

GENERAL DESCRIPTION

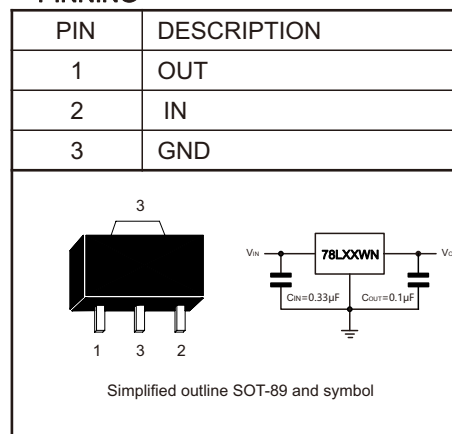
This series of fixed-voltage monolithic integrated circuit voltage regulators is designed for a wide range of applications. These applications include on-card regulation or elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used with power-pass elements to make high-current voltage regulators. Each of these regulators can deliver up to 100mA of output current. The internal limiting and thermal shutdown features of these regulators make them essentially immune to overload.

When used as a replacement for a Zener diode-resistor combination, an effective improvement in output impedance can be obtained together with lower-bias current.

FEATURES

- 3-Terminal Regulators
- Output Current Up to 100mA
- No External Components
- Internal Thermal Overload Protection
- Internal Short-Circuit Limiting
- Totally Lead-Free & Fully RoHS Compliant (Note 1)
- Halogen and Antimony Free. "Green" Device (Note 2)

PINNING



Mechanical Data

- Case: SOT-89
- Case Material: Molded Plastic.
UL Flammability Classification Rating 94V-0

ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

Parameter	78L05WN/78L09WN	78L12WN	78L15WN	Unit
Input Voltage	30	35	40	V
Operating Junction Temperature Range	-40~125	-40~125	-40~125	°C
Storage Temperature Range	-65~+150	-65~+150	-65~+150	°C
Lead temperature 1.6mm (1/16 inch) from case for 10s	260	260	260	°C

Recommended operating conditions

Parameter	MIN	MAX	Unit	
Input Voltage	78L05WN	7	20	
	78L09WN	11.5	24	
	78L12WN	14.5	27	
	78L15WN	17.5	30	
Output Current	ALL	100	mA	
Operating Junction Temperature Range	ALL	0	125	°C

Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS3) compliant.
2. Halogen and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br +Cl) and <1000ppm antimony compounds.



78L05WNELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JINCTION TEMPERATURE

(VI=10V, Io=40mA, Ci=0.33uF,Co=0.1uF, unless otherwise specified)

Parameter	Symbol	Test conditions		MIN	TYP	MAX	UNIT
Output voltage	Vo	Io=40mA	25°C	4.8	5	5.2	V
		7V≤Vi≤20V, Io=1mA-40mA	0-125°C	4.75	5	5.25	V
		Io=1mA-70mA		4.75	5	5.25	V
Line regulation	ΔVo	7V≤Vi≤20V	25°C		32	150	mV
		8V≤Vi≤20V			26	100	mV
Load Regulation		Io=1mA-100mA			15	60	mV
		Io=1mA-40mA			8	30	mV
Quiescent Current	Iq	Io=0mA	25°C		1.9	6	mA
			125°C			5.5	mA
Quiescent Current Change	ΔIq	8V≤Vi≤20V	0-125°C			1.5	mA
		1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100KHz	25°C		42		uV
Ripple Rejection	RR	8V≤Vi≤18V,f=120Hz	25°C	41	49		dB
Dropout Voltage	Vd		25°C		1.7		V

78L09WNELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JINCTION TEMPERATURE

(VI=16V, Io=40mA, Ci=0.33uF,Co=0.1uF, unless otherwise specified)

