PDN Number:	20201117001.3	**PDN Date:**	Nov 20, 2020
Title:	Discontinuance of select MicroStar BGA & MicroStar BGA Jr. devices		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Last date to order:	May 20, 2021	**Last date to ship:**	May 20, 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 SnPb and Pb-free 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. For questions regarding the release status of a particular device, please contact UBGAMKT@list.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 / 4208515**
Wire Type	**Cu**
Substrate	**Laminate**

Group 3 Devices: Products in the Microstar 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**
CDCU2A877ZQLR	CDCU2A877NMKR	Q
CDCU2A877ZQLT	CDCU2A877NMKT	Q
CDCU877AZQLR	CDCU877ANMKR	Q
CDCU877AZQLT	CDCU877ANMKT	Q
CDCUA877ZQLR	CDCUA877NMKR	Q
CDCUA877ZQLT	CDCUA877NMKT	Q
DE111001ZHHA	DE111001ZAYA	Q
DE129003ZHHA	DE129003ZAYA	Q
DEF01000ZHHA	DEF01000ZAYA	Q
DFDF2812ZHHAR	TMS320F2812ZAYAR	Q
DRV8601ZQVR	DRV8601NMBR	Q
HD3SS212ZQER	Contact UBGAMKT@list.ti.com	Not Applicable
HD3SS212ZQET	Contact UBGAMKT@list.ti.com	Not Applicable
HD3SS213ZQER	Contact UBGAMKT@list.ti.com	Not Applicable
HD3SS214IZQER	Contact UBGAMKT@list.ti.com	Not Applicable
HD3SS214ZQER	Contact UBGAMKT@list.ti.com	Not Applicable
HD3SS215IZQER	Contact UBGAMKT@list.ti.com	Not Applicable
HD3SS215IZQET	Contact UBGAMKT@list.ti.com	Not Applicable
HD3SS215ZQER	Contact UBGAMKT@list.ti.com	Not Applicable
HPA00394ZQLR	CDCUA877NMKR	Q
M430F5438AQZQWRET	M430F5438AQZCARET	Q
MSP430A147IZQER	MSP430F5522IZXHR	Q
MSP430BT5190IZQWR	MSP430BT5190IZCAR	Q
MSP430BT5190IZQWT	MSP430BT5190IZCAT	Q
MSP430F5324IZQE	MSP430F5324IZXH	Q
MSP430F5324IZQER	MSP430F5324IZXHR	Q
MSP430F5326IZQE	MSP430F5326IZXH	Q
MSP430F5326IZQER	MSP430F5326IZXHR	Q
MSP430F5328IZQE	MSP430F5328IZXH	Q
MSP430F5328IZQER	MSP430F5328IZXHR	Q
MSP430F5335IZQWR	MSP430F5335IZCAR	Q
MSP430F5335IZQWT	MSP430F5335IZCAT	Q
MSP430F5338IZQWR	MSP430F5338IZCAR	Q
MSP430F5338IZQWT	MSP430F5338IZCAT	Q
MSP430F5358IZQWR	MSP430F5358IZCAR	Q
MSP430F5358IZQWT	MSP430F5358IZCAT	Q
MSP430F5359IZQWR	MSP430F5359IZCAR	Q
MSP430F5359IZQWT	MSP430F5359IZCAT	Q
MSP430F5419AIZQWR	MSP430F5419AIZCAR	Q

