



12500 TI Boulevard, MS 8640, Dallas, Texas 75243

PDN# 20200623000.3

**Discontinuance of select MicroStar BGA & MicroStar BGA Jr. devices
Product Discontinuance Notification**

Date: June 24, 2020

To: TOKYO ELECTRON DEVICE (DSTR) PCN

Dear Customer:

The recipient has been identified for notification of changes for one or more of the products affected by the change detailed in the notice. Customers are notified based on the past twenty-four (24) months of the customer's purchase history or the recipient is listed as being part of GIDEP (Government-Industry Data Exchange Program).

TI would appreciate it if you would notify us of any future demand and estimated quantities needed for the affected products as soon as possible.

In an attempt to satisfy continuing requirements, TI is offering a non-cancelable, non-refundable last time buy for the product. Related dates are included in the notification. We will contact you as soon as we have completed a review of all customer responses and determined the appropriate course of action required to satisfy the need for this/these products.

Any inquiries should be directed to your local Field Sales Representative.

If additional supply is required beyond the dates defined in this letter, please contact your local Field Sales Representative to determine if the parts may be available from a TI-authorized distributor for discontinued products. There is no guarantee of continued supply for these products.

For questions regarding this notice, contact your local Field Sales Representative or the PCN Team (PCN_ww_admin_team@list.ti.com).

Sincerely,

PCN Team
SC Business Services

20200623000.3
Attachments1

Products Affected:

The devices listed on this page are a subset of the complete list of affected devices. According to our records, you have purchased this device within the past twenty-four (24) months. The corresponding customer part number is also listed, if available.

DEVICE	CUSTOMER PART NUMBER
TMS320VC5410AZGU16	null
TMS320VC5509AZHH	null
TMS320VC5409AZGU16	null
TMS320VC5501ZZZ300	null
TMS320VC5510AZGWA2	null
TMS320VC5416ZGU120	null
OMAP5910JZZG2	null
TMS320VC5507ZHH	null
TMS320C5532AZHH05	null
TMS320VC5506ZHH	null
TMS320VC5510AZGW2	null
TMS320VC5502ZZZ300	null
TMS320VC5416ZGU160	null
TMS320VC5503ZHH	null
TMS320C6204ZHK200	null
TMS320C6204GHKA200	null
TMS320C5533AZHH05	null
TMS320C6205ZHK200	null
TMS320VC5410AGGU12	null
TMS320VC5410AZGU12	null
TMS320C5532AZHH10	null

Details of this Product Discontinuance follow on the next page(s).

PDN Number:	20200623000.3	PDN Date:	June 24, 2020
Title:	Discontinuance of select MicroStar BGA & MicroStar BGA Jr. devices		
Customer Contact:	PCN Manager	Dept:	Quality Services
Last date to order:	March 24, 2021	Last date to ship:	March 24, 2022
Change Type:	Product Discontinuance - End Of Life		

Product Discontinuance Notification Details

Description of Discontinuance:

Texas Instruments, Incorporated (TI) is announcing the discontinuance of select MicroStar BGA & MicroStar BGA Jr. package devices. A non-cancelable, non-refundable last time buy is being offered per the date shown above. Part numbers are shown in the Product Affected section below. Recommended replacements are being offered on some devices as shown in the Product Affected Section.

Group 1 Devices: Products in the Microstar BGA package were redesigned using a laminate BGA package (nFBGA). These products have Pb-Free Package Balls.

Group 2 Devices: Products in the Microstar BGA package were redesigned using a laminate BGA package (nFBGA). These Products being Discontinued currently have SnPb Package Balls. Some customers may wish to stay with SnPb package balls in the nFBGA package; some may wish to move to Pb-free nFBGA package balls. Both replacement part numbers are provided.

Group 1 and 2 Devices additional information:

Availability of replacement devices (in nFBGA packages) may vary. The replacements that are not yet released to production as of the date on this PDN are noted in **red text** in the Product Affected section. These devices are estimated to be released to production in August. For questions regarding the release status of a particular device, please contact phoebewong@ti.com.