Parameter	Symbol	Test conditions		MIN	TYP	MAX	UNIT
Output voltage	Vo	Io=40mA	25°C	8.6	9	9.4	V
		12V≤Vi≤24V, Io=1mA-40mA	0-125°C	8.55	9	9.45	V
		Io=1mA-70mA		8.55	9	9.45	V
Line regulation	ΔVo	12V≤Vi≤24V	25°C		45	175	mV
		13V≤Vi≤24V			40	125	mV
Load Regulation		Io=1mA-100mA			19	90	mV
		Io=1mA-40mA			11	40	mV
Quiescent Current	Iq	Io=0mA	25°C		2.2	6	mA
			125°C			5.5	mA
Quiescent Current Change	ΔIq	13V≤Vi≤24V	0-125°C			1.5	mA
		1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100KHz	25°C		58		uV
Ripple Rejection	RR	15V≤Vi≤25V,f=120Hz	25°C	38	45		dB
Dropout Voltage	Vd		25°C		1.7		V



78L12WNELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JINCTION TEMPERATURE

(VI=19V, Io=40mA, Ci=0.33uF,Co=0.1uF, unless otherwise specified)

Parameter	Symbol	Test conditions		MIN	TYP	MAX	UNIT
Output voltage	Vo	Io=40mA	25°C	11.5	12	12.5	V
		14V≤Vi≤27V, Io=1mA-40mA	0-125°C	11.4	12	12.6	V
		Io=1mA-70mA		11.4	12	12.6	V
Line regulation	ΔVo	14V≤Vi≤27V	25°C		55	250	mV
		16V≤Vi≤27V			49	200	mV
Load Regulation		Io=1mA-100mA			22	100	mV
		Io=1mA-40mA			13	50	mV
Quiescent Current	Iq	Io=0mA	25°C		2.5	6.5	mA
			125°C			6	mA
Quiescent Current Change	ΔIq	16V≤Vi≤27V	0-125°C			1.5	mA
		1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100KHz	25°C		70		uV
Ripple Rejection	RR	15V≤Vi≤25V,f=120Hz	25°C	37	42		dB
Dropout Voltage	Vd		25°C		1.7		V

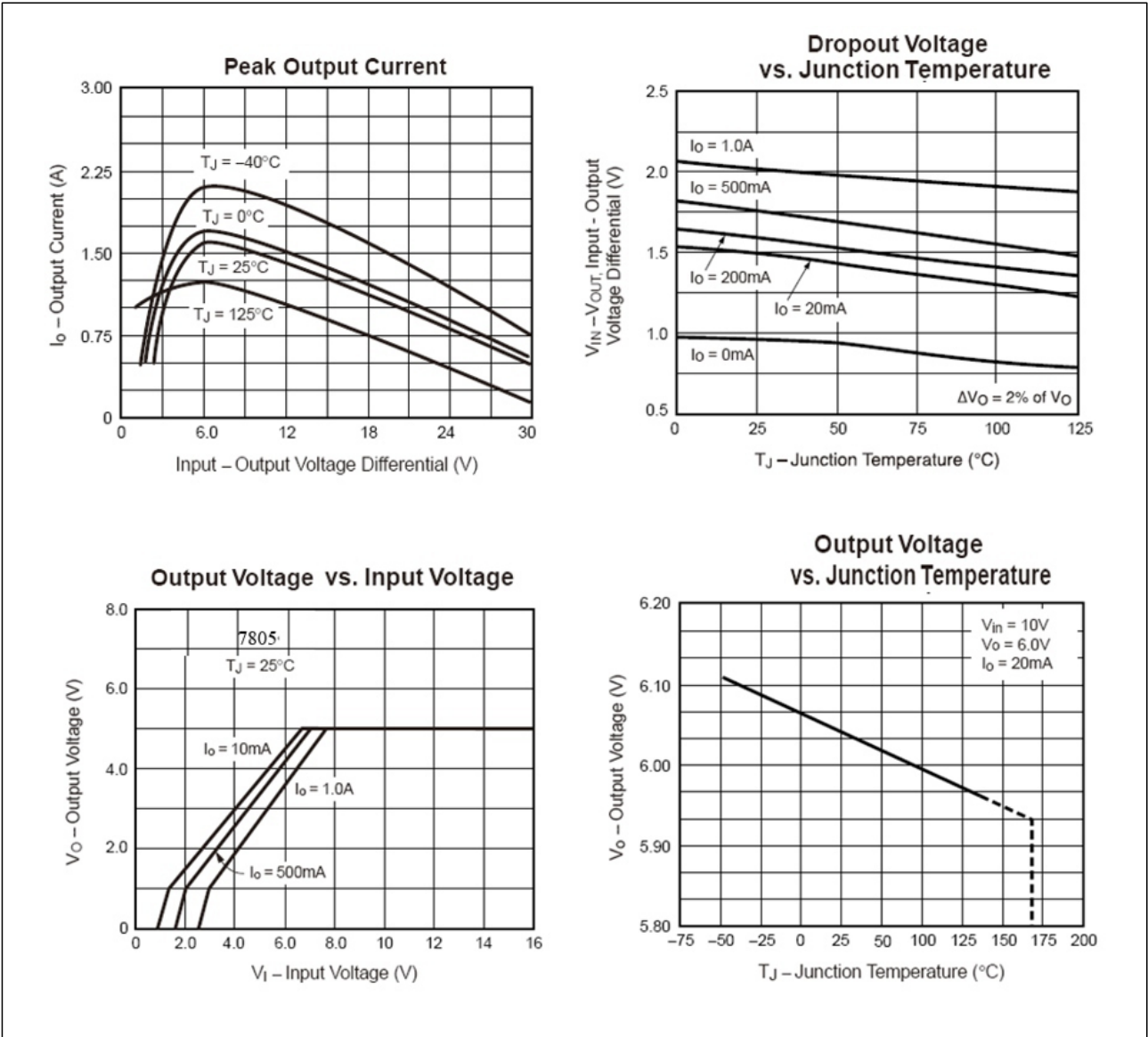
78L15WNELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JINCTION TEMPERATURE

