



Continental Device India Pvt. Limited
An IATF 16949, ISO9001 and ISO 14001 Certified Company



SILICON PLANAR ZENER DIODES

2.4V to 120V, 500mW



DO-35

BZX55C2.4V ~ 120V

**DO-35 Leaded
Glass Axial Package
RoHS compliant**

GENERAL DISCRIPTION:

Best suited for Industrial, Military and Space Applications. The glass passivated diode chip in the hermetically sealed glass package with double studs provides excellent stability and reliability.

FEATURES:

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

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

ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C Unless otherwise specified)

PARAMETER	SYMBOL	VALUE	UNIT
Power Dissipation ¹	P _{TA}	500	mW
Surge Power Dissipation Pulse Width=10 ms	P _S	5.0	W
Junction Temperature	T _j	175	°C
Storage Temperature	T _{stg}	-65 to +175	°C
Operating temp	T _{opt}	-65 to +175	°C
Thermal Resistance Junction to Ambient ¹	R _{th(j-a)}	0.3	°C/mW
Forward Voltage @ I _F =200mA (BZX55C 2.4V - 27V)	V _F	1.2	V
Forward Voltage @ I _F =200mA (BZX55C 30V - 120V)	V _F	1.5	V

Note:

1. On infinite heatsink with 4mm lead length.



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ELECTRICAL CHARACTERISTICS at (Ta = 25 °C Unless otherwise specified)

Device	V _{ZT} @ I _{ZT} ¹		r _{ZT} @ I _{ZT} ¹	I _{ZT}	r _{ZK} @ I _{ZK}	I _{ZK}	Temp. Coeff of Zener Voltage typ	I _R @ V _R		V _R	I _{ZM} T _{amb} 50°C
	Min (V)	Max (V)						@25°C Max (µA)	@150°C Max (µA)		
BZX55C 2V4	2.28	2.56	85	5.0	600	1.0	-0.07	50	100	1.0	155
BZX55C 2V7	2.50	2.90	85	5.0	600	1.0	-0.07	10	50	1.0	135
BZX55C 3V0	2.80	3.20	85	5.0	600	1.0	-0.07	4.0	40	1.0	125
BZX55C 3V3	3.10	3.50	85	5.0	600	1.0	-0.06	2.0	40	1.0	115
BZX55C 3V6	3.40	3.80	85	5.0	600	1.0	-0.06	2.0	40	1.0	105
BZX55C 3V9	3.70	4.10	85	5.0	600	1.0	-0.05	2.0	40	1.0	95
BZX55C 4V3	4.00	4.60	75	5.0	600	1.0	-0.03	1.0	20	1.0	90
BZX55C 4V7	4.40	5.00	60	5.0	600	1.0	-0.01	0.5	10	1.0	85
BZX55C 5V1	4.80	5.40	35	5.0	500	1.0	0.01	0.1	2.0	1.0	80
BZX55C 5V6	5.20	6.00	25	5.0	450	1.0	0.03	0.1	2.0	1.0	70
BZX55C 6V2	5.80	6.60	10	5.0	200	1.0	0.04	0.1	2.0	2.0	64
BZX55C 6V8	6.40	7.20	8	5.0	150	1.0	0.05	0.1	2.0	3.0	58
BZX55C 7V5	7.00	7.90	7	5.0	50	1.0	0.06	0.1	2.0	5.0	53
BZX55C 8V2	7.70	8.70	7	5.0	50	1.0	0.06	0.1	2.0	6.2	47
BZX55C 9V1	8.50	9.60	10	5.0	50	1.0	0.07	0.1	2.0	6.8	43
BZX55C 10	9.40	10.60	15	5.0	70	1.0	0.07	0.1	2.0	7.5	40
BZX55C 11	10.40	11.60	20	5.0	70	1.0	0.07	0.1	2.0	8.2	36
BZX55C 12	11.40	12.70	20	5.0	90	1.0	0.07	0.1	2.0	9.1	32
BZX55C 13	12.40	14.10	26	5.0	110	1.0	0.08	0.1	2.0	10	29
BZX55C 15	13.80	15.60	30	5.0	110	1.0	0.08	0.1	2.0	11	27
BZX55C 16	15.30	17.10	40	5.0	170	1.0	0.08	0.1	2.0	12	24
BZX55C 18	16.80	19.10	50	5.0	170	1.0	0.08	0.1	2.0	13	21
BZX55C 20	18.80	21.20	55	5.0	220	1.0	0.08	0.1	2.0	15	20
BZX55C 22	20.80	23.30	55	5.0	220	1.0	0.08	0.1	2.0	16	18
BZX55C 24	22.80	25.60	80	5.0	220	1.0	0.09	0.1	2.0	18	16
BZX55C 27	25.10	28.90	80	5.0	220	1.0	0.09	0.1	2.0	20	14
BZX55C 30	28.00	32.00	80	5.0	220	1.0	0.09	0.1	2.0	22	13
BZX55C 33	31.00	35.00	80	5.0	220	1.0	0.09	0.1	2.0	24	12
BZX55C 36	34.00	38.00	80	5.0	220	1.0	0.09	0.1	2.0	27	11
BZX55C 39	37.00	41.00	90	2.5	500	0.5	0.09	0.1	5.0	30	10
BZX55C 43	40.00	46.00	90	2.5	600	0.5	0.09	0.1	5.0	33	9.2
BZX55C 47	44.00	50.00	110	2.5	700	0.5	0.09	0.1	5.0	36	8.5
BZX55C 51	48.00	54.00	125	2.5	700	0.5	0.09	0.1	10	39	7.8
BZX55C 56	52.00	60.00	135	2.5	1000	0.5	0.09	0.1	10	43	7.0

