PCN Numb	ber:		20210	315000.	2			PCN	N Da	ate:	Mar	<sup>-</sup> 16, 2021	
Title:						using	qualified					gy, Die Revi	sion
litie:				ional AT									
Customer	Contac	t:	<u>P</u>	<u>CN Mana</u>	<u>ager</u>			Dep	ot:		Qua	ality Service	s
Proposed 1 <sup>st</sup> Ship Date:			S	ept 12, 2	2021		Estima			nple		e provided	
<u> </u>				ерс 12, 4	2021		Availa	bility	<b>/:</b>		sam	nple request	
Change Ty				_									
Assembly Site				_	mbly Pr				$\square$			Materials	
🛛 Design					rical Sp							al Specificat	on
X Test Si							Labeling		<u> </u>		Proce		
	Bump S				r Bump							np Process	
X Wafer	Fab Site	5			<u>r Fab M</u>				$\boxtimes$	Wafe	r Fab	Process	
				Part	number								
					PCN	Deta	IIS						
Descriptio													
												technology	
												selected de	vice
as listed be		ne prodi	uci aff	ecteu se		JUNSTRU		nerel	nces	s are n	οιea	DEIOM:	
	Cur	rent Fa	b Site					Add	litio	nal Fa	ıb Sit	te	
Current I	Fab	Proce	ss	Wat	fer	Ado	litional		Pr	ocess		Wafer	
Site				Diam	_		b Site					Diamete	r
SFAB		НСМО	)S	150	mm		RFAB		L	BC9		300 mm	
The die was	s also ch	nanged a	as a re	sult of t	he proce	ess cha	ange.						
Probe site c	change:			Currer	nt:				N	New:			
Probe site c	5		ТІЗ			SH-BIP)	)	ΤΙ CI			D-PR)		
	change: obe Site		TIS	Currer Sherman-		SH-BIP)	)	τι сι		New: gdu (CL	D-PR)		
	obe Site	ences ar		Sherman-	Probe (S	SH-BIP)	)	TI CI			D-PR)		
Pro	obe Site		e note	Sherman- d below	Probe (S				heng	gdu (Cl			
Pro	obe Site		e note	Sherman- d below	Probe (S	sembl			heng lific	gdu (Cl ation			
Pro	obe Site	ocess r	e note migrat	Sherman- d below	Probe (S : ILA Ass	sembl FMX	y/Test	qual	heng lific Ml	gdu (Cl ation LA			
Pro	obe Site	ocess r	re note migrat	Sherman- d below tion & M	Probe (S	sembl FMX	y/Test	<b>qual</b> Nil	heng lific MI PdAu	<b>ation</b> L <b>A</b> u, RLF	for D		
Pro	obe Site	ocess r	re note migrat	Sherman- d below	Probe (S	sembl FMX	y/Test	<b>qual</b> Nil	heng lific MI PdAu	gdu (Cl ation LA	for D		
Pro Construction Group 1 RI	obe Site	Lead fi Bond v	re note migrat inish wire dia	Sherman- d below tion & M ameter	Probe (S	sembl FMX Au, nor , 0.96n	y/Test n RLF nils	<b>qual</b> Nil Cu,	heng lific MI PdAu , 0.8	<b>ation</b> L <b>A</b> U, RLF 30 mils	for D		
Pro Construction Group 1 RI	obe Site	Lead fi Bond v	re note migrat inish wire dia	Sherman- d below tion & M ameter	Probe (S <b>1LA Ass</b> NiPd/ Cu, Cu,	sembl FMX Au, nor , 0.96n alifica	y/Test n RLF nils	qual Nil Cu, <b>r PW</b>	heng lific MI PdAu , 0.8	ation LA u, RLF 30 mils	for D		
Pro Construction Group 1 RI	obe Site	Lead fi Bond v	re note migrat inish wire dia migrat	Sherman- d below tion & M ameter	Probe (S <b>ILA Ass</b> NiPdA Cu, Cu,	sembl FMX Au, nor , 0.96n alifica Currei	y/Test n RLF nils ntion fo	qual Nif Cu, r PW	heng lific MI PdAu , 0.8 / de Prop	ation LA u, RLF 30 mils vices: posed	for D		
Pro Construction Group 1 RI	obe Site	Lead fi Bond v	re note migrat inish wire dia migrat	Sherman- d below tion & M ameter tion & B	Probe (S <b>1LA Ass</b> NiPd/ Cu, <b>CM qu</b> NiPd	sembl FMX Au, nor , 0.96n alifica Currei Au, No	y/Test n RLF nils ntion fo nt on RLF	qual Nif Cu, r PW	heng lific MI PdAu , 0.8 / de Prop liPd/	ation LA u, RLF 30 mils evices: posed Au, RLI	for D		
