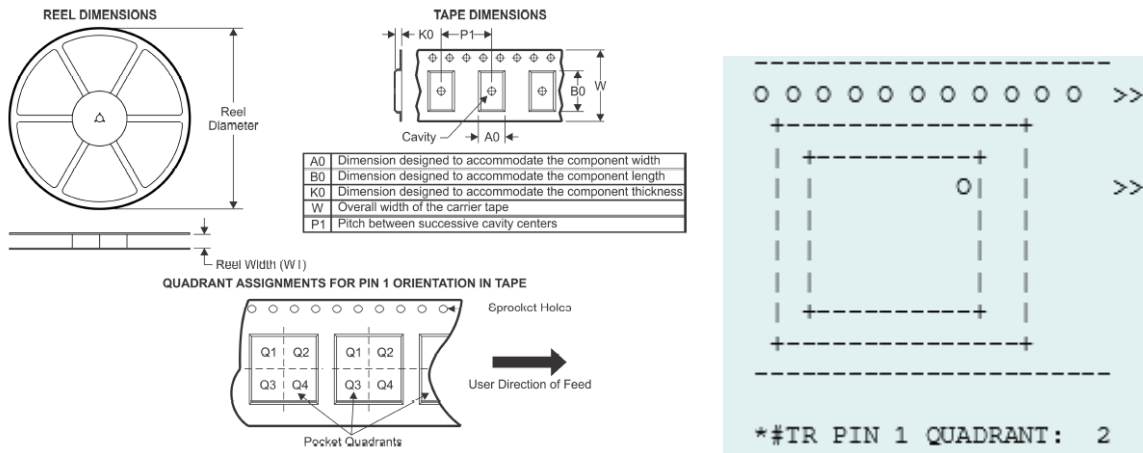


Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
LP5009RUKR	WQFN	RUK	20	3000	330.0	12.4	3.3	3.3	1.1	8.0	12.0	Q2

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
LP5009RUKR	WQFN	RUK	20	3000	367.0	367.0	35.0

TAPE AND REEL INFORMATION



Marking picture	vendor Name	Part No.	Marking Rule
LP5009	TI	LP5009RUKR	the marking " LP5009" represents the device name, by identifying units marking LP5009 correctly to determine device

Component	Homogeneous Material Name.	Substance	CAS Number	Amount (mg)	Percentage %
Bond Wire	Copper and Its Alloys	Copper	7440-50-8	0.081908	99.99878
	Precious Metals	Silver	7440-22-4	0.000001	0.001221
Die Attach Adhesive	Precious Metals	Silver	7440-22-4	0.206	80
	Thermoplastics	Epoxy	85954-11-6	0.0515	20
Lead Frame	Copper and Its Alloys	Copper	7440-50-8	15.6032	97.52
	Copper and Its Alloys	Iron	7439-89-6	0.368	2.3
	Copper and Its Alloys	Phosphorus	7723-14-0	0.0048	0.03
	Zinc and Its Alloys	Zinc	7440-66-6	0.024	0.15
Lead Frame Plating	Nickel and Its Alloys	Nickel	7440-02-0	0.4756	95.12
	Precious Metals	Gold	7440-57-5	0.0039	0.78
	Precious Metals	Palladium	7440-05-3	0.0205	4.1
Mold Compound	Other Inorganic Materials	Fused Silica	60676-86-0	8.12064	88
	Other Organic Materials	Chlorine	7782-50-5	0.000092	0.000997
	Other Plastics and Rubber	Carbon Black	1333-86-4	0.027684	0.3
	Thermoplastics	Epoxy	85954-11-6	1.079584	11.699
Semiconductor Device	Ceramics / Glass	Doped Silicon	7440-21-3	0.569732	100

Basic Information	Result
Device Part Number	LP5009RUKR
Wafer fab information, process type and node	TI RFAB LBC9
Wafer process was qualified and released to production or not.	Mature
Products have been applied with this wafer process?	Yes
Is there any part from the same wafer process family have been used in customer?	YES
Wafer Process Capability(SPC)	Meet SPC Spec
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?	NO
Assembly Factory, Package type	TI CDAT QFN
Package Size (Length*Width*Height)	3x3x0.8mm

Ball/Lead pitch		0.4MM
Is there any part from the same package family have been used in customer? If yes, please list the part number.		YES
Wire Bonding (Only for Wire Bonding Package)	Wire composition	Cu
	Wire diameter	0.96mil
Assembly Process Capability(SPC)		Meet spc spec
Is there any assembly process CPK<1.33? If yes, please list it and provide the improvement plan.		NO
Range of Operation Temperature (Ta, Tj or Tc)		Ta: -40C~85C
Storage Temperature range		-65 ~ 150C
Storage limit		1years at customer side
Max.Junctioin Temperature		125C
IFR, Intrinsic Failure Rate, FIT		0.4FIT@60%CL
MSL, Moisture Sensitive Level		MSL 2
Theta ja, jc and jb	Θja	53.7°C/W
	Θjc	55.3 °C/W
	Θjb	27.4°C/W
ESD (HBM、 CDM, for all pin)	HBM	4000
	CDM	1500
Latch-Up (At max. Ambient Temperature)		Meet qual test requirement
Test Factory		TI CDAT
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 specify the test condition and result details.		NO
Wafer reliability Qualification Report, including: TDDb, HCI, NBTI, PBTI, EM, SM .etc		YES
Package Qualification Report, including: PC, THB, HAST, UHAST, HTSL, TC, BLTC, DT, Bend, PDT, PVT .etc		See TI.com qual report
Device Qualification Report, including: ELFR, HTOL, LTOL, ASER, SSER, ESD-HBM, ESD-CDM, LU .etc		See TI.com qual report
The device should be done reliability monitoring. Please provide the latest Reliability Monitoring Report, including: PC, THB, HAST, UHAST, TC, HTSL, HTOL .etc		ORT test based on package
Characterization report, follow JESD86		Refer to datasheet

