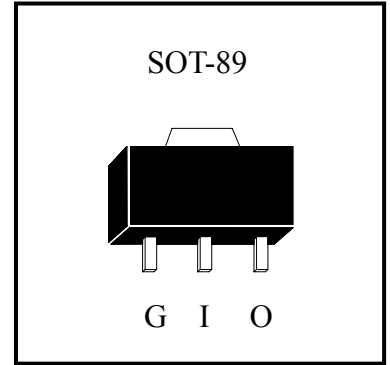


Low Current Negative Voltage Regulator

LM79LXXM3



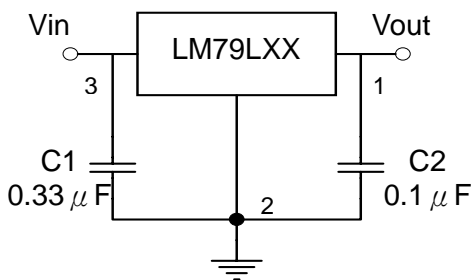
Description

The LM79LXXM3 series of negative regulators are available in the SOT-89 package and with -5V, -6V, -8V, -9V, -12V, -15V, -18V and -24V fixed output voltages, making it useful in a wide range of applications. These regulators can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each type employs internal current limiting, thermal shut-down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 100mA output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents. LM79LXXM3 is characterized for operation from 0°C to 125°C.

Features:

- Internal Short-Circuit Current Limiting
- Internal Thermal Overload Protection
- No External Components Required
- Pb-free lead plating package

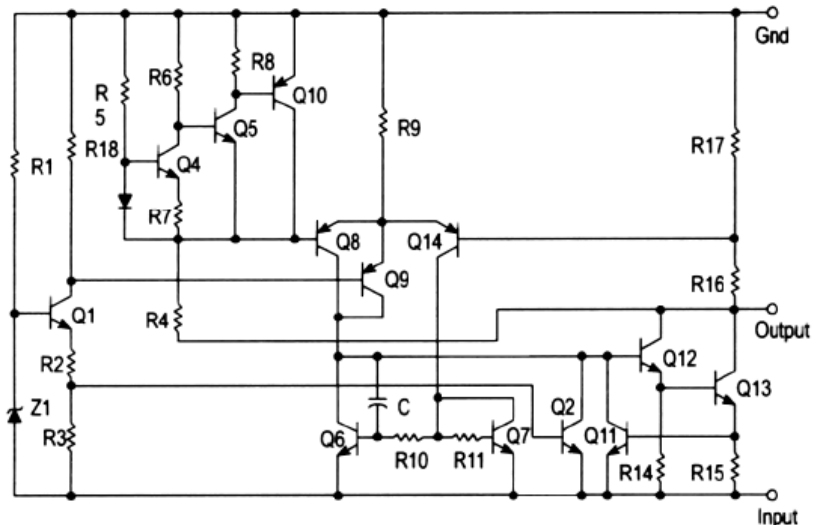
Typical Application



A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0V above the output voltage even during the low point on the input ripple voltage.

Note : C1 and C2 are required if regulator is located far from power supply filter and load, or oscillation may be induced on the loop.

Representative Schematic Diagram





Absolute Maximum Ratings

Parameter	Ratings	Unit
Input Voltage	LM79L05 ~ 09	-30
	LM79L12 ~18	-35
	LM79L24	-40
Output Current	100	mA
Operating Junction Temperature Range	0 ~ 125	°C
Storage Temperature Range	-65 ~ 150	°C
Power Dissipation	350 (Note)	mW

Note : When tested in free air condition, without heat sinking.

Electrical Characteristics

LM79L05 ($V_{in}=-10V$, $I_o=40mA$, $T_j=0\sim 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$, unless otherwise noted) (Note 1)

