ANALOG DEVICES
AHEAD OF WHAT'S POSSIBLE™

RELIABILITY DATA
LTC6812 & LTC6813 PCN
7/12/2019

• Operating Life Test

PACKAGE TYPE	SAMPLE SIZE	OLDEST DATE CODE	NEWEST DATE CODE	K DEVICE HOURS AT +125°C	NUMBER OF FAILURES
LQFP	154	1916	1916	25.87	0
	154			25.87	0

• Early Life Failure Rate Test

PACKAGE TYPE	SAMPLE SIZE	OLDEST DATE CODE	NEWEST DATE CODE	K DEVICE HOURS AT +125°C	NUMBER OF FAILURES
LQFP	800	1916	1916	38.40	0
	800			38.40	0

1. Electro-Static Discharge (ESD) Test Results

1.1 Test Description

The HBM ESD testing was performed on a THERMOFISHER Mk.2 using the Human Body Module per JESD22-A114. This test is performed for classification only. **Class 1A >±250V, Class 1B >±500V, Class 1C >±1000V, Class 2 >±2000V, Class 3A >±4000V and Class 3B >±8000V. A copy of the circuit is shown below:**

1.2 Test Circuit & Condition

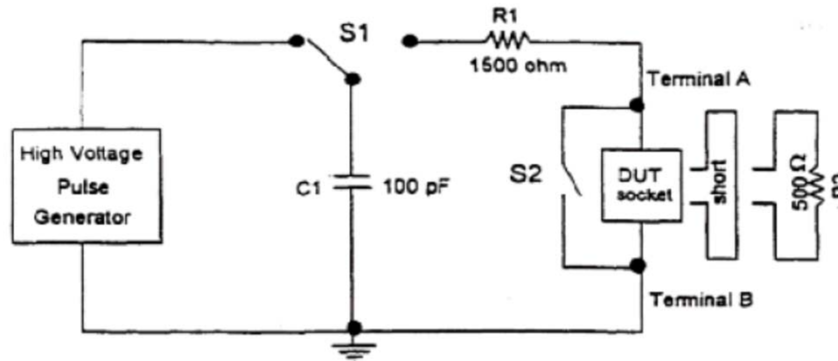


Figure 1 — Typical equivalent HBM ESD circuit

NOTE 1 The performance of any simulator is influenced by its parasitic capacitance and inductance.

NOTE 2 Precautions must be taken in tester design to avoid recharge transients and multiple pulses.

NOTE 3 R2, used for initial equipment qualification and requalification as specified in 3.1, shall be a low inductance, 4000 V, 500 Ω resistor with +/-1% tolerance.

NOTE 4 Stacking of DUT socket adaptors (piggybacking) is allowed only if the waveforms can be verified to meet the specifications in Table 1.

NOTE 5 Reversal of terminals A and B to achieve dual polarity is not permitted.

NOTE 6 S2 shall be closed at least 10 milliseconds after the pulse delivery period to ensure the DUT socket is not left in a charged state.

NOTE 7 R1, 1500 Ω +/- 1%.

NOTE 8 C1, 100 pF +/- 10% (effective capacitance).

