding 2200 Revision D podification	h Teny Bipowe (Bong species Cycleg	structive Pttypical Andres	LALVO Paniatarca and Hamid V and Cord LFo	bernal Visual	yalad Dimension reind Strength (Leaded)	sidence lo Golverta Charlosi Book	saturce to Soldering Heat	erred Shack chooladio Discherge (1930)	denoted ity	cencer Characterization	ad Piec	an Load Test	rea Patanderco Maion Uite	sűrepy, sű	R Spray critical Transient Conductio	ar Breejh	# Current Durability dot*Life Mode Verfication	to Bart Bridsmoo	ol Durp Bridarance elaser Teet C 6006-12-62, 40000-10	enreter-Analysis repetition of current with ch materization electrical dis
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ANY DAS RES AND			Mediantic and the inclusion of a schedure	•			1 - 1		1 - 1					11				_		_	T.T				
PAS-RES-AN-02 Any change with impact or the mattix balaxy.	processability/manufacturability at customer, which is not cowered in p	P	Technical interface means component terminals.	в					-								7				- 7				-
DATASPEET							1 1		1 1			-		1 1	1					4			444		1 1
PAS-RES-DS-01 Change of datasheet paramapecification	elens/electrical specification (min/max/typ. values) and / or ACIDC P	P Information Not included: Editorial changes.	e.g. tighten of electrical parameter distribution	A Risk assessment depending on change for each application.	14 (A) (A)					· ·	· · ·				· ·	-		· ·		· ·	· ·	· -	1.1	1.1	-
PAS-RES-CG-02 Connection of data sheet	1	No technical change of the product, only correction is description (wording, drawing,) (B: In case of adherial changes, (P): In case of impact on product integrity.	e.g. data sheet correction because of new information about component behavior	A	• • •		-							-							•				-
PAG-PES-DS-03 Specification of additional	aramiters I	Description of a new not previously covered parameter. No technical change of the product. ((): no influence (P): Flok assessment depending on change for each application to provide	e.g. adding new (tested) parameter.	A	· · ·		-																		-
		existence or accessoral parametes (stat. exaluation)	1														يلجيه								
PAS-RES-MA-01 Change of material compt	tion - InkWire material of Resistor element P	P Change of Ink / Wire material	e.g. resistor paste, NCr, resistor wire	c		• •	-		-	. W			• F		в.	•	• • •	R -	-						· ·
PAS-RES-MA-02 Change of material compc	Son - InkWire material of Terminal element P	P Change of Ink / Wire material	e.g. AgPd paste, Ag paste, lead wire , NCr for side termination	в		• •	-		-	. w			• F		в.	•	•	R -	-		•				•
PAS-RES-MA-03 Change of material compt	tion - Package/ Mold P	P Charge of Package	e.g. for chip res.: final costing, epoxy	в	• •	• •		• • •	•	• •	• • •		• •			•		R -							
PAS-RES-MA-04 Change of material compo	tion - Passivation P	P Charge of Passivation /Inner protection	e.g. charge of glass	c	· · ·	• •	-	• • •			• • •		•	•	•	-		R -	-	Ν -		•	1		-
PAS-RES-MA-05 Change of material compo	tion - Substrate mathelal P	P Change of substrate material P Change to a new or additional material	a a for 2nd scena runn	с с											B -	-				· ·		÷			
Charge of supplier of main	· .	* supplier at component manufacturer.	* + -3r and source purpose	-		•		• • •		• •	• • • • •	•	• • •		· ·		للغله	<u> </u>		<u>- 1 -</u>		-			•
PAS-RES-DE-01 Changes of termination, as PAS-RES-DE-02 Changes of inner constru	face finish, shape, color, appearance or dimension structure	P Charge of package P Charge of passivation/inner protection	e.g. change of glass, laquer, eposy,	BC		: :	-	• • •		• •						•		R -	-	 N -		· ·			
PROCESS			e.g. charge of fring profile					_				_			-	-					-				
PAS-RES-PR-01 Changes in process lector	bgy or manufacturing methods - Ink Fire -	P Change of ink fire process	e.g. change from normal atmospher to nitrogen atmospher	c	•	•		• •		• R	· · ·				в .	•		· ·	-	· ·		· ·		· ·	•
PAS-RES-PR-02 Changes in process lectro PAS-RES-PR-03 Changes in process lectro	ogy or manufacturing methods - Ink Print . logy or manufacturing methods - Trim -	P Charge of tim process P Charge of tim process	e.g. charge from mill trimming to laser trimming	c						- R			•		в .	к -		N							:
PAS-RES-PR-04 Changes in process laches DaS-RES-RR-05 Changes in process laches	bgy or manufacturing methods - Lead Form -	P Charge of lead form process	e.g. charge from bending to punching e.g. chip resistors: electroplating process	8											в.			<u></u>		N -					
PAS-RES-PR-06 Changes in recome factor	ay a manufacturing methods - Marking	P Chance of marking process	e.g. weiding of leads for through put devices.	в																					
PAS-RES-PR-07 Changes in process lecter	isgy or manufacturing methods - Molding	P Charge of molding process		в	• • •	•••		• • •	•	• •	• • •		• •			•		R -	•	· ·				<u> </u>	-
PACKING / SHIPPING -	EW MATERIAL, ORTICAL DIMENSIONS	r Variation within process specification.	Is g. process control														جنفيه							فيلغه	
PAS-RES-PN-01 Packing / shipping specific part.petr.ph.01	tion charge (losening of tolerances) P	P Change of packing specification.	e.g. number of pieces on real. e.g. change of MSL	8														<u></u>				: : :			
PARLIER, DAUD		P Channa of coming	e.g. change in dry pack assurance (HIC, MBB) e.g. change by material	8																					
PACKING / SHEPPing -	ISUAL INSPECTION	Change or camer	e.g. charge by geometry.																						
PAS-RES-PV-01 Change of labeling	1	P Charge of labeling, also on real.	(i) e.g. additional information (RoHG stamp) (P) e.g. charge of cuatomer specific information	в			-		-							-	/				·				-
PAS-RES-PV-02 Change of product markin		P Marking on device.	e.g. change of content of marking e.g. change of method of marking	в																					
		Charge in packing specification which	e.g. change of appearance of marking e.g. change of documentation in packing																						
Charge or packing shippin	P	 does not osscriped a change of dimensions or material of the packing. 	specification														للنام							<u>نا ا</u>	
Deviction from	presided which uses a different technylow or which due to its a	Change in process technique which is n already covered shows	of e.o. new equipment supplier with different																						1
PAS-RES-EQ-01 Production from a new equi	ected to influence the integrity of the final product P	P Note: Changes affecting the product no covered by the table require also a PCN	concept	c		•		• • •					• •		8 -			· ·		· ·		: i			•
PAS-RES-EQ-02 Production from a new equipment or extension of	prestition which uses the same basic technology (replacement earling equipment pool)	P PCN required for dedicated equipment for sensitive component production.	 a additional equipment to increase production capacity a preplacement of same equipment 	c	• • •		-	• • •	-				• •	- 1	в.	-					·				•
PAS-RES-EQ-03 Change in final test equipr	ent type that uses a different technology P	P PCN required for dedicated equipment for sequence for dedicated equipment	e.g. change of leater platform	c	• • •		-				· · ·				в -	-	I	· ·	-	· ·	•	• •	•	· •	• •
LOGSTICS / CAPACITY /	TESTING - PROCESS FLOW	for sensorie carameters.	1				1 1					-		1 1		_				_				هزواه	1 1
PAS-RES-PF-01 Manufacturing alle transfer	or movement of a part of production process to a different location/sile P	P P Change of manufacturing alls. Note: Reorganization inside one plantistic is not affected	Movement or transfer of manufacturing sile or process step(s) to a different location/sile.	8	• • •	• •	-	• • •	•	• •	• • •	•	•••	•	в -	•	•	R -	-	Ν -	·	• •	· ·	•	•
PAS-RES-PF-02 Elimination or addition of a LOQUETICS / CARACITY	restructuring process shep .	P Change of manufacturing process sequence.	e.g. seathing / cleaning process e.g. change of order of processes	c	• • •	• •	-		•					•	в.	-			•				·		•
PAS-RES-QG-01 Change of text coverage u elementation/addition of elec monitoring procedure or a	ed by the supplier to ensure data sheet compliance (e.g., ical measurement/set flow block, nelaoston/enhancement of	P Change of test coverage.	 e.g. charge from 100% to sample inspection e.g. test flow block, reduction from three to two temperature measurements e.g. charge in burn inhum in process. 	c	• • •				-							•	•		•		•		•	•	- R P
ANY							1											_				_			1
PAS-IND-AN-01 Any change with impact or PAS-IND-AN-02 Any change with impact or the matrix below.	special canoner characteristics/contractual agreements P processability/manufacturability at customer, which is not covered in P	P P	Not reevent for technical evaluation. Technical interface means component terminals.	в															-						
DATASHEET DATASHEET PAS-IND-DS-01 Diange of datasheet para specification	elensielectical specification (min/max/lyp. selses) and / or ACIDC p	P Change of application relevant.	e.g. tighten of electrical parameter distribution	A Bisk assessment depending on change for each application.			-		-							-			-					•	
		No technical change of the product, only correction in description (wording,																							
		and the second s	a citate sheet connection because of new													-	I				4 . 17				-
PAS-IND-DS-02 Correction of data sheet	1	P (7:1: in case of editorial changes. (7: in case of impact on product integrity.	information about component behavior	^																	\square		+		