Pro Construction Group 1 RI	obe Site	Lead fi Bond v	re note migrat inish wire dia migrat	Sherman- d below tion & M ameter tion & B	Probe (S <b>1LA Ass</b> NiPd/ Cu, <b>CM qu</b> NiPd	sembl FMX Au, nor , 0.96n alifica Currei	y/Test n RLF nils ntion fo nt on RLF	qual Nif Cu, r PW	heng lific MI PdAu , 0.8 / de Prop liPd/	ation LA u, RLF 30 mils vices: posed	for D		
Pro Construction Group 1 RI Group 2 RI	bbe Site on differe FAB/Pr FAB/Pr	Lead fi Bond v Lead fi Bond w	re note migrat inish wire dia migrat nish vire dia	Sherman- d below tion & M ameter tion & B	Probe (S	Sembl FMX Au, nor , 0.96n alifica Currei Au, No , 0.96	y/Test n RLF nils ntion fo nt on RLF mils	qual Nil Cu, r PW F N Cu	heng lific MI PdAu , 0.8 / de Prop liPdA u, 0.	ation LA u, RLF 30 mils evices: posed Au, RLI .80 mil	for D		
Pro Construction Group 1 RI Group 2 RI	bbe Site on differe FAB/Pr FAB/Pr	Lead fi Bond v Lead fi Bond w	re note migrat inish wire dia migrat nish vire dia	Sherman- d below tion & M ameter tion & B	Probe (S ILA Ass NiPdA Cu, OM qu NiPd Cu Cu Cu Cu	sembl FMX Au, nor , 0.96n alifica Currer Au, Nc , 0.96 alifica	y/Test n RLF nils ntion fo nt on RLF mils	qual Nil Cu, r PW F N Cu	heng lific MI PdAu , 0.8 / de Prop liPdA J, 0.	ation LA u, RLF 30 mils vices: posed Au, RLI .80 mil	for D		
Pro	bbe Site on differe FAB/Pr FAB/Pr	Lead fi Bond v Cocess r Lead fi Bond w	re note migrat inish wire dia migrat vire dia migrat	Sherman- d below tion & M ameter tion & B	Probe (S <b>1LA Ass</b> <b>NiPd</b> Cu, <b>OM qu</b> NiPd Cu <b>OM qu</b> <b>Cu</b>	sembl FMX Au, nor , 0.96n alifica Currer Au, No , 0.96 alifica Currer	y/Test n RLF nils nt on RLF mils ntion fo nt	qual Nif Cu, r PW F N Cu	lific MI PdAu , 0.8 Prop IiPd/ J, 0. V de Prop	ation LA u, RLF 30 mils vices: posed Au, RLI .80 mil .80 mil	for D		
Pro Construction Group 1 RI Group 2 RI	bbe Site on differe FAB/Pr FAB/Pr	Lead fin Bond w Cocess r Lead fin Bond w Cocess r Lead fin	re note migrat inish wire dia migrat vire dia migrat	Sherman- d below tion & M ameter tion & B ameter	Probe (S ILA Ass NiPd/ Cu, Cu, Cu, Cu, Cu, Cu, Cu, Cu,	Sembl FMX Au, nor , 0.96n alifica Currer Au, No , 0.96 alifica Currer Au, No	y/Test n RLF nils ntion fo nt on RLF mils nt on RLF	qual Nil Cu, r PW F N Cu F N	heng lific MI PdAu , 0.8 / de Prop liPdA / de Prop liPdA	ation LA u, RLF 30 mils evices: posed Au, RLI svices: posed Au, RLI	for D		
Pro Construction Group 1 RI Group 2 RI	bbe Site on differe FAB/Pr FAB/Pr	Lead fi Bond v Cocess r Lead fi Bond w	re note migrat inish wire dia migrat vire dia migrat	Sherman- d below tion & M ameter tion & B ameter	Probe (S ILA Ass NiPd/ Cu, Cu, Cu, Cu, Cu, Cu, Cu, Cu,	sembl FMX Au, nor , 0.96n alifica Currer Au, No , 0.96 alifica Currer	y/Test n RLF nils ntion fo nt on RLF mils nt on RLF	qual Nil Cu, r PW F N Cu F N	heng lific MI PdAu , 0.8 / de Prop liPdA / de Prop liPdA	ation LA u, RLF 30 mils vices: posed Au, RLI .80 mil .80 mil	for D		
Pro Construction Group 1 RI Group 2 RI	bbe Site on differe FAB/Pr FAB/Pr FAB/Pr	Lead fi Bond v Cocess r Lead fi Bond w Cocess r Lead fi Bond w	re note migrat inish wire dia migrat nish vire dia nish vire dia	Sherman- d below tion & M ameter tion & B ameter	Probe (S ILA Ass NiPd/ Cu, OM qu NiPd Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu	sembl FMX Au, nor , 0.96n alifica Currer Au, No , 0.96 alifica Currer Au, No , 0.96	y/Test n RLF nils ntion fo nt on RLF mils nt on RLF mils	qual Nif Cu, r PW F N Cu F N Cu	heng lific MI PdAu , 0.8 / de Prop liPd/ J, 0. / de Prop liPd/ J, 0.	ation LA u, RLF 30 mils vices: posed Au, RLI 80 mil evices: posed Au, RLI 80 mil	for D		