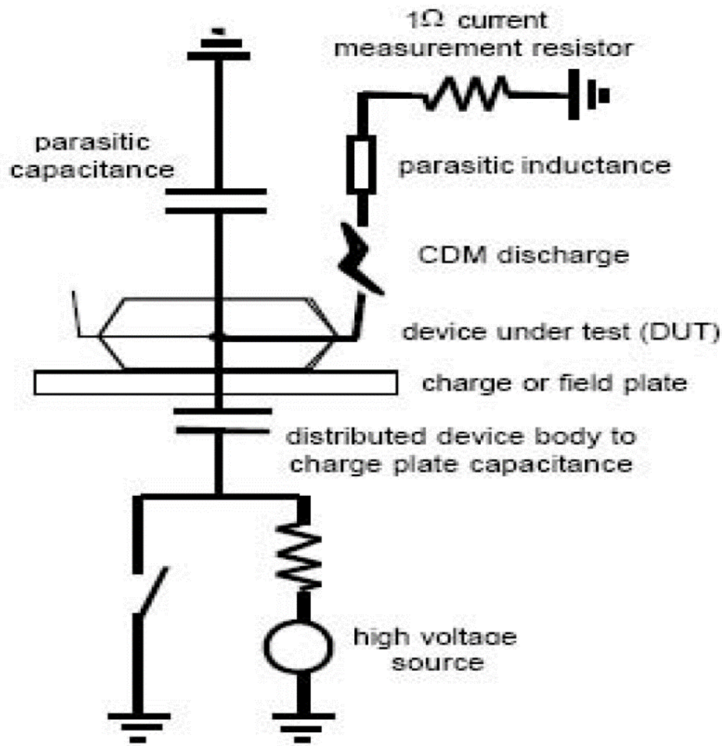
1.3 ESD Data

Device	Model	S/S	Pins	Voltage Passed	Voltage Failed
LTC6813	HBM Class 1C	3	All Pins	>±1000V	

1.7 Test Description

The Charged Device Model (CDM) ESD testing was performed on a THERMOFISHER RCDM system per ESDA ESD STM5.3.1-1999 / AEC-Q100-011-Rev-B. This test is performed for information only. A copy of the circuit is shown below:

1.8 Test Circuit & Condition



(b) Field induced charge CDM

1.9 ESD Data

Device	Model	S/S	Pins	Voltage Passed	Voltage Failed
LTC6813	CDM	3	All Pins	>±750V	

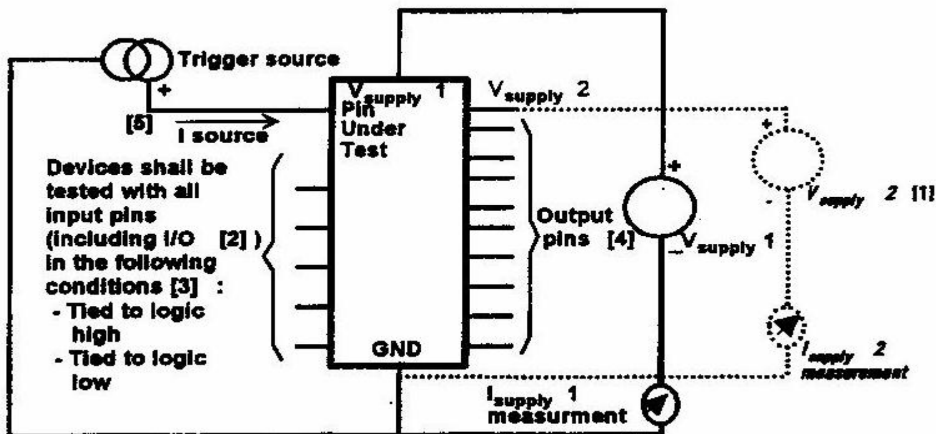
4. Latch-Up Test Results

4.1 Test Description

Latchup Testing was performed at +25°C and +125°C using the LTX Integrated Circuit Test system. The Power Supply pins are biased to the appropriate Datasheet specifications and the individual non-Power Supply pins are tested incrementally while the current is monitored until failure occurs.