MSP430F5419AIZQWT	MSP430F5419AIZCAT	Q
MSP430F5436AIZQWR	MSP430F5436AIZCAR	Q
MSP430F5436AIZQWT	MSP430F5436AIZCAT	Q
MSP430F5438AIZQWR	MSP430F5438AIZCAR	Q
MSP430F5438AIZQWT	MSP430F5438AIZCAT	Q
MSP430F5522IZQE	MSP430F5522IZXH	Q
MSP430F5522IZQER	MSP430F5522IZXHR	Q
MSP430F5524IZQE	MSP430F5524IZXH	Q
MSP430F5524IZQER	MSP430F5524IZXHR	Q
MSP430F5526IZQE	MSP430F5526IZXH	Q
MSP430F5526IZQER	MSP430F5526IZXHR	Q
MSP430F5528IZQE	MSP430F5528IZXH	Q
MSP430F5528IZQER	MSP430F5528IZXHR	Q
MSP430F5632IZQWR	MSP430F5632IZCAR	Q
MSP430F5635IZQWR	MSP430F5635IZCAR	Q
MSP430F5635IZQWT	MSP430F5635IZCAT	Q
MSP430F5638IZQWR	MSP430F5638IZCAR	Q
MSP430F5638IZQWT	MSP430F5638IZCAT	Q
MSP430F5659IZQWR	MSP430F5659IZCAR	Q
MSP430F5659IZQWT	MSP430F5659IZCAT	Q
MSP430F6433IZQWR	MSP430F6433IZCAR	Q
MSP430F6433IZQWT	MSP430F6433IZCAT	Q
MSP430F6438IZQWR	MSP430F6438IZCAR	Q
MSP430F6634IZQWR	MSP430F6634IZCAR	Q
MSP430F6635IZQWR	MSP430F6635IZCAR	Q
MSP430F6638IZQWR	MSP430F6638IZCAR	Q
MSP430F6638IZQWT	MSP430F6638IZCAT	Q
MSP430F6659IZQWR	MSP430F6659IZCAR	Q
MSP430F6659IZQWT	MSP430F6659IZCAT	Q
MSP430FG6626IZQWR	MSP430FG6626IZCAR	Q
MSP430FG6626IZQWT	MSP430FG6626IZCAT	Q
MSP430V287IZQWR	MSP430V287IZCAR	Q
MSP430V287IZQWT	MSP430V287IZCAT	Q
PCI1510ZGU	Contact UBGAMKT@list.ti.com	Not Applicable
PCI1520IZHK	Contact UBGAMKT@list.ti.com	Not Applicable
PCI1520ZHK	Contact UBGAMKT@list.ti.com	Not Applicable
PCI2050BIZHK	Contact UBGAMKT@list.ti.com	Not Applicable
PCI2050BZHK	Contact UBGAMKT@list.ti.com	Not Applicable
SN65DSI83ZQER	SN65DSI83ZXHR	Q
SN65DSI84ZQER	SN65DSI84ZXHR	Q
SN65DSI85ZQER	SN65DSI85ZXHR	Q
SN65DSI86ZQER	SN65DSI86ZXHR	Q
SN65LVDS301ZQE	SN65LVDS301ZXH	Q
SN65LVDS301ZQER	SN65LVDS301ZXHR	Q
SN65LVDS302ZQE	SN65LVDS302ZXH	Q
SN65LVDS302ZQER	SN65LVDS302ZXHR	Q

