

BSS84W

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BSS84W

50V P-Channel Enhancement Mode MOSFET

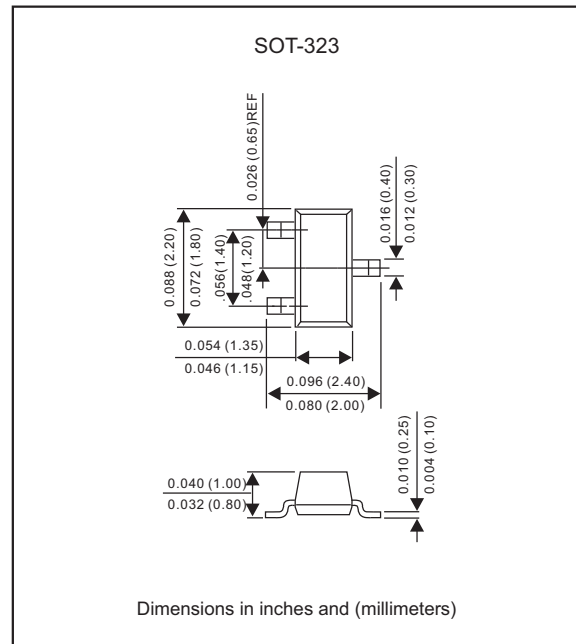
Features

- Simple drive requirement
- Small package outline
- Lead-free parts meet RoHS requirements
- Suffix "-H" indicates halogen free parts, ex. BSS84W-H

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-323
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.006 gram

Package outline



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

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Drain-source voltage	V_{DS}			-50	V
Drain current					
– Continuous $T_A = 25^\circ\text{C}$	I_D			-130	mA
– Pulsed ($t_p \leq 10\mu\text{s}$)	I_{DM}			-520	
Gate-to-source voltage – continuous	V_{GS}			± 20	V
Total power dissipation	P_D			225	mW
FR-5 Board (Note 1) @ $T_A = 25^\circ\text{C}$					
Derate above 25°C				1.8	$\text{mW}/^\circ\text{C}$
Thermal resistance junction to ambient	$R_{\theta JA}$			556	$^\circ\text{C}/\text{W}$
Maximum lead temperature for soldering Purposes, for 10 seconds	T_L			260	$^\circ\text{C}$
Operation junction temperature range	T_J	-55		+150	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55		+150	$^\circ\text{C}$

1. FR-5 = 1.0×0.75×0.062 in.

BSS84W**Electrical characteristics** (At $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	MIN.	TYP.	MAX.	Unit
OFF CHARACTERISTICS						
Drain-source breakdown voltage	$V_{GS} = 0V, I_D = -250\mu A$	$V_{(BR)DSS}$	-50			V
Zero gate voltage drain current	$V_{DS} = -25V, V_{GS} = 0V$ $V_{DS} = -50V, V_{GS} = 0V$ $V_{DS} = -50V, V_{GS} = 0V, T_J = 125^\circ\text{C}$	I_{DSS}			-0.1	μA
					-15	
					-60	
Gate-body leakage current	$V_{GS} = \pm 20V$	I_{GSS}			± 10	μA

ON CHARACTERISTICS (NOTE 1)

Gate threshold voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	$V_{GS(th)}$	-0.8		-2.0	V
Static drain-source on-resistance	$V_{GS} = -5.0V, I_D = -100mA$	$R_{DS(on)}$		5.0	10	Ω
Transfer admittance	$V_{DS} = -25V, I_D = -100mA, f = 1.0kHz$	$ y_f _{sl}$	50			ms

DYNAMIC CHARACTERISTICS

Input capacitance	$V_{DS} = -5.0V$	C_{iss}		30		μF
Output capacitance		C_{oss}		10		
Reverse transfer capacitance		C_{rss}		5		

