

Formosa MS

ZS4728A-Q1 THRU ZS4764A-Q1

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ZS4728A-Q1 THRU ZS4764A-Q1

1000mW Surface Mount Zener Diodes - 3.3V-100V

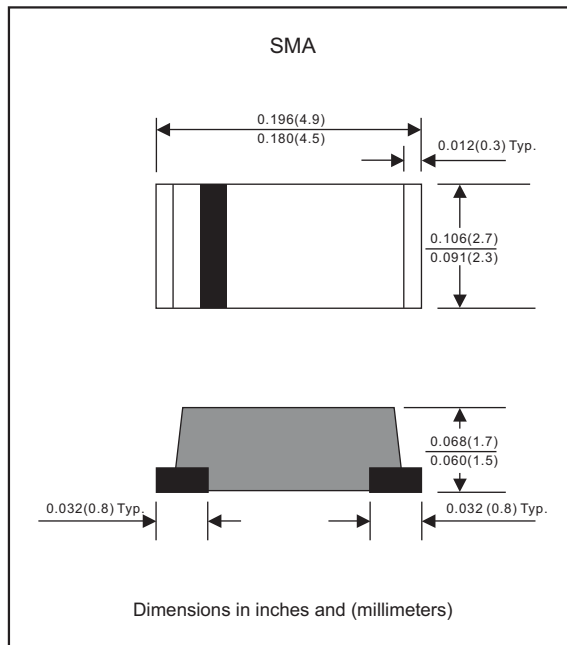
Features

- Batch process design, excellent power dissipation offers better reverse leakage current and thermal resistance.
- Standard zener voltage tolerance $\pm 5\%$.
- Low inductance.
- Low profile package.
- Built-in strain relief.
- Lead-free parts meet RoHS requirements.
- Qualified to AEC-Q101 standards for high reliability
- Suffix "-H" indicates Halogen free parts, ex. ZS4728A-Q1-H.

Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, JEDEC DO-214AC / SMA
- Terminals : Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.05 gram

Package outline



Maximum ratings (at $T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 200 \text{ mA}$	V_F			1.20	V
Power Dissipation	$a_t T_L = 75^\circ\text{C}$	P_D			1000	mW
Thermal resistance	Junction to case(Note 1) Junction to ambient(Note 1)	$R_{\theta JC}$ $R_{\theta JA}$		30 50		$^\circ\text{C/W}$
Operating junction temperature range		T_J	-55		+150	$^\circ\text{C}$
Storage temperature range		T_{STG}	-65		+175	$^\circ\text{C}$

Note : 1. Mounted on 0.2"x0.2" (5x5mm) FR-4 PCB

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Electrical characteristics (at $T_A=25^\circ\text{C}$ unless otherwise noted)