SN74AVC24T245ZRGR	SN74AVC24T245NMUR	Q
SN74AVC32T245ZKER	SN74AVC32T245NMJR	Q
SN74AVCH24T245ZRGR	SN74AVCH24T245NMUR	Q
SN74LVCH32373AZKER	SN74LVCH32373ANMJR	Q
SN74SSTU32864ZKER	SN74SSTU32864NMJR	Q
SN74SSTUB32864ZKER	SN74SSTUB32864NMJR	Q
SN74SSTUB32866ZKER	SN74SSTUB32866NMJR	Q
TLV320AIC3106IZQER	TLV320AIC3106IZXHR	Q
TLV320AIC33IZQE	TLV320AIC33IZXH	Q
TLV320AIC33IZQER	TLV320AIC33IZXHR	Q
TMS320C28341ZHHT	TMS320C28341ZAYT	Q
TMS320C28343ZHHT	TMS320C28343ZAYT	Q
TMS320C28345ZHHT	TMS320C28345ZAYT	Q
TMS320F28015ZGMA	TMS320F28015NMFA	Q
TMS320F2801ZGMA	TMS320F2801NMFA	Q
TMS320F2806ZGMA	TMS320F2806NMFA	Q
TMS320F2806ZGMS	TMS320F2806NMFS	Q
TMS320F2808ZGMA	TMS320F2808NMFA	Q
TMS320F2808ZGMS	TMS320F2808NMFS	Q
TMS320F2809ZGMA	TMS320F2809NMFA	Q
TMS320F2809ZGMS	TMS320F2809NMFS Contact UBGAMKT@list.ti.com	Q
TMS320F2812ZHHA	TMS320F2812ZAYA	Q
TMS320F2812ZHHAR	TMS320F2812ZAYAR	Q
TMS320F2812ZHHS	TMS320F2812ZAYS	Q
TMS320F28232ZHHA	TMS320F28232ZAYA	Q
TMS320F28234ZHHA	TMS320F28234ZAYA	Q
TMS320F28334ZHHA	TMS320F28334ZAYA	Q
TMS320F28335ZHHA	TMS320F28335ZAYA	Q
TPA6203A1ZQVR	TPA6203A1NMBR	Q
TPA6205A1ZQVR	TPA6205A1NMBR	Q
TPS658643ZGUR	TPS658643ZWSR	Q
TPS6591104DA2ZRC	TPS6591104DA2NMA	Q
TPS65911062A2ZRCRP	TPS65911062A2NMARP	Q
TPS659110A2ZRCR	TPS659110A2NMAR	Q
TPS659112A2ZRCR	TPS659112A2NMAR	Q
TPS6591133A2ZRC	TPS6591133A2NMA	Q
TPS659114A2ZRCR	TPS659114A2NMAR	Q
TPS65921B1ZQZR	TPS65921B1ZBHR	Q
TPS65921BZQZR	TPS65921BZBHR	Q
TPS65951A1ZGUR	TPS65951A1ZWSR	Q
TWL6040A3ZQZR	TWL6040A3ZBHR	Q
TXB0104ZXUR	TXB0104NMNR	Q
TXB0108ZXYR	TXB0108NMER	Q
TXS0104EZXUR	TXS0104ENMNR	Q
TXS0108EZXYR	TXS0108ENMER	Q

XIO1100ZGB	Contact UBGAMKT@list.ti.com	Not Applicable
XIO1100ZGBR	Contact UBGAMKT@list.ti.com	Not Applicable
XIO2000AZHH	Contact UBGAMKT@list.ti.com	Not Applicable
XIO2000AZZZ	Contact UBGAMKT@list.ti.com	Not Applicable
XIO2001IZGU	Contact UBGAMKT@list.ti.com	Not Applicable
XIO2001IZGUR	Contact UBGAMKT@list.ti.com	Not Applicable
XIO2001ZGU	Contact UBGAMKT@list.ti.com	Not Applicable
XIO3130IZHC	Contact UBGAMKT@list.ti.com	Not Applicable
XIO3130ZHC	Contact UBGAMKT@list.ti.com	Not Applicable

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
PCI2050BGHK	Contact UBGAMKT@list.ti.com	None	Not Applicable
PCI2050BIGHK	Contact UBGAMKT@list.ti.com	None	Not Applicable
TLV320AIC33IGQE	TLV320AIC33IZXH	TLV320AIC33IGVX	Q
TMS320F2808GGMA	TMS320F2808NMFA	TMS320F2808GBAA	Q
TMS320F2808GGMS	TMS320F2808NMFS	TMS320F2808GBAS	Q
TMS320F2809GGMA	TMS320F2809NMFA	TMS320F2809GBAA Contact UBGAMKT@list.ti.com	Q
TMS320F2809GGMS	TMS320F2808NMFS	TMS320F2809GBAS Contact UBGAMKT@list.ti.com	Q
TMS320F2812GHHA	TMS320F2812ZAYA	TMS320F2812GBBA	Q
TMS320F2812GHHAR	TMS320F2812ZAYAR	TMS320F2812GBBAR	Q
TMS320F2812GHHS	TMS320F2812ZAYA	TMS320F2812GBBS	Q

