

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.

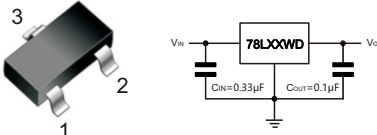
When used as a replacement for a Zener diode-resistor combination, an effective improvement in output impedance can be obtained together with lower-bias current.

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

PIN	DESCRIPTION
1	OUT
2	IN
3	GND



Simplified outline SOT-23 and symbol

Mechanical Data

- Case: SOT-23
- Case Material: Molded Plastic.
UL Flammability Classification Rating 94V-0

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

Parameter	78L05WD/78L09WD	78L12WD	78L15WD	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	78L05WD	7	20	V
	78L09WD	11.5	24	
	78L12WD	14.5	27	
	78L15WD	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.



78L05WD ELECTRICAL 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

78L09WD ELECTRICAL 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



78L12WD ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JINCTION TEMPERATURE

($V_I=19V$, $I_o=40mA$, $C_i=0.33\mu F$, $C_o=0.1\mu F$, unless otherwise specified)

Parameter	Symbol	Test conditions		MIN	TYP	MAX	UNIT
Output voltage	V_o	$I_o=40mA$	25°C	11.5	12	12.5	V
		$14V \leq V_I \leq 27V$, $I_o=1mA-40mA$	0-125°C	11.4	12	12.6	V
		$I_o=1mA-70mA$		11.4	12	12.6	V
Line regulation	ΔV_o	$14V \leq V_I \leq 27V$	25°C		55	250	mV
		$16V \leq V_I \leq 27V$			49	200	mV
Load Regulation		$I_o=1mA-100mA$			22	100	mV
		$I_o=1mA-40mA$			13	50	mV
Quiescent Current	I_q	$I_o=0mA$	25°C		2.5	6.5	mA
			125°C			6	mA
Quiescent Current Change	ΔI_q	$16V \leq V_I \leq 27V$	0-125°C			1.5	mA
		$1mA \leq I_o \leq 40mA$				0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100KHz$	25°C		70		μV
Ripple Rejection	RR	$15V \leq V_I \leq 25V$, $f=120Hz$	25°C	37	42		dB
Dropout Voltage	V_d		25°C		1.7		V