Part No.	Marking code	Zener voltage			Test current	Zener impedance			Leakage current		Maximum Surge current
		V _Z @ I _{ZT} (Volts)			I _{ZT}	Z _{ZT} @ I _{ZT}	Z _{ZK} @ I _{ZK}	I _{ZK}	I _R	V _R	I _{Surge}
		Min.	Nom.	Max.	mA	(Ω)Max	(Ω)Max	mA	(uA)Max	Volts	mApk
ZS4728A-Q1	Z3V3	3.14	3.3	3.47	40	10	400	1.00	100	1.0	1380
ZS4729A-Q1	Z3V6	3.42	3.6	3.78	40	10	400	1.00	100	1.0	1260
ZS4730A-Q1	Z3V9	3.71	3.9	4.10	40	9	400	1.00	50	1.0	1190
ZS4731A-Q1	Z4V3	4.09	4.3	4.52	40	9	400	1.00	10	1.0	1070
ZS4732A-Q1	Z4V7	4.47	4.7	4.94	53	8	500	1.00	10	1.0	970
ZS4733A-Q1	Z5V1	4.85	5.1	5.36	49	7	550	1.00	10	1.0	890
ZS4734A-Q1	Z5V6	5.32	5.6	5.88	45	5	600	1.00	10	2.0	810
ZS4735A-Q1	Z6V2	5.89	6.2	6.51	41	2	700	1.00	10	3.0	730
ZS4736A-Q1	Z6V8	6.46	6.8	7.14	37	3.5	700	1.00	10	4.0	660
ZS4737A-Q1	Z7V5	7.13	7.5	7.88	34	4.0	700	0.50	10	5.0	605
ZS4738A-Q1	Z8V2	7.79	8.2	8.61	31	4.5	700	0.50	10	6.0	550
ZS4739A-Q1	Z9V1	8.65	9.1	9.56	28	5	700	0.50	10	7.0	500
ZS4740A-Q1	Z10	9.50	10	10.50	25	7	700	0.25	10	7.6	454
ZS4741A-Q1	Z11	10.45	11	11.55	23	8	700	0.25	5	8.4	414
ZS4742A-Q1	Z12	11.40	12	12.60	21	9	700	0.25	5	9.1	380
ZS4743A-Q1	Z13	12.35	13	13.65	19	10	700	0.25	5	9.9	344
ZS4744A-Q1	Z15	14.25	15	15.75	17	14	700	0.25	5	11.4	304
ZS4745A-Q1	Z16	15.20	16	16.80	15.5	16	700	0.25	5	12.2	285
ZS4746A-Q1	Z18	17.10	18	18.90	14	20	750	0.25	5	13.7	250
ZS4747A-Q1	Z20	19.00	20	21.00	12.5	22	750	0.25	5	15.2	225
ZS4748A-Q1	Z22	20.90	22	23.10	11.5	23	750	0.25	5	16.7	205
ZS4749A-Q1	Z24	22.80	24	25.20	10.5	25	750	0.25	5	18.2	190
ZS4750A-Q1	Z27	25.65	27	28.35	9.5	35	750	0.25	5	20.6	170
ZS4751A-Q1	Z30	28.50	30	31.50	8.5	40	1000	0.25	5	22.8	150
ZS4752A-Q1	Z33	31.35	33	34.65	7.5	45	1000	0.25	5	25.1	135
ZS4753A-Q1	Z36	34.20	36	37.80	7.0	50	1000	0.25	5	27.4	125
ZS4754A-Q1	Z39	37.05	39	40.95	6.5	60	1000	0.25	5	29.7	115
ZS4755A-Q1	Z43	40.85	43	45.15	6.0	70	1500	0.25	5	32.7	110
ZS4756A-Q1	Z47	44.65	47	49.35	5.5	80	1500	0.25	5	35.8	95
ZS4757A-Q1	Z51	48.45	51	53.55	5.0	95	1500	0.25	5	38.8	90
ZS4758A-Q1	Z56	53.20	56	58.80	4.5	110	2000	0.25	5	42.6	80
ZS4759A-Q1	Z62	58.90	62	65.10	4.0	125	2000	0.25	5	47.1	70
ZS4760A-Q1	Z68	64.60	68	71.40	3.7	150	2000	0.25	5	51.7	65
ZS4761A-Q1	Z75	71.25	75	78.75	3.3	175	2000	0.25	5	56.0	60
ZS4762A-Q1	Z82	77.90	82	86.10	3.0	200	3000	0.25	5	62.2	55
ZS4763A-Q1	Z91	86.45	91	95.55	2.8	250	3000	0.25	5	69.2	50
ZS4764A-Q1	Z100	95.00	100	105.0	2.5	350	3000	0.25	5	76.0	45

Note : 5% tolerance of Zener voltage

Rating and characteristic curves (ZS4728A-Q1 THRU ZS4764A-Q1)