Product Affected: Group 3

Product Being Discontinued	RECOMMENDED REPLACEMENT PRODUCTS	REPLACEMENT CODES
74SSTUB32866AZKER	None	Not Applicable
CD3215C00ZQZR	CD3215C00ZBHR	Q
CD3240B0ZRPR	None	Not Applicable
HPA02255ZRQR	None	Not Applicable
MPD23683ZQER	None	Not Applicable
MSP430F5333IZQWR	MSP430F5335IZCAR	Q
MSP430F5336IZQWR	MSP430F5338IZCAR	Q
MSP430F5336IZQWT	MSP430F5338IZCAR	Q
MSP430F5513IZQER	MSP430F5522IZXHR	Q
MSP430F5514IZQE	MSP430F5524IZXHR	Q
MSP430F5514IZQER	MSP430F5524IZXHR	Q
MSP430F5630IZQWR	MSP430F5632IZCAR	Q
MSP430F5630IZQWT	MSP430F5632IZCAR	Q
MSP430F5633IZQWR	MSP430F5635IZCAR	Q
MSP430F5633IZQWT	MSP430F5635IZCAR	Q
MSP430F5634IZQWT	MSP430F5635IZCAT	Q

MSP430F5658IZQWR	MSP430F5659IZCAR	Q
MSP430F5658IZQWT	MSP430F5659IZCAT	Q
MSP430F6435IZQWR	MSP430F6438IZCAR	Q
MSP430F6435IZQWT	MSP430F6438IZCAR	Q
MSP430F6459IZQWT	MSP430F6659IZCAR	Q
MSP430F6633IZQWR	MSP430F6634IZCAR	Q
MSP430F6633IZQWT	MSP430F6634IZCAR	Q
MSP430F6636IZQWR	MSP430F6638IZCAR	Q
MSP430FG6425IZQWR	MSP430FG6626IZCAR	Q
MSP430FG6426IZQWR	MSP430FG6626IZCAR	Q
MSP430FG6625IZQWR	MSP430FG6626IZCAR	Q
MSP430V317IZQWR	MSP430F5635IZCAR	Q
MSP430V345IZQER	MSP430F5528IZXH	Q
SM320F28335GHHAEP	None	Not Applicable
SN65LVDS306ZQER	None	Not Applicable
TLV320AIC3010DZQZR	None	Not Applicable
TLV320AIC3010DZQZT	None	Not Applicable
TMS320C2834FZHH	None	Not Applicable
TMS320C2834HZHH	None	Not Applicable
TMS320C2834LZHH	None	Not Applicable
TMS320C2834MZHH	None	Not Applicable
TMS320F2802ZGMS	TMS320F2806NMFS	Q
TPA2005D1ZQYR	None	Not Applicable
TPA6202A1ZQVR	None	Not Applicable
TPS65857ZQZR	None	Not Applicable
TSB43CA42ZGW	None	Not Applicable
TSB43EA42ZGU	None	Not Applicable
TSB43EB42ZGU	None	Not Applicable
TSB43EC42ZGU	None	Not Applicable
TSC2046IZQCR	None	Not Applicable
TUSB1211A1ZRQ	TUSB1210BRHBR	F
TUSB1211A1ZRQR	TUSB1210BRHBT	F
V62/09624-02XE	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: OMAP5912ZVL	QBS Package Reference: AM3517ZCN	QBS Package Reference: CODMIOZWCR	QBS Package Reference: LMK04616ZCRR	QBS Package Reference: MSP430FG439IZCA	QBS Package Reference: MSP430FR5994IZVW	QBS Package Reference: PCD3215C00AZBHR , PCD3215C00BZBHR	QBS Package Reference: TMP570LS3137BZWTQQ1	QBS Package Reference: TMS320DM6446ZWT	QBS Package Reference: TPS659038TZWSRQ1	QBS Package Reference: TS3DDR4000ZBAR
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 Cycle, -40/85C	1000 Cycles	-	-	-	-	-	-	1/32/0	-	-	-	-
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 Datasheet Parameters	Pass	-	-	-	-	-	-	-	-	-	-
ED	Electrical Characterization	Per Datasheet 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	-