Symbol	Parameter	Min	Typ	Max	Conditions	Units
Vo	Output Voltage	-4.85	-5	-5.15	$V_{in}=-10V$, $I_o=40mA$, $T_j=25^{\circ}C$ $-7V \leq V_{in} \leq -20V$, $1mA \leq I_o \leq 40mA$	V
		-4.75	-	-5.25	$V_{in}=-10V$, $1mA \leq I_o \leq 70mA$ (Note 2)	
ΔV_o	Line Regulation	-	15	150	$-7V \leq V_{in} \leq -20V$, $T_j=25^{\circ}C$	mV
ΔV_o	Load Regulation	-	20	60	$1mA \leq I_o \leq 100mA$, $T_j=25^{\circ}C$	mV
IQ	Quiescent Current	-	-	6	$V_{in}=-10V$, $I_o=40mA$, $T_j=25^{\circ}C$	mA
ΔIQ	Quiescent Current Change	-	-	1.5	$-8V \leq V_{in} \leq -20V$	mA
		-	-	0.1	$1mA \leq I_o \leq 40mA$	
Vn	Output Noise Voltage	-	40	-	$10Hz \leq f \leq 100KHz$	μV
$\Delta V_{in} / \Delta V_{out}$	Ripple Rejection	41	49	-	$-8V \leq V_{in} \leq -18V$, $f=120Hz$, $T_j=25^{\circ}C$	dB
VD	Dropout Voltage	-	1.7	-	$I_o=100mA$, $T_j=25^{\circ}C$	V

LM79L06 ($V_{in}=-11V$, $I_o=40mA$, $T_j=0\sim 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$, unless otherwise noted) (Note 1)

Symbol	Parameter	Min	Typ	Max	Conditions	Units
Vo	Output Voltage	-5.82	-6	-6.18	$V_{in}=-11V$, $I_o=40mA$, $T_j=25^{\circ}C$ $-8V \leq V_{in} \leq -20V$, $1mA \leq I_o \leq 40mA$	V
		-5.70	-	-6.30	$V_{in}=-11V$, $1mA \leq I_o \leq 70mA$ (Note 2)	
ΔV_o	Line Regulation	-	20	150	$-8V \leq V_{in} \leq -20V$, $T_j=25^{\circ}C$	mV
ΔV_o	Load Regulation	-	21	60	$V_{in}=-11V$, $1mA \leq I_o \leq 100mA$, $T_j=25^{\circ}C$	mV
IQ	Quiescent Current	-	-	6	$V_{in}=-11V$, $I_o=40mA$, $T_j=25^{\circ}C$	mA
ΔIQ	Quiescent Current Change	-	-	1.5	$-9V \leq V_{in} \leq -20V$	mA
		-	-	0.1	$1mA \leq I_o \leq 40mA$	
Vn	Output Noise Voltage	-	44	-	$10Hz \leq f \leq 100KHz$	μV
$\Delta V_{in} / \Delta V_{out}$	Ripple Rejection	40	48	-	$-9V \leq V_{in} \leq -19V$, $f=120Hz$, $T_j=25^{\circ}C$	dB
VD	Dropout Voltage	-	1.7	-	$I_o=100mA$, $T_j=25^{\circ}C$	V



LM79L08 ($V_{in}=-14V$, $I_o=40mA$, $T_j=0\sim 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$, unless otherwise noted) (Note 1)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
Vo	A-rank(3%)	Output Voltage	-7.76	-8	-8.24	$V_{in}=-14V$, $I_o=40mA$, $T_j=25^{\circ}C$ $-10.5V \leq V_{in} \leq -23V$, $1mA \leq I_o \leq 40mA$ $V_{in}=-14V$, $1mA \leq I_o \leq 70mA$ (Note 2)	V
	B-rank(5%)		-7.60	-	-8.40		
ΔV_o	Line Regulation	-	42	175	$-10.5V \leq V_{in} \leq -23V$, $T_j=25^{\circ}C$	mV	
ΔV_o	Load Regulation	-	30	80	$1mA \leq I_o \leq 100mA$, $T_j=25^{\circ}C$	mV	
IQ	Quiescent Current	-	-	6	$V_{in}=-14V$, $I_o=40mA$, $T_j=25^{\circ}C$	mA	
ΔIQ	Quiescent Current Change	-	-	1.5	$-11V \leq V_{in} \leq -23V$	mA	
		-	-	0.1	$1mA \leq I_o \leq 40mA$		
Vn	Output Noise Voltage	-	54	-	$10Hz \leq f \leq 100KHz$	μV	
$\Delta V_{in} / \Delta V_{out}$	Ripple Rejection	37	46	-	$-11V \leq V_{in} \leq -21V$, $f=120Hz$, $T_j=25^{\circ}C$	dB	
VD	Dropout Voltage	-	1.7	-	$I_o=100mA$, $T_j=25^{\circ}C$	V	