				1 1			-			1 1 1		1 1	1 1	_							
	PAS-IND-MA-01	Change of material composition - Bobbin Material	P P ("Spulerköper") typically made by plastic	e.g. charge from Thermoset to Thermoplastic	в		-		•	• • • •		-				-					-
INDUCTORS			raterial				_												_		
	PAS-IND-MA-02	Change of material composition - Core Material	P P Charge of core material, which is material with magnetic function	e.g. change from NZh into MhZh	A		-	· · · ·	•		· · · ·	-	- B •						-		•
incourtered				a a site insulation insulation taxes																	
INDUCTORS	PAS-IND-MA-03	Change of material composition - Insulation Material	P P Charge of insulation material	e.g. change from Polyurethane to Polyamide	c		-	· · · · · · ·	•	· · · ·	• • •	A	- в •	-		-					-
	DAS IND AND OF	Change of material composition - Law! Material	P P Channe of least material	e.g. change from tin coverd to non-coverd lead	в				•				•	•	•						
INDUCTORS				material	-		_													-	
																					mechanical stress distribution
	PRO-IND-MA-CO	Unange or material composition - Noid Compound	P P Charge of hold compound material	e.g. change to green mold	•		-		•	· · · ·		-	· • •	-							 changes. ACJ, were soldering and board coaling has to be assessed.
INDUCTORS							-		-												MSL might change.
	PAS-IND-MA-05	Change of material composition - Solder Material	P P Charge of solder material at internal	e.g. change of SnAgCu composition	в		-		•			-	• • •	•	• • •	-					-
INDUCTORS			Contraction.																		
	PAS-IND-MA-07	Change of material composition - Wire / Foil Material	P P Foll for multilever inductors.	e.o. change of Gu composition	8							А	. в .		•						
INDUCTORS			electrode).		5				-											-	·
																					Considere in case of core-core due
	PR0-IND-MA-08	Unange or material composition - Gase	P P Charge or gue material	e g. change from gue A into gue b	c		-		•		• • •	-	• • •	-							the air gap.
			Characteria a second and different and sold										-								Assumption material specification
	PAS-IND-MA-09	Change of supplier of material	 P suppler at component manufacturer. 	e.g. for 2nd source purpose	c	• • • •	-	•••	•	• • • •	· · ·		. в.						-		 remains unchanged. Otherwise see change of material.
INDUCTORS									-												
	PAS-IND-MA-10	Change of material composition - Polling Material	P P Change of polling material	e.g. change from eposy reain to silicon	C A If influence on other connections on PCB or laquer expected.	•		· · · ·	•	• • • •	• • •		• B ·								•
INDUCTORS		05321																			
incourtered			Material without magnetic function													1 1					
INDUCTORS	PAS-IND-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Bobbin	 P ("Spulerkörper") typically made by plastic material 	e.g. construction / dimension change of bobbin	в		-		•	• • • •		•	· • ·	-							•
	PAS-IND-DE-02	Changes of termination, surface finish, shape, color, appearance or dimension situature -	I P Charge of lead/terminals	e.o. change from PTH terminals to SMD terminals					•	• • • •	• • •	•	• • •	•	• • •						 Effect regarding EMC relevant for high
INDUCTORS		LeadTerrinols			^		_						-		-					-	 frequency only.
	PAS-IND-DE-03	Changes of termination, surface finish, shape, color, appearance or dimension abucture - Mold	P Charge of mold	e.g. new mold material with different colour	в			• • • • •	•	• · • •		-	. в .								 Parameter Analysis only for components where mold material has
INDUCTORS																					magnetic function
	PAS-IND-DE-04	Changes of inner construction - Core Construction	- P Charge of core construction, which is	e.g. change fromdrum core & shield core into pot	A		-		•	• • • •	• • •	-	- в -	-		-					•
140001000	045 BD 05 05		0	e.g. site insulation, insulation tapes,																	
INDUCTORS	PAPINO LE 10	unanges u vivel construction - insussion by sent	- P Unange or insulation system	e.g. change from Polyurethane to PTFE (Tellon)	~		-		•			^	° .							-	
	PAS-IND-DE-05	Changes of inner construction - Wire / Foil Convinction	- P Change of size / foil dimension-	way wange from round cross section to rectangular cross section	в					• • • • •			- B								•
		and get a company where a second state of the second state states	- Change of Mark / Not Galler/2012	e.g. from single wire to 82 wire	-																
NO CTOPS	PAS-IND-DE-07	Changes of termination, surface finish, shape, color, appearance or dimension structure - Polling Internal	I P Change of potting dimension	e.g. change of polling (filling) height	C If data about is affected (PAS-IND-DS- 01)				•	• • • •	• • •	- T	- в -	-		- T					•
INDUCTORS		PROCESS			12.2				_												-
																					Mechanical damage of wire,
	PAS-IND-PR-01	Changes in process lechnology or manufacturing methods - insulation Ship	- P (Mechanical) removal of insulation.	e.g. change from mechanical removal to laser removal	в	• • • • •	-	•	•	· · · ·	• • •	-	• • •			-				· ·	 Impact on solderability in case of shipping process is affecting soldering
INDUCTORS																					2763.
INDUCTORS	PAS-IND-PR-02	Changes in process lechnology or manufacturing methods - Lead Prep. / Plating	- P Charge of lead prep. / plating	e.g. charge from hot dip tinning to electropiating	в	• • • •	-		•	· · · ·	• • •		• • •	•	• • •	-				• •	 Influence regarding reliability of solder joint.
	Design of the	Channel in second hadronics on second states at the second states of	D Connection of wire terminal and / ~	e.g. chanle from Manual winding to Semi-automic-	<u>,</u>																a human at an initial second
INDUCTORS	PR0-IND-991-03	Changes in process technology or manufacturing methods - Terminal Attach	 P connection of termination to core/bobbin. 	winding (winding of wire on terminal)	c	• • • •	-		•	· · · ·	• ^ •	-	• • •	-						•	 Increase of contact resistance.
	PAS-IND-PR-04	Changes in process lechnology or manufacturing methods - Marking	. P Charge of marking process	e.g. change from ink marking to laser marking	в	• • • • •	-		•	· · · ·		-				-			-		-
incourtered	PAS-IND-PR-05	Operation in success inclusions on succeeduations and solar	R Create of antifere array	e.g. change from one component molding to two									. B .								_
INDUCTORS		Charges in process accreacy or management and mentals - mounty	· · · Charge of Housing process	component molding (other technology needed)	5		_		-										_	-	
INDUCTORS	PAS-IND-PR-05	Changes in process technology or manufacturing methods - Soldering Internal Connections	. P Charge of soldering internal connection	e.g. change from not sp shring to resistance welding	в	• • • •	-		•	· · · · ·	• • •	-	• • •	•	• • •				-		-
NO ICTORS	PAS-IND-PR-07	Changes in process lechnology or manufacturing methods - Winding Insulation	. P Charge of winding - insulation	e.g. change from manual to automatic process	в	• • • • •	-	· · · ·	•			A	- в -	-		-					-
	PAS-IND-PR-08	Damas in rencass inclusions or manufacturing methods - Working Was	P Channe of windows - wine	e.g. change from semi-automatic winding to full	c								. B .								•
INDUCTORS			. ,	automatic winding	ç		_						-							-	
	PA5-IND-PR-09	Process integrity: tuning within specification	 P Variation within process specification. 	e.g. process control	c		-		-			-				-			-	· ·	
	PAS-IND-PR-10	Changes in process lechnology or manufacturing methods - Poting	. P Charge of poting process	e.g. change from manual potting process to	c	• • • • •		· · · ·	•	• • • •		-									-
INDUCTORS		DECORPTION AND ADDRESS OF THE DECORPTION		automatic poting process	-		_					1 1							1 1		
INDUCTORS				[[-							1 1				<u>г г</u>		1 1			
INDUCTORS	PRG-IND-999-01	Packing / antipping specification change (loosening of lowrances)	P P Charge of packing specification.	e.g. number or pieces on ree.	в							-				-			-		-
	PAS-IND-PN-92	Dry pack requirements change	P P Charge of drugeck requirements.	e.g. charge of MSL	в							-									
INDUCTORS				e g. change in by pack assurance (rec., Mab)			_													_	
	PAS-IND-PN-03	Change of carrier (tray, reel)	P P Change of carrier	e.g. change by material e.g. change by geometry.	в				-			-		-		-					- ·
INDUCTORS		PACKING / SHIPPING - VISUAL INSPECTION		1																	
	DAT NO DUN	Owner divisities	I R Commentation day and	(8 e.g. additional information (RoHS stamp)	8																_
INDUCTORS	PAD IN PAD	Conde or assess	1 P Crange of abeling, and of real.	(P) e.g. charge of customer specific information	5		-					-							-		
	PAS-IND-PV-02	Change of product marking	I P Marking on device.	e.g. change of content of marking e.g. change of method of marking	в							-									
INDUCTORS				e.g. charge of appearance of marking			_												_	_	
	PAS-IND-PV-03	Change of packing/shipping specification	P P does not described a change of	e.g. change of documentation in packing		• • • • •						-									-
INDUCTORS			dmensions or material of the packing.																		
INDUCTORS		LOGISTICS / CAPACITY / TESTING - EQUIPMEMENT		I I				1 1 1 1	<u> </u>		T T T	1 1	- I I			r r	<u> </u>		1 1		-
		Production from a new equipment/loci which uses a different technology or which due to its unique	Change in process technique which is no already covered above.																		Test effort depends on final risk assessment.
	PRO-IND-ELD-01	form or function can be expected to influence the integrity of the final product	P P Note: Changes affecting the product not created by the table service also a PCN.	e g. introduction of poting process	c	• • • • •	-					-		-							Performance test according to affected
INDUCTORS							_												_	_	Test effect descends on Real side
	PA5-IND-ED-02	Production from a new equipment/loci which uses the same basic technology (replacement	PCN required for dedicated equipment	e.g. duplication of existing winding machine	c	• • • • •						-									. assessment.
INDUCTORS		weeksees or registeriou or essend editioneut bool)	tor senses component production.																		process change.
			Change of final test equipment which use																		
	PAS-IND-ED-03	Change in final test equipment type that uses a different technology	P P CN required for dedicated equipment	e.g. change of leater platform	c				1				- в -	1.1		-				· ·	Gage RSR / delta correlation
INDUCTORS		· · · · · · · · · · · · · · · · · · ·	for sensitive parameters.	l																	
INDUCTORS		LUXES IILS / CAPACITY / TESTING - PROCESS FLOW	Owned 1111	,				1 1 1 1	-		1 1 1		1 1	-				1 1		1	
	PAS-IND-PT-01	Manufacturing site transfer or movement of a part of production process to a different location/site	P P Note: Reorganization inside one	Movement or transfer of manufacturing site or process step/a) to a different location/site	в	• • • • •	-	• • •				-	- В -		• • •	-				• •	•
INDUCTORS			plantinite is not affected																		
	PAS-IND-PT-02	Elimination or addition of a manufacturing process step	- P Charge of manufacturing process assumed to the second	e.g. washing / cleaning process e.g. change of order of processes	c	• • • • •	-					-				-				· ·	 Characterisation depends on impact of production flow.
INDUCTORS																					
	PAS-IND-PF-03	Elimination of final electrical measurement / lest flow block	Peduction of final testing. P PCN required for dedicated final test	e.g. elimination of High-voltage measurement	c	• • • • •															Characterisation depends on impact of Institute from
INDUCTORS			reductions for sensitive parameters.																		sade sold now.
INDUCTORS		LOGISTICS / CAPACITY / TESTING - Q-GATE		1 1			-	1 1 1 1	-		1 1 1								1 1	_	
	Dist and of all	Change of test coverage used by the supplier to ensure data sheet compliance (e.g.,	R Commentional and an annual	e.g. charge from 100% to sample inspection e.g. lest flow block, reduction from three to two	6																R (electr. funct): test coverage.
NO CTOPS	Province-Glariti	monitoring procedure or sampling)	 Conseque on Matt COMPTAGE. 	temperature measurements e.g. change in burn initun in process.																	process.
CERAMIC / TANTALUM		CERAMC / TANTALUM			1		_							L							
CERAMIC / TANTALUM		ANY												_							
CERAMIC / TANTALUM	PAS-CER-AN-01	Any change with impact on special cuatomer characteristical/contractual agreements	РР	Not relevant for technical evaluation.	•		-					+ - T		-		1 - T					
CERAMIC / TANTALUM	PAS-CER-AN-02	the matrix below.	РР	Technical interface means component terminals.	8	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-							1.1		-				· •	•
CERAMIC / TANTALUM		DATASHEET		· · ·							1 1 1										
	PAS-CER-OS-01	Change of datasheet parameters/electrical specification (min./max./typ. values) and / or ACIDC	P P Information	e.o. lighten of electrical personalar distribution	A Risk assessment depending on change																
CERAMIC / TANTALUM		specification	Not included: Editorial changes.	······································	for each application.																
			No technical change of the product, only																		
	PAS-CER-OS-02	Convertion of data sheat	p drawing)	e.g. data sheet correction because of new																	
		and the second second second	 (i): In case of editorial changes. (P): In case of impact on product 	information about component behavior																	
CERAMIC / TANTALUM			integrity.																		
			Description of a new not previously																		
			No technical charge of the product.																		
	PAS-CER-OS-03	Specification of additional parameters	I P (0: no influence (P): Risk assessment depending on	e.g. adding new (lasted) parameter.	A	1 1 1 1 1	-					-		1.1		-					•
			change for each application to provide evidence of additional parameters (what	1																	
CERAMIC / TANTALUM			eakation)																		
CERAMIC / TANTALUM	DAT OF DATA AL	MATRAL		1				1 1 1 1			T . T . T										
CERAMIC / TANTALUM	PAS-CER-MA-02	Unange or material composition - Ceramic Binder	P P Binder material (ceramic) P P Binder material treater.	a a channe from any 1 in 2	C				-												
CERAMIC / TANTALUM	PAS-CER-MA-03	Change of material composition - Dielectric	P P Dielectric change (ceramic only)	e.g. change from ceramic A into ceramic B	c							•	- В	С							•
	PAS-CER-MA-04	Change of material composition - Electrode Atlach	p p Electrode attach (only tantal, glue, carbon, Act	e.g. change of Ag particle size in conductive	c		-				- C •	-	- B -	С	• • •	-					
CERNMIC / TANDALUM	PAS-CER-MA-05	Charges of material composition . Electrode Material	p p Electrode Material (only cetamic, inner	a or channe from analysis to fake share (M	c								. B .								
CERAMIC / TANTALUM		and the second sec	alchodel	- g g - rom specific to need maps (N parts)					-												Check whether ADI at Tier 1 can be
	PAS-CER-MA-06	Change of material composition - Encapsulation	P P Encapsulation	e.g. charge from eposy1 into eposy2	c		-	• • •	•	• • • •		-		1.1		-					affected
CERMIC / IANIALIM												. T				. T					

| > </th <th>1</th> <th>PASCERMAN</th> <th>Correction and a state</th> <th></th> <th>Charge to a new or additional material</th> <th> </th> <th>c.</th> <th></th> <th>• B .</th> <th></th> <th>• • •</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Assumption</th> <th>on material specification</th>
 | 1
 | PASCERMAN
 | Correction and a state | | Charge to a new or additional material
 | | c.
 | | | | | | | | | | | • B .
 | | • • • | | | | | | | | Assumption
 | on material specification |

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| No. Solution <t< td=""><td>CERAMIC / TANTALUM</td><td></td><td>Desizy</td><td></td><td>supplier at component manufacturer.</td><td>e.g. for 2nd source purpose</td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>change of</td><td>raterial</td></t<>
 | CERAMIC / TANTALUM |

 | Desizy | | supplier at component manufacturer.
 | e.g. for 2nd source purpose |
 | | | | - | | | | | | |
 | | | | | | | | | | change of
 | raterial |
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 | CEMME? PROLON | PAS-CER-OE-01

 | Changes of termination, surface finish, shape, color, appearance or dimension structure - Lead | I P | Learl damater
 | a o, channa from 0.8mm into 0.6mm | в
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 | CERAMIC / TANTALUM |

 | Danster
Danse of territories, soften finish share, color, annergane or dimension shortens, | |
 | e o channe in width of termination from 0.1.40 Term | -
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 | CERAMIC / TANTALUM | PASCEROLO

 | Termination Area
Changes of termination, surface finish, shape, color, appearance or dimension structure - | I P | Herrisrapon anea
 | inb 0.2 - 0.4 mm | 8
 | | • | | - | | | | - | | |
 | | | - | | - | - | | | | -
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|
 | CERAMIC / TANTALUM
CERAMIC / TANTALUM
 | PAS-CER-CE-04
 | Termination Interface
Ohanges of Inner construction - Electrode Thickness | - P | Electrode thickness (ceramic only)
 | e.g. N layer change from 2.5µm into 3.5µm | c
 | | | | - | | | | 1 | | • | - B -
 | | | | | - | - | - | - | |
 | |
| Image: state
 | CERAMIC / TANTALUM | PAS-CER-DE-05

 | Changes of inver construction - Layer Thickness | - P | Layer thickness (delectric thickness)
 | e.g. Ceramic layer thickness changes from 3µm into
5µm. | с
 | | | • • | • | | - | • • • | • | · · • | • | - в - | | - c -
 | - | | | | - | | | - |
 |
| And <th< td=""><td></td><td>PAS-CER-DE-05</td><td>Changes of inner construction - Number of Layers</td><td>- P</td><td>Number of layers (ceramic only). Always
in combination with PMS/CERUCE/05</td><td>nee also layer thickness</td><td>с</td><td></td><td></td><td>- C</td><td>c</td><td>. c c</td><td></td><td>с</td><td>с</td><td> c</td><td>с</td><td>- B,C -</td><td></td><td>. с.</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>
 | |
PAS-CER-DE-05
 | Changes of inner construction - Number of Layers | - P | Number of layers (ceramic only). Always
in combination with PMS/CERUCE/05
 | nee also layer thickness | с
 | | | - C | c | . c c | | с | с | c | с | - B,C -
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 | CERAMIC / TANTALUM
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| No. <td< td=""><td>CERAMIC / TANTALUM</td><td>PAS-CER-PR-01</td><td>Changes in process technology or manufacturing methods - Dicing</td><td>- P</td><td>Charge of dicing</td><td>e.g. charge from cutting to sawing</td><td>c</td><td></td><td>• • •</td><td>• •</td><td>-</td><td>• • •</td><td>•</td><td>• • •</td><td>•</td><td></td><td>•</td><td>· B ·</td><td></td><td>- C -</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>
 | CERAMIC / TANTALUM |
PAS-CER-PR-01
 | Changes in process technology or manufacturing methods - Dicing | - P | Charge of dicing
 | e.g. charge from cutting to sawing | c
 | | • • • | • • | - | • • • | • | • • • | • | | • | · B ·
 | | - C - | - | | | | | | |
 | |
| And Processing an
 | CERAMIC / TANTALUM | PRO-CER+PHR2

 | Changes is process technology or manufacturing methods - Electrode apply | - P | Electrode apply (dielectric layer process)
 | e.g. change from wet to dry process | c
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| 1 1 2 </td <td>CERAMC / TANTALUM</td> <td>PAS-CER-PR-03
PAS-CER-PR-04</td> <td>Changes is process technology or manufacturing methods - Firing
Changes is rescass technology or manufacturing methods - Lamination</td> <td>- P</td> <td>Charge of firing profile
Charge of lamination / press techingue</td> <td>e.g. separation of decarbonization and firing profile.</td> <td>c</td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>•</td> <td>- в -</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td>-</td> <td></td> <td>-</td> <td>-</td> <td></td>
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| And a
 | CERAMIC / TANTALUM
 | PAS-CER-PR-06
 | Changes is process technology or manufacturing methods - Screening Printing | - P | Charge of screening / printing
 | e.g. change from screen printing into offset printing | c
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| Alt <th< td=""><td>CERAMIC / TANTALUM</td><td>PAS-CER-PR-07</td><td>Changes in process technology or manufacturing methods - Termination</td><td>- P</td><td>Change for termination preparation like
plating or apply of termination base layer.</td><td>e.g. change in plating technology (final termination)
e.g. change from dp in paste to plating (apply)</td><td>в</td><td></td><td>• • •</td><td>• •</td><td>•</td><td>• • •</td><td>•</td><td></td><td>•</td><td>• • •</td><td></td><td>• B -</td><td>•</td><td>• • •</td><td>-</td><td></td><td></td><td></td><td>-</td><td></td><td></td><td>-</td><td></td></th<>
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 | CERAMIC / TANTALUM
 | PAS-CER-PR-08
 | Process integrity: tuning within specification | • P | Variation within process specification.
 | e.g. process control | с
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| Matrix
 | CERRARC/ DAVIALON | PAS-CER-PN-01

 | Packing / shipping specification change (losening of blerances) | P P | Charge of packing specification.
 | e.g. number of pieces on reel. | в
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| And a
 | CERAMIC / TANTALUM
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 | e.g. change of MSL |
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| And And <td>CERAMIC / TANTALUM</td> <td>PAPERT NU</td> <td>Lry pack requirements change</td> <td>PP</td> <td>Charge of drypack requirements.</td> <td>e.g. change in dry pack assurance (HIC, MBD)</td> <td>в</td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td>
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 | Lry pack requirements change | PP | Charge of drypack requirements.
 | e.g. change in dry pack assurance (HIC, MBD) | в
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 | CERAMIC / TANTALUM
 | PAS-CER-PN-03
 | Change of carrier (tray, reel) | P P | Charge of carrier
 | e.g. change by material
e.g. change by geometry. | В
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e.g. charge of content of matting</td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>-</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td>-</td><td></td></th<>
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e.g. charge of appearance of marking</td><td>в</td><td></td><td>10 C</td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>-</td><td></td><td></td><td>-</td><td>-</td><td></td><td></td><td>-</td><td></td></t<></table-container>
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 | PAS-CER-PV-03
 | Change of packing/shipping specification | р р | Change in packing specification which
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 | e.g. change of documentation in packing |
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 | specification |
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 | PAS-CER-EQ-01
 | Production from a new equipment/loci which uses a different technology or which due to its unique
form or function can be expected to influence the integrity of the final product | P P | already covered above.
Note: Changes affecting the product not
 | e.g. change from wet to dry technology. | с
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 | | PAS-CER-EQ-02

 | Production from a new equipment/loci which uses the same basic technology (replacement
equipment or extension of existing equipment pool) | - P | PCN required for dedicated equipment
for sensitive component production.
 | e.g. elmination of manual handling processes | с
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 | | PAS-CER-EQ-03

