SILICON HIGH SPEED SWITCHING DIODE

1N914
1N914B
1N916

DO-35

DO-35 Leaded
Glass Axial Package
RoHS compliant

Device marking

Part number e.g. Device 1N914: **1N914**

GENERAL DESCRIPTION:

The 1N914_B, 1N916 are a high-speed switching diode fabricated in planar technology, and encapsulated in a hermetically sealed leaded glass DO-35 package

FEATURES:

1. Hermetically sealed leaded glass DO-35 package
2. High switching speed: max. 4 ns
3. Continuous reverse voltage:max. 75 V
4. Repetitive peak reverse voltage:max. 100 V
5. Recurrent Peak Forward Current : 225mA
6. This product is available in AEC-Q101 Compliant and PPAP Capable also.

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

APPLICATION:

1. High-speed switching
2. General purpose Industrial, Military and Space switching applications.
3. Extremely low leakage and very high reliability applications.

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

PARAMETER		SYMBOL	VALUE	UNIT
Maximum Repetitive Reverse Voltage		V_{RRM}	100	V
Continuous Reverse Voltage		V_R	75	V
Average Rectified Forward Current	T_a = 25 °C	$I_{F(AV)}$	75	mA
	T_a =150 °C		10	mA
DC Forward Current		I_F	75	mA
Recurrent Peak Forward Current		I_{FRM}	225	mA
Non-Repetitive Peak Forward Surge Current	tp=1s	I_{FSM}	500	mA
Power Dissipation		P_{tot}	250	mW
Storage Temperature Range		T_{STG}	-65 to +200	°C
Operating Junction Temperature Range		T_J	-65 to +175	°C

THERMAL RESISTANCE

PARAMETER	SYMBOL	TEST CONDITIONS	VALUE	UNIT
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	lead length 10 mm [1]	500	K/W
Thermal resistance from junction to tie-poin	$R_{\theta J\text{-}tp}$	lead length 10 mm	240	K/W

Note:

1. Device mounted on a printed circuit-board without metallization pad.

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

PARAMETER		SYMBOL	TEST CONDITIONS	VALUE			UNIT
				MIN	TYP	MAX	
Forward Voltage	**IN914/916**	V_F	I_F=10mA	--	--	1.0	V
	1N914B		I_F=5mA	--	0.62	0.72	V
			I_F=100mA	--	--	1.0	V
Reverse Leakage		I_R	V_R=20V	--	--	25	nA
			V_R=20V; T_A = 150°C	--	--	50	µA
			V_R=75V	--	--	5.0	µA
Reverse Breakdown Voltage		V_{BR}	I_R=100µA	100	--	--	V
Diode Capacitance		C_D	V_R=0; f = 1.0MHz		--	2.5	pF
Reverse Recovery Time		t_{rr}	I_F=10mA to I_R=10mA, R_L=100Ω measured at I_R=1mA	--	--	8	ns
			I_F=10mA to I_R=60mA, R_L=100Ω measured at I_R=1mA	--	--	4	ns

Note:

2. These ratings are limiting values above which the serviceability of the diode may be impaired.
3. Non-recurrent square wave P_W = 8.3ms

TYPICAL CHARACTERISTICS CURVES

Fig 1:Maximum permissible continuous forward current vs ambient temperature.

