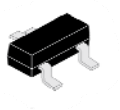
SILIICON PLANAR VOLTAGE REGULATOR DIODE BZX84BXXX



SOT-23

SOT-23
SMD Package
RoHS compliant

FEATURE:

1. This product is available in AEC-Q101 Compliant and PPAP Capable also

Note: Foe AEC-Q101 compliant products , please suffix - AQ in the part number while ordering

APPLICATIONS: Low voltage general purpose voltage regulator diode

ABSOLUTE MAXIMUM RATING (Ta = 25 ℃ Unless otherwise specified)

PARAMETER	SYMBOL	VALUE	UNIT
Working Voltage Tolerance		± 2	%
Repetitive Peak Forward Current	I_{FRM}	250	mA
Repetitive Peak Working Current	I_{ZRM}	250	mA
Power Dissipation upto Ta=25ºC	P_D [1]	300	mW
Power Dissipation upto Tc=25ºC	P_D [2]	250	mW
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	-65 to +150	°C
Junction to Ambient	$R_{th\ (j-a)}$ [1]	420	K/W

Forward Voltage at VF <0.9V at 10mA and <1.5V at 200mA

ELECTRICAL CHARACTERISTICS at (Ta = 25 ℃ Unless otherwise specified)

Device	Working Voltage VZ (+ 2%) (V)		Differential Resistance rdiff (Ω)	Temperature Coefficient S_Z (mV/K)		Differential Resistance rdiff (Ω)	I_R at V_R µA		Marking
	at I_Z test=5mA		at I_Z test=5mA	at I_Z test=5mA		at I_Z test=1mA			
	Min	Max	Max	Min	Max	Max	Max	(V)	
BZX84B4V3	4.21	4.39	90	-3.5		600	3.0	1.0	W7
BZX84B4V7	4.61	4.79	80	-3.5	0.2	500	3.0	2.0	W8
BZX84B5V1	5.00	5.20	60	-2.7	1.2	480	2.0	2.0	W9
BZX84B5V6	5.49	5.71	40	-2.0	2.5	400	1.0	2.0	WA
BZX84B6V2	6.08	6.32	10	0.4	3.7	150	3.0	4.0	WB
BZX84B6V8	6.66	6.94	15	1.2	4.5	80	2.0	4.0	WC
BZX84B7V5	7.35	7.65	15	2.5	5.3	80	1.0	5.0	WD
BZX84B8V2	8.04	8.36	15	3.2	6.2	80	0.7	5.0	WE
BZX84B9V1	8.92	9.28	15	3.8	7.0	100	0.5	6.0	WF
BZX84B10	9.80	10.20	20	4.5	8.0	150	0.2	7.0	WG

Forward Voltage at VF <0.9V at 10mA and <1.5V at 200mA

ELECTRICAL CHARACTERISTICS at (Ta = 25 ℃ Unless otherwise specified)

Device	Working Voltage VZ (+ 2%) (V)		Differential Resistance rdiff (Ω)	Temperature Coefficient S_Z (mV/K)		Differential Resistance rdiff (Ω)	I_R at V_R µA		Marking
	at I_Z test=5mA		at I_Z test=5mA	at I_Z test=5mA		at I_Z test=1mA			
	Min	Max	Max	Min	Max	Max	Max	(V)	
BZX84B11	10.78	11.22	20	5.4	9.0	150	0.1	8	WH
BZX84B12	11.76	12.24	25	6.0	10	150	0.1	8	WI
BZX84B13	12.74	13.26	30	7.0	11	170	0.1	8	WK
BZX84B15	14.70	15.30	30	9.2	13	200	0.05	10.5	WL
BZX84B16	15.68	16.32	40	10.4	14	200	0.05	11.2	WM
BZX84B18	17.64	18.36	45	12.4	16	225	0.05	12.6	WN
BZX84B20	19.60	20.40	55	14.4	18	225	0.05	14.0	WO
BZX84B22	21.56	22.44	55	16.4	20	250	0.05	15.4	WP
BZX84B24	23.52	24.48	70	18.4	22	250	0.05	16.8	WR
BZX84B27	26.46	27.54	80	21.4	25.3	300	0.05	18.9	WS
BZX84B30	29.40	30.60	80	24.4	29.4	300	0.05	21.0	WT
BZX84B33	32.34	33.66	80	27.4	33.4	325	0.05	23.1	WU
BZX84B36	35.28	36.72	90	30.4	37.4	350	0.05	25.2	WW
BZX84B39	38.22	39.78	130	33.4	41.2	350	0.05	27.3	WX
BZX84B43	42.14	43.86	150	37.6	46.6	375	0.05	30.1	WY
BZX84B47	46.06	47.94	170	42.0	51.8	375	0.05	32.9	WZ
BZX84B51	49.98	52.02	180	46.6	57.2	400	0.05	35.7	XA