The devices in the MicroStar BGA package were redesigned using a laminate BGA package (nFBGA). nFBGA provides the same X and Y dimensions as MicroStar BGA, and provides pin-to-pin and footprint compatibility. However the nFBGA PCB land pattern and stencil recommendations have been updated to achieve better soldering results after extensive testing and evaluation. For more details, please refer to this [nFBGA application note](#).

BOM for new nFBGA Package:

	Assembly Site nFBGA
Assembly Site	TI Philippines
Mount Compound	film/epoxy
Mold compound	4205283
Wire Type	Cu
Substrate	Laminate

Group 3 Devices: Products in the Micostar BGA package are being discontinued and were not redesigned into a laminate BGA package. TI has recommended replacements for some of these devices, but not all.

NOTE: There are no samples offered for withdrawn/obsolete products. For samples of any replacement products, please contact your local sales representative or visit the TI store at <https://www.ti.com/store>.

Reason for Withdrawal/Discontinuance:		
Due to an equipment End-Of-Life notice from our substrate supplier, we are phasing out certain MicroStar BGA & MicroStar BGAjr package devices and offering a last time buy.		
Product Affected: Group 1 Products with Pb-Free Package Balls		
Product Being Discontinued (Pb-Free Package Balls)	RECOMMENDED REPLACEMENT PRODUCTS (nFBGA Package) (Pb-Free Package Balls)	REPLACEMENT CODES
AFE4491ZRC	AFE4491NMAT	Q
AFE4491ZRCR	AFE4491NMAR	Q
AFE4491ZRCT	AFE4491NMAT	Q
C5509ZOOM1C2103DR	TMS320VC5509AZAYR	Q
D35004AZGW160	D35004AZAV160	Q
D35004AZGW200	D35004AZAV200	Q
D35004AZGWA200	D35004AZAVA200	Q
D36155ZGU160	D36155ZWS160	Q
DVC5416ZGU160IDWLD	TMS320VC5416ZWS160	Q
MSP430F2416TZQW	MSP430F2416TZCA	Q
MSP430F2416TZQWR	MSP430F2416TZCAR	Q
MSP430F2417TZQWR	MSP430F2417TZCAR	Q
MSP430F2418TZQW	MSP430F2418TZCA	Q
MSP430F2418TZQWR	MSP430F2418TZCAR	Q
MSP430F2616TZQW	MSP430F2616TZCA	Q
MSP430F2616TZQWR	MSP430F2616TZCAR	Q
MSP430F2617TZQW	MSP430F2617TZCA	Q
MSP430F2617TZQWR	MSP430F2617TZCAR	Q
MSP430F2618TZQW	MSP430F2618TZCA	Q
MSP430F2618TZQWR	MSP430F2618TZCAR	Q
MSP430F2619TZQW	MSP430F2619TZCA	Q
MSP430F2619TZQWR	MSP430F2619TZCAR	Q
MSP430F478IZQW	MSP430F478IZCA	Q
MSP430F478IZQWR	MSP430F478IZCAR	Q
MSP430F5508IZQE	MSP430F5508IZXH	Q
MSP430F5509IZQER	MSP430F5509IZXHR	Q
MSP430FG4617IZQWR	MSP430FG4617IZCAR	Q
OMAP5910JZZG2	OMAP5910JZVL2	Q
OMAP5912ZZG	OMAP5912ZVL	Q
OMAP5912ZZGR	OMAP5912ZVLR	Q
TMS320C54CSTZGU	TMS320C54CSTZWS	Q
TMS320C5502ZZZR300	TMS320C5502ZAVR300	Q
TMS320C5532AZHH05	TMS320C5532AZAY05	Q
TMS320C5532AZHH10	TMS320C5532AZAY10	Q
TMS320C5532AZHHA05	TMS320C5532AZAYA05	Q
TMS320C5532AZHHA10	TMS320C5532AZAYA10	Q
TMS320C5532NZHH10	TMS320C5532NZAY10	Q
TMS320C5533AZHH05	TMS320C5533AZAY05	Q