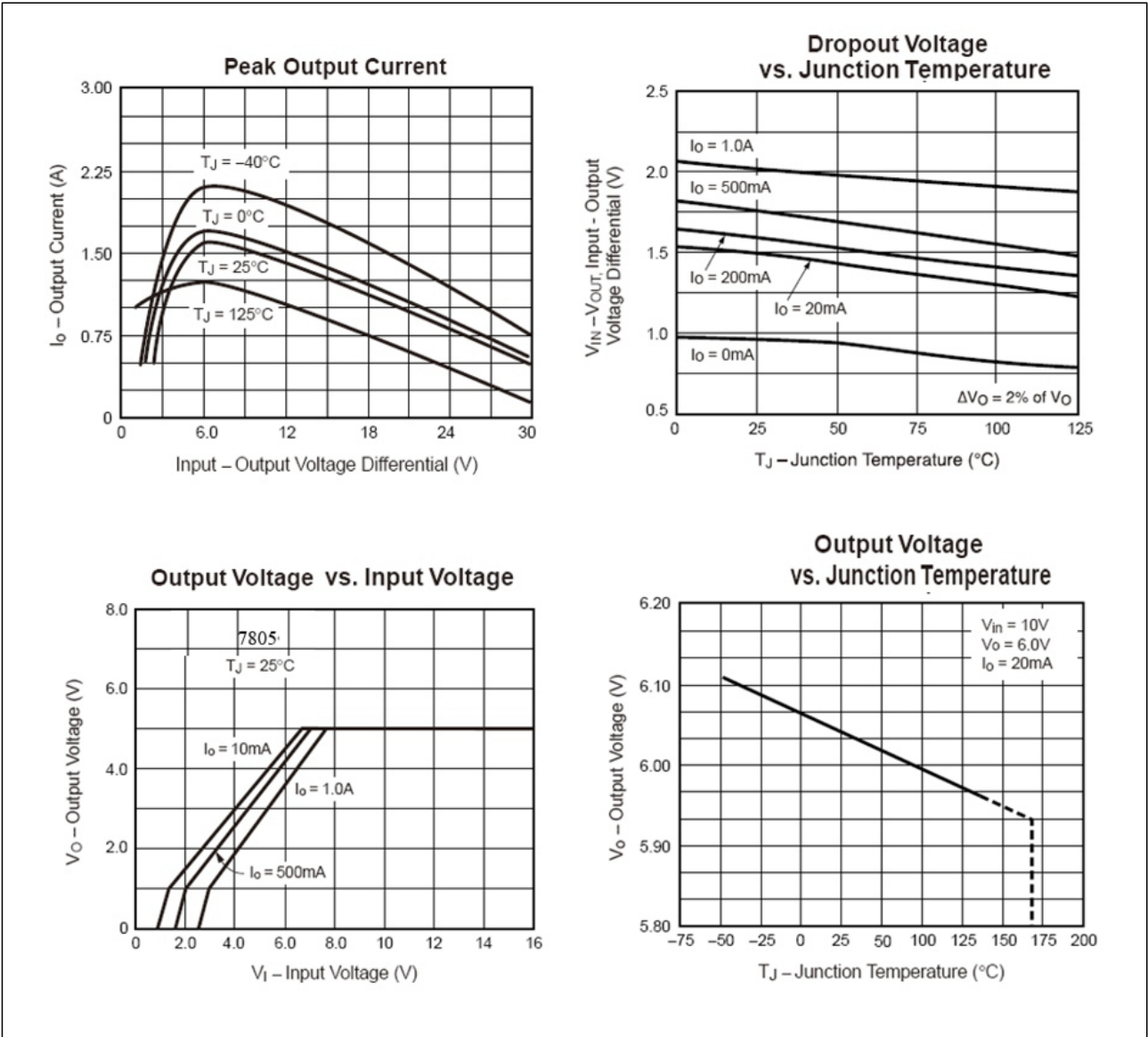
78L15WD ELECTRICAL CHARACTERISTICS AT SPECIFIED VIRTUAL JINCTION TEMPERATURE

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

Parameter	Symbol	Test conditions		MIN	TYP	MAX	UNIT
Output voltage	V_o	$I_o=40mA$	25°C	14.4	15	15.6	V
		$17.5V \leq V_I \leq 30V$, $I_o=1mA-40mA$	0-125°C	14.25	15	15.75	V
		$I_o=1mA-70mA$		14.25	15	15.75	V
Line regulation	ΔV_o	$17.5V \leq V_I \leq 30V$	25°C		65	300	mV
		$19V \leq V_I \leq 30V$			58	250	mV
Load Regulation		$I_o=1mA-100mA$			25	150	mV
		$I_o=1mA-40mA$			15	75	mV
Quiescent Current	I_q	$I_o=0mA$	25°C		2.6	6.5	mA
			125°C			6	mA
Quiescent Current Change	ΔI_q	$19V \leq V_I \leq 30V$	0-125°C			1.5	mA
		$1mA \leq I_o \leq 40mA$				0.1	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100KHz$	25°C		82		μV
Ripple Rejection	RR	$18.5V \leq V_I \leq 28.5V$, $f=120Hz$	25°C	34	39		dB
Dropout Voltage	V_d		25°C		1.7		V