Note:

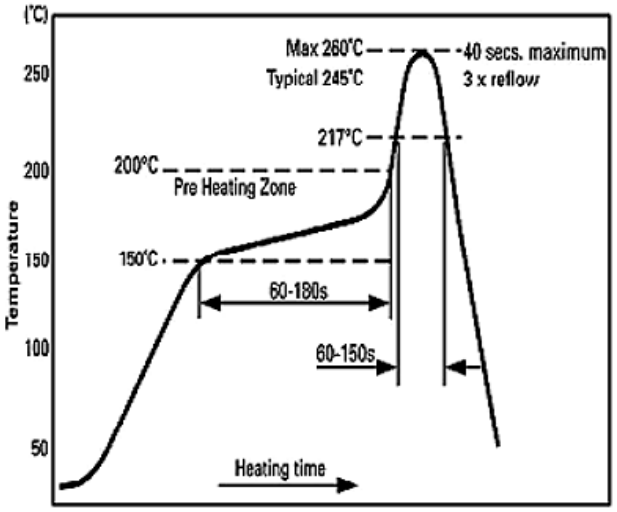
1. Device mounted on a ceramic alumna
2. Device mounted on an FR5 printed circuit board
3. Pulse Test 20ms < tp < 50ms

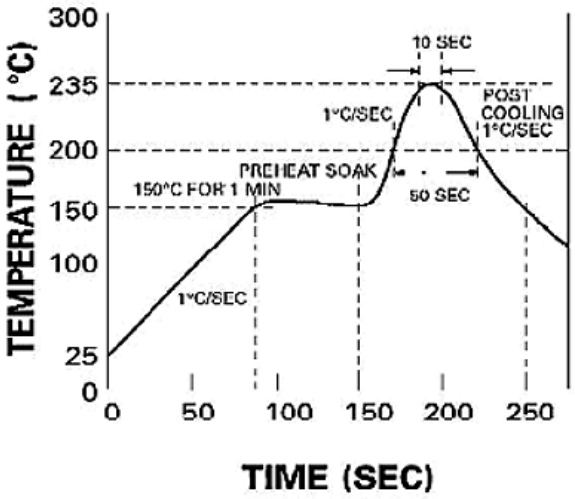
Recommended Reflow Solder Profiles

The recommended reflow solder profiles for Pb and Pb-free devices are shown below.

Figure 1 shows the recommended solder profile for devices that have Pb-free terminal plating, and where a Pb-free solder is used.

Figure 2 shows the recommended solder profile for devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with a leaded solder