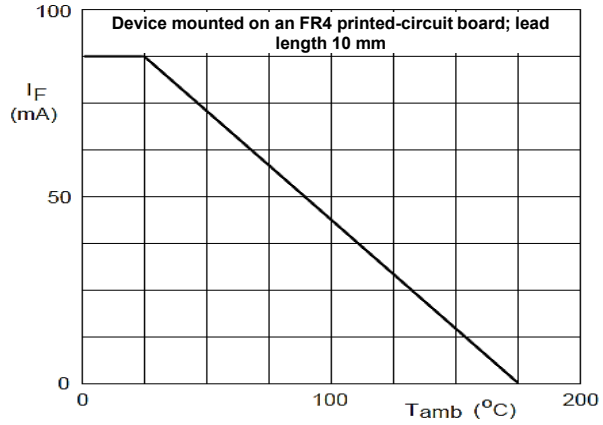


Fig 3: Reverse Current vs. Junction temperature

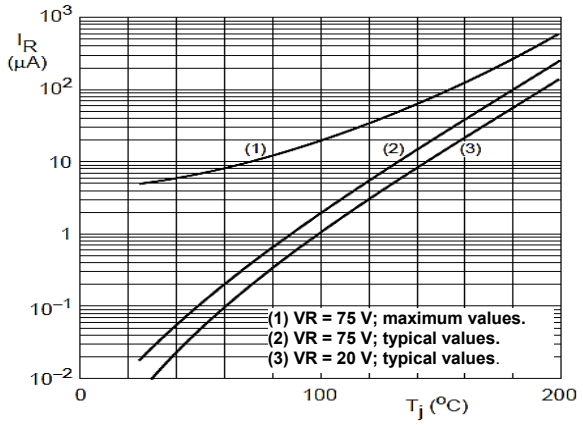


Fig 2: Forward Current vs. Forward Voltage

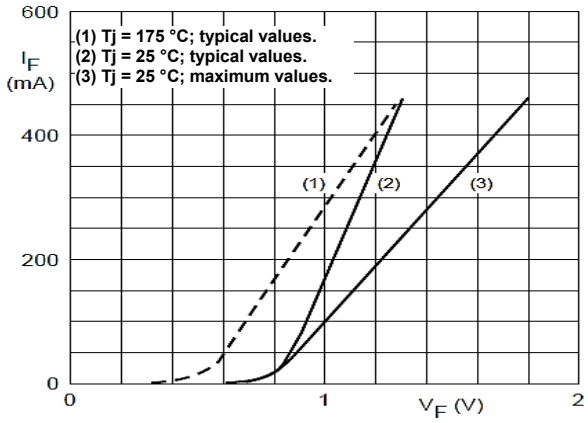


Fig.4 Diode capacitance vs reverse voltage; typical values.

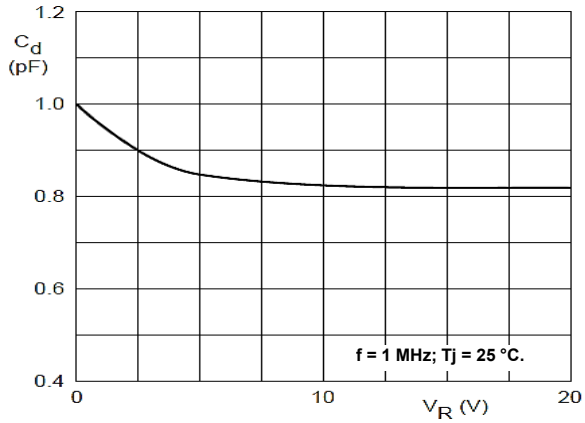
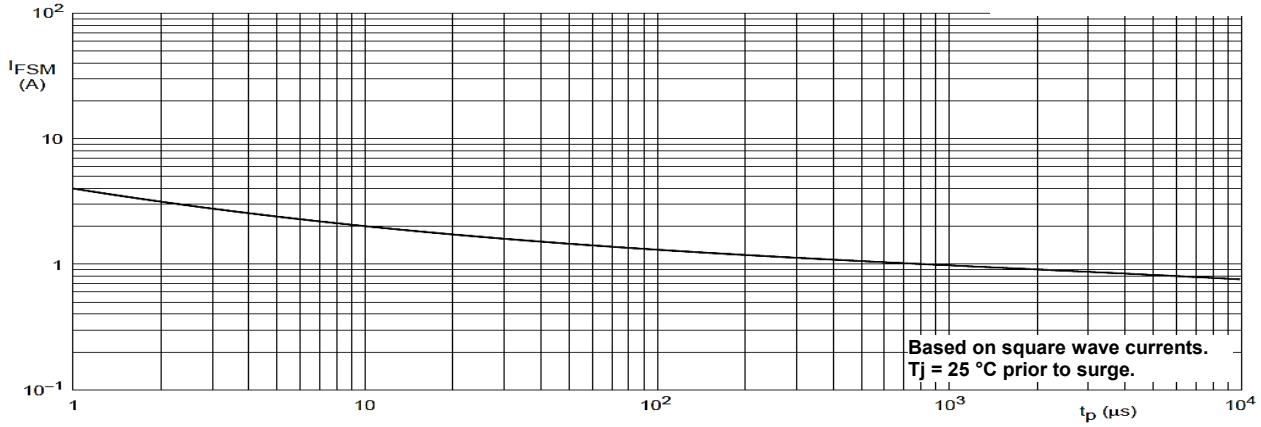
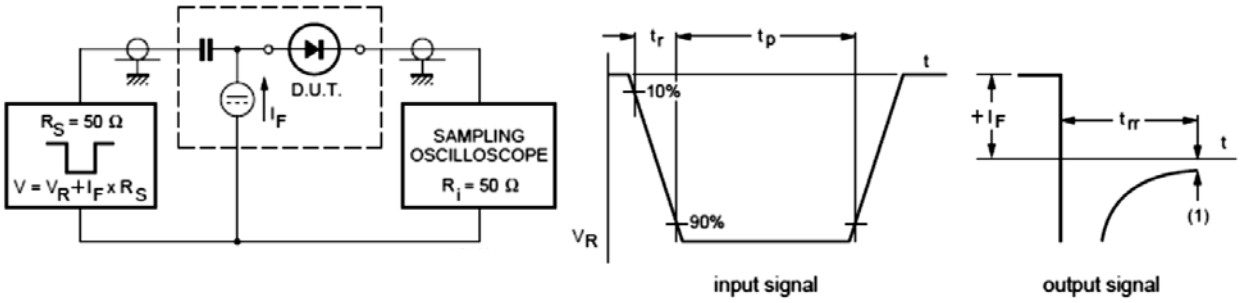


Fig.5 Maximum permissible non-repetitive peak forward current as a function of pulse duration.



