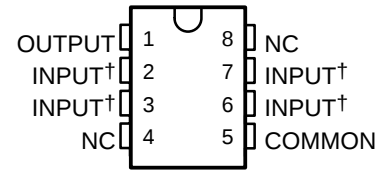


MC79L00 SERIES NEGATIVE-VOLTAGE REGULATORS

SLVS011C – OCTOBER 1982 – REVISED APRIL 2001

- 3-Terminal Regulators
- Output Current up to 100 mA
- No External Components Required
- Internal Thermal-Overload Protection
- Internal Short-Circuit Current Limiting
- Direct Replacement for Motorola MC79L00 Series
- Available in 5% or 10% Selections

**D PACKAGE
(TOP VIEW)**



† Internally connected
NC – No internal connection

description

This series of fixed negative-voltage integrated-circuit voltage regulators is designed for a wide range of applications. These include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. In addition, they can be used to control series pass elements to make high-current voltage-regulator circuits. One of these regulators can deliver up to 100 mA of output current. The internal current-limiting and thermal-shutdown features essentially make the regulators immune to overload. When used as a replacement for a zener-diode and resistor combination, these devices can provide an effective improvement in output impedance of two orders of magnitude, with lower bias current.

The MC79L00C series is characterized for operation over the virtual junction temperature range of 0°C to 125°C.

**LP PACKAGE
(TOP VIEW)**



AVAILABLE OPTIONS

T _J	NOMINAL OUTPUT VOLTAGE (V)	PACKAGED DEVICES			
		OUTPUT VOLTAGE TOLERANCE			
		SMALL OUTLINE (D)		PLASTIC CYLINDRICAL (LP)	
		5%	10%	5%	10%
0°C to 125°C	-5	MC79L05ACD	–	MC79L05ACLP	–
	-12	MC79L12ACD	MC79L12CD	MC79L12ACLP	MC79L12CLP
	-15	MC79L15ACD	MC79L15CD	MC79L15ACLP	–

The D package is available taped and reeled. Add the suffix R to the device type (e.g., MC79L05ACDR). The LP package is available taped and reeled or in ammo pack. Add the suffix M to the device type for ammo pack (e.g., MC79L15ACLPM).



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

**TEXAS
INSTRUMENTS**

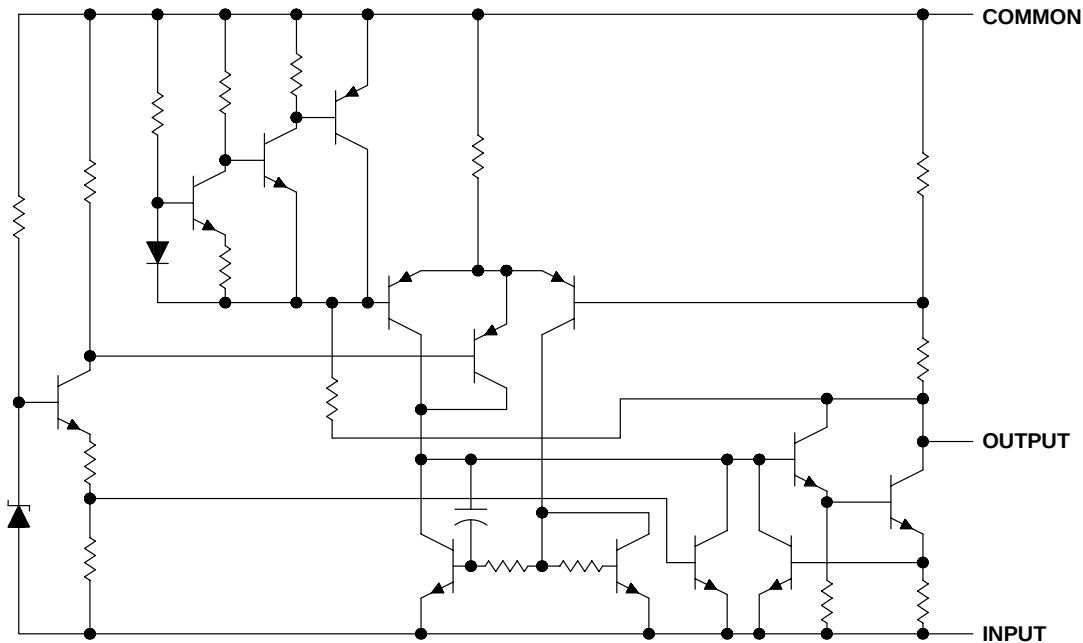
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MC79L00 SERIES
NEGATIVE-VOLTAGE REGULATORS

SLVS011C – OCTOBER 1982 – REVISED APRIL 2001

equivalent schematic



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)[†]

Input voltage: MC79L05	–30 V
MC79L12, MC79L15	–35 V
Operating free-air, case, or virtual junction temperature	150°C
Package thermal impedance, θ_{JA} (see Notes 1 and 2): D package	97°C/W
LP package	156°C/W
Lead temperature 1.6 mm (1/16 inch) from case for 10 seconds	260°C
Storage temperature range, T_{stg}	–65°C to 150°C

[†] Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. Maximum power dissipation is a function of $T_J(\text{max})$, θ_{JA} , and T_A . The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(\text{max}) - T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can impact reliability.
2. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions

		MIN	MAX	UNIT
V_I Input voltage	MC79L05	–7	–20	V
	MC79L12	–14.5	–27	
	MC79L15	–17.5	–30	
I_O Output current			100	mA
T_J Operating virtual junction temperature		0	125	°C

