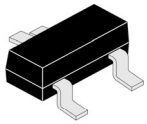
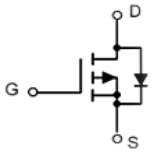
P-CHANNEL MOSFET

BSS84





SOT-23
Surface Mount
Plastic Package
RoHS compliant

SOT-23

MARKING : B84

DESCRIPTION: These are miniature surface mount MOSFETs, reduces power losses and conserve energy, making this device ideal for use in small power management circuitry.

FEATURES:

1. Energy Efficient
2. Low Threshold Voltage
3. High-speed Switching
4. Miniature Surface Mount Package Saves Board Space

$V_{(BR)DSS}$	$R_{DS(ON)}$MAX	I_D
-50V	8Ω@-10V	-0.13A
	10Ω@-5V	

APPLICATION:

DC−DC converters,load switching, power management in portable and battery−powered products such as computers, printers, cellular and cordless telephones.

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

PARAMETER	SYMBOL	VALUE	UNIT
Drain-Source Voltage	V_{DS}	-50	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-0.13	A
Pulsed Drain Current note a1 @t_p <10 s	I_{DM}	-0.52	A
Power Dissipation	P_D	225	mW
Thermal Resistance from Junction to Ambient note a2	$R_{\theta JA}$	556	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Maximum Lead Temperature for Soldering Purposes, Duration for 5 Seconds	T_L	260	°C
Operating Ambient Temperature Range	T_{opr}	-55 to +150	°C

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

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-50	--	--	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-50V,V_{GS} = 0V	--	--	-15	μA
		V_{DS} =-25V,V_{GS} = 0V	--	--	-0.1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	--	--	±5	μA
Gate threshold voltage note a3	$V_{GS(ht)}$	V_{DS} =VGS, I_D =-250μA	-0.9	-1.6	-2	V
Drain-source on-resistance note a3	$R_{DS(on)}$	V_{GS} =-5V, I_D =-0.1A	--	5.8	10	Ω
		V_{GS} =-10V, I_D =-0.1A	--	4.5	8	Ω
Forward Transconductance note a1	g_{FS}	V_{DS}=-25V; I_D=-100mA	50	--	--	mS
Dynamic Characteristics note a4						
Input capacitance	C_{iss}	V_{DS}=5V,V_{GS} =0V,f =1MHz	--	30	--	pF
Output capacitance	C_{oss}		--	10	--	pF
Reverse transfer capacitance	C_{rss}		--	5	--	pF
Switching Characteristics note a4						
Turn-on delay time	$t_{d(on}$	V_{DD}=-15V, R_L=50Ω, I_D =-2.5A	--	2.5	--	ns
Turn-on rise time	t_r		--	1	--	ns
Turn-off delay time	$t_{d(off)}$		--	16	--	ns
Turn-off fall time	t_f		--	8	--	ns
Drain-Source Diode Characteristics						
Continuous Current	I_S		--	--	-0.13	A
Pulsed Current	I_{SM}		--	--	-0.52	A
Diode forward voltage note a3	V_{SD}	I_S=-0.13A, V_{GS} = 0V	--	--	-2.2	V

Notes :

a[1] : Repetitive rating : Pulse width limited by junction temperature.

a[2] : Surface mounted on FR4 board , t≤10s.

a[3] : Pulse Test : Pulse Width≤300μs, Duty Cycle≤2%.

a[4] : Guaranteed by design, not subject to producing.