 | Change in final test equipment type that uses a different technology | р р | different technology.
PCN required for dedicated equipment
 | e.g. change of leater platform | с
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plantisite is not affected!
 | process step(s) to a different location/site. | в
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 | Elimination or addition of a manufacturing process step | . Р | Charge of manufacturing process
 | e.g. washing / cleaning process | с
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	PAS-FLM-PR-04	Process integrity: Junio within specification	Р	Variation within process specification.	e a process control	с						-																			
Film capacitors		PACIONS / SHPPING - NEW MATERIAL, CRITICAL DIMENSIONS											_	-																	
Dim canadiana	PAS-FLM-PN-01	Packing / shipping specification change (losening of tolerances) P	Ρ	Charge of packing specification.	e.g. number of pieces on real.	в		1. A.	1.1		-			-	- F																
r ini capacita i					a o, charge of MSI																										
Film capacitors	PAG-FLM-PN-02	Dry pack requirements change P	Р	Change of drypack requirements.	e.g. change in dry pack assurance (HC, MBD)	в		1.1	1.1		-			-	-				1.1						1.1	-				1	
	PAS-FLM-PN-03	Change of carrier (bay, reel)	Р	Charge of carrier	e.g. charge by material	в																									
Film capacitors			_		e.g. charge by geometry.																			1 1							
r in capacita i		PROVAL APPRIAT * VICE DAPECTOR	1	1	1		1								<u> </u>									<u> </u>		1			1 1		
	PAS-FLM-PV-01	Change of labeling	Р	Change of labelling, also on real.	(8 e.g. additional information (RoHS stamp)	в																				-					
Dim canadiana					(P) eg. crange of camping specific monitories																										
			-		e.g. charge of content of marking	-																									
Film capacitors	PAPPENPPA	Cardeo boost amend	P	Marking on one ce.	e.g. charge of appearance of marking	•			1.1																	-				-	
	DAS-ELM-DV/23	Construction of the second sec		Charge in packing specification which	e.g. charge of documentation in packing																										
Film capacitors		Cargo o procignitição processos		dmensions or material of the packing.	specification								-			-							-			-					
Film capacitors		LOGISTICS / CAPACITY / TESTING - EQUIPEMEMENT		1			1			- r	-			-1				- r - r						т т				r - r			
		Deviction from a new environmentional which uses a different technology or which due to its unique		Change in process technique which is no shareful covered shows	at																									Test of	fort depends on final risk
	PAS-FLM-EQ-01	form or function can be expected to influence the integrity of the final product	P	Note: Changes affecting the product not	e.g. implementation of new machines	с		• •	1.1	•		•	• •	•	•	• •			• •	- в		• •				-				Perfor	mance test according to affected
Film capacitors			-	Contractory and data require and a P Cit						_			_	_							_		_						_	proces	is crange.
	PAS-FLM-EQ-02	Production from a new equipment/loci which uses the same basic technology (replacement	Р	PCN required for dedicated equipment	a a selection of existing methic caractly	c										• •				- в		• .									mont depends on miss rak
Film capacitors		equipment or extension of existing equipment pool)	1	for sensitive component production.		-																								Perfor	mance test according to affected is change.
				Charge of final test equipment which use																											
	PAS-FLM-EQ-03	Change in final test equipment type that uses a different technology P	Ρ	PCN required for dedicated equipment	e.g. charge of tester platform	с		1. A. S.	1.1											- B						-				• Gage I	R&R / delta correlation
Film capacitors			-	for sensitive parameters.																				1 1							
r in capacita i		Constrain Connect 11 Restrict - Process Poor	1	1	1		1								<u> </u>									<u> </u>		1			1 1		
	PAS-FLM-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	Р	Charge of manufacturing site. Note: Reorganization inside one	Movement or transfer of manufacturing sile or movement elements in a different location/sile	в		• •		• •		•	• •	•	•	• •	• •	• •	• •	• B	• •	• •				-			•	•	
Film capacitors				pareus a no anicad																											
	PAS-FLM-PF-02	Elimination or addition of a manufacturing process step	Р	Change of manufacturing process	e.g. washing / cleaning process	с		• •																						• Chara	clarisation depends on impact of
Film capacitors	-		4	mquend.	wig unange of order of processes		-						_										_	1		_				produc	and the second
T III CIÇACIXI		COMPACT PROPERTY INSTANCE OF A COMPACT OF A	1		e.g. charge from 100% to sample inspection						1 1													1 1		1					
	PAS-FLM-QG-01	 Course or was Contrage used by the support to ensure data sheet compliance (e.g., elimination/addition of electrical measurement/test flow block, relaxation/enhancement of antibiotic second as a second-or 	Р	Charge of test coverage.	e.g. test flow block, reduction from three to two temperature measurements	с		1 A 1			-	-			-									-						- R (elec	ability) only for change in burn in
Film capacitors	-	ervered hingegrad ou muchaudh	1	I	e g. charge in burn inhun in process.																			1 1						proces	
QUARTZ CRYSTAL / SAW		DUARTZ CRYSTAL / SAW							_					_			_	_	_				_			_					
CUARTZ CRYSTAL / SAW	PAS-QUA-AN-01	Any change with impact on special customer characteristics/contractual agreements P	Ρ		Not relevant for technical evaluation.	•					- I													1 - 1						- 1	
	PAS-QUA-AN/72	Any change with impact on processability/manufacturability at customer, which is not covered in	Р		Technical interface means common termining	в																									
QUARTZ CRYSTAL / SAW		Permits below.	1.	l	the second se	-	1						_											1 1							
GUNNEZ CRYSTAL / SAW			1	Charge of application relevant			L				1 1	1												1 1						1	
	PAS-QUA-OS-01	Linange or casasheet parameters/electrical specification (min./max./typ. values) and / or ACIDC perfication	Р	Information	e.g. lighten of electrical parameter distribution	A	resk assessment depending on change for each application.	1 A 1			-	-		-											· ·						
QUARTZ ORYSTAL / SAW			-	Not included: Lotoria changes.																											
				correction in description (wording,																											
	PAS-QUA-DS-02	Correction of data sheet	Ρ	(t): In case of editorial changes.	e.g. data sheet correction because or new information about component behavior	A			1.1																	-			-	- C	
QUARTZ ORYSTAL / SAW				(P): In case or impact on product integrity.																											
				Description of a new not previously																											
				covered parameter. No technical change of the product.																											
	PAS-QUA-05-03	Specification of additional parameters	Р	(R: no influence (P): Risk assessment depending on	e.g. adding new (leated) parameter.	A			1.1																	-			-	- C	
				change for each application to provide evidence of additional parametes (stat.																											
QUARTZ ORYSTAL / SAW				evaluation)																											
QUARTZ ORYSTAL / SAW		MATERIAL	-			-							-	-									-				-				
CUMPTZ CRYSTM (SAW	PAS-QUA-MA-01	Change of material composition - Quartz Blank P	Ρ	A change of Quartz Blank is a wry rare case. Mainly for SAW-Filter		A		- ·	•	• •			· •	-	-		• •	•	•	- B	•		· ·			-			-	- C	
	DAS-CUMMAN2	Charges of material composition - Ease	D	Charming of the material of the base	a a channe from caramic in anyon																									O0 ma	y be influenced
QUARTZ CRYSTAL / SAW	PAPELONIA A	P	P	changing of the reasons of the table.	e g charge nonceranic o spory	~		· ·			-	-			-							•				-				may cl	hance
QUARTZ CRYSTAL / SAW	PAS-QUA-MA-03	Change of material composition - Lead / Termination P	Ρ	Charge of Lead/Termination	e.g. charge of plating finish. (eg:Au, AgPid,Sn)	в		• •	•	•		-		•	•	• •		• •		• B	•	• •			• •	-			-	-	
CUMPTZ CRYSTM (SAW	PAS-QUA-MA-04	Change of material composition - Sealing P	Ρ	Charge of Glass Seal	e.g. charge to lead free glass	в		· ·	•	• •	•	•	• •	•		• •	• •	• •	•	- B	•	• •			•	-			-	 X-Ray when a 	inspection may be influenced sealing is containing Pb
	PAS-QUA-MA-05	Change of material composition - Can / Cap P	Р	Changing of the material of the can/cap	e.g. charge from metal to ceramic material	A			•			•		•	•		• •		•	- B					• •						
QUARTZ CRYSTAL / SAW	Diff Can be of	Construction and the Rest Const		Channel Bank Dormal	e.g. charge of glue (Silicone to Epoxy)							Y	× .							. B					Y .						
QUARTZ ORYSTAL / SAW	PAS-QUA-MA-06	Change of maserial composition - paark support	P	Charge of bank support	e o, change metal holders (old trops)	Ľ.					-			-		-										-				- Decti	cal function effected in case of
	DAS-CURAMANT	Darve of material compation - Dermit		Channe of Desmoid	e.g. change to green mold compound															. в										mecha ACL a	nical stress distribution change.
					e.g. charge of filer particles	5														-										has to	be assessed. MSL might be
QUARTE DRISTAL / SAW				Channe of Case Sealors, Channe of																										Charge	-
	PAS-QUA-MA-08	Change of material composition - Case Sealing P	Р	material for seam welding Delevant for components with caracter	e.g. charge from solder paste to adhesive give	с		- ·	•			Y	•	•			• •	• •	•	- B	•					-			-	- Imped	ance my be influenced.
QUARTZ CRYSTAL / SAW				base and metall cap.																											
	PAS-QUA-MA-09	Change of material composition - Electrode P	Р	Change of Electrode material on crystal Nerk	e.g. change from Au to Ag	с		- ·	•			Y	Y •			- Y		• •	•	- B						-					
QUARTZ CRYSTAL / SAW				Charge of Insulator.																											
	PAS-QUA-MA-10	Change of material composition - Insulator P	Р	Only for leaded types Not relevant for typical SMD.	e.g. meuesing plate under crystal e.g. Glass sealing for leads	в		•	•	• •	•	•	•	•	•	•	•	• •	•	- B	• •									-	
SAMOZ LIKTOTAL I SAW	Designation of	Dama of material commution - Median		Channe of marking metanical	e.g. charge of ink	Р																									and recemend
QUARTZ CRYSTAL / SAW	- nmam10-11	P P	1 "		e g. chemical to environmental triendy	•							-										-	1						ALL C	wine reducial and off-orders
	PAS-QUA-MA-12	Change of supplier of material -	Ρ	Charge to a new or additional material supplier at component manufacturer.	e.g. for 2nd source purpose	с		1 A 1			-	-									-					-				- remain	a unchanged. Otherwise see
CUARTZ CRYSTAL / SAW		DESIGN	·											-									_							crang	e or small it.
	PAS-QUA-DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Resea	Р	Charge of Base design	e g. due to miniaturization purpose.	в						•	• •		•		• •		•			•				•				-	
QUARIZ CRYSTAL / SAW		Common d'Américana antes faith deux antes	1	Charge of Lead/Termination desire	-																									0	y be influenced
CI METZ CRUSSIN COM	PAS-QUA-DE-02	Linanges or semination, surface finish, shape, color, appearance or dimension situature - Lead / Termination	Ρ	Change geometry or terminal pad or lead	d e.g. change lead design to improve reliability.	в		•	1.1	•	-	-		•	•	•	• •	• •		• B	•	• •			•					- Relabi	lly of solder joints may be ed
And Anna Anna IAL I SAM	PAS-QUADE-IN	Changes of lemination, surface finish, shape, color, appearance or dimension situcture - Can /		Change of Can/Can desires	e.o. due to ministurization runnee															- B											
QUARTZ CRYSTAL / SAW		Lup 1	+÷																											Derti	cal function affected in case of
	PAS-QUALITE AN	Changes of termination, surface finish, shape, color, appearance or dimension structure -	Р	Charge of Package (Molded). Charge the design of the perkinen	e.g. change from welded device to glued device	в					•				•				•	- В		• .			• .					- MC -	nical stress distribution change.
CUMPTI CRUSSING CRUSS		Package	1.	Not relevant for typical SMD.	(case sealing)																									has to	be assessed. MSL might be
And Anna Anna IAL I SAM		Charges of largeringing, surface fields share, only	1	Charge of Insulator design.	1																									cally	
CUMPTI CRISTIN (SHI	PAS-QUA-DE-05	Insulator	Р	Only for leaded types (old technology) Not relevant for typical SMD.		в		•		• •	•	•	•	•	•	• •	•	• •	• •	- В	•									-	
	PAS-QUA-DE-05	Charges of inner construction - Quartz Blank	Р	Charge of Quartz Blank design	e.g. change dimension of blank, add phase,	с											• •	• •	• .	- B	•									-	
QUARTZ CRYSTAL / SAW			11		e.g. charge design of glue shape							×	×												×						
QUARTZ CRYSTAL / SAW	HAS-QUA-DE-07		Р	unarge of Blank Support design	e g. charge design of metall supporter	c				• •	-		•				• • •	• • •	· · ·		•			1 . 1	1 1						
QUARTZ CRYSTAL / SAW	DAT OUR DE OL	PROCESS		Owner of Carola Bank source	and a design of an internal horizon backers'	6	1				1			1.							1.			1					1		
QUARIZ CRYSTAL / SAW	PAPQ049901		r.	Course of Quarty Dank process	way wanty of cuting or apping seconology	· ·														- D	-									-	
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-02	Changes in process technology or manufacturing methods - Blank Eliching / Geaning	Р	Using different / new technology	e.g. change from liquid etching to plasma etching	с		•			-	-		-	•	1.1		•	•	- B	-				1.1					-	
	PAS-QUA-PR-03	Changes in process technology or manufacturing methods - Dectrode Formation	Р	Charge of Electrode Formation provises	e.g. change from exporation to southering	с												•	•	- в										-	
QUARTZ CRYSTAL / SAW		· · · · · · · · · · · · · · · · · · ·	+ ·			-																									
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-OI	Changes in process lechnology or manufacturing methods - Trimming -	Ρ	unange of Auto Trim process (Method of final frequency tuning)	e.g. charge from exporation to ion beam	с		•	1.1		-			-		· ·	• •	•	•	- B	•									-	
	1			Charge of Blank bonding / annealing																											
	PAS-QUA-PR-05	Changes in process technology or manufacturing methods - Bonding / Annealing -	Р	process. Change of method how apply conductive material to base or blank		с		•	1.1	• •	•	Y	Y •	-			• •	•	•	- В	•				Υ.	1				-	
QUARIZ CRYSTAL / SAW			-	Channel Contra 1 1	e.g. charge of the sealing method	6						~																			
QUARTZ CRYSTAL / SAW	-Ab-Quin-PR-05		1 "	crossige or capican attaching process	e.g. charge from batch own to reflow oven	c				•				•			• •	•		. в	•			<u> </u>							
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-07	Changes in process technology or manufacturing methods - Molding -	Ρ	unarge of Overmolding process. Not relevant for typical SMD.	e.g. change of overmold process parameter	с		• •	1.1	• •	•	•	• •	•	•	•	• •	•	•	- B	•	•			· ·			· · ·		-	
	PAS-QUA-PRIM	Changes in process technology or manufacturing methods - Marking		Change of Marking recome	e.g. charge from inked marking to later marking e.g. marking of pin 1	Р																									wok recessary
QUARTZ CRYSTAL / SAW			1	gen and an and process	e.g. charge of appearance (additional marking)	•							_						_												,
QUARTZ CRYSTAL (SAM	PAS-QUA-PR-09	Changes in process technology or manufacturing methods - Aging -	Ρ	Change of Aging process. Typically no aging done on quartz crystals.	If aging is done: e.g. change of times or temperatures	с		•		• •	-	-					• •	• •	• •	- B	•					-				-	
QUARTZ CRYSTAL / SAW	PAS-QUA-PR-10	Process integrity: luning within specification	Р	Variation within process specification.	e.g. process control	с					-	-		-	- I									-						-	
QUARTZ CRYSTAL / SAW		PADIONG / SHIPPING - NEW MATERIAL, ORTICAL DIMENSIONS	-		1		-						-					_	-				_			-	-		_		
	PAS-QUA-PN-01	Packing / shipping specification charge (loosening of tolerances) P	Ρ	Charge of packing specification.	e.g. number of pieces on real.	в		1. A.			-	-		-	-														-	-	
and the second se																					1.1										

