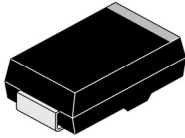
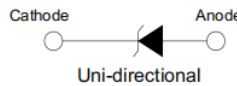


3000W Surface Mount Transient Voltage Suppressors



DO-214AB (SMC)



SMDJ5.0A/CA ~

**SMDJ220A/CA
DO-214AB(SMC)
Surface Mount
Plastic Package
RoHS compliant**

FEATURES:

1. Peak power dissipation 3000W @10 x 1000 us Pulse
2. Low profile package.
3. Excellent clamping capability.
4. Typical I_R less than 2uA when V_{BR} above 12V.
5. Glass passivated junction.
6. Fast response time: typically less than 1.0ps from 0 Volts to BV min
7. IEC 61000-4-2 ESD 30KV(Air), 30KV(Contact)
8. ESD protection of data lines in accordance with IEC 61000-4-2
9. EFT protection of data lines in accordance with IEC 61000-4-4
10. Halogen free and RoHS compliant
11. Lead-free finish
12. This product is available in AEC-Q101 Qualified and PPAP Capable also.

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

APPLICATIONS: Protection of I/O Interfaces, VCC bus and other vulnerable circuits used in telecom, computer, Industrial and consumer electronic applications.

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

PARAMETER	SYMBOL	VALUE	UNIT
Peak Pulse Power Dissipation on 10/1000 us Waveform (Note 1, 2, FIG.1)	P_{PPM}	3000	W
Power Dissipation on Infinite Heat Sink at $T_L=50^{\circ}C$	P_D	6.5	W
Peak Pulse Current of on 10/1000us Waveform (Note 1, FIG.3)	I_{PPM}	See Table 1	A
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave (Note 2. 3)	I_{FSM}	300	A
Operating Junction Temperature Range	T_J	-55 to +150	$^{\circ}C$
Storage Temperature Range	T_{STG}	-55 to +150	$^{\circ}C$

Notes:

1. Non-repetitive current pulse, per Fig.3 and derated above $T_A=25^{\circ}C$ per Fig.2.
2. Mounted on 8.0x8.0mm² (0.03mm thick) Copper Pads to each terminal.
3. Measured on 8.3ms single half sine-wave, or equivalent square wave, for Unidirectional device only.