4.2 Test Circuit & Condtion

4.2.1 Test Circuit 1

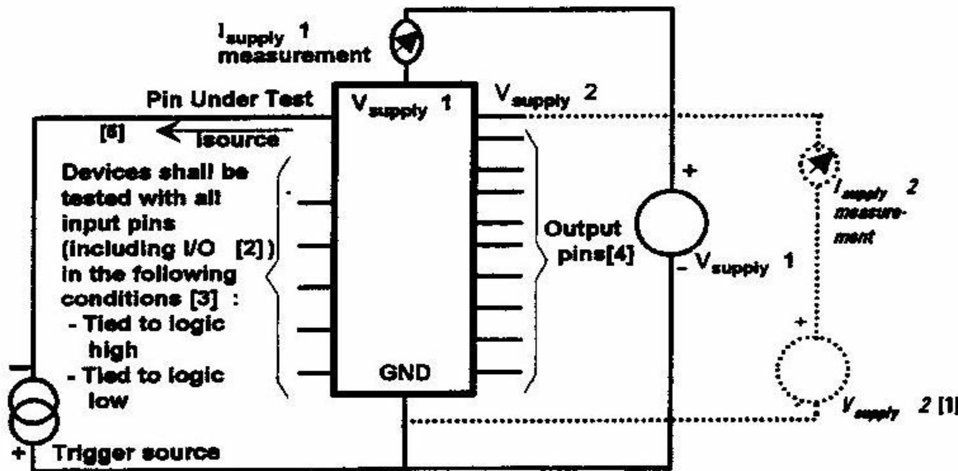


1. DUT biasing shall include additional $V_{supplies}$ as required.
2. DUT shall be preconditioned so that all I/O pins are placed in a valid state per 4.1. I/O pins in the output state shall be open circuit.
3. Logic high and logic low shall be per the device specification. When logic levels are used in respect to a non-digital device, it means the maximum high or minimum low voltage that can be supplied to the pin per the device specifications, unless these conditions violate device setup condition requirements.
4. Output pins shall be open circuit except when latch-up tested.
5. The trigger test condition is defined in figure 2 and table 1.

NOTE: Dynamic devices may have timing signals applied per 4.2.3.

Figure 5 - The equivalent circuit for positive input/output I-test latch-up testing

4.2.2 Test Circuit 2



1. DUT biasing shall include additional Vsupplies as required.
2. DUT shall be preconditioned so that all I/O pins are placed in a valid state per 4.1. I/O pins in the output state shall be open circuit.
3. Logic high and logic low shall be per the device specification. When logic levels are used with respect to a non-digital device, it means the maximum high or minimum low voltage that can be supplied to the pin per the device specification, unless these conditions violate the device setup condition requirements.
4. Output pins shall be open circuit except when latch-up tested.
5. The trigger test condition is defined in figure 3 and table 1.

NOTE: Dynamic devices may have timing signals applied per 4.2.3.

Figure 6 - The equivalent circuit for negative input/output I-test latch-up testing

4.3 Latch-Up Data

Device	Mode	Current	Temp	S/S	Results
LTC6813	CKT1 & CKT2	>±200mA	+25°C	5	PASS
	CKT1 & CKT2	>±100mA	+125°C	5	PASS

LTC6813 PCN Datasheet Changes

LTC6813-1

	MIN (OLD)	MIN (NEW)
t_{CYCLE}	2027	1743
	352	303
	2717	2337
	174.2	150.0
	29.1	25.0
	232.3	200.0
	970	834
	176	151
	1307	1124
t_{SKEW1}	168	144
	470	404
t_{SKEW2}	202	174
	580	500

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
ADC Timing Specifications							
t_{CYCLE} (Figure 3, Figure 4, Figure 6)	Measurement + Calibration Cycle Time When Starting from the REFUP State in Normal Mode	Measure 18 Cells	●	2027	2343	2488	µs
		Measure 3 Cells	●	352	407	432	µs
		Measure 18 Cells and 2 GPIO Inputs	●	2717	3140	3335	µs
	Measurement + Calibration Cycle Time When Starting from the REFUP State in Filtered Mode	Measure 18 Cells	●	174.2	201.3	213.8	ms
		Measure 3 Cells	●	29.1	33.6	35.7	ms
		Measure 18 Cells and 2 GPIO Inputs	●	232.3	268.5	285.1	ms
	Measurement + Calibration Cycle Time When Starting from the REFUP State in Fast Mode	Measure 18 Cells	●	970	1121	1191	µs
		Measure 3 Cells	●	176	203	215	µs
		Measure 18 Cells and 2 GPIO Inputs	●	1307	1511	1605	µs
t_{SKEW1} (Figure 6)	Skew Time. The Time Difference Between Cell 18 and GPIO1 Measurements, Command = ADCVAX	Fast Mode	●	168	194	206	µs
		Normal Mode	●	470	543	577	µs
t_{SKEW2} (Figure 3)	Skew Time. The Time Difference Between Cell 18 and Cell 1 Measurements, Command = ADCV	Fast Mode	●	202	233	248	µs
		Normal Mode	●	580	670	711	µs

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Worked on: (Name, Function)	Max Mustermann
Date:	
PCN number:	
Signature:	

Basis: IEC 60810

Mark change with an "x"

Assessment of impact on Supply Chain

Assessment of impact on Supply Chain regarding following aspects: contractual agreements; technical interface of processability/manufacturability of customer; form, fit, function, quality performance, reliability.