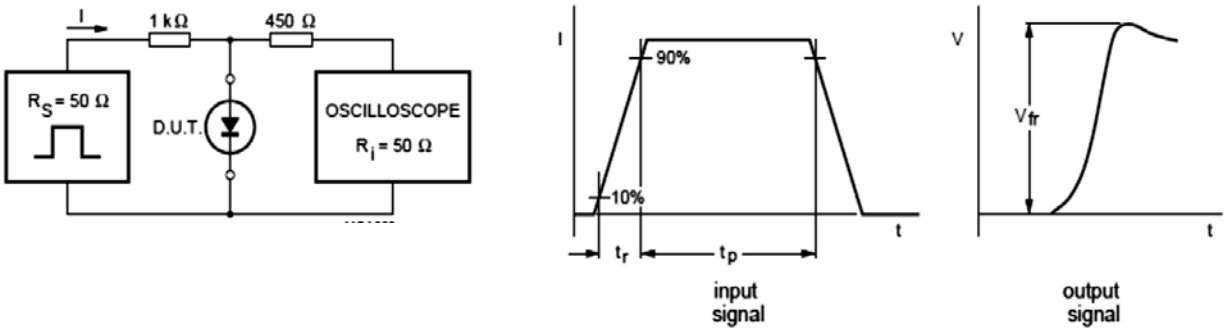
TEST CIRCUITS AND WAVEFORMS

Fig.6 Reverse recovery voltage test circuit and waveforms.



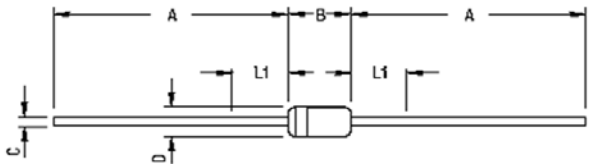
(1) I_R = 1 mA.

Fig.7 Forward recovery voltage test circuit and waveforms.



Package Details

DO-35 Leaded Glass Axial Package



DIM	MIN	MAX
A	25.4	38.1
B	3.05	5.08
C	--	0.50
D	1.53	2.28
L1	--	1.27

All dimensions are in mm

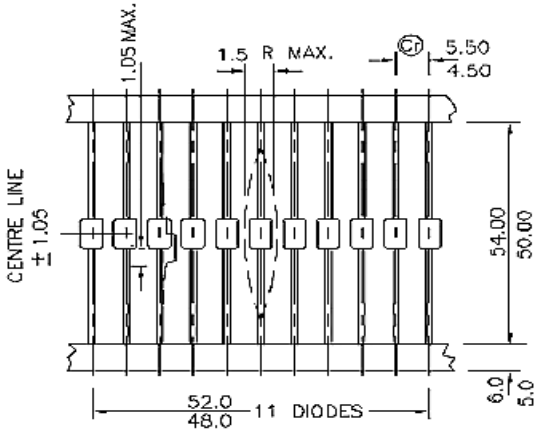
Note:

1. Lead diameter. In zone L1, is not controlled, to allow for flash, lead finish, build up and minor irregularities other than heat slugs.
2. Cathode is marked by Black Band.