FIG.1 MAXIMUM CONTINUOUS POWER DERATING

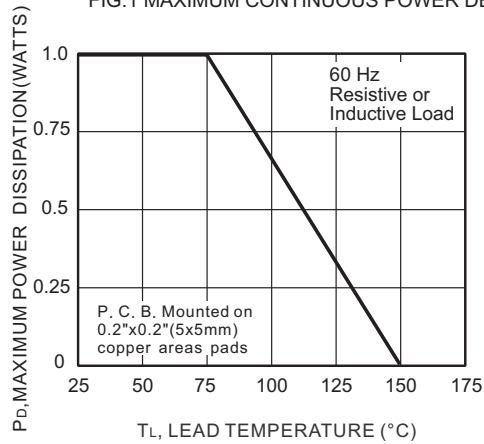


FIG.2A Range for Units to 12 Volts

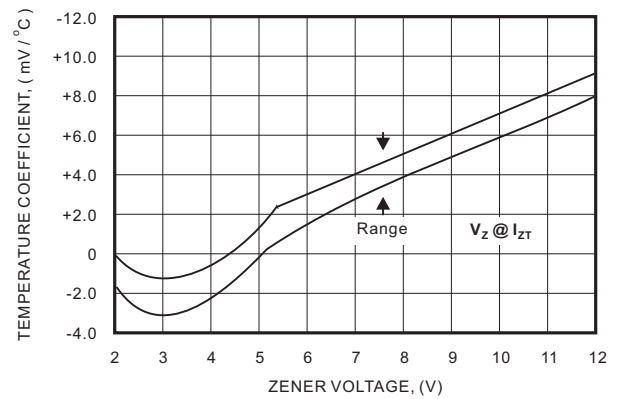


FIG.2B Range for Units to 12 to 100 Volts

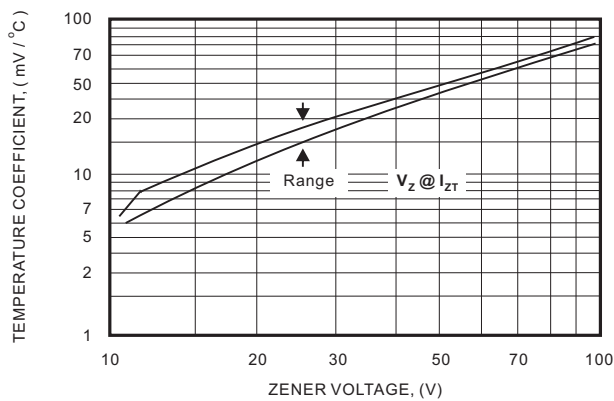
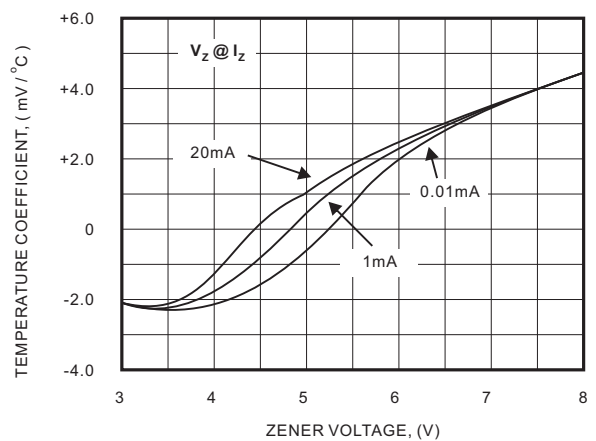
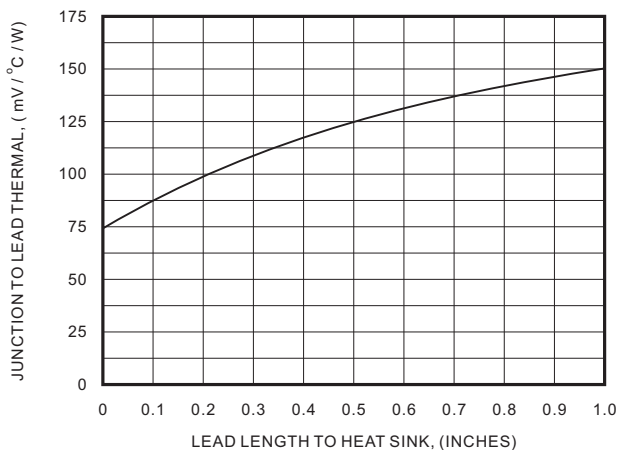


Fig. 3 Temperature Coefficients (-55°C to +150°C temperature change; 90% of the units are in the ranges indicated.)