Column 3 is "Remaining risks on Supply Chain?": No / Yes.

ID	Type of change	No	Yes	Understanding of semiconductors experts	Examples to explain	Evaluation level A/B/C	Further applicable conditions	Remarks
	MKT							
LED-MK-01	Any change with impact on agreed upon contractual agreements	P	P	Not relevant for technical evaluation		*		
LED-MK-02	Any change with impact on technical interface or processability/manufacturability of customer which is not covered in the matrix below	P	P	See processability, no faster test of technical interface impact component terminals		B	Check if LED-DS-01 is affected. Processability should be assessed.	
	DATASHEET							
LED-DS-01	Change of datasheet parameters/electrical/specification limits (min./max./typ. values and/or Pulse/DC specification)	P	P	Change of application relevant information (e.g. maximum drive current). Not included: Editorial changes		A		
LED-DS-02	Correction of data sheet	I	P	Data sheet (editorial changes) has to check if application affected. I: In case of editorial changes P: in case of impact on product integrity	e.g. change of ESD level	A		
LED-DS-03	Specification of additional parameters	I	P	Definition of an additional parameter which was not specified before. I: if integrity of the device is not affected P: if change in bin ...	e.g. adding new tested parameter	C		Formalism since this is not a product change, ony addtional information Classification: C
	DESIGN							
LED-DE-01	Design changes in epitaxy.	P	P	Any device relevant changes in design / layout of epitaxial layers Not included: Changes within design rules and design specification without affecting specified functions, parameters and reliability.	e.g. change from Double-hetero to Quantum wells; e.g. change of barrier thickness	C	A: change from Double hetero to Quantum wells --> spectrum is affected	
LED-DE-02	Design changes in routing/layout.	P	P	Any change in chip design / layout. Not included: Changes within design rules and design specification without affecting specified functions, parameters and reliability.	e.g. change in layout of current spreader; thickness of current spreader; e.g. reduction of bond pad size	C	A: change in layout of current spreader --> radiation pattern changes	TR might be considered for complex die bond technologies
LED-DE-03	Die shrink	P	P	Shrink of active area. Not included: sawing street/kerf/scribe line	Typical shrink of die.	A		
LED-DE-04	LED package (except leadframe)	P	P	any change in housing thickness; any change in form or dimensions	e.g. change of dimensions; e.g. change of x, y, or z dimension of the package	B	Check if LED-DS-02 is affected which leads to a change of the elctrooptic parameters or distributions.	
LED-DE-05	Design of leadframe	P	P	any change of leadframe / carrier dimensions; any change of outer dimensions	e.g. change in leadframe / carrier dimensions in x,y, or z direction; e.g. change inner design of the leadframe not affecting the e/o performance & reliability of the device	B	Check if LED-DS-02 is affected which leads to a change of the elctrooptic parameters or distributions.	
	PROCESS - WAFER PRODUCTION							
LED-PW-01	New / change of wafer substrate or carrier material	P	P	New wafer substrate material.	e.g. different wafer material to currently released material (change from Sapphire to Silicon)	C	Check if LED-DS-02 is affected which leads to a change of the elctrooptic parameters or distributions.	
LED-PW-02	Wafer diameter	P	P	change of wafer diameter resulting in equipment and process changes	e.g. 4" to 6"	C	In case other type of changes are affected i.e equipment/process technology - they need to be identified in addition	
LED-PW-03	New final wafer thickness	P	P	Change in final wafer thickness	e.g. change in final chip/die thickness	C	Check if LED-DS-02 is affected which leads to a change of the elctrooptic parameters or distributions.	
LED-PW-04	Change of electrically active doping/implantation element	P	P	Change in electrically active doping / implantation element resulting in a new technology.	e.g. change from Be to C as dopant	C		
LED-PW-05	Change of stacking	P	P	change in layer sequence or thickness	e.g. change of isolation layer thickness between n- and p-material	A	customer application needs to be checked due to potential system voltage differences	
LED-PW-06	New / change of metallization (specifically chip frontside)	P	P	Change in metallization of bondpads, material, layer thickness	e.g. change in bond pad metallization thickness	C		
LED-PW-07	New / change of metallization (specifically chip backside)	P	P	Change of bottom layer of die (between die and leadframe/carrier). Change in process, material, or dimensions necessary.	e.g. change from Au to Au/Ge	C	A: customer application needs to be checked due to potential system voltage differences	
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 etching, change from horizontal to vertical oven for oxidation, change from contact litho into stepper litho, ...	e.g. change from wet etch to dry etch; e.g. change from laser cutting (sawing) to plasma cutting (sawing); e.g. change from contact litho to stepper litho	C	B: change from CVD dep to sputter dep for backside/frontside metallization. In case of new equipment please check if LED-PA-14 is also affected.	Qualification effort depends on type of change.