LM79L09 ($V_{in}=-15V$, $I_o=40mA$, $T_j=0\sim 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$, unless otherwise noted) (Note 1)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
Vo	A-rank(3%)	Output Voltage	-8.73	-9	-9.27	$V_{in}=-15V$, $I_o=40mA$, $T_j=25^{\circ}C$ $-11.5V \leq V_{in} \leq -24V$, $1mA \leq I_o \leq 40mA$ $V_{in}=-15V$, $1mA \leq I_o \leq 70mA$ (Note 2)	V
	B-rank(5%)		-8.55	-	-9.45		
ΔV_o	Line Regulation	-	42	200	$-11.5V \leq V_{in} \leq -24V$, $T_j=25^{\circ}C$	mV	
ΔV_o	Load Regulation	-	30	90	$1mA \leq I_o \leq 100mA$, $T_j=25^{\circ}C$	mV	
IQ	Quiescent Current	-	-	6.0	$V_{in}=-15V$, $I_o=40mA$, $T_j=25^{\circ}C$	mA	
ΔIQ	Quiescent Current Change	-	-	1.5	$-12V \leq V_{in} \leq -24V$	mA	
		-	-	0.1	$1mA \leq I_o \leq 40mA$		
Vn	Output Noise Voltage	-	54	-	$10Hz \leq f \leq 100KHz$	μV	
$\Delta V_{in} / \Delta V_{out}$	Ripple Rejection	37	46	-	$-12V \leq V_{in} \leq -22V$, $f=120Hz$, $T_j=25^{\circ}C$	dB	
VD	Dropout Voltage	-	1.7	-	$I_o=100mA$, $T_j=25^{\circ}C$	V	

LM79L12 ($V_{in}=-19V$, $I_o=40mA$, $T_j=0\sim 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$, unless otherwise noted) (Note 1)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
Vo	A-rank(3%)	Output Voltage	-11.64	-12	-12.36	$V_{in}=-19V$, $I_o=40mA$, $T_j=25^{\circ}C$ $-14.5V \leq V_{in} \leq -27V$, $1mA \leq I_o \leq 40mA$ $V_{in}=-19V$, $1mA \leq I_o \leq 70mA$ (Note 2)	V
	B-rank(5%)		-11.40	-	-12.60		
ΔV_o	Line Regulation	-	50	250	$-14.5V \leq V_{in} \leq -27V$, $T_j=25^{\circ}C$	mV	
ΔV_o	Load Regulation	-	24	100	$1mA \leq I_o \leq 100mA$, $T_j=25^{\circ}C$	mV	
IQ	Quiescent Current	-	-	6.5	$V_{in}=-19V$, $I_o=40mA$, $T_j=25^{\circ}C$	mA	
ΔIQ	Quiescent Current Change	-	-	1.5	$-16V \leq V_{in} \leq -27V$	mA	
		-	-	0.1	$1mA \leq I_o \leq 40mA$		
Vn	Output Noise Voltage	-	80	-	$10Hz \leq f \leq 100KHz$	μV	
$\Delta V_{in} / \Delta V_{out}$	Ripple Rejection	37	42	-	$-15V \leq V_{in} \leq -25V$, $f=120Hz$, $T_j=25^{\circ}C$	dB	
VD	Dropout Voltage	-	1.7	-	$I_o=100mA$, $T_j=25^{\circ}C$	V	



LM79L15 ($V_{in}=-23V$, $I_o=40mA$, $T_j=0\sim 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$, unless otherwise noted) (Note 1)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
Vo	A-rank(3%)	Output Voltage	-14.55	-15	-15.45	$V_{in}=-23V$, $I_o=40mA$, $T_j=25^{\circ}C$ $-17.5V \leq V_{in} \leq -30V$, $1mA \leq I_o \leq 40mA$ $V_{in}=-23V$, $1mA \leq I_o \leq 70mA$ (Note 2)	V
	B-rank(5%)		-14.25	-	-15.75		
ΔV_o	Line Regulation	-	65	300	$-17.5V \leq V_{in} \leq -30V$, $T_j=25^{\circ}C$	mV	
ΔV_o	Load Regulation	-	25	150	$1mA \leq I_o \leq 100mA$, $T_j=25^{\circ}C$	mV	
IQ	Quiescent Current	-	-	6.5	$V_{in}=-23V$, $I_o=40mA$, $T_j=25^{\circ}C$	mA	
ΔI_Q	Quiescent Current Change	-	-	1.5	$-20V \leq V_{in} \leq -30V$	mA	
		-	-	0.1	$1mA \leq I_o \leq 40mA$		
Vn	Output Noise Voltage	-	90	-	$10Hz \leq f \leq 100KHz$	μV	
$\Delta V_{in} / \Delta V_{out}$	Ripple Rejection	34	39	-	$-18.5V \leq V_{in} \leq -28.5V$, $f=120Hz$, $T_j=25^{\circ}C$	dB	
V _D	Dropout Voltage	-	1.7	-	$I_o=100mA$, $T_j=25^{\circ}C$	V	

