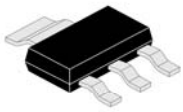
NPN Plastic-Encapsulate Transistors

CSC6124

SOT-89
Surface Mount
Plastic Package
RoHS compliant



SOT-89

FEATURES:

1. Low collector emitter saturation voltage: $_{VCE(sat)}$=0.5V (max) (I_C=1A)
2. High-speed switching: t_{stg}=400ns (typ.)
3. Complementary to CSA2206

APPLICATION: LED Bypass devices

1. Power Amplifier Applications
2. Power Switching Applications

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

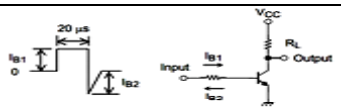
PARAMETER		SYMBOL	VALUE	UNIT
Collector Base Voltage		V_{CBO}	160	V
Collector Emitter Voltage		V_{CEX}	160	V
		V_{CEO}	80	V
Emitter Base Voltage		V_{EBO}	7	V
Collector Current	DC	I_C	2	A
	PULSE	I_{CP}	4	A
Base Current		I_B	0.5	A
Collector Power Dissipation (NOTE 1)	t=10s	P_C	2.5	W
	DC		1.0	
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	-55 to +150	°C

NOTE:

1. Mounted on an FR4 board (glass-epoxy; 1.6 mm thick; Covered area, 645 mm ^{2})

2.Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in Temperature, etc.) may cause this product to decrease in there liability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

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

PARAMETER		SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector cut-off current		I_{CBO}	V_{CB} = 160V, I_E = 0	--	--	1.0	μA
Emitter cut-off current		I_{EBO}	V_{EB} = 7V, I_C = 0	--	--	1.0	μA
Collector-base breakdown voltage		$V_{(BR)CBO}$	I_C = 10uA, I_B = 0	160	--	--	V
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	I_C = 10mA, I_B = 0	80	--	--	V
DC current gain		$h_{FE}^{(1)}$	V_{CE} = 2V, I_C = 1mA	80			
		$h_{FE}^{(2)}$	V_{CE} = 2V, I_C = 0.5A	100		200	
		$h_{FE}^{(3)}$	V_{CE} = 2V, I_C = 1A	60			
Collector-emitter saturation voltage		$V_{CE(sat)}^{(1)}$	I_C = 0.5A, I_B = 50mA			0.3	V
		$V_{CE(sat)}^{(2)}$	I_C = 1A, I_B = 100mA			0.5	V
Base-emitters saturation voltage		$V_{BE(sat)}$	I_C = 1A, I_B = 100mA			1.5	V
Transition frequency		f_T	V_{CE} = 2V, I_C = 0.5A		150		MHz
Collector output capacitance		C_{ob}	V_{CB} = 10V, I_E = 0, f=1MHz		14		pF
Switching time	Rise time	t_r			50		ns
	storage time	t_{stg}			400		
	Fall time	t_f	I_{B1} = I_{B2} = 100 mA Duty cycle ≤ 1%		150		