Pro Construction Group 1 RI Group 2 RI	bbe Site on differe FAB/Pr FAB/Pr FAB/Pr	Lead fi Bond v Cocess r Lead fi Bond w Cocess r Lead fi Bond w	re note migrat inish wire dia migrat nish vire dia nish vire dia	Sherman- d below tion & M ameter tion & B ameter	Probe (S ILA Ass NiPd/ Cu, OM qu OM qu OM qu OM qu OM qu OM qu OM qu OM qu	sembl FMX Au, nor , 0.96n alifica Currer Au, No , 0.96 alifica Currer Au, No , 0.96	y/Test n RLF nils nt on RLF mils nt on RLF mils nt on RLF mils	qual           Nil           Cu,           r           PW           N           Cu           r           PW           Image: Second Secon	heng heng MI PdAu , 0.8 / de Prop liPdA J, 0. / de Prop liPdA J, 0.	ation LA u, RLF 30 mils vices: posed Au, RLI 80 mil evices: posed Au, RLI 80 mil	for D		
Pro Construction Group 1 RI Group 2 RI Group 3 RI	bbe Site on differe FAB/Pr FAB/Pr FAB/Pr	Lead fin Bond w Cocess r Lead fin Bond w Cocess r Lead fin Bond w	re note migrat inish wire dia migrat nish vire dia migrat	Sherman- d below tion & M ameter tion & B ameter tion & B ameter	Probe (S ILA Ass NiPd/ Cu, Cu, Cu, Cu, Cu, Cu, Cu, Cu,	sembl FMX Au, nor , 0.96n alifica Currer Au, No , 0.96 alifica Au, No , 0.96 alifica Currer	y/Test n RLF nils ntion fo nt on RLF mils nt on RLF mils nt on RLF mils	qual           Nil           Cu,           r           PW           N           Cu           r           PW           N           Cu           r           PW           N           Cu           r           PW           F           PW           F           PW           F	heng lific MI PdAu , 0.8 / de Prop liPd/ J, 0. / de Prop liPd/ J, 0. / de Prop liPd/ J, 0. / de Prop liPd/ J, 0.8 / de Prop	ation LA u, RLF 30 mils evices: posed Au, RLI 80 mil evices: posed Au, RLI 80 mil evices: posed	for D		
Pro Construction Group 1 RI Group 2 RI	bbe Site on differe FAB/Pr FAB/Pr FAB/Pr	Lead fin Bond w Cocess r Lead fin Bond w Cocess r Lead fin Bond w Cocess r Mount	re note migrat inish wire dia migrat nish vire dia migrat nish vire dia migrat	Sherman- d below tion & M ameter tion & B ameter tion & B ameter tion & B	Probe (S ILA Ass NiPd/ Cu, OM qu NiPd Cu OM qu OM qu	sembl FMX Au, nor , 0.96n alifica Currer Au, No , 0.96 alifica Au, No , 0.96 alifica Currer Au, No , 0.96	y/Test n RLF nils ntion fo nt on RLF mils nt on RLF mils nt on RLF mils	qual Nif Cu, r PW F N Cu F PW	heng lific MI PdAu , 0.8 / de Prop liPd/ J, 0. / de Prop liPd/ J, 0. / de Prop 414	ation LA u, RLF 30 mils vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mils vices: posed Au, RLI 80 mils	for D		