TMS320C5533AZHH10	TMS320C5533AZAY10	Q
TMS320C5533AZHHA05	TMS320C5533AZAYA05	Q
TMS320C5533AZHHA10	TMS320C5533AZAYA10	Q
TMS320C5534AZHH05	TMS320C5534AZAY05	Q
TMS320C5534AZHH10	TMS320C5534AZAY10	Q
TMS320C5534AZHHA05	TMS320C5534AZAYA05	Q
TMS320C5534AZHHA10	TMS320C5534AZAYA10	Q
TMS320C5534NZHH10	TMS320C5534NZAY10	Q
TMS320C5535AZHH05	TMS320C5535AZAY05	Q
TMS320C5535AZHH10	TMS320C5535AZAY10	Q
TMS320C5535AZHHA05	TMS320C5535AZAYA05	Q
TMS320C5535AZHHA10	TMS320C5535AZAYA10	Q
TMS320C6204ZHK200	TMS320C6204ZWT200	Q
TMS320C6204ZHKA200	TMS320C6204ZWT200	Q
TMS320C6205DZHK200	TMS320C6205DZWT200	Q
TMS320C6205ZHK200	TMS320C6205ZWT200	Q
TMS320DA150ZGU160	TMS320DA150ZWS160	Q
TMS320SP103AZGW2	TMS320VC5510AZAV2	Q
TMS320SP109AZHH	TMS320SP109AZAY	Q
TMS320VC5402AZGU16	TMS320VC5402AZWS16	Q
TMS320VC5409AZGU12	TMS320VC5409AZWS12	Q
TMS320VC5409AZGU16	TMS320VC5409AZWS16	Q
TMS320VC5410AZGU12	TMS320VC5410AZWS12	Q
TMS320VC5410AZGU16	TMS320VC5410AZWS16	Q
TMS320VC5416ZGU120	TMS320VC5416ZWS120	Q
TMS320VC5416ZGU160	TMS320VC5416ZWS160	Q
TMS320VC5501ZZZ300	TMS320VC5501ZAV300	Q
TMS320VC5502ZZZ200	TMS320VC5502ZAV200	Q
TMS320VC5502ZZZ300	TMS320VC5502ZAV300	Q
TMS320VC5503ZHH	TMS320VC5503ZAY	Q
TMS320VC5506ZHH	TMS320VC5506ZAY	Q
TMS320VC5506ZHHR	TMS320VC5506ZAYR	Q
TMS320VC5507ZHH	TMS320VC5507ZAY	Q
TMS320VC5507ZHHR	TMS320VC5507ZAYR	Q
TMS320VC5509AZHH	TMS320VC5509AZAY	Q
TMS320VC5509AZHHC	TMS320VC5509AZAYC	Q
TMS320VC5509AZHHR	TMS320VC5509AZAYR	Q
TMS320VC5510AZGW1	TMS320VC5510AZAV1	Q
TMS320VC5510AZGW2	TMS320VC5510AZAV2	Q
TMS320VC5510AZGWA1	TMS320VC5510AZAVA1	Q
TMS320VC5510AZGWA2	TMS320VC5510AZAVA2	Q
TMS320VC5510AZGWD2	TMS320VC5510AZAVD2	Q
TMS32C5534AZHHA05R	TMS32C5534AZAYA05R	Q
TMS32C5535AZHHA10R	TMS32C5535AZAYA10R	Q
TMS32C6205DZHKA200	TMS32C6205DZWT200	Q
TNETV2505CZGW	TNETV2505ZAV	Q