TYPICAL CHARACTERISTICS CURVES

Fig 1. Collector-emitter Voltage vs. Collector Current

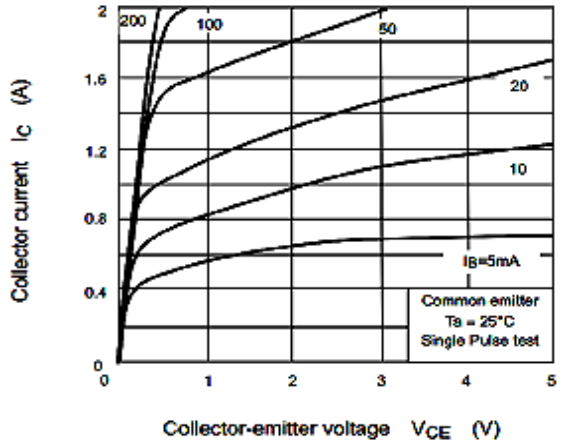


Fig 2. Collector Current vs. DC current gain

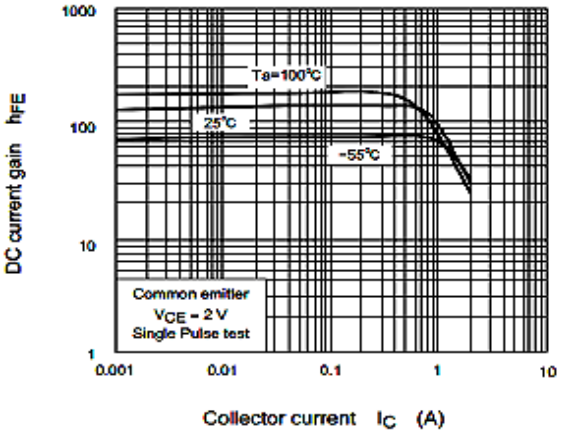


Fig 3. Collector Current vs. Collector-emitter saturation voltage

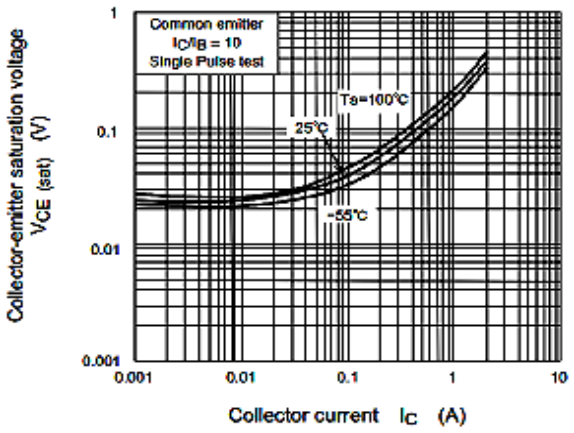
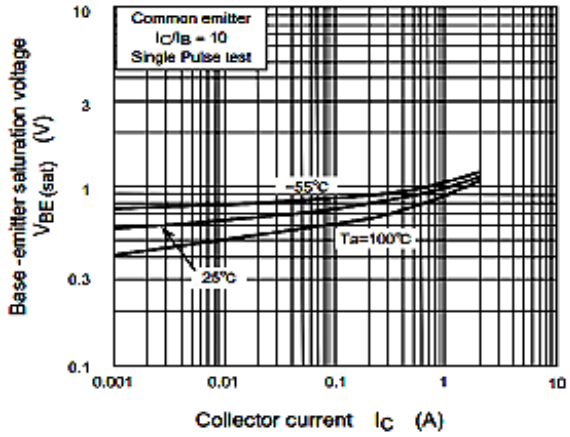