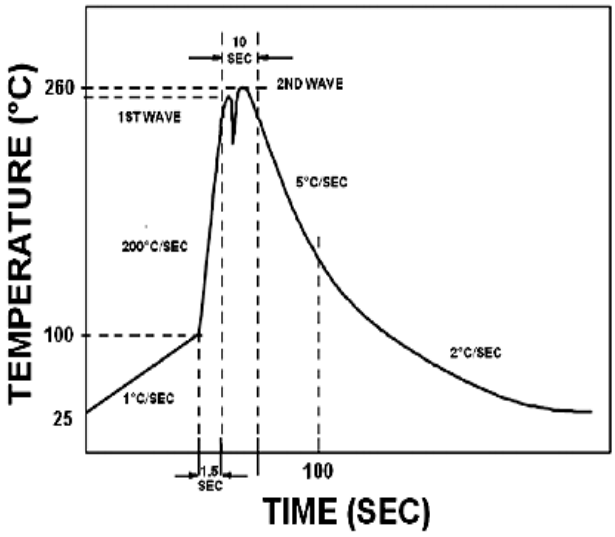


Reflow profiles in tabular form

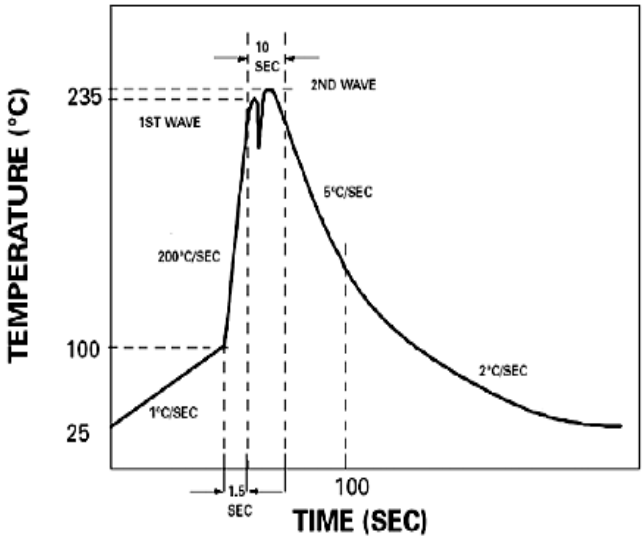
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
Preheat – Temperature Range – Time	 150-170°C 60-180 seconds	 150-200°C 60-180 seconds
Time maintained above: – Temperature – Time	 200°C 30-50 seconds	 217°C 60-150 seconds
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	40 seconds
Ramp-Down Rate	3°C/second max.	6°C/second max.

Recommended Wave Solder Profiles

The Recommended solder Profile For Devices with Pb-free terminal plating where a Pb-free solder is used



The Recommended solder Profile For Devices with Pb-free terminal plating used with leaded solder, or for devices with leaded terminal plating used with leaded solder



Wave Profiles in Tabular Form

Profile Feature	Sn-Pb System	Pb-free System
Average Ramp-Up Rate	~200°C/second	~200°C/second
Heating rate during preheat	Typical 1-2, Max 4°C/sec	Typical 1-2, Max 4°C/Sec
Final preheat Temperature	Within 125°C of Solder Temp	Within 125°C of Solder Temp
Peak Temperature	235°C	260°C max.
Time within +0 -5°C of actual Peak	10 seconds	10 seconds
Ramp-Down Rate	5°C/second max.	5°C/second max.

