PCN Number:	20161007005	**PCN Date:**	Nov. 30, 2016
Title:	Metal re-spin for 949/929/947		
Customer Contact:	PCN Manager	**Dept:**	Quality Services
Proposed 1st Ship Date:	May 30, 2017	**Estimated Sample Availability:**	Date provided at sample request

Change Type:

☐	Assembly Site	☒	Design	☐	Wafer Bump Site
☐	Assembly Process	☐	Data Sheet	☐	Wafer Bump Material
☐	Assembly Materials	☐	Part number change	☐	Wafer Bump Process
☐	Mechanical Specification	☐	Test Site	☐	Wafer Fab Site
☐	Packing/Shipping/Labeling	☐	Test Process	☐	Wafer Fab Materials
				☐	Wafer Fab Process

PCN Details

Description of Change:

Texas Instruments Incorporated is announcing the qualification of design improvements for the DS90Ux949, DS90Ux929 and DS90Ux947 family of devices. The design improvements include:

- Fixing FPD-Link Port 1 of DS90Ux949 and DS90Ux947 serializer devices internal synchronization circuitry which may cause the deserializer devices to have unstable LOCK and bit errors, resulting in display flickering, black screen and/or other failures. More information can be found in the DS90Ux949 and DS90Ux947 8D Report.
- Fixing insufficient gain in clock generation circuitry in HDMI receiver which may limit maximum frequency operation, resulting in display flickering, black screen and/or other failures. More information can be found in the DS90Ux929 8D Report.

Reason for Change:

To address various design issues.

Anticipated impact on Fit, Form, Function, Quality or Reliability (positive / negative):

Positive: Quality

Changes to product identification resulting from this PCN:

None

Product Affected:

DS90UB929TRGCRQ1	DS90UB949TRGCRQ1	DS90UH947TRGCRQ1
DS90UB929TRGCTQ1	DS90UB949TRGCTQ1	DS90UH947TRGCTQ1
DS90UB947TRGCRQ1	DS90UH929TRGCRQ1	DS90UH949TRGCRQ1
DS90UB947TRGCTQ1	DS90UH929TRGCTQ1	DS90UH949TRGCTQ1

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

DS90UH929TRGCRQ1

Approved 11/04/2014

Product Attributes

	Qual Device: DS90UH929TRGCTQ1	QBS Device: DS90UH949TRGCTQ1 PG-2.3	QBS Product: DS90UH947TRGCRQ1	QBS Product: DS90UH949TRGCRQ1	QBS Process: SN65DSI96IPAPQ1
Automotive Grade Level	2	2	2	2	2
Operating Temp Range	-40C to +105C	-40C to +105C	-40C to +105C	-40C to +105C	-40C to +105C
Wafer Fab Site	DMOS6	DMOS6	DMOS6	DMOS6	DMOS6
Die Revision	B	BB	A	B	-
Assembly Site	CLARK	CLARK	CLARK	CLARK	CLARK
Package Type	QFN/SON	QFN/SON	QFN/SON	QFN/SON	LEADED
Package Designator	RGC (QFN)	RGC (QFN)	RGC (QFN)	RGC (QFN)	PAP
Ball/Lead Count	64	64	64	64	64

- QBS: Qual By Similarity
- Qual Devices qualified at LEVEL3-260C: DS90UH947TRGCRQ1

Qualification Results

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

Type	#	Test Spe	Min Lot Qty	SS/ Lot	Test Name / Condition	Duration	Qual Device: DS90UH929 TRGCTQ1	QBS Device: DS90UH949TRGCR1 PG-2.3	QBS Product: DS90UH947 TRGCRQ1	QBS Product: DS90UH949 TRGCRQ1	QBS Process: SN65DSI96IPAPQ1
Test Group A – Accelerated Environment Stress Tests											
PC	A1	JESD22-113	-	-	Automotive Preconditioning	Level 3-260C	-	-	1/320/0	3/912/0	3/777/0
HAST	A2	JESD22-A110	3	77	Biased HAST, 110C/85% RH	268 Hours	-	-	1/77/0	3/231/0	3/231/0
AC	A3	JESD22-A102	3	77	Autoclave 121C	96 Hours	-	-	1/770	3/231/0	3/231/0
TC	A4	JESD22-A104	3	77	Temperature Cycle -65 to 150C	500 Cycles	-	-	-		3/231/0
TC-BP	A4	JESD22-A104	3	77	Post Temp. Cycle Bond Pull	Wires	-	-	3/90/0	3/90/0	1/60/0
TC	A4	JESD22-A104	3	77	Temperature Cycle, --65/150C	1000 Cycle	-	-	1/77/0	3/231/0	
PTC	A5	JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	-	N/A	N/A	NA	NA
HTSL	A6	JESD22-A103	1	45	High Temp. Storage Bake,150C	1000 Hours	-	-	1/45/0	3/179/0	1/45/0
Test Group B – Accelerated Lifetime Simulation Tests											

