

# BZT55 Series

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# BZT55 Series

## 500mW Surface Mount Zener Diodes 2.4V-51V

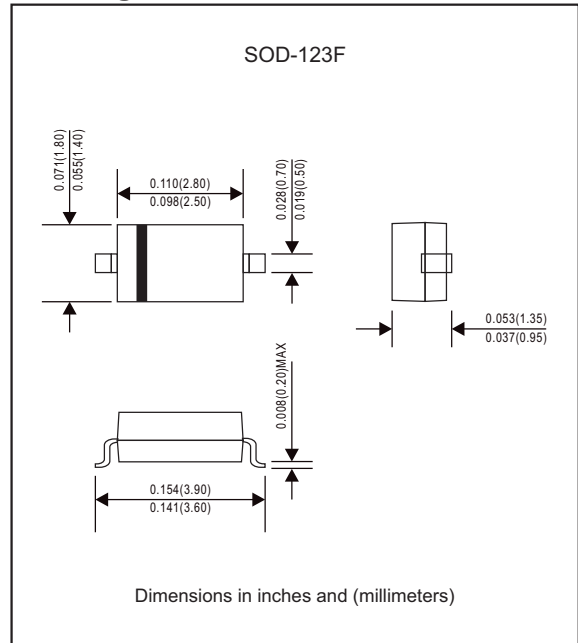
### Features

- Silicon epitaxial planar chip structure
- Zener breakdown voltage range, 2.4V to 51V ex.BZT55C2V4
- Zener breakdown voltage range, 2.2V to 36V ex.BZT55B2V2
- Small package size for high density applications
- Ideally suited for automated assembly processes
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates Halogen-free parts, ex.BZT55C2V4-H

### Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, SOD-123F
- Terminals :Plated terminals, solderable per MIL-STD-750, Method 2026
- Polarity : Indicated by cathode band
- Mounting Position : Any
- Weight : Approximated 0.010 gram

### Package outline



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

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
Forward voltage	at $I_F=10\text{mA}$	$V_F$			0.9	V
Total power dissipation	at $T_A=25^\circ\text{C}$ Mounted on FR-5 board, Note 1	$P_D$			500	mW
Thermal resistance	Junction to ambient, Note 1 Junction to case, Note 1	$R_{\theta JA}$ $R_{\theta JC}$		305 200		$^\circ\text{C/W}$ $^\circ\text{C/W}$
Operating junction temperature range		$T_J$	-55		+150	$^\circ\text{C}$
Storage temperature range		$T_{STG}$	-55		+150	$^\circ\text{C}$

Note1. Device mounted on ceramic PCB; 7.6mm x 9.4mm x 0.87mm with pad area 25mm<sup>2</sup>