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ELECTRICAL CHARACTERISTICS at (Ta = 25 °C Unless otherwise specified)

Device	V_{ZT} @ I_{ZT} ¹		r_{ZT} @ I_{ZT} ¹	I_{ZT}	r_{ZK} @ I_{ZK}	I_{ZK}	Temp. Coeff of Zener Voltage typ	I_R @ V_R		V_R	I_{ZM} T_{amb} 50°C
	Min (V)	Max (V)	Max (Ω)	(mA)	Max (Ω)	(mA)	(%/°C)	@25°C Max (µA)	@150°C Max (µA)	(V)	Max (mA)
BZX55C 62	58.00	66.00	150	2.5	1000	0.5	0.09	0.1	10	47	6.4
BZX55C 68	64.00	72.00	200	2.5	1000	0.5	0.09	0.1	10	51	5.9
BZX55C 75	70.00	80.00	250	2.5	1500	0.5	0.09	0.1	10	56	5.3
BZX55C 82	77.00	87.00	300	2.5	2000	0.5	0.09	0.1	10	62	4.8
BZX55C 91	85.00	96.00	450	1.0	5000	0.1	0.09	0.1	10	68	4.4
BZX55C 100	94.00	106	450	1.0	5000	0.1	0.09	0.1	10	75	4.0
BZX55C 110	104	116	600	1.0	5000	0.1	0.09	0.1	10	82	3.6
BZX55C 120	114	127	800	1.0	5000	0.1	0.09	0.1	10	91	3.3

Note:

1. Pulse Condition : 20ms ≤ tp ≤50ms . Duty Cycle <2%

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.

Figure 1

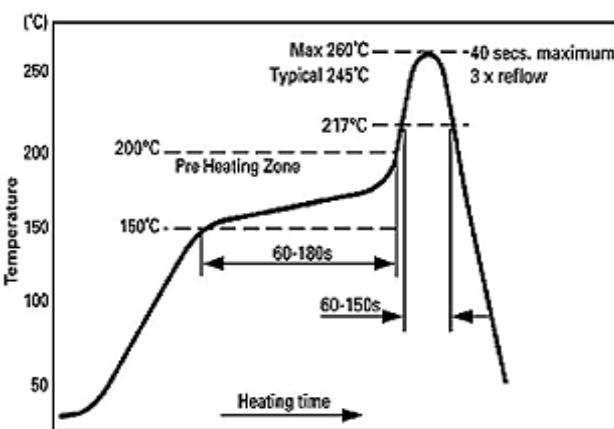
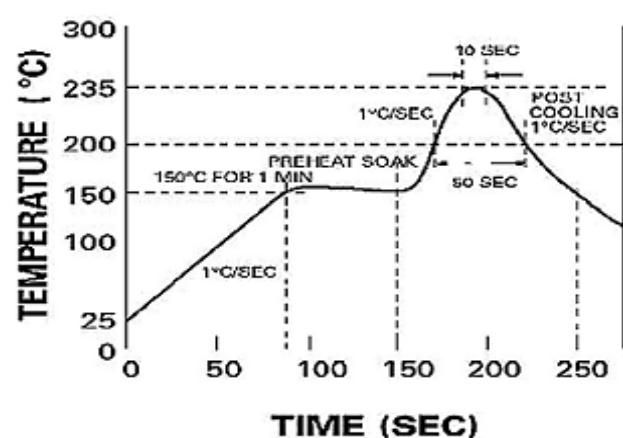


