


PRODUCT / PROCESS CHANGE INFORMATION

1. PCI basic data

1.1 Company		STMicroelectronics International N.V
1.2 PCI No.		CRP/18/10710
1.3 Title of PCI		ALTERNATIVE METHODOLOGY FOR BIAS & LINEARITY STUDIES IN SEMICONDUCTOR INDUSTRY
1.4 Product Category		ALL automotive products
1.5 Issue date		2018-05-10

2. PCI Team

2.1 Contact supplier	
2.1.1 Name	MARCELI SMIALKOWSKI
2.1.2 Phone	+44 1628896277
2.1.3 Email	marceli.smialkowski@st.com
2.2 Change responsibility	
2.2.1 Process Owner	Guy CAUQUIL
2.2.2 Corporate Quality Manager	Roberto LISSONI

3. Change

3.1 Category	3.2 Type of change	3.3 Manufacturing Location
Parametric Test	Modification of testing method or program with no change of test coverage and no change of spec limit	The improved methodology is ready to be applied on all ST manufacturing Front End plants.

4. Description of change

	Old	New
4.1 Description	<p>To conduct bias & linearity studies, AIAG MSA manual rely on a statistical approach based on t-test statistical value, which provides a criteria to judge if the difference in bias or linearity response is statistically different from zero compared to the repeatability of the metrology system.</p> <p>Bias & Linearity studies based on Ttest statistics approach conducted at several ST Front-End manufacturing plants, involving either identical or different metrology techniques tested over their operating range, all exhibit some bias error and nonlinear behavior.</p> <p>A clear picture on the consequences of this established situation versus the accuracy requirement has been highlighted by Sematech consortium few years ago and is summarized in the Sematech internal document in: http://sematech.org/docubase/document/Semiconductor_Industry_MSA_Practices.pdf</p>	<p>An alternative methodology to outdoing classical statistical approach as described in the AIAG MSA Manual - which appears to be no more suitable to the semiconductor industries - is provided by rather focusing the statistical studies on:</p> <ul style="list-style-type: none"> - The compliance of the bias to the metrology supplier accuracy - The stability of the linearity response of the system over time - The consistency of the linearity response within equipment fleet <p>The method which is described in the ST Company Specification "MEASURING SYSTEM ANALYSIS (M.S.A.)", DMS #0151977 is based on a statistical analysis to verify the good correlation (R2) between the values given by the metrology systems over their operation range. The method also allow to verify that the level of misalignment between metrology systems does not impact the quality decision judgment.</p>
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	<p>form: no changes in the product</p> <p>fit: no changes in the product</p> <p>function: no changes in the product</p> <p>reliability or processability: no changes in the product</p>	

5. Reason / motivation for change

5.1 Motivation	<p>Modern wafer fab's requirements have now even surpassed the expectations in the AIAG MSA manual. To fulfill the aggressive requirement of semiconductor product specifications, the metrology repeatability and stability improved very drastically. Two main aspects can be highlighted:</p> <ul style="list-style-type: none"> - In many cases, tolerance of reference standards are now much larger than the precision of the semiconductor metrology equipment themselves. This inevitably leads to the conclusion that statistically it exists a significant Bias even if this Bias is included in the tolerance provided by the best in-class worldwide certified instrument. Being this bias within the potential values, it is fully acceptable. - In the field of semiconductor metrology, metrology systems are used indifferently to measure all parameters in the manufacturing line coming from multiple products and equipment monitoring. They have to cover a very wide measurement range not only one product specifications. Linearity as well as uniformity (change in repeatability over operating range) or consistency (change in repeatability over time) actually varies significantly over the operating range of our metrology equipment. This is totally in compliance with process control requirements over the operating range. Still, due to the excellent repeatability of our metrology system, which is inherent to our industry requirements, this inevitably leads to the conclusion that the linearity error of our measurement systems is statistically significantly different from zero when compared to their repeatability. It appeared that the statistical approach for Bias and linearity studies as described in AIAG is not adapted to FE metrology semiconductor equipment due to their excellent repeatability. <p>Do not consider following Chapter 8 "Qualification / Validation": Please refer to ATTACHMENT to this notification for all details regarding qualification strategy (10710 PRODUCT - PROCESS CHANGE NOTIFICATION_rev3.docx).</p>
5.2 Customer Benefit	QUALITY IMPROVEMENT

6. Marking of parts / traceability of change

6.1 Description	ALL automotive products in the list
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7. Timing / schedule

7.1 Date of qualification results	2018-01-31
7.2 Intended start of delivery	2018-06-18
7.3 Qualification sample available?	Not Applicable