TYPICAL CHARACTERISTICS CURVES

Fig 1: Forward Characteristics

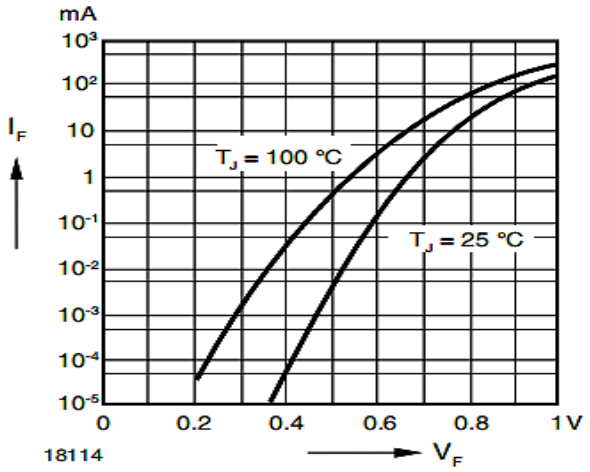


Fig 2: Admissible Power Dissipation vs. Ambient Temperature

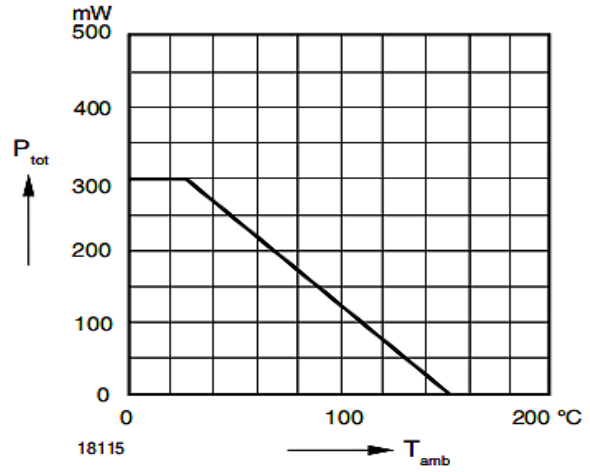


Fig 3: Dynamic Resistance vs. Zener Current

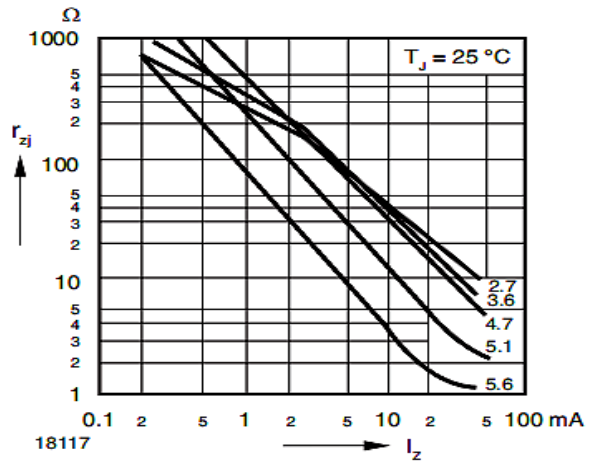


Fig 4: Dynamic Resistance vs. Zener Current

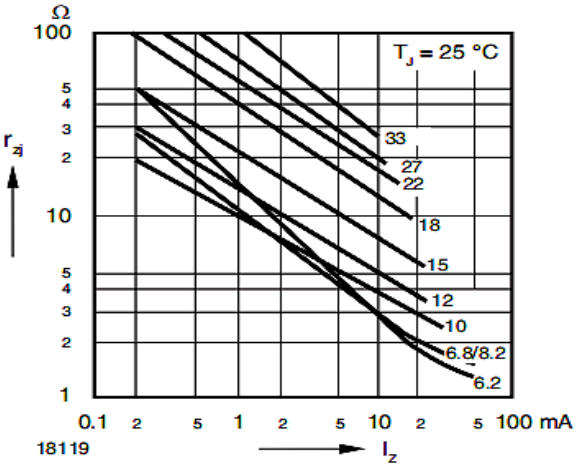


Fig 5: Dynamic Resistance vs. Zener Current

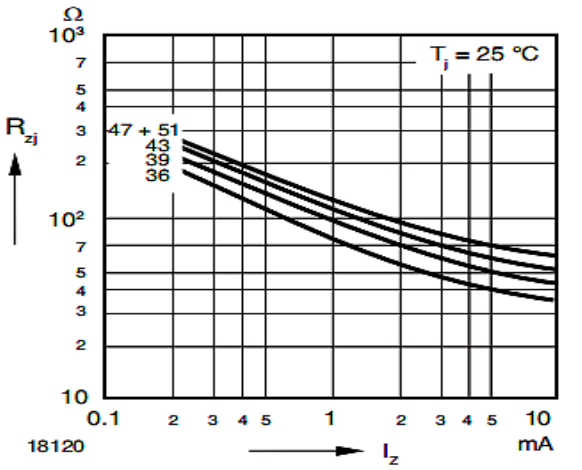
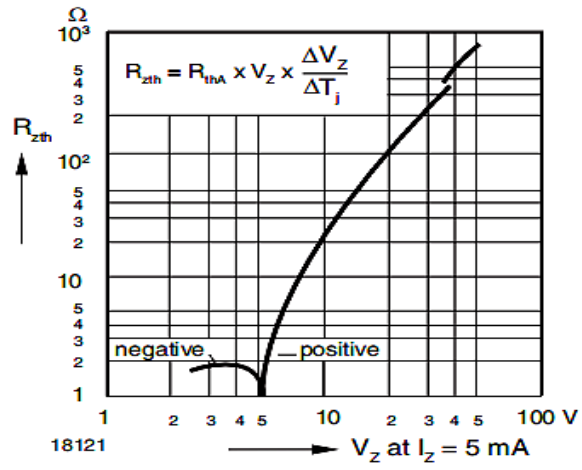


Fig 6: Thermal Differential Resistance vs. Zener Voltage



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TYPICAL CHARACTERISTICS CURVES