SMDJ5.0_220A_CA
Rev1_01032022ESW



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

Type Number		Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min. @I _T	Breakdown Voltage Max. @I _T	Test Current	Maximum Clamping Voltage @I _{PP}	Peak Pulse Current	Reverse Leakage @ V _{RMW}
(Uni)	(Bi)	(Uni)	(Bi)	V _{RMW} (V)	V _{BR MIN} (V)	V _{BR MAX} (V)	I _T (mA)	V _C (V)	I _{PP} (A)	I _R (uA)
SMDJ5.0A	SMDJ5.0CA	HDE	IDE	5.0	6.40	7.00	10	9.2	326.1	800
SMDJ6.0A	SMDJ6.0CA	HDG	IDG	6.0	6.67	7.37	10	10.3	291.3	800
SMDJ6.5A	SMDJ6.5CA	HDK	IDK	6.5	7.22	7.98	10	11.2	267.9	500
SMDJ7.0A	SMDJ7.0CA	HDM	IDM	7.0	7.78	8.60	10	12.0	250.0	200
SMDJ7.5A	SMDJ7.5CA	HDP	IDP	7.5	8.33	9.21	1	12.9	232.6	100
SMDJ8.0A	SMDJ8.0CA	HDR	IDR	8.0	8.89	9.83	1	13.6	220.6	50
SMDJ8.5A	SMDJ8.5CA	HDT	IDT	8.5	9.44	10.40	1	14.4	208.3	20
SMDJ9.0A	SMDJ9.0CA	HDV	IDV	9.0	10.00	11.10	1	15.4	194.8	10
SMDJ10A	SMDJ10CA	HDX	IDX	10.0	11.10	12.30	1	17.0	176.5	5
SMDJ11A	SMDJ11CA	HDZ	IDZ	11.0	12.20	13.50	1	18.2	164.8	2
SMDJ12A	SMDJ12CA	HEE	IDZ	12.0	13.30	14.70	1	19.9	150.8	2
SMDJ13A	SMDJ13CA	HEG	IEG	13.0	14.40	15.90	1	21.5	139.5	2
SMDJ14A	SMDJ14CA	HEK	IEK	14.0	15.60	17.20	1	23.2	129.3	2
SMDJ15A	SMDJ15CA	HEM	IEM	15.0	16.70	18.50	1	24.4	123.0	2
SMDJ16A	SMDJ16CA	HEP	IEP	16.0	17.80	19.70	1	26.0	115.4	2
SMDJ17A	SMDJ17CA	HER	IER	17.0	18.90	20.90	1	27.6	108.7	2
SMDJ18A	SMDJ18CA	HET	IET	18.0	20.00	22.10	1	29.2	51.4	2
SMDJ20A	SMDJ20CA	HEV	IEV	20.0	22.20	24.50	1	32.4	92.6	2
SMDJ22A	SMDJ22CA	HEX	IEX	22.0	24.40	26.90	1	35.5	84.5	2
SMDJ24A	SMDJ24CA	HEZ	IEZ	24.0	26.70	29.50	1	38.9	77.1	2
SMDJ26A	SMDJ26CA	HFE	IFE	26.0	28.90	31.90	1	42.1	71.3	2
SMDJ28A	SMDJ28CA	HFG	IFG	28.0	31.10	34.40	1	45.4	66.1	2
SMDJ30A	SMDJ30CA	HFK	IFK	30.0	33.30	36.80	1	48.4	62.0	2
SMDJ33A	SMDJ33CA	HFM	IFM	33.0	36.70	40.60	1	53.3	56.3	2
SMDJ36A	SMDJ36CA	HFP	IFP	36.0	40.00	44.20	1	58.1	51.6	2
SMDJ40A	SMDJ40CA	HFR	IFR	40.0	44.40	49.10	1	64.5	46.5	2
SMDJ43A	SMDJ43CA	HFT	IFT	43.0	47.80	52.80	1	69.4	43.2	2
SMDJ45A	SMDJ45CA	HFV	IFV	45.0	50.00	55.30	1	72.7	41.3	2
SMDJ48A	SMDJ48CA	HFX	IFX	48.0	53.30	58.90	1	77.4	38.8	2
SMDJ51A	SMDJ51CA	HFZ	IFZ	51.0	56.70	62.70	1	82.4	36.4	2
SMDJ54A	SMDJ54CA	HGE	IGE	54.0	60.00	66.30	1	87.1	34.4	2
SMDJ58A	SMDJ58CA	HGG	IGG	58.0	64.40	71.20	1	93.6	32.1	2
SMDJ60A	SMDJ60CA	HGK	IGK	60.0	66.70	73.70	1	96.8	31.0	2
SMDJ64A	SMDJ64CA	HGM	IGM	64.0	71.10	78.60	1	103.0	29.1	2
SMDJ70A	SMDJ70CA	HGP	IGP	70.0	77.80	86.00	1	113.0	26.5	2
SMDJ75A	SMDJ75CA	HGR	IGR	75.0	83.30	92.10	1	121.0	24.8	2
SMDJ78A	SMDJ78CA	HGT	IGT	78.0	86.70	95.80	1	126.0	23.8	2
SMDJ85A	SMDJ85CA	HGV	IGV	85.0	94.40	P	1	137.0	21.9	2
SMDJ90A	SMDJ90CA	HGX	IGX	90.0	100.00	111.00	1	146.0	20.5	2
SMDJ100A	SMDJ100CA	HGZ	IGZ	100.0	111.00	123.00	1	162.0	18.5	2
SMDJ110A	SMDJ110CA	HHE	IHE	110.0	122.00	135.00	1	177.0	16.9	2