		1	i r	1			1			-		-	1 1	1 1	- 1	1 1	<u> </u>	1 1	1	1 1	1	1 1	<u> </u>	1	1	- 1		1	1		1
	PAS-QUA-PN-02	Dry pack requirements change	Р	P Charge of drypack requirements.	e.g. charge of MSL e.g. charge in dry pack assurance (HIC, MSB)	в			- C					· ·	-		-				-										
CONCLUCTSING / SAW			-		e.o. change by material	-				-					-										+ +		-		-		
QUARTZ CRYSTAL / SAW	PAPGONTING	Charge of Carrier (14), real	P	p charge of carrier	e.g. charge by geometry.					1									- I		-		1.1					1 . 1			
QUARTZ CRYSTAL / SAW		PALADAS STIPPINS * VISIAL INFORMATION	<u>г</u>		L	1	1			1	ГГ	1	<u>1 1</u>	<u> </u>	Т		r r		1	1 1	1	T 1	<u>т т</u>	1	<u>1 1</u>	1	1	<u>1 1</u>	1	1	1
CUMPTZ CRYSTM / SAW	PAS-QUA-PV-01	Change of labeling		P Charge of labeling, also on reel.	(P) e.g. additional information (Horid stamp) (P) e.g. change of customer specific information	в			1.1					· ·	-		-				-										
					e.g. charge of content of marking																										
QUARTZ CRYSTAL / SAW	PAS-QUA-PV-02	Change of product marking		P Marking on device.	e.g. change of method of marking e.g. change of appearance of marking	в									-		-				-										
	Dist Clin Di (Cl	Course of contractivity international		Charge in packing specification which	e.g. charge of documentation in packing																										
QUARTZ CRYSTAL / SAW	PAPadit Pag	Condition beging index and in	P	dmensions or material of the packing.	specification	-									-		-														
QUARTZ CRYSTAL / SAW		LOGISTICS / CAPACITY / TESTING - EQUIPMEMENT	r r			-	1		_		r - r														1 1					r	1
		Production from a new equipment/bol which uses a different technology or which due to its unique		Charge in process technique which is not already covered above.	e. g. new equipment supplier with different process																										Test effort depends on final risk assessment.
	PAS-QUALD-01	form or function can be expected to influence the integrity of the final product	P	^P Note: Charges affecting the product not covered by the table require also a PCN.	concept			•							-		-				-									•	Performance test according to affected process change.
QUARTZ CRYSTAL / SAW																					-			-			-				Test effort depends on final risk
	PAS-QUA-ED-02	Production from a new equipmentitiool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	-	P PCN required for dedicated equipment for sensitive component production.	e.g. additional equipment to increase production capacity	с		•	- C								-													•	assessment. Performance test according to affected
QUARTZ ORYSTAL / SAW					e.g. replacement of same equipment				_	-		-									-	_		-			_		-		process change.
	Diff (1) 10 (2)	Please is first indexections has being a different indextory		Change of final test equipment which use different technology.	a a shares of bala shiften															в.											Case BER / data secondation
CUMPTI CRYSTM / SAW	-	Charge in this was equiption gips the lank a circle in an energy	·	PCN required for dedicated equipment for sensitive parameters.	e g change of anna partons																										Cargo Part I Gana Command
QUARTZ CRYSTAL / SAW		LOGISTICS / CAPACITY / TESTING - PROCESS FLOW					*																								
	PAS-QUA-PT-01	Manufacturing site transfer or movement of a part of production process to a different location/site	Р	P Note: Recramization inside one	Movement or transfer of manufacturing site or	в		• •									•	• .		в •										•	
QUARTZ CRYSTAL / SAW				plantialia is not affected	process single) to a constant boundaries.					-		-					-										_				
QUARTZ CRYSTAL / SAW	PAS-QUA-PF-02	Elimination or addition of a manufacturing process step	-	P Sequence.	e.g. charge of order of processes	с		•	1.1			-		* *	1		-				-								5 - F	•	production flow
QUARTZ CRYSTAL / SAW		LOGISTICS / CAPACITY / TESTING - Q-GATE	r r							-		-																1 1			
	QUA-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addition of electrical measurement/lest flow block, releasion/enhancement of		P Change of test coverage.	e.g. change from 100% to sample inspection e.g. lest flow block, reduction from three to two	с																									R (electr. funct): test coverage. R (reliability) only for change in burn in
QUARTZ CRYSTAL / SAW		monitoring procedure or sampling)			e.g. charge in burn inihun in process.	-																									process.
Al-Cap		Auminium Electrolytic Capacitor																													
Al-Cap	PAS-ALU-AN-01	Any change with impact on special customer characteristics/contractual agreements	Ρ	Р	Not relevant for technical evaluation.	•									-		-		-		-		-		-			-		-	
Al-Cap	PAS-ALU-AN-02	Any change with impact on processability/manufacturability at customer, which is not covered in the matrix below.	Р	Р	Technical interface means component terminals. See processability on board level.	в		1 A 1	1.1					· ·					-				-						•	-	
Al-Cap		DATASHEET	,		1				_			-											_		1 1						1
	PAS-ALU-DS-01	Change of datasheet parameters/electrical specification (min/max/kpp. values) and / or ACIDC	Р	Change of application relevant P information	e.g. tighten of electrical parameter distribution	A	Risk assessment depending on change														-										
Al-Cap		apen.in.essini		Not included: Editorial changes.			www.nappecason.			+																-					
				No technical change of the product, only correction in description (wording,																											
	PAS-ALU-DS-02	Correction of data sheet	1	P (fc: in case of editorial changes.	e.g. cass sneet correction because of new information about component behavior	A		1.1	1.1					· ·	-		•		-	· ·	-								· ·		
Al-Cap			LI	yrst in case or impact on product integrity.																											
	1			Description of a new not previously																											
				No technical charge of the product.																											
	PAS-ALU-DS-03	Specification of additional parameters		P (P): Risk assessment depending on	e.g. adding new (tested) parameter.	^			1.1						-		-				-										
				evidence of additional parametes (stat. evaluation)																											
Al-Cap		MATERAL								-		-															-				
	PAS-ALU-MA-01	Change of material composition - Housing	Р	P Change of housing	e.g. charge Al alloy for housing	с	Capacitor body by preasing.			•	· ·			· ·			-														
Al-Cap					a stress of a the second		D: in case of external surface of sealing																								
60m	PAS-ALU-MA-02	Change of material composition - Sealing	Р	P Change of sealing	e.g. change of sealing disc material (axial, Snap in)	c	is changed. Evaluation only, if capacitor is glued	· ·	•	•	• •	•	•	• •		• • •	s			• •	-								· ·		
	PAS-ALU-MA-03	Change of material composition - External Insulation	Ρ	P Charge of external insulation / skewing	e.g. charge from PVC into PET	с	E: Only for glued capacitors.			•	•	•	•	• •		• • •	s														Eixed Humidity test can be done
Al-Cap			-	-	e.g. change of coour																-			-			-				without applying votage.
Al-Cap	PAS-ALD-MA-04	Change of material composition - Lead / Infinitiation	P	P Change of was or outer termination.	e.g. charge of leadhame finish from tinilead into tin				•						•		· ·		-	• •	· ·								•		
	PAS-ALU-MA-05	Change of material composition - Internal Insulation / Paper	Р	P Change of paper type / internal insulation	e.g. charge of paper thickness 50 µm to 40µm	с	& Only if impedance increase (delta characterization). Check if datasheet is			•			•				-			в.				•						•	
Al-Cap							affected (PAS-ALU-DS-01).		_	-		-									-	_		-			_		-		
	PAS-ALU-MA-06	Change of material composition - Electrolyte	Р	P Change of electrolyte	e.g. charge in formulation	с	characterization). Check if database is	- ·	• •	•			•	· ·			-			в -				•						•	
Al-Cap	PAS-ALU-MA-07	Change of material composition - Tape Material	Р	P Change of closing type material	e.g. charge of glue or basis material	с	anoun (Preverouron).			•			•				-														
Al-Cap	PAS-ALU-MA-08	Change of material composition - Sase Plate	Ρ	P Change of base plate material	e.g. charge of used plastic material	В		•	•	•							•						-							-	
																															Test effort depends on final risk assessment.
	PAS-ALU-MA-09	Change of supplier of material	-	P Change to a new or additional material	e.g. for 2nd source purpose	с				•		•			•		•		•	в •	•									•	Performance test according to affected material.
				appen a corporate nanoaca a.																											Assumption material specification remains unchanged. Otherwise see
Al-Cap							1			_																					change of material.
ko-cap	DAS-ALL/DE-01	Changes of termination, surface finish, shape, color, appearance or dimension structure - Wire		P Change of wire dameter	a o charpe from 0.8 kto 0.6 km alte damaier	в	1								•																1
Al-Cap		Diameter Changes of termination, surface finish, altaps, color, appearance or dimension structure -		 Change of termination appearance 											-						-			-			-				
Al-Cap	PAPALOLE-G	Termination	· ·	For welded Al capacitors only.	eş cargeronnar in no oğrar.					-		-			-				-		-					-				-	
	PAS-ALU-DE-03	Changes of termination, surface finish, shape, color, appearance or dimension shucture - Appearance		P Note: Marking on device is defined as	e.g. change of colour/appearance e.g. change of safety vent shape	в		- ·	1.0					· ·			-														
	DAR HULPE OF	Changes of termination, surface finish, shape, color, appearance or dimension structure - Rubber		D Change of rubber sealing stand-off shape	a a shares of sector (desire	۵.																									
Al-Cap	PAS-ALL-CE-05	beang Changes of inner construction - Aluminum Foil	H-I	P Change of Al foil with	e.o. charge of width	0				1.		-								в .				-		-	_	1.	-		
Al-Cap	PAS-ALU-DE-05	Changes of inner construction - Separator		P Charge of separator width	e.g. charge of width	с							•							в -	-				· ·						
Al-Cap	PAS-ALU-DE-07	Changes of inner construction - Separator Density	-	p Charge of separator density	e.g. charge of separator density/resistivity	с				•			•	· ·	-		-	• •	-	в -	-		-	•				-		•	
Al-Cap	PAS-ALU-DE-08	Dhanges of inner construction - Inner Connection	-	P Charge of inner connection	e.g. charge of shape/dimension	с			1.0	•		-		· ·	•	• • •	•		-	в -	•		-	• •				-	· ·	-	Terminal Strength (11) not for axial components without paddle tabs.
Al-Cap	PAS-ALU-DE-09	Changes of inner construction - Closing Tape	- I	P Charge of closing type	e.g. charge of dimension	с			•		• •		1 · 1	· ·			-			· · ·			1 · [1 · 1					-	
Al-Cap	PAS-ALU-DE-10	Changes of inner construction - Foil	1 ·	P Charge of foil type	e.o. change of elicitiess	c		· ·	•	•		•	· ·	· ·	-		-			в .	-		1 -	• •		•				•	
Al-Cap		M07402	1							1		-		1 1	1		1		1		1		1 1	1							Terminal Strength (11) and Vibration
Al-Cap	PAS-ALU-PR-01	Changes in process technology or manufacturing methods - Terminal Attach	-	P Charge of terminal attach process	e.g. change of stitching / welding layout	c				•		-		· ·	•		•	1.1	-	8 -	•				-				· ·		(14) not for axial components without paddle table.
Al-Cap	PAS-ALU-PR-02	Changes in process technology or manufacturing methods - Winding		p Charge of winding process	e.g. change of material disposition	В	A only for HV application	• •		•			•		-					в -	-		-		-			-		•	
Al-Cap	PAS-ALU-PR-03	Changes in process technology or manufacturing methods - impregnation	-	p Charge of impregation	e.g. change of bulk process into individual impregnation	с		•	•	•		-	•		-		-	•	-	в -	-		-	• •	-			-		•	surge voltage text for high voltage components only.
Al-Cap	PAS-ALU-PR-OI	Changes in process technology or manufacturing methods - Assembly	-	p Charge of assembly process	e.g. change of assembly process sequence	с				•		-	1.1	· •		• •			-				-						· ·		R Depends on process change
	PAS-ALU-PR-05	Changes in process technology or manufacturing methods - Aging / Testing	- 1	P Charge of aging/lasting process	e.g. change of timing, voltage or temperature of process	с		• •					-							в.			-		-			-		•	R Depends on process change
	Dars al LLCPL OF	Discuss in second including or manufacturing without Trian P. Provident	1.1	P Channe of him J from annual to	a n channe of troins above benders	в																									Soldershills may be believed
Al-Cap			1	. crange or even a form process (eaded)			-			1					-						-					-	-		-		
Al-Cap	PAS-ALU-PR-07	Changes in process technology or manufacturing methods - Trim & Form SMD	-	P Charge of trim & form process (SMD)	e.g. charge of looling shape or bending procedure	В								• •			•		•		•		-		-			-		-	Solderability may be influenced
Al-Cap	PAS-ALU-PR-08	Process integrity: tuning within specification	- 1	P Variation within process specification.	e.g. process control	с		1 A A									-						-		-	•		-	· ·	-	
Al-Cap		PADRING / SHEPPING - NEW MATERIAL, ORTICAL DIVENSIONS	1 1		1	-	1			1	<u> </u>	-	1	1 1	-	- I I	1 1	1 1		1 1	1		1 1	1	1 1		1	1 1		-	
Al-Cap	PAS-ALU-PN-01	Packing / shipping specification change (losening of tolerances)	Р	P Charge of packing specification.	e.g. number of pieces on real.	в		1 A 1			· ·			· ·	1		-	· ·		•					-				· ·		
	PAS-ALU-PN-02	Dry pack requirements change	Р	P Charge of drypack requirements.	e.g. charge of MSL	в															-									-	
Al-Cap					e.g. crange in dry pack assurance (reC, MBB) e.g. change by material					1											_										
Al-Cap	PAS-ALU-PN-03	Lange or carrier (bay, ree)	1 12	P Charge or camer	e.g. charge by geometry.	8				1 .	<u> </u>			· ·			1 - 1								1.1						
- and a second		Province - whether - Wound Interfaciency	1.1		(8 e.g. additional information (RoHS stamp)					1					. 1										1.1			1.1			
Al-Cap	PRG-ALU-PV-01	Linarge or speeing	1	 unarge of labelling, also on real. 	(P) e.g. charge of customer specific information	•				1											-										
	PAS-ALU-PV-02	Change of product marking	1	P Narking on device.	e.g. change of content of marking e.g. change of method of marking	в									-		-				-							-			
Al-Cap				Channel In stands	e.g. change of appearance of marking					+																					
	PAS-ALU-PV-03	Change of packing/ah/pping specification	Р	P does not described a change of demonstrate or protected of the even?	e.g. change of documentation in packing specification	•		1 A 1				-			-		-		-		-		•		-			-	· ·	-	
Al-Cap		LOGISTICS / CAPACITY / TESTING - EQLIPERATINENT	<u> </u>	amenators or material of the packing.	F	I	1			-		-															-		_		
				Change in propers ferbrings which in out								1																			Test effort depends on final size
	PAS-ALU-EQ-01	Production from a new equipment/lool which uses a different technology or which due to its unique form or function can be expected to influence the integrity of the final product	Р	P Note: Charges affecting the product and	e.g. new equipment supplier with different process concept	с		• •		•			•	· •	•		-			в -	-		-	• •						•	assessment. Performance test according in effected
Al-Cap		· · · · · · · · · · · · · · · · · · ·		covered by the table require also a PCN.																											process change.
	Par 400 FT	Production from a new equipmentifical which uses the same basic technology (necks-www)	l T	PCN required for dedicated equipment	e.g. additional equipment to increase production												T														Test effort depends on final risk assessment.
	- namesni242	equipment or extension of existing equipment pool)	111	for sensitive component production.	a a replacement of same excircment					1.			-		-																Performance test according to affected