8. Qualification / Validation

8.1 Description			
8.2 Qualification report and qualification results	In progress	Issue Date	

9. Attachments (additional documentations)

10710 Public product.pdf
10710 PRODUCT - PROCESS CHANGE NOTIFICATION_rev3.docx

10. Affected parts

10. 1 Current		10.2 New (if applicable)
10.1.1 Customer Part No	10.1.2 Supplier Part No	10.1.2 Supplier Part No
	BAT54JFILM	
	ESDA6V1L	
	HDMIULC6-4SC6	
	SM15T200A	
	SM15T39CA	
	SM6T200A	
	SM6T33CA	
	STL40DN3LLH5	
	STPS15L60CB-TR	
	STPS3150U	
	VN820B5TR-E	
	VNB20N07TR-E	
	VND14NV04TR-E	
	VND5025AKTR-E	
	VND5050JTR-E	
	VND5T035AKTR-E	
	VNN1NV04PTR-E	

	X0202MN 5BA4	
	STPS340U	

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Public Products List

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PCI Title : ALTERNATIVE METHODOLOGY FOR BIAS & LINEARITY STUDIES IN SEMICONDUCTOR INDUSTRY

PCI Reference : CRP/18/10710

Subject : Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change.

SPC560B50L3B4E0X	SPC564L70L3BCOSR	SPC560P40L3CEFAR
SPC564L60L5BCOQR	M95040-DRMN3TP/K	M24C16-DRDW8TP/K
M24C16-DRMN3TP/K	SPC56EL60L3CBFSY	M24128-DRDW8TP/K
SPC564B64L7C9E0X	M24C32-DRDW3TP/K	SPC564B70L7B9ECX
SPC560D40L3B3E0X	M95160-DRMN3TP/K	SPC560B50L5B4E0X
SPC560D40L1C4E0X	SPC56EC64B3C9EEY	SPC560P34L1CEFAY
SPC560B64L7C6E0Y	SPC560D30L3B3E0X	M95128-DRDW3TP/K
SPC560C50L3C6E0X	M24C64-DRMN3TP/K	SPC560B64L7B6E0X
SPC560B54L5B6E0X	SPC560B60L7B6E0X	SPC560D30L1B4E0X
M95320-DRDW3TP/K	M95020-DRDW3TP/K	SPC560P50L5CEFAR
SPC560B64L3B6E0X	M95080-DRMF3TG/K	SPC560P50L5BEAAY
M24256-DRMN3TP/K	SPC564B74L7B8E0X	SPC560B60L5B6E0Y
SPC560B50L5B6E0X	M95640-DRMF3TG/K	SPC560B60L3C6E0Y
M95320-DWDW4TP/K	SPC560B60L5B6E0X	SPC560B50L5C6E0Y
SPC560B40L3B4E0X	M24C04-DRMN3TP/K	M95160-DWDW4TP/K
SPC56AP60L3BEAAR	ST72F321AR9TCTXS	M24C16-DRMN8TP/K
SPC560P50L3CEFAY	M95128-DRMN3TP/K	M24512-DRMF3TG/K
SPC560D40L3C4E0Y	SPC564B74L7B9ECX	M95128-DWDW4TP/K
M24C64-DRMF3TG/K	SPC560P40L3CEFBR	SPC56EL60L5CCOSR
SPC564L60L3BCOQR	M95320-DRMN3TP/K	SPC56EL60L3CBFSR
SPC560P44L3CEFAR	SPC560B64L5C6E0Y	M24256-DRDW8TP/K
M95256-DRDW3TP/K	SPC560B50L3C6E0X	M95020-DRMN3TP/K
M24C64-DRDW3TP/K	M95M01-DWDW4TP/K	STM8AF6246TCSSSX
SPC560P44L3CEFAY	M24128-DRMN8TP/K	SPC560P54L5CEAAR
M95040-DWDW4TP/K	M95640-DWDW4TP/K	STGYA120M65DF2AG
M95256-DWDW4TP/K	SPC564B64L7B8E0X	SPC560B64L5C6E0X
SPC56EC74L7C9ECY	SPC570S50E1CEFAR	SPC560D40L1B4E0X
M24256-DRMF3TG/K	SPC560P34L1CEFAR	SPC560B54L3C6E0X
STPS41H100CGY-TR	SPC560B54L5B6E0Y	SPC560B50L3B6E0X
SPC560B40L3B6E0Y	M24C08-DRMF3TG/K	SPC560P50L5BEFAR
SPC56EL60L5CBFQR	M24C02-DRMN3TP/K	STTH8L02DDJFY-TR
SPC560B60L7C6E0X	M24C64-DRDW8TP/K	SPC560C50L3B4E0X
SPC564L70L5BBOSR	SPC560B54L5C6E0X	SPC560P50L3BEABY
SPC560B40L3C4E0X	SPC560P50L3CEFBR	SPC56EL70L5CBFSR
SPC56EL70L5CBFSY	M24128-DRMN3TP/K	SPC560D40L3B4E0X
SPC560B60L7B6E0Y	M24512-DRDW8TP/K	SPC560P54L3BEABR