Type	Test Name / Condition	Duration	Qual Device: OMAP5912ZVL	QBS Package Reference: AM3517ZCN	QBS Package Reference: CODMIOZWCR	QBS Package Reference: LMK04616ZCRR	QBS Package Reference: MSP430FG439IZCA	QBS Package Reference: MSP430FR5994IZVW	QBS Package Reference: PCD3215C00AZBHR , PCD3215C00BZBHR	QBS Package Reference: TMP570LS3137BZWTQQ1	QBS Package Reference: TMS320DM6446ZWT	QBS Package Reference: TPS659038TZWSRQ1	QBS Package Reference: TS3DDR4000ZBAR
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 Storage Bake 150C	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	-	-
HTSL	High Temp Storage Bake 150C	500 Hours	-	-	-	-	-	-	-	-	-	2/90/0	-
HTSL	High Temp Storage Bake 170C	420 hours	-	-	-	-	-	-	-	-	-	-	3/231/0
MQ	Manufacturability (Assembly)	(per mfg. Site specification)	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
MSL	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
SBS	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
THB	Biased Temperature and Humidity, 85C/85%	1000 Hours	-	-	-	-	-	-	-	3/230/0	3/231/0	3/231/0	-

Type	Test Name / Condition	Duration	Qual Device: OMAP5912ZVL	QBS Package Reference: AM3517ZCN	QBS Package Reference: CODMIOZWCR	QBS Package Reference: LMK04616ZCRR	QBS Package Reference: MSP430FG439IZCA	QBS Package Reference: MSP430FR5994IZVW	QBS Package Reference: PCD3215C00AZBHR , PCD3215C00BZBHR	QBS Package Reference: TMP570LS3137BZWTQQ1	QBS Package Reference: TMS320DM6446ZWT	QBS Package Reference: TPS659038TZWSRQ1	QBS Package Reference: TS3DDR4000ZBAR
	RH												
UHAST	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	-
UHAST	Unbiased HAST 130C/85 %RH	96 Hours	-	3/231/0	-	-	-	-	-	-	-	-	3/231/0
WBP	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
WBS	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: AFE4491NMA	Qual Device: DRV8601NMBR	Qual Device: TXS0108ENMER	QBS Package Reference: AM3517ZCN	QBS Package Reference: LMK04616ZCRR	QBS Package Reference: PCD3215C00BZBHR	QBS Package Reference: TMP570LS3137BZWTQQ1
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 -	500 V	1/3/0	1/3/0	1/3/0	-	-	-	1/3/0

Type	**Test Name / Condition**	**Duration**	**Qual Device: AFE4491NMA**	**Qual Device: DRV8601NMBR**	**Qual Device: TXS0108ENMER**	**QBS Package Reference: AM3517ZCN**	**QBS Package Reference: LMK04616ZCRR**	**QBS Package Reference: PCD3215C00BZBHR**	**QBS Package Reference: TMP570LS3137BZWTQQ1**
	CDM								
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	-
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

Type	Test Name / Condition	Duration	Qual Device: AFE4491NMA	Qual Device: DRV8601NMBR	Qual Device: TXS0108ENMER	QBS Package Reference: AM3517ZCN	QBS Package Reference: LMK04616ZCRR	QBS Package Reference: PCD3215C00BZBHR	QBS Package Reference: TMP570LS3137BZWTQQ1
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
UHAST	Unbiased HAST 110C/85% RH	264 Hours	3/230/0	3/231/0	3/231/0	-	3/231/0	3/231/0	3/231/0
UHAST	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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