Pro Construction Group 1 RI Group 2 RI	bbe Site on differe FAB/Pr FAB/Pr FAB/Pr	Lead fi Bond v OCCESS T Lead fi Bond w OCCESS T Lead fi Bond w OCCESS T COCESS T	re note migrat inish wire dia migrat nish vire dia migrat compco ompou	Sherman- d below tion & M ameter tion & B ameter tion & B ameter tion & B	Probe (S ILA Ass NiPd/ Cu, OM qu NiPd Cu Cu Cu Cu Cu Cu Cu Cu Cu Cu	sembl FMX Au, nor , 0.96n alifica Currer Au, No , 0.96 alifica Currer Au, No , 0.96 alifica Currer 404250 420619	y/Test n RLF nils ntion fo nt on RLF mils ntion fo nt 00 93	qual Nif Cu, r PW F N Cu F N Cu F PW	heng heng lific MI PdAu , 0.8 / de Prop liPd/ u, 0. / de Prop liPd/ u, 0. / de Prop liPd/ u, 0.	ation LA u, RLF 30 mils vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mil 80 mils vices: posed Au, RLI 80 mils	for D		
Pro Construction Group 1 RI Group 2 RI	bbe Site on differe FAB/Pr FAB/Pr FAB/Pr	Lead fin Bond w Cocess r Lead fin Bond w Cocess r Lead fin Bond w Cocess r Mount	re note migrat inish wire dia migrat nish vire dia migrat nish vire dia migrat compou nish	Sherman- d below tion & M ameter tion & B ameter tion & B ameter tion & B	Probe (S ILA Ass NiPd/ Cu, OM qu OM QU	sembl FMX Au, nor , 0.96n alifica Currei Au, No , 0.96 alifica Currei Au, No , 0.96 alifica Currei 404250 420619 Au, No	y/Test n RLF nils nt on RLF mils nt on RLF mils nt on RLF mils nt on RLF nt 00 93 on RLF	qual Nif Cu, r PW F N Cu r PW F N Cu r PW	heng           lific           MI           PdAu           , 0.8           / de           Prop           liPd/           J, 0.           / de           Prop           liPd/           J, 0.           / de           Prop           liPd/           J, 0.           / de           Prop           liPd/           414           421           liPd/	ation LA u, RLF 30 mils vices: posed Au, RLI 80 mil svices: posed Au, RLI svices: posed Au, RLI svices: posed s	for D		
Pro Construction Group 1 RI Group 2 RI Group 3 RI Group 4 RI	bbe Site FAB/Pr FAB/Pr FAB/Pr FAB/Pr	Lead fin Bond w Cocess r Lead fin Bond w Cocess r Lead fin Bond w Cocess r Mount Mold co Lead fin Mold co	re note migrat inish wire dia migrat nish vire dia migrat nish vire dia compou nish vire dia	Sherman- d below tion & M ameter tion & B ameter tion & B ameter tion & B	Probe (S ILA Ass NiPd/ Cu, Cu, Cu, Cu, Cu, Cu, Cu, Cu,	sembl FMX Au, nor , 0.96n alifica Currei Au, Nc , 0.96 alifica Currei Au, Nc , 0.96 alifica Currei Au, Nc , 0.96	y/Test n RLF nils nt on RLF mils nt on RLF mils nt on RLF mils nt 00 93 on RLF mils	qual Nil Cu, r PW F Cu F N Cu Cu F PW F N Cu	heng heng lific PdAu , 0.8 / de Prop liPd/ J, 0. / de Prop liPd/ J, 0. / de Prop liPd/ J, 0.	ation LA u, RLF 30 mils vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mil 80 mil	for D	) Devices:	ith
Pro Construction Group 1 RI Group 2 RI Group 3 RI Group 4 RI	bbe Site FAB/Pr FAB/Pr FAB/Pr FAB/Pr	Lead fin Bond w Cocess r Lead fin Bond w Cocess r Lead fin Bond w Cocess r Mount Mold co Lead fin Mold co	re note migrat inish wire dia migrat nish vire dia migrat nish vire dia compou nish vire dia	Sherman- d below tion & M ameter tion & B ameter tion & B ameter tion & B	Probe (S ILA Ass NiPd/ Cu, Cu, Cu, Cu, Cu, Cu, Cu, Cu,	sembl FMX Au, nor , 0.96n alifica Currei Au, Nc , 0.96 alifica Currei Au, Nc , 0.96 alifica Currei Au, Nc , 0.96	y/Test n RLF nils nt on RLF mils nt on RLF mils nt on RLF mils nt 00 93 on RLF mils	qual Nil Cu, r PW F Cu F N Cu Cu F PW F N Cu	heng heng lific PdAu , 0.8 / de Prop liPd/ J, 0. / de Prop liPd/ J, 0. / de Prop liPd/ J, 0.	ation LA u, RLF 30 mils vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mil vices: posed Au, RLI 80 mil 80 mil	for D		ith