LM79L18 ($V_{in}=-27V$, $I_o=40mA$, $T_j=0\sim 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$, unless otherwise noted) (Note 1)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
Vo	A-rank(3%)	Output Voltage	-17.46	-18	-18.54	$V_{in}=-27V$, $I_o=40mA$, $T_j=25^{\circ}C$ $-20.5V \leq V_{in} \leq -33V$, $1mA \leq I_o \leq 40mA$ $V_{in}=-27V$, $1mA \leq I_o \leq 70mA$ (Note 2)	V
	B-rank(5%)		-17.10	-	-18.90		
ΔV_o	Line Regulation	-	70	300	$-20.5V \leq V_{in} \leq -33V$, $T_j=25^{\circ}C$	mV	
ΔV_o	Load Regulation	-	27	170	$1mA \leq I_o \leq 100mA$, $T_j=25^{\circ}C$	mV	
IQ	Quiescent Current	-	-	6.5	$V_{in}=-27V$, $I_o=40mA$, $T_j=25^{\circ}C$	mA	
ΔI_Q	Quiescent Current Change	-	-	1.5	$-21V \leq V_{in} \leq -33V$	mA	
		-	-	0.1	$1mA \leq I_o \leq 40mA$		
Vn	Output Noise Voltage	-	150	-	$10Hz \leq f \leq 100KHz$	μV	
$\Delta V_{in} / \Delta V_{out}$	Ripple Rejection	33	48	-	$-23V \leq V_{in} \leq -33V$, $f=120Hz$, $T_j=25^{\circ}C$	dB	
V _D	Dropout Voltage	-	1.7	-	$I_o=100mA$, $T_j=25^{\circ}C$	V	

LM79L24 ($V_{in}=-33V$, $I_o=40mA$, $T_j=0\sim 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$, unless otherwise noted) (Note 1)

Symbol	Parameter	Min	Typ	Max	Conditions	Units	
Vo	A-rank(3%)	Output Voltage	-23.28	-24	-24.72	$V_{in}=-33V$, $I_o=40mA$, $T_j=25^{\circ}C$ $-27V \leq V_{in} \leq -38V$, $1mA \leq I_o \leq 40mA$ $V_{in}=-33V$, $1mA \leq I_o \leq 70mA$ (Note 2)	V
	B-rank(5%)		-22.80	-	-25.20		
ΔV_o	Line Regulation	-	90	350	$-27V \leq V_{in} \leq -38V$, $T_j=25^{\circ}C$	mV	
ΔV_o	Load Regulation	-	40	200	$1mA \leq I_o \leq 100mA$, $T_j=25^{\circ}C$	mV	
IQ	Quiescent Current	-	-	6.5	$V_{in}=-33V$, $I_o=40mA$, $T_j=25^{\circ}C$	mA	
ΔI_Q	Quiescent Current Change	-	-	1.5	$-28V \leq V_{in} \leq -38V$	mA	
		-	-	0.1	$1mA \leq I_o \leq 40mA$		
Vn	Output Noise Voltage	-	200	-	$10Hz \leq f \leq 100KHz$	μV	
$\Delta V_{in} / \Delta V_{out}$	Ripple Rejection	31	47	-	$-29V \leq V_{in} \leq -35V$, $f=120Hz$, $T_j=25^{\circ}C$	dB	
V _D	Dropout Voltage	-	1.7	-	$I_o=100mA$, $T_j=25^{\circ}C$	V	

Note : 1. The maximum steady state usable output current is dependent on input voltage, heat sinking, lead length of the package and copper of PCB. The data above represent pulse test conditions with junction temperatures specified at the initial of test.