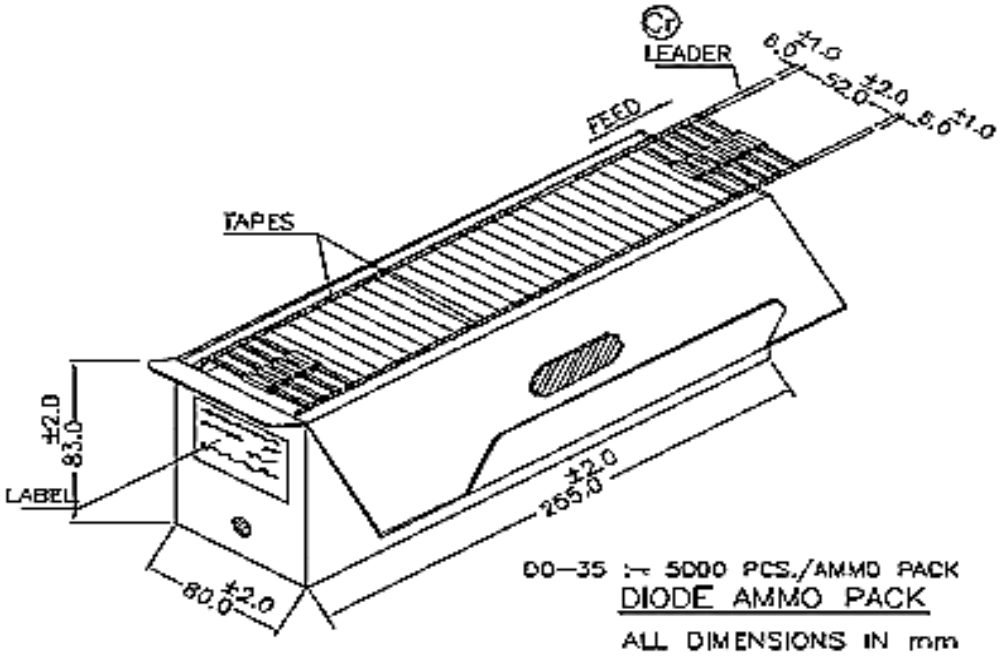
DO-35 TAPING SPECIFICATION

1. T & A Indicate Axial Tape & AMMO Packing (52mm Tape Spacing)
2. 300mm (min) Leader Tape On Every spool.
3. No of empty Places Allowed 0.25% without Consecutive Empty Places
4. End 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
6. DO-35: **SPQ: 5000pc/Tape, MOQ:100K pcs.(20Tapes)**

Axial Tape details



AMMO Packing details



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

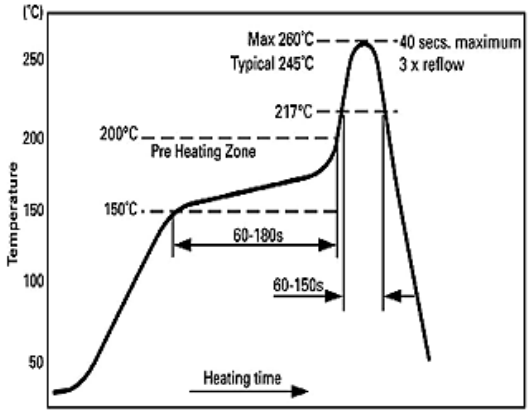
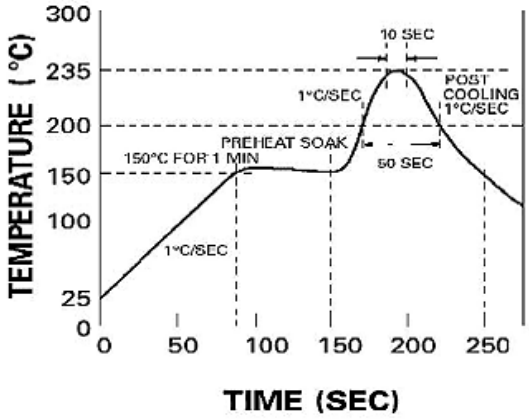


Figure 2

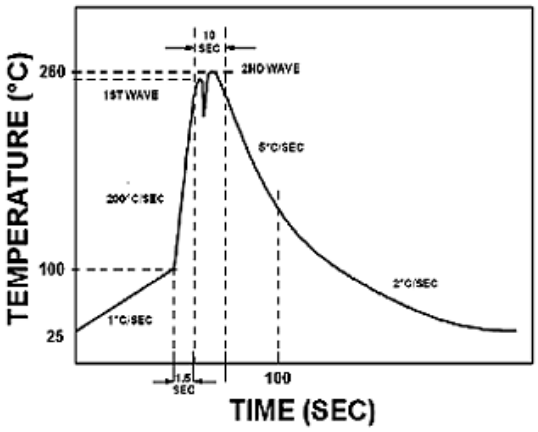


Reflow profiles in tabular form

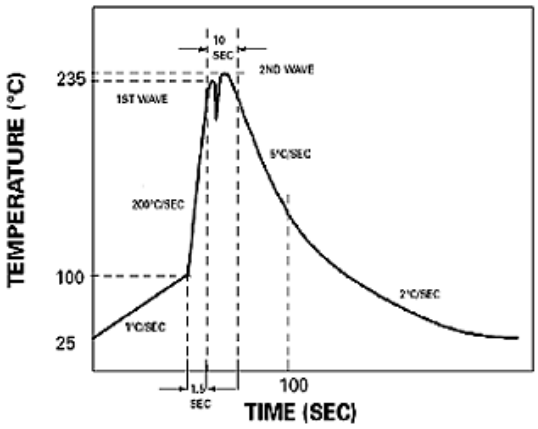
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
Preheat – Temperature Range – Time	 150-170°C 60-180 seconds	 150-200°C 60-180 seconds
Time maintained above: – Temperature – Time	 200°C 30-50 seconds	 217°C 60-150 seconds
Peak Temperature	235°C	260°C max.
Time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

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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