Fig 4. Collector Current vs. Base-emitter saturation voltage



CSC6124
Rev01 25062020EJS

TYPICAL CHARACTERISTICS CURVES

Fig 6. Collector emitter voltage vs. Collector current

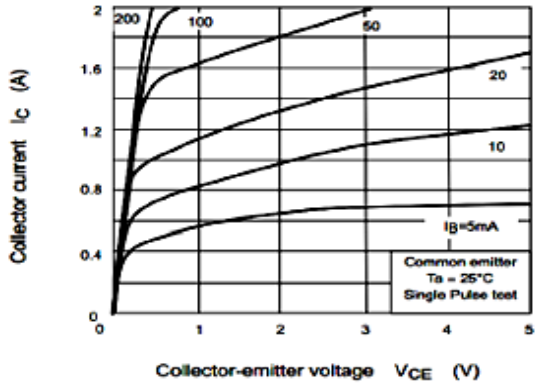


Fig 7. Collector Current vs. DC current gain

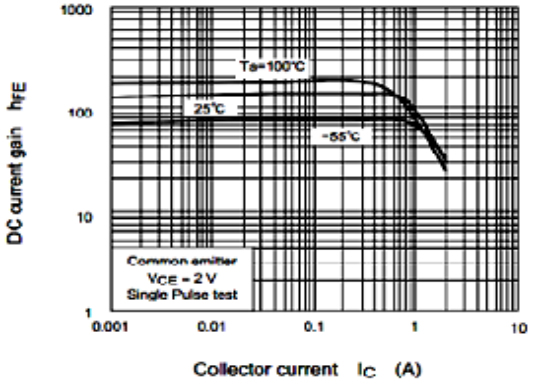


Fig 8. Collector Current vs. Collector emitter saturation voltage

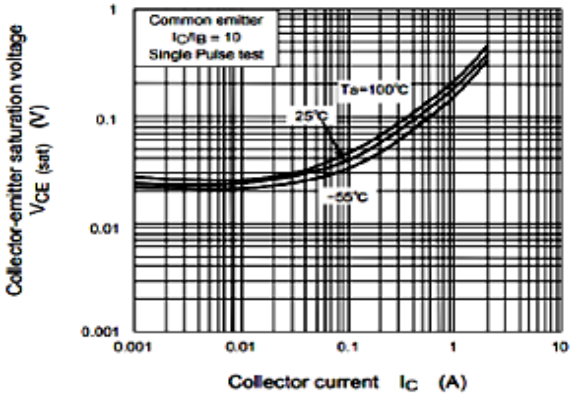


Fig 9. Collector Current vs. Base emitter saturation voltage

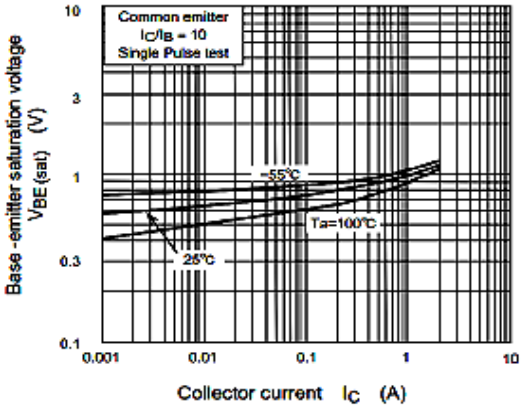


Fig 10. Base-Emitter Voltage vs. Collector current

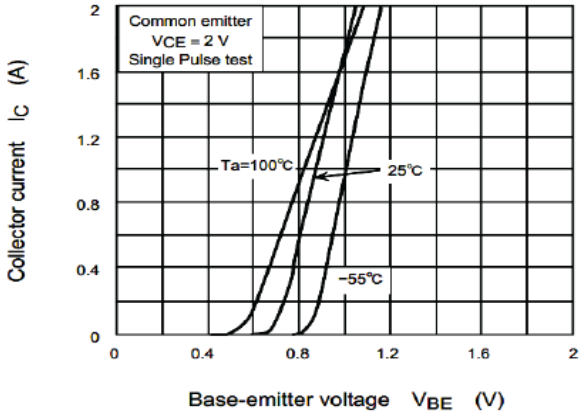
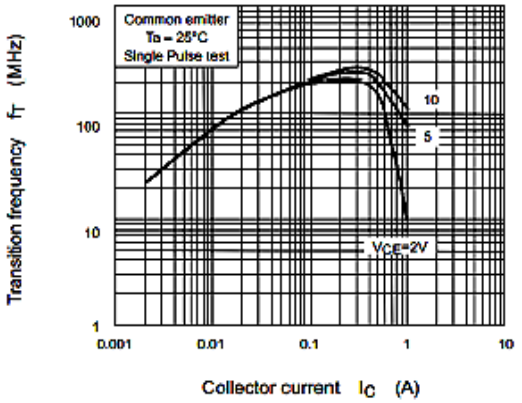