1. For P Type device the voltage and current values will be negative (-)

TYPICAL CHARACTERISTICS CURVES

Fig 1: Output Characteristics

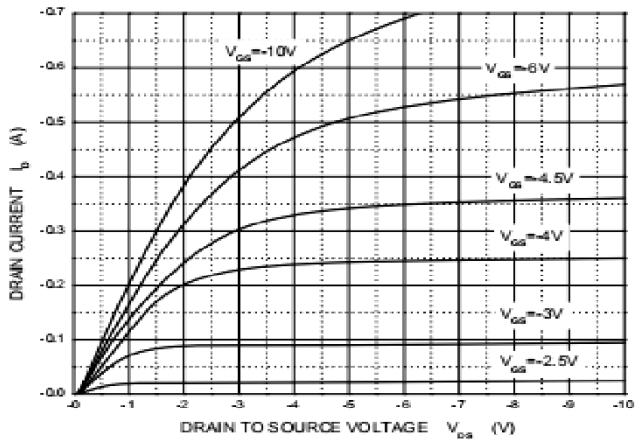


Fig 2: Transfer Characteristics

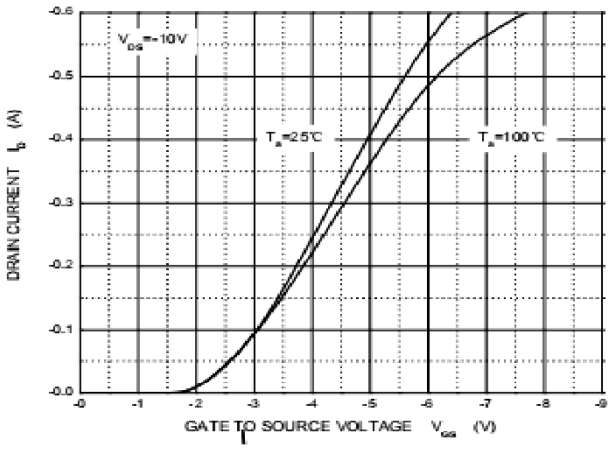


Fig 3: On State Resistance vs Continuous Drain Current

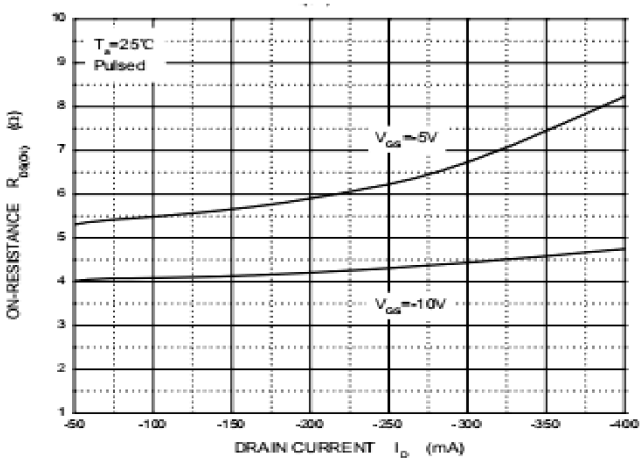


Fig 4: On State Resistance vs Gate-Source Voltage

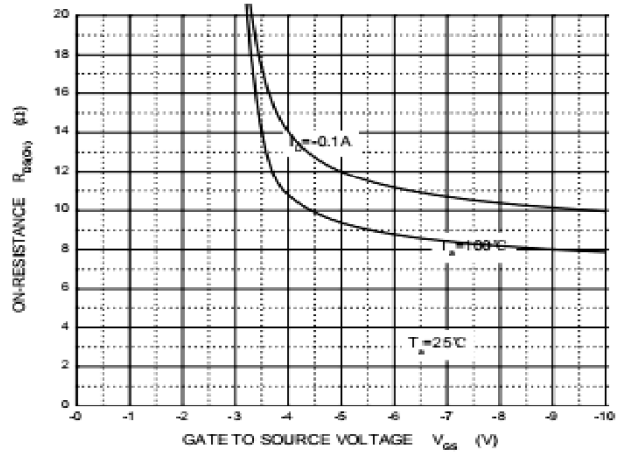


Fig 5: Source current vs Source to Drain voltage

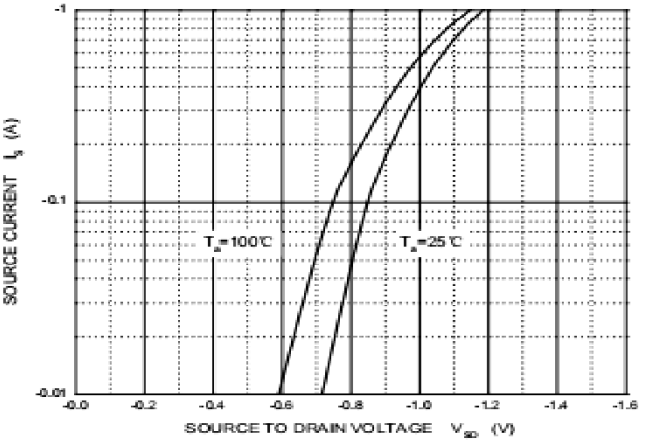
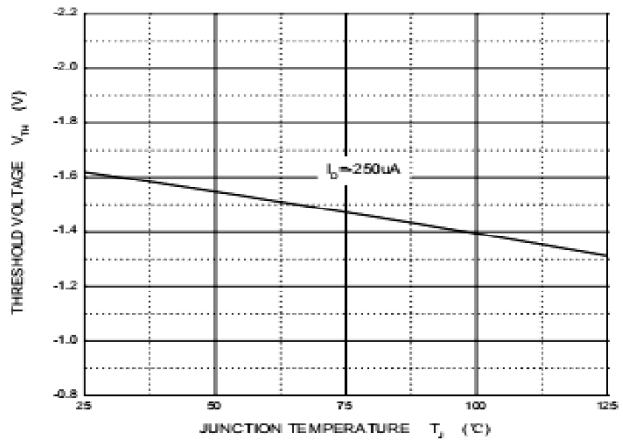
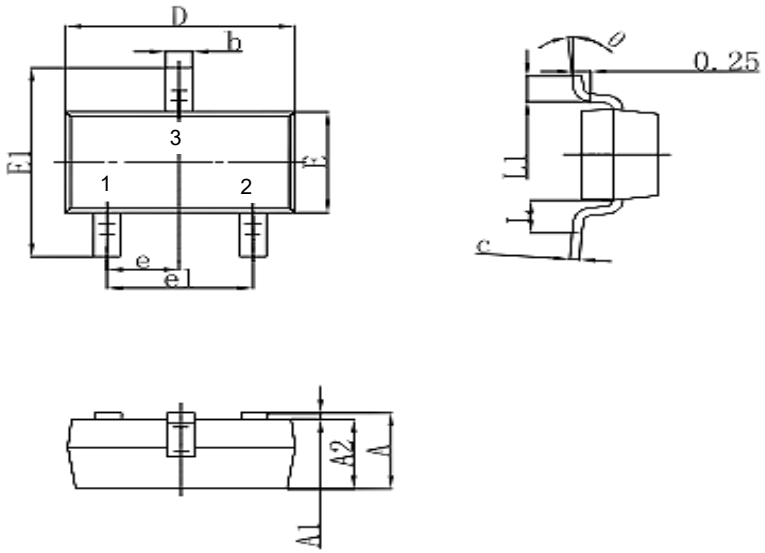


