

LMK1D1204RGTR

## Quality, reliability & packaging data download

Status: ACTIVE

Report date: 12/20/2021



Assembly site: **TI Semiconductor**

RoHS	Yes
REACH	Yes
Device marking	LD1204
Lead finish/Ball material	NIPDAU
MSL rating/Peak reflow	Level-2-260C-1 YEAR
Rating	Catalog

## Material content

Component	Substance	CAS Number	Homogeneous Material Level		Component Level		
			Amount (mg)	Percentage %	ppm	Percentage %	ppm
<b>Bond Wire</b>							
Copper and Its Alloys	Copper	7440-50-8	0.040677	97.535068	975351	0.136579	1366
Not Categorized	Proprietary Materials	—	0.000005	0.011989	120	0.000017	0
Precious Metals	Gold	7440-57-5	0.000021	0.050354	504	0.000071	1
Precious Metals	Palladium	7440-05-3	0.001001	2.400192	24002	0.003361	34
Precious Metals	Silver	7440-22-4	0.000001	0.002398	24	0.000003	0
Sub-total	—	—	0.041705	100	1000000	0.140031	1400
<b>Die Attach Adhesive</b>							
Precious Metals	Silver	7440-22-4	0.336464	80.000000	800000	1.129729	11297
Thermoplastics	Epoxy	85954-11-6	0.084116	20.000000	200000	0.282432	2824
Sub-total	—	—	0.420580	100	1000000	1.412161	14122
<b>Lead Frame</b>							
Copper and Its Alloys	Copper	7440-50-8	15.89576	97.520000	975200	53.372427	533724
Copper and Its Alloys	Iron	7439-89-6	0.3749	2.300000	23000	1.258784	12588
Copper and Its Alloys	Phosphorus	7723-14-0	0.00489	0.030000	300	0.016419	164
Zinc and Its Alloys	Zinc	7440-66-6	0.02445	0.150000	1500	0.082095	821
Sub-total	—	—	16.30000	100	1000000	54.729724	547297
<b>Lead Frame Plating</b>							
Nickel and Its Alloys	Nickel	7440-02-0	0.4756	95.120000	951200	1.596899	15969
Precious Metals	Gold	7440-57-5	0.0039	0.780000	7800	0.013095	131
Precious Metals	Palladium	7440-05-3	0.0205	4.100000	41000	0.068832	688
Sub-total	—	—	0.5000	100	1000000	1.678826	16788
<b>Mold Compound</b>							
Other Inorganic Materials	Fused Silica	60676-86-0	9.867229	88.000002	880000	33.130719	331307
Other Organic Materials	Chlorine	7782-50-5	0.000112	0.000999	10	0.000376	4
Other Plastics and Rubber	Carbon Black	1333-86-4	0.033638	0.299998	3000	0.112945	1129
Thermoplastics	Epoxy	85954-11-6	1.311781	11.699002	116990	4.404504	44045
Sub-total	—	—	11.212760	100	1000000	37.648544	376485
<b>Semiconductor Device</b>							
Ceramics / Glass	Doped Silicon	7440-21-3	1.307674	100.000000	1000000	4.390714	43907
Sub-total	—	—	1.307674	100	1000000	4.390714	43907
<b>Total</b>	—	—	<b>29.782719</b>	—	—	<b>100</b>	<b>1000000</b>

## 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	
7.26×10 <sup>8</sup>	1.4	55	60	0.7	125	1000	8473	0	—	

## Qualification summary

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	<a href="#">See data sheet</a>
CDM	JESD22-C101	1	3	ESD - CDM	Classification	<a href="#">See data sheet</a>
MSL	J-STD-020	—	—	Per J-STD-020	Classification	<a href="#">See data sheet</a>

## Ongoing reliability monitoring

### FAB process reliability data

Fab Process	Reliability Test	Rolling Year (4Q20 - 3Q21) Sample Size	Cumulative Sample Size	Disposition
High-Speed BICMOS	High Temperature Operating Life, 125C, 1000 Hours (or Equivalent)	913	32071	Pass

### Assembly process reliability data

Package Family	Reliability Test	Rolling Year (4Q20 - 3Q21) Sample Size	Cumulative Sample Size	Disposition
QFN	Autoclave, 121C, 96 Hours	8698	151039	Pass
QFN	Biased HAST, 110C/85%RH, 264 Hours	1175	16319	Pass
QFN	Biased HAST, 130C/85%RH, 96 Hours	11715	93265	Pass
QFN	High Temperature Storage Life, 150C, 1000 Hours	4891	45735	Pass
QFN	High Temperature Storage Life, 170C, 420 Hours	2928	62680	Pass
QFN	Temperature Cycle, -40/125C, 850 Cycles	78	1034	Pass

QFN	Temperature Cycle, -55/125C, 700 Cycles	5038	29873	Pass
QFN	Temperature Cycle, -65/150C, 500 Cycles	19321	230251	Pass
QFN	Temperature-Humidity Bias Test (85C/85%RH), 1000 Hours	170	6660	Pass
QFN	Unbiased HAST, 110C/85%RH, 264 Hours	80	15429	Pass
QFN	Unbiased HAST, 130C/85%RH, 96 Hours	8041	44046	Pass

## Additional resources

[General quality guidelines](#)

[Certifications](#)

[Conflict minerals specialized disclosure report](#)

[Restricted chemical test report](#)

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