SMDJ5.0_220A_CA
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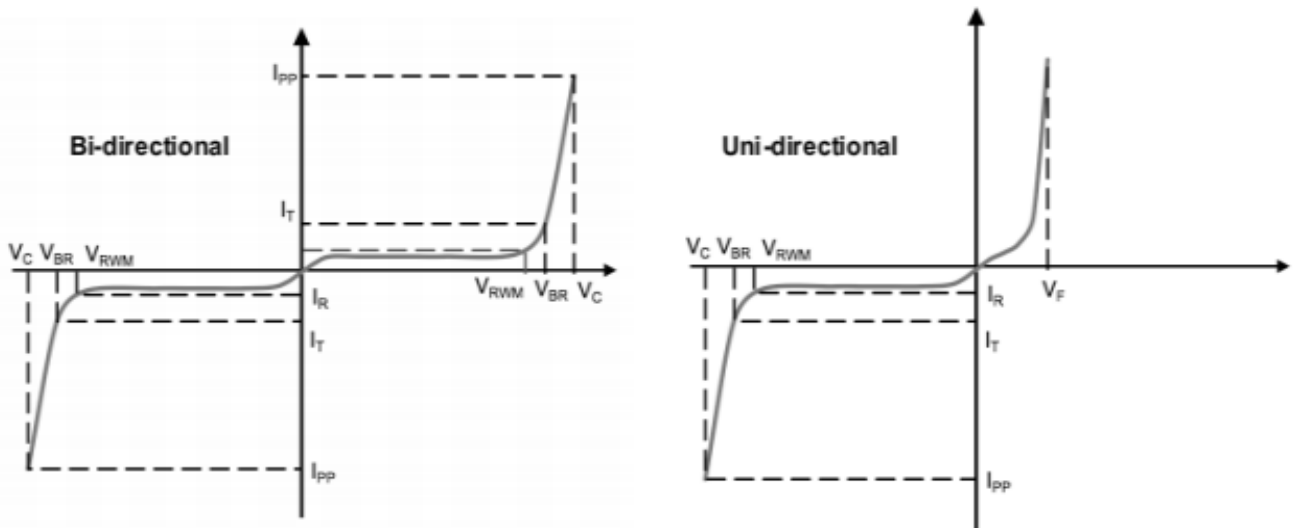
ELECTRICAL CHARACTERISTICS at (Ta = 25 °C Unless otherwise specified)

Type Number		Marking Code		Reverse Stand-off Voltage	Breakdown Voltage Min. @I _T	Breakdown Voltage Max. @I _T	Test Current	Maximum Clamping Voltage @I _{PP}	Peak Pulse Current	Reverse Leakage @ V _{RMW}
(Uni)	(Bi)	(Uni)	(Bi)	V _{RMW} (V)	V _{BR MIN} (V)	V _{BR MAX} (V)	I _T (mA)	V _C (V)	I _{pp} (A)	I _R (uA)
SMDJ120A	SMDJ120CA	HHG	IHG	120.0	133.00	147.00	1	193.0	15.5	2
SMDJ130A	SMDJ130CA	HHG	IHK	130.0	144.00	159.00	1	209.0	14.4	2
SMDJ150A	SMDJ150CA	HHM	IHM	150.0	167.00	158.00	1	243.0	12.3	2
SMDJ160A	SMDJ160CA	HHP	IHP	160.0	178.00	197.00	1	259.0	11.6	2
SMDJ170A	SMDJ170CA	HHR	IHR	170.0	189.00	209.00	1	275.0	10.9	2
SMDJ180A	SMDJ180CA	HHT	IHT	180.0	200.00	221.00	1	292.0	10.3	2
SMDJ190A	SMDJ190CA	HHV	IHV	190.0	211.00	233.00	1	308.0	9.7	2
SMDJ200A	SMDJ200CA	HHX	IHX	200.0	224.00	247.00	1	324.0	9.3	2
SMDJ210A	SMDJ210CA	HHZ	IHZ	210.0	237.00	263.00	1	340.0	8.8	2
SMDJ220A	SMDJ220CA	HIE	IIE	220.0	244.00	270.00	1	356.0	8.4	2

Notes:

1. For Bi-directional type having V_{RMW} of 10 Volts and less, the I_R limit is double.

CURVE CHARACTERISTICS



1. P_{PPM}: Peak Pulse Power Dissipation - Max power dissipation
2. V_{RMW}: Reverse Stand-off Voltage - Maximum voltage that can be applied to TVS without operation
3. V_{BR}: Breakdown Voltage – Maximum voltage that flows through the TVS at a specified current (IT)
4. V_C: Clamping Voltage – Peak voltage measured across the TVS at a specified IPPM (peak impulse current)
5. I_R: Reverse Leakage Current – Current measured at VR
6. V_F: Forward Voltage Drop for Uni-directional