TNETV2505ZGW	TNETV2505ZAV	Q	
TNETV2510CZGW	TNETV2510ZAV	Q	
TNETV2510ENZGW	TNETV2510ZAV	Q	
TNETV2510FIDZGW	TNETV2510ZAV	Q	
TNETV2510IDZGW	TNETV2510ZAV	Q	
TNETV2510ZGW	TNETV2510ZAV	Q	
VC55GPSZHH	TMS320VC5509AZAY	Q	
WDVC5510AZGWA2	WDVC5510AZAVA2	Q	
Product Affected – Group 2 Products being Discontinued currently with SnPb Package Balls			
Product Being Discontinued (SnPb Package Balls)	RECOMMENDED REPLACEMENT PRODUCTS (nFBGA Package) (Pb-Free Package Balls)	RECOMMENDED REPLACEMENT PRODUCTS (nFBGA Package) (SnPb Package Balls)	REPLACEMENT CODES
OMAP5910JGZG2	OMAP5910JZVL2	OMAP5910JGVL2	Q
TMS320C54CSTGGU	TMS320C54CSTZWS	TMS320C54CSTGWS	Q
TMS320C6204GHKA200	TMS320C6204ZWTA200	TMS320C6204GWTA200	Q
TMS320C6205DGHK200	TMS320C6205DZWT200	TMS320C6205DGWT200	Q
TMS320C6205GHK20	TMS320C6205ZWT200	TMS320C6205GWT200	Q
TMS320C6205GHKA200	None	TMS320C6205GWTA200	Q
TMS320VC5402AGGU16	TMS320VC5402AZWS16	TMS320VC5402AGWS16	Q
TMS320VC5409AGGU12	TMS320VC5409AZWS12	TMS320VC5409AGWS12	Q
TMS320VC5409AGGU16	TMS320VC5409AZWS16	TMS320VC5409AGWS16	Q
TMS320VC5410AGGU12	TMS320VC5410AZWS12	TMS320VC5410AGWS12	Q
TMS320VC5410AGGU16	TMS320VC5410AZWS16	TMS320VC5410AGWS16	Q
TMS320VC5416GGU120	TMS320VC5416ZWS120	TMS320VC5416GWS120	Q
TMS320VC5416GGU160	TMS320VC5416ZWS160	TMS320VC5416GWS160	Q
TMS320VC5501GZZ300	TMS320VC5501ZAV300	TMS320VC5501GBE300	Q
TMS320VC5502GZZ200	TMS320VC5502ZAV200	TMS320VC5502GBE200	Q
TMS320VC5502GZZ300	TMS320VC5502ZAV300	TMS320VC5502GBE300	Q
TMS320VC5506GHH	TMS320VC5506ZAY	TMS320VC5506GBB	Q
TMS320VC5507GHH	TMS320VC5507ZAY	TMS320VC5507GBB	Q
TMS320VC5509AGHH	TMS320VC5509AZAY	TMS320VC5509AGBB	Q
TMS320VC5509AGHHR	TMS320VC5509AZAYR	TMS320VC5509AGBBR	Q
TMS320VC5510AGGW1	TMS320VC5510AZAV1	TMS320VC5510AGBC1	Q
TMS320VC5510AGGW2	TMS320VC5510AZAV2	TMS320VC5510AGBC2	Q
TMS320VC5510AGGWA1	TMS320VC5510AZAVA1	TMS320VC5510AGBCA1	Q
TMS320VC5510AGGWA2	TMS320VC5510AZAVA2	TMS320VC5510AGBCA2	Q
TMS32C6205DGHKA200	TMS32C6205DZWTA200	TMS32C6205DGWTA200	Q
TMSDVC5510AGGWA2	None	TMSDVC5510AGBCA2	Q
TNETV2510ENGW	TNETV2510ZAV	None	Q
TNETV2510GGW	TNETV2510ZAV	None	Q
TNETV2510IDGGW	TNETV2510ZAV	None	Q
VC55GPSGHH	TMS320VC5509AZAY	TMS320VC5509AGBB	Q