And <th< th=""><th></th><th></th><th>-</th><th>1</th><th>1</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>1</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>1</th></th<>			-	1	1								1															1
Non-Networks Non	PAS-ALU-EID-03	Change in final lest equipment type that uses a different lachnology P	p different technology. PCN required for decated equipment for acquired for decated equipment.	e.g. change of leater platform	c		•		· ·				-			-	- в -	-		-				· · ·			•	Gago RS
And <th< td=""><td></td><td>LOGISTICS / CAPACITY / TESTING - PROCESS FLOW</td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td></th<>		LOGISTICS / CAPACITY / TESTING - PROCESS FLOW				1																			-			
And <th< td=""><td>PAS-ALU-PF-01</td><td>Manufacturing alls transfer or movement of a part of production process to a different location/sile P</td><td>Charge of manufacturing site. P Note: Reorganization inside one</td><td>Movement or transfer of manufacturing site or process step(s) to a different location/site.</td><td>в</td><td></td><td>• •</td><td></td><td></td><td>•</td><td></td><td></td><td></td><td></td><td>• .</td><td></td><td>• в •</td><td>•</td><td>•</td><td></td><td>•</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	PAS-ALU-PF-01	Manufacturing alls transfer or movement of a part of production process to a different location/sile P	Charge of manufacturing site. P Note: Reorganization inside one	Movement or transfer of manufacturing site or process step(s) to a different location/site.	в		• •			•					• .		• в •	•	•		•							
110 1			plantisis is not affected													_		_						4		++	_	_
Note <	PAS-ALU-PF-02	Elimination or addition of a manufacturing process step -	P Charge of manufacturing process sequence.	e.g. washing / cleaning process e.g. change of order of processes	c		•	· ·			-		-					-		-						· ·	•	productio
Normal	PAS-ALU-PF-03	Elimination of final electrical measurement / lead flow block	Peduction of final testing. P PON required for dedicated final test reductions for sensitive parameters.	e.g. elemination of additional impedance control	с				· ·				-		· ·	-		-		-						· · ·	•	Charact final test
And <th< td=""><td></td><td>LOGISTICS / CAPACITY / TESTING - Q-GATE</td><td></td><td>a a sharen fare 1999 is seenin insertion</td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td>1</td><td></td><td>-</td><td></td><td>1</td><td></td><td></td><td></td><td>+</td><td>1</td><td></td><td>-</td><td></td></th<>		LOGISTICS / CAPACITY / TESTING - Q-GATE		a a sharen fare 1999 is seenin insertion		1							1			1		-		1				+	1		-	
A </td <td>PAS-ALU-QG-01</td> <td>Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addisor of electrical measurement/test flow block, relaxation/enhancement of monitoring occedance or anambino)</td> <td>p Charge of test coverage.</td> <td> a. g. leaf flow block, reduction from three to two temperature measurements </td> <td>с</td> <td></td> <td>· · · ·</td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td>R (electr R (reliabi process</td>	PAS-ALU-QG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., elimination/addisor of electrical measurement/test flow block, relaxation/enhancement of monitoring occedance or anambino)	p Charge of test coverage.	 a. g. leaf flow block, reduction from three to two temperature measurements 	с		· · · ·			-			-			-		-		-							-	R (electr R (reliabi process
		NTC	1	e.g. change in burn inihun in process.						1 1					1 I													
Autom Au	PAS-NTC-AN-01	Any Any change with impact on special customer characteristics/contractual agreements P Any change with impact on special customer characteristics/contractual agreements P	P	Not relevant for technical evaluation.	· ·	1				1 . 1			· ·					· ·		-	· .			<u>+-</u>	· ·			-
And <th< td=""><td>PAS-NTC-AN-02</td><td>Projectal gle two in space con procession presentation activity in California, which is not Colored in p the matrix follow. DATASPEET</td><td>P</td><td>Technical interface means component terminals.</td><td>В</td><td></td><td></td><td></td><td></td><td>•</td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>-</td><td></td><td></td><td></td><td>· ·</td><td></td><td>•</td><td>-</td><td></td></th<>	PAS-NTC-AN-02	Projectal gle two in space con procession presentation activity in California, which is not Colored in p the matrix follow. DATASPEET	P	Technical interface means component terminals.	В					•			-					-		-				· ·		•	-	
And <td< td=""><td>PAS-NTC-DS-01</td><td>Change of datasheet parameters/electrical specification (min/max/kps.values) and / or ACIDC p specification</td><td>Change of application relevant P Information</td><td>e.g. lighten of electrical parameter distribution</td><td>A</td><td>Risk assessment depending on change for each application.</td><td></td><td></td><td></td><td>-</td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td></td<>	PAS-NTC-DS-01	Change of datasheet parameters/electrical specification (min/max/kps.values) and / or ACIDC p specification	Change of application relevant P Information	e.g. lighten of electrical parameter distribution	A	Risk assessment depending on change for each application.				-			-					-		-							-	
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	PAS-NTC-DS-02	Correction of data sheet	P (traving,) (t): In case of editorial changes. (P): In case of impact on product	 g. data sheet correction because of new information about component behavior 	A				· ·				-			-		-		-		• •		1.1		1 1	-	
Anome A B <th< td=""><td></td><td></td><td>Integrity. Description of a new not previously</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td>—</td><td></td><td></td><td>-</td><td></td></th<>			Integrity. Description of a new not previously															_						—			-	
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No			(P): Risk assessment depending on change for each application to provide evidence of additional parametes (stat.																									
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Sample in any lege in a start in a s	PAS-NTC-MA-01	Charge of material composition - Ceramic Binder P	P Charge of Einder Material to bind ceramics.		с		• •	•					-		•••	-		-		-	•					<u> </u>	-	Descent
	PAS-NTC-MA-02	Drange of material composition - Geramic P	p Change of ceramic composition	e.g. changes in additives amount	c		· · ·	•		•	-		-	· · ·	•••		• в •	s		-	-			•			•	an antici performa
1 1	PAS-NTC-MA-03	Charge of material composition - Inner Electrode	Charge of inver electrode material (ink praterial). Valid in case of material	e.a. change from AgPt preterial in AnDM evaluated													. B											- 54C
Prior Pr		P	structures only.	a p change of costion	, c	A Risk assessment on application level,																				<u> </u>	+	Paramete
And <th< td=""><td>PAS-NTC-MA-OI</td><td>Drange of material composition - Encapsulation P</td><td>P Charge of encapsulation material.</td><td>e.g. change of additives in an insulation.</td><td>В</td><td>r meracion with other material expected.</td><td></td><td>• •</td><td>•</td><td>•</td><td>-</td><td></td><td>-</td><td></td><td>• •</td><td></td><td>- в •</td><td></td><td></td><td>-</td><td>•</td><td></td><td></td><td>- ·</td><td>•</td><td></td><td>· ·</td><td>an antici performa</td></th<>	PAS-NTC-MA-OI	Drange of material composition - Encapsulation P	P Charge of encapsulation material.	e.g. change of additives in an insulation.	В	r meracion with other material expected.		• •	•	•	-		-		• •		- в •			-	•			- ·	•		· ·	an antici performa
And a	PAS-NTC-MA-05	Change of material composition - Lead material / Termination P	P Change of lead or outer termination. Change of lead (finish) material, termination material or attachment	e.g. change from SnPb to pure Sn	в	compatibility of soldering process.	· · ·			•	•	• • •	•			•	• в .	•	•		-			•			•	
Matrix	THE NEW YORK		c Change to a new or additional material		_						_										_						-	Assumpt
And <td< td=""><td>PAPAICAPO</td><td>DESCN</td><td>" supplier at component manufacturer.</td><td>e (j. for 2nd source purpose</td><td>, C</td><td></td><td></td><td></td><td>•</td><td>1.1</td><td>-</td><td>• • • • •</td><td></td><td>•</td><td>1.1.</td><td></td><td>• 5 •</td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td>ĽĽ</td><td></td><td>change o</td></td<>	PAPAICAPO	DESCN	" supplier at component manufacturer.	e (j. for 2nd source purpose	, C				•	1.1	-	• • • • •		•	1.1.		• 5 •			-						ĽĽ		change o
And <th< td=""><td>PAS-NTC-DE-01</td><td>Charges of termination, surface finish, shape, color, appearance or dimension structure - Lead Diameter</td><td>p Charge of lead dameler</td><td>e.g. change lead dameter from 0.5 to 0.4 mm</td><td>в</td><td></td><td>•</td><td></td><td></td><td>•</td><td>-</td><td></td><td>•</td><td></td><td></td><td>-</td><td>- В -</td><td>•</td><td>•</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td>•</td><td></td></th<>	PAS-NTC-DE-01	Charges of termination, surface finish, shape, color, appearance or dimension structure - Lead Diameter	p Charge of lead dameler	e.g. change lead dameter from 0.5 to 0.4 mm	в		•			•	-		•			-	- В -	•	•	-							•	
All	PAS-NTC-DE-02	Changes of termination, surface finish, shape, color, appearance or dimension structure - Termination Area	P Charge of termination area	e.g. change of lermination layer thickness e.g. change in lermination dimensions	в		•			•	-		-			-	• B -	•	•	-	-				-		•	SMD cor
And <th< td=""><td>PAS-NTC-DE-03</td><td>Changes of termination, surface finish, shape, color, appearance or dimension structure - Internal Connection</td><td>p Charge of inner connection</td><td>e.g. change from soldered connection to welded connection</td><td>с</td><td></td><td>•</td><td></td><td></td><td>•</td><td>•</td><td>• • •</td><td>•</td><td>• •</td><td></td><td>•</td><td>• B -</td><td>•</td><td>•</td><td>-</td><td>-</td><td></td><td></td><td></td><td>-</td><td></td><td>•</td><td></td></th<>	PAS-NTC-DE-03	Changes of termination, surface finish, shape, color, appearance or dimension structure - Internal Connection	p Charge of inner connection	e.g. change from soldered connection to welded connection	с		•			•	•	• • •	•	• •		•	• B -	•	•	-	-				-		•	
A </td <td>PAS-NTC-DE-04</td> <td>Charges of termination, surface finish, shape, color, appearance or dimension structure - Appearance</td> <td>Change of appearance. P Note: Marking on device is defined as apperate change (PAS-FLM-PV-02).</td> <td>e.g. change or adding of colour on component Mainly in combination with other changes!</td> <td>в</td> <td></td> <td>· · ·</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td>· ·</td> <td>-</td> <td></td> <td>-</td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>· · ·</td> <td>-</td> <td></td>	PAS-NTC-DE-04	Charges of termination, surface finish, shape, color, appearance or dimension structure - Appearance	Change of appearance. P Note: Marking on device is defined as apperate change (PAS-FLM-PV-02).	e.g. change or adding of colour on component Mainly in combination with other changes!	в		· · ·						-		· ·	-		-		-						· · ·	-	
And the stand and the st	PAS-NTC-DE-05	Changes of inner construction - Electrode -	P Charge of electrode layer thickness or geometry. For multi-layer technology	e.g. charge of electrode design	с								-					•	•									
N </td <td>PAS-NTC-DE-06</td> <td>Changes of inner construction - Layer Thickness -</td> <td>P Change of ceramic layer thickness. For</td> <td>e.g. charge from 1.5µm into 1.0µm</td> <td>с</td> <td></td> <td>• • •</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	PAS-NTC-DE-06	Changes of inner construction - Layer Thickness -	P Change of ceramic layer thickness. For	e.g. charge from 1.5µm into 1.0µm	с														• • •									
Prime Prime Prim			Change of number of ceramic or electrode learns France learns																									
And and any and any	PAG-NIC-DE-07		Inchrokogy only. Always in combination with PAS-NTC-DE-05.	see ano nyer bickress	c				•				1			· ·				<u> </u>					<u> </u>			
And <th< td=""><td>PAS-NTC-PR-01</td><td>PROJERTS Process is process technology or manufacturing methods - Lamination -</td><td>P Charge of lamination / press technique technology</td><td>e g. stamp press to isostatic press</td><td>c</td><td>1</td><td>••</td><td></td><td></td><td></td><td>•</td><td></td><td>-</td><td></td><td></td><td></td><td>- в -</td><td></td><td></td><td>-</td><td>•</td><td></td><td></td><td>1.</td><td></td><td></td><td></td><td></td></th<>	PAS-NTC-PR-01	PROJERTS Process is process technology or manufacturing methods - Lamination -	P Charge of lamination / press technique technology	e g. stamp press to isostatic press	c	1	••				•		-				- в -			-	•			1.				
And a	PAS-NTC-PR-02	Oranges in process lachnology or manufacturing methods - Pring .	p Change of firing / sintering profile	e.g. temperature and / or time and / or atmosphere. e.g. from turnel to batch kin.	с		• •		• •			• • •	-			•	- в -	-		-							•	
And a	PAS-NTC-PR-03	Changes in process lectnology or manufacturing methods - Dicing -	P Change of dicing / slicing	e.g. change from cuting to sawing	с		• •		• •	•	•		-	• • •			- в -			-	-				-		•	
A A B </td <td>PAS-NTC-PR-04</td> <td>Dranges in process lectrology or manufacturing methods - Termination -</td> <td>P Charge for termination preparation like plating or apply of termination base lave</td> <td>e.g. change in plating technology (final termination) r. e.g. change from dp in paste to platimo (apply)</td> <td>в</td> <td></td> <td>• •</td> <td></td> <td></td> <td>•</td> <td>•</td> <td>• • •</td> <td>•</td> <td>· · ·</td> <td></td> <td>•</td> <td>• в -</td> <td>•</td> <td>•</td> <td>-</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>•</td> <td></td>	PAS-NTC-PR-04	Dranges in process lectrology or manufacturing methods - Termination -	P Charge for termination preparation like plating or apply of termination base lave	e.g. change in plating technology (final termination) r. e.g. change from dp in paste to platimo (apply)	в		• •			•	•	• • •	•	· · ·		•	• в -	•	•	-	-						•	
And a	PAS-NTC-PR-05	Changes is process technology or manufacturing methods - Decirode apply .	P Change of electrode apply. For multi	e.g. change of inner electrode lay down method.	с						•				•••	•	- в -	•										
And the state of the state	PAS-NTC-PR-05	Changes in process technology or manufacturing methods - Assembly .	P Charge in assembly process for leaded	e.g. soldering method for lead attach to element or	в				• .					• • •	• •		• • •											
Name <	PAS-NTC-PR-07	Process integrity: tuning within specification .	P Variation within process specification.	e.g. process control	c	1					-		1 -		· · ·					<u> </u>				<u> </u>	1 ·		1 -	
And a	PAS-NTC-PN-01	Packing / shipping specification change (lossening of lolerances) P	P Charge of packing specification.	e.g. number of pieces on real.	в						-		-		· ·			- 1		-	•			1.				
A by	PAS-NTC-PN-02	Dry pack requirements change P	P Charge of drypack requirements.	e.g. change of MSL e.g. change in dry pack assurance (HIC, MBB)	в					· ·	-		-			-		-		-	•			•	-	• •	-	
Normal water Normal water <th< td=""><td>PAS-NTC-PN-03</td><td>Drange of carrier (tray, reel) P</td><td>p Charge of carrier</td><td>e.g. change by material e.g. change by geometry.</td><td>в</td><td></td><td>· · ·</td><td></td><td></td><td></td><td>-</td><td></td><td>-</td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>-</td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	PAS-NTC-PN-03	Drange of carrier (tray, reel) P	p Charge of carrier	e.g. change by material e.g. change by geometry.	в		· · ·				-		-					-		-	-							
Image: condition of the state of the st	DATE NTO DUCAL	PACKING / SHIPPING - VISUAL INSPECTION	D. Channe of bibling where as 1	(i) e.g. additional information (RoHS stamp)		1				1.1			Î.		1			1		1			1.1		1		Ì	
Name	PAG-NIC-PV-01	Concept of standard analytics	p- crossige of sciency, also on real.	(P) e.g. change of customer specific information e.g. change of content of marking														-							<u> </u>		-	
Phane Ph		Lander or however serviced	Change in packing specification which	e.g. change of appearance of marking	8								-							-		-			-		-	
Vert vert vert vert vert vert vert vert v	PAS-NTC-PV-03	Change of packing/httpping specification P	P does not described a change of dmensions or material of the packing.	e.g. change of documentation in packing specification	·		1997 - 19				-		-					-		-	-				1			
Anderstand and and angle and angl		LOGISTICS / CAPACITY / TESTING - EQUIPEMENT	Characterization										1															Tester
Image: proper	PAS-NTC-EQ-01	Production from a new equipment/lool which uses a different technology or which due to its unique product form or function can be expected to influence the integrity of the final product	P Note: Charges affecting the product no	e.g. change from wet to dry technology.	с						-		-					-		-				•			•	Performa
Process			covered by the table require also a PCN	·																							-	Test effo
Normal Participation P Participation Parinditation Participation	PAS-NTC-EO-02	Production mom a new equipment/bool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	P PCN required for dedicated equipment for sensitive component production.	e.g. elmination of manual handling processes	с		•				-		-					-		-	-					• •	•	Performa process of
	PAS-NTC-EQ-03	Change in final test equipment type that uses a different technology	Change of final test equipment which us different technology.	e .g. change of tester platform	с												. в .											Gape pag
Normation P			r-Lini required for dedicated equipment for sensitive parameters.																									-
Normal bit in the interview of the intervie	PAS-NTC-PT-01	Manufacturing alls transfer or movement of a part of production process to a different locationhile P	P Note: Reorganization inside one	Movement or transfer of manufacturing sile or recovery standards in a different transfer better	в				• .							•	• в •		•								۰.	
AND AND And and and and and and and and and and a	PAS-NTC-PF-02	Entitation or addition of a manufacturine process also	p Change of manufacturing process	e.g. unshing / cleaning process	с																						1.	Characte
Anstrong Anstrong <th< td=""><td></td><td>LOGISTICS / CASHOTY / TESTING - O-CATE</td><td>sequence.</td><td>e.g. change of order of processes</td><td>, v</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>productio</td></th<>		LOGISTICS / CASHOTY / TESTING - O-CATE	sequence.	e.g. change of order of processes	, v															-								productio
Image: Second	PASATE-OG-01	Charge of last coverage used by the supplier to ensure data sheet compliance (e.g.,	P Change of last coverage	e.g. change from 100% to sample inspection e.g. lest flow block, reduction from three to two																								Characte test cove
Normal product Normal		monitoring procedure or sampling)	ge to sea coverage.	temperature measurements e.g. change in burn inihun in process.	Č																							R (relabil process.
Instrume P<		PTC Any																			_							
Term Name P P Speciality instants Speciality instants P Speciality instants Speciality	PAS-PTC-AN-01	Any change with impact on special customer characteristics/contractual agreements P Any change with impact on processability/manufacturability at customer, which is not covered in	P	Not relevant for technical evaluation. Technical interface means component terminals.									1															
normality of the state of the s		te matis below. P DATASHEET		See processability on board level.	•								1															
	PAS-PTC-DS-01	Diarge of datasheet parameters/electrical specification (min/max/kps.values) and / or AODC p pecification	Charge of application relevant Information	e.g. lighten of electrical parameter distribution	A	Risk assessment depending on change for each application.							-															

