15V NAGATIVE VOLTAGE REGULATOR

LM79L15

TO-92

TO-92 Leaded
Plastic Package
RoHS compliant

FEATURES:

1. Maximum output current : I_{OM}: 0.1A
2. Output voltage: V_O: - 15 V
3. Continuous total dissipation: P_D:0.625 W (Ta = 25°C)

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

PARAMETER	SYMBOL	VALUE	UNIT
Input Voltage	V_i	-35	V
Thermal Resistance from Junction to Ambient Temperature	$R_{\theta JA}$	200	°C/W
Operating Junction Temperature Range	T_{OPR}	-40 to +125	°C
Storage Temperature Range	T_{STG}	-65 to +150	°C

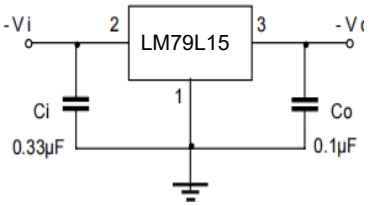
ELECTRICAL CHARACTERISTICS* at (Ta = 25 ℃ Unless otherwise specified)

(V_i=-23V,I_o=40mA,C_i=0.33$_\mu$F,C_o=0.1$_\mu$F, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	VALUE			UNIT
			MIN	TYP	MAX	
Output Voltage	V_o	T_J=25℃	-14.55	-15.0	-15.45	V
		-17.5V≤V_i≤-24V, I_o=1mA~40mA	-14.25	-15.0	-15.75	
		I_o=1mA~70mA	-14.25	-15.0	-15.75	
Load Regulation	$\triangle V_o$	I_o=1mA~100mA ,V_i=-23V, T_J=25℃	--	25	150	mV
		I_o=1mA~40mA ,Vi=-23V, T_J=25℃	--	15	75	
Line Regulation	$\triangle V_o$	-17.5V≤V_i≤-24V, Io=40mA, T_J=25℃	--	65	300	mV
		-20V≤V_i≤-30V, I_O=1mA-40mA T_J=25℃	--	50	250	
Quiescent Current	I_q	T_J=25℃	--	--	6.5	mV
Quiescent Current Change	$\triangle I_q$	-20V≤Vi≤-30V, I_O=40mA	--	--	1.5	mV
		1mA≤I_O≤40mA	--	--	0.1	
Output Noise Voltage	V_N	10H_z≤f≤100KH_z ,T_J=25℃	--	90	--	$_\mu$V/V_o
Ripple Rejection	RR	-18.5V≤V_i≤-28.5V,f=120H_z	34	39	--	dB
Dropout Voltage	V_d	T_J=25℃	--	1.7	--	V

*** Pulse test.**

TYPICAL APPLICATION



Notes: Bypass capacitors are recommended for optimum stability and transient response and should be located as close as possible to the regulators