Figure 2

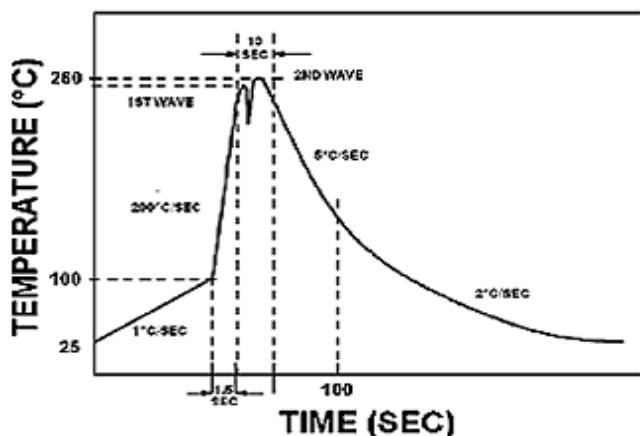


Reflow profiles in tabular form

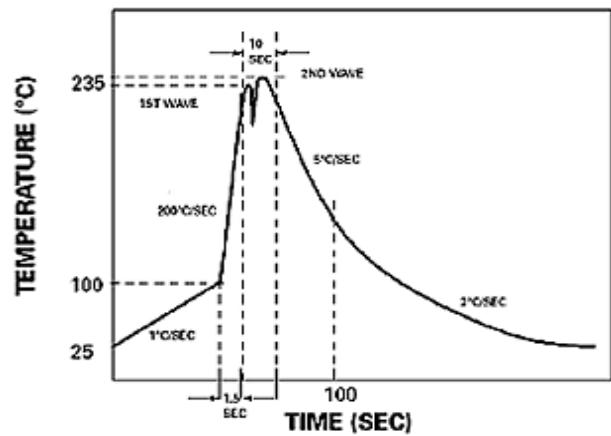
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
Preheat		
– Temperature Range	150-170°C	150-200°C
– Time	60-180 seconds	60-180 seconds
Time maintained above:		
– Temperature	200°C	217°C
– Time	30-50 seconds	60-150 seconds
Peak Temperature	235°C	260°C max.
Time 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 CHARACTERISTIC CURVES