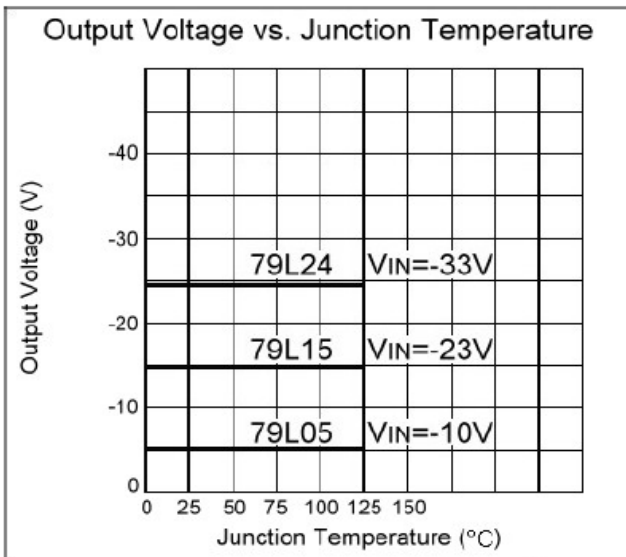
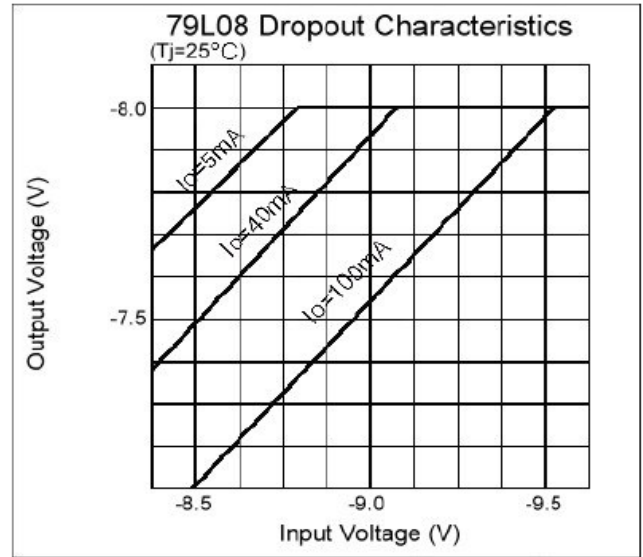
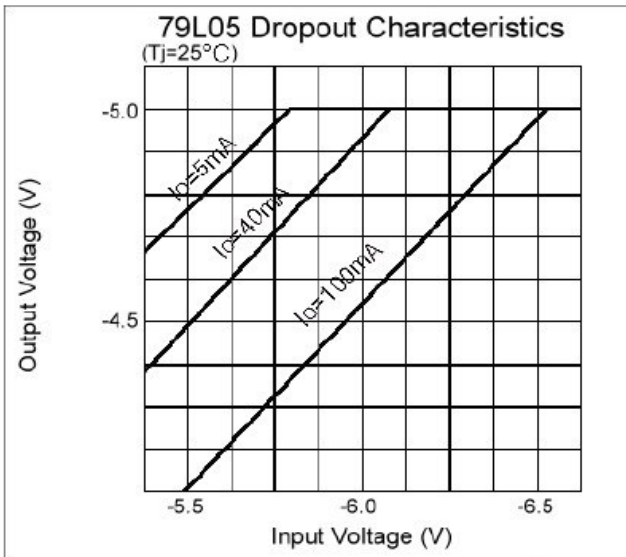
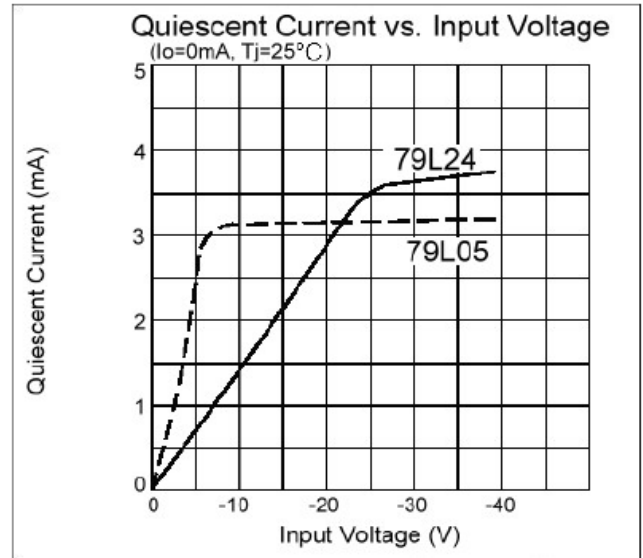
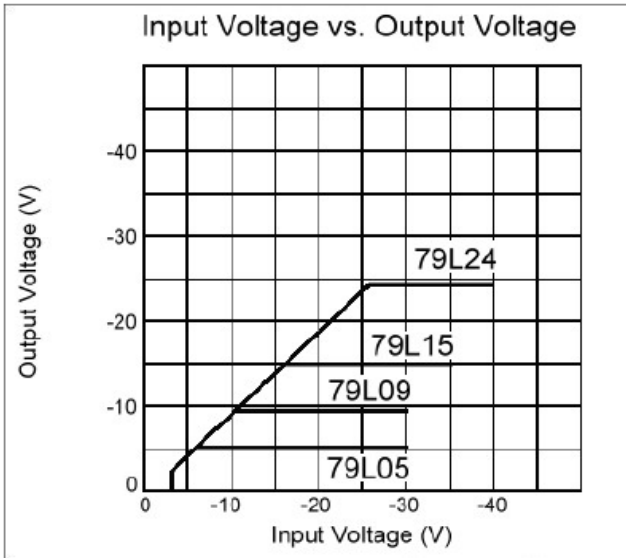
2. Power dissipation < 0.5W