Fig 6: Threshold Voltage



SOT-23 Package Outline Dimensions

SOT-23 Plastic Package

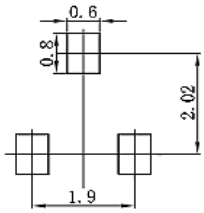


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

PIN CONFIGURATION

1.GATE
2.SOURCE
3.DRAIN

SOT-23 Suggested Pad Layout



Note:

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

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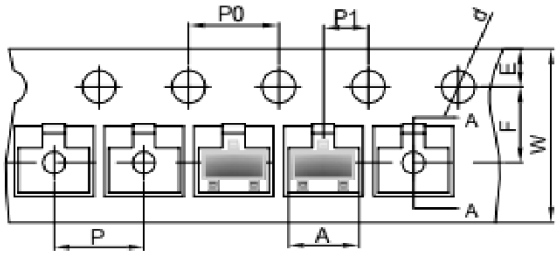
SOT-23 Tape and reel

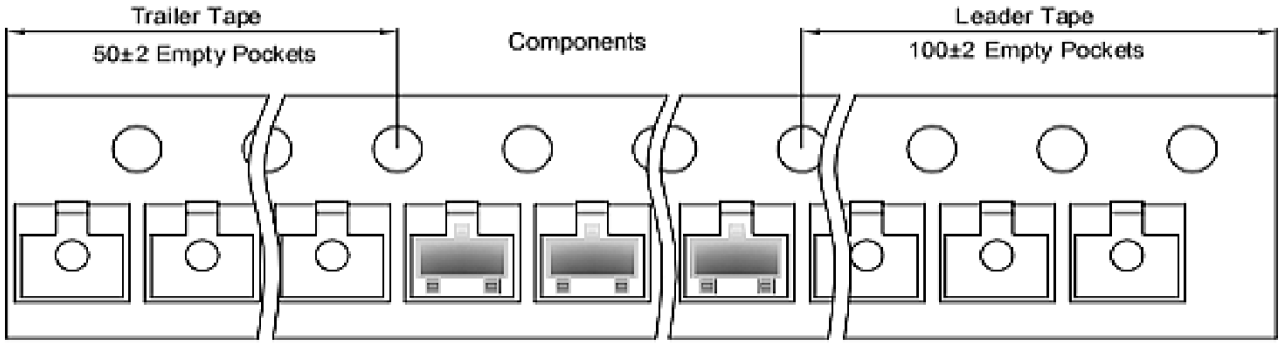
SOT-23 Embossed Carrier Tape



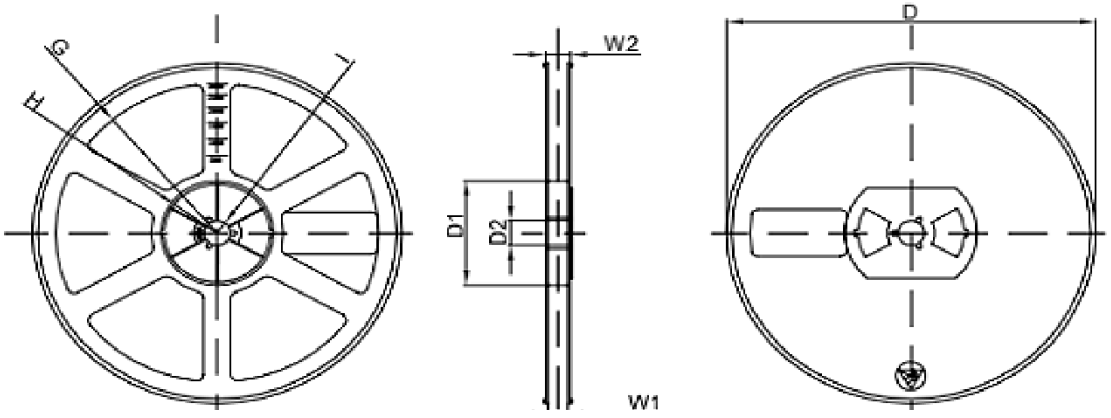
Packaging Description:
SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm 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-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer