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SPC560P50L3BEABR	SPC560B50L3C6E0Y	M95512-DWDW4TP/K
M95M02-DWMN3TP/K	M95640-DRDW3TP/K	SPC564B64L7C8E0X
M24C32-DRMN3TP/K	SPC560P60L3BEABR	SPC570S50E1CEFAY
M24C32-DRDW8TP/K	SPC564L54L3BCFQR	M95040-DRDW3TP/K
SPC56EL70L5CBOSY	SPC56AP60L5CEFAY	ST72F324BK6TCTXS
SPC560B60L5C6E0X	SPC560B50L1B4E0X	M95256-DRMF3TG/K
SPC560D40L1B3E0X	M95080-DRDW3TP/K	SPC560P40L1CEFAR
M95128-DRMF3TG/K	SPC560B50L1C6E0Y	SPC560B40L5C6E0X
M24C04-DRMF3TG/K	M95160-DRDW3TP/K	SPC564B64L7C800Y
M95512-DRMN3TP/K	SPC560B40L3B6E0X	M24C02-DRDW3TP/K
SPC560P54L5BEAAR	SPC560P60L5CEAAR	M24C02-DRDW8TP/K
SPC560P44L3BEAAY	SPC560P50L3CEFAR	M95256-DRMN3TP/K
M95M01-DWMN3TP/K	SPC560P40L3BEAAY	M24C16-DRDW3TP/K
M24512-DRDW3TP/K	STM8AF6246TDSSSX	SPC560B54L3B4E0X
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SPC560B50L5C6E0X	M24512-DRMN3TP/K	M24C04-DRDW3TP/K
SPC560B40L3C6E0X	M95640-DRMN3TP/K	SPC560B54L3B6E0X
STPS15H100CBY-TR	M95M01-DWDW3TP/K	SPC560B60L3C6E0X
SPC560B64L7C6E0X	SPC560P40L1CEFBR	SPC560C50L3C6E0Y
M95512-DRDW3TP/K	M95080-DRMN3TP/K	SPC564L60L5CCFQR
STD20NF06LT4	VND5004BSP30TR-E	VND5160AJTR-E
ESDA6V1-5SC6Y	VN5E050J-E	STPSC10H12GY-TR
L99DZ81EPTR	L5150BNTR	VND7N04TR-E
VND7004AYTR	ESDLIN1524BJ-HQ	VND5T035AKTR-E
VN750SMPTR-E	VN5E160MS-E	VN5772AKTR-E
TDA7718B	TDA7851L	STB75NF75LT4
VN772KPTR-E	ESDA6V1LY	VND10N06-E
VND10N06TR-E	STD1HN60K3	STGD18N40LZT4
LDP01-35AY	STTH4R02SY	STPS1545G-TR
VNV35N07-E	SMAJ30CA-TR	STPS4045CWY
SM30T7.5CAY	STM8AL3166UCY	SM6T75AY
VND600SPTR-E	STM8AF6246UCY	STTH1R06UFY
STD25NF20	STGB10NB40LZT4	SM4T7V6CAY
SM4T6V7AY	STD28P3LLH6AG	VNP5N07-E
STPS3150U	ESDA6V1L	SMA6T33CAY
ST10F273M-4T3	VN5E016MH-E	VNH5050A-E
STM8AF6248TAY	VND5E160MJTR-E	L9911V
SM4T35AY	BAT54JFILM	STTH1512GY-TR
VN800PTTR-E	STA1085EOA3TR	L9960
STD14NM50N	TDA7851FH-QIX	TDA7567PDTR
VND5T100AJ-E	VND7012AYTR	STA1080EOA
VN5E010AH-E	STB120N4F6	L4949EPTR-E
STA1095EOA	E-L9637D	VNQ830PTR-E
SM4T18AY	L9658TR	SM30T42AY
M93C76-RMN3TP/K	STL10N3LLH5	FDA4100LV
VN800PS-E	L99DZ80EPTR	STH185N10F3-6
VNB10N07TR-E	STD18NF03L	ESDALC5-1BT2Y
SMA6T68CAY	STH315N10F7-6	VNQ500PEP-E
L9733XPTR	STTH1003SBY-TR	HSP051-4M10
VN610SPTR-E	SM6T39CAY	SM6T39AY