Product Affected: Group 3		
Product Being Discontinued	RECOMMENDED REPLACEMENT PRODUCTS	REPLACEMENT CODES
M430F5359IZQWR-AU	None	Not Applicable
MPD23796ZQWT	None	Not Applicable
MSP430F2419TZQW	MSP430F2619TZCAR	Q
MSP430F2419TZQWR	None	Not Applicable
MSP430V3071ZQER	MSP430F5308IZXH	Q
MSP430V406IZQER	MSP430F5510IZXHR	Q
SM320VC5416GGU16EP	None	Not Applicable
SM320VC5510AZPHA2	None	Not Applicable
SM32VC5510AGGWA2EP	None	Not Applicable
TLV320AIC3254NZQER	TLV320AIC3254IRHBR	S
TMS320LC548GGU-80	None	Not Applicable
TMS320VC5510AGPHA2	None	Not Applicable
TVP5150AM1LGQCR	None	Not Applicable
V62/04605-01XA	None	Not Applicable
V62/04610-01XA	None	Not Applicable
VSP6300AZSPR	None	Not Applicable
Replacement Notes: F = Similar functionality but not equivalent. P = Same functionality but not pin-for-pin equivalent and may not be parametrically equivalent. Q = Same functionality and PIN-OUT as the compared device but is NOT an exact equivalent. S = EXACT equivalent in functionality and parametrically to the compared device.		

Qualification Report (nFBGA)

Approve Date 20-Jan-2020

Qualification Results

Data Displayed as: Number of lots / Total sample size / Total failed

Type	Test Name / Condition	Duration	Qual Device: <u>OMAP5912ZVL</u>	QBS Package Reference: <u>AM3517ZCN</u>	QBS Package Reference: <u>CODMIOZWCRCR</u>	QBS Package Reference: <u>LMK04616ZCRR</u>	QBS Package Reference: <u>MSP430FG439IZCA</u>	QBS Package Reference: <u>MSP430FR5994IZVW</u>	QBS Package Reference: <u>PCD3215C00AZBHR</u>	QBS Package Reference: <u>TMP570LS3137BZWTQ1</u>	QBS Package Reference: <u>TMS320DM6446ZW</u>	QBS Package Reference: <u>TPS659038TZWSRQ1</u>	QBS Package Reference: <u>TS3DDR4000ZBAR</u>
AC	Autoclave 121C	96 Hours	-	-	-	-	-	3/231/0	-	-	-	-	-
BLR	Board Level Reliability, Temp Cycle, -40/125C	1000 Cycles	-	1/32/0	1/32/0	-	-	-	-	1/32/0	-	-	-
BLR	Board Level Reliability, Temp	1000 Cycles	-	-	-	-	-	-	1/32/0	-	-	-	-