Fig 7: Dynamic Resistance vs. Zener Voltage

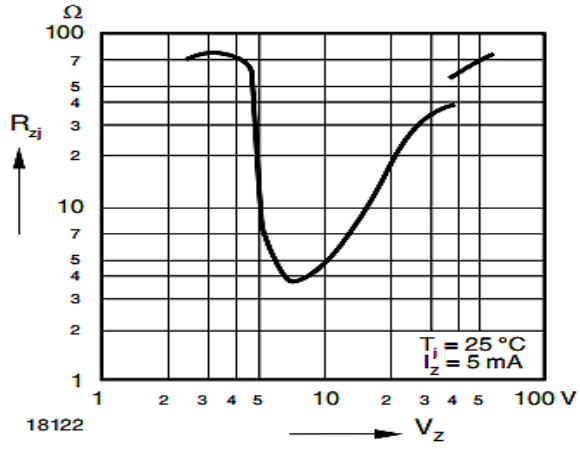


Fig 8: Temperature Dependence of Zener Voltage vs. Zener Voltage

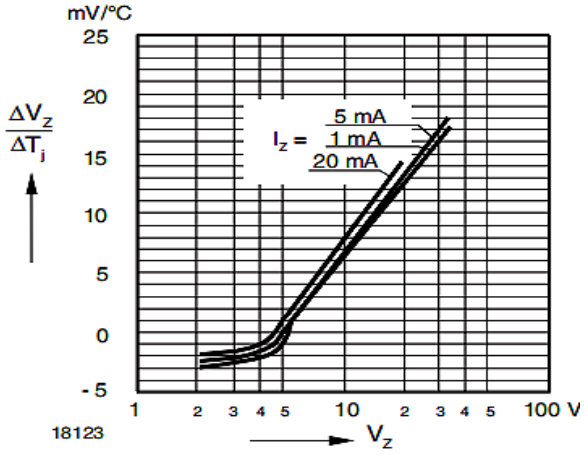


Fig 9: Change of Zener Voltage vs. Junction Temperature

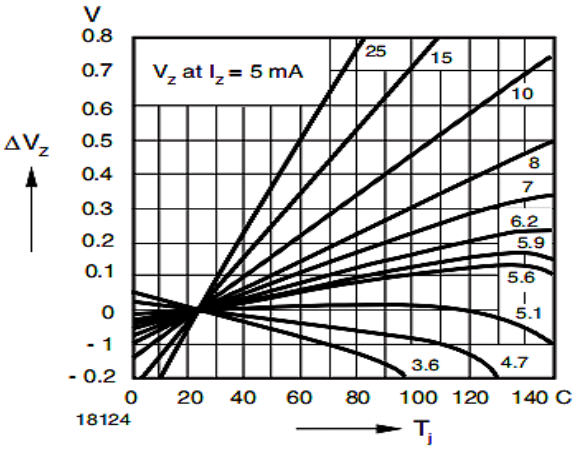


Fig 10: Temperature Dependence of Zener Voltage vs. Zener Voltage

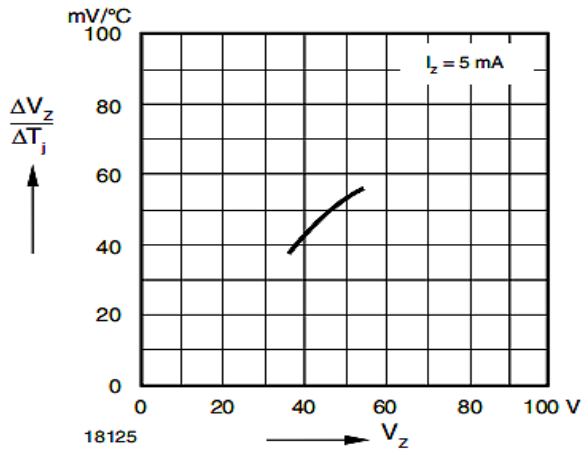


Fig 11: Change of Zener Voltage vs. Junction Temperature

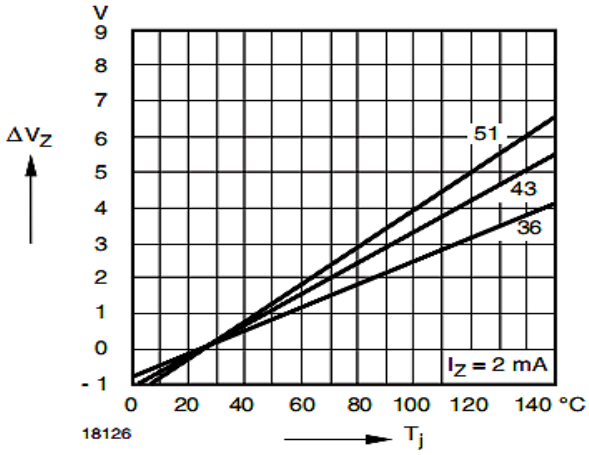
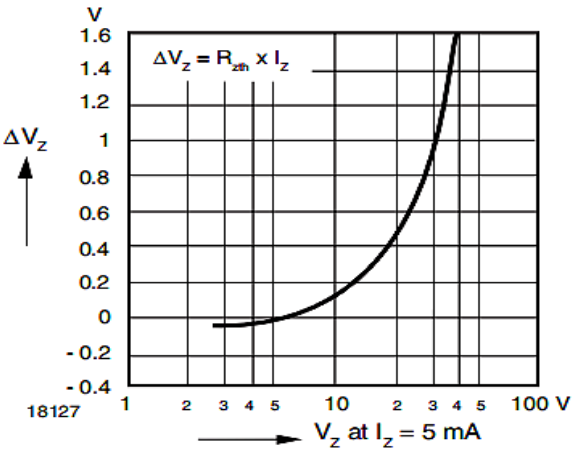


Fig 12: Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage



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TYPICAL CHARACTERISTICS CURVES

Fig 13: Change of Zener Voltage from Turn-on up to the Point of Thermal Equilibrium vs. Zener Voltage