# BZT55 Series

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

Part No.	Marking code	Zener voltage			Test current	Zener impedance			Leakage current		Typical Temperature Coefficient	
		V <sub>Z</sub> @ I <sub>ZT</sub>				I <sub>ZT</sub>	Z <sub>ZT</sub> @ I <sub>ZT</sub>	Z <sub>ZK</sub> @ I <sub>ZK</sub>	I <sub>ZK</sub>	I <sub>R</sub>	V <sub>R</sub>	@ I <sub>ZT</sub> (mV/°C)
		Min.(V)	Nom.(V)	Max.(V)	mA		Max.(Ω)	Max.(Ω)	mA	Max.(μA)	Volts	
BZT55C2V4	WX,MH	2.2	2.4	2.6	5	100	600	1.0	50.0	1.0	-3.5	0
BZT55C2V7	W1,MJ	2.5	2.7	2.9	5	100	600	1.0	20.0	1.0	-3.5	0
BZT55C3V0	W2,MK	2.8	3.0	3.2	5	95	600	1.0	10.0	1.0	-3.5	0
BZT55C3V3	W3,MM	3.1	3.3	3.5	5	95	600	1.0	5.0	1.0	-3.5	0
BZT55C3V6	W4,MN	3.4	3.6	3.8	5	90	600	1.0	5.0	1.0	-3.5	0
BZT55C3V9	W5,MP	3.7	3.9	4.1	5	90	600	1.0	3.0	1.0	-3.5	0
BZT55C4V3	W6,MR	4.0	4.3	4.6	5	90	600	1.0	3.0	1.0	-3.5	0
BZT55C4V7	W7,MX	4.4	4.7	5.0	5	80	500	1.0	3.0	2.0	-3.5	0.2
BZT55C5V1	W8,MY	4.8	5.1	5.4	5	60	480	1.0	2.0	2.0	-2.7	1.2
BZT55C5V6	W9,MZ	5.2	5.6	6.0	5	40	400	1.0	1.0	2.0	-2.0	2.5
BZT55C6V2	WA,NA	5.8	6.2	6.6	5	10	150	1.0	3.0	4.0	0.4	3.7
BZT55C6V8	WB,NB	6.4	6.8	7.2	5	15	80	1.0	2.0	4.0	1.2	4.5
BZT55C7V5	WC,NC	7.0	7.5	7.9	5	15	80	1.0	1.0	5.0	2.5	5.3
BZT55C8V2	WD,ND	7.7	8.2	8.7	5	15	80	1.0	0.7	5.0	3.2	6.2
BZT55C9V1	WE,NE	8.5	9.1	9.6	5	15	100	1.0	0.5	6.0	3.8	7.0
BZT55C10	WF,NF	9.4	10	10.6	5	20	150	1.0	0.2	7.0	4.5	8.0
BZT55C11	WG,NH	10.4	11	11.6	5	20	150	1.0	0.1	8.0	5.4	9.0
BZT55C12	WH,NJ	11.4	12	12.7	5	25	150	1.0	0.1	8.0	6.0	10.0
BZT55C13	WI,NK	12.4	13	14.1	5	30	170	1.0	0.1	8.0	7.0	11.0
BZT55C15	WJ,NM	13.8	15	15.8	5	30	200	1.0	0.1	10.5	9.2	13.0
BZT55C16	WK,NN	15.3	16	17.1	5	40	200	1.0	0.1	11.2	10.4	14.0
BZT55C18	WL,NP	16.8	18	19.1	5	45	225	1.0	0.1	12.6	12.4	16.0
BZT55C20	WM,NR	18.8	20	21.2	5	55	225	1.0	0.1	14.0	14.4	18.0
BZT55C22	WN,NX	20.8	22	23.3	5	55	250	1.0	0.1	15.4	16.4	20.0
BZT55C24	WO,NY	22.8	24	25.6	5	70	250	1.0	0.1	16.8	18.4	22.0
BZT55C27	WP,NZ	25.1	27	28.9	2	80	300	0.5	0.1	18.9	21.4	25.3
BZT55C30	WQ,PA	28.0	30	32.0	2	80	300	0.5	0.1	21.0	24.4	29.4
BZT55C33	WR,PB	31.0	33	35.0	2	80	325	0.5	0.1	23.1	27.4	33.4
BZT55C36	WS,PC	34.0	36	38.0	2	90	350	0.5	0.1	25.2	30.4	37.4
BZT55C39	WT,PD	37.0	39	41.0	2	130	350	0.5	0.1	27.3	33.4	41.2
BZT55C43	WU,6A	40.0	43	46.0	2	100	700	1.0	0.1	32.0	10.0	12.0
BZT55C47	WV,6B	44.0	47	50.0	2	100	750	1.0	0.1	35.0	10.0	12.0
BZT55C51	WW,6C	48.0	51	54.0	2	100	750	1.0	0.1	38.0	10.0	12.0

### Note:

1. Tested with pulses, period = 5ms, pulse width = 300us.
2. When provided, otherwise, parts are provided with date code only, and type number identifications appears on reel only.
3. f=1KHz.