MC79L00 SERIES NEGATIVE-VOLTAGE REGULATORS

SLVS011C – OCTOBER 1982 – REVISED APRIL 2001

electrical characteristics at specified virtual junction temperature, $V_I = -10$ V, $I_O = 40$ mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS [†]	T_J	MC79L05C			MC79L05AC			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Output voltage [‡]		25°C	-4.6	-5	-5.4	-4.8	-5	-5.2	V
	$V_I = -7$ V to -20 V, $I_O = 1$ mA to 40 mA	0°C to 125°C	-4.5		-5.5	-4.75		-5.25	
	$V_I = -10$ V, $I_O = 1$ mA to 70 mA	0°C to 125°C	-4.5		-5.5	-4.75		-5.25	
Input regulation	$V_I = -7$ V to -20 V	25°C			200			150	mV
	$V_I = -8$ V to -20 V				150			100	
Ripple rejection	$V_I = -8$ V to -18 V, $f = 120$ Hz	25°C	40	49		41	49		dB
Output regulation	$I_O = 1$ mA to 100 mA	25°C			60			60	mV
	$I_O = 1$ mA to 40 mA				30			30	
Output noise voltage	$f = 10$ Hz to 100 kHz	25°C		40			40		μV
Dropout voltage	$I_O = 40$ mA	25°C		1.7			1.7		V
Bias current		25°C			6			6	mA
		125°C			5.5			5.5	
Bias current change	$V_I = -8$ V to -20 V	0°C to 125°C			1.5			1.5	mA
	$I_O = 1$ mA to 40 mA				0.2			0.1	

[†] All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output. Pulse-testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.

[‡] This specification applies only for dc power dissipation permitted by absolute maximum ratings.

electrical characteristics at specified virtual junction temperature, $V_I = -19$ V, $I_O = 40$ mA (unless otherwise noted)

PARAMETER	TEST CONDITIONS [†]	T_J	MC79L12C			MC79L12AC			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Output voltage [‡]		25°C	-11.1	-12	-12.9	-11.5	-12	-12.5	V
	$V_I = -14.5$ V to -27 V, $I_O = 1$ mA to 40 mA	0°C to 125°C	-10.8		-13.2	-11.4		-12.6	
	$V_I = -19$ V, $I_O = 1$ mA to 70 mA	0°C to 125°C	-10.8		-13.2	-11.4		-12.6	
Input regulation	$V_I = -14.5$ V to -27 V	25°C			250			250	mV
	$V_I = -16$ V to -27 V				200			200	
Ripple rejection	$V_I = -15$ V to -25 V, $f = 120$ Hz	25°C	36	42		37	42		dB
Output regulation	$I_O = 1$ mA to 100 mA	25°C			100			100	mV
	$I_O = 1$ mA to 40 mA				50			50	
Output noise voltage	$f = 10$ Hz to 100 kHz	25°C		80			80		μV
Dropout voltage	$I_O = 40$ mA	25°C		1.7			1.7		V
Bias current		25°C			6.5			6.5	mA
		125°C			6			6	
Bias current change	$V_I = -16$ V to -27 V	0°C to 125°C			1.5			1.5	mA
	$I_O = 1$ mA to 40 mA				0.2			0.1	

[†] All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output. Pulse-testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.

[‡] This specification applies only for dc power dissipation permitted by absolute maximum ratings.

MC79L00 SERIES NEGATIVE-VOLTAGE REGULATORS

SLVS011C – OCTOBER 1982 – REVISED APRIL 2001

electrical characteristics at specified virtual junction temperature, $V_I = -23\text{ V}$, $I_O = 40\text{ mA}$ (unless otherwise noted)

PARAMETER	TEST CONDITIONS†	T_J	MC79L15C			MC79L15AC			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Output voltage‡		25°C	-13.8	-15	-16.2	-14.4	-15	-15.6	V
	$V_I = -17.5\text{ V to } -30\text{ V}$, $I_O = 1\text{ mA to } 40\text{ mA}$	0°C to 125°C	-13.5		-16.5	-14.25		-15.75	
	$V_I = -23\text{ V}$, $I_O = 1\text{ mA to } 70\text{ mA}$	0°C to 125°C	-13.5		-16.5	-14.25		-15.75	
Input regulation	$V_I = -17.5\text{ V to } -30\text{ V}$	25°C			300			300	mV
	$V_I = -17.5\text{ V to } -30\text{ V}$				250			250	
Ripple rejection	$V_I = -18.5\text{ V to } -28.5\text{ V}$, $f = 120\text{ Hz}$	25°C	33	39		34	39		dB
Output regulation	$I_O = 1\text{ mA to } 100\text{ mA}$	25°C			150			150	mV
	$I_O = 1\text{ mA to } 40\text{ mA}$				75			75	
Output noise voltage	$f = 10\text{ Hz to } 100\text{ kHz}$	25°C		90			90		μV
Dropout voltage	$I_O = 40\text{ mA}$	25°C		1.7			1.7		V
Bias current		25°C			6.5			6.5	mA
		125°C			6			6	
Bias current change	$V_I = -20\text{ V to } -30\text{ V}$	0°C to 125°C			1.5			1.5	mA
	$I_O = 1\text{ mA to } 40\text{ mA}$				0.2			0.1	

† All characteristics are measured with a 0.33-μF capacitor across the input and a 0.1-μF capacitor across the output. Pulse-testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.

‡ This specification applies only for dc power dissipation permitted by absolute maximum ratings.

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