TYPICAL CHARACTERISTIC CURVES

Fig 1: Output Characteristics

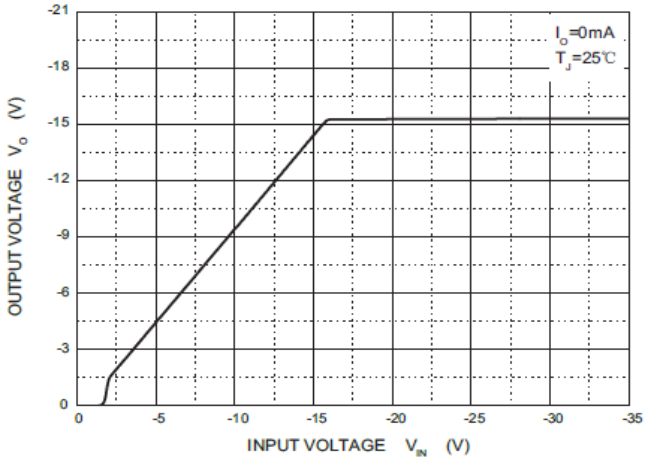


Fig 3: Dropout Characteristics

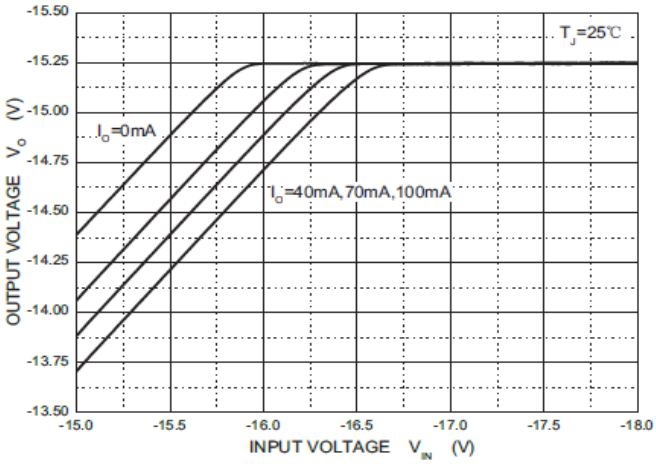


Fig 2: Quiescent Current vs Input Voltage

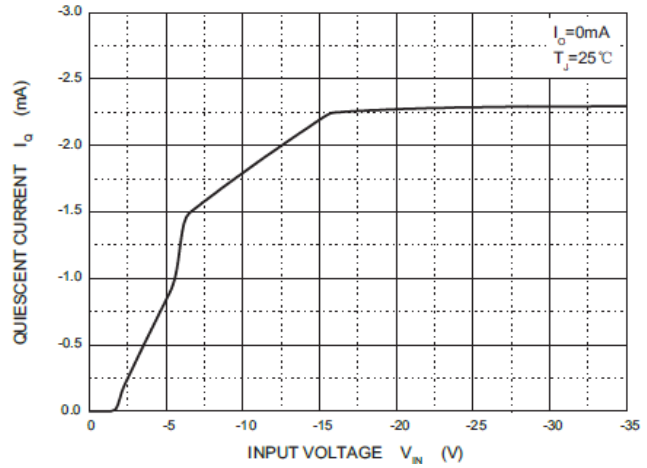


Fig 4: Current Cut-off Grid Voltage

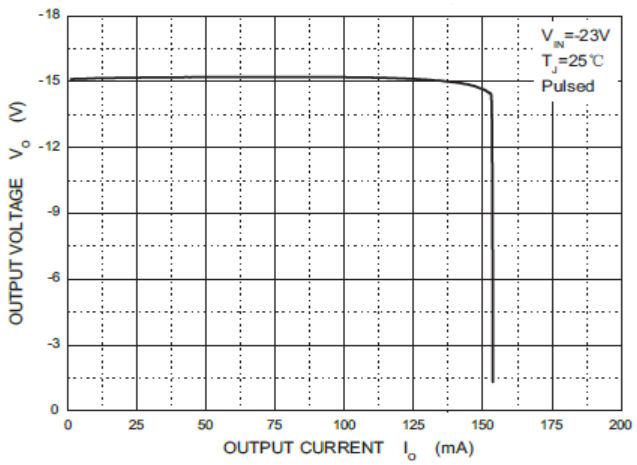


Fig 5: Output Voltage vs Junction Temperature

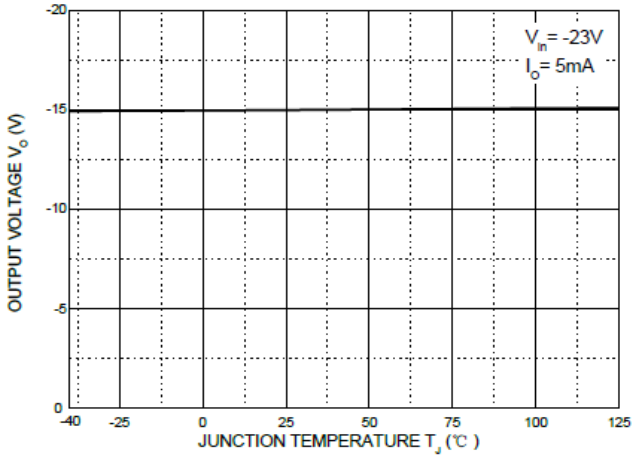
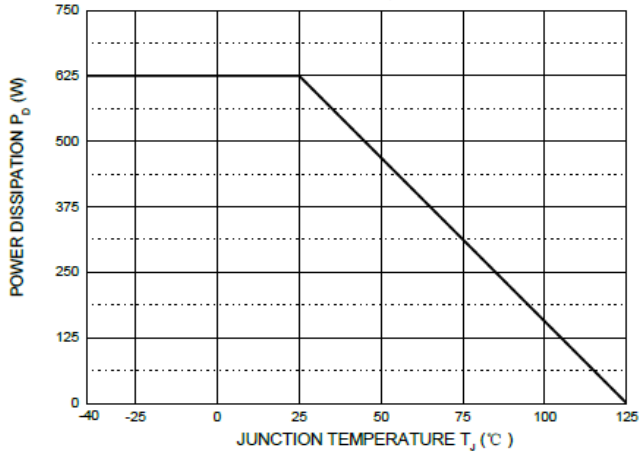