Type	Test Name / Condition	Duration	Qual Device: <u>OM AP5 912 ZV L</u>	QBS Package Reference: <u>AM351 7ZCN</u>	QBS Package Reference: <u>CODM IOZW CR</u>	QBS Package Reference: <u>LMK0 4616Z CRR</u>	QBS Package Reference: <u>MSP43 0FG43 9IZCA</u>	QBS Package Reference: <u>MSP43 0FR59 94IZV W</u>	QBS Package Reference: <u>PCD32 15C00 AZBH R, PCD32 15C00 BZBH R</u>	QBS Package Reference: <u>TMP5 70LS3 137BZ WTO Q1</u>	QBS Package Reference: <u>TMS32 0DM64 46ZW T</u>	QBS Package Reference: <u>TPS65 9038T ZWSR Q1</u>	QBS Package Reference: <u>TS3DD R4000 ZBAR</u>
	Cycle, -40/85C												
CDM	ESD - CDM	250 V	1/3/0	-	-	-	2/6/0	1/3/0	-	-	-	-	-
CDM	ESD - CDM	500 V	1/3/0	-	-	-	-	-	-	1/3/0	1/3/0	1/3/0	-
CDM	ESD - CDM	750 V	-	-	-	-	-	-	-	1/3/0	1/3/0	1/3/0	-
CDM	ESD - CDM	1000 V	-	-	-	-	-	-	-	-	1/3/0	-	1/3/0
CDM	ESD - CDM	1500 V	-	-	-	1/3/0	-	-	6/18/0	-	-	-	-
ED	Electrical Characterization, side by side	Per Datash eet Parameters	Pass	-	-	-	-	-	-	-	-	-	-
ED	Electrical Characterization	Per Datash eet Parameters		-	-	Pass	-	-	Pass	Pass	Pass	Pass	Pass
FLAM	Flammability (IEC 695-2-2)	-	-	-	-	-	-	-	3/15/0	-	-	-	3/15/0
FLAM	Flammability (UL 94V-0)	-	-	-	-	-	-	-	3/15/0	-	-	-	3/15/0
FLAM	Flammability (UL-1694)	-	-	-	-	-	-	-	3/15/0	-	-	-	3/15/0
HAST	Biased HAST, 110C/85%RH	264 Hours	-	3/231/0	-	3/231/0	-	3/231/0	3/231/0	-	-	-	1/77/0
HBM	ESD - HBM	1000 V	-	-	-	-	2/6/0	1/3/0	-	-	1/3/0	-	-
HBM	ESD - HBM	2000 V	-	-	-	-	2/6/0	-	6/18/0	1/3/0	1/3/0	1/3/0	-
HBM	ESD - HBM	3000 V	-	-	-	-	-	-	-	-	-	-	1/3/0
HBM	ESD - HBM	4000 V	-	-	-	1/3/0	-	-	-	-	-	-	-
HTOL	Life Test, 90C	2000 Hours	-	-	-	-	-	-	-	-	3/387/0	-	-
HTOL	Life Test, 125C	1000 Hours	-	-	-	-	-	-	6/462/0	3/231/0	-	3/231/0	-
HTOL	Life Test, 115C	1000 Hours	-	-	-	1/77/0	-	-	-	-	-	-	-
HTOL	Life Test, 140C	480 hours	-	-	-	-	-	-	-	-	-	-	1/77/0
HTSL	High Temp	1000 Hours	3/231/0	3/45/0	-	1/77/0	3/231/0	3/231/0	3/231/0	1/45/0	3/231/0	-	-

Type	Test Name / Condition	Duration	Qual Device: <u>OMAP5912ZVL</u>	QBS Package Reference: <u>AM3517ZCN</u>	QBS Package Reference: <u>CODMIOZWCR</u>	QBS Package Reference: <u>LMK04616ZCRR</u>	QBS Package Reference: <u>MSP430FG439IZCA</u>	QBS Package Reference: <u>MSP430FR5994IZVW</u>	QBS Package Reference: <u>PCD3215C00AZBHR, PCD3215C00BZBHR</u>	QBS Package Reference: <u>TMP570LS3137BZWTQ1</u>	QBS Package Reference: <u>TMS320DM6446ZW</u>	QBS Package Reference: <u>TPS659038TZWSRQ1</u>	QBS Package Reference: <u>TS3DDR4000ZBAR</u>
	Storage Bake 150C												
HT SL	High Temp Storage Bake 150C	500 Hours	-	-	-	-	-	-	-	-	-	2/90/0	-
HT SL	High Temp Storage Bake 170C	420 hours	-	-	-	-	-	-	-	-	-	-	3/231/0
M Q	Manufacturability (Assembly)	(per mfg. Site specification)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
M SL	Moisture Sensitivity, JEDEC	Level 3-260C	3/36/0	-	-	-	3/36/0	3/36/0	3/36/0	3/36/0	3/36/0	3/36/0	3/36/0
PD	Physical Dimensions	(per mechanical drawing)	3/15/0	-	-	-	1/5/0	-	3/15/0	-	-	3/30/0	3/15/0
SB S	Ball Shear	Balls	3/90/0	3/150/0	-	3/240/0	3/60/0	3/60/0	3/540/0	1/50/0	-	3/150/0	3/60/0
SD	Solderability	PB-Free Solder	3/66/0	-	-	-	1/12/0	-	3/66/0	-	-	-	3/66/0
TC	Temperature Cycle, -55/125C	1000 Cycles	-	3/231/0	-	-	-	-	-	3/231/0	3/231/0	3/231/0	-
TC	Temperature Cycle, -55/125C	700 Cycles	3/231/0	-	-	3/231/0	3/231/0	3/231/0	3/231/0	-	-		3/231/0
TH B	Biased Temperature and Humidity, 85C/85% RH	1000 Hours	-	-	-	-	-	-	-	3/230/0	3/231/0	3/231/0	-
U H AS T	Unbiased HAST 110C/85%RH	264 Hours	3/231/0	-	-	3/231/0	3/231/0	-	3/231/0	3/231/0	3/231/0	3/231/0	-
U H AS T	Unbiased HAST 130C/85%RH	96 Hours	-	3/231/0	-	-	-	-	-	-	-	-	3/231/0
W BP	Wire Pull	Wires	1/76/0	3/228/0	-	3/228/0	3/228/0	3/228/0	3/228/0	3/300/0	3/228/0	3/300/0	3/228/0
W BS	Ball Bond Shear	Wires	1/76/0	3/228/0	-	3/228/0	3/228/0	3/228/0	3/228/0	3/300/0	3/228/0	3/300/0	3/228/0

