

SN74LVC1G04QDCKRQ1

Quality, reliability & packaging data download

Status: ACTIVE

Report date: 03/20/2024



Assembly site: Ext-Mfg

RoHS	Yes
REACH	Yes
Device marking	CCJ, CCO
Lead finish/Ball material	SN
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	0.013862	100.000000	1000000	0.195748	1957
Sub-total	—	—	0.013862	100	1000000	0.195748	1957
Die Attach Adhesive							
Precious Metals	Silver	7440-22-4	0.046584	80.000000	800000	0.657823	6578
Thermoplastics	Epoxy	85954-11-6	0.011646	20.000000	200000	0.164456	1645
Sub-total	—	—	0.058230	100	1000000	0.822279	8223
Lead Frame							
Copper and Its Alloys	Copper	7440-50-8	3.0972	96.787500	967875	43.736274	437363
Copper and Its Alloys	Iron	7439-89-6	0.0752	2.350000	23500	1.061917	10619
Copper and Its Alloys	Phosphorus	7723-14-0	0.00264	0.082500	825	0.037280	373
Other Nonferrous Metals and Alloys	Lead	7439-92-1	0.00016	0.005000	50	0.002259	23
Precious Metals	Silver	7440-22-4	0.0208	0.650000	6500	0.293722	2937
Zinc and Its Alloys	Zinc	7440-66-6	0.004	0.125000	1250	0.056485	565
Sub-total	—	—	3.20000	100	1000000	45.187937	451879
Lead Frame Plating							
Other Nonferrous Metals and Alloys	Tin	7440-31-5	0.08	100.000000	1000000	1.129698	11297
Sub-total	—	—	0.08	100	1000000	1.129698	11297
Mold Compound							
Other Inorganic Materials	Fused Silica	60676-86-0	3.129283	86.850006	868500	44.189326	441893
Other Organic Materials	Carbon Black	1333-86-4	0.005405	0.150010	1500	0.076325	763
Other Organic Materials	Proprietary Non Halide Flame Retardant	Trade Secret	0.018015	0.499988	5000	0.254394	2544
Thermoplastics	Epoxy	85954-11-6	0.450386	12.499997	125000	6.360004	63600
Sub-total	—	—	3.603089	100	1000000	50.880049	508800
Semiconductor Device							
Ceramics / Glass	Doped Silicon	7440-21-3	0.126355	100.000000	1000000	1.784288	17843
Sub-total	—	—	0.126355	100	1000000	1.784288	17843
Total	—	—	7.081536	—	—	100	1000000

Assembly site: Ext-Mfg

RoHS	Yes
REACH	Yes
Device marking	CCJ, CCO
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	0.015721	100.000000	1000000	0.141757	1418
Sub-total	—	—	0.015721	100	1000000	0.141757	1418
Die Attach Adhesive							
Precious Metals	Silver	7440-22-4	0.038275	76.999678	769997	0.345128	3451
Thermoplastics	Epoxy	85954-11-6	0.011433	23.000322	230003	0.103092	1031
Sub-total	—	—	0.049708	100	1000000	0.448220	4482
Lead Frame							
Copper and Its Alloys	Copper	7440-50-8	6.8208	97.440000	974400	61.503525	615035
Copper and Its Alloys	Iron	7439-89-6	0.1645	2.350000	23500	1.483305	14833
Copper and Its Alloys	Phosphorus	7723-14-0	0.0056	0.080000	800	0.050496	505
Zinc and Its Alloys	Zinc	7440-66-6	0.0091	0.130000	1300	0.082055	821
Sub-total	—	—	7.0000	100	1000000	63.119381	631194
Lead Frame Plating							
Nickel and Its Alloys	Nickel	7440-02-0	0.19024	95.120000	951200	1.715404	17154
Precious Metals	Gold	7440-57-5	0.00156	0.780000	7800	0.014067	141
Precious Metals	Palladium	7440-05-3	0.0082	4.100000	41000	0.073940	739
Sub-total	—	—	0.20000	100	1000000	1.803411	18034
Mold Compound							
Other Inorganic Materials	Fused Silica	60676-86-0	3.173963	87.000008	870000	28.619797	286198
Other Organic Materials	Carbon Black	1333-86-4	0.003648	0.099994	1000	0.032894	329

Thermoplastics	Epoxy	85954-11-6	0.470622	12.899998	129000	4.243624	42436
Sub-total	—	—	3.648233	100	1000000	32.896316	328963
Semiconductor Device							
Ceramics / Glass	Doped Silicon	7440-21-3	0.176434	100.000000	1000000	1.590915	15909
Sub-total	—	—	0.176434	100	1000000	1.590915	15909
Total	—	—	11.090096	—	—	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
2.21×10^9	0.5	55	60	0.7	125	1000	25789	0	—

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	—

TDDb	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
CMOS	Life test 125C, 1000 Hours or Equivalent JEDEC Condition	1025	53111	Pass

Assembly process reliability data

Package Family	Reliability Test	Rolling Year (1Q2023 - 4Q2023) Sample Size	Cumulative Sample Size	Disposition
SOP/SOT	Biased HAST 130C/85%RH, 96 Hours or Equivalent JEDEC Condition	11601	98492	Pass
SOP/SOT	High temp storage bake 150C, 1000 Hours or Equivalent JEDEC Condition	15564	76204	Pass
SOP/SOT	Temperature cycle -65/150C, 500 Hours or Equivalent JEDEC Condition	25896	179071	Pass
SOP/SOT	Unbiased HAST 130C/85% RH, 96 Hours or Equivalent JEDEC Condition	18039	150208	Pass

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[Certifications](#)

[Conflict minerals specialized disclosure report](#)

[Restricted chemical test report](#)

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