Fig 6: Power Derating Curve



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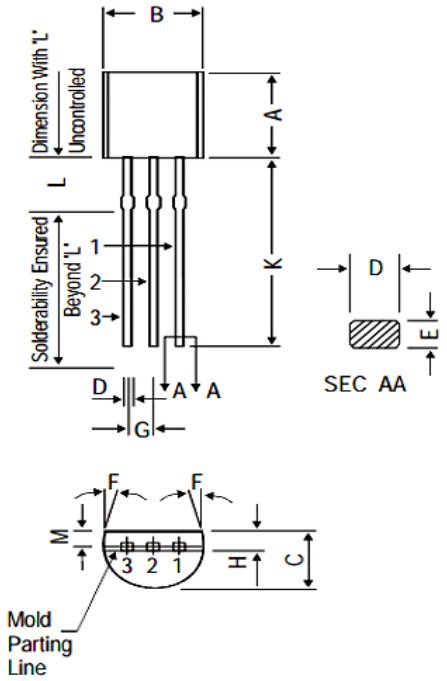
Rev0_21072023EJS

PACKAGE DETAILS

TO-92 Leaded Plastic Package



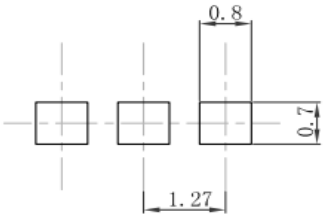
DIM	MIN	MAX
A	4.32	5.33
B	4.45	5.20
C	3.18	4.19
D	0.41	0.55
E	0.35	0.50
F	5 DEG	
G	1.14	1.40
H	1.20	1.40
K	12.7	--
L	1.982	2.082
M	1.03	1.20

All Dimensions are in mm

Pin Configuration

1. Output
2. Input
3. Ground

PCB Design:

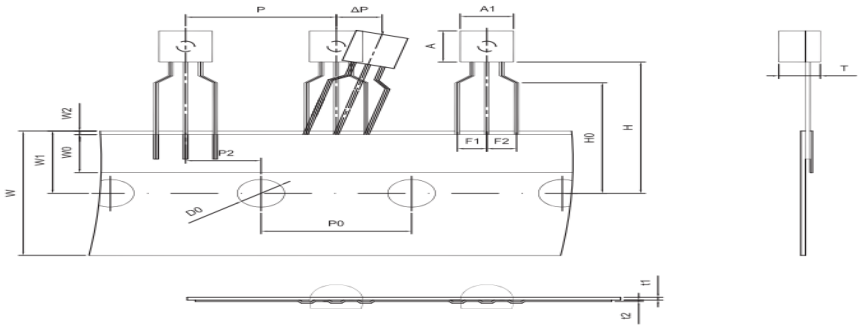


Note:

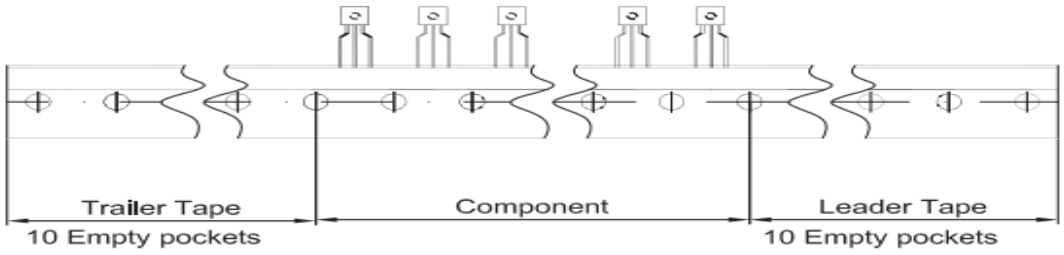
1. Controlling dimension in mm.
2. General tolerance:±0.05mm.
3. The pad layout is for reference purposes only.

