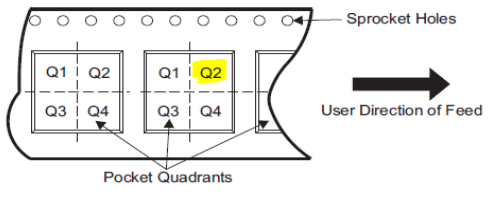
Process Certification Questionnaire for SMT Component				
Manufacturer information			*Manufacturer name :*	*Texas Instruments*
			Contact phone and mail :	*support@ti.com*
			Part Number :	*AMC7932FPHPR*
Materials of Lead / termination / solder ball	Non BGA/CCGA components	Surface plating/ coating material	Composition	*NiPdAu*
			Thickness(μm)	Au 0.003um~0.015um Pd 0.01um ~ 0.15um, Ni 0.5um ~ 2.0um
			Plating/coating process（optional）	
		The second layer	*NA*	
			Composition	
			Thickness(μm)	
		The third layer	*NA*	
			Composition	
			Thickness(μm)	
		Basic metal		*Cu*
	SMD/SMC	weight（g）		*0.2441875*
		Package body color(optional)		
		The valid pick area on top of the components(length*width/mm)(optional)		
		Flatness of the pick area（must for RF component、Gas-discharge tube)		
		Lead/leadless/solder ball co-planarity (for multiple leads or solder balls/mm)		*0.08mm*
		Mark point (Must for Polarity device)	Is there any Mark point in the top side of component?	*Yes*
			Is the mark point sole? (if not, pls. give the relationship between mark and terminals)	*Yes*
			Is there any specific location number of terminals in the component specification?	
		The pads diameter A in the component side (must for ≥4GB DDR, see Figure 3)		
		Does this component need to adding heat sinks?		*No*
		Pressure-bearing strength on the component /psi（(If the component need to add heat sinks, pressure-bearing strength shall be provided when the component is bare die/WLCSP BGA)		
		Does this component have any special requirement when adding heat sinks?		
		(Internal die size when the comoponent is BGA/leadless(length*width*thickness)		
		Warpage Test Requirement(must for BGA/LGA/SMT connector)		
		The warpage test report that describes the warpage of BGA（including BGA connector）and LGA with length or width larger than 7mm during reflow must be offered		
		For Al SMD Capacitor,the leads and the plastic base must meet the requirements as showed in right columns where the dark blue means the plastic base and the silver one means the leads: size A ≤ 0.05mm, size B ≤ 0.3mm and size C is 0.1mm.		
		Device_Structure _Geometry_Model(Optional,need to include the structure size of each part. IC component including ≥4GB DDR, PBGA with length greater than 35 mm, CBGA with side length greater than 23 mm, plastic QFN with side length more than 6 mm, plastic LGA with side length greater than 15 mm, ceramic LGA with length greater than 5 mm advised to supply）		
	material	Please add a report of specialty parameters of body material (molding, die, substrate, lead, etc) including Plastic Module, CTE, Heat condictivity(must for IC component including ≥4GB DDR, PBGA with length greater than 35 mm, CBGA with side length greater than 23 mm, plastic QFN with side length more than 6 mm, plastic LGA with side length greater than 15 mm, ceramic LGA with length greater than 5 mm）		
RoHS compliant	Are matters RoHS compliant listed below? (please refer to "sheet4RoHS Compliant" in this file)			*Yes*
Storage, packaging, MSL and ESD	Storage	Relative humidity (%)		*20%≤RH≤70%*
				Other（please specify）:
		Temperature (℃)		
				Other（please specify）: –65°C to +150°C
		Maximum storage time for the component (month)		