		1	<u> </u>							- I I	_		-	1 1 1		1 1	1	1 1	1 1		1 1		1 1			-	1	1
				No technical change of the product, only correction in description (wording,																								
	PAS-PTC-DS-02	Correction of data sheet	I P	drawing) ((): In case of editorial changes.	e.g. data sheet correction because of new information about component behavior	A		 • 					-						-		-	· ·				· ·		
				(P): In case of impact on product integrity.																								
				Description of a new not previously																								
				covered parameter. No technical change of the product.																								
	PAS-PTC-DS-03	Specification of additional parameters	I P	(Ec no influence (P): Risk assessment depending on	e.g. adding new (lasted) parameter.	A													-		-							
				change for each application to provide evidence of additional parametes (stat.																								
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	DATE DTC MIL OF	MALENAL		Change of Binder Material to bind					1 1		1	<u> </u>	1	T T T			1	гг	1 1	<u> </u>	<u>1 1</u>	1	<u> </u>		1	1		1
	PARPIC-BROT	Change of material composition - Ceramic tander	PP	ceramica.		U.			-						• •				-									Deservice and an arts are set of
	PAS-PTC-MA-02	Change of material composition - Ceramic	р р	Charge of ceramic composition	e.g. charges in additives amount	с									• •			в •	s									an anticipated impact on electrical performance.
													_									_						5 = 5MD device only
	PAS-PTC-MA-03	Change of material composition - Polymer	P P	Charge of polymer composition		с		• •											-		-							
	PAS-PTC-MA-04	Change of material composition - Encapsulation	р р	Change of encapsulation material.	e.g. charge of coaling e.g. charge of additions in an insulation	в	A reak assessment on application www. If interaction with other material expected.		•	• •	•							в •	-		-							Parameter analyse only necessary if an anticipated impact on electrical
				Charge of lead (finish) material.			Risk assessment needed to evaluate															-						performance.
	PAS-PTC-MA-05	Change of material composition - Lead material / Termination	P P	termination material or attachment	e.g. change from SnPb to pure Sn	в	compatibility of addering process.				•	• • •		• •	• •		• •	в -	•	• • •	-	· ·				· ·		
	PAS-PTC-MA-05			Change to a new or additional material																								Assumption material specification
	PADP IC BIO	Change of supplier of material	- P	supplier at component manufacturer.	e.g. for 2nd source purpose	c		• • •	-	•								ь.		•							•	remains unchanged. Otherwise see change of material.
		DESIGN			T T				-			- I - I	-	1 1 1					1 1				1 1			-		1
	PAS-PTC-DE-01	Danster	I P	Charge of lead dameler	e.g. change lead diameter from 0.5 to 0.4 mm	В		•			•		• •	• •				в -	•	• • •	-	· ·				· ·	•	
	PAS-PTC-DE-02	Changes of lemination, surface finish, shape, color, appearance or dimension structure - Termination Area	I P	Change of termination area	e.g. change of termination layer thickness e.g. change in termination dimensions	в		• • •			•		• •				•	в -	•	• • •	-						•	SMD components only!
	PAS-PTC-DE-03	Changes of lermination, surface finish, shape, color, appearance or dimension structure - Internal	I P	Charge of inner connection	e.g. change from acidered connection to welded	с								• •	• •			в.		• • •								
		Connector		Charge of appearance.	connection								_															
	PAS-PTC-DE-04	Appearance	I P	Note: Marking on device is defined as separate chance (PAS-PTC-PV-02).	Mainly in combination with other changes!	в		• • •					•						-		-							
	PAS-PTC-DE-05	Changes of inner construction - Electrode	. Р	Change of electrode layer thickness or	e.g. change of electrode design	с				• •						• •			•	• • •	-							
	PASIPTOPLOS	Please disconnectedaria i any Telesco		Charge of ceramic layer thickness. For	a subservations of them into a film																							
	- APP IL-LE-M	Comparison of the construction - Layer Incomes	• P	multi-layer technology only.	way cowaye from 1.0µm into 1.0µm	c							•						· · ·									
	PASIPTCIPENT	Channel of Inner combination. Monthered I wave		Change of number of ceramic or electrode layers. For mub-layer																								
				technology only. Always in combination with PAS-PTC-DE-05.		c																						
		PROCESS			•							_		· · · ·														
	PAS-PTC-PR-01	Changes in process lechnology or manufacturing methods - Lamination	- P	Charge of lamination / press technique technique	e.g. stamp press to leostatic press	с		•		•	-	• • •				• •		в -	•		-		-				•	
	PAS-PTC-DB-02	Discuss in necessar inclusions or manufacturize and their Print.		Change of firing / sinteriors rentile	e.g. temperature and / or time and / or atmosphere.													в										
	- APP IL TIME	searches a because echoolity or manufacturing methods - Firing	. Р	and the second second begins	e.g. from tunnel to batch kin.	c							•					D .										
	PAS-PTC-PR-03	Changes in process technology or manufacturing methods - Dicing	- P	Charge of dicing / slicing	e.g. change from cutting to sawing	с			•	• •	•	• • •	• •	· ·	• •	· ·		в.	-		-						•	
	PAS-PTC-PR-04	Discuss in nervess technology or may facturing reditoris - Termination		Charge for termination preparation like	e.g. change in plating technology (final termination)	в												8										
		and the second second of the second s		plating or apply of termination base layer	a.g. change from dp in paste to plating (apply)																							
	PAS-PTC-PR-05	Changes in process technology or manufacturing methods - Electrode apply	- P	Change of electrode apply. For multi layer technology only.	e.g. change of inner electrode lay down method.	с			•		-	• • •				• •	• •	в -	•								•	
	PAS-PTC-PR-05	Disease in nerves inclusion or manufacturion methods - Assembly	. P	Charge in assembly process for leaded	e.g. soldering method for lead attach to element or	в																						
				or encapsulated devices.	coating / encapsulation process					-			_	-	-	-							_					
	PAS-PTC-PR-07	Process integrity: tuning within specification	. Р	Variation within process specification.	e.g. process control	с		10 C 10 C 10 C	-										-		-		-			· ·		
		PADRING / SHIPPING - NEW MATERIAL, CRITICAL DIMENSIONS			T T				-			- I - I	-	1 1 1				 	1 1				1 1			-		1
	PAS-PTC-PN-01	Packing / shipping specification change (loosening of lolerances)	ΡΡ	Charge of packing specification.	e.g. number of pieces on real.	в		1 (A) (A)	-		-								-									
	PAS-PTC-PN-02	Dry pack requirements change	Р Р	Charge of drypack requirements.	e.g. change of MSL e.g. change in dry pack assurance (HIC, MBB)	в		 • • • 					-						-									
	PAS-PTC-PN-03	Change of carrier (bay, reel)	р р	Charge of carrier	e.g. charge by material	в													-									
		PACKING / SHIPPING - VISUAL INSPECTION			The charge of picture y.																							
	PAS-PTC-PV-01	Change of labeling	I P	Charge of labeling, also on reel.	(8 e.g. additional information (RoHG stamp)	в													-		-							
					e.g. change of content of marking																							
	PAS-PTC-PV-02	Change of product marking	I P	Marking on device.	e.g. change of method of marking e.g. change of appearance of marking	в			-										-					1.1				
	PAS-PTC-PV-03	Change of packing/shipping specification	P P	Charge in packing specification which does not described a change of	e.g. charge of documentation in packing																							
	-			dmensions or material of the packing.	specification									1 1 1														
				Channe in moreau technique attich is no							1		1					<u> </u>	1				TT	1 1	1			Test effort depends on final sisk
	PAS-PTC-EQ-01	Production from a new equipment/tool which uses a different technology or which due to its unique form or function can be especial to influence the integrity of the final product	р р	already covered above. Note: Changes affecting the product not	e.g. change from wet to dry technology.	с		• • •											-		-						· ·	assessment. Performance test according to affected
				covered by the table require also a PCN.																								process change.
	Def 275 20.00	Production from a new equipment/lool which uses the same basic technology (replacement		PCN required for dedicated equipment																								Test effort depends on final risk assessment.
	Property and a second	equipment or extension of existing equipment pool)	- P	for sensitive component production.	e.g. eimmation or manual nandang processes	c		• • • • •											-								•	Performance test according to affected
				Charge of final test equipment which use																								
	PAS-PTC-EQ-03	Change in final test equipment type that uses a different technology	р р	different technology. PCN required for dedicated equipment	e.g. change of tester platform	с		 • • • 										в -	-		-						•	Gage RSR / delta correlation
				for sensitive parameters.																								
		LOGISTICS / CAPACITY / TESTING - PROCESS FLOW		Overse of some dashed on who							-	1 1	-	1 1 1		1 1	-	1 1			1 1	-			-	_		1
	PAS-PTC-PF-01	Manufacturing site transfer or movement of a part of production process to a different location/site	Р Р	Note: Reorganization inside one	Movement or transfer of manufacturing site or process step(s) to a different location/site.	в		• • •	•	• •	•		• •	• •	• •	• •	• •	в •	•	• • •						· ·	• •	
	PASEDTC PT CO	Particular and the discussion of the		Charge of manufacturing process	e.g. washing / cleaning process																							Characterisation depends on import of
	PRAFF 10-PT-62	Americanon or addition or a manufacturing process step	- P	sequence.	e.g. charge of order of processes	c													-								•	production flow
		LOGISTICS / CAPACITY / TESTING - Q-GATE			1	-	1				-			1 1 1			_		1 1			-	1 1			-		Characterization depends on import of
	PAS-PTC-OG-01	Change of test coverage used by the supplier to ensure data sheet compliance (e.g., distributed billion of also bird measurementation from block and estimated astronomy .		Charge of test coverage.	e.g. change from 100% to sample inspection e.g. test flow block, reduction from three to two	c																						test coverage. D (electr funct): test coverage.
		monitoring procedure or sampling)			temperature measurements e.g. change in burn inhun in process.	·																						R (reliability) only for change in burn in process.
		VDR		-	· · · · · · · · · · · · · · · · · · ·								_															•
۲	DATE ATTE AN OF	key			L									1.1.1				1	1		1.1		1.1					
t in the second s	-AS-YUM-ANOT	way onange was impact on special customer characteristics/contractual agreements and charge with impact on reconsent/librimer/actionability of customer, which is not exceeded in	P P		Not research for technical evaluation.						-					-												
1. Sec.	PAS-VDR-AN-02	the matter below.	P P		See processability on board level.	В		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1.1									-		-		-	1 1		· ·	• •	
2		DATASHEET			1	-	1				-			1 1 1					1 1			-	1 1			-		1
	PAS-VOR-OS-01	Change of datasheet parameters/electrical specification (min/max/hps values) and / or ACIDC specification	РР	unange or appearson relevant information	e.g. tighten of electrical parameter distribution	A	Risk assessment depending on change for each application.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1											-		-							
		1		No technical charge of the sector .																								
				correction in description (wording, drawing,)	e.o. data sheet correction hermine of new																							
	PAS-VDR-DS-02	Correction of data sheet	I P	(i): In case of editorial changes.	information about component behavior	A																						
1. Sec.				integrity.																								
				Description of a new not previously covered parameter.																								
	DAS ADD DE CO			No technical change of the product. (I): no influence																								
		specification of additional parameters	I P	(P): Risk assessment depending on change for each application to provide	e.g. adding new (tested) parameter.	A																						
		1		evidence of additional parametes (stat. evaluation)																								
		MATRAL			· · ·																							
	PAS-VOR-MA-01	Change of material composition - Ceramic Binder	Р Р	Change of Binder Material to bind ceramics.		с					-				• •	• •			-		-		-					
	PAS-VOR-MA-02	Change of material composition - Ceramic	P P	Charge of ceramic composition	e.g. charges in additives amount	с					-				• •	• •	•	в •	s		-							
	PAS-VDR-MA-C3	Change of material composition - Electrode	р р	Charge of inner electrode material. Valid	e.g. change from AgPt material to ApPd material	с				• .							• .	в.										
			\vdash	Cann of multisyer souchares only.			& Risk assessment on application level																					
				Change of encapsulation material.	e.g. change of coaling e.g. change of additions in an insulation	в	If interaction with other material expected.		•	• •	•					• •		в •	-		-						•	
	PAS-VOR-MA-04	Change of material composition - Encapsulation	Р Р										_	1 1														
с t	PAS-VDR-MA-OI	Change of material composition - Encapsulation	P P	Charge of lead (finish) material,			Risk assessment needed to evaluate compatibility of addering records.																					
c c	PAS-VOR-MA-04 PAS-VOR-MA-05	Change of material composition - Encapsulation Change of material composition - Lead material / Termination	р р р р	Change of lead (finish) material, termination material or attachment material.	e.g. change from SnPb to pure Sn	в	Risk assessment needed to evaluate compatibility of soldering process.		1.1		•	• •	-	•	•		• •	в -	•	•	-							
e e	PAS-VER-MA-ON PAS-VER-MA-OS PAS-VER-MA-OS	Charge of material composition - Encapsulation Charge of material composition - Lead material / Territration Charge of material - Lead material / Territration	P P	Charge of lead (finish) material, termination material or attachment material. Charge to a new or additional material	e.g. change from SnPb to pure Sn	в	Risk assessment needed to evaluate compatibility of addening process.	• • •	•	• •	•	•••		•	•	• •	• •	в.	·	• • •	-		•	• •	•		· ·	Assumption material specification
e e e	PAS-VERMA-04 PAS-VERMA-05 PAS-VERMA-05	Deerge of makinal composition - Disciplication Deerge of makinal composition - Load makinal / Terretoxion Deerge of supplier of makinal	P P P P	Change of lead (finish) material, territration material or attachment material. Change to a new or additional material supplies at component manufacturer.	e.g. dur 2nd source purpose	в	Rak assessment needed to evaluate compatibility of addening process.	· · ·	•	•	•	•••		•	•	•	•••	в. в.	•	• •	-	· ·	•	· ·		· ·		Assumption material specification remains unchanged. Observice see change of material.
4 9 9 9	PAS-VERMA-04 PAS-VERMA-05 PAS-VERMA-05 PAS-VERMA-05	Darge d'initié compatier. Exceptables Darge d'initié compaties : Laid métanit "Serieston Darge d'initié compaties : Laid métanit "Serieston Darge d'initié compatie d'initié d'initié compatie d'initié d'initié d'initié d'initié d'initié d'initié d'initié Darge d'initié compatie d'initié	P P P P	Change of lead (finish) material, termination material or attachment material. Change to a mee or additional material applier at component manufacturer. Change of lead dameter	e g. change from SnPb to pure Sn e.g. for 2nd source purpose	B	Plat assessment needed to evaluate compatibility of addering process.	•••	•	• •	•	• • •		•	•••	• •	•••	в. в.	•	• • •	•	· ·	•	· ·	•	· ·	· ·	Assumption material specification remains unchanged. Otherwise are change of material.
4 9 9 9 9 9 9	PAS-VERMA-04 PAS-VERMA-05 PAS-VERMA-06 PAS-VERMA-06 PAS-VERMA-06 PAS-VERMA-06	Darge d miand compation - Boxpation Darge d miand compation - Land maint / Termination Darge d major d major d Termination Darge d manager and the set of the set	P P P P . P	Change of lead (Thirth) material, termination material or attachment material Change to a max or additional material applier at component manufacturer. Change of lead damater Change of lead damater	e.g. change hom SoPb to pure So e.g. for 2nd source purpose e.g. change lead domain from 0.3 to 0.5 m e.g. change of lemistation layer frictows	8 C 8	Risk assessment needed to evaluate compatibility of addering process.		•	· ·	• •			•	•	· ·	• •	B - B - B -	•	• · · ·	· ·	· ·	•	· ·		· ·	· ·	Assumption material specification remains unchanged. Otherwise see change of material.
	PAS-VERMA-04 PAS-VERMA-05 PAS-VERMA-05 PAS-VERMA-06 PAS-VERMA-06 PAS-VERMA-07 PAS-VERMA-08 PAS-VERMA-08 PAS-VERMA-08	Darge et nésred argustion - Engustion Darge et nésred argustion - Leet néslect l'interdute Darge et néglet et néslect Darge et néglet et néslect Darge Darges et néslecte fisio, fisio, fisio, fisio, sejence et d'évand et darber - Leet Darges et néslectes fisio, fisio, fisio, fisio, sejence et d'évand et darber - territerie des	P P P P - P I P I P	Change of Isad (Trich) material, investigation material or attachment material change to a new or additional material suppler at component manufacturer. Change of Isad disensite Change of Isad disensite Change of Isad disensite Change of Isad disensite Change of Isad disensite	G dange hon Sofb to pue So G dange hon Sofb to pue So G dange had densite hon 0.3 to 0.6 mm G dange had densite hon 0.3 to 0.6 mm G dange hardnolog densites G dange hardnolog densites G dange hardnolog densites	B C B B	Rok assessment neded to evaluate compatibility of addering process.	· · · ·	•	· ·	•	• • •		• •	• ·	· ·	• •	B - B - B -	• • •		· · ·	· ·	•	· ·	· ·	· ·	· ·	Assumption material specification remains enclaraged. Otherwise see change of material. 2MD components only!