Texas Instruments Incorporated

These changes are part of our multiyear plan to transition products from our 150-milimeter factories to newer, more efficient manufacturing processes and technologies, underscoring our commitment to product longevity and supply continuity.

Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):							
None							
Antic	Anticipated impact on Material Declaration						
	No Impact to the Material Declaration		Material Declarations or Product Content reports are driven from production data and will be available following the production release. Upon production release the revised reports can be obtained from the <u>TI ECO website</u> .				

# Changes to product identification resulting from this PCN:

# Fab Site Information:

Chip Site	Chip Site Origin Code (20L)	Chip Site Country Code (21L)	Chip Site City
SH-BIP-1	SHE	USA	Sherman
RFAB	RFB	USA	Richardson

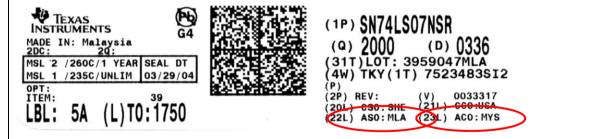
# Die Rev:

Current	New
Die Rev [2P]	Die Rev [2P]
E, G	A, B

### **Assembly Site Information:**

MLA	MLA	MYS	Kuala Lumpur
FMX	MEX	MEX	Aguascalientes
Assembly Site	Assembly Site Origin (22L)	Assembly Country Code (23L)	Assembly City

Sample product shipping label (not actual product label)



# **Product Affected:**

# Group 1 Device list (RFAB/Process migration & MLA/Test Assembly qualification for D Devices):

SN74HC21QDRQ1	SN74HC151QDRQ1	SN74HC138QDRG4Q1
SN74HC139QDRQ1	SN74HC165QDRQ1	SN74HC253QDRG4Q1

# Group 2 Device list (RFAB/Process migration & BOM qualification for PW devices)

SN74HC138QPWRQ1	SN74HC165QPWRG4Q1	SN74HC166AIPWRG4Q1
SN74HC139QPWRQ1	SN74HC165QPWRQ1	

# Group 3 Device list (RFAB/Process migration & BOM qualification for PW devices)

MSA00282PWRG4	SN74HC21QPWRG4Q1	SN74HC21QPWRQ1	
Crown ( Device list (D			
Group 4 Device list (R	FAB/Process migration	i & BOM qualification f	or PW devices)
SN74HC21QPWRQ1-NG			



TI Information Selective Disclosure

E

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

### Approved 25-Jan-2021

Attributes	QBS Product Reference: <u>SN74HCS595QDRQ1</u>	QBS Process Reference: <u>SN74HCS595QPWRQ1</u>	QBS Process Reference: <u>SN74HCS74QPWRQ1</u>	QBS Package Reference: <u>SN74HCS74QDRQ1</u>
Automotive Grade Level	Grade 1	Grade 1	Grade 1	-
Operating Temp Range	-40 to +125 C	-40 to +125 C	-40 to +125 C	-40 to +125 C
Product Function	Logic	Logic	Logic	Logic
Wafer Fab Supplier	RFAB	RFAB	RFAB	RFAB
Die Revision	A2	A2	B1	B1
Assembly Site	MLA	MLA	MLA	MLA
Package Type	SOIC	TSSOP	TSSOP	SOIC
Package Designator	D	PW	PW	D(SOIC)
Ball/Lead Count	16	16	14	14

