ON Semiconductor
Formerly a Division of Motorola

Subject: Motorola PRODUCT AND PROCESS CHANGE NOTIFICATION 4958

TITLE: TRANSFER OF 3 LEAD SURFACE MOUNT (D2T) PACKAGE TO TESLA

EFFECTIVE DATE: 07-NOV-99

AFFECTED CHANGE CATEGORIES

Motorola Assembly Site	Subcontractor Assembly Site
Motorola Test Site	Assembly Process
Test Process	Labeling Change On Shipping Pack

AFFECTED PRODUCT DIVISIONS
GENERAL PURPOSE PRO

ADDITIONAL RELIABILITY DATA: Available Ref: RJJ930
Contact your local Motorola Sales Office.

SAMPLES: Contact Below Ref: R23126@email.sps.mot.com
Contact your local Motorola Sales Office.

For any questions concerning this notification:
REFERENCE:THOMAS GRINTER PHONE: 480-413-7640

DISCLAIMER:

MOTOROLA WILL CONSIDER THIS CHANGE APPROVED UNLESS SPECIFIC CONDITIONS OF ACCEPTANCE ARE PROVIDED IN WRITING WITHIN 30 DAYS OF RECEIPT OF THIS NOTICE. TO DO SO, CONTACT YOUR LOCAL MOTOROLA SALES OFFICE.

GPCN FORMAT: CUSTOMER

DO NOT REPLY TO THIS MESSAGE.

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PRODUCT AND PROCESS CHANGE NOTIFICATION

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ISSUE DATE: 30-Jul-1999 NOTIFICATION #:4958
EFFECTIVE DATE: 07-Nov-1999 ISSUING DIVISION:PHX-GPPD

DESCRIPTION AND PURPOSE

The three lead TO-220 for these devices already exists in Tesla assembly/test. This move will add the surface mount version which requires solder plating, and trim and form to be built in Tesla.

DIFFERENCCES EXTERNALLY:

1. Solder plating is required on the heat sink surface, and leads. Tesla has only solder dip for the leads. Contract soder plating will be used at Tesla.

2. There is an assembly site difference. The existing assembly and test site for the (D2t) packages now is Kuala Lumpur, Malaysia, Motorola site.

The new assembly/test site will be Tesla Sezam in Czech Republic.

3. An alternative mold CPD EME6600H production for the Tesla Assembly /Test site is expected to be qualified by mid November 1999.

QUALIFICATION PLAN

See existing reliability data provided by 3 lead TO-220 Tesla line. The existing reliability data from the D2T line in KLM Malaysia using the same element Bill of Materials to be used in Tesla. Additional data to be run involving both surface mount and insertion mount to be provided by Nov. 1, 1999.

RELIABILITY DATA SUMMARY

EXISTING THREE LEAD STRAIGHT LEAD TESLA DATA: 3/30/99

A. LOT	DEVICE	WRETYP. MLD	CPD	DIE	FRME	EXT PL	LD CNF
E51103	MC7805CT	2Mil AL	6300H	SN SB	CU	Sldr Dip	Insrt
E51104	MC7805CT	2mil CU	6300H	SN SB	CU	Sldr Dip	Insrt
E51107	MC7905CT	2mil AL	6300H	SN SB	CU	Sldr Dip	Insrt
E51108	MC7905CT	2mil CU	6300H	SN SB	CU	Sldr Dip	Insrt
E51111	LM317T	2mil AL	6300H	SN SB	CU	Sldr Dip	Insrt
E51112	LM317T	2mil CU	6300H	SN SB	CU	Sldr Dip	Insrt

RESULTS	TEST	QTY PER LOT	STATUS	RESULTS
PTH	TA 121 DegC,192 hrs. RH, 100% P 151 psi	77	Comp.	0 rejects
TmpCyc.	-65 DegC to 150 DegC, DT = 15 min	77	Comp.	0 rejects
HTSL	175 DegC, NO bias, 500 hrs	77	Comp.	0 rejects
HTRB	TA=125 DegC, Vin=35V, 1,000 hours	77	Comp.	0 rejects
Sldr Ht	Temp=260 DegC, immersion = 10 sec	15	Comp.	0 rejects
Ld Bend		10	Comp.	0 rejects

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Surface Mount qualification in KLM mold compounds. Nitto Mp130, Sumitomo 6300H Date: March 1996

LOT	DEVICE	WIRE	CPD	DIE ATTCH	FRME MAT	EX PL	LEAD CONF
A	LM317D2T	2Mil CU	6300H	SN SB	CU	Sldr PL	Surface
B	LM317D2T	2Mil CU	MP130	SN SB	CU	Sldr PL	Surface
C	LM317D2T	2Mil CU	MP130	SN SB	CU	Sldr PL	Surface
D	LM317D2T	2Mil CU	MP130	SN SB	CU	Sldr PL	Surface

RESULTS
HTRB 0 rejects, 1008 hrs 0/77 for A,B,C and D ESD, HBM, 2000V Pass
Preconditioning: 24 hrs bake 125 DegC, 10 Temp Cycles
168 hrs 85 DegC/85% RH. Results: 0 rejects for all samples and visual
IR three passes 120 DegC. and electrical
Temp Cycling following preconditioning -65 DegC to 150 DegC, 77 parts per sample
Results: all samples A,B,C and D 0 rejects after 1000 cycles
AutoClave 15 psi Results: 240 hrs of test A,B,C,D 0 rejects at end of test

ELECTRICAL CHARACTERISTIC SUMMARY

CHARACTERIZATION DATA

3 LEAD TESLA TO-220 Date: 3/30/99

No performance change as the same die source is used, same assembly materials are used. Cpk evaluation for the various reliability tests. Original Cpk values, and percentage change after reliability tests.