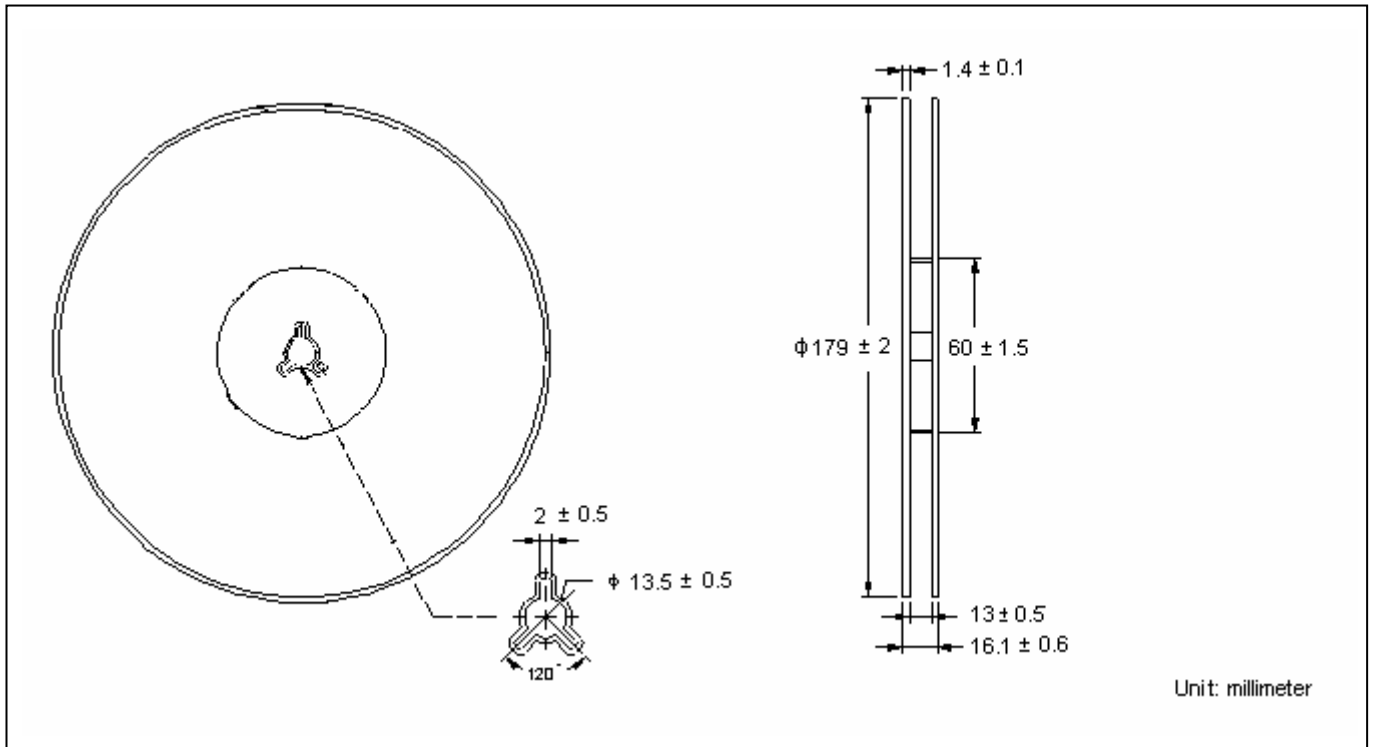
Ordering Information

Device	Output Voltage Tolerance	Package	Shipping	Marking
LM79LXXM3 A-rank	±3%	SOT-89 (Pb-free)	1000 pcs / Tape & Reel	79LXX
LM79LXXM3 B-rank	±5%	SOT-89 (Pb-free)	1000 pcs / Tape & Reel	79LXX