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

Туре	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	QBS Product Reference: <u>SN74HCS595QDRQ1</u>	QBS Process Reference: <u>SN74HCS595QPWRQ1</u>	QBS Process Reference: <u>SN74HCS74QPWRQ1</u>	QBS Package Reference: <u>SN74HCS74QDRQ1</u>
			- Accel	erated En	vironment Stress Tests					
PC	A1	JEDEC J- STD-020 JESD22- A113	3	77	Preconditioning	Level 1-260C	1/77/0	3/276/0	3/828/0	3/1038/0
HAST	A2	JEDEC JESD22- A110	3	77	Biased HAST, 130C/85%RH	96 Hours	-	1/77/0	3/231/0	3/231/0
AC	A3	JEDEC JESD22- A102	3	77	Autoclave 121C	96 Hours	-	1/77/0	3/231/0	3/231/0
тс	A4	JEDEC JESD22- A104 and Appendix 3	3	77	Temperature Cycle, - 65/150C	500 Cycles	1/77/0	1/77/0	3/231/0	3/231/0
PTC	A5	JEDEC JESD22- A105	1	45	Power Temperature Cycle	1000 Cycles	-	-	-	-
HTSL	A6	JEDEC JESD22- A103	1	45	High Temp Storage Bake 150C	1000 Hours	-	1/45/0	3/135/0	3/135/0
			– Accel	erated Lif	etime Simulation Tests					
HTOL	B1	JEDEC JESD22- A108	3	77	Life Test, 150C	300 Hours	-	1/77/0	3/231/0	1/77/0
ELFR	B2	AEC Q100- 008	3	800	Early Life Failure Rate, 125C NVM Endurance,	48 Hours	-	-	3/2400/0	-
EDR	В3	AEC Q100- 005	3	77	Data Retention, and Operational Life	-	-	-	-	-
1	1		C – Pac	kage Ass	embly Integrity Tests					
WBS	C1	AEC Q100- 001	1	30	Wire Bond Shear (Cpk>1.67)	Wires	1/30/0	1/30/0	3/90/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull (Cpk>1.67)	Wires	1/30/0	1/30/0	3/90/0	3/90/0
SD	СЗ	JEDEC JESD22- B102	1	15	Pb Free Surface Mount Solderability	Pb Free/Solder-	1/15/0	-	3/45/0	3/45/0
Туре	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	QBS Product Reference: <u>SN74HC S595QDRQ1</u>	QBS Process Reference: <u>SN74HCS595QPWRQ1</u>	QBS Process Reference: <u>SN74HCS74QPWRQ1</u>	QBS Package Reference: <u>SN74HCS74QDRQ1</u>
PD	C4	JESD22- B100 and B108	3	10	Physical Dimensions	Cpk>1.67	1/30/0	3/90/0	3/90/0	3/90/0
	_	Test Group	D – Die	e Fabricat	ion Reliability Tests					
EM	D1	JESD61	-	-	Electromigration	-	-	-	-	-
TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	-	-	-	-
HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	-	-	-	-
NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	-	-	-	-
SM	D5	-	-	-	Stress Migration	-	-	-	-	-
			up E – I	Electrical	Verification Tests					
НВМ	E2	AEC Q100- 002	1	3	ESD - HBM	7000V	-	-	1/3/0	-
НВМ	E2	AEC Q100- 002	1	3	ESD - HBM	8000V	-	-	-	1/3/0
НВМ	E2	AEC Q100- 002	1	3	ESD - HBM	9000V	1/3/0	1/3/0	-	-
CDM	E3	AEC Q100- 011	1	3	ESD - CDM	1500V	-	-	1/3/0	-
CDM	E3	AEC Q100- 011	1	3	ESD - CDM	2000V	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	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold test	3/90/0	3/90/0	3/90/0	3/90/0