SWITCHING CHARACTERISTICS

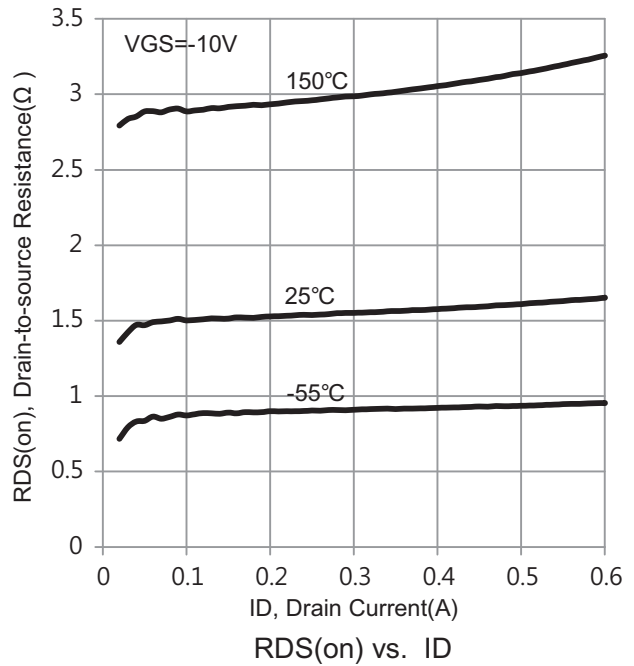
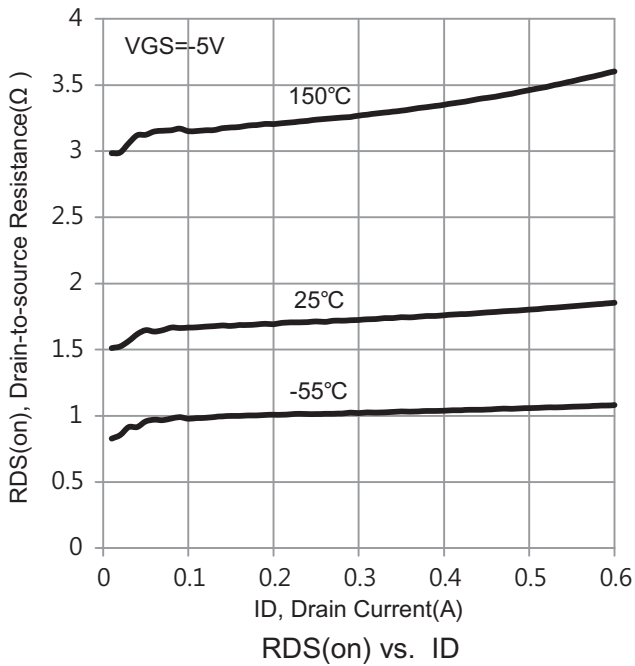
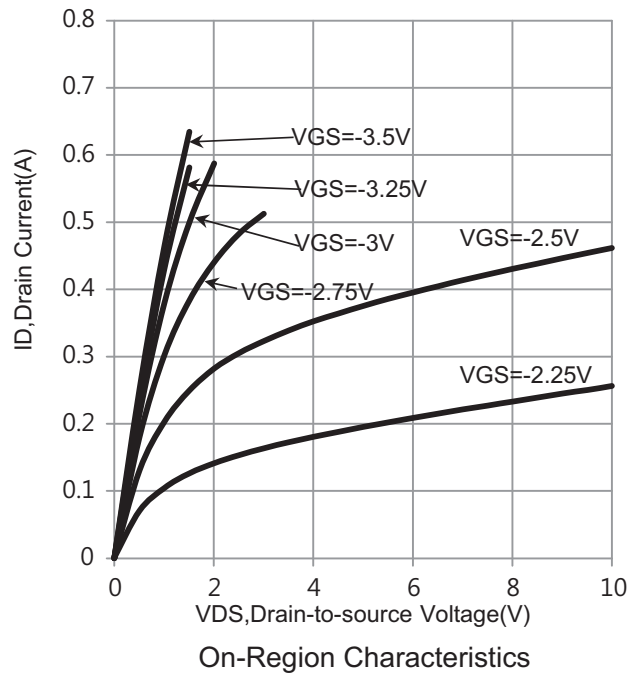
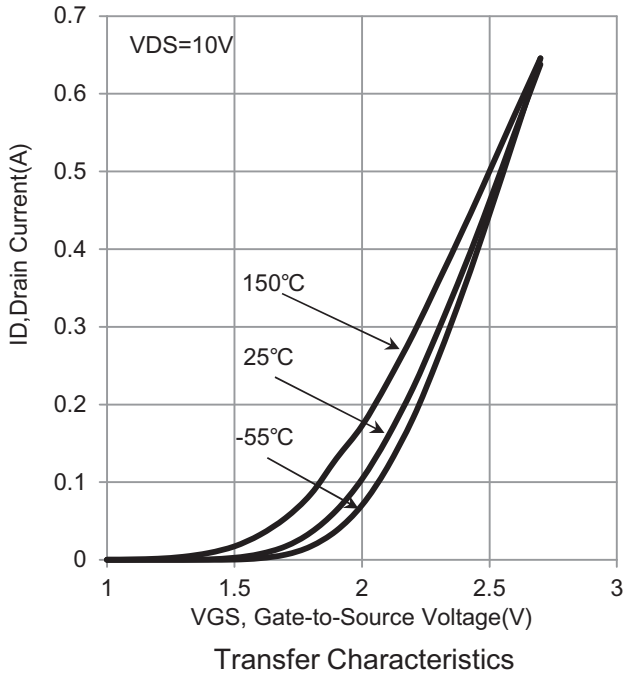
Turn-on delay time	$V_{DD} = -15V, R_L = 50\Omega, I_D = -2.5A$	$t_{d(on)}$		2.5		ns
Rise time		t_r		1.0		
Turn-off delay time		$t_{d(off)}$		16		
Fall Time		t_f		8.0		