Unit:mm

TO-92 PACKAGE TAPEING DIMENSION



Dimiensions are in millimeter								
A1	A	T	P	P0	P2	F1	F2	W
4.5	4.5	3.5	12.7	12.7	6.35	2.5	2.5	18.0
W0	W1	W2	H	H0	D0	t1	t2	ΔP
6.0	9.0	1.0 MAX.	19.0	16.0	4.0	0.4	0.2	0



Package	Box	Box Size(mm)	Carton	Carton Size(mm)
TO-92	2000 pcs	333×162×43	20,000 pcs	350×340×250

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

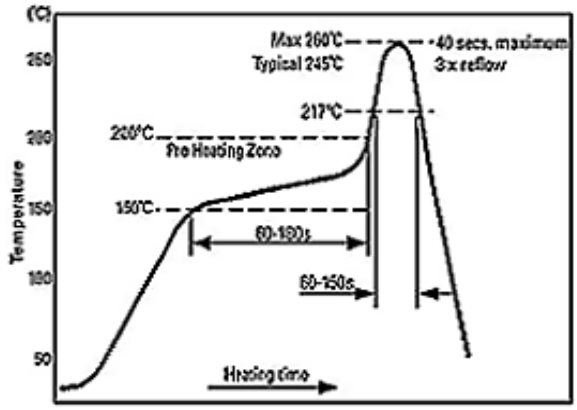
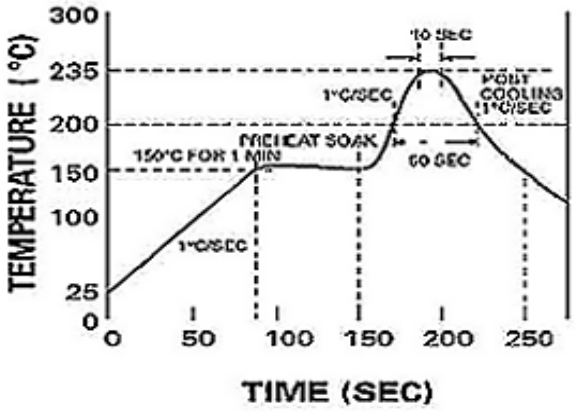


Figure 2

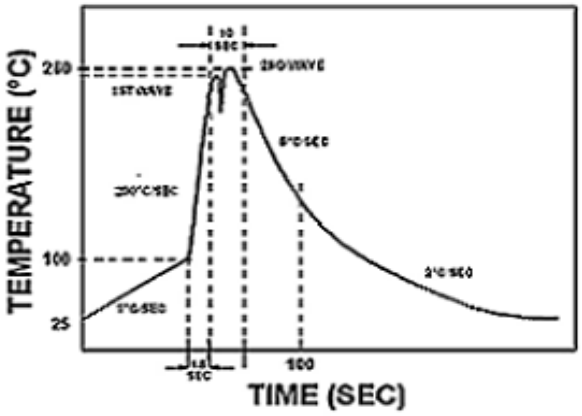


Reflow profiles in tabular form

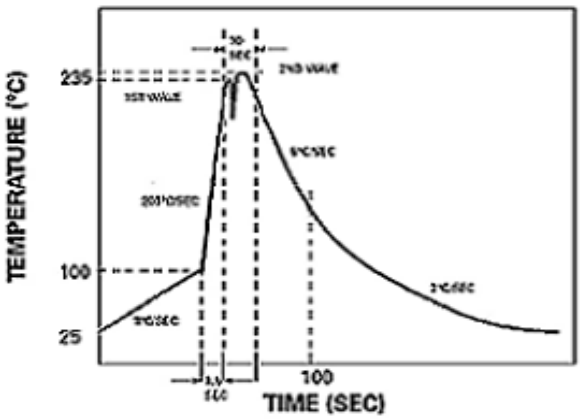
Profile Feature	Sn-Pb System	Pb-Free System
Average Ramp-Up Rate	~3°C/second	~3°C/second
Preheat – Temperature Range – Time	 150-170°C 60-180 seconds	 150-200°C 60-180 seconds
Time maintained above: – Temperature – Time	 200°C 30-50 seconds	 217°C 60-150 seconds
Peak Temperature	235°C	260°C max.
Time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