TYPICAL CHARACTERISTICS CURVES

Fig 1: Peak Pulse Power Rating

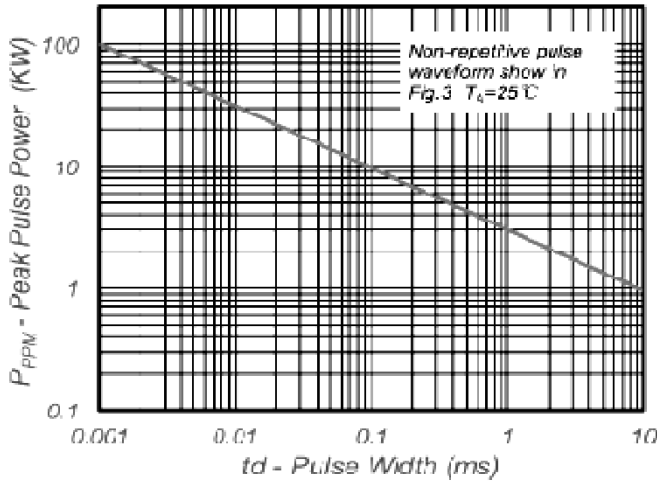


Fig 2: Pulse Waveform

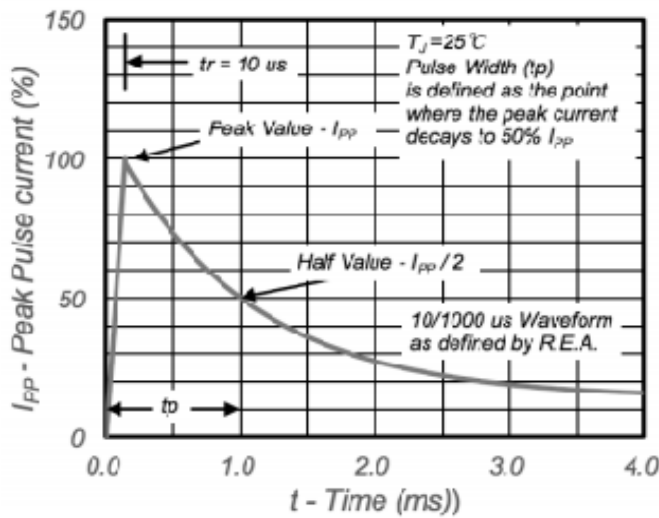


Fig 3: Pulse Derating Curves

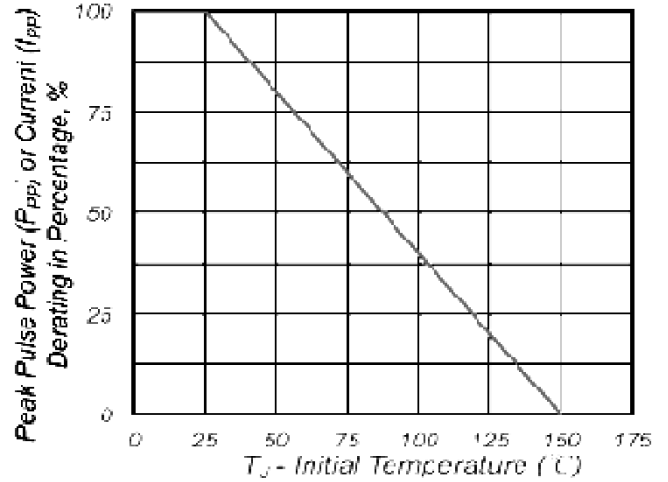
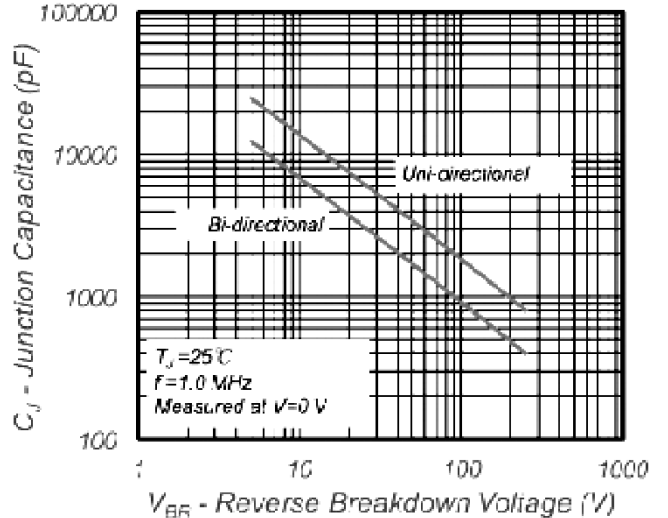
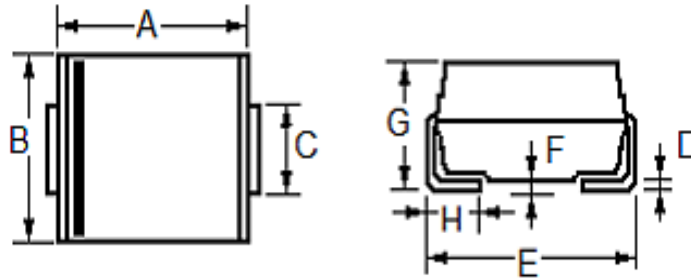