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HTOL	B1	JESD22-A108	3	77	Life Test, 125C	408 Hours	-	1/77/0	1/77/0	1/77/1*	
HTOL	B2	JESD22-A108	3	77	Life Test, 125C	1000 Hours	-	-	1/77/0	1/76/0	
ELFR	B3	AEC-Q100-008	3	800	Early Life Failure Rate, 125C	24 Hours	-	-	-	1/2400/1*	
ELFR	B3	AEC-Q100-008	3	800	Early Life Failure Rate, 105C	24 Hours	-	-			3/2400/0
EDR	B3	AEC-Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	NA	-	N/A	N/A	NA	NA
Test Group C – Package Assembly Integrity Tests											
WBS	C1	AEC-Q100-001	1	30	Bond Shear	Wires	-	-		1/30/0	-
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull	Wires	-	-		1/30/0	3/231/0
SD	C3	JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	Pb or PB Free	-	-		-	1/15/0
PD	C4	JESD22 B100 and B108	3	10	Physical Dimensions	--	-	-		1/30/0	1/10/0
Test Group E – Electrical Verification Tests											
HBM	E2	AEC-Q100-002	1	3	ESD - HBM	2000 V	-	1/3/0	1/3/0	1/3/0	1/3/0
CDM	E3	AEC-Q100-011	1	3	ESD - CDM	1000 V	-	1/3/0	1/3/0	1/3/0	-
LU	E4	AEC-Q100-004	1	6	Latch-up	(Per AEC Q100-004)	-	1/6/0	1/6/0	1/6/0	1/6/0
ED	E5	AEC-Q100-009			Electrical Distribution	CPK>1.67 Room, Hot and cold test	-	Pass	Pass	Pass	Pass
ESD	E6				ESD - IEC Air Gap	18K V	-	1/6/0	1/6/0	1/6/0	-
ESD	E7				ESD - IEC Air Contact	10 KV	-	-	1/6/0	1/6/0	-
ESD	E8				ESD - ISO Contact	18KV	-	-	1/6/0	1/6/0	-
ESD	E9				ESD-ISO Air Gap	10KV	-	-	1/6/0	1/6/0	

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST & TC samples, as applicable.
* EOS
Ambient Operating Temperature by Automotive Grade Level:
Grade 0 (or E): -40C to +150C
Grade 1 (or Q): -40C to +125C
Grade 2 (or T): -40C to +105C
Grade 3 (or I) : -40C to +85C
E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):
Room/Hot/Cold : HTOL
Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
Room : AC/uHAST

Green/Pb-free Status:
Qualified Pb-Free(SMT) and Green

TI Information
Selective Disclosure

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

DS90UH947TRGCRQ1 PG 2.2

Approved 09/21/2016

Product Attributes

	Qual Device: DS90UH949TRGCTQ1 PG-2.3	QBS Product: DS90UH947TRGCRQ1	QBS Product: DS90UH949TRGCRQ1	QBS Process: SN65DSI96IPAPQ1
Automotive Grade Level	2	2	2	2
Operating Temp Range	-40C to +105C	-40C to +105C	-40C to +105C	-40C to +105C
Wafer Fab Site	DMOS6	DMOS6	DMOS6	DMOS6
Die Revision	BB	A	B	-
Assembly Site	CLARK	CLARK	CLARK	CLARK
Package Type	QFN/SON	QFN/SON	QFN/SON	LEADED
Package Designator	RGC (QFN)	RGC (QFN)	RGC (QFN)	PAP
Ball/Lead Count	64	64	64	64

- QBS: Qual By Similarity
- Qual Devices qualified at LEVEL3-260C: DS90UH947TRGCRQ1

