

SN74AHC125QPWR

## Quality, reliability & packaging data download

Status: ACTIVE

Report date: 08/23/2022



Assembly site: **TI MALAYSIA A/T**

RoHS	Yes
REACH	Yes
Device marking	HA125Q
Lead finish/Ball material	NIPDAU
MSL rating/Peak reflow	Level-1-260C-UNLIM
Rating	Automotive

## Material content

Component	Substance	CAS Number	Amount (mg)	Homogeneous Material Level		Component Level	
				Percentage %	ppm	Percentage %	ppm
<b>Bond Wire</b>							
Other Nonferrous Metals and Alloys	Yttrium	7440-65-5	0.000001	0.000739	7	0.000002	0
Precious Metals	Gold	7440-57-5	0.135319	99.998522	999985	0.236603	2366
Precious Metals	Silver	7440-22-4	0.000001	0.000739	7	0.000002	0
Sub-total	—	—	0.135321	100	1000000	0.236606	2366
<b>Die Attach Adhesive</b>							
Precious Metals	Silver	7440-22-4	0.189853	80.000084	800001	0.331954	3320
Thermoplastics	Epoxy	85954-11-6	0.047463	19.999916	199999	0.082988	830
Sub-total	—	—	0.237316	100	1000000	0.414942	4149
<b>Lead Frame</b>							
Copper and Its Alloys	Copper	7440-50-8	21.33279	97.410000	974100	37.299973	373000
Copper and Its Alloys	Iron	7439-89-6	0.5256	2.400000	24000	0.919001	9190
Copper and Its Alloys	Phosphorus	7723-14-0	0.00657	0.030000	300	0.011488	115
Other Nonferrous Metals and Alloys	Lead	7439-92-1	0.00657	0.030000	300	0.011488	115
Other Nonferrous Metals and Alloys	Tin	7440-31-5	0.00657	0.030000	300	0.011488	115
Zinc and Its Alloys	Zinc	7440-66-6	0.0219	0.100000	1000	0.038292	383
Sub-total	—	—	21.90000	100	1000000	38.291729	382917
<b>Lead Frame Plating</b>							
Nickel and Its Alloys	Nickel	7440-02-0	0.370968	95.120000	951200	0.648630	6486
Precious Metals	Gold	7440-57-5	0.003042	0.780000	7800	0.005319	53
Precious Metals	Palladium	7440-05-3	0.01599	4.100000	41000	0.027958	280
Sub-total	—	—	0.390000	100	1000000	0.681907	6819
<b>Mold Compound</b>							
Other Inorganic Materials	Fused Silica	60676-86-0	29.028477	86.000000	860000	50.755734	507557
Other Plastics and Rubber	Carbon Black	1333-86-4	0.101262	0.300000	3000	0.177055	1771
Thermoplastics	Epoxy	85954-11-6	4.624304	13.700000	137000	8.085507	80855
Sub-total	—	—	33.754043	100	1000000	59.018295	590183
<b>Semiconductor Device</b>							
Ceramics / Glass	Doped Silicon	7440-21-3	0.775828	100.000000	1000000	1.356520	13565
Sub-total	—	—	0.775828	100	1000000	1.356520	13565
Total	—	—	57.192508	—	—	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
9.3×10 <sup>8</sup>	1.1	55	60	0.7	125	1000	10859	0	—

## Qualification summary

Type	AEC Q100 test #	Test spec	Min lot qty	SS / lot	Test name	Condition	Result
<b>Test group A - accelerated environment stress test</b>							
THB/HAST	A2	JESD22-A101/JESD22-A110	3	77	Temperature humidity-bias or biased HAST	THB 85C/85%RH for 1000 hours or HAST 110C/85%RH for 264 hours or equivalent	Pass
AC/UHAST	A3	JESD22-A102/JESD22-A118	3	77	Autoclave or unbiased HAST	AC 121C for 96 hours or UHAST 110C/85%RH for 264 hours or equivalent	Pass
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
HTSL	A6	JESD22-A103	1	45	High temp storage bake	Per grade requirements. See data sheet.	Pass
<b>Test group B - accelerated lifetime simulation test</b>							
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
<b>Test group C - package assembly integrity tests</b>							
WBS	C1	AEC Q100-001	1	30	Wire bond shear	Cpk > 1.67	Pass
WBP	C2	MIL-STD883 method 2011	1	30	Wire bond pull	Cpk > 1.67	Pass
SD	C3	JEDEC J-STD-002D	1	15	Solderability	>95% lead coverage	Pass
PD	C4	JESD22-B100 and B108	3	10	Physical dimensions	Cpk > 1.67	Pass
<b>Test group D - die fabrication reliability tests</b>							
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
NBTI	D4	—	—	—	Negative bias temperature instability	Per technology requirements	Pass
<b>Test group E - electrical verification</b>							
HBM	E2	AEC Q100-002	1	3	Electrostatic discharge - human body model	Per AEC Q100-002	<a href="#">See data sheet</a>
CDM	E3	AEC Q100-011	1	3	Electrostatic discharge - charged device model	Per AEC Q100-011	<a href="#">See data sheet</a>
LU	E4	AEC Q100-004	1	6	Latch-up	Per AEC Q100-004	Pass
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 (2Q21 - 1Q22) Sample Size	Cumulative Sample Size	Disposition
CMOS	High Temperature Operating Life, 125C, 1000 Hours (or Equivalent)	388	52086	Pass

### Assembly process reliability data

Package Family	Reliability Test	Rolling Year (2Q21 - 1Q22) Sample Size	Cumulative Sample Size	Disposition
TSSOP	Autoclave, 121C, 96 Hours	1155	53383	Pass
TSSOP	Biased HAST, 110C/85%RH, 264 Hours	374	1220	Pass
TSSOP	Biased HAST, 130C/85%RH, 96 Hours	1267	34128	Pass
TSSOP	High Temperature Storage Life, 150C, 1000 Hours	1420	10513	Pass
TSSOP	High Temperature Storage Life, 170C, 420 Hours	154	16911	Pass
TSSOP	Temperature Cycle, -40/125C, 850 Cycles	0	82	Pass
TSSOP	Temperature Cycle, -55/125C, 700 Cycles	0	1403	Pass
TSSOP	Temperature Cycle, -65/150C, 500 Cycles	4255	75024	Pass
TSSOP	Temperature-Humidity Bias Test (85C/85%RH), 1000 Hours	0	1416	Pass
TSSOP	Unbiased HAST, 130C/85%RH, 96 Hours	716	8984	Pass

## Additional resources

[General quality guidelines](#)

[Certifications](#)

[Conflict minerals specialized disclosure report](#)

[Restricted chemical test report](#)

For additional component information, please visit [Material content search](#)

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