				Other（please specify）: 60 months
		Storage time for the packing satify the component maximum storage time（MSL≥2）		*Yes*
	Packaging	packaging standard		*JEDEC*
				Other（please specify）:
		Packaging type		*Tape*
				Other（please specify）:
		Position of component pin 1 in packing.		*position Q2*
		Pitch on Tape L/mm（see Figure 5, must for tape)		*12*
		Packaging height H(see right figure 5)		*1.5*
		Packaging width W （see right figure 5）		*16*
		Packaging satisfy ASTM F1249 standards(must for MSL≥2)		
		Vacuum and moisture-proof packing (must for components with immersion tin coated leads)		
		vacuum degree of the packing		
				Other（please specify）:
		Anti-sulfur packaging (must for components with Ag plating)		
		Ag_Logo added on the smallest packing(see Figure 6, must for silver plated components)		
		Immersion Tin_Logo added on the smallest packing(see figure 7, must for immersion Tin		
	MSD	MSL		*Level-3-260C-168HR*
		Baking Standards（must for component with MSL≥2)		*J-STD-033*
		MLS added on the smallest packing（must for component with MSL≥2, see Figure 8)		
		Humidity indicator and drying agent separate in packing		*Yes*
		Humidity indicator and drying agent added in the smallest packing, and the humidity indicator must include RH5%, 10%, 60%. The color change from blue to pink （must for component with MSL≥2, see Figure 9)		*Yes*
Assembly process	Soldering method			*Reflow*
				Other（please specify）:
	Profile recommended (the actual testing temperature at solder joints)(optional)			*Should defer to solder paste company's recommended profile*
	Manual soldering parameters recommended(optional)	Manual soldering temperature and time(optional)		*Best practice for hand soldering is to ensure that the soldering iron is in contact with the component at the minimum time as possible to limit the risk for the PCB pad to lift. TI testing was performed with 5 seconds max time at 400C with no obvious anomalies observed.*
	Repair method and parameters recommended(optional)	Repair method(optional)		
				其它other（please specify）: TI does not have data on rework of its parts at specified temperatures. However, TI does not expect any problems with processing of parts through normal rework operations.
		Repair temperature and time(optional)		
	Heat Resistance	Maximum Reflow Soldering times		*3times*
		Can heat resistance of SMT components meet JSTD020D. (should focus on the classification of		*Yes*
		Pick-and-place pressure of SMD device（must for bare chip and ceramic capacitor)		
				Other（please specify）:
Test report	Tin whisker test for lead-free components	The test shall be done when the lead pitch is ≤0.5mm with the surface plating of Sn(matte) or SnCu.Tin whisker shall be tested per JESD22- A 121.01, and the result must meet the demand of Class 2 in JESD201A (please refer to sheet3JESD201A).		
	Solderability test			*Yes*
	Resistance to dissolution of metallization report(for lead components)			
	Board level reliability test report（IC component including ≥4GB DDR, PBGA with length greater than 35 mm, CBGA with side length greater than 23 mm, plastic QFN with side length more than 6 mm, plastic LGA with side length greater than 15 mm, ceramic LGA with length greater than 5 mm advised to supply）			