Fig 4: Typical Junction Capacitance



PACKAGE DETAIL

DO-214AB (SMC)



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	6.60	7.11	0.260	0.280
B	5.59	6.22	0.220	0.245
C	2.90	3.20	0.114	0.126
D	0.125	0.305	0.006	0.012
E	7.75	8.13	0.305	0.320
F	---	0.203	---	0.008
G	2.06	2.62	0.079	0.103
H	0.76	1.52	0.030	0.060

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

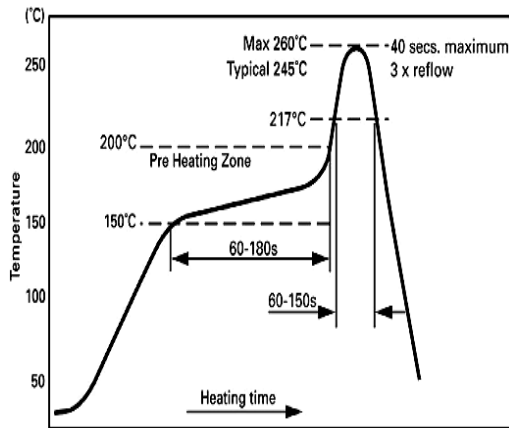
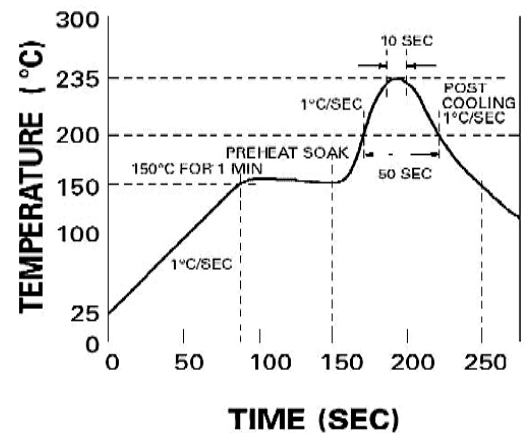


Figure 2



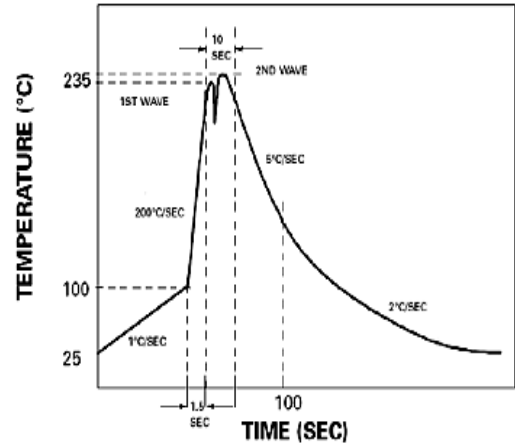
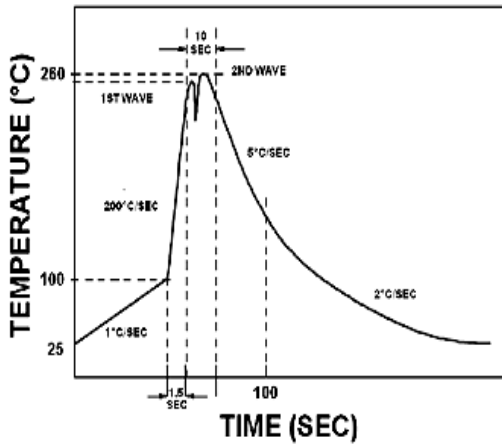
Reflow profiles in tabular form

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
– Tim	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.



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Recommended Product Storage Environment for Discrete

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.



CDIL is a registered trademark of
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