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L99ASC03TR	L9733CNTR	TDA7569BDLVPDTR
ESDA14V2SC6	STM8AL3148TCX	L9779WD-SPI-TR
VND5025AK-E	VN7050AJTR	STM8AF6266UCX
SM4T30AY	E-L9637D013TR	VN7020AJTR
STB155N3LH6	STPS340UY	VND5E004A30TR-E
STGD19N40LZ	SM6T82AY	SMAJ24CA-TR
L99PM72GXPTR	VNQ5027AKTR-E	ESDCAN03-2BWY
L9349TR-LF	STD9NM50N	F272-BAR-P-TX
STB85NF55LT4	STD105N10F7AG	VNB10N07-E
STM8AF6286TAY	STTH2R02A	VND7020AJTR
L9524C-TR	SMA6T56AY	L9959S-TR-D
STPS360AFY	STD95N4LF3	STPSC10H065GY-TR
VNL5300S5TR-E	SMA6T47AY	STM8AF6268TCY
SMA6T6V7AY	VNLD5300-E	L9951TR
TDA75612LV-48X	TDA7418TR	SM4T21AY
VNB35NV04TR-E	STPS5H100B-TR	VN5E050AJ-E
VN5E050AJTR-E	VG6640AB1M	SM6T68CAY
VND5E025AYTR-E	VN5050JTR-E	VN7040AJTR
HDMIULC6-4SC6	VNS3NV04DP-E	VN771KPTR-E
STPS2H100UY	STPS2H100AY	VND5E160JTR-E
STTH30ST06WY	VN5010AKTR-E	VNS7NV04P-E
VNQ830P-E	VND5050AK-E	STB80NF03L-04T4
STPS3L60SY	VN920B5-E	STPA008-4WX
VNQ600AP-E	ST72F361K9TCS	VND5050KTR-E
TDA7801PDTR	TDA75610LV	VN5E160S-E
STPS3150UY	STPS1045BY-TR	STPS15H100CB-TR
TDA7391LVPDTR	SMA6T22AY	VND3NV04TR-E
STPS140AY	VND5T100LASTR-E	SM30T33CAY
SM4T15CAY	STA1090HOA	VNQ660SP-E
TDA7562	STL15DN4F5	VNP35N07-E
VND5T016ASP-E	STN3NF06L	VN820SP-E
STM8AF6288TDX	STL8N10LF3	VNP10N06-E
L9651	VN820B5TR-E	STGB20N40LZ
STM8AF6286TAX	VNL5050S5TR-E	SM15T36AY
STB170NF04	VNQ690SP-E	L9805E
STA1085EOA3	VN5050AJTR-E	VNL5160N3TR-E
FDA801B-VYT	VN750PT-E	VN7007ALHTR
VN5E050MJTR-E	VNB14NV04TR-E	TN5050H-12WY
VNS14NV04PTR-E	STP100NF04	VN5E160AS-E
TDA7303	STL8N6LF3	STL135N8F7AG
VNB20N07TR-E	VN5050J-E	VND7030AJTR
TDA7387EP	E-L9823013TR	VN7016AJTR
VND5004ATR-E	STD65N55LF3	L9777B13TR
STPSC20065WY	SM30T6.8CAY	SM4T6V7CAY
STPS3H100UFY	L99DZ70XPTR	L9680TR
STW78N65M5	VN5770AKP-E	SM30T28CAY
L9177TR	STPS5L60SY	L5150GJTR
VG6640AB1M/1	SM30T12AY	L4993MDTR
L5150CJTR	STW75NF30	SMA6T39CAY
L99CL01XPTR	M93C86-RMN3TP/K	STP80NF55-08