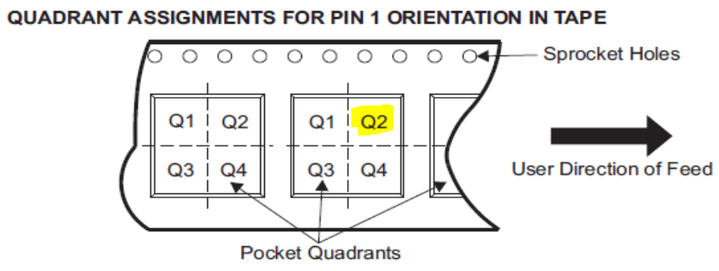
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



Basic Packaging Information

													Material Information					Inner Packaging Information					Outer Packaging Information				
Item	Description	Unit	Supplier Name	Manufacturer	Part No.	Weight of single device	Packaging type	Width of tape (mm)	Feeder hold type	Feeder step (mm)	Packaging direction	Qty	Gross Weight (kg)	Length (mm)	Width (mm)	Material	Qty	Gross Weight (kg)	Length (mm)	Width (mm)	Height	Material
1	32-Channel, 12-Bit Analog Monitor and Controller With Multichannel ADC, Bipolar DACs, Temperature Sensor and GPIO Ports	PCS	C-PAK	TEXAS INSTRUMENTS	AMC7932FPHPR	0.2441875	Tape	16	Single	12	Refer to figure 1 (quadrant Q2)	1	N/A	330	16.4	Reel	1	N/A	350	350	43	Tape and Reel Box

Figure 1



Device Process Qualification Information

Question	Answer
Is the product co-developed with Customer?	No
Is there wafer probe test for the product?	Yes
Is the product manufacturing in a new wafer fab which is runing more than 1 year?	No
Is there any material which is first using in your company such as substrate, bump, soder ball etc.?	No
Please provide the process flow chart and mark special process in red.	No special process
Do you use epoxy for electrical contact in the product? If yes, pls provide the quality control method.	Yes, aligned criteria with Customer
How many kinds of epoxy are used in the product? If more than one ,pls provide the quality control method	One
Do you have copper wire cycle/exposure time control between WB and molding if copper wire is used?	Yes
What's the product's test coverage?	Production processing does not necessarily include testing of all parameters. It is TI's policy to fully characterize products in an initial qualification, to perform 100% electrical test on key parameters, and to guarantee other parameters by design.
Does Final Testing implement the +/-3sigma statistical bin limits for "good bin","leakage bin" and "Open/Short bin" ?	Yes
Do you have OCAP（Out of control action plan) ,PFMEA, DFMEA for the whole process?	Yes
Does the Reliability engineer involved in MRB meeting?	Yes
Will you still ship the material to Customer if you do not find the root cause of maverick lot,?	No
Will you inform Customer before you ship MRB lot to Customer?	Yes
Is key wafer process parameter's Cpk higher than 1.33?	Yes
Is key assembly process parameter's Cpk higher than 1.67?	Yes