# BZT55 Series

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

Part No.	Marking code	Zener voltage		Test current	Zener impedance			Leakage current	
		$V_Z @ I_{ZT}$			$Z_{ZT} @ I_{ZT}$	$Z_{ZK} @ I_{ZK}$	$I_{ZK}$	$I_R$	$V_R$
		Min.(V)	Max.(V)	mA	Max.( $\Omega$ )	Max.( $\Omega$ )	mA	Max.( $\mu\text{A}$ )	Volts
BZT55B2V2	12,2WY	2.22	2.41	5	100	1000	0.5	120.0	0.7
BZT55B2V4	22,2WX	2.43	2.63	5	100	1000	0.5	100.0	1.0
BZT55B2V7	32,2W1	2.69	2.91	5	110	1000	0.5	100.0	1.0
BZT55B3V0	42,2W2	3.01	3.22	5	120	1000	0.5	50.0	1.0
BZT55B3V3	52,2W3	3.32	3.53	5	120	1000	0.5	20.0	1.0
BZT55B3V6	62,2W4	3.60	3.845	5	100	1000	1.0	10.0	1.0
BZT55B3V9	72,2W5	3.89	4.16	5	100	1000	1.0	5.0	1.0
BZT55B4V3	82,2W6	4.17	4.43	5	100	1000	1.0	5.0	1.0
BZT55B4V7	92,2W7	4.55	4.75	5	100	800	0.5	2.0	1.0
BZT55B5V1	A2,2W8	4.98	5.20	5	80	500	0.5	2.0	1.5
BZT55B5V6	C2,2W9	5.49	5.73	5	60	200	0.5	1.0	2.5
BZT55B6V2	E2,2WA	6.06	6.33	5	60	100	0.5	1.0	3.0
BZT55B6V8	F2,2WB	6.65	6.93	5	40	60	0.5	0.5	3.5
BZT55B7V5	H2,2WC	7.28	7.6	5	30	60	0.5	0.5	4.0
BZT55B8V2	J2,2WD	8.02	8.36	5	30	60	0.5	0.5	5.0
BZT55B9V1	L2,2WE	8.85	9.23	5	30	60	0.5	0.5	6.0
BZT55B10	05,2WF	9.77	10.21	5	30	60	0.5	0.1	7.0
BZT55B11	15,2WG	10.76	11.22	5	30	60	0.5	0.1	8.0
BZT55B12	25,2WH	11.74	12.24	5	30	80	0.5	0.1	9.0
BZT55B13	35,2WI	12.91	13.49	5	37	80	0.5	0.1	10.0
BZT55B15	45,2WJ	14.34	14.98	5	42	80	0.5	0.1	11.0
BZT55B16	55,2WK	15.85	16.51	5	50	80	0.5	0.1	12.0
BZT55B18	65,2WL	17.56	18.35	5	65	80	0.5	0.1	13.0
BZT55B20	75,2WM	19.52	20.39	5	85	100	0.5	0.1	15.0
BZT55B22	85,2WN	21.54	22.47	5	100	100	0.5	0.1	17.0
BZT55B24	95,2WO	23.72	24.78	5	120	120	0.5	0.1	19.0
BZT55B27	A5,2WP	26.19	27.53	5	150	150	0.5	0.1	21.0
BZT55B30	C5,2WQ	29.19	30.69	5	200	200	0.5	0.1	23.0
BZT55B33	E5,2WR	32.15	33.79	5	250	250	0.5	0.1	25.0
BZT55B36	F5,2WS	35.07	36.87	5	300	300	0.5	0.1	27.0

### Note:

1. Tested with pulses, period = 5ms, pulse width = 300us.
2. When provided, otherwise, parts are provided with date code only, and type number identifications appears on reel only.
3.  $f=1\text{KHz}$ .