SOURCE-DRAIN DIODE CHARACTERISTICS

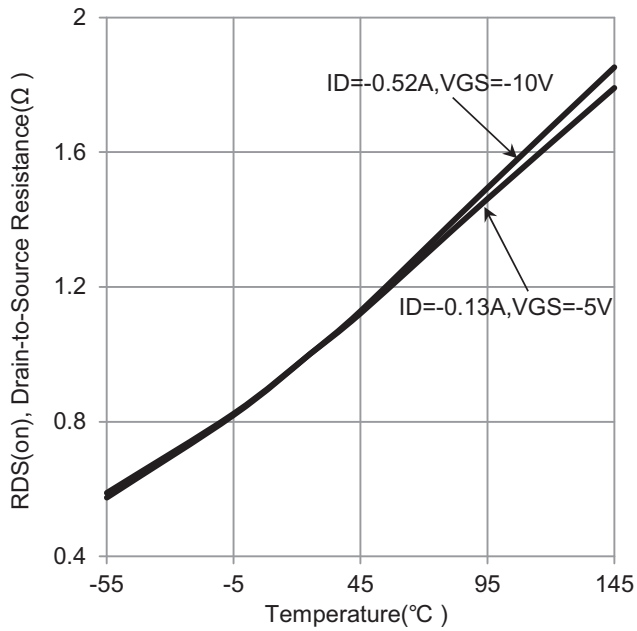
Continuous current		I_S			-0.13	A
Pulsed current		I_{SM}			-0.52	A
Forward on voltage		V_{SD}		-2.5		V