Check Items for LP5009RUKR		Result
Surface plating/ coating material	Composition	NIPDAU
	Thickness(μm)	Confidential
Basic metal		Cu
Package standard		JEDEC
Weight of component (g)		0.0266
Weight/ available P&P area \leq 0.06g/mm ²		Yes
coplanarity	coplanarity during reflow process	refer to datasheet
Pin1 Mark point	Is there any pin1 Mark point in the top side of component?	Yes
	Is the pin1 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?	Yes
	Component orientation can be Identified by mounting machine or AOI?	Yes
seal	Is there any hole or gap in package body, flux enter package inside form the hole or gap, resulting in function fail	NO
exposed Non-insulator on component body	Whether there exists non-insulator at no soldering position. Are non-insulator and adjacent soldering pin the same circuit?	NO
	Have Dimension and Position of non-insulator been indicated in component spec.	Yes
Are matters RoHS compliant listed below? (please refer to "sheet7 RoHS Compliant" in this file) Lead, Cd, Hg, Cr VI, PBB, PBDE Lead-free		Yes
Is it Halogen-free		Yes
Relative humidity (%)		$\geq 20\% \& \leq 70\%$
Temperature (C)		$\geq -10\text{C} \& \leq 35\text{C}$

Maximum storage time (month)	Follow MSL rating rules Allowed 1 year stored at customer side
Packaging type	tape and reel
Position of component pin 1 in packing	Q2
Packaging height(K0)	1.1
Packaging width(W)	12mm
component pitch:P1	8mm
ESD packaging	Yes
Rollover rate $\leq 0.05\%$ in packing	Yes
Maximum component rotation for punched $\leq 10^\circ$	Yes
tray packing Baking conditions: $125^\circ @ 24h$	Yes
reel tape packing Baking conditions: $40^\circ @ 192h$	Yes
Can reel tape packing meet EIA 481 standard?	EIA
MSL	2
Baking requirement if moisture meets J-STD-033?	Yes
Moisture sensitive level at level 2 and level 2 above, moisture sensitive protection must include: moisture sensitive indicator card, desiccant, moisture sensitive grade logo	Yes
Manual soldering conditions: soldering iron tip temperature $400^\circ C$ time $\geq 5s$ 。 Or hot gun temperature $340^\circ C$ time $\geq 10s$	Yes
Maximum soldering times ≥ 3	Yes
Can heat resistance of SMT components meet JSTD020D. (should focus on the classification of temperature and reflow profiles, that is table 4-1, 4-2 and 5-2, please refer to sheet6 J-STD-020D in this file)	Yes
Maximum pick-and-place pressure (N)	Yes
Whether the welding process and design requirements of component have all written to the component specifications	Yes
Whether Pad & stencil design as Mandatory requirements in component spec?	recommended
Whether the device has special requirements for the reflow temperature ramp-up rate and ramp-down rate? Customer follow J-STD-002 standard	No

Are there other mandatory requirements in component spec?	No
Solder ability test report	Yes
Board level reliability test report	No

Texas Instruments Qualification Summary

Quality and reliability are built into TI's culture, with the goal of providing customers high quality products. TI's semiconductor technologies are developed with a minimum goal of fewer than 50 Failures in Time (FIT) at 100,000 Power-On-Hours at 105C junction temperature. TI builds simulations, accelerated testing, and robustness evaluations into the product development process. During the product development process, TI carefully assesses silicon process reliability, package reliability, and silicon/package interaction.

TI also evaluates manufacturability of the device to verify a robust silicon and assembly flow to enable continuity of supply to customers. Non-Automotive devices are qualified with industry standard test methodologies performed primarily to the intent of the Joint Electron Devices Engineering Council (JEDEC). TI qualifies new devices, significant changes, and product families based on JEDEC JESD47. The data shown is representative of the material sets, processes, and manufacturing sites used by the device family.

Qualification summary for:	LP5009RUKR
Report date:	08/27/2020

Stress	Reference	Min lot qty	SS / lot	Condition	Duration	Result
HTOL	JESD22-A108	3	77	Life test, 125C	1000 hours	Pass
HTSL	JESD22-A103	3	25	High temp storage bake 150C	1000 hours	Pass
AC/UHAST	JESD22-A102/JESD22-A118	3	25	Autoclave 121C or unbiased HAST 130C / 85% RH	96 hours	Pass
THB/HAST	JESD22-A101/JESD22-A110	3	25	THB 85C/85%RH or HAST 130C/110C/85% RH	1000 hours or 96 hours	Pass
TC	JESD22-A104	3	25	Temperature cycle -65/150C	500 cycles	Pass
SD	J-STD-002	3	22	Per specification	>95% lead coverage	Pass
HBM	JS-001	1	3	ESD - HBM	Classification	See data sheet

CDM	JESD22-C101	1	3	ESD - CDM	Classification	See data sheet
LU	JESD78	1	3	Latch-up	Per JESD78	Pass
MSL	J-STD-020	—	—	Per J-STD-020	Classification	See data sheet

Important information/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](#) 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.

TI reference number:17228719