Fig 1: Thermal Resistance vs. Lead Length

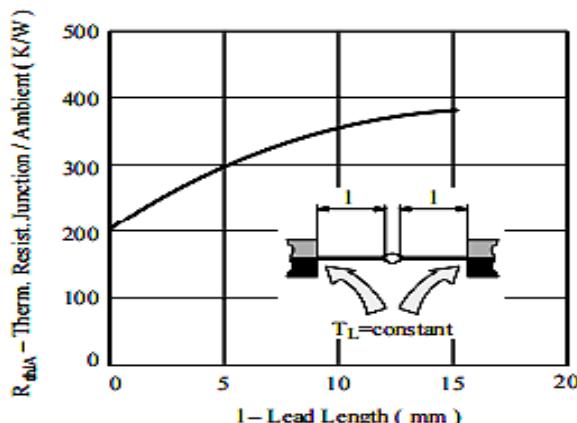


Fig 2: Total Power Dissipation vs. Ambient Temperature

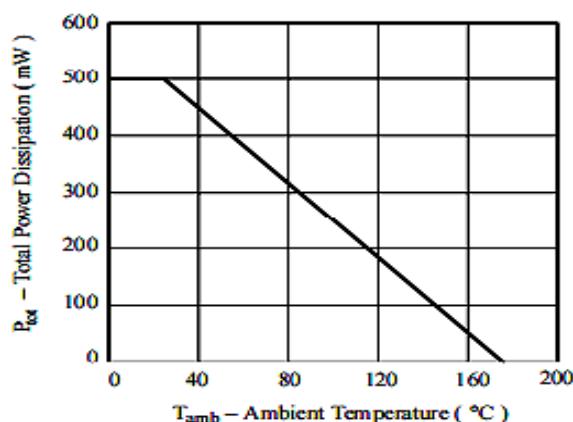
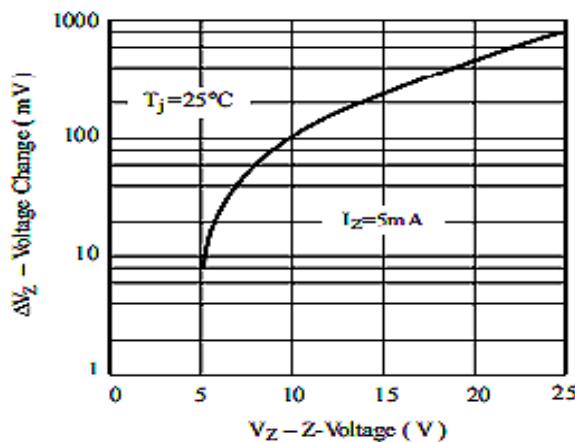

 Fig 3: Typical Change of Working Voltage under Operating Conditions at T_{amb}=25°C


Fig 4: Typical Change of Working Voltage vs. Junction Temperature

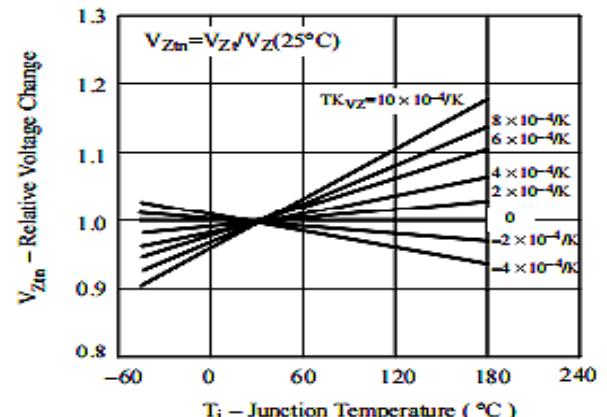
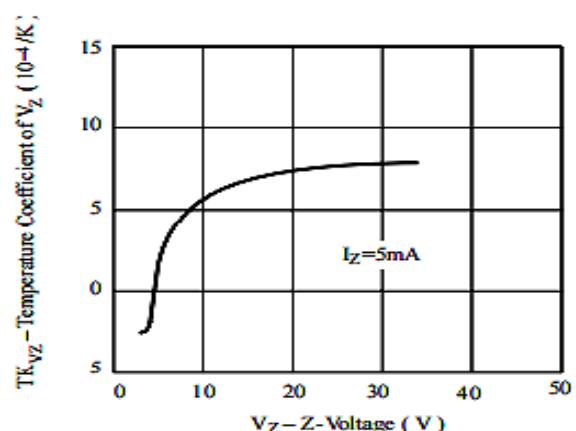
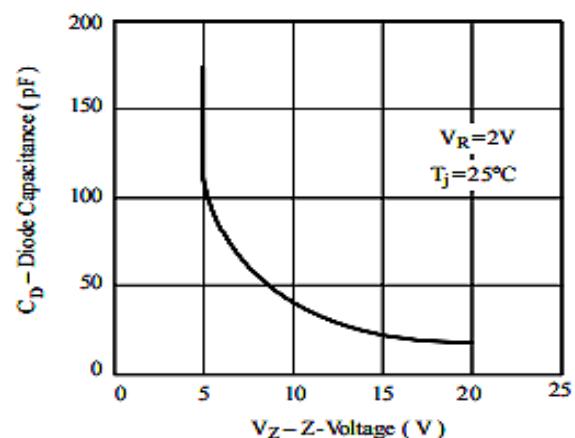