LED-PW-09	Process Integrity: Tuning within specification	--	P	Variation within process specification	e.g. process control	C		
LED-PW-10	Change of material supplier with no impact on agreed specifications	--	P	Change of wafer supplier. Change of supplier for chemicals needed for wafer production.	e.g. Change of wafer supplier.	C		Qualification effort depends on type of change.
LED-PW-11	Change of specified wafer 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 cleaning process in wafer production	C		Qualification effort depends on type of change. PPAP has to be updated.
LED-PW-12	Change in die coating or passivation	P	P	Change in material, thickness, and process for coating and passivation	e.g. change from SiO2 to SiN3	C		
LED-PW-13	New wafer production location or transfer of wafer production to a different not previously released location/site/subcontractor	P	P	New wafer propduction location or transfer of wafer production with possible additional changes.		C	A or B: Impact on other type of changes described under PROCESS - WAFER PRODUCTION and EQUIPMENT categories of this DeQuMa	
	BARE DIE DELIVERIES							
LED-BD-01	New / change of front side metallization	P	P	Change in bondpads, material, pad pitch, surface changes, layer thickness	e.g. change from Au to Al alloy; e.g. change in over pad metallization	B		
LED-BD-02	New / change of backside metallization	P	P	Change of bottom layer of die (between die and leadframe/carrier). Change in process, material, or dimensions.	e.g. change from Au to Au alloy	B	Check if LED-DS-02 is affected which leads to a change of the elctrooptic parameters or distributions.	customer application needs to be checked due to potential system voltage differences
LED-BD-03	Change of wafer setup or number of dies on wafer.	I	P	Needed information for pick & place machine. I: only additional number of chips P: change in spacing between chips and form of wafer	e.g. information change for pick & place machine.	B		
LED-BD-04	New final wafer thickness	P	P	Changes in final Chip height (including carrier); very rare and usually combined with a material change (change of carrier material)	e.g. change on converter thickness	B	Check if LED-DS-01 is also affected.	
LED-BD-05	Change in die coating or passivation	P	P	Change in material, thickness, and process for coating and passivation	e.g. change from SiO2 to SiN3	B	Check if LED-DS-01 is also affected.	
	PROCESS - ASSEMBLY							
LED-PA-01	Change of leadframe/carrier base material	P	P	New leadframe/carrier material (new in composition)	e.g. change from copper alloy to bare copper	B	Check if LED-DS-02 is affected which leads to a change of the elctrooptic parameters or distributions.	Explanation should be provided in case H2S test is not applicable
LED-PA-02	Change of leadframe/carrier finishing material (internal)	P	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 NiPd protection layer; e.g. change from Ag spot to Au spot	A		H2S test should be considered for automotive exterior applications. explanation should be provided in case H2S test is not applicable
LED-PA-03	Change of lead and heat slug plating material/plating thickness (external)	P	P	Change in material and process technique for final pin termination (e.g. pure tin). Herein package, processability and reliability on board level can be verified by generic data. Classification depends on impact of change	e.g. change in heat slug stack; e.g. change from Sn into Ni/Pd/Au; e.g. change of layer thickness	B		Explanation should be provided in case H2S test is not applicable
LED-PA-04	Bump Material / Metall System (internal)	P	P	Stack die or die to substrate	e.g. change to Pb-free material	A		
LED-PA-05	Die attach material	P	P	Change of die attach material (e.g. soft solder, epoxy, etc). Thermal managment must be respected.	e.g. change of Ag glue to Au glue;	B		
LED-PA-06	Change of bond wire material	P	P	Material, wire diameter, change in process technique	e.g. change from 30µ to 25µ	A		Site audit for material change with impact on bondprocess (e.g. from Au to Cu) recommended.
LED-PA-07	Change in material for sub-components (excluding LED chip & LED package related items) with impact on agreed specifications	P	P	Change of sub-component supplier using different technology/materials Note: [illegible]	e.g. using a different ESD-diode in technology and material than previously	A	Check if LED-DS-01 is also affected.	Qualification effort depends on type of change.
LED-PA-08	Die Overcoat / Underfill	--	P	Supporting layers for complex packages like flip chip. --: No change in product integrity P: change can influence the integrity of final product	P: e.g. change of underfill with change of thermal resistance	B	Check if LED-DS-01 is also affected.	