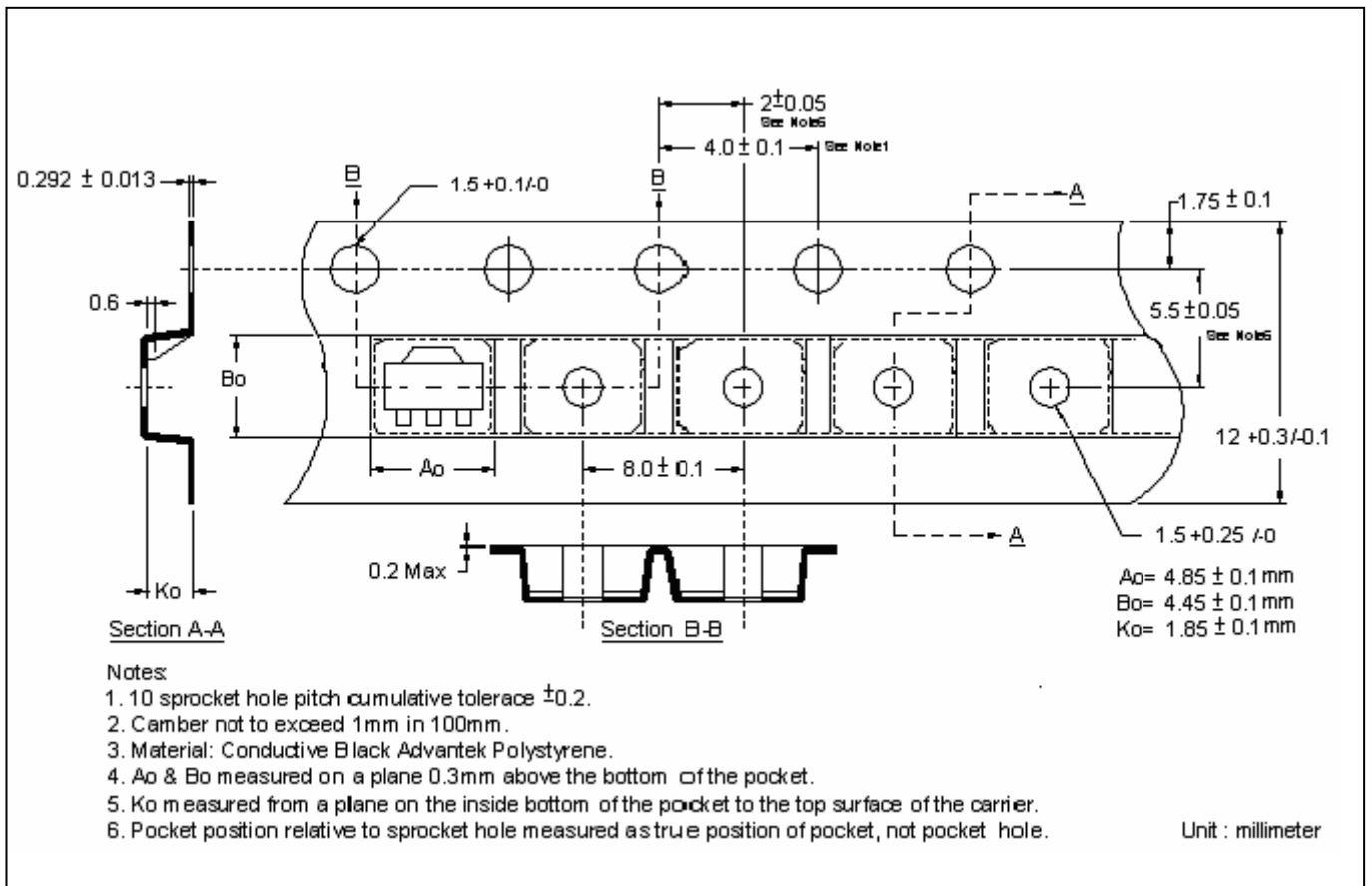
Typical Characteristics



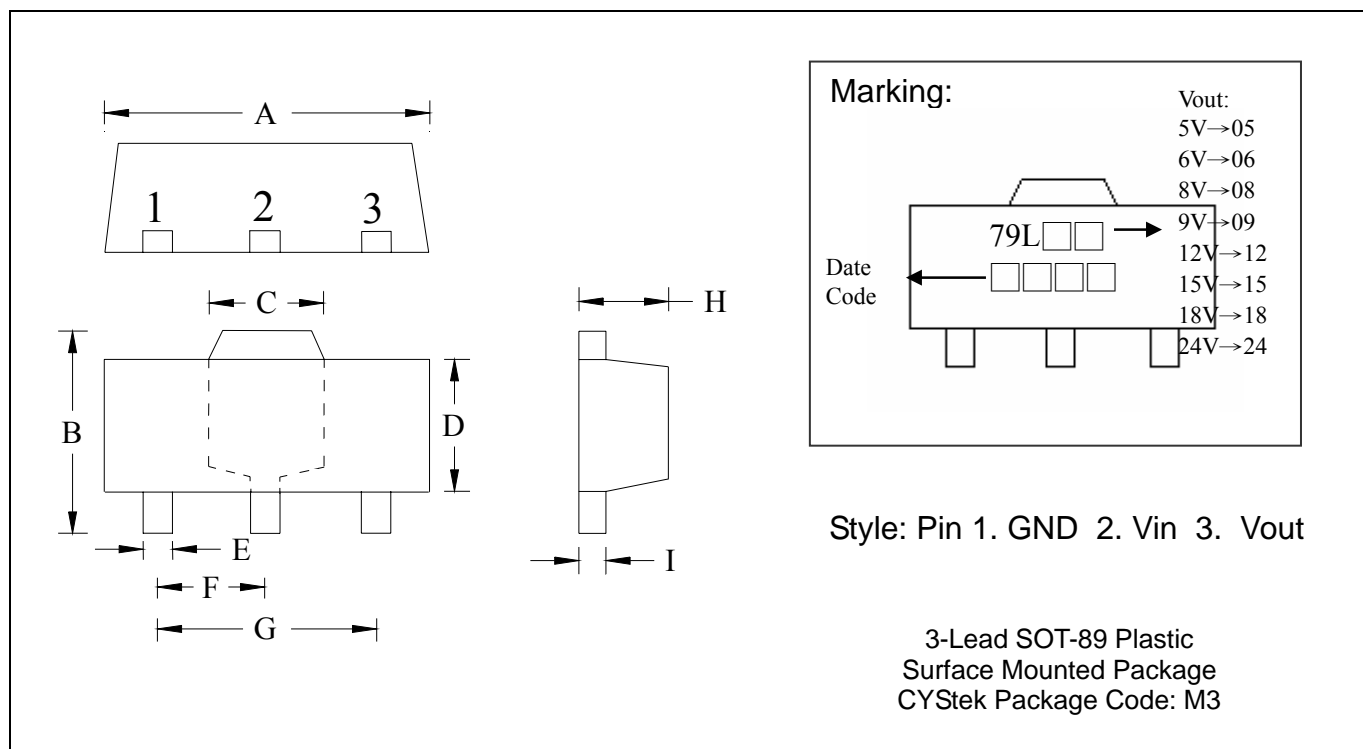
Reel Dimension



Carrier Tape Dimension



SOT-89 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1732	0.1811	4.40	4.60	F	0.0583	0.0598	1.48	1.527
B	0.1594	0.1673	4.05	4.25	G	0.1165	0.1197	2.96	3.04
C	0.0591	0.0663	1.50	1.70	H	0.0551	0.0630	1.40	1.60
D	0.0945	0.1024	2.40	2.60	I	0.0138	0.0161	0.35	0.41
E	0.01417	0.0201	0.36	0.51					

- Notes:
1. Controlling dimension: millimeters.
 2. Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 3. If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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