## Rating and characteristic curves (BZT55 Series)

FIG. 1-TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE

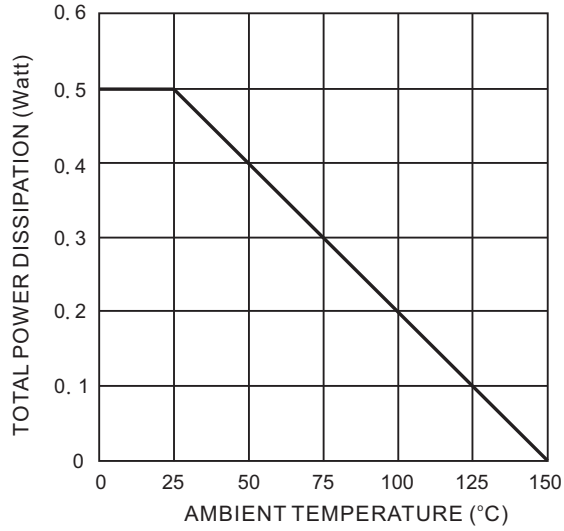
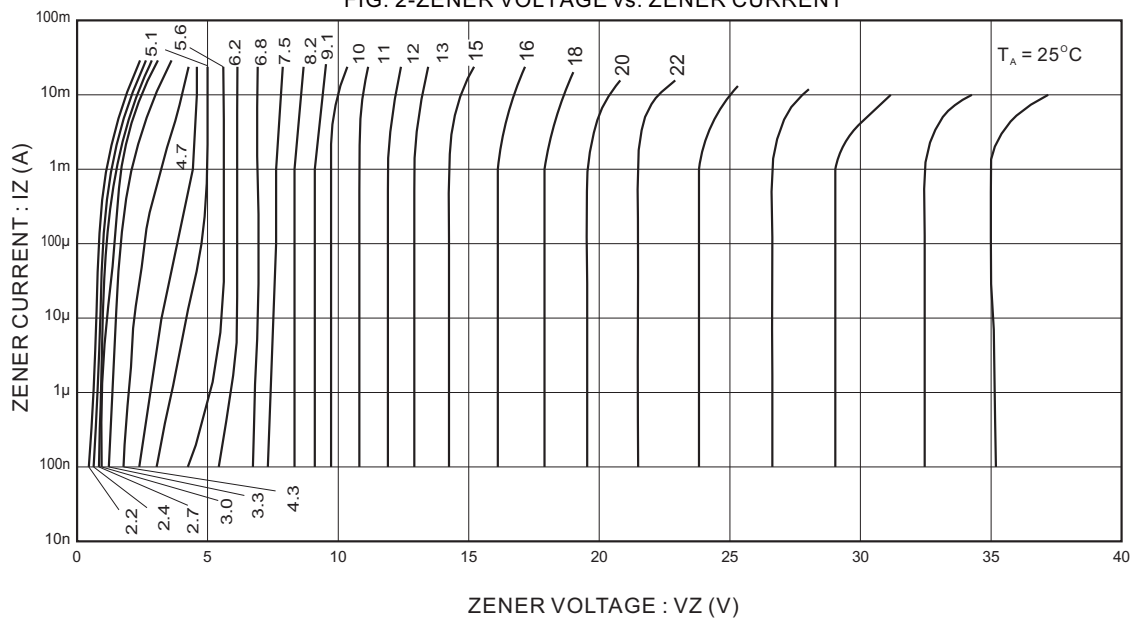