LED-PA-09	Change of mold compound/encapsulation/sealing material	P	P	Change of mold compound, encapsulation, or sealing material might be affected optical function in case of package related effect (e.g. browning). Component assembly and board coating has to be assessed. MSL might be changed.	e.g. PPA mold compound	A	Check if LED-DS-01 is also affected.	
LED-PA-10	Change of conversion material	P	P	Change of material class.	e.g. change from granats to nitrides	C	Check if LED-DS-01 is affected for optical/photometric parameters	
LED-PA-11	Change of direct supplier for converter material	--	P	New supplier with same material specification		C		
LED-PA-12	Change of converter process technology	I	P	new technology for converter production I: no influence on e/o performance of product P: in case of impact on product integrity	e.g. change from volume conversion to layer conversion; 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-DS-01	
LED-PA-13	Change of product marking	I	P	Marking on device. I: change in appearance; readability not affected P: change of content or change of appearance of data matrix code	e.g. marking of cathode;	B		
LED-PA-14	Change in process technique (e.g., die attach, bonding, moulding, plating, trim and form, ...)	P	P	Any change in assembly process technique	e.g. change die attached from gluing to soldering;	B	A or B: Please check if EQUIPMENT and other type of changes of material (LED-PA-04/05/06/07/08/09/10) are affected	Qualification effort depends on type of change.
LED-PA-15	Process Integrity: Tuning within specification	--	P	Variation within process specification	e.g. process control	C		
LED-PA-16	Change of direct material supplier with no impact on specification	--	P	Change of suppliers e.g. for lead frames, wire material, die attach, electronical components ...	Change of suppliers e.g. for lead frames, wire material, ESD-diode ...	C	Assumption that change material specification remains unchanged. Otherwise see change of material	See change of material.
LED-PA-17	Change of specified assembly process sequence (additional and/or deletion of process step)	I	P	Addition or deletion of a process step in assembly process sequence with potentially significant impact on the product perfomance I: no influence on product integrity P: influence on product integrity expected	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.
LED-PA-18	New assembly location or transfer of assembly to a different not previously released location/site/subcontractor	P	P	New assembly location, assembly transfer or relocation. Transfer of known technology and equipment.	e.g. Dual source strategy	C	A or B: Impact on other type of changes described under PROCESS ASSEMBLY and EQUIPMENT	Qualification effort depends on type of change.
	PACKING/SHIPPING							
LED-PS-01	Inner Packing/shipping specification change	P	P	dimension change of direct product packing	e.g. SMT pocket in tape changes	B		
LED-PS-02	Outer Packing/shipping specification change	I	P	dimension changes indirect product packing I: small changes in dimension or appearance P: number of reels in the packing are changing	e.g. pizza box	*		
LED-PS-03	Change of labelling	I	P	Change of labelling also on reel. I: additional information no change of previous information P: change in content of previous information	(I) e.g. additional information (RoHS stamp) (P) e.g. change of customer specific information	B	Check if LED-DS-01 is also affected.	
LED-PS-04	Dry pack requirement change	P	P	Change of dry pack requirements (change in MSL)	e.g. change from MSL3 to MSL1	*	Check if LED-DS-02 is also affected.	
	EQUIPMENT							
LED-EQ-01	Production from a new equipment/tool 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 require also a PCN.	e.g change from single wafer to batch process; e.g. over pad metallisation; e.g. dambar cutting (mechanical to laser cutting)	B	Check if LED-DS-01 is also affected. Corrosion stability should be assessed.	Qualification effort depends on type of change.
LED-EQ-02	Production from a new equipment/tool 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.	e.g. change from single site to multi site handler.	C		Qualification effort depends on type of change.
LED-EQ-03	Change in final test equipment type that uses a different technology	I	P	Change of tester platform (e.g. major test program changes, new tester interface, ...) I: product specification is not affected P: product specification is affected	e.g. change in test method from cd to lumen	B		Gage R&R / delta correlation
	TEST FLOW							
LED-TF-01	Move of all or part of electrical wafer test and/or final test to a different location/site/subcontractor	P	P	Tester transfer or relocation.	e.g. Dual source strategy	C		Gage R&R / delta correlation; additional specification check B should be considered for Wafer testing
	Q-GATE							
LED-QG-01	Change of the test coverage/testing process flow used by the supplier to ensure data sheet compliance (e.g. elimination/addition of electrical measurement/test flow block; relaxation/enhancement of monitoring procedure or sampling)	--	P	Reduction or additional control steps, test coverage within the process flow	e.g. test flow block like Final test / final clearance	C		