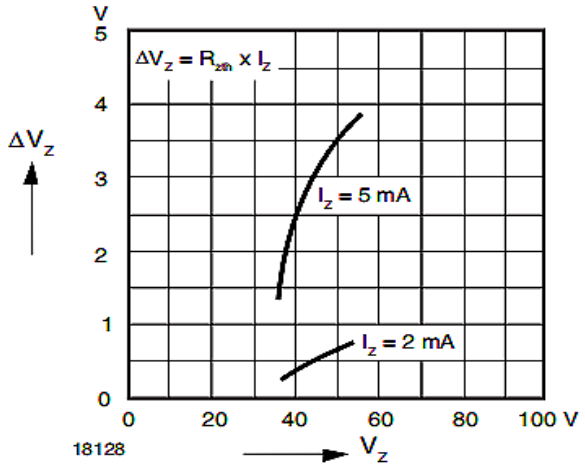


Fig 14: Breakdown Characteristics

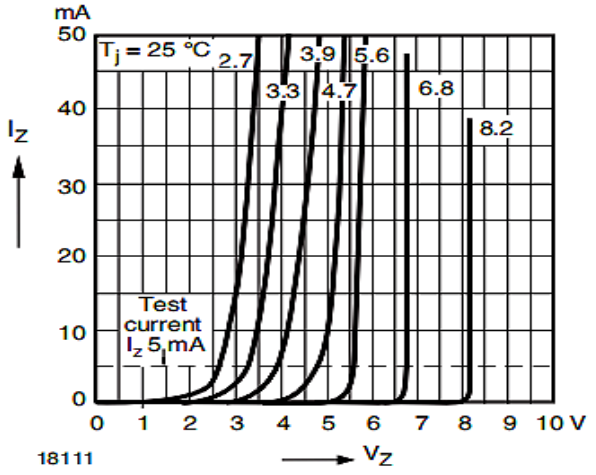


Fig 15: Breakdown Characteristics

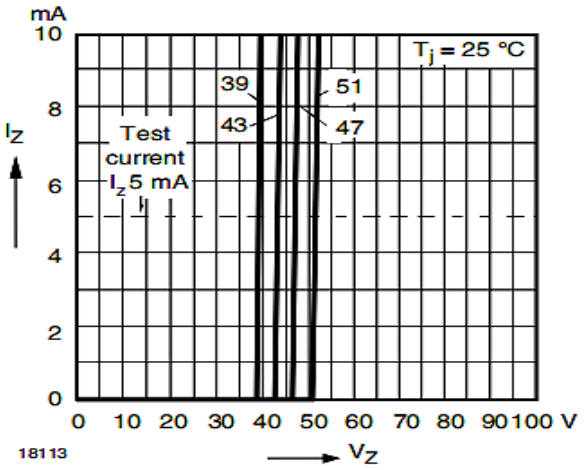
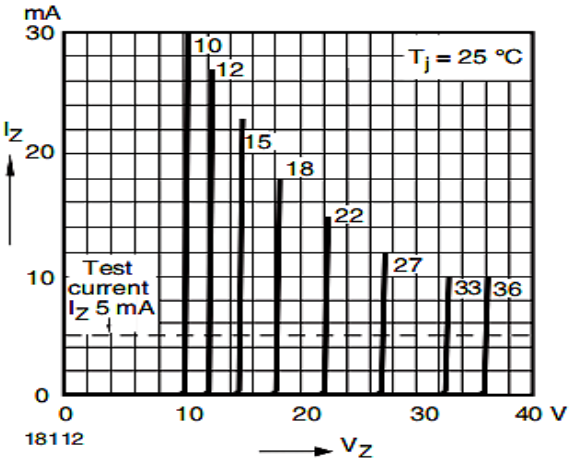
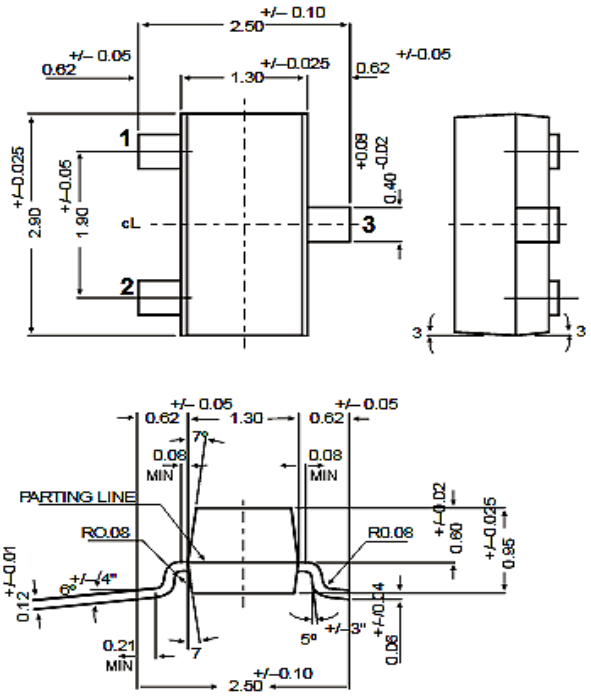


