

PCN Number:		20151211000		PCN Date:		1/11/2016																						
Title:		8" conversion																										
Customer Contact:		PCN Manager			Dept:		Quality Services																					
Proposed 1st Ship Date:		07/11/2016		Estimated Sample Availability:		Date provided at sample request																						
Change Type:																												
<input type="checkbox"/>	Assembly Site	<input checked="" type="checkbox"/>	Design	<input type="checkbox"/>	Wafer Bump Site																							
<input type="checkbox"/>	Assembly Process	<input type="checkbox"/>	Data Sheet	<input type="checkbox"/>	Wafer Bump Material																							
<input checked="" type="checkbox"/>	Assembly Materials	<input checked="" type="checkbox"/>	Part number change	<input type="checkbox"/>	Wafer Bump Process																							
<input type="checkbox"/>	Mechanical Specification	<input type="checkbox"/>	Test Site	<input type="checkbox"/>	Wafer Fab Site																							
<input type="checkbox"/>	Packing/Shipping/Labeling	<input type="checkbox"/>	Test Process	<input type="checkbox"/>	Wafer Fab Materials																							
				<input checked="" type="checkbox"/>	Wafer Fab Process																							
PCN Details																												
Description of Change:																												
Texas Instruments Incorporated is announcing the qualification for TMS3705xDRG4 with the following changes:																												
<ul style="list-style-type: none"> Moving the wafer production from 6" to 8" to utilize the newest tools for this process. Using newest technology and knowledge in mold compound and die attach. Further planned improvement for potential delamination, introduction of rough lead frame. Due to customers demand the usage of Cu bond wires is also evaluated. New p/n TMS3705DDRQ1 replaces TMS3705A1DRG4, TMS3705BDRG4 and TMS3705CDRQ1. 																												
<table border="1"> <thead> <tr> <th>Description</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td>Wafer size</td> <td>6" (150mm)</td> <td>8" (200mm)</td> </tr> <tr> <td>Lead frame</td> <td>4221346-0001</td> <td>4209812-0002</td> </tr> <tr> <td>Mold compound</td> <td>4205694-0034</td> <td>4211880-0013</td> </tr> <tr> <td>Die attach</td> <td>4042500-0009</td> <td>4147858-0005</td> </tr> <tr> <td>Bond wire</td> <td>Au (0.96 MILS)</td> <td>Cu 4218106-1000</td> </tr> <tr> <td>Die</td> <td>BEPE3705BN [A1-version]</td> <td>BEPE3705CN [B-version]</td> </tr> </tbody> </table>								Description	From	To	Wafer size	6" (150mm)	8" (200mm)	Lead frame	4221346-0001	4209812-0002	Mold compound	4205694-0034	4211880-0013	Die attach	4042500-0009	4147858-0005	Bond wire	Au (0.96 MILS)	Cu 4218106-1000	Die	BEPE3705BN [A1-version]	BEPE3705CN [B-version]
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Reason for Change:																												
Continuous support for this product by improving the device reliability and availability.																												
<ul style="list-style-type: none"> The combination of the new mold compound in conjunction with the new die attach material and rough lead frame decreases the possibility of delamination (see next slide). The B-version is optimized for higher communication data rates and, therefore, works without frequency measurement during the write phase (for details see: http://www.ti.com/lit/qpn/tms3705). The TMS3705DDRQ1 is backwards compatible to both, TMS3705A1DRG4 and TMS3705BDRG4 																												
Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):																												
None.																												
Changes to product identification resulting from this PCN:																												
None.																												
Product Affected:																												
TMS3705A1DRG4 TMS3705BDRG4 TMS3705CDRQ1																												

Automotive Qualification
(As per AEC-Q100 and JEDEC Guidelines)

Q100 qualification of BAST TMS3705DDRQ1 8"

Product Attributes

Attributes	Qual Device: TMS3705DDRQ1
Qual ID	20151005-115501
Operating Temp Range	-40C/85C
Automotive Grade Level	Major Change
Wafer Fab Supplier	DFAB
Die Revision	-
Assembly Site	TI TAIWAN
Package Type	SOIC
Package Designator	D(SOIC)
Ball/Lead Count	16