Public Products List

STTH1602CT	SMA6T14AY	STTH30RQ06WY
VND5E050ACJTR-E	STPA002OD-4WX	SM30T56CAY
VNB20N07-E	L9524C	STB80NF55-06T
STPS140UY	VND810PEP-E	VN7140AJTR
STPS1L60ZFY	STPS2545CTY	STM8AF52AATAX
VN5772AK-E	VND5E160ASOTR-E	STPS1L40ZFY
STTH30RQ06DY	VN750PTTR-E	SM6T24AY
STH315N10F7-2	SMA6T39AY	L99H01QFTR
STPS2L60AY	VN5R003H-E	VND5012AK-E
SM4T50CAY	L9825TR	STPS8L30BY-TR
VN5770AKPTR-E	STPS660DDJFY-TR	VND7050AJTR
STA680	ESDCAN06-2BWY	STPS3045CGY-TR
STPS1L40AY	VNQ5E050K-E	VNL5030S5TR-E
TDA7851F	VNL5160S5-E	VND5E025MK-E
TDA7564B	STM8AF6269TCX	ESDA14V2LY
STB45NF06T4	STPS1H100AY	STH275N8F7-2AG
SM6T7V5AY	SM6T27CAY	VNQ5E160AK-E
LDP01-39AY	VNP10N07-E	TDA7802PDTR
STW62N65M5	VNS1NV04PTR-E	TMMBAT46FILM
MJD44H11T4-A	L4995RJTR	VB525SP-E
TDA7563B	VNQ5E250AJTR-E	L9301-TR
L99ASC03	STPS5H100BY-TR	L4979D013TR
L99MD02XPTR	VND600SP-E	STM8AF6246UCX
VN7140AS12TR	STF40NF06	STB21NK50Z
VND5N07TR-E	STPSC15H12DY	SM15T30CAY
VNQ600PTR-E	BAR46AFILM	STPS140ZY
VN5E050JTR-E	VNL5160S5TR-E	TDA7850H
ST25R3914-AQFT	VN5E025AJTR-E	L93PI
VNQ5160K-E	VNQ6040STR-E	STPS15L45CB-TR
TDA7715LV	VND830SPTR-E	TDA7562B
L9942XP1TR	TDA75610LVPDTR	DALC208SC6
SM15T75AY	SMBJ26A-TR	TDA7419TR
STGD3NB60SDT4	L9333MD	STPS30H60CGY-TR
ESDA6V1-4BC6	STTH2L06UFY	VND5N07-1-E
STTH1210DY	L9904TR	STPS15L45CUBY-TR
E-L9758BBTR	STB45N60DM2AG	L9959T-TR-D
STA1085EOA	VN5E025MJ-E	VND5050AKTR-E
VNH5200ASTR-E	STTH4R02UY	SM15T27AY
STB60NF06LT4	L9733XP	ST72F361AR9TAXS
VNS1NV04DP-E	L99PM60JTR	STD44N4LF6
TIP107	STPS30150CG-TR	SM15T56CAY
L9911P	STD25NF10LA	VND5E160J-E
L5150CSTR	VN5016AJ-E	SPC563M64L5COAR
M93C46-RMN3TP/K	STH270N8F7-6	VNP20N07-E
SM4T56CAY	STPS2045CGY-TR	STM8AF52A8TDX
BU941ZPFI	VN7004CHTR	SM15T36CAY
VNP8TD8	VND5012AKTR-E	STL58N3LLH5
VN5E010AHTR-E	SMAJ15A-TR	SMA6J5.0CA-TR
STTH112UFY	L9960T-TR	VND5E008AYTR-E
VNQ5050K-E	TDA7576B	VN5012AKTR-E



Public Products List

L9474N	STTH15RQ06GY-TR	STTH3R06UFY
LDP01-42AY	TDA7569BLV	ESDCAN24-2BLY
VND7NV04TR-E	L9362013TR	STTH3010WY
LDP01-82AY	STD26NF10	VND14NV04-E
VNB14NV04-E	STP150NF04	LDP01-68AY
STS5DNF60L	VNQ5E160AKTR-E	STTH5R06BY-TR
SM30T15AY	SM4T35CAY	VB526SPTR-E
USBLC6-2SC6Y	L5300AH7TR	L9779WD-TR
STD95N4F3	SM6T22CAY	STPS10170CG-TR
STA1080EOAS1	VB525SPTR-E	STB150NF55T4
VNN7NV04PTR-E	ST10F276-6QR3	VNQ690SPTR-E
L9339-TR	L5963Q-V0T	STD96N3LLH6
VND5E004ATR-E	SPC564A80B4CFAR	VND14NV04TR-E
VNH7070BASTR	MJB44H11T4-A	BAT54AWFILMY
STTH16L06CTY	VND5E006ASPTR-E	VND5E025BK-E
VN920SPTR-E	STP95N4F3	L5956PDTR
STPSC12065DY	SM30T19AY	VND5E050KTR-E
E-TDA7386	VNQ5050AK-E	STD120N4F6
STP80NS04ZB	VNH3SP30TR-E	STTH16L06CGY-TR
VN7007AHTR	STL120N4F6AG	VN5E006ASPTR-E
BAT54FILMY	VND7140AJ12TR	STTH102AY
VN610SP-E	STD45P4LLF6AG	ESDCAN01-2BLY
STW36NM60ND	SMA6T56CAY	STP76NF75
VNQ5E050KTR-E	TDA7706CB	STL8DN6LF3
VN820PT-E	STTH208UFY	E-TDA7391PDTR
L4995J	STTH16L06CG-TR	SMA6T12AY
SM6T200A	STM8AF52A8TCX	STGB18N40LZT4
VNQ5E050AKTR-E	STTH3L06UFY	STD120N4LF6
STP85NF55	VN800PSTR-E	STPS340U
STPSC10H065DY	STPS41H100CTY	VNB35NV04-E
SM15T68CAY	STH145N8F7-2AG	BAT54CWFILMY
ST72F561K6TCS	VND3NV04-E	SM6T12AY
VND5E050ACKTR-E	TDA7719TR	STPS1H100UY
VN5E016AFHTR-E	VND5E160AJTR-E	STPS200170TV1Y
L9959U-TR-D	TDA7708S	SM30T26CAY
VN5010AK-E	VN5E160STR-E	VND5025AKTR-E
LDP01-33AY	STA1080HOA	STPS1L40UY
DVIULC6-4SC6Y	VNH5180A-E	VND5E012MYTR-E
VND5E025AKTR-E	VN5E160MSTR-E	E-TDA7385
L9654TR	VN5T006ASP-E	SM4T82CAY
STM8AF5288TAX	L9822EPD013TR	VNQ6040S-E
SM15T22CAY	STD10NF30	VND5T016ASPTR-E
L5300GJTR	STM8AF6266TCX	ESDLIN1524BJ
SM4T18CAY	VND830PTR-E	STGB20NB41LZT4
VNQ7050AJTR	VND7140AJTR	L9380-TR-LF
VNB35N07TR-E	STB76NF75	STN4NF06L
SM30T47AY	STP185N55F3	L4995AJTR
TDA2004R	STPS2L60ZFY	SM6T15CAY
TDA7718N	VNN3NV04PTR-E	TYN612MFP
VND5E025BKTR-E	VN920SP-E	VN7008AJTR