(VI=23V, Io=40mA, Ci=0.33uF,Co=0.1uF, unless otherwise specified)

Parameter	Symbol	Test conditions		MIN	TYP	MAX	UNIT
Output voltage	Vo	Io=40mA	25°C	14.4	15	15.6	V
		17.5V≤Vi≤30V, Io=1mA-40mA	0-125°C	14.25	15	15.75	V
		Io=1mA-70mA		14.25	15	15.75	V
Line regulation	ΔVo	17.5V≤Vi≤30V	25°C		65	300	mV
		19V≤Vi≤30V			58	250	mV
Load Regulation		Io=1mA-100mA			25	150	mV
		Io=1mA-40mA			15	75	mV
Quiescent Current	Iq	Io=0mA	25°C		2.6	6.5	mA
			125°C			6	mA
Quiescent Current Change	ΔIq	19V≤Vi≤30V	0-125°C			1.5	mA
		1mA≤Io≤40mA				0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100KHz	25°C		82		uV
Ripple Rejection	RR	18.5V≤Vi≤28.5V,f=120Hz	25°C	34	39		dB
Dropout Voltage	Vd		25°C		1.7		V

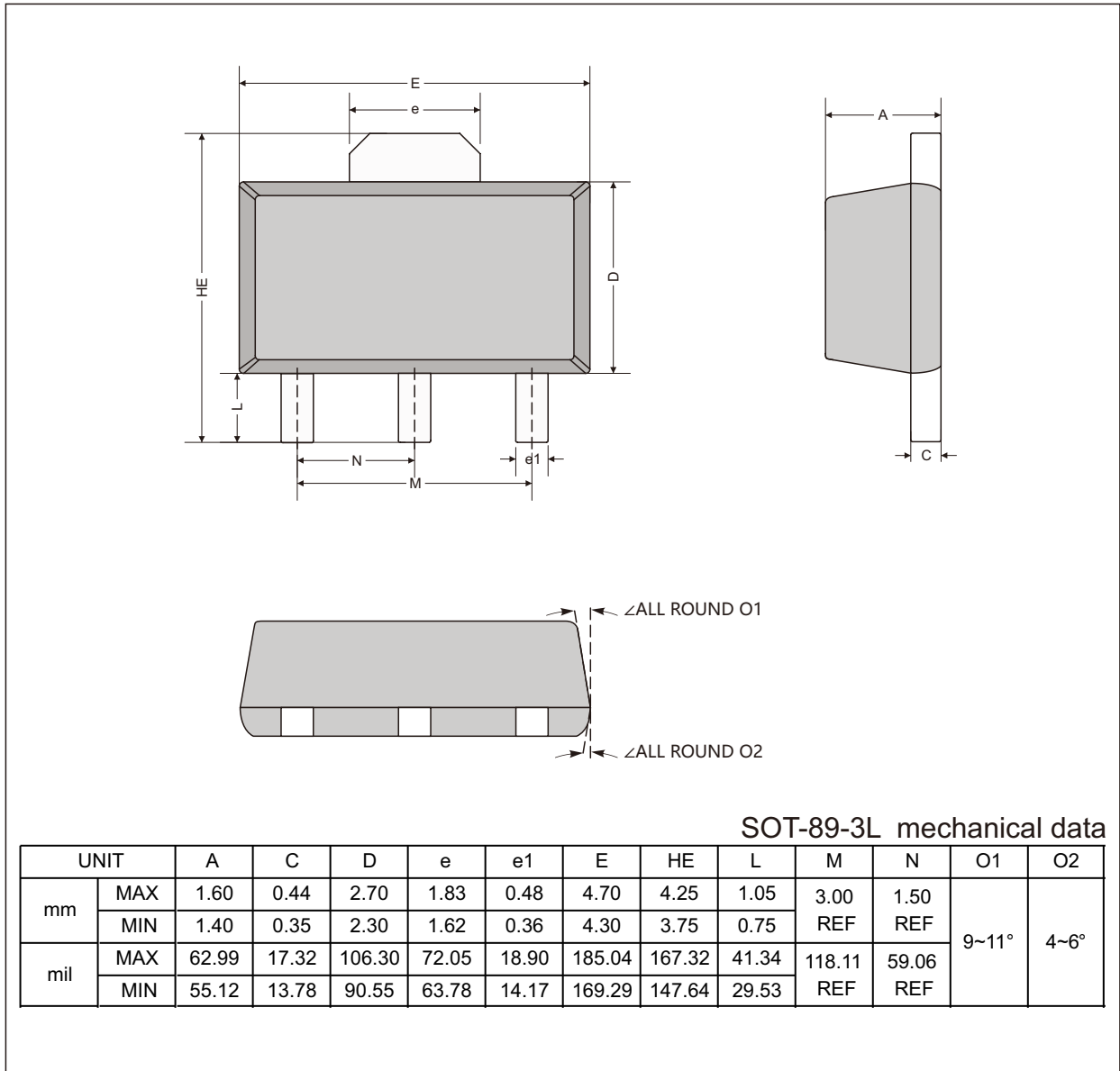


Typical Performance Characteristics

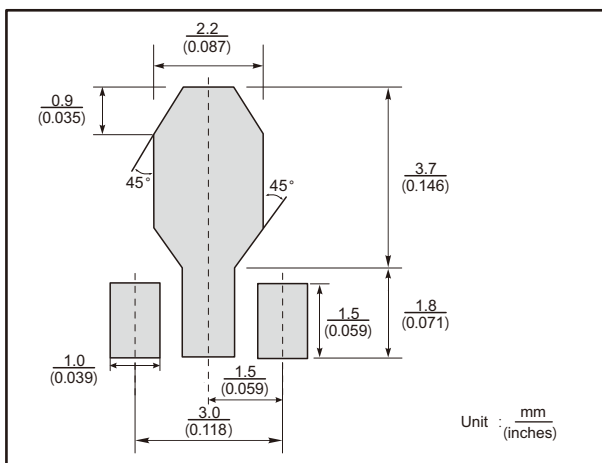




SOT-89-3L Package Outline Dimensions



The recommended mounting pad size



Marking

Type number	Marking code
78L05WN	78L05
78L09WN	78L09
78L12WN	78L12
78L15WN	78L15



Important Notice and Disclaimer

Jingdao Microelectronics reserves the right to make changes to this document and its products and specifications at any time without notice.

Customers should obtain and confirm the latest product information and specifications before final design, purchase or use.

Jingdao Microelectronics makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, not does Jingdao Microelectronics assume any liability for application assistance or customer product design.

Jingdao Microelectronics does not warrant or accept any liability with products which are purchased or used for any unintended or unauthorized application.

No license is granted by implication or otherwise under any intellectual property rights of Jingdao Microelectronics.

Jingdao Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of Jingdao Microelectronics.