 Fig 5: Temperature Coefficient of V_Z vs. Z-Voltage


Fig 6: Diode Capacitance vs. Z-Voltage



TYPICAL CHARACTERISTIC CURVES

Fig 7: Forward Current vs. Forward Voltage

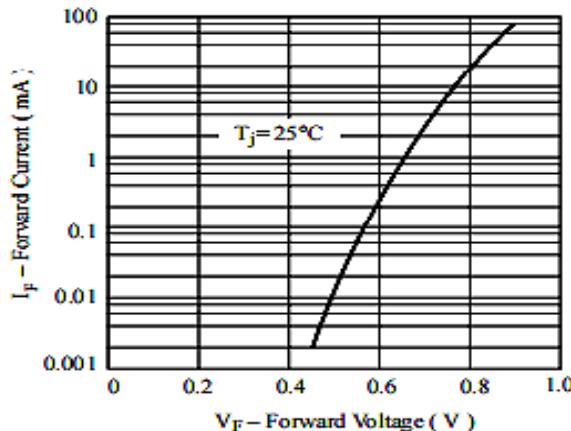


Fig 8: Z-Current vs. Z-Voltage

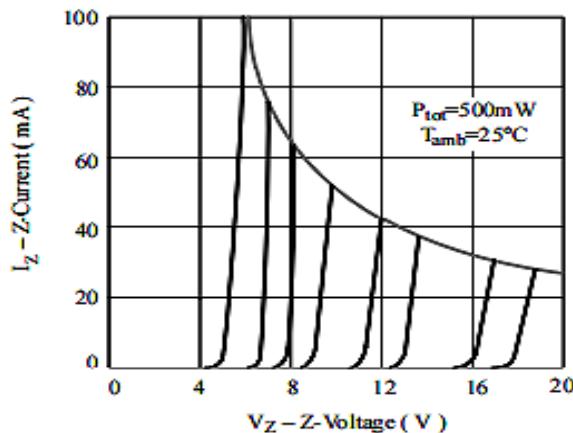


Fig 9: Z-Current vs. Z-Voltage

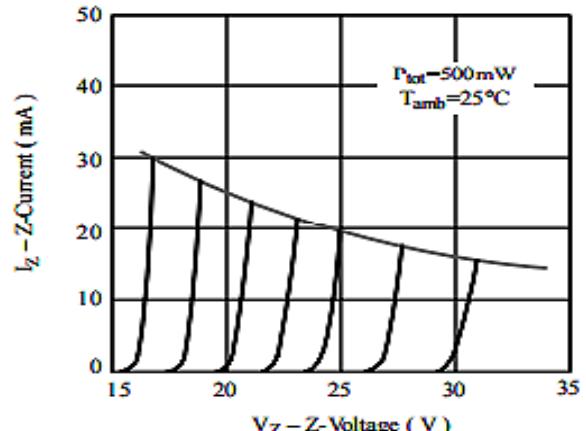


Fig 10: Differential Z-Resistance vs. Z-Voltage

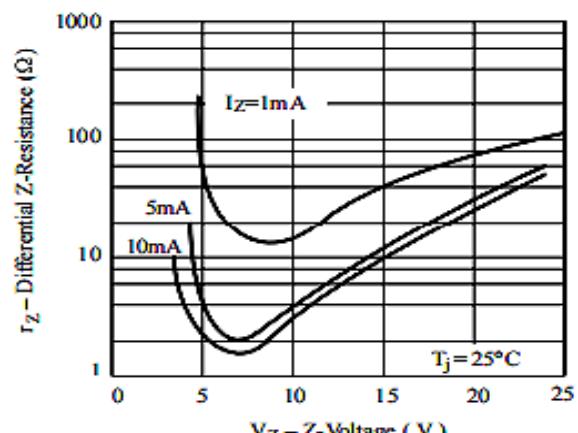
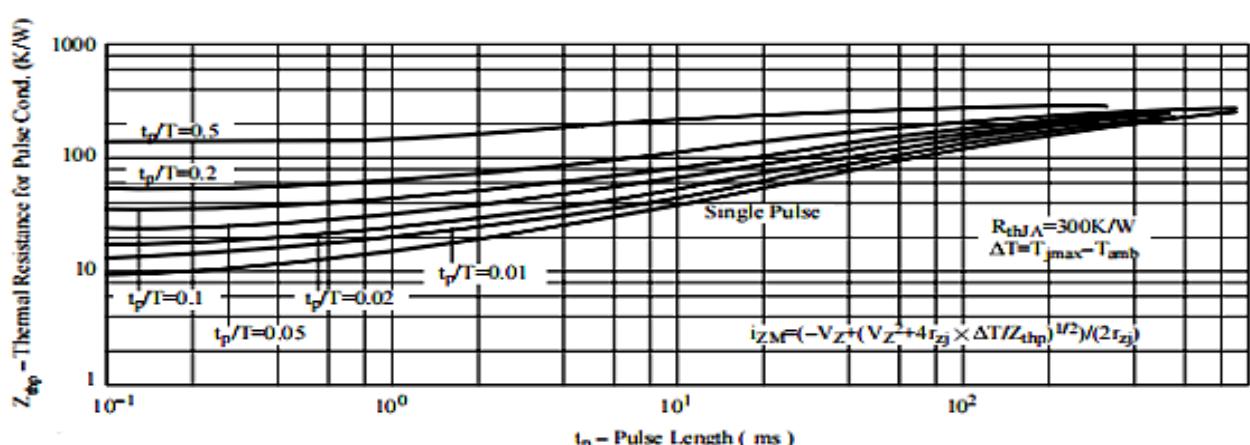