IC Reliability Qualification Information

Category	Requirement Items		Vendor 's Feedback
General Information	Supplier Name		Texas Instruments
	Device Part Number		AMC7932FPHPR
Wafer related Information	Wafer fab information, process type and node		CMOS 180nm
	Die Size (Length*Width*Height)		4415 X 4345 UM
	Complexity (transistor or gate number): To get failure rate per SR332		Proprietary
	Number of year/months since this wafer process was qualified and released to production.		> 10 yrs
	How many of your products have been applied with this wafer process?		Proprietary
	Is there any part from the same wafer process family have been used in Customer? If yes, please list the part number.		See TI's general quality guidelines Section 10 PROCESS MONITORING / PRODUCT ASSURANCE (http://www.ti.com/lit/ml/szzq076j/szzq076j.pdf)
	Wafer Process Capability(SPC)		Cpk data is not maintained or shared for this grade of product. See TI's general quality guidelines Section 10 PROCESS MONITORING / PRODUCT ASSURANCE (http://www.ti.com/lit/ml/szzq076j/szzq076j.pdf)
	Is there any wafer process CPK<1.33? If yes, please list it and provide the improvement plan.		No
	Chip ID:Do you have chip ID or die ID for this device?		AMC7932
Assembly related Information	Assembly Factory, Package type		TI TAIWAN A/T (142,SEC.1,HSIN NAN RD.CHUNG HO Taipei, TPE 235). PKG=TQFP
	Package Size (Length*Width*Height)		7x7x1 mm
	Ball/Lead pitch		0.5 mm
	Is there any part from the same package family have been used in Customer? If yes, please list the part number.		Info not available
	Wafer cutting method		Requested data is not maintained or shared for this grade of product.
	Wire Bonding	Wire composition	Cu
		Wire diameter	0.96 mil
	Substrate Information	Substrate vendor	N/A
		Substrate technology	N/A
		Substrate metal layers	N/A
	Flip Chip Bumping, for BGA package (Only for Flipchip	Bumping vendor	N/A
		Bumping Technology	N/A
		Bump material composition	N/A
		Bump diameter,Bump pitch	N/A
		The Specification/criteria of bump void	N/A
		Bump Electromigration test result, required for SnPb bump only	N/A
	Flip Chip Underfill,	Underfill Part Number, The glass transition temperature of Underfill	N/A
		The Specification/criteria of underfill void	N/A
	Assembly Process Capability(SPC)		See TI's general quality guidelines Section 10 PROCESS MONITORING / PRODUCT ASSURANCE (http://www.ti.com/lit/ml/szzq076j/szzq076j.pdf)
	Is there any assembly process CPK<1.33? If yes, please list it and provide the improvement plan.		Cpk data is not maintained or shared for this grade of product. See TI's general quality guidelines Section 10 PROCESS MONITORING / PRODUCT ASSURANCE (http://www.ti.com/lit/ml/szzq076j/szzq076j.pdf)
	Please feedback the Die crack prevention Process Checklist_V2.2		N/A for this package technology
General Specification	Operating Lifetime at max Tj		>10 Years
	Nonvolatile memory erase times		N/A
	Range of Operation Temperature （Ta, Tj or Tc）		Tj: -40 to 150°C
	Storage Temperature range		-65 to 150°C
	Storage limit		60 months
	Max.Junctioin Temperature		150C
	Max. Power Dissipation		See datasheet
	EFR, Early Failure Rate, FIT		N/A
	IFR, Intrinsic Failure Rate, FIT		0.2 FIT / 0.7eV, 60% CL, Tj:55 degreeC
	The number of power cycle which component can endure		N/A
	MSL, Moisture Sensitive Level		Level-3-260C-168HR
	Theta ja, j	Θja	22.1℃/W
		Θjc	12.7℃/W
		Θjb	6.6℃/W
	ESD (HBM	HBM	1000 V
		CDM	500 V
	Latch-Up (At max. Ambient Temperature)		See Qual Report
Soft Error related			N/A
	Soft Error	with ECC	N/A
		without ECC	N/A
	Does ultra-low-alpha (<0.002 cph/cm2) material have been used? If No, pls list the emission material and its emmission rate(counts per		N/A
Testing related	Test Factory		TI TAIWAN A/T (142,SEC.1,HSIN NAN RD.CHUNG HO Taipei, TPE 235)
	ATE fault coverage rate(For Stuck at, Transition fault, Path-delay fault respectively)		TI Proprietary
			TI Proprietary
			TI Proprietary
			TI Proprietary
			N/A
	leakage test limits		TI Proprietary
Mechanical stress related	Transient compressive load limit: To measure of BGA crushing potential or die crack potential;		N/A
	static compressive load force limit: To measure of BGA crushing potential or die crack potential;		N/A
	Short-term Bending Srain（ue）		N/A
	Long-term Bending Srain（ue）		N/A
	Three dot bend		N/A
	lid torque limit		N/A
	lid pull limit		N/A
	TIM adhesive strength		N/A
Reliability Qualification	If the chip is new process or new design, And some Lifetime limit test(Test to fail or beyond JEDEC standard) had been down. Please sp		See Qual Report
	Wafer reliability Qualification Report, including: TDDB, HCI, NBTI, PBTI, EM, SM .etc		Requested data is not maintained or shared for this grade of product.
	Package Qualification Report, including: PC, THB, HAST, UHAST, HTSL, TC, BLTC, DT, Bend, PDT, PVT .etc		See Qual Report
			See Qual Report
			See Qual Report
			See Qual Report
			See Qual Report
			See Qual Report
			N/A
			N/A
			N/A
			N/A
	Device Qualification Report, including: ELFR, HTOL, LTOL, ASER, SSER, ESD-HBM, ESD-CDM, LU .etc		http://www.ti.com/quality/docs/estimator.tsp
			See Qual Report
			N/A
			N/A
			N/A
			See Qual Report
			See Qual Report
			See Qual Report
	The device should be done reliability monitoring. Please provide the latest Reliability Monitoring Report, including: PC, THB, HAST, UHA		See Qual Report
	Soft Error Qualification Report		N/A
	Characterization report, follow JESD86		N/A
The suggestion and requirement	The suggestion and requirement to customer(From Quality and Reliability Point of view): Please specify the suggestions and requiremen		N/A