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VNQ5E250AJ-E	SMAJ188CA-TR	VND830SP-E
STD18NF25	STA1085POA3	STTH30L06WY
STPSC20H065CWY	VNQ5027AK-E	SM6T30CAY
SM15T39CAY	VNS3NV04PTR-E	STB25NF06AG
SM6T33CA	STGD25N40LZAG	E-L9826TR
VN7003ALHTR	ESDA5V3SC6Y	SM15T27CAY
VNH5050ATR-E	L99H01XPTR	VNLD5160TR-E
VN5050AJ-E	ESDCAN05-2BWY	STM8AF6266TAX
VN920B5TR-E	STPS1150AY	STGD20N40LZ
SM4T12CAY	STA1052S1	TDA7802
STPS160UY	STTH2R06UFY	ESDAXLC6-1BT2
VND5E050MCKTR-E	SM6T18CAY	TN2015H-6FP
STGD20N45LZAG	SM6T36AY	VN7050ASTR
STPS3H100AFY	L9952GXPTR	SM6T16V5CAY
STB120N4LF6	TDA7721TR	SM15T22AY
STB30NF20L	VN820SPTR-E	STPA003OD-4WX
SM6T30AY	STL92N10F7AG	STM8AF6248TCX
TDA75613LV	L9339	ESDA6V1SC6Y
STB9NK80Z	STD3N95K5AG	TDA7391
SM4T28AY	SM30T39CAY	SM6T36CAY
TDA7851A	VNS7NV04PTR-E	STL20NF06LAG
L99DZ100GTR	SM6T6V8CAY	STPS2150A
L99PM62GXPTR	STV270N4F3	SMA6T30AY
STPA001	VNQ600P-E	STPS2200U
FDA2100LV	FDA801B-VYY	STP315N10F7
L9997ND013TR	STB18NF25	L99DZ120TR
TDA7850A	ST72F324BK6TCS	STP180NS04ZC
TDA7563AH	VN5025AJTR-E	L4989D013TR
TDA7575BPDTR	L9951XPTR	VND5E050MCJTR-E
STM8AF5288TCX	VN7010AJTR	VND5050AJ-E
VND5T100LAJ-E	STM8AF52AAATCY	L99MM70XPTR
VN770KP-E	VND5160J-E	VND5N07-E
L9911F	STB85NF55T4	TDA7387
VNN1NV04PTR-E	SMCJ24CA-TR	SM6T250CAY
SM6T42CAY	VND7NV04-E	VNH7070ASTR
TDA7718NTR	L9916	TDA7388A
STD86N3LH5	D44H11	STW72N60DM2AG
L9950TR	DALC208SC6Y	STP36NF06L
L9348-TR	STP46NF30	TDA7575B
TDA7454	VNS1NV04P-E	SM30T35AY
SM15T68AY	VN5025AJ-E	L4979MD
L9911I	VND14NV04-1-E	VN5160S-E
SM6T6V8AY	VNP35NV04-E	VN5E016MHTR-E
STH410N4F7-2AG	VNLD5090TR-E	TDA75610S-8ZT
VND5E050ASOTR-E	L9374TRLF	L4993DTR
SM4T47AY	VNH7013XPTR-E	VND830P-E
SM6T22AY	VND5E050JTR-E	VNB35N07-E
L9958SBTR	VNV20N07-E	ESDCAN02-2BWY
STP150NF55	STA1085POA	L4995RKTR
SM15T47AY	VNQ5160KTR-E	TDA7705TR