Device evaluation – MATERIAL PERFORMANCE TEST RESULTS (on the basis of IEC 60810)

ID	Line eval.	IEC 60810	Check spec.	HTOL	TC	WHTOL	PTC	ESD-HBM	ESD-MM	PD	VVF	MS	RSH	SD	TMSK	H2S	PLT	DEW	FMGC	TR	WBS	BS	DS	Notes	Whisker	Param.
LED-MK-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-MK-02	-	-	-	-	T	-	-	-	-	-	-	-	S,T	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-DS-01	-	-	-	E	E	E	-	E	E	-	-	-	S	-	-	-	E	-	-	E	-	-	-	-	-	E
LED-DS-02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-DS-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•
LED-DE-01	-	•	-	•	-	•	•	-	•	-	-	-	-	-	-	-	•	H	-	-	-	-	-	-	-	•
LED-DE-02	-	•	-	•	•	•	•	-	•	-	-	-	•	-	B,D,M	M	•	M	M	-	B	B	D,M	-	-	•
LED-DE-03	-	•	-	•	•	•	•	•	•	-	-	-	•	-	-	-	•	-	-	•	B	B	•	-	-	•
LED-DE-04	-	•	-	•	•	•	•	-	-	•	V	V	•	T	-	D	-	D	D	L	B	B	D	-	-	•
LED-DE-05	-	-	•	•	•	•	•	•	•	•	V	V	•	T	•	-	-	-	-	•	B	B	D	-	2	•
LED-PW-01	-	•	•	•	P	P	•	P	P	-	-	-	•	-	P	P	•	P	P	•	-	-	•	-	-	•
LED-PW-02	•	•	•	•	-	•	•	P	P	-	-	-	•	-	-	-	•	-	-	•	-	-	-	-	-	•
LED-PW-03	-	•	-	•	•	P	•	P	P	-	-	-	•	-	-	-	•	-	-	•	B	B	•	-	-	•
LED-PW-04	-	•	C	•	-	C	C	•	•	-	-	-	•	-	-	-	•	-	-	•	-	-	-	-	-	•
LED-PW-05	-	-	-	•	F	•	•	•	•	-	-	-	•	-	-	-	•	F	-	-	-	-	-	-	-	•
LED-PW-06	-	•	M	•	•	•	•	M,B	M,B	-	-	-	•	-	B	M	•	M	M	-	•	•	-	-	-	•
LED-PW-07	-	•	M	•	•	•	•	D,M	D,M	-	-	-	•	-	D,M	D,M	•	D,M	D,M	D,M	-	-	•	-	-	•
LED-PW-08	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-PW-09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
LED-PW-10	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-PW-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-PW-12	-	•	P	•	•	•	P	P	P	-	-	-	-	-	-	P	-	P	P	-	P	P	-	-	-	•
LED-PW-13	•	•	-	•	•	-	-	•	-	-	-	-	•	-	-	-	•	-	-	J	•	•	•	-	-	•
LED-BD-01	-	-	M	•	•	•	•	M,B	M,B	-	-	-	-	-	•	•	•	•	•	•	•	•	-	-	-	-
LED-BD-02	-	-	M	•	•	•	•	D,M	D,M	-	-	-	•	-	•	•	•	•	•	•	-	-	•	-	-	-
LED-BD-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-BD-04	-	-	P	•	•	P	•	P	P	•	-	-	•	-	-	-	•	-	-	•	B	B	•	-	-	•
LED-BD-05	-	•	P	•	•	P	P	P	P	-	-	-	-	-	-	P	-	P	P	-	P	P	-	-	-	•
LED-PA-01	-	•	•	P	•	•	-	-	-	-	-	-	•	•	-	A	-	A	A	P,1	•	•	•	-	P	-
LED-PA-02	-	•	•	P	•	•	-	-	-	-	-	-	•	•	-	A	-	A	A	P,1	•	•	•	-	-	-
LED-PA-03	-	-	M	P	•	K	-	-	-	1	-	-	•	•	-	A	-	A	A	P,1	-	-	-	-	K	-
LED-PA-04	-	-	•	•	•	•	•	-	-	-	-	-	•	•	•	W	-	W	W	•	-	-	•	-	-	-
LED-PA-05	-	•	•	•	•	•	•	-	-	-	N	N	•	-	N	Q	-	N	Q	•	-	-	•	-	-	-
LED-PA-06	-	•	•	•	•	P,D	•	-	-	-	D	D	•	-	D	P,D	•	-	P,D	-	•	-	•	-	-	-
LED-PA-07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-PA-08	-	•	P	•	•	P	•	-	-	-	-	P	•	-	P	P	•	-	P	U	-	-	U	-	-	-
LED-PA-09	-	•	•	•	-	•	•	-	-	D	D	D	•	T	P	P	P	P	P	P	-	-	-	-	-	-
LED-PA-10	-	•	•	•	Y	•	•	-	-	-	Y	Y	•	-	Y	P	P	P	P	Y	-	-	-	-	-	•
LED-PA-11	-	-	•	•	P	•	•	-	-	-	P	P	•	-	P	P	P	P	P	P	-	-	-	-	-	•
LED-PA-12	-	•	-	•	Y	•	•	-	-	-	Y	Y	•	-	Y	Z	Z	Z	Z	Y	-	-	-	-	-	•
LED-PA-13	-	-	-	-	O	-	-	-	-	-	-	-	T	T	-	-	-	-	-	-	-	-	-	-	-	-
LED-PA-14	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-PA-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-PA-16	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-PA-17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-PA-18	•	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-PS-01	-	-	P	-	-	-	-	P	P	-	-	-	-	T	-	-	-	-	-	-	-	-	-	-	-	-
LED-PS-02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-PS-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-PS-04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-EQ-01	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-EQ-02	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LED-EQ-03	-	•	-	-	-	-	-	•	•	-	-	-	-	T	-	-	-	-	-	-	-	-	-	-	-	•
LED-TF-01	•	-	-	B	•	•	B	•	•	-	-	-	•	T	B	-	B	-	-	-	B	B	B	-	-	•
LED-QG-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•
Tests, which should be considered for the 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 'G' for generic)																										