Fig 16: Breakdown Characteristics



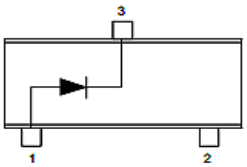
PACKAGE DETAILS

SOT-23 SMD Package

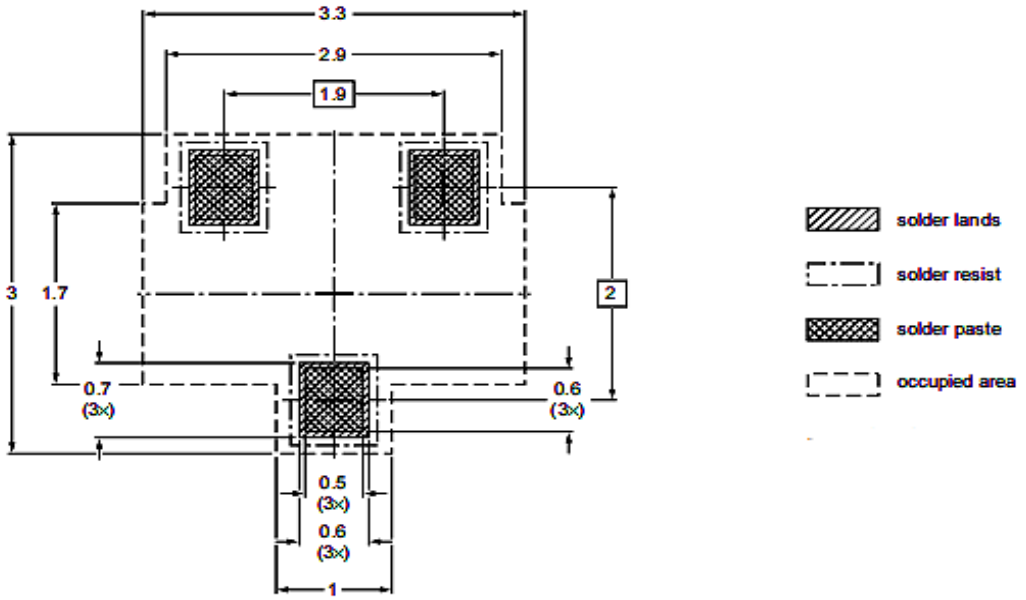


Pin Configuration

1. ANODE
2. NC
3. CATHODE

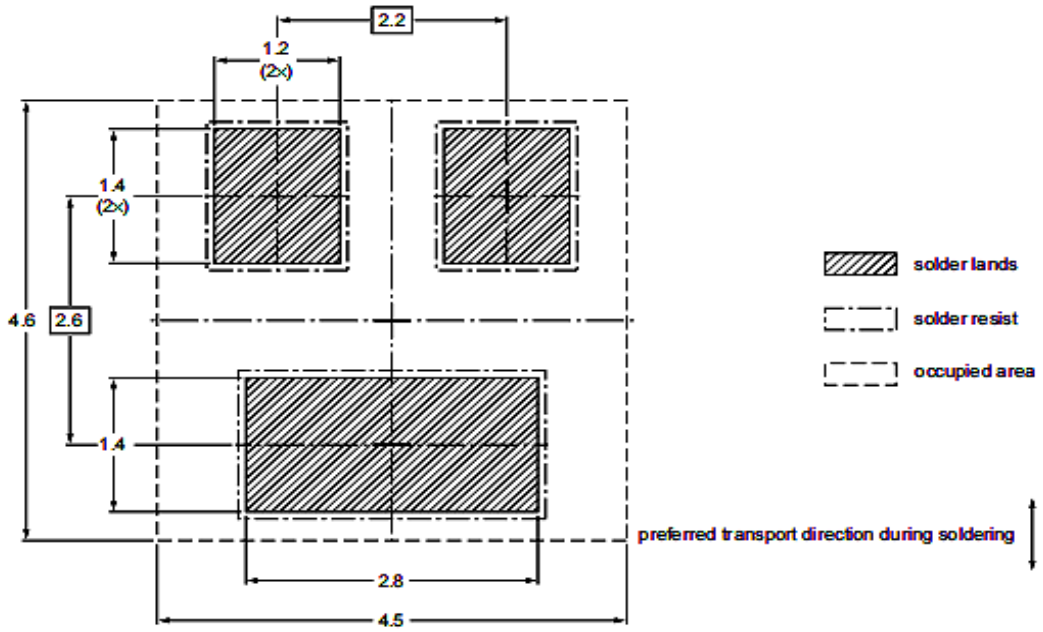


Reflow soldering footprint SOT23



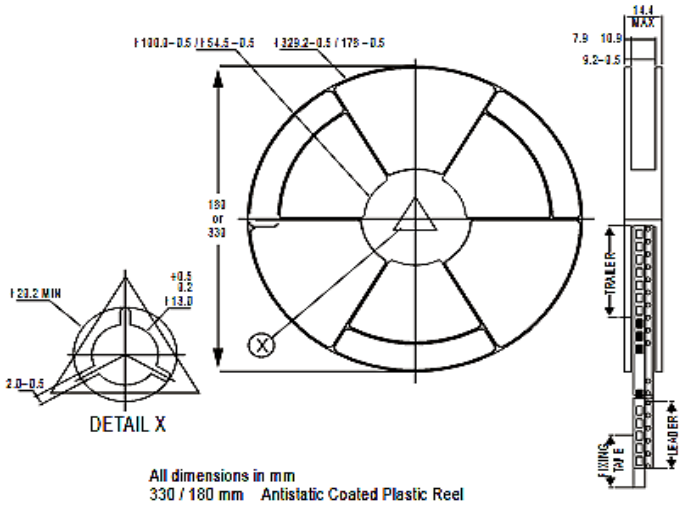
All Dimensions in mm

Wave soldering footprint SOT23



All Dimensions in mm

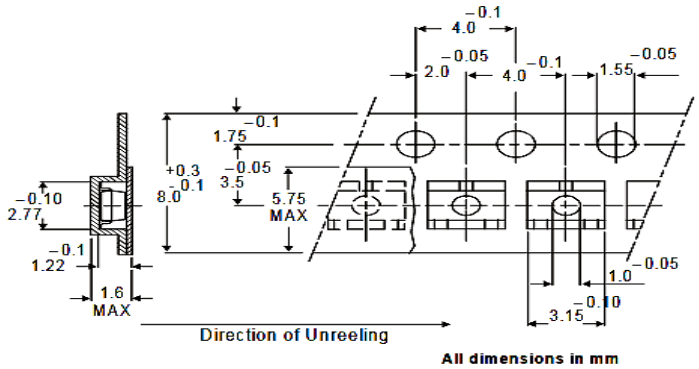
SOT-23 Package Reel Information Reel specifications for Packing (13"/7" reels)



Size of Tape	8mm	8mm
Size of reel	330mm (13")	180mm (7")
No. of Device	10,000 Pcs	3,000 Pcs

1. The bandoier of 330mm reel contains at least 10,000 device.
2. The bandoier of 180mm reel contains at least 3,000 device.
3. No more than 0.5% missing device/reel 50 empty compartments for 330mm reel. 15 empty compartments for 180mm reel.
4. Three consecutive empty places might be found provided this gap is followed by 6 consecutive devices.
5. The carrier tape (leader) starts with at least 75 empty positions (equivalent to 330 mm). In order to fix the carrier tape a self adhesive tape of 20 to 50 mm is applied. At the end of the bandolier at least 40 empty positions (equivalent to 160 mm) are there.

Tape Specification for SOT-23 Surface Mount Device



Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
SOT-23 T&R	3K/reel	136 gm/3K pcs	3" x 7.5" x 7.5"	12.0K	17" x 15" x 13.5"	192.0K	12 kgs
			9" x 9" x 9"	51.0K	19" x 19" x 19"	408.0K	28 kgs
	10K/reel	415 gm/10K pcs	13" x 13" x 0.5"	10.0K	17" x 15" x 13.5"	300.0K	16 kgs

Recommended Product Storage Environment for Discrete Semiconductor Devices

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.
If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.
The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start.
For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	**Time**	**Condition**
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH

Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).
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Continental Device India Pvt. Limited
C-120 Naraina Industrial Area, New Delhi 110 028, India.
Telephone +91-11-2579 6150, 4141 1112 Fax +91-11-2579 5290, 4141 1119
email@cdil.com www.cdil.com
CIN No. U32109DL1964PTC004291