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: DS90UH947TRGCRQ1 PG 2.2	Qual Device: DS90UH947TRGCRQ1	QBS Product: DS90UH949TRGCRQ1	QBS Process: SN65DSI96IPAPQ1
Test Group A – Accelerated Environment Stress Tests										
PC	A1	JESD22-113	-	-	Automotive Preconditioning	Level 3-260C		1/320/0	3/912/0	3/777/0
HAST	A2	JESD22-A110	3	77	Biased HAST, 110C/85%RH	268 Hours		1/77/0	3/231/0	3/231/0
AC	A3	JESD22-A102	3	77	Autoclave 121C	96 Hours		1/770	3/231/0	3/231/0
TC	A4	JESD22-A104	3	77	Temperature Cycle -65 to 150C	500 Cycles		-		3/231/0
TC-BP	A4	JESD22-A104	3	77	Post Temp. Cycle Bond Pull	Wires		3/90/0	3/90/0	1/60/0
TC	A4	JESD22-A104	3	77	Temperature Cycle, --65/150C	1000 Cycle		1/77/0	3/231/0	
PTC	A5	JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles		N/A	NA	NA
HTSL	A6	JESD22-A103	1	45	High Temp. Storage Bake, 150C	1000 Hours		1/45/0	3/179/0	1/45/0
Test Group B – Accelerated Lifetime Simulation Tests										
HTOL	B1	JESD22-A108	3	77	Life Test, 125C	408 Hours	1/77/0	1/77/0	1/77/1*	
HTOL	B2	JESD22-A108	3	77	Life Test, 125C	1000 Hours		1/77/0	1/76/0	

ELFR	B3	AEC-Q100-008	3	800	Early Life Failure Rate, 125C	24 Hours		-	1/2400/1*	
ELFR	B3	AEC-Q100-008	3	800	Early Life Failure Rate, 105C	24 Hours				3/2400/0
EDR	B3	AEC-Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	NA	N/A	N/A	NA	NA
Test Group C – Package Assembly Integrity Tests										
WBS	C1	AEC-Q100-001	1	30	Bond Shear	Wires	-		1/30/0	-
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull	Wires	-		1/30/0	3/231/0
SD	C3	JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	Pb or PB Free	-		-	1/15/0
PD	C4	JESD22 B100 and B108	3	10	Physical Dimensions	--	-		1/30/0	1/10/0
Test Group E – Electrical Verification Tests										
HBM	E2	AEC-Q100-002	1	3	ESD - HBM	2000 V	1/3/0	1/3/0	1/3/0	1/3/0
CDM	E3	AEC-Q100-011	1	3	ESD - CDM	1000 V	1/3/0	1/3/0	1/3/0	-
LU	E4	AEC-Q100-004	1	6	Latch-up	(Per AEC Q100-004)	1/6/0	1/6/0	1/6/0	1/6/0
ED	E5	AEC-Q100-009			Electrical Distribution	CPK>1.67 Room, Hot and cold test	Pass	Pass	Pass	Pass
ESD	E6				ESD - IEC Air Gap	18K V	1/6/0	1/6/0	1/6/0	-
ESD	E7				ESD - IEC Air Contact	10 KV	-	1/6/0	1/6/0	-
ESD	E8				ESD - ISO Contact	18KV	-	1/6/0	1/6/0	-
ESD	E9				ESD-ISO Air Gap	10KV	-	1/6/0	1/6/0	

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST & TC samples, as applicable.
* EOS
Ambient Operating Temperature by Automotive Grade Level:
Grade 0 (or E): -40C to +150C
Grade 1 (or Q): -40C to +125C
Grade 2 (or T): -40C to +105C
Grade 3 (or I) : -40C to +85C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):
Room/Hot/Cold : HTOL
Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
Room : AC/uHAST
Green/Pb-free Status:
Qualified Pb-Free(SMT) and Green

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

DS90UH949TRGCRQ1 PG 2.3

Approved 09/21/2016

Product Attributes

	Qual Device: DS90UH949TRGCTQ1 PG-2.3	QBS Product: DS90UH947TRGCRQ1	QBS Product: DS90UH949TRGCRQ1	QBS Process: SN65DSI96IPAPQ1
Automotive Grade Level	2	2	2	2
Operating Temp Range	-40C to +105C	-40C to +105C	-40C to +105C	-40C to +105C
Wafer Fab Site	DMOS6	DMOS6	DMOS6	DMOS6
Die Revision	BB	A	B	-
Assembly Site	CLARK	CLARK	CLARK	CLARK
Package Type	QFN/SON	QFN/SON	QFN/SON	LEADED
Package Designator	RGC (QFN)	RGC (QFN)	RGC (QFN)	PAP
Ball/Lead Count	64	64	64	64