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STW65N65DM2AG	STB270N4F3	SM30T35CAY
L9856-TR-LF	SM4T47CAY	VN5R003HTR-E
L9615D013TR	L9616	SM15T30AY
VND810PEPTR-E	E-L9826	STTH2R02UY
SM6T56AY	L5957PDTR	STBR3012WY
STM8AL3166UAY	SM6T47AY	SM15T200A
L9613B	SM6T47CAY	VNL5050N3TR-E
VN5E010MHTR-E	L9916BDTR	SM15T33CAY
STPS160AY	STI55NF03L	VND5T100LAJTR-E
STGB25N40LZAG	STW19NM60N	STPS8H100G-TR
STGD10HF60KD	VN7140ASTR	F272-BAR-P
SM4T26CAY	STPS3045DJFY-TR	VNH7100BASTR
VNL5090N3TR-E	SM6T82CAY	L9949TR
L5957	TDA7563BH	VN5E016AHTR-E
STD65N55F3	VN770KPTR-E	VN750SMP-E
STD85N10F7AG	VND5160JTR-E	SM4T39CAY
L99DZ100GPTR	SM6T33CAY	MJD32CT4-A
VN7003AHTR	VNLD5160-E	STPS2L40ZFY
SM6T56CAY	VPS2535HTR	STD15P6F6AG
TDA7388	VNQ600APTR-E	SM4T39AY
VND7N04-E	STTH8R06GY-TR	VND5050JTR-E
SM15T15CAY	L9613B013TR	STPA008-QIX
M93C66-RMN3TP/K	STB36NM60ND	SM6T39CA
VND7050AJ12TR	L9409F	E-L9935
SMAJ33A-TR	LDP01-28AY	STM8AF6223PCX
FDA2100LV-T	STB46N30M5	VND7040AJTR
TDA7705	BU941ZT	SM6T10AY
STP141NF55	SM15T39AY	STPSC12065GY-TR
SM6T24CAY	STH185N10F3-2	L99SD01-E
BU931T	STW50N65DM2AG	STP120N4F6
SM6T27AY	STTH1R04AY	VNH5180ATR-E
SMAJ40CA-TR	SM6T33AY	SMA6T18AY
VND5E025MKTR-E	VN750PS-E	ESDAXLC6-1BT2Y
LDP01-56AY	L9950XPTR	FDA450LV
STTH2R02AFY	L4925PD013TR	STPS2H100ZFY
L4988DTR	VN5T016AHTR-E	ST72F561R9TAXS
SMAJ170A-TR	SM30T28AY	VNLD5090-E
VNS1NV04DPTR-E	L99SD01TR-E	VNQ5E160KTR-E
L5300GJ	SM4T68AY	VN820B5-E
E-L9823	VND5E025ASTR-E	VNLD5300TR-E
STTH802BY-TR	TDA75610S-48X	VNQ660SPTR-E
TDA7801PD	STL45N10F7AG	TDA75610DLVPDTR
VN5160STR-E	STL66DN3LLH5	L4995JTR
SM30T18CAY	VN820PTTR-E	STTH3R02AFY
SMA6T30CAY	STPA001A	STTH1L06UFY
L99PM72PXPTR	VN5E025ASOTR-E	STD8NF25
SM6T18AY	SM4T56AY	TDA7418
SM4T30CAY	TDA7850	ESDA25LY
TDA75610S-QLX	SM15T39CA	STB27NM60ND
L4995K	L9651-TR	SM15T18AY