FIG. 2-ZENER VOLTAGE vs. ZENER CURRENT

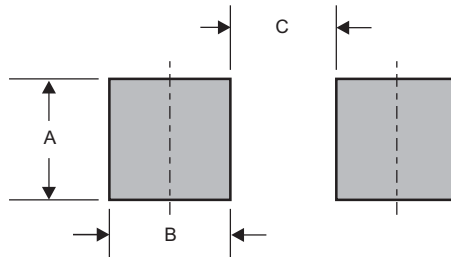


# BZT55 Series

## Pinning information

Pin	Simplified outline	Symbol
Pin1 cathode Pin2 anode		

## Suggested solder pad layout

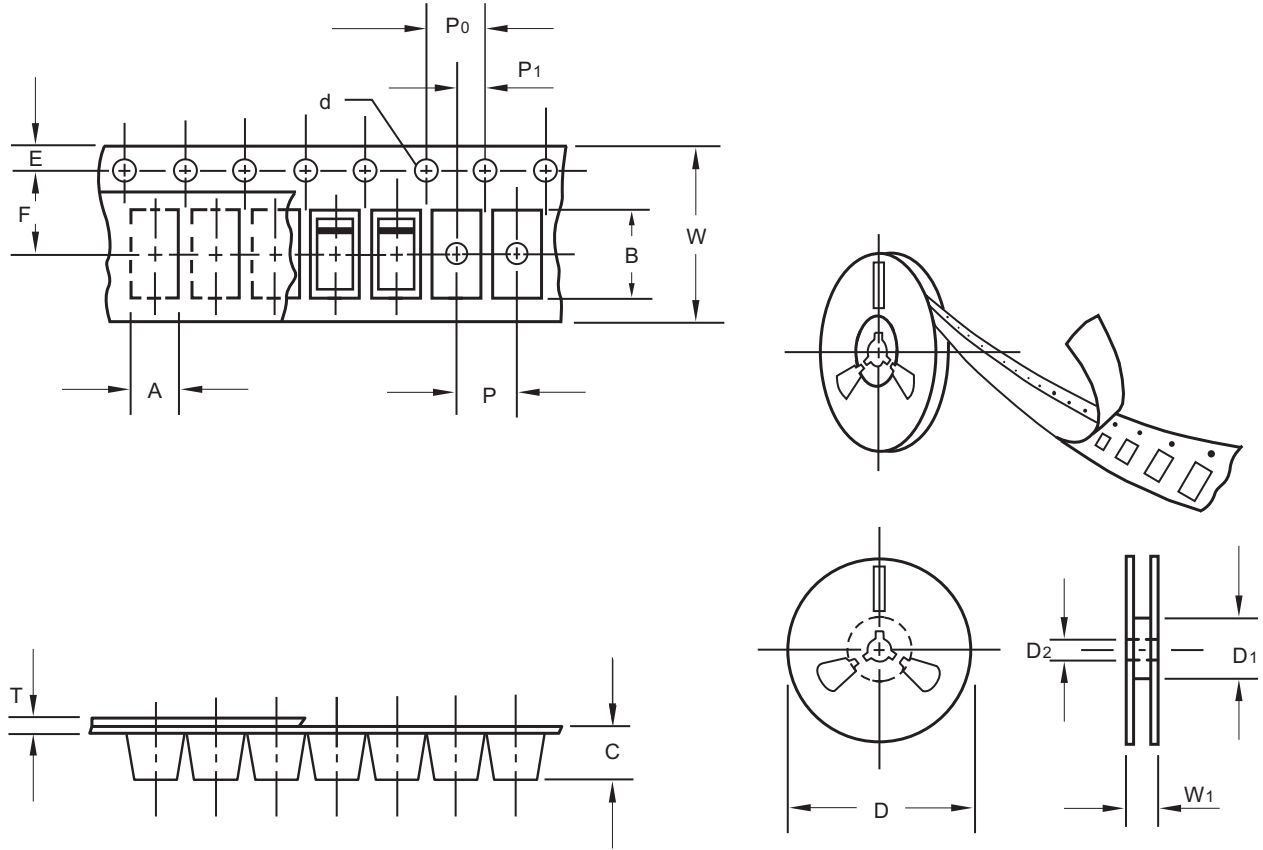


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD-123F	0.048 (1.22)	0.036 (0.91)	0.093 (2.36)