Fig 11. Collector Current vs. Transition Frequency



CSC6124
Rev01 25062020EJS

TYPICAL CHARACTERISTICS CURVES

Fig 12. Transient thermal impedance vs. Pulse width

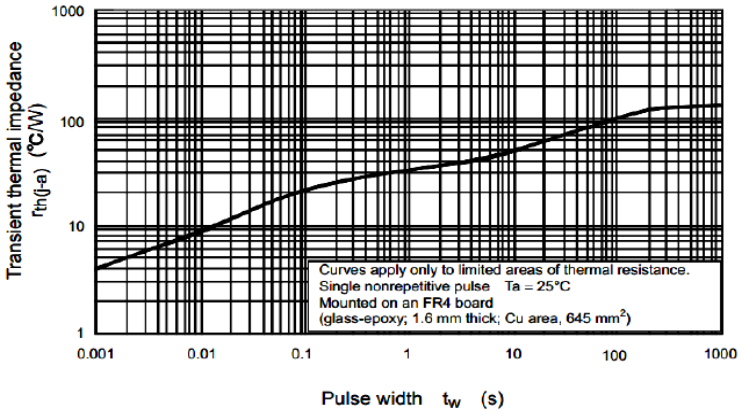


Fig 13. Ambient temperature vs. Collector power

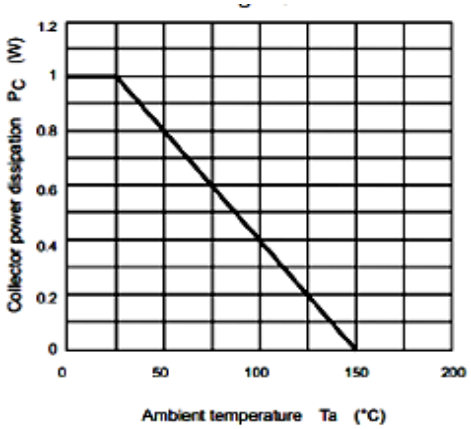


Fig 14. Collector base voltage vs. Collector output capacitance

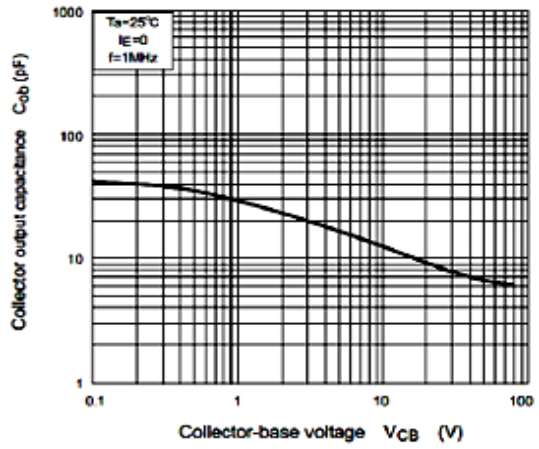
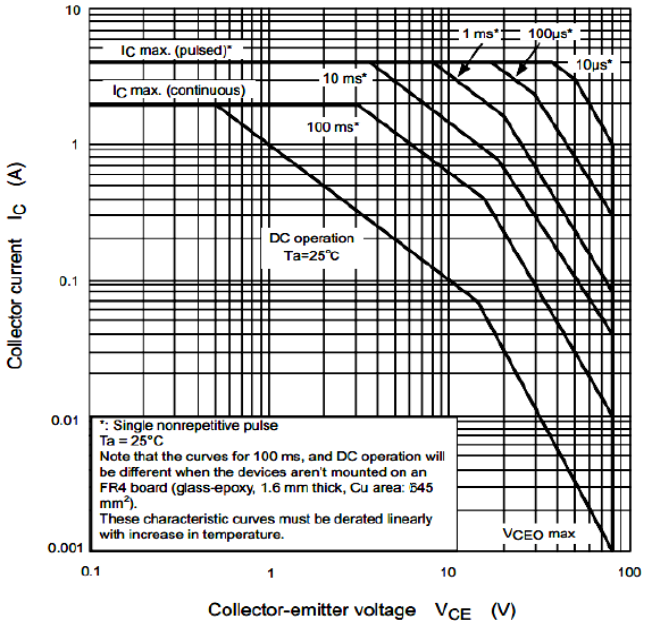