Note 1: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

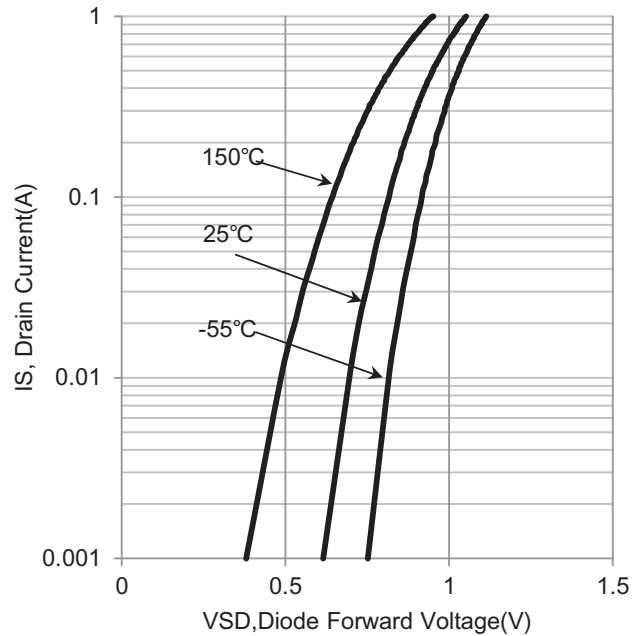
Rating and characteristic curves (BSS84W)



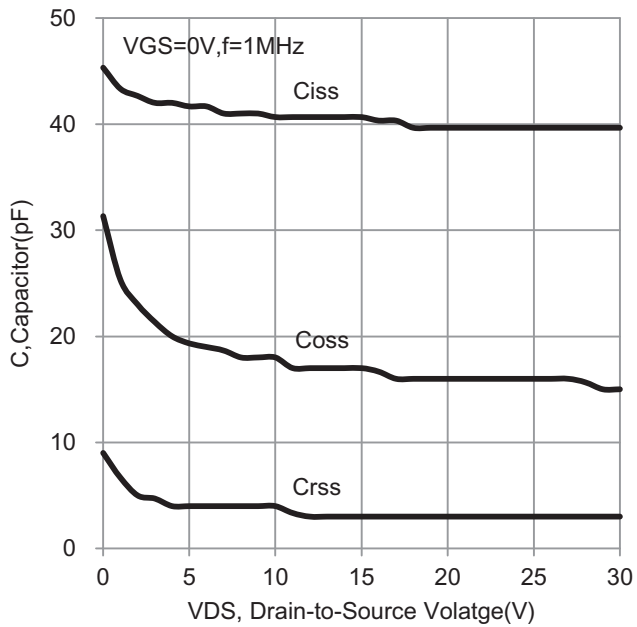
Rating and characteristic curves (BSS84W)



RDS(on) vs. Temperature



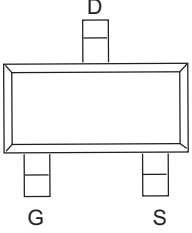
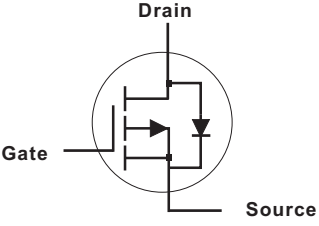
IS vs. VSD



Capacitor vs. VDS

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Pinning information

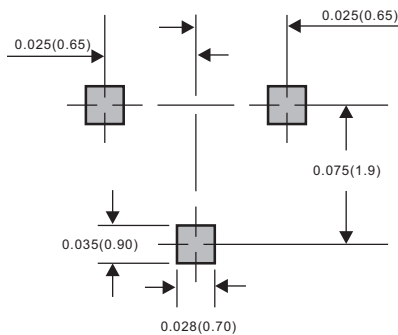
Pin	Simplified outline	Symbol
PinD Drain PinG Gate PinS Source		