Rating and characteristic curves (ZS4728A-Q1 THRU ZS4764A-Q1)

FIG.4 Typical Thermal Resistance versus Lead

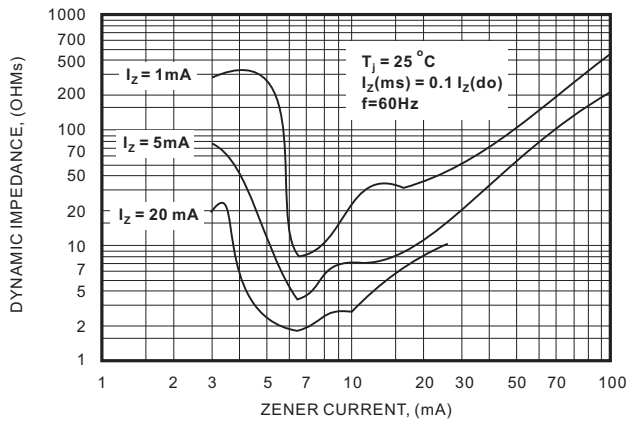


Fig 5. Effect of Zener Current

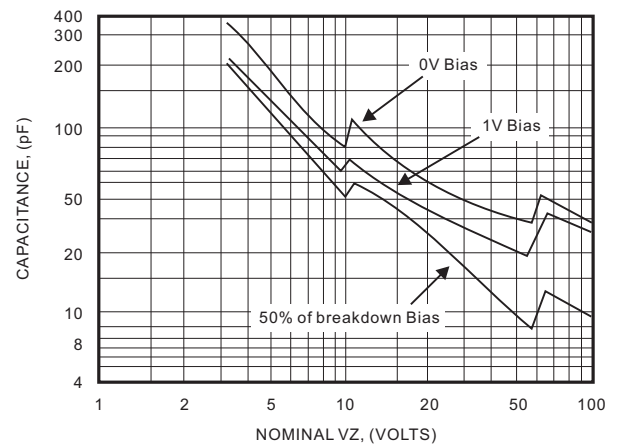
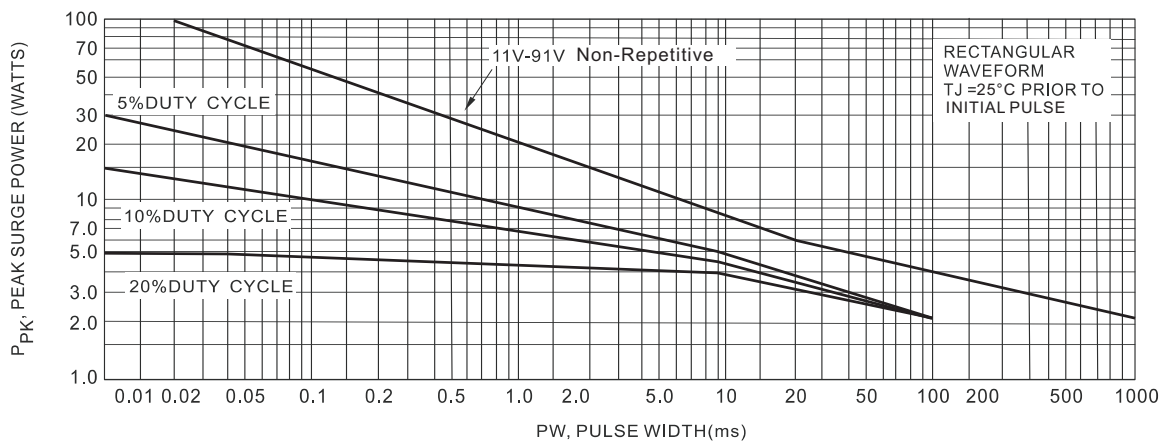


Fig 6. Maximum surge power



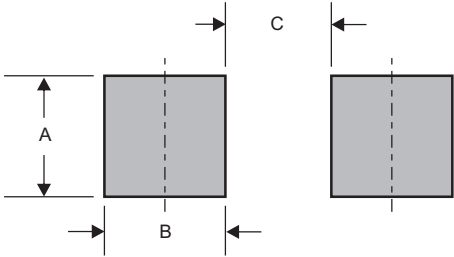
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Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