Fig 11: Thermal Response


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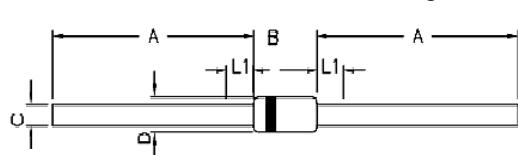
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PACKAGE DETAILS

DO-35 Glass Axial Package



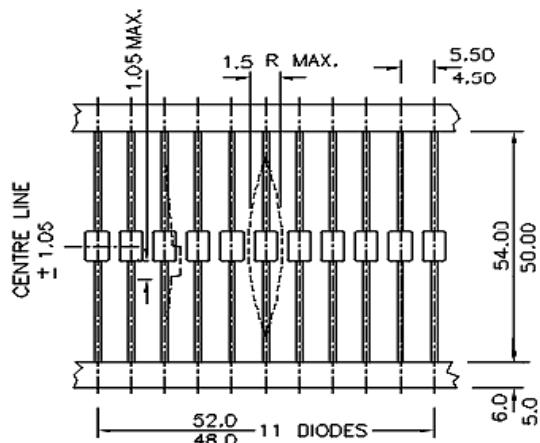
DIM	MIN	MAX
A	27.5	--
B	--	3.9
C	--	0.5
D	--	1.9

Note:

Cathode is Marked by Band

All Dimensions are in mm

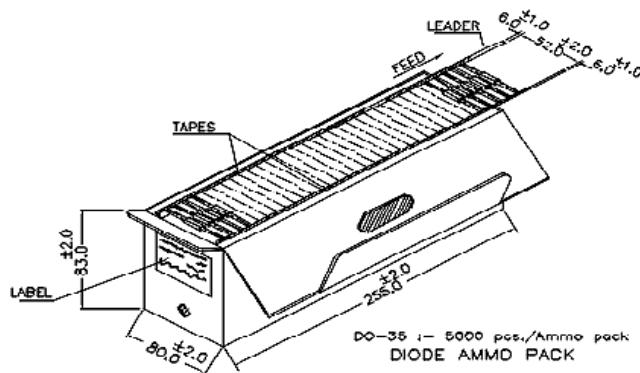
DO-35, 52mm Taping Specification



52mm Taping Specification

1. T & A Indicates Axial Tape & Ammo Packing (52 mm Tape Spacing)
2. 300 mm(min) leader tape on every spool
3. No. of empty places allowed 0.25% without Consecutive empty places
4. Ends of leads shall preferably not protrude beyond the tapes
5. Components shall be held sufficiently in the tape or tapes so that they can not come free in normal handling.

All Dimensions are in mm



Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Qty
DO-35 T&A	5K/ammo box	0.88kg/5K pcs	10"X3.5"X3.5"	5.0K	12.7"X12.7"X20"	125.0K	25Kgs

on request also available in 26 mm Tape and Ammo Pack

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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

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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).

CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.



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