- QBS: Qual By Similarity
- Qual Devices qualified at LEVEL3-260C: DS90UH947TRGCRQ1

Qualification Results

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

Type	#	Test Sp	Min Lot Qty	SS / Lot	Test Name / Condition	Duration	Qual Device: DS90UH949TRGCRQ1 PG-2.3	QBS Product: DS90UH947TRGCRQ1	QBS Product: DS90UH949TRGCRQ1	QBS Process: SN65DSI96IPAPQ1
Test Group A – Accelerated Environment Stress Tests										
PC	A1	JESD22-113	-	-	Automotive Preconditioning	Level 3-260C	-	1/320/0	3/912/0	3/777/0
HAST	A2	JESD22-A110	3	77	Biased HAST, 110C/85%RH	268 Hours	-	1/77/0	3/231/0	3/231/0
AC	A3	JESD22-A102	3	77	Autoclave 121C	96 Hours	-	1/770	3/231/0	3/231/0
TC	A4	JESD22-A104	3	77	Temperature Cycle -65 to 150C	500 Cycles	-	-		3/231/0
TC-BP	A4	JESD22-A104	3	77	Post Temp. Cycle Bond Pull	Wires	-	3/90/0	3/90/0	1/60/0
TC	A4	JESD22-A104	3	77	Temperature Cycle, --65/150C	1000 Cycle	-	1/77/0	3/231/0	
PTC	A5	JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	N/A	N/A	NA	NA
HTSL	A6	JESD22-A103	1	45	High Temp. Storage Bake, 150C	1000 Hours	-	1/45/0	3/179/0	1/45/0
Test Group B – Accelerated Lifetime Simulation Tests										
HTOL	B1	JESD22-A108	3	77	Life Test, 125C	408 Hours	1/77/0	1/77/0	1/77/1*	
HTOL	B2	JESD22-A108	3	77	Life Test, 125C	1000 Hours	-	1/77/0	1/76/0	

ELFR	B3	AEC-Q100-008	3	800	Early Life Failure Rate, 125C	24 Hours	-	-	1/2400/1*	
ELFR	B3	AEC-Q100-008	3	800	Early Life Failure Rate, 105C	24 Hours	-			3/2400/0
EDR	B3	AEC-Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	NA	N/A	N/A	NA	NA
Test Group C – Package Assembly Integrity Tests										
WBS	C1	AEC-Q100-001	1	30	Bond Shear	Wires	-		1/30/0	-
WBP	C2	MIL-STD883 Method 2011	1	30	Bond Pull	Wires	-		1/30/0	3/231/0
SD	C3	JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	Pb or PB Free	-		-	1/15/0
PD	C4	JESD22 B100 and B108	3	10	Physical Dimensions	--	-		1/30/0	1/10/0
Test Group E – Electrical Verification Tests										
HBM	E2	AEC-Q100-002	1	3	ESD - HBM	2000 V	1/3/0	1/3/0	1/3/0	1/3/0
CDM	E3	AEC-Q100-011	1	3	ESD - CDM	1000 V	1/3/0	1/3/0	1/3/0	-
LU	E4	AEC-Q100-004	1	6	Latch-up	(Per AEC Q100-004)	1/6/0	1/6/0	1/6/0	1/6/0
ED	E5	AEC-Q100-009			Electrical Distribution	CPK>1.67 Room, Hot and cold test	Pass	Pass	Pass	Pass
ESD	E6				ESD - IEC Air Gap	18K V	1/6/0	1/6/0	1/6/0	-
ESD	E7				ESD - IEC Air Contact	10 KV	-	1/6/0	1/6/0	-
ESD	E8				ESD - ISO Contact	18KV	-	1/6/0	1/6/0	-
ESD	E9				ESD-ISO Air Gap	10KV	-	1/6/0	1/6/0	

A1 (PC): Preconditioning:
Performed for THB, Biased HAST, AC, uHAST & TC samples, as applicable.
* EOS
Ambient Operating Temperature by Automotive Grade Level:
Grade 0 (or E): -40C to +150C
Grade 1 (or Q): -40C to +125C
Grade 2 (or T): -40C to +105C
Grade 3 (or I) : -40C to +85C

E1 (TEST): Electrical test temperatures of Qual samples (High temperature according to Grade level):
Room/Hot/Cold : HTOL
Room/Hot : THB / HAST, TC / PTC, HTSL, ELFR, ESD & LU
Room : AC/uHAST

Green/Pb-free Status:
Qualified Pb-Free(SMT) and Green

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