

Quality, reliability & packaging data download

Status: ACTIVE

Report date: 10/11/2024



Assembly site: TI Semiconductor

RoHS	Yes
REACH	Yes
Device marking	PFNI
Lead finish/Ball material	SN
MSL rating/Peak reflow	Level-1-260C-UNLIM
Rating	Catalog

Material content

Homogeneous Material Level				Component Level			
Component	Substance	CAS Number	Amount (mg)	Percentage %	ppm	Percentage %	ppm
Bond Wire							
Copper and Its Alloys	Copper	7440-50-8	0.012399	97.537760	975378	0.077957	780
Not Categorized	Proprietary Materials	—	0.000001	0.007867	79	0.000006	0
Precious Metals	Gold	7440-57-5	0.000007	0.055066	551	0.000044	0
Precious Metals	Palladium	7440-05-3	0.000305	2.399308	23993	0.001918	19
Sub-total	—	—	0.012712	100	1000000	0.079925	799
Die Attach Adhesive							
Precious Metals	Silver	7440-22-4	0.163444	80.000000	800000	1.027630	10276
Thermoplastics	Epoxy	85954-11-6	0.040861	20.000000	200000	0.256907	2569
Sub-total	—	—	0.204305	100	1000000	1.284537	12845
Lead Frame							
Copper and Its Alloys	Copper	7440-50-8	5.354722	97.713923	977139	33.667020	336670
Copper and Its Alloys	Iron	7439-89-6	0.11782	2.150000	21500	0.740776	7408
Copper and Its Alloys	Phosphorus	7723-14-0	0.000849	0.015493	155	0.005338	53
Other Nonferrous Metals and Alloys	Lead	7439-92-1	0.000005	0.000091	1	0.000031	0
Zinc and Its Alloys	Zinc	7440-66-6	0.006603	0.120493	1205	0.041515	415
Sub-total	—	—	5.479999	100	1000000	34.454680	344547
Lead Frame Plating							
Other Nonferrous Metals and Alloys	Tin	7440-31-5	0.283	100.000000	1000000	1.779320	17793
Sub-total	—	—	0.283	100	1000000	1.779320	17793
Mold Compound							
Other Inorganic Materials	Fused Silica	60676-86-0	8.415708	87.999996	880000	52.912515	529125
Other Organic Materials	Carbon Black	1333-86-4	0.02869	0.300001	3000	0.180384	1804
Other Organic Materials	Chlorine	7782-50-5	0.000096	0.001004	10	0.000604	6
Thermoplastics	Epoxy	85954-11-6	1.118811	11.698999	116990	7.034358	70344
Sub-total	—	—	9.563305	100	1000000	60.127861	601279
Semiconductor Device							
Ceramics / Glass	Doped Silicon	7440-21-3	0.361627	100.000000	1000000	2.273676	22737
Sub-total	—	—	0.361627	100	1000000	2.273676	22737
Total	—	—	15.904948	—	—	100	1000000

Assembly site: Ext-Mfg

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

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	0.022564	100.000000	1000000	0.138728	1387
Sub-total	—	—	0.022564	100	1000000	0.138728	1387
Die Attach Adhesive							
Precious Metals	Silver	7440-22-4	0.16753	80.000191	800002	1.030010	10300
Thermoplastics	Epoxy	85954-11-6	0.041882	19.999809	199998	0.257499	2575
Sub-total	—	—	0.209412	100	1000000	1.287509	12875
Lead Frame							
Copper and Its Alloys	Copper	7440-50-8	6.041125	97.437500	974375	37.142104	371421
Copper and Its Alloys	Iron	7439-89-6	0.1457	2.350000	23500	0.895794	8958
Copper and Its Alloys	Phosphorus	7723-14-0	0.005115	0.082500	825	0.031448	314
Other Nonferrous Metals and Alloys	Lead	7439-92-1	0.00031	0.005000	50	0.001906	19
Other Nonferrous Metals and Alloys	Tin	7440-31-5	0.00775	0.125000	1250	0.047649	476
Sub-total	—	—	6.200000	100	1000000	38.118901	381189
Lead Frame Plating							
Nickel and Its Alloys	Nickel	7440-02-0	0.114144	95.120000	951200	0.701781	7018
Precious Metals	Gold	7440-57-5	0.000936	0.780000	7800	0.005755	58
Precious Metals	Palladium	7440-05-3	0.00492	4.100000	41000	0.030249	302
Sub-total	—	—	0.120000	100	1000000	0.737785	7378
Mold Compound							
Other Inorganic Materials	Fused Silica	60676-86-0	7.807431	86.000001	860000	48.001724	480017

Other Organic Materials	Carbon Black	1333-86-4	0.045392	0.500000	5000	0.279080	2791
Thermoplastics	Epoxy	85954-11-6	1.225585	13.499999	135000	7.535154	75352
Sub-total	—	—	9.078408	100	1000000	55.815958	558160
Semiconductor Device							
Ceramics / Glass	Doped Silicon	7440-21-3	0.634513	100.000000	1000000	3.901119	39011
Sub-total	—	—	0.634513	100	1000000	3.901119	39011
Total	—	—	16.264897	—	—	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
1.61×10^9	0.6	55	60	0.7	125	1000	18799	0	—

Qualification summary

Stress	Reference	Min lot qty	SS / lot	Condition	Duration	Result	Notes
HTOL	JESD22-A108	3	77	Life test, 125C	1000 hours	Pass	Or equivalent JEDEC condition
HTSL	JESD22-A103	3	25	High temp storage bake, 150C	1000 hours	Pass	Or equivalent JEDEC condition
AC/UHAST	JESD22-A102/JESD22-A118	3	25	Unbiased HAST 130C / 85% RH	96 hours	Pass	Or equivalent JEDEC condition
THB/HAST	JESD22-A101/JESD22-A110	3	25	HAST 130C/85%RH	96 hours	Pass	Or equivalent JEDEC condition
TC	JESD22-A104	3	25	Temperature cycle -65/150C	500 cycles	Pass	Or equivalent JEDEC condition
SD	J-STD-002	3	22	Per specification	>95% lead coverage	Pass	—
HBM	JS-001	1	3	ESD - HBM	Classification	See data sheet	—
CDM	JS-002	1	3	ESD - CDM	Classification	See data sheet	—
LU	JESD78	1	3	Latch-up	Per JESD78	Pass	As applicable per JESD78
MSL	J-STD-020	—	—	Per J-STD-020	Classification	See data sheet	—

Ongoing reliability monitoring

FAB process reliability data

Fab Process	Reliability Test	Rolling Year (4Q2023 - 3Q2024) Sample Size	Cumulative Sample Size	Disposition
CMOS	Life test 125C, 1000 Hours or Equivalent JEDEC Condition	1450	53536	Pass

Assembly process reliability data

Package Family	Reliability Test	Rolling Year (4Q2023 - 3Q2024) Sample Size	Cumulative Sample Size	Disposition
SOP/SOT	Biased HAST 130C/85%RH, 96 Hours or Equivalent JEDEC Condition	9919	102573	Pass
SOP/SOT	High temp storage bake 150C, 1000 Hours or Equivalent JEDEC Condition	9671	80769	Pass
SOP/SOT	Temperature cycle -65/150C, 500 Hours or Equivalent JEDEC Condition	18740	187894	Pass
SOP/SOT	Unbiased HAST 130C/85% RH, 96 Hours or Equivalent JEDEC Condition	13709	156679	Pass

Additional resources

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[Certifications](#)

[Conflict minerals specialized disclosure report](#)

[Restricted chemical test report](#)

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