SOT-23 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	

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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

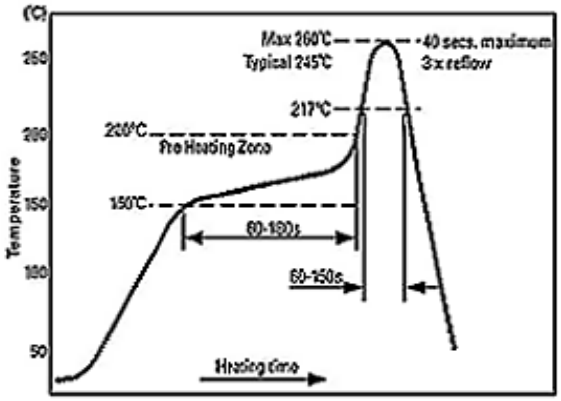
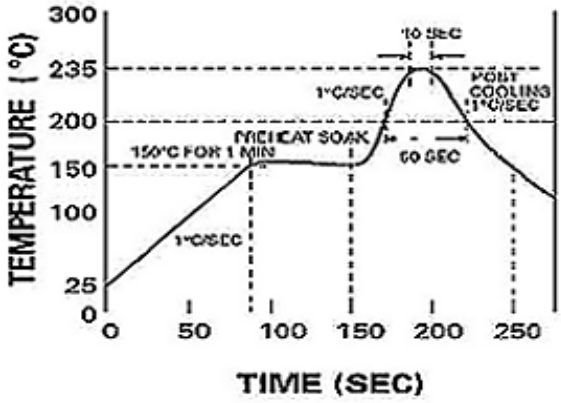


Figure 2

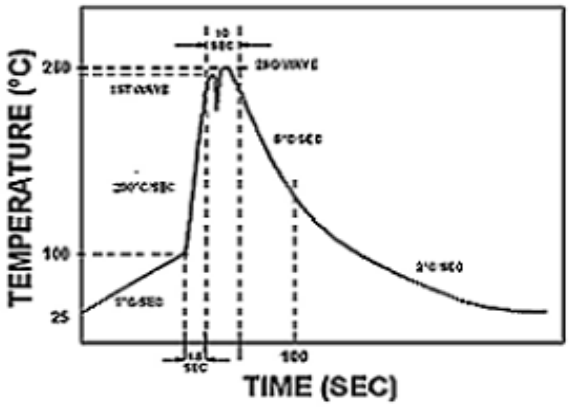


Reflow profiles in tabular form

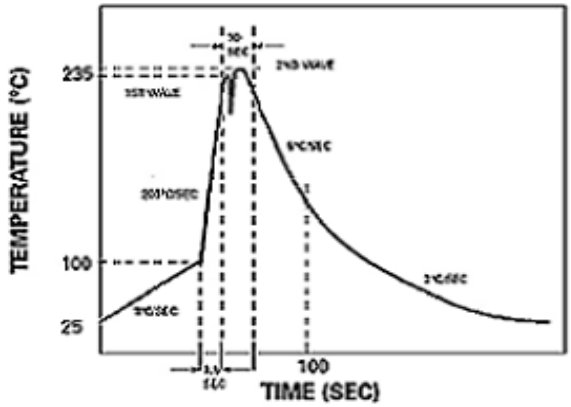
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
Preheat – Temperature Range – Time	 150-170°C 60-180 seconds	 150-200°C 60-180 seconds
Time maintained above: – Temperature – Time	 200°C 30-50 seconds	 217°C 60-150 seconds
Peak Temperature	235°C	260°C max.
Time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