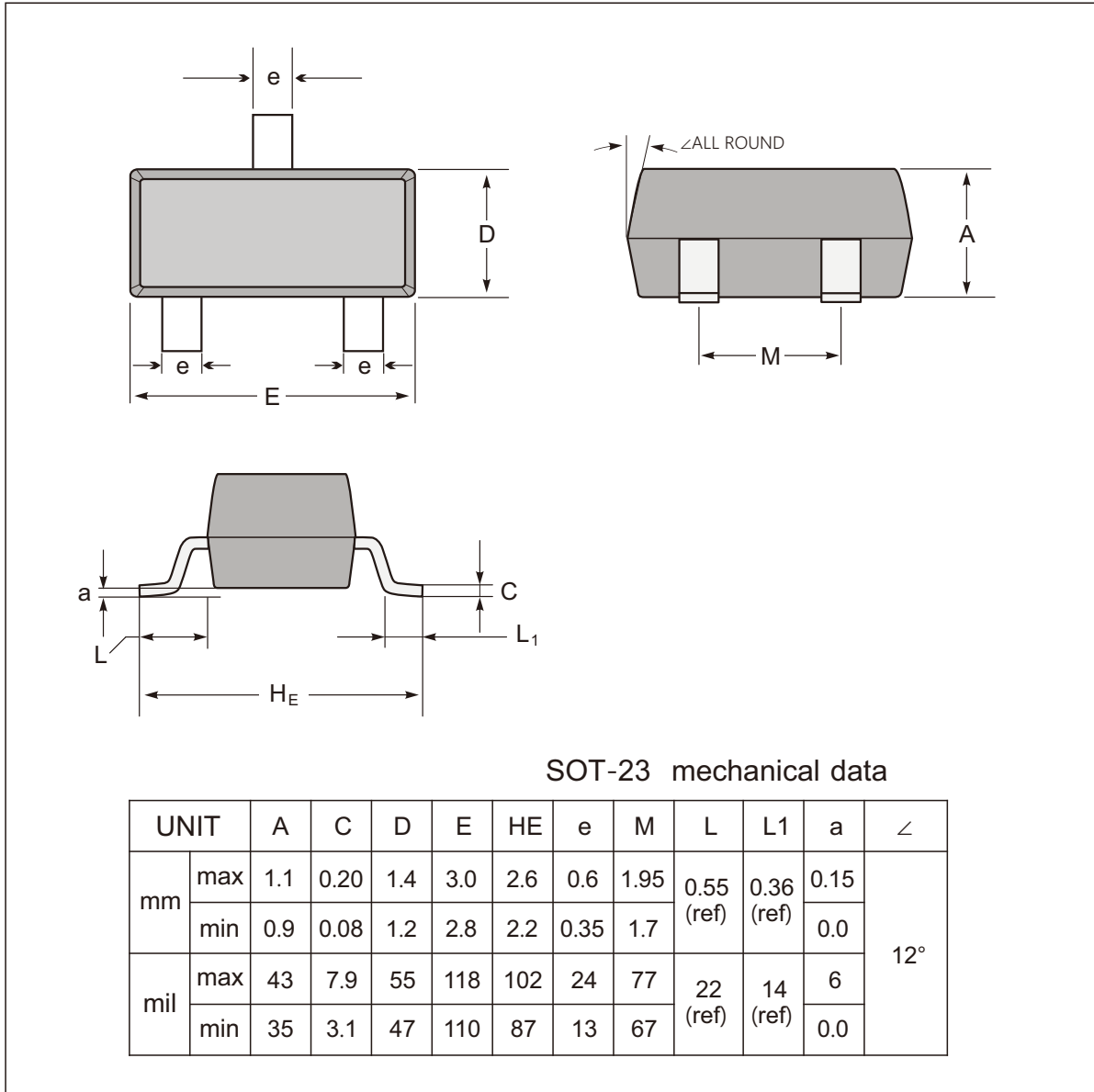


Typical Performance Characteristics

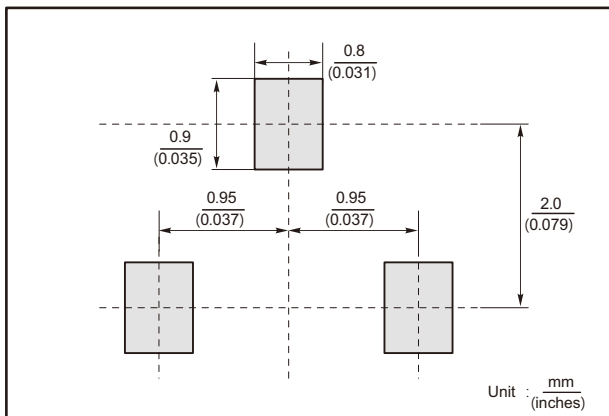




SOT-23 Package Outline Dimensions



The recommended mounting pad size



Marking

Type number	Marking code
78L05WD	78L05
78L09WD	78L09
78L12WD	78L12
78L15WD	78L15



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