Material Content Information

Texas Instruments Inc. **Data As of:** Jul 4, 2018 12:00:00 AM

Search Results for: AMC7932FPHPR

Current Production Information

TI Part Number:	AMC7932FPHPR	**Assembly Site:**	PHI
Lead/Ball Finish:	NiPdAu	**Package Type / Pins:**	PHP|48
Planned Lead/Ball Finish:	NiPdAu	**Package Body Size (WxLxH) mm:**	7 x 7 x 1
MSL / Reflow Ratings:	NA	**Total Device Mass (mg):**	244.1875

Environmental Ratings Information

RoHS & High-Temp Compliant:	Y	**Green Compliant:**	Y

Component Information

Component	Substance	CAS Number	Amount (mg)	Homogeneous Material Level		Component Level	
				Percentage %	ppm	Percentage %	ppm
Bond Wire							
Copper and Its Alloys	Copper	7440-50-8	0.291944	99.9972	999972	0.1196	1196
Copper and Its Alloys	Iron	7439-89-6	0.000001	0.0005	5	0	0
Nickel and Its Alloys	Nickel	7440-02-0	0.000001	0.0002	2	0	0
Other Inorganic Materials	Sulfur	7704-34-9	0	0.0006	6	0	0
Other Nonferrous Metals and Alloys	Manganese	7439-96-5	0.000001	0.0003	3	0	0
Precious Metals	Silver	7440-22-4	0.000004	0.0012	12	0	0
Sub-Total			**0.291952**	**100**	**1000000**	**0.1196**	**1196**
Die Attach Adhesive							
Precious Metals	Silver	7440-22-4	3.668782	85	850000	1.5024	15024
Thermoplastics	Epoxy	85954-11-6	0.647432	15	150000	0.2651	2651
Sub-Total			**4.316214**	**100**	**1000000**	**1.7676**	**17676**
Lead Frame							
Copper and Its Alloys	Copper	7440-50-8	156.413544	97.05	970500	64.0547	640547
Copper and Its Alloys	Iron	7439-89-6	4.190368	2.6	26000	1.716	17160
Copper and Its Alloys	Phosphorus	7723-14-0	0.241752	0.15	1500	0.099	990
Zinc and Its Alloys	Zinc	7440-66-6	0.322336	0.2	2000	0.132	1320
Sub-Total			**161.168**	**100**	**1000000**	**66.0018**	**660018**
Lead Frame Plating							
Nickel and Its Alloys	Nickel	7440-02-0	0.532672	95.12	951200	0.2181	2181
Precious Metals	Gold	7440-57-5	0.004368	0.78	7800	0.0018	18
Precious Metals	Palladium	7440-05-3	0.02296	4.1	41000	0.0094	94
Sub-Total			**0.56**	**100**	**1000000**	**0.2293**	**2293**
Mold Compound							
Other Inorganic Materials	Fused Silica	60676-86-0	58.023484	88	880000	23.7619	237619
Other Plastics and Rubber	Carbon Black	1333-86-4	0.263743	0.4	4000	0.108	1080
Thermoplastics	Epoxy	85954-11-6	7.64855	11.6	116000	3.1322	31322
Sub-Total			**65.935777**	**100**	**1000000**	**27.0021**	**270021**
Semiconductor Device							
Ceramics / Glass	Silicon	7440-21-3	11.91552	100	1000000	4.8797	48797
Sub-Total			**11.91552**	**100**	**1000000**	**4.8797**	**48797**
Total			**244.1875**			**100**	**1000000**

Important Part Information

There is a remote possibility the Customer Part Number (CPN) your company uses could reference more than one TI part number. This is due to two or more users (EMSIs or subcontractors) using the same CPN for

Product Content Methodology

For an explanation of the methods used to determine material weights, See Product Content Methodology.

Material Declaration Certificate for Semiconductor Products

provided by its suppliers and their combination into finished IC packaged products. TI semiconductor products designated to be Pb-free, Green or RoHS Exempt

JIG Level-A Banned Substances	Threshold, Homogeneous Level (1)
Asbestos	Not intentionally added
Azo colorants	Not intentionally added
RoHS - Cadmium/Cadmium Compounds	75 ppm, Not intentionally added (RoHS threshold = 100ppm)
Chromium/Hex.Chromium.Compounds	1000 ppm, Not intentionally added
RoHS - Lead/Lead Compounds	1000 ppm, Not intentionally added
RoHS - Mercury/Mercury Compounds	1000 ppm, Not intentionally added
Ozone Depleting Substances	Class I : Not intentionally added Class II : 1000ppm
RoHS - Polybrominated Biphenyls (PBBs)	1000 ppm, Not intentionally added
RoHS - Polybrominated Diphenyl Ethers (PBDEs)	1000 ppm, Not intentionally added
Polychlorinated Biphenyls (PCBs)	Not intentionally added
Polychlorinated Naphthalenes (>3 Chlorine atoms)	Not intentionally added
Radioactive Substances	Not intentionally added
Shortchain Chlorinated Paraffins	Not intentionally added
Tributyl Tin (TBT) and Triphenyl Tin (TPT)	Not intentionally added
Tributyl Tin Oxide (TBTO)	Not intentionally added

(1) Threshold does not apply to applications covered by a RoHS substance exemption.

representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI materials are available at www.ti.com/ecoinfo.

Signature: (click here for signed certificate)

Name/Title: Robert Furtaw, Vice President, Worldwide Quality

Date: Dec 20, 2016

Common TI Product Stewardship Position Statements

Topic	Download Document
REACH	REACH
RoHS	RoHS Material Declaration Certificate
Lead-free Conversion overview	Materials Content Search Tool
Lead-free (Pb-free) Logo	RoHS Exemption Renewal Process & Exemptions Used by TI
Green Conversion and Low Halogen	Low Halogen
EVM Position Statement	EVM Statement
Cobalt Dichloride	Cobalt Dichloride
Decabromodiphenyl ether (DecaBDE)	DecaBDE
Dimethyl Fumarate (DMF):	DMF
EU ELV	N/A
Ozone Depleting Substances (ODS):	ODS
Perfluorooctane sulfonates (PFOS):	PFOS
HBCDD & Phthalates	HBCDD & Phthalates Statement
Red Phosphorous	Red Phosphorous
Silicone	Silicone Statement

including the requirement that lead not exceed 0.1% by weight in homogeneous materials unless exempt. Where designed to be soldered at high temperatures, TI

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with RoHS pursuant to an exemption.

by weight in homogeneous mold compound material). To satisfy customer requests, efforts through early 2Q09 are being made to verify that all non-metal