Reason for exception of tests and/or usage of generic data:

Symbol	Meaning
--	Not required.
I	Information Note required
P	PCN required

A letter or "•" indicates that performance of that stress test should be considered for the appropriate process change.

	CONDITIONS	No
A	Not for Ag plated devices applicable (Ag intended to fail for this test)	
B	Only if Bondframe/Wirebond is changed/affected	
C	Only if dopand/implantation material is changed	
D	Only if Dimensions are changing	
E	Only if min/max Values are changing	
F	Sequence change only	
H	Non Epoxy Casted Devices only	
J	Only for chip technology using wafer bonding	
K	Not for Au plated devices	
L	Only if Leadframe/Substrate Dimensions are changed	
M	Only if metal composition is changed including sequence	
N	Only for glued chips	
O	Only if process is changing	
P	Only if material properties are changed	
Q	Only if glue components are changing	
R	Only if marking technology changes	
S	Only if Floor Life is affected	
T	Only if Board Reliability is affected	
U	Only if underfill is affected	
V	Only for non-hermetic devices	
W	Only if risk of corrosion is increasing	
Y	Only for layer technology	
Z	Only if conversion technology changes	
1	Only if data sheet parameters are affected	
[illegible]	Only if outer dimensions are critical	

--- Please mark 'NO' with 'x', default is 'YES'