PAS-VOR-DE-04	Changes of isemination, surface finish, shape, color, appearance or dimension shuckare - Appearance	P Note	inge of appearance. In: Marking on device is defined as erate chance (PAS-VDI9-PV-02).	e.g. change or adding of colour on component Mainly in combination with other changes!	в			•	-			-	•	-		-			-		-		-	-		-			-			-	
PAS-VDR-DE-05	Changes of inner construction - Electrode	P Charg	inge of electrode layer thickness or metry.	e.g. charge of electrode design	с			•		•	• •	-	• •	•				•		- В		• •					•		-			•	
PAS-VDR-DE-05	Changes of inner construction - Layer Thickness -	p Charg	inge of ceramic layer thickness. For	e.g. charge from 1.5µm into 1.0µm	с			• •	-	•			• •	•		-		•		. в		• •	-			-	•		-			•	
PAS-VOR-DE-07	Charges of inner construction - Namber of Layers -	P electro techno with P	inge of number of ceramic or those system. For multi-layer mology only. Alkerys in combination (PAS-VDR-DE-05.	see also layer thickness	c		•	•	-	•	• •		• .	•		-	• •	•	-		-	• •	-			-	•	• •	-			-	
PAS-VOR-DE-08	Changes of inner construction - Grain size	P result charg	inge of grain size. Grain size is a at of process and / or material nos.	e. g. change of grain size.	c			•					• •			-			-	. в			-			-	•		-			•	
PAS-VOR-DE-09	Changes of inner construction - Grain boundary state	. P bound	inge of grain boundary size. Grain indary size is a result of process and / material chances	e.g. change of grain boundary size.	с			•	-	-	· •	-	• .			-			•	- в	-		-		-	-	•		-		-	•	
	PROCESS																																
PAS-VDR-PR-01	Changes in process technology or manufacturing methods - Lamination	P Charg	inge of lamination / press technique hod	e.g. pressures or temperature	с		•	•	-	-	• •	•	· ·	-		-		•		- B		• •	-	-		-			-			•	
PAS-VDR-PR-02	Changes in process technology or manufacturing methods - Firing	. p Charg	ange of firing / sintering profile	e.g. temperature and / or time and / or atmosphere. e.g. from tunnel to batch kin.	с		•	•	•	•	• •	-	• •	•		-		•	•	- B			-	-		-	•		-			•	
PAS-VDR-PR-03	Changes in process technology or manufacturing methods - Dicing	P Charg	ings of dicing	e.g. charge from cutting to sawing	с		•	•	•	•	- •	•	•	•	•	•		•		- B		• •	-			-	•		-			•	
PAS-VDR-PR-04	Changes in process technology or manufacturing methods - Termination	P Charg	inge for termination preparation like ing or apply of termination base layer.	e.g. change in plating technology (final termination) e.g. change from dp in paste to plating (apply)	в		•	•	•	•		-	• •	•	• •	-	• •	•	-	. в	-	• •		-	-	-	•		-		-	•	
PAS-VDR-PR-05	Changes in process technology or manufacturing methods - Electrode apply	P Charg	inge of electrode apply. For multi ir technology only.	e.g. change of inner electrode lay down method.	c		•	•	•	-		•		-		-		•	•	- в	-	•	-			-			-			•	
PAS-VDR-PR-06	Changes in process technology or manufacturing methods - Assembly	P Charg	inge in assembly process for leaded incapeulated devices.	e.g. soldering method for lead attach to element or coaling / encapsulation process	в		•	•	•	•	· ·	-	•	•		-	• •	-		•	•					-	-		-				
PAS-VDR-PR-07	Process integrity: tuning within specification	P Variat	ation within process specification.	e.g. process control	с				-			-				-			-							-			-				
	PADRING / SHIPPING - NEW MATERIAL, ORTICAL DIMENSIONS					·																											
PAS-VDR-PN-01	Packing / shipping specification change (loosening of tolerances) F	p Dang	ange of packing specification.	e.g. number of pieces on real.	в							-		-		-		-	-							-	-		-				
PAS-VDR-PN-02	Dry pack requirements change	P P Charg	ange of drypack requirements.	e.g. change of MSL e.g. change in dry pack assurance (HIC, MBD)	в						· ·	-		-		-		1.1					1.1			-			-				
PAS-VOR-PN-03	Change of carrier (tray, resi)	P Charg	inge of carrier	e.g. change by malerial e.g. change by geometry.	в							-		-		-		-	-		-					-			-				
	PACKING / SHIPPING - VISUAL INSPECTION																																
PAS-VDR-PV-01	Change of labeling	I P Charg	inge of labelling, also on reel.	(R e.g. additional information (RoHS stamp) (P) e.g. change of customer specific information	в				-	-		-	· ·	-		-							-	-		-			-			-	
PAS-VDR-PV-02	Change of product marking	P Marke	King on device.	e.g. change of content of marking e.g. change of method of marking e.g. change of appearance of marking	в		-		-			-		-		-			-		-		-	-		-			-		-	-	
PAS-VDR-PV-03	Change of packing/shipping specification	P P does i dmen	inge in packing specification which a not described a change of ensions or material of the packing.	e.g. charge of documentation in packing specification	·				-	-						-			-		-		-			-	-		-		-	-	
	LOGISTICS / CAPACITY / TESTING - EQUIPEMENENT					•																											
PAS-VDR-EQ-01	Production from a new equipmentition which uses a different technology or which due to its unique form or function can be supected to influence the integrity of the final product	P P Chang alread Note: cover	inge in process technique which is not ady covered above. In: Changes affecting the product not ered by the table require also a PCN.	e. g. change from wel to dry technology.	c		•	•	-	•		-	• .		• .	-	•		•	- в			-		•	-	-					•	Test effort depends on final ris assessment. Performance test according to process change.
PAS-VDR-ED-02	Production from a new equipment/lool which uses the same basic technology (replacement equipment or extension of existing equipment pool)	P PCNr for set	N required for dedicated equipment sensitive component production.	e.g. elimination of manual handling processes	c		•	•		•			• .		• .	-	•		•	. в					•				-			•	Test effort depends on final ri assessment. Performance test according to process change.
PAS-VOR-EQ-03	Change in final test equipment type that uses a different technology	P P PCNr for se	inge of final test equipment which use went technology. N required for dedicated equipment sensitive parameters.	e.g. change of leater platform	с		·		-							-		-	-	- в	-		-			-						•	Gage R&R / delta correlation
	LOGISTICS / CAPACITY / TESTING - PROCESS FLOW																	_								_					-		
PAS-VOR-PF-01	Manufacturing alle transfer or movement of a part of production process to a different location/bile	P P Note:	inge of manufacturing alle. In: Reorganization inside one date is not affected	Movement or transfer of manufacturing sile or process step(s) to a different location/site.	в		•	•	•	•		•	• •	•	• .	•	• •	•	•	• B	-	• •	•			-			-		•	•	
PAS-VOR-PF-02	Elimination or addition of a manufacturing process step	P Charg	inge of manufacturing process vence.	e.g. washing / cleaning process e.g. change of order of processes	с		•		-			-		-															-			•	Characterisation depends on i production flow
	LOOPERCE CARRONY (TERTUS) O CATE	1 1-4-								_		-													-					-	-		r
PAS-VDR-QG-01	Charge of text correspondence in marries - Green. Charge of text coverage used by the suppler to ensure data sheet compliance (e.g., elimination/side) of lectrical measurement/text flow block, relaxed/orientancement of monitoring procedure or sumpling)	p Charg	inge of test coverage.	e.g. change from 100% to sample inspection e.g. test flow block, reduction from three to two temperature measurements e.g. change in burn initium in process.	с		•		-	-						-		-	-				-			-			-			-	R (electr. funct): test coverage R (reliability) only for change i process.
Tests, which should	Id be considered for the appropriate process change.																																

reas, which arous be considered to one appropriate process change.	
Tests, which should be considered for the appropriate process change after selection of condition table.	
Suppliers performed tests (mark with an 'X' for done or 'O' for generic)	
Reason for exception of tests and/or usage of generic data:	
Nazarn for exception of tasks and/or usage of generic data:	

-	Not required
1	Information Note required
Р	PCN required

	CONDITIONS	No
A	Termination equipment only	
c	Ceramics only	
в	Comparative data (unchanged vs. changed) required	
E	Capacitive trimmers only	
F	Film products only	
N	Networks only	
R	Resistors only	
8	SMD components only	
w	Wirewound products only	
Y	Component not hermitically sealed	
lote 1:	For parts marked with ink only. Laser and stamp marked parts shall be exempt.	

