

OPA328DBVR

Quality, reliability & packaging data download

Status: ACTIVE

Report date: 09/13/2024



Assembly site: **TI Semiconductor**

RoHS	Yes
REACH	Yes
Device marking	OP328
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	0.012699	97.542054	975421	0.065987	660
Not Categorized	Proprietary Materials	—	0.000001	0.007681	77	0.000005	0
Precious Metals	Gold	7440-57-5	0.000007	0.053768	538	0.000036	0
Precious Metals	Palladium	7440-05-3	0.000312	2.396497	23965	0.001621	16
Sub-total	—	—	0.013019	100	1000000	0.067650	676
Die Attach Adhesive							
Other Inorganic Materials	Silica	7631-86-9	0.054925	44.999836	449998	0.285404	2854
Other Plastics and Rubber	Imidazole Derivative	288-32-4	0.001221	1.000360	10004	0.006345	63
Thermoplastics	Epoxy	85954-11-6	0.06591	53.999803	539998	0.342485	3425
Sub-total	—	—	0.122056	100	1000000	0.634233	6342
Lead Frame							
Copper and Its Alloys	Copper	7440-50-8	5.28283	96.402007	964020	27.450892	274509
Copper and Its Alloys	Iron	7439-89-6	0.140288	2.560000	25600	0.728971	7290
Copper and Its Alloys	Phosphorus	7723-14-0	0.00811	0.147993	1480	0.042142	421
Other Nonferrous Metals and Alloys	Lead	7439-92-1	0.000548	0.010000	100	0.002848	28
Precious Metals	Silver	7440-22-4	0.03836	0.700000	7000	0.199328	1993
Zinc and Its Alloys	Zinc	7440-66-6	0.009864	0.180000	1800	0.051256	513
Sub-total	—	—	5.480000	100	1000000	28.475436	284754
Lead Frame Plating							
Other Nonferrous Metals and Alloys	Tin	7440-31-5	3.8	100.000000	1000000	19.745740	197457
Sub-total	—	—	3.8	100	1000000	19.745740	197457
Mold Compound							
Aluminum and Its Alloys	Alumina	1344-28-1	0.046267	0.499996	5000	0.240415	2404
Other Inorganic Materials	Fused Silica	60676-86-0	8.096787	87.500018	875000	42.072909	420729
Other Organic Materials	Carbon Black	1333-86-4	0.02776	0.299996	3000	0.144248	1442
Other Organic Materials	Proprietary Non Halide Flame Retardant	Trade Secret	0.083281	0.899998	9000	0.432749	4327
Other Plastics and Rubber	Amine	24304-00-5	0.02776	0.299996	3000	0.144248	1442
Thermoplastics	Epoxy	85954-11-6	0.971614	10.499997	105000	5.048747	50487
Sub-total	—	—	9.253469	100	1000000	48.083315	480833
Semiconductor Device							
Ceramics / Glass	Doped Silicon	7440-21-3	0.576113	100.000000	1000000	2.993626	29936
Sub-total	—	—	0.576113	100	1000000	2.993626	29936
Total	—	—	19.244657	—	—	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	
5.97×10 ⁸	1.7	55	60	0.7	125	1000	6973	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 (3Q2023 - 2Q2024) Sample Size	Cumulative Sample Size	Disposition
High-Precision CMOS	Life test 125C, 1000 Hours or Equivalent JEDEC Condition	4851	58184	Pass

Assembly process reliability data

Package Family	Reliability Test	Rolling Year (3Q2023 - 2Q2024) Sample Size	Cumulative Sample Size	Disposition
SOP/SOT	Biased HAST 130C/85%RH, 96 Hours or Equivalent JEDEC Condition	10295	101957	Pass
SOP/SOT	High temp storage bake 150C, 1000 Hours or Equivalent JEDEC Condition	9491	80268	Pass
SOP/SOT	Temperature cycle -65/150C, 500 Hours or Equivalent JEDEC Condition	19148	185896	Pass
SOP/SOT	Unbiased HAST 130C/85% RH, 96 Hours or Equivalent JEDEC Condition	13795	155832	Pass

Additional resources

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[Certifications](#)

[Conflict minerals specialized disclosure report](#)

[Restricted chemical test report](#)

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