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STPS0540ZY	STL70N4LLF5	E-L9935013TR
STD30NF04LT	STPS340B-TR	SM30T47CAY
STPSC20065GY-TR	TDA75610S-ZST	L9466N
STTH1L06A	STPS640CBY-TR	STPS3L60UY
SM15T82AY	ST72F521R9TCXS	STS5NF60L
L9825	HDMIULC6-4SC6Y	TDA7719
STA5630ATR	VN5E160ASOTR-E	SM30T21CAY
STP85NF55L	STPS5H100AFY	ST25R3915-AQFT
SM6T75CAY	STTH1002CBY-TR	STM8AF6288TCY
STTH310S	E-L9338MD	STD4NK100Z
MJD31CT4-A	STPSC20065DY	STL40DN3LLH5
STD7ANM60N	VN5E160ASTR-E	LDP01-26AY
TDA7707	STB45N40DM2AG	VNQ5E160K-E
STP45N40DM2AG	STTH6010WY	M93C56-RMN3TP/K
X0202MN 5BA4	SM30T30AY	ESDAVLC8-1BT2Y
STH270N4F3-6	TDA7415CB	STD901T
SMA6T68AY	STL7N6LF3	VNL5030JTR-E
E-L9338MD/TR	E-TDA7375AV	VNH5019ATR-E
ST72F324BK6TAXS	SMA6T28CAY	TDA7715
BU931P	L9904	STM8AF6268TCX
STPS30L30CG-TR	L9777A13TR	STB37N60DM2AG
SM30T10CAY	STH300NH02L-6	L9352B-TR-LF
STB43N65M5	VN750B5-E	STB200NF03T4
STM8AF6268TAX	SMA6J188CA-TR	STD70NS04ZL
STPSC10H12DY	STD100N3LF3	VNV35N07TR-E
TDA7391LV	L4953G	L99MD01XPTR
SMA6T18CAY	STD30NF06T4	STM8AF6223PCAU
L9616-TR	STA5620ATR	STTH310UFY
L9914A	SM15T33AY	ST72F321AR9TAXS
STPS2545CGY-TR	STL120N4LF6AG	VN5T016AH-E
VNV20N07TR-E	SM15T6V8CAY	FDA450LV-T
SMBJ33A-TR	SMA6J70CA-TR	E-TDA7560
SM15T10AY	STB18NF30	VND5T100AJTR-E
VNL5300S5-E	STPS40L45CG-TR	VND10N06-1-E
STTH1002CGY-TR	STD155N3LH6	TYN612MRG
USBLC6-4SC6Y	STL140N4F7AG	L9333MD-TR
STTH30L06GY-TR	L4995AKTR	VN750PSTR-E
SM6T68AY	VN750B5TR-E	SM15T47CAY
STGB20N45LZAG	STL115N10F7AG	VNL5050S5-E
SMA6T22CAY	SM4T26AY	SM30T56AY
TDA7718BTR	L9468N	STL210N4F7AG
VNQ5050AKTR-E	VNH7100ASTR	SM15T24CAY
T3035H-6I	STTH30RQ06GY-TR	L9958TR
VND5004ASP30TR-E	STPS20H100CGY-TR	SM6T42AY
SM30T30CAY	VN7040ASTR	L9662TR
TDA7563A	VND5E025LKTR-E	STB80NF55-06-1
SM30T39AY	L9779WD-SPI	T835-600B-TR
VN772KP-E	BAT54WFILMY	STW22N95K5
L9953LXPTR	TDA7376PDTR	VN5T006ASPTR-E
ESDA5V3LY	SM6T27A	SM4T21CAY



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STB36NM60N	TDA7376B	ST72F321R6TAS
VN7004CLHTR	STP45N60DM2AG	STTH602CBY-TR
USBLC6-2SC6	L4949EDTR-E	STPS15L60CB-TR
STH410N4F7-6AG	VNQ7140AJTR	TDA2005R
STTH110UFY	VND5050AJTR-E	VND5E012AYTR-E
SM30T21AY	L99ASC03GTR	VND5E160AJ-E
BAT20JFILM	STTH3010GY-TR	SM6T15AY
VN5016AJTR-E	SM15T82CAY	SM15T24AY
L9958XPTR	E-TDA7375V	SM4T68CAY
TDA7802SMTR	TDA7577BLV	STM8AF6266TDX
STTH5R06GY-TR	ESDLIN03-1BWY	L5959
L4995KTR	STPS40L45CGY-TR	SMA6T6V7CAY
VNS3NV04DPTR-E	L5962TR	SM4T33AY
L9915-CB	STTH15RQ06DY	STD1802T4-A
STW45N60DM2AG	SMA6T82AY	STPS1545CGY-TR
VND5E006ASP-E	L9484	SM30T23AY
L9953XPTR	STH275N8F7-6AG	L4979MD013TR
VNQ5050KTR-E	STB60NF06T4	HSP061-4M10Y
STL7DN6LF3	SMA6T33AY	SMA6T28AY
BAT54SFILMY	STL190N4F7AG	VNQ500PEPTR-E
TN2015H-6T	L9679PTR	SM30T33AY
STN4NF03L	STW47NM60ND	STW58N60DM2AG
STPS3045CG-TR	STB7ANM60N	VNQ6004SATR-E
STB130NS04ZB-1	L9848TR	L5958SMTR
L9954LXPTR	E-TDA7342N	STPS20L60CGY-TR
ESDA25SC6Y	SMA6T47CAY	STTH30R04DY
SM4T14CAY	STB45N50DM2AG	VN800PT-E
L9678PTR	VNL5090S5TR-E	STW46NF30
STGWA40M120DF3	L99H01QF	STTH1R04UY
TDA7561	L99MC6GJTR	STD35NF06LT4
STD15N50M2AG	STTH1502DI	VN5E025MJTR-E
L9960TR	STL66N3LLH5	L9779WD
STD47N10F7AG	VND5160AJ-E	VND1NV04-1-E
STB46NF30	SM4T28CAY	VND5050J-E
TDA7563BPDTR	SM30T6.8AY	E-TDA7396
STM8AF6286TCX	LDP01-30AY	STPSC20H12GY-TR
TDA7569BLVPDTR	L9903TR	SMA6T24CAY
TDA7577BLVPDTR	STPS3L40SY	STM8AF62A6UCY
SM4T33CAY	TS820-600FP	VND5T035LAKTR-E



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