Suggested solder pad layout

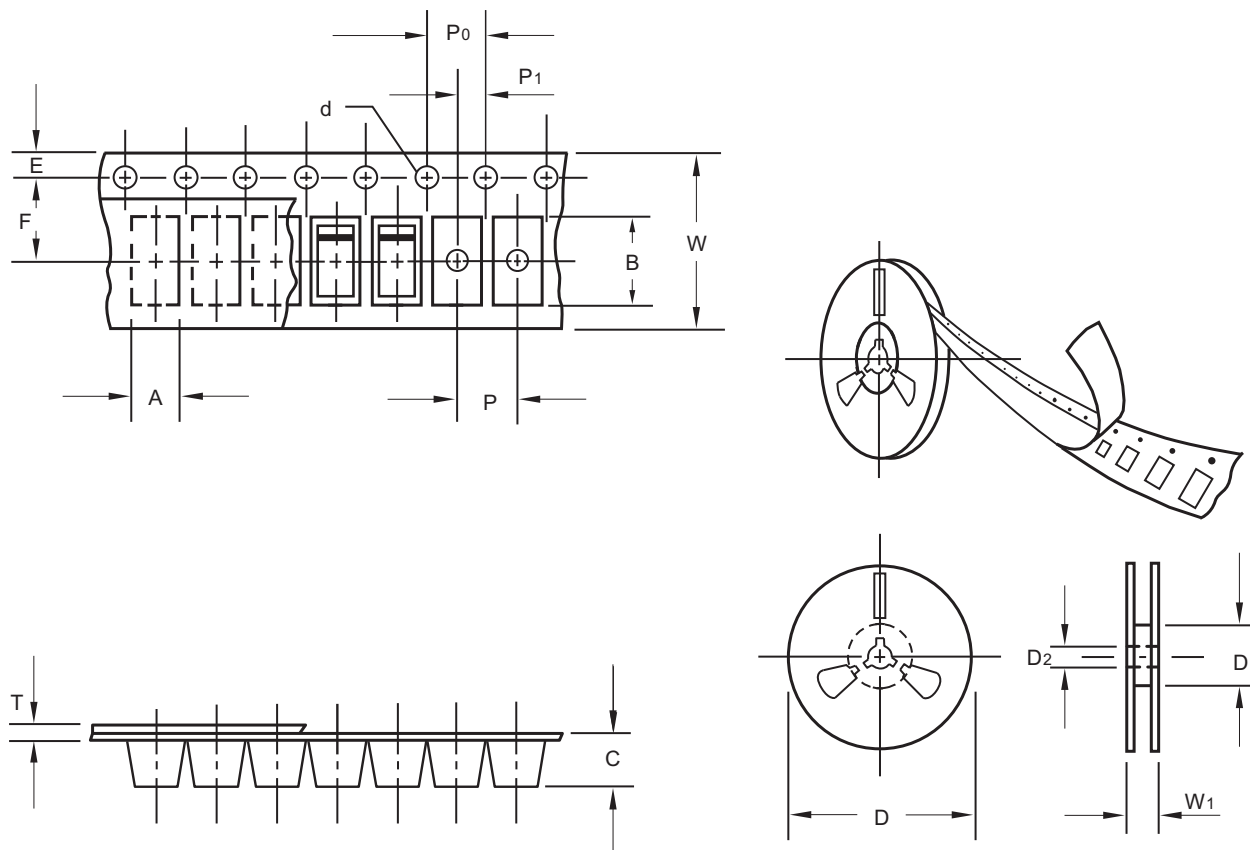


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SMA	0.110 (2.80)	0.063 (1.60)	0.087 (2.20)

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Packing information



unit:mm

Item	Symbol	Tolerance	SMA
Carrier width	A	0.1	2.80
Carrier length	B	0.1	5.00
Carrier depth	C	0.1	1.90
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	50.00
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	62.00
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	5.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	12.00
Reel width	W1	1.0	18.00