- QBS: Qual By Similarity*

- Qual Device OMAP5912ZVL is qualified at LEVEL3-260CG

- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable

- The following are equivalent HTOL options based on an activation energy of 0.7eV : 125C/1k Hours, 140C/480 Hours, 150C/300 Hours, and 155C/240 Hours

- The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/1k Hours, and 170C/420 Hours

- The following are equivalent Temp Cycle options per JESD47 : -55C/125C/700 Cycles and -65C/150C/500 Cycles

Quality and Environmental data is available at TI's external Web site: <http://www.ti.com/>

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

Qualification Report (nFBGA)

Approve Date 08-Apr-2020

Qualification Results

Data Displayed as: Number of lots / Total sample size / Total failed

Type	Test Name / Condition	Duration	Qual Device: AFE4491N MA	Qual Device: DRV8601N MBR	Qual Device: TXS0108E NMER	QBS Package Reference: AM3517ZCN	QBS Package Reference: LMK04616ZCRR	QBS Package Reference: PCD3215C00BZBHR	QBS Package Reference: TMP570L S3137BZ WTQQ1
BLR	Board Level Reliability , Temp Cycle, -40/125C	1000 Cycles	-	-	-	1/32/0	-	-	1/32/0
BLR	Board Level Reliability , Temp Cycle, -40/85C	1000 Cycles	-	-	-	-	-	1/32/0	-
CDM	ESD - CDM	250 V	1/3/0	1/3/0	1/3/0	-	-	-	-
CDM	ESD - CDM	500 V	1/3/0	1/3/0	1/3/0	-	-	-	1/3/0
CDM	ESD - CDM	750 V	-	-	-	-	-	-	1/3/0
CDM	ESD - CDM	1000 V	-	-	-	-	-	-	-
CDM	ESD - CDM	1500 V	-	-	-	-	1/3/0	6/18/0	-
ED	Electrical Characterization	Per Datasheet Parameters	-	-	-	-	Pass	Pass	Pass
ED	Electrical Characterization, side by side	(per datasheet)	Pass	Pass	Pass	-	-	-	-
FLAM	Flammability (IEC 695-2-2)	Method B/IEC 695-2-2	-	-	-	-	-	3/15/0	-
FLAM	Flammability (UL 94V-0)	Method A/UL 94V-0	-	-	-	-	-	3/15/0	-