Marking

Type number	Marking code
BSS84W	PD

Suggested solder pad layout

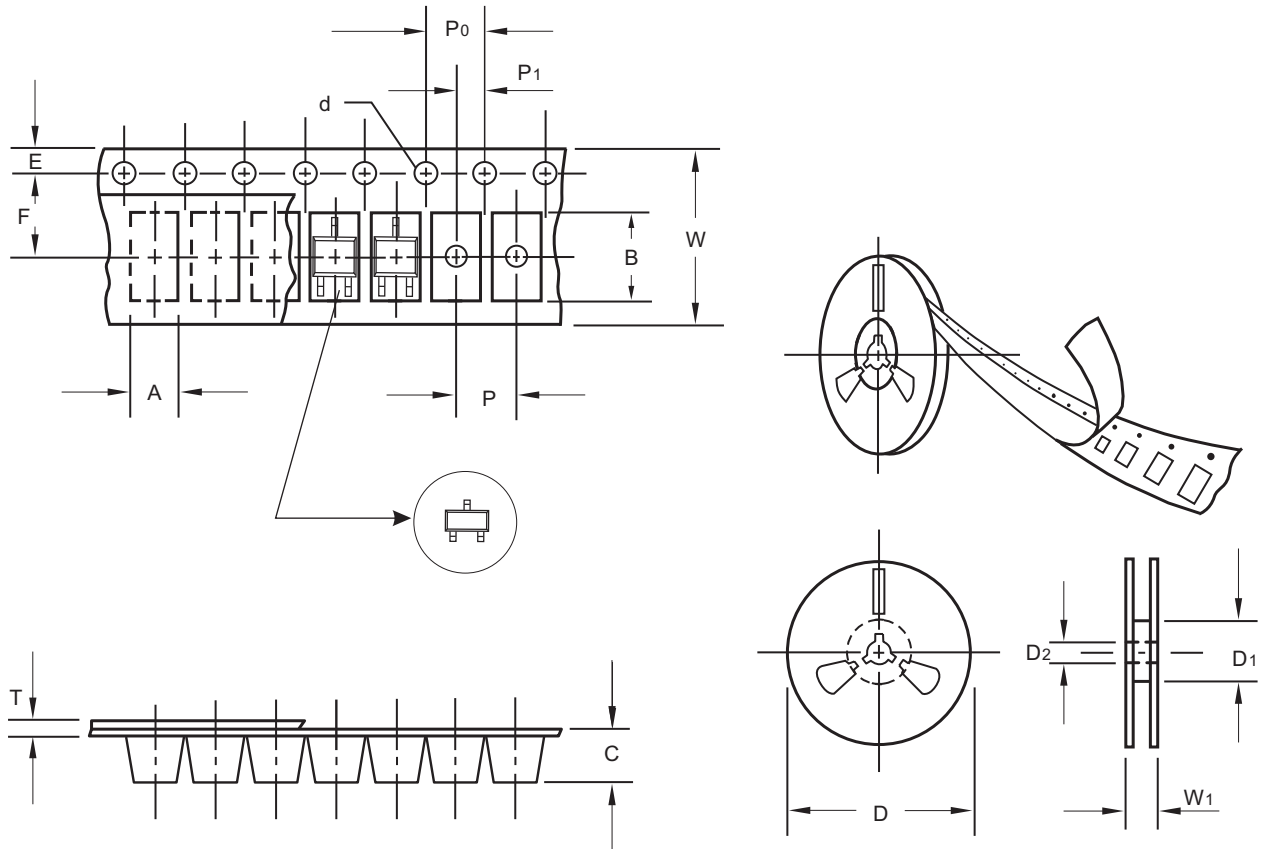
SOT-323



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-323
Carrier width	A	0.1	2.36
Carrier length	B	0.1	2.40
Carrier depth	C	0.1	1.20
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
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	3.50
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	8.00
Reel width	W1	1.0	11.40