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

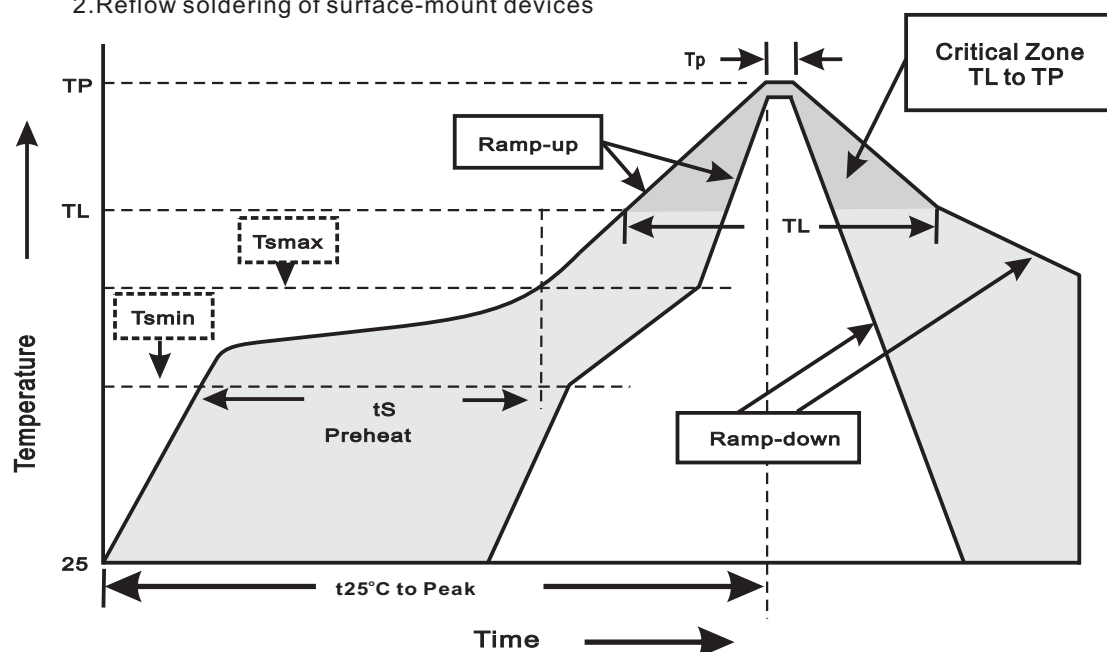
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)	APPROX. GROSS WEIGHT (kg)
SMA	7"	2,000	4.0	20,000	183*155*183	178	382*356*392	160,000	16.0
SMA	13"	7,500	4.0	15,000	335*335*38	330	350*330*360	120,000	14.5

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

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High reliability test capabilities

Item Test	Conditions	Reference
1. MSL Preconditioning	24hr bake@125°C+168hrs@85°C /85%RH+3xIR@260°C+1flux immersion+alcohol+DI H2O rinse	JESD22-A113
2. High Temperature Reverse Bias	Vz=Vz NOM*80% (Tj=150°C)Test Duration:1000hrs	JESD22-A108
3. High Temperature Storage Life	Ta=125°C Test Duration:1000hrs	JESD22 A-103
4. Temperature Cycle	-55°C(15min) to 150°C(15min)Test Cycles:1000cycles	JESD22 A-104
5. Autoclave	P=2atm Ta=121°C RH=100% Test Duration:96hrs	JESD22 A-102
6. Solderability	245±5°C for 5sec	J-STD-002
7. Moisture Resistance	Ta=85°C/85% Relative humidity Test Duration:1000hrs	MIL-STD-750E METHOD 1021.2
8. Resistance To Solder Heat	260±5°C for 10sec	JESD22 B-106
9. High Temperature High Humidity Reverse Bias	Ta=85°C, 85%RH, with device reverse biased at 80% of rated breakdown voltage up to a maximum of 100V or limit of chamber Test Duration:1000hrs	JESD22-A101