

UCC28C57LQDRQ1

Quality, reliability & packaging data download

Status: ACTIVE

Report date: 03/20/2024



Assembly site: TI MALAYSIA A/T

RoHS	Yes
REACH	Yes
Device marking	8C57LQ
Lead finish/Ball material	NIPDAU
MSL rating/Peak reflow	Level-1-260C-UNLIM
Rating	Automotive

Material content

Homogeneous Material Level						Component Level	
Component	Substance	CAS Number	Amount (mg)	Percentage %	ppm	Percentage %	ppm
Bond Wire							
Precious Metals	Gold	7440-57-5	0.107729	98.872042	988720	0.116185	1162
Precious Metals	Palladium	7440-05-3	0.001229	1.127958	11280	0.001325	13
Sub-total	—	—	0.108958	100	1000000	0.117511	1175
Die Attach Adhesive							
Precious Metals	Silver	7440-22-4	0.13757	80.000233	800002	0.148369	1484
Thermoplastics	Epoxy	85954-11-6	0.034392	19.999767	199998	0.037092	371
Sub-total	—	—	0.171962	100	1000000	0.185460	1855
Lead Frame							
Copper and Its Alloys	Copper	7440-50-8	30.2796	97.050000	970500	32.656388	326564
Copper and Its Alloys	Iron	7439-89-6	0.8112	2.600000	26000	0.874875	8749
Copper and Its Alloys	Phosphorus	7723-14-0	0.0468	0.150000	1500	0.050474	505
Zinc and Its Alloys	Zinc	7440-66-6	0.0624	0.200000	2000	0.067298	673
Sub-total	—	—	31.2000	100	1000000	33.649035	336490
Lead Frame Plating							
Nickel and Its Alloys	Nickel	7440-02-0	0.09512	95.120000	951200	0.102586	1026
Precious Metals	Gold	7440-57-5	0.00078	0.780000	7800	0.000841	8
Precious Metals	Palladium	7440-05-3	0.0041	4.100000	41000	0.004422	44
Sub-total	—	—	0.10000	100	1000000	0.107849	1078
Mold Compound							
Other Inorganic Materials	Fused Silica	60676-86-0	53.309285	88.000000	880000	57.493781	574938
Other Organic Materials	Carbon Black	1333-86-4	0.181736	0.300000	3000	0.196001	1960
Other Organic Materials	Organic Phosphorus	1330-78-5	0.333183	0.550000	5500	0.359336	3593
Thermoplastics	Epoxy	85954-11-6	6.754529	11.150000	111500	7.284724	72847
Sub-total	—	—	60.578733	100	1000000	65.333842	653338
Semiconductor Device							
Ceramics / Glass	Doped Silicon	7440-21-3	0.562175	100.000000	1000000	0.606303	6063
Sub-total	—	—	0.562175	100	1000000	0.606303	6063
Total	—	—	92.721828	—	—	100	1000000

MTBF/FIT estimates

MTBF / FIT		MTBF / FIT supporting data							
MTBF	FIT	Usage temp (°C)	Conf level (%)	Activation energy (eV)	Test temp (°C)	Test duration (hours)	Sample size	Fails	Additional comments

8.71×10 ⁹	0.1	55	60	0.7	125	1000	101758	0	—
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Qualification summary

Type	AEC Q100 test #	Test spec	Min lot qty	SS / lot	Test name	Condition	Result	Notes
Test group A - accelerated environment stress test								
THB/HAST	A2	JESD22-A101/JESD22-A110	3	77	Biased HAST	130C/85%RH 96 hours	Pass	Or equivalent Q100 condition
AC/UHAST	A3	JESD22-A102/JESD22-A118	3	77	Unbiased HAST	130C/85%RH for 96 hours	Pass	Or equivalent Q100 condition
TC	A4	JESD22-A104	3	77	Temperature cycle	Per grade requirements. See data sheet.	Pass	—
TC-WBP	A4	MIL-STD883 method 2011	1	30	Post temp cycle bond pull	Per requirements	Pass	As applicable per die configuration
HTSL	A6	JESD22-A103	1	45	High temp storage bake	Per grade requirements. See data sheet.	Pass	—
Test group B - accelerated lifetime simulation test								
HTOL	B1	JESD22-A108	3	77	High temperature operating life	Per grade requirements. See data sheet.	Pass	—
ELFR	B2	AEC Q100-008	3	800	Early life failure rate	Per grade requirements. See data sheet.	Pass	—
Test group C - package assembly integrity tests								
WBS	C1	AEC Q100-001	1	30	Wire bond shear	Cpk > 1.67	Pass	As applicable per die configuration
WBP	C2	MIL-STD883 method 2011	1	30	Wire bond pull	Cpk > 1.67	Pass	As applicable per die configuration
SD	C3	JEDEC J-STD-002	1	15	Solderability	>95% lead coverage	Pass	—
PD	C4	JESD22-B100 and B108	3	10	Physical dimensions	Cpk > 1.67	Pass	—
SBS	C5	AEC Q100-010	3	5 balls from 10 devices	Solder Ball Shear	Cpk > 1.67	Pass	As applicable per die configuration
Test group D - die fabrication reliability tests								
EM	D1	—	—	—	Electromigration	Per technology requirements	Pass	—
TDDDB	D2	—	—	—	Time dependent dielectric breakdown	Per technology requirements	Pass	—
HCI	D3	—	—	—	Hot carrier injection	Per technology requirements	Pass	—
BTI	D4	—	—	—	Bias temperature instability	Per technology requirements	Pass	—
Test group E - electrical verification								
HBM	E2	AEC Q100-002	1	3	Electrostatic discharge - human body model	Per AEC Q100-002	See data sheet	—
CDM	E3	AEC Q100-011	1	3	Electrostatic discharge - charged device model	Per AEC Q100-011	See data sheet	—
LU	E4	AEC Q100-004	1	3	Latch-up	Per AEC Q100-004	Pass	As applicable per Q100-004
ED	E5	AEC Q100-009	3	30	Electrical distributions	Per AEC Q100-009	Pass	—

Ongoing reliability monitoring

FAB process reliability data

Fab Process	Reliability Test	Rolling Year (1Q2023 - 4Q2023) Sample Size	Cumulative Sample Size	Disposition
Power BICMOS	Life test 125C, 1000 Hours or Equivalent JEDEC Condition	31433	391952	Pass

Assembly process reliability data

Package Family	Reliability Test	Rolling Year (1Q2023 - 4Q2023) Sample Size	Cumulative Sample Size	Disposition
SOIC	Biased HAST 130C/85%RH, 96 Hours or Equivalent JEDEC Condition	7851	71252	Pass
SOIC	High temp storage bake 150C, 1000 Hours or Equivalent JEDEC Condition	6939	60854	Pass
SOIC	Temperature cycle -65/150C, 500 Hours or Equivalent JEDEC Condition	14472	158420	Pass
SOIC	Unbiased HAST 130C/85% RH, 96 Hours or Equivalent JEDEC Condition	9720	118431	Pass

Additional resources

[General quality guidelines](#)

[Certifications](#)

[Conflict minerals specialized disclosure report](#)

[Restricted chemical test report](#)

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