Type	Test Name / Condition	Duration	Qual Device: <u>AFF4491N</u> <u>MA</u>	Qual Device: <u>DRV8601N</u> <u>MBR</u>	Qual Device: <u>TXS0108E</u> <u>NMER</u>	QBS Package Reference: <u>AM3517ZC</u> <u>N</u>	QBS Package Reference: <u>LMK04616</u> <u>ZCRR</u>	QBS Package Reference: <u>PCD3215C</u> <u>00BZBHR</u>	QBS Package Reference: <u>TMP570L</u> <u>S3137BZ</u> <u>WTQQ1</u>
FLAM	Flammability (UL-1694)	Method C/UL-1694	-	-	-	-	-	3/15/0	-
HAST	Biased HAST, 110C/85% RH	264 Hours	-	-	-	3/231/0	3/231/0	3/231/0	-
HBM	ESD - HBM	2000 V	-	-	-	-	-	6/18/0	1/3/0
HBM	ESD - HBM	4000 V	-	-	-	-	1/3/0	-	-
HTOL	Life Test, 115C	1000 Hours	-	-	-	-	1/77/0	-	-
HTOL	Life Test, 125C	1000 Hours	-	-	-	-	-	6/462/0	3/231/0
HTSL	High Temp Storage Bake 150C	1000 Hours	3/230/0	3/231/0	3/231/0	3/45/0	1/77/0	3/231/0	1/45/0
MQ	Manufacturability (Assembly)	(per mfg. Site specification)	Pass	Pass	Pass	Pass	Pass	Pass	Pass
MSL	Moisture Sensitivity, JEDEC	Level 2-260C	-	3/36/0	3/36/0	-	-	-	-
MSL	Moisture Sensitivity, JEDEC	Level 3-260C	3/36/0	-	-	-	-	3/36/0	3/36/0
PD	Physical Dimensions	(per mechanical drawing)	3/15/0	3/15/0	3/15/0	-	-	3/15/0	-
SBS	Ball Shear	Balls	3/90/0	3/90/0	3/90/0	3/150/0	3/240/0	3/540/0	1/50/0
SD	Solderability	PB-Free Solder	3/66/0	3/66/0	3/66/0	-	-	3/66/0	-
TC	Temperature Cycle, -55/125C	1000 Cycles	-	-	-	3/231/0	-	-	3/231/0
TC	Temperature Cycle, -55/125C	700 Cycles	3/231/0	3/231/0	3/231/0	-	3/231/0	3/231/0	-
THB	Biased Temperature and Humidity, 85C/85% RH	1000 Hours	-	-	-	-	-	-	3/230/0
UHA	Unbiased HAST	264 Hours	3/230/0	3/231/0	3/231/0	-	3/231/0	3/231/0	3/231/0

Type	Test Name / Condition	Duration	Qual Device: <u>AFE4491NMA</u>	Qual Device: <u>DRV8601NMBR</u>	Qual Device: <u>TXS0108ENMER</u>	QBS Package Reference: <u>AM3517ZCN</u>	QBS Package Reference: <u>LMK04616ZCRR</u>	QBS Package Reference: <u>PCD3215C00BZBHR</u>	QBS Package Reference: <u>TMP570L S3137BZ WTQQ1</u>
	110C/85% RH								
UHA	Unbiased HAST 130C/85% RH	96 Hours	-	-	-	3/231/0	-	-	-
WBP	Wire Pull	Wires	1/76/0	1/76/0	3/228/0	3/228/0	3/228/0	3/228/0	3/300/0
WBS	Ball Bond Shear	Wires	1/76/0	1/76/0	3/228/0	3/228/0	3/228/0	3/228/0	3/300/0

- QBS: Qual By Similarity*

- Qual Devices DRV8601NMBR and TXS0108ENMER are qualified at LEVEL2-260C

- Qual Device AFE4491NMA is qualified at LEVEL3-260CG

- Device AFE4491NMA contains multiple dies.

- Preconditioning was performed for Autoclave, Unbiased HAST, THB/Biased HAST, Temperature Cycle, Thermal Shock, and HTSL, as applicable

- The following are equivalent HTOL options based on an activation energy of 0.7eV : 125C/1k Hours, 140C/480 Hours, 150C/300 Hours, and 155C/240 Hours

- The following are equivalent HTSL options based on an activation energy of 0.7eV : 150C/1k Hours, and 170C/420 Hours

- The following are equivalent Temp Cycle options per JESD47 : -55C/125C/700 Cycles and -65C/150C/500 Cycles

Quality and Environmental data is available at TI's external Web site: <http://www.ti.com/>

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

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