### **Qualification Results** Data Displayed as: Number of lots / Total sample size / Total failed

	Туре:	ED	CDM	HBM	LU						
Test Group E – Electrical Verification Tests											
	Test Name / Condition:	Electrical Distributions	ESD - CDM	ESD - HBM	Latch-up						
	#	E5	E3	E2	E4						
	Test Spec	AEC Q100-009	AEC Q100-011	AEC Q100-002	AEC Q100-004						
	Min Lot Qty	3	1	1	1						
	SS/Lot	30	3	3	6						
	Duration:	Cpk>1.67 Room, hot, and cold test	1000V	2000V	(Per AEC Q100-004)						
Qual Device:	SN74HC139QDRQ1	1/30/0	1/3/0	1/3/0	1/6/0						
Qual Device:	SN74HC138QDRG4Q1	1/30/0	1/3/0	1/3/0	1/6/0						
Qual Device:	SN74HC165QDRQ1	1/30/0	1/3/0	1/3/0	1/6/0						
Qual Device:	SN74HC151QDRQ1	1/30/0	1/3/0	1/3/0	1/6/0						
Qual Device:	SN74HC253QDRG4Q1	3/30/0	1/3/0	1/3/0	1/6/0						
Qual Device:	SN74HC21QDRQ1	1/30/0	1/3/0	1/3/0	1/6/0						

A1 (PC): Preconditioning: Performed for THB, Biased HAST, AC, uHAST, TC & PTC samples, as applicable.

 $\begin{array}{l} \mbox{Ambient Operating Temperature by Automotive Grade Level:} \\ \mbox{Grade 0 (or E): } -40^\circ C \ to +150^\circ C \\ \mbox{Grade 1 (or Q): } -40^\circ C \ to +125^\circ C \\ \mbox{Grade 2 (or T): } -40^\circ C \ to +105^\circ C \\ \mbox{Grade 3 (or I): } -40^\circ C \ to +85^\circ C \\ \end{array}$ 

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

# Group 2, 3, 4 (PW Devices) Qual Memo:



TI Information Selective Disclosure

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

### Approved 21-Jan-2021

### **Product Attributes**

Attributes	Qual Device: <u>SN74HCS595QPWRQ1</u>	QBS Product Reference: <u>SN74HCS74QPWRQ1</u>	
Automotive Grade Level	Grade 1	Grade 1	
Operating Temp Range	-40 to +125 C	-40 to +125 C	
Product Function	Logic	Logic	
Wafer Fab Supplier	RFAB	RFAB	
Die Revision	A2	B1	
Assembly Site	MLA	MLA	
Package Type	TSSOP	TSSOP	
Package Designator	PW	PW	
Ball/Lead Count	16	14	

- QBS: Qual By Similarity

- Qual Device SN74HCxxxQPWRQ1 are qualified at LEVEL1-260CG

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

Туре	#	Test Spec	Min Lot Qty	SS/Lot	Test Name / Condition	Duration	QBS Product Reference: <u>SN74HC S595QPWRQ1</u>	QBS Product Reference: <u>SN74HC S74QPWRQ1</u>
_		Test Group A	- Acceler	ated Environn	nent Stress Tests			
PC	A1	JEDEC J-STD- 020 JESD22- A113	3	77	Preconditioning	Level 1-260C	3/276/0	3/828/0
HAST	A2	JEDEC JESD22-A110	3	77	Biased HAST, 130C/85%RH	96 Hours	1/77/0	3/231/0
AC	A3	JEDEC JESD22-A102	3	77	Autoclave 121C	96 Hours	1/77/0	3/231/0
TC	A4	JEDEC JESD22-A104 and Appendix 3	3	77	Temperature Cycle, - 65/150C	500 Cycles	1/77/0	3/231/0
PTC	A5	JEDEC JESD22-A105	1	45	Power Temperature Cycle	1000 Cycles	-	-
HTSL	A6	JEDEC JESD22-A103	1	45	High Temp Storage Bake 150C	1000 Hours	1/45/0	3/135/0
			<ul> <li>Acceler</li> </ul>	ated Lifetime	Simulation Tests			
HTOL	B1	JEDEC JESD22-A108	3	77	Life Test, 150C	300 Hours	1/77/0	3/231/0
ELFR	B2	AEC Q100-008	3	800	Early Life Failure Rate, 125C	48 Hours	-	3/2400/0
EDR	B3	AEC Q100-005	3	77	NVM Endurance, Data Retention, and Operational Life	-	-	-
		Test Group	C – Packa	ige Assembly	Integrity Tests			
WBS	C1	AEC Q100-001	1	30	Wire Bond Shear (Cpk>1.67)	Wires	1/30/0	3/90/0
WBP	C2	MIL-STD883 Method 2011	1	30	Wire Bond Pull (Cpk>1.67)	Wires	1/30/0	3/90/0
SD	C3	JEDEC JESD22-B102	1	15	Surface Mount Solderability >95% Lead Coverage	-	-	3/45/0
PD	C4	JEDEC JESD22-B100 and B108	3	10	Physical Dimensions	Cpk>1.67	3/90/0	3/90/0
		Test Group	D – Die I	abrication Re	eliability Tests			
EM	D1	JESD61	-	-	Electromigration	-	-	-
TDDB	D2	JESD35	-	-	Time Dependant Dielectric Breakdown	-	-	-
Туре	#	Test Spec	Min Lot	SS/Lot	Test Name / Condition	Duration	QBS Product Reference: <u>SN74HC S595QPWRQ1</u>	QBS Product Reference: <u>SN74HC S74QPWRQ1</u>