Device Eng. Lot A MC7805CT assembly in Tesla. Average readings after environmental tests.

REL TESTS	VO,	REG LN,	REG LO,	IQ,	DEL IQ,	RR
TC 1000cyc avg	5.004V	3.92mv	2.32mv	3.287ma	212ua	.229mv
PTH 192hrs avg	5.003V	3.97mv	2.36mv	3.299ma	211ua	.241mv
HTOL 1000hravg	5.003V	3.68mv	2.34mv	3.289ma	209ua	.238mv

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Device Eng. Lot A MC7805CT assembly in Tesla. Cpk values after environmental tests.

REL TESTS	VO,	REG IN,	REG LO,	IQ,	DEL IQ,	RR
TC 1000cyc	cpk 5.21	2.98	6.16	28.65	23.57	40.64
PTH 192hrs	cpk 6.02	3.03	6.24	28.62	27.53	33.76
HTOL 1000hrs	cpk 5.75	2.93	8.85	25.78	27.33	38.03

Device Eng. Lot B MC7805CT assembly in Tesla. Average readings after environmental tests.

REL TESTS	VO,	REG LN,	REG LO,	IQ,	DEL IQ
TC 1000 cycles avg	4.985V	1.30mv	1.56mv	5.735ma	205ua
PTH 192 hrs avg	4.992V	1.13mv	1.42mv	5.678ma	208ua
HTOL 1000 hrs avg	5.011V	1.00mv	1.52mv	5.802ma	204ua

Device Eng. Lot B MC7905CT assembly in Tesla. Cpk values after environmental tests.

REL TESTS	VO,	REG IN,	REG LO,	IQ,	DEL IQ
TC 1000 cycles	cpk 2.90	16.4	55.66	9.29	46.37
PTH 192 hrs	cpk 3.52	36.34	49.67	8.88	57.61
HTOL 1000 hrs	cpk 3.58	46.20	51.76	8.20	53.61

No performance change as the same die source is used, same assembly materiels are used. Cpk evaluation for the various reliability tests. Orginal Cpk values, and percentage change after reliability tests.

Device Eng. Lot C LM317T assembly in Tesla. Average readings after environmental tests.

REL TESTS	VO,	REG LN,	REG LO,	I ADJ,	DEL IQ,	RR
TC 1000cyc	avg1.2572V	.39mv	.79mv	42.4ua	.003ua	.169mv
PTH 1000hrs	avg1.2570V	.42mv	.80mv	42.4ua	.004ua	.175mv
HTOL 1000hrs	avg1.2570V	.39mv	.76mv	47.4ua	.003ua	.187mv

Device Eng. Lot C LM317T assembly in Tesla. Cpk values after environmental tests.

REL TESTS	VO,	REG IN,	REG LO,	I ADJ,	DEL IQ,	RR
TC 1000 cyc	cpk 4.17	40.97	42.48	2160	353	43.85
PTH 192 hrs	cpk 4.41	38.37	55.81	2155	343	14.38
HTOL 1000 hrs	cpk 5.06	41.08	50.83	2153	361	38.36

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CHANGED PART IDENTIFICATION

Marking change in site location for present KLM site is Q and for Tesla it is SQ. No other marking changes are planned.

FILE FORMAT: ASCII TEXT
FONT - Courier
SIZE - 12 Point
LINE - 70 characters/line
PAGE - 55 lines/page
PAGEBREAK CHARACTER - ^L (Control L)

AFFECTED DEVICE LIST (WITHOUT SPECIALS)

LM2931AD2T-5.0 , LM2931AD2T-5.0R4, LM2931D2T-5.0 , LM2931D2T-5.0R4
LM317BD2T , LM317BD2TR4 , LM317D2T , LM317D2TR4
LM337AD2T , LM337AD2TR4 , LM337BD2T , LM337BD2TR4
LM337D2T , LM337D2TR4 , LT1585ACM , LT1585ACM-1.5
MC7805ACD2T , MC7805ACD2TR4 , MC7805BD2T , MC7805BD2TR4
MC7805CD2T , MC7805CD2TR4 , MC7806BD2T , MC7806BD2TR4
MC7808BD2T , MC7808BD2TR4 , MC7808CD2T , MC7808CD2TR4
MC7809BD2TR4 , MC7809CD2T , MC7809CD2TR4 , MC7812ACD2T
MC7812ACD2TR4 , MC7812BD2T , MC7812BD2TR4 , MC7812CD2T
MC7812CD2TR4 , MC7815ACD2T , MC7815ACD2TR4 , MC7815BD2T
MC7815BD2TR4 , MC7815CD2T , MC7815CD2TR4 , MC7818BD2T
MC7818BD2TR4 , MC7818CD2T , MC7824BD2T , MC7824CD2T
MC78T05CD2T , MC78T05CD2TR4 , MC7905ACD2T , MC7905BD2T
MC7905BD2TR4 , MC7905CD2T , MC7905CD2TR4 , MC7906CD2T
MC7908CD2T , MC7908CD2TR4 , MC7912ACD2T , MC7912CD2T
MC7912CD2TR4 , MC7915BD2T , MC7915CD2T , MC7915CD2TR4
MC7924CD2T , PC33273D2T , PC33273D2T-3.3 , SC79021D2T
SC79021D2TR4 , XT1585ACM