- QBS: Qual By Similarity
- Qual Device TMS3705DDRQ1 is qualified at LEVEL3-260CG

Critical Package Attributes

Attributes	Qual Device: TMS3705DDRQ1
Mold Compound	G633CB-1
Die attach	QMI505MT
Wire type	1.0 mil / PCC wire
Flammability rating	UL 94 V0

Qualification Results

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

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: TMS3705DDRQ1
	Qual ID							20151005-115501
Test Group A – Accelerated Environment Stress Tests								
	PC	A1	JEDEC J-STD-020 JESD22-A113	3	77	PreCon Level 3	3cy/260C	3/840/0
	THB	A2	JEDEC JESD22-A101	3	77	Biased Temperature and Humidity, 85C/85%RH	1000/85/85	3/240/0
	AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96/121 C / 15psi	3/240/0
	TC	A4	JEDEC JESD22-A104	3	77	Temperature cycling - 50C/125C (Customer conditions)	1000 Cycles	3/77/0

	Type	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	Qual Device: TMS3705DDRQ1
	PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle, -40/105C	1000h/-40 C/+105 C	1/45/0
	HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 150C	500h/150 C	1/45/0
Test Group B – Accelerated Lifetime Simulation Tests								
	HTOL	B1	JESD22	3	77	High temperature operating life	1000hr / 85C	3/213/0
	ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 105C	24/105 C	8/2400/0
	EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	Not Applicable
Test Group C – Package Assembly Integrity Tests								
	WBS	C1	AEC Q100-001	1	30	Wire Bond Shear (Cpk>1.67)	-	Pass
	WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull (Cpk>1.67)	-	1/30/0
	WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull after Temp cycling	1000 TC	1/5/0
	SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	-	Qualified by NiPdAu technology
	PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions (Cpk>1.67)	-	Qualified by existing TMS3705x
	SBS	C5	AEC Q100-010	3	50	Solder Ball Shear (Cpk>1.67)	-	Not Applicable to SMT devices
	LI	C6	JEDEC JESD22-B105	1	50	Lead Integrity	-	Not Applicable to SMT devices
Test Group D – Die Fabrication Reliability Tests								
	EM	D1	JESD61	-	-	Electromigration	-	Per Process Technology
	TDD B	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	Per Process Technology
	HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	Per Process Technology
	NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	Fail mode Not applicable above 180nm geometries
	SM	D5	-	-	-	Stress Migration	-	Per Process Technology
Test Group E – Electrical Verification Tests								
	HBM	E2	AEC Q100-002	1	3	ESD - HBM - Q100	2500V/3 units	1/3/0
	CDM	E3	AEC Q100-011	1	3	ESD - CDM - Q100	1500Vx/3 units	1/3/0
	LU	E4	AEC Q100-004	1	6	Latch-up	100 mA @ 1.5Vcc	1/6/0

A1 (PC): Preconditioning:

Performed for THB, Biased HAST, AC, uHAST & TC samples, as applicable.

Junction Operating Temperature by Automotive Grade Level:

Grade 0 (or E): -40°C to +150°C

Grade 1 (or Q): -40°C to +125°C

Grade 2 (or T): -40°C to +105°C

Grade 3 (or I) : -40°C to +85°C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):

Room/Hot/Cold : HTOL, ED

Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU

Room : AC/uHAST

Green/Pb-free Status:

Qualified Pb-Free(SMT) and Green

Change Number: C1510011

TI Qualification ID: 20151005-115501

For questions regarding this notice, e-mails can be sent to the regional contacts shown below or your local Field Sales Representative.

Location	E-Mail
USA	PCNAmericasContact@list.ti.com
Europe	PCNEuropeContact@list.ti.com
Asia Pacific	PCNAsiaContact@list.ti.com
Japan	PCNJapanContact@list.ti.com