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

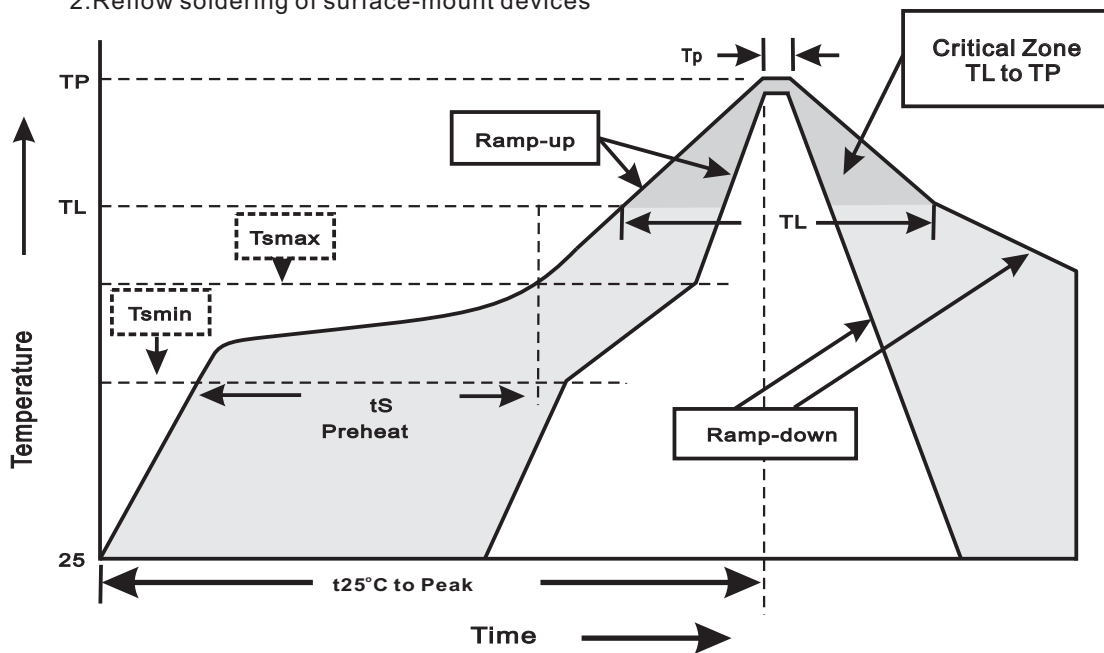
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Reel packing

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)
SOT-323	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(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{smín}) -Temperature Max(T _{smáx}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smáx} 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

BSS84W**High reliability test capabilities**

Item Test	Conditions	Reference
1. Solder Resistance	at $260\pm 5^{\circ}\text{C}$ for $10\pm 2\text{sec}$.	MIL-STD-750D METHOD-2031
2. Solderability	at $245\pm 5^{\circ}\text{C}$ for 5 sec.	MIL-STD-202F METHOD-208
3. High Temperature Reverse Bias	$V_{\text{DS}}=0.8 \times \text{BV}_{\text{DSS}}$, $V_{\text{GS}}=0\text{V}$ at $T_{\text{J}}=150^{\circ}\text{C}$ for 168 hrs.	MIL-STD-750D METHOD-1026
4. Operation Life Test	Continuous operation at max rated $T_{\text{A}}=25^{\circ}\text{C}$, $P_{\text{C}}=P_{\text{C(max)}}$ for 500hrs.	MIL-STD-750D METHOD-1027
5. Pressure Cooker	$15P_{\text{SIG}}$ at $T_{\text{A}}=121^{\circ}\text{C}$ for 4 hrs.	JESD22-A102
6. Temperature Cycling	-55°C to $+125^{\circ}\text{C}$ dwelled for 30 min. and transferred for 5min. total 10 cycles.	MIL-STD-750D METHOD-1051
7. Humidity	at $T_{\text{A}}=85^{\circ}\text{C}$, RH=85% for 1000hrs.	MIL-STD-750D METHOD-1038
8. High Temperature Storage Life	at 175°C for 1000 hrs.	MIL-STD-750D METHOD-1031