# BZT55 Series

## Packing information



unit:mm

Item	Symbol	Tolerance	SOD-123F
Carrier width	A	0.1	2.00
Carrier length	B	0.1	3.85
Carrier depth	C	0.1	1.10
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D <sub>1</sub>	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D <sub>1</sub>	min	62.00
Feed hole diameter	D <sub>2</sub>	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P <sub>0</sub>	0.1	4.00
Embossment center	P <sub>1</sub>	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W <sub>1</sub>	1.0	11.40

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

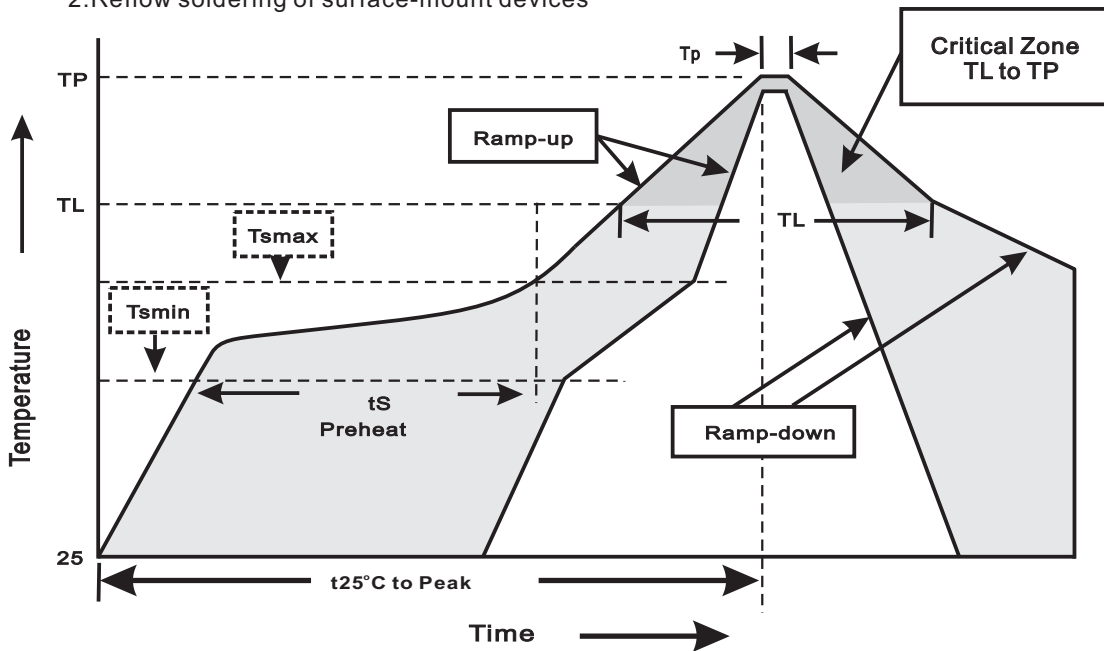
# BZT55 Series

## 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)
SOD-123F	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	9.5

## 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(TL to TP)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(ts)	150°C 200°C 60~120sec
Tsmax to TL -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(TL) -Time(tL)	217°C 60~260sec
Peak Temperature(TP)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(tP)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes



# BZT55 Series

## High reliability test capabilities

Item Test	Conditions	Reference
1. Solder Resistance	at 260±5°C for 10±2sec.	MIL-STD-750D METHOD-2031
2. Solderability	at 245±5°C for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_z = V_z \text{ Nom} * 80\%$ at $T_j = 150^\circ\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1038
4. Pressure Cooker	15P <sub>SIG</sub> at $T_A = 121^\circ\text{C}$ for 4 hrs.	JESD22-A102
5. Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
6. Humidity	at $T_A = 85^\circ\text{C}$ , RH=85% for 1000hrs.	MIL-STD-750D METHOD-1021
7. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031