(Name, Function	Max Mustermann																											
Date			Basis: IEC 60810																					_		_		
PCN number														MATERIAL	Devi	ce evalu	ation	(an the basis of	EC (0)	40)						4		
Signature					8									MATERIAL	PERFORMA	INCE LEST N	ESOLIS	(on the basis of	20 000	10)						4		
					B/C																							
					Evelue Al	1	ž	ĝ				a second																
					ş		A REAL	1		1		ž.		F													10 M 10 10	
	Assessment of impact on Supply Chain regarding following aspects - contractual agreements	Remaining risks on	Understanding of semiconductors experts	Examples to explain	fication r	Further applicable conditions	Contraction	0	- 1	and Ope	- 0 - F	ateo Itu	1			1					8		÷				Remarks	
Mark change with an "x"	 technical interface of processability/manufacturability of customer form, fit, function, quality performance, reliability 	Chain7			ked hed broad		12 041	1		A key		and the		1 Dense	5 5	a fake	1	a a	÷.		1	The set	of Barg		. 1		the Area (
					g-loafer articul proces		0100	1		, in the second s	Power	0 893	0 050	Ph size	a de la companya de	1	Them a	Hyder g	Paket	Dealte	1961	1	uli « De	4	De De	100	Domes of Contra	
a la	Type of change	No. Yes			480°.		EC	1		1	а	1				а			я	а	1		я					
LED-AN-01	Any change with impact on agreed upon contractual agreements	P P	Not relevant for technical evaluation.		•		• •									-		-	-	-		-	•	-		<u> </u>	•	
LED-AN-62	Any change with impact on technical interface or processability/manufacturability of customer, which is not survived in the matrix below	P P	See processability on board level technical interface means component terminals		8	Check if LED 05-01 is affected Processability should be assessed.	· ·		т	1.1	1.1					S,T					-	-		· .	· ·	· ·	•	
LED 05-01	Drange of datastheet parameters/electrical specification (min.htms.htp://wikeeij.and/or Palas/DC	P P	Change of application relevant information (e.g. maximum pulse current)		A			E	E	E		E	E			s			E			E					E	_
	eedication		Not included: Editorial changes. Data sheet (editorial changes) has to check if application						-															+	+	+-		-
LED-05-02	Connection of data altern	I P	affected E. In cases of editional changes Pits cases of impact on product integrity	e.g., charge of ESD level	*		· ·	1.1	1	1.1	1	1			1	-			1	1		-	- 1	1	· ·			
			Definition of an additional parameter which was not specified before It if integrity of the device is not affected																								Formalism since this is not a structure change, ony addition	wi information
Liberty	specification of additional parameters	1	P: If there is a risk on supply chain than at least one additional other change category will apply - LBD- DS-82 correction of data sheet	t e.g. adding new leaded parameter						-									-					1			Cassification: C	
	telian	1	Any device relevant changes in design / lavout of episatel						-	1	1				1		1	1				1		=	=	+-		_
LED-DE-01	Design dranges in epitasy.	P P	ayers Not included: Changes within design rules and design specification without affecting specified functions, parameters	e.g. change from Double-hetero to Quantum wells e.g. change of barrier thickness	c	A change from Double herers to Quantum webs -> spectrum is affected		•	•	•	•	•	•	· ·					•	н	-	-	-	÷	•	•	•	
IED/IC **			and relationly. Any change in chip design l'layour. Not included: Changes within design rules and desion	e.g. change in layout of current spreader; thickness of current spreader		A change in layout of current spreader ->														~	н		р	B	DM			
about the	umage unangen it Koldigilitytul.	r P	specification without affecting specified functions, parameters and missibility.	e.g. reduction of bond pad size		navalist patient changes		•	<u> </u>						-		1,0,6			-				4		4	 Tet regit be canadered for complex de band technologies 	
LED-DE-ES	Die station	P P	errent w aund 2002. Not included: using street/withcribe ine	Typical shrink of die.	A	Check (18D-0542 is affected which leave	· ·	•	<u> </u>	•	•	•	•			· ·			•	-		•	В	В	-	4		_
LED-DE-04	LED package (eccept inadfame)	P P	any change in housing thickness any change is form or dimensions	e.g. change of x y, or 2 dimension of the package		to a charge of the elchooptic parameters or distributions.	· ·	•	L.	•	•			• v	v	· ·	т.	D		D	D	L	В	В	D .	4		
LED-DE-ES	Design of leadfame	P P	any change of leadhame / carrier dimensions any change of outer dimensions	ing, unwege et Maditaria / Carrier dimensions in xy, or 2 direction e.g. change inner design of the leadheane not affecting the eto performance & Heladdity of the device		Check if LED-05402 is affected which leads to a change of the elicitospic parameters or electrosters.	• •	• •	•	•	•	•	•	• v	v	•	т •		-	-	-	•	в	в	D -	2	•	
	PROCESS - WAFER PRODUCTION					Charle FIED MEAN IN STATUS WARE			-	-	1				1			1				1		-		-		
LED-PW-01	New/ change of wafer substrate or carrier material	p p	New valler substrate material.	e.g. different water material to currently released material (change from Sapphine to Silicon)	c	to a change of the elchooptic parameters or debilisations.	· ·	• •	Р	Р	•	Р	Р			•	- P	Р	•	Р	Р	•	-	-	·	<u> </u>	•	
LED-PW-02	Mahe damater	P P	change of water diameter resulting in equipment and process changes	49.4°214°	c	In case other type of changes are affected i.e equipment/process technology - they need to be identified in addition	• •	• •		•		Р	Р			•			•		-	•	-	- I	·		•	
LED-PW-03	Newfinal aufor thickness	p p	Change in final wafer thickness	e.g. change in final chipidie thickness	c	Check if LED-05-02 is affected which leads to a charge of the elchooptic parameters			•	Р		Ρ	Р								-		в	в			•	
LED.PW.04	Peace of all thirds article disclosionization all the		Change in electrically active duping / implantation element	e o chance from lie to C as donast	c	or distributions.			<u> </u>	c	c													-		+.		
100.000.00			resulting in a new technology	e.g. change of instation layer thickness between n- and p-		customer application needs to be checked			6	-										e				+	+	+-		-
100.000.00				rativiat		due to potential system voltage differences			<u> </u>	<u> </u>			ме		-	-								-		÷		-
LIDPHUN	New/ change of metallitation (specifically chip floritude)	PP	Change in metalization of bondpack, material, sayer thickness.	e g. change in bond pad metaktation Bickness	÷	A customer application needs to be		•••	<u> </u>	<u> </u>	•	M,D	M,D		-		- B	-	Ŀ			-		-		<u> </u>		_
LED-PW-07	New/ change of metallization (specifically chip backside)	p p	wadfame/carrier). Change is process, material, or dimensions necessary.	e.g. change from Au to Auitie	c	checked due to potential system voltage differences Recharge from CVD dea to another day for		•••	<u> </u>	•	•	D,M	D,M			•	- D,M	D,M	•	D,M	D,M	D,M	-	<u> </u>	-	<u> </u>	•	
LED-PW-08	Change in process technique (e.g. significant process changes like lithography, etch, oxide deposition, die back surface preparation/backgrind,)	P	Change from wet to dry exching, change from horizontal to vertical over for calization, change from contact litho into theorer litho	e.g. change from wet exch to dry etch e.g. change from later cutting (caving) to plasma cutting (caving)	c	backside/frontoide metalization In case of new equipment please check if LSD-PA-14 is also affected.							-			-		-	-		-	-	-	-			- Qualification effort depends on type of shange.	
LED PW-09	Process Integrity: Tuning within specification	P	Variation within process specification	e.g. charge from control little to exepper little	c						-		-						-			-	-					-
LED-PW-10	Change of nativital supplier with no impact on agreed specifications.	P	Change of earlier supplier. Change of supplier for chemicals needed for earlier production.	e.g. Change of wafer supplier.	c					1.1			-			-	÷	-	-	-	-	-	-	-	÷ .	-	Qualification effort depends on type of shange.	
LED-PW-11	Change of specified water process sequence (deletion and/or additional process step)	P	Any change which is not covered by another type of change. Risk is to be assessed	e.g. additional deaning process in water production	c		• •				-	-				-			-			-	-				Cualification effort depends on type of change. PRAP has to be opdated.	
LED-PW-12	Change in die caating or passivation	P P	Change in material, thickness, and process for stating and passivation	e.g. change from SIC2 to SIND	c			۰ ۱	•	•	Ρ	Ρ	Ρ			-		Р		Ρ	Ρ	-	Р	Р	· -		•	
LED-PW-13	Newwafer production tocation or transfer of wafer production to a different not previously released location/likeleubcontractor	P P	New water propluction location or transfer of water production with possible additional changes.		c	A or it impact on other type of changes described under PROCESS - WHER PRODUCTION and EQUIPMENT categories	• •	• •	•	•		•	•			•		-	•		-	J	•	•	•		•	
	BARE DE DELAVERES	_				of the DirQuids				-	і				-			1				T		=	_	-		_
160-60-61	New / change of those wetallization	P P	byer biskness Change of bottom layer of die (between die and	e.g. change in over pad metalization		Check FLED-DS-02 is affected which leads			÷		÷	M,8	M,B				•	<u> </u>			•			4		÷	sustamer application needs to be checked due to screening	al ayatem
1404043	www.userge.urbabilide.installization	P P	leadtametarier) Change is process, material, or dimensions. Needed information for pick & place machine.	ng, snangé Tom Au ti Au alloy		wire change of the ectropic parameters or deprovisions.		•	<u> </u>		•	U,M	D,M				•	· ·		•	•	•		-	-	4	suitage differences	
LED-RD-03	Change of water setup or number of dies on water.	I P	t only additional number of chips If chance in spacing between chips and form of water Phases in first Chip backholise context	e.g. information change for pick & place machine.	8		- ·		<u> </u>		•	-	-			•			-	-		-	•	4	· ·	4		
LED-RD-64	New final water Packness	P P	example on the crep regresses and the set of carrier example on the set of th	e.g. change on converter thickness		Check of LED-05-01 is also affected.	* * ·	2	<u> </u>	Р	•	Ρ	Ρ	•	-	· ·			•		-	•	В	В	-			
LED-RD-ES	Charge in de coaring or passivation Peocessa - Assemble, Y	P P	compression waterial, thickness, and process for starting and passivation	e.g. change from SICO to SINO		uma a LED-09-01 is and attected.	•	•	· ·	•	Ρ	Р	Ρ			•		Р	•	Р	Р	•	Р	Р	· ·			
LED-PA-01	Change of Inaditans/Lative base nutrerial	p p	New leadTame/carrier material (new in composition)	e.g. change from copper alky to bare copper	8	Check if LED-05-02 is affected which leads to a charge of the elchooptic parameters or distributions.	- • ·	Р	•	•	-		-		-	•	• •	A	-	A	A	P,1	•	•	•	Р	- Explanation should be provided in case HDS text is not ap	plicable
LED-PA-02	Change of Inaditaria/carrier finishing instantial (internal)	P P	Change of surface material of die attach pad and second bond area (s.g. influence in adhesion to mold compound, wedge faced suitability)	e.g. change from Ag faxih to NiPd protection layer e.g. change from Ag spot to Au spot	A		-	P	•	•	•	-	-			•	• •	A	-	A	A	P,1	•	•	•		High text should be considered for automotive extension app explanation should be provided in case High text is not ap-	plications. plicable
LEDANO			-1 Change in material and process technique for final pin termination (e.g. pure tin). Herein package, processability and	e.g. change in heat slug stack				Р		к				1				4			4	P1				~		
	reaulies a sea sea and sea and barried aspectational accesses (equates)		reliability on board level can be writed by generic data. Classification depends on impact of change	wg, crawye widt 38 MD NAMONA e.g. charge of layer thickness				ĺ.	Ļ.								-			<u>^</u>	<u>^</u>					^	suplanation should be provided in case HDS test is not app	mad00
LEDPAGE	Bump Material / Metall System (etoemal)	P P	Stack die or die to externale Change of die attach material (e.g. soft solder, worse, wei-	e.g. change to Po-free material	•				<u> </u>	•	•	-	-		-		• •	w	-	w	w	•	-	4	+	+-		
LEDPARE	De attach repentir Pennie of hours also sustained	P P	Thermal management must be respected.	e.g. change of Ag glue to Au glue;					<u>⊢</u> ÷	PD	÷			- N	N		- N	PD		N	PD			+			Site audit for material change with impact on bondprocess	(k.g. tom Ai
LEDPAG	minige in material for ad-components (excluding LED drip & LED package mixed bens) with impact	- P	Change of sub-component supplier using different technology/materials	e.g. using a different ESD-dode in technology and naterial		Check if LED-0541 is also affected.			H	P,0																	to Cu) recommended.	
	en agreed specifications	. 1	Note: Jung start lest at OEMs night be necessary Supporting layers for complex packages like flip chip.	than previously		Check (140-0241) is also affected			<u> </u>				-											+	÷	+	and a second sec	
LIDPAN	De Oveloat / Undertit	P	No change in product integrity P: change can influence the integrity of final product	Pr. e.g. change of underfit with change of thermal resistance				<u> </u>	<u> </u>	P	•	-			ρ		- P	P	•	-	٣	U	-	-	• •	4		_
LED-PA-09	Change of mold compound/encapeulation/sealing material	P P	 unwaye so ends compound, encapeutation, or sealing material might be affected optical function in case of package related effect (s.g. browning). Component assembly and board coating has to be assessed. Microsoft be changed. 	e.g. PPA maid compound	A	Check if LED-05-01 is also affected.	- ·	• •	•	•	•		-	D D	D	•	T P	Р	Ρ	Р	Р	Ρ	-		• •	•	· ·	
LED-PA-10	Change of convenion material	p p	Change of material class.	e.g. change from pranats to nitrides	c	Check if LED-05-01 is affected for optical/photometric perameters		• •	Y	•	•		-	- Y	Y	1.	- Y	Р	Р	Р	Ρ	Y	-				1 ·	
LED-PA-11	Change of direct supplier for converter material	P	New supplier with same material specification		c		- ·	•	Р	•	•			- P	Ρ	•	- P	Ρ	Ρ	Ρ	Ρ	Ρ	-	-	•	-	•	
LED-PA-12	Drange of converter process technology	I P	new technology for converter production E no influence on with performance of product Pt in case of impact on product integrity	e.g. change from volume convension to layer convension; e.g. change from stamping to printing of layer	c	Check if any change in electro-optical characteristics results in change of data sheet LED 05-01	- ·	•	Y	•	•			- Y	Y	•	- Y	Z	z	z	z	Y	-	•	÷		•	
LED-PA-13	Change of product marking	I P	Marking on device. E change in appearance, readability not affected Pt change of content or change of appearance of data matrix	e.g. marking of carthode;	8		• • •		0			-				т	т.		-	-	-	-	-				· ·	
LED BALL	Panta in provate technique (e.g. die attrich branking gesching under this		tode	a n-channa dia attachat finan dision ta asitasi		Aur & Peace check I EQUIPMENT and																						
LEDBARK	house backet framework and the sector of the		Variation within concess star-fit ation		6	04/05/06/07/08/05/10) are affected			<u> </u>								_							4			and a set of the set o	_
LEDPAN	Chance of direct material suppler with no impact on sanctification	P	Change of suppliers e.g. for lead transe, wire material, die	e gry proditik verserar Change of suppliers e.g. for isad fames, who material, ESD-	c	Assumption that change material specification remains unchanged.																					- See change of monetal	
		- 1 °	attach, erectronical components	duar		Otherwise see change of material.			1													T I						

LED-PA-17	Change of specified assembly process sequence (additional and/or deletion of process tesp)	i.	Addition or deletion of a process this in assentity process exponence with potentially appricant inpact on the product pachinemaco a product integrity in influence on product integrity in influence on product integrity sepacided	e.g. additional or deletion plasma cleaning process	c	Single case assessment necessary to identify possible interactions or risk.	.		-	-	÷	-	-	-	-	-	-		-		-	-	-	-	-	-		-	Qualification effort depends on type of change.
LEDPA1E	New assembly location or transfer of assembly to a different not previously released location/shellu.docretra-tion	Р	P New assembly location, assembly transfer or relocation. Transfer of known technology and equipment.	e.g. Dual source stategy	c	A or B: Impact on other type of changes described under PROCESS ASSEMBLY and EQUIPMENT	• •	1.1	-	-	-	-	-	-		-	-			-	-	-	-	-	+				Qualification effort depends on type of change.
	PACKING/SKIPPING																												
LED-P3-01	Inner Packing/shipping specification change	P	P dimension change of direct product packing	e.g. SMIT pocket in tape changes.	8		1.0	P -	-			Ρ	P		-	-		Τ -	-				-	-	-	-		-	
LED-PS-02	Outer Packinghthipping specification change	1	dimension changes indirect product packing P It small changes in dimension or appearance P : number of mells in the packing are changing	eg, pizz box	•			1.1	-	-		-		+	+		-	• •	-		-	-	-	-	+	+			
LED-PS-03	Change of labeling		Change of labeling also on reel. E additional information no change of previous information P: change in content of previous information	(f) e.g. additional information (RoHdi stamp) (P) e.g. change of customer specific information		Check if LED-05-01 is also affected.			-	-	-	-	-	+	+		-	• •		-	-	-	-	-	+	+			
LED-P3-04	Dry pack requirement change	р	P Change of dry pack requirements (change in MSL)	e.g. change from Mik.3 to Mik.1	•	Check if LED-0542 is also affected.		1.1					-								-	-	-						
	EQUIPMENT			•																									
LED-EQ-E1	Production from a new equipment hoot which uses a different basic technology	p	P Change in process technique which is not already covered above. Note: Major changes affecting the product not covered by the table moule also a PCN.	 e.g. change from single wafer to batch process e.g. over pad metrikation e.g. cambar cutting (mechanical to laser outring) 	8	Check if LED-05-01 is also affected. Corrosion stability should be assessed.	+	· • ·			-	-	-	-	-	-	-	· ·	-	-		-		-	÷.	-		-	Qualification effect depends on type of shange.
160-60-03	Production from a new equipment/hool which uses the same basic technology (replacement equipment or extension of existing equipment pool) without change of process.	-	P PCN required for dedicated equipment for sensitive component production.	^d e.g. change from single site to multi site handler.	c			1.0	-	-	-	-	-	-		-	-				-	-	-	-	1	-		-	Qualification effort depends on type of change.
LED-EQ-ES	Change in final test equipment type that uses a different technology	÷.	Change of tester platform (e.g. major test program changes, tese tester interface,) Expendent specification is not affected Pr product specification is affected	e.g. change in text method from of to lumen	•		. •					•	·	-	-		-	т.	-	-		-	-	-	-	-		•	flage RBR / delta correlation
	TEST FLOW										<i></i>																		
LED-19-41	tilive of all or part of electrical earlier test and/or final test to a different location/obe/subcontractor	р	P Texter transfer or relocation.	e.g. Dual source storiegy	c		•	- в	•	•	в	•	•	-		-	•	тв	-	в	-	-	-	в	в	в		•	Gage RBR / delta correlation; additional specification check It should be considered for Wafer testing
-	0.0ATE											-	-																
LED-QS-01	Change of the test sourceage testing process flow-used by the supplier to ensure data sheet compliance is g. elimination/addition of electrical measurementheir flow block; researcherhancement of mentioning procedure or assigning	-	P Reduction or additional control steps, test coverage within the process flow	e.g. text flow block like Final text / final clearance	c		- ·		-	-	-	-	-	+	+		-	• •		-	-	-	-	-	+	+		•	
Tests, which s	hould be considered for the appropriate process change.										-	-	-	-	-	-	-			-	-		-	-	-	-		-	
		_		-				1	_	_														_		-	Ē		
Tests, which a	hould be considered for the appropriate process change after selection of condition t	able.										-				-		1.1					-		1.1				
Suppliers perf	erned tests (mark with an 'X' for done or 'G' for generic)																												
Desarco for an	writes of tasts and/or usans of reneric data:							1	1		-			1 1						_			-	-		_			
																													1