Туре	#	Test Spec	Lot Qty	SS/Lot	Test Name / Condition	Duration	QBS Product Reference: <u>SN74HC S595QPWRQ1</u>	QBS Product Reference: <u>SN74HC S74QPWRQ1</u>
HCI	D3	JESD60 & 28	-	-	Hot Injection Carrier	-	-	-
NBTI	D4	-	-	-	Negative Bias Temperature Instability	-	-	-
SM	D5	-	-	-	Stress Migration	-	-	-
		Test Gro	oup E – El	ectrical Verific	ation Tests			
HBM	E2	AEC Q100-002	1	3	ESD - HBM	9000V	1/3/0	-
HBM	E2	AEC Q100-002	1	3	ESD - HBM	7000V	-	1/3/0
CDM	E3	AEC Q100-011	1	3	ESD - CDM	2000V	1/3/0	-
CDM	E3	AEC Q100-011	1	3	ESD - CDM	1500V	-	1/3/0
LU	E4	AEC Q100-004	1	6	Latch-up	(Per AEC- Q100-004)	1/6/0	1/6/0
ED	E5	AEC Q100-009	3	30	Electrical Distributions	Cpk>1.67 Room, hot, and cold test	3/90/0	3/90/0

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

	Туре:	ED	CDM	HBM	LU	
		Test Group E – Electrical Ve	erification Tests			
	Test Name / Condition:	Electrical Distributions	ESD - CDM	ESD - HBM	Latch-up	
	#	E5	E3	E2	E4	
	Test Spec	AEC Q100-009	AEC Q100-011	AEC Q100-002	AEC Q100-004	
	Min Lot Qty	3	1	1	1	
	SS/Lot	30	3	3	6	
	Duration:	Cpk>1.67 Room, hot, and cold test	1000V	2000V	(Per AEC Q100-004)	
Qual Device:	SN74HC138QPWRQ1	2/30/0	1/3/0	1/3/0	1/6/0	
Qual Device:	<u>SN74HC166AIPWRG4Q1</u>	1/30/0	1/3/0	1/3/0	1/6/0	
Qual Device:	SN74HC139QPWRQ1	1/30/0	1/3/0	1/3/0	1/6/0	
Qual Device:	SN74HC165QPWRG4Q1	2/30/0	1/3/0	1/3/0	1/6/0	
Qual Device:	SN74HC165QPWRQ1	2/30/0	1/3/0	1/3/0	1/6/0	
Qual Device:	MSA00282PWRG4	1/30/0	1/3/0	1/3/0	1/6/0	
Qual Device:	SN74HC21QPWRG4Q1	2/30/0	1/3/0	1/3/0	1/6/0	
Qual Device:	SN74HC21QPWRQ1	2/30/0	1/3/0	1/3/0	1/6/0	
Qual Device:	<u>SN74HC21QPWRQ1-NG</u>	2/30/0	1/3/0	1/3/0	1/6/0	

### A1 (PC): Preconditioning:

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

Ambient Operating Temperature by Automotive Grade Level: Grade 0 (or E): -40°C to +150°C Grade 1 (or Q): -40°C lo +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

For questions regarding this notice, e-mails can be sent to the 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
WW PCN Team	PCN ww admin team@list.ti.com

### **IMPORTANT NOTICE AND DISCLAIMER**

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, or other requirements. These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI

intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you will fully indemnify TI and its representatives against, any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to TI's Terms of Sale (<u>www.ti.com/legal/termsofsale.html</u>) or other applicable terms available either on ti.com or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products.