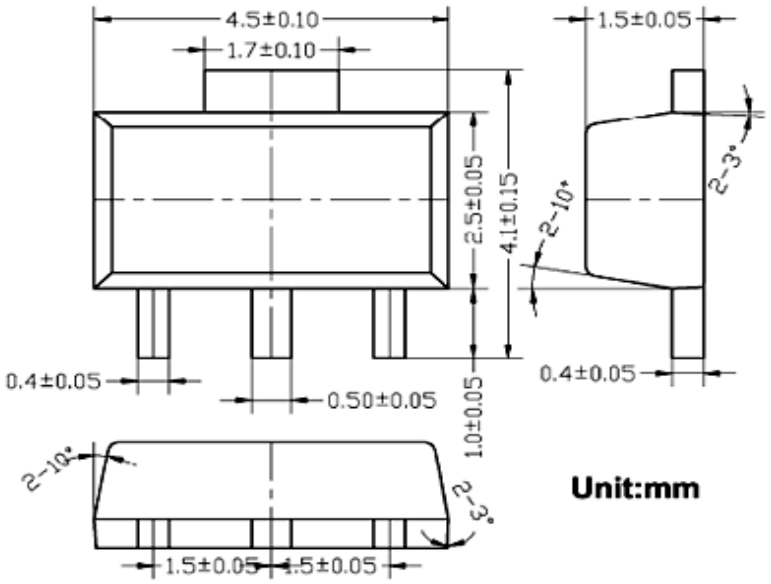
Fig 15. Safe Operating Area



PACKAGE DETAIL

SOT-89 Surface Mount Plastic Package

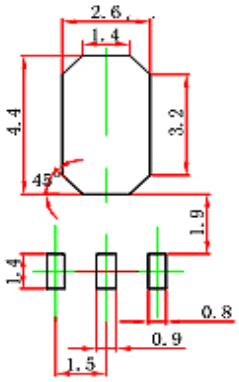
SOT-89 Package outline Dimension



Pin Configuration

1. Base
2. Collector
3. Emitter

SOT-89 Suggested Pad Layout

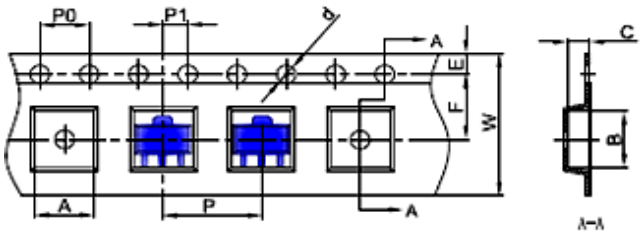


Note:

1. Control dimension: in millimeters.
2. General tolerance:±0.05mm.
3. The pad layout is for reference purpose only.

SOT-89 Tape and Reel

SOT-89 Embossed Carrier Tape

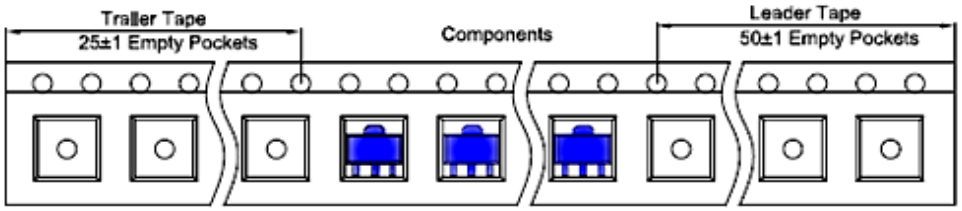


Packaging Description:

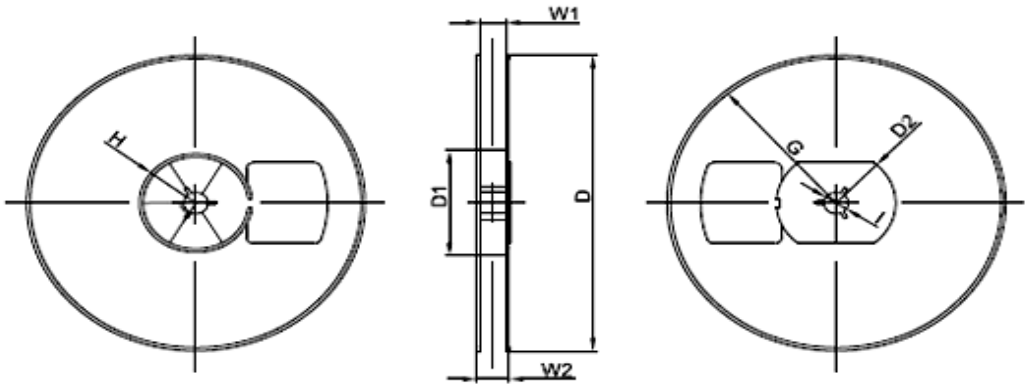
SOT-89 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 1,000 units per 7" or 18.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-89-3L	4.85	4.45	1.85	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

SOT-89 Tape Leader and Trailer



SOT-89 Reel



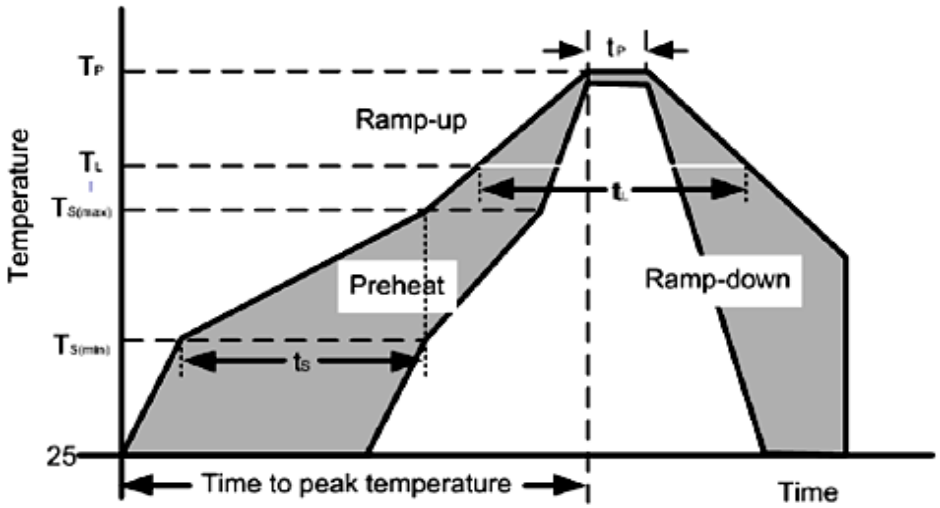
Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø180.00	60.00	R32.00	R86.50	R30.00	Ø13.00	13.20	16.50

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
1000 pcs	7 Inch	10,000 pcs	203×203×195	40,000 pcs	438×438×220	

CSC6124
Rev01 25062020EJS

Soldering Parameters

Reflow Condition		Pb-Free assembly
Pre Heat	Temperature Min ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max)(ts)	60-190 secs
		5°C/second max
Ts(max) to T_L – Ramp-up Rate		5°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Temperature (t_L)	60 - 150 Seconds
Peak Temperature (T_P)		260+0/-5°C
Time within actual peak Temperature (t_P)		20 - 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to Peak Temperature (T_P)		8 minutes Max
Do not exceed		280°C



CSC6124
Rev01 25062020EJS

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).

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
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

CSC6124
Rev01 25062020EJS