MC79L00A Series

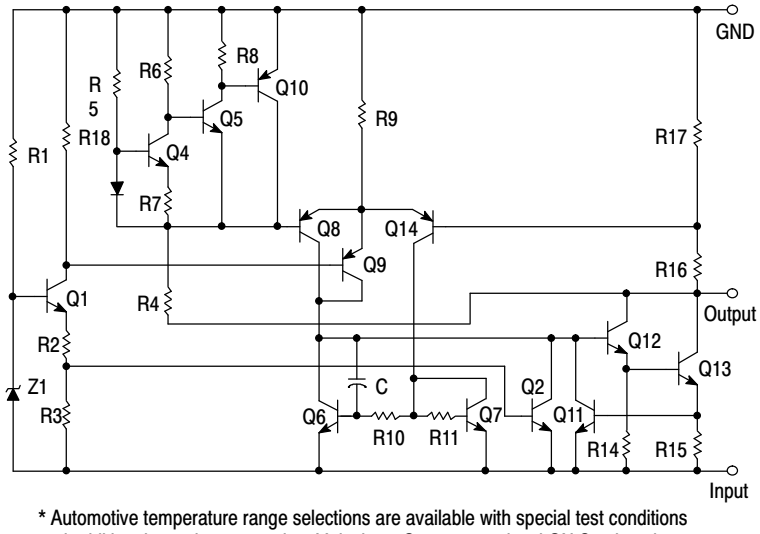
100 mA Negative Voltage Regulators

The MC79L00A Series negative voltage regulators are inexpensive, easy−to−use devices suitable for numerous applications requiring up to 100 mA. Like the higher powered MC7900 Series negative regulators, this series features thermal shutdown and current limiting, making them remarkably rugged. In most applications, no external components are required for operation.

The MC79L00A devices are useful for on−card regulation or any other application where a regulated negative voltage at a modest current level is needed. These regulators offer substantial advantage over the common resistor/Zener diode approach.

Features

- No External Components Required
- Internal Short Circuit Current Limiting
- Internal Thermal Overload Protection
- Low Cost
- Complementary Positive Regulators Offered (MC78L00 Series)
- Pb−Free Packages are Available



* Automotive temperature range selections are available with special test conditions and additional tests in 5, 12 and 15 V devices. Contact your local ON Semiconductor sales office for information.

Figure 1. Representative Schematic Diagram

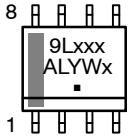
ON Semiconductor®

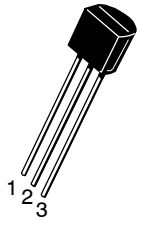
THREE−TERMINAL LOW CURRENT NEGATIVE FIXED VOLTAGE REGULATORS

MARKING DIAGRAMS

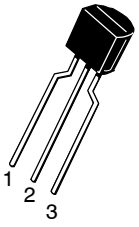
SOIC−8
D SUFFIX
CASE 751

Pin 1. V_{out}
2. V_{in}
3. V_{in}
4. NC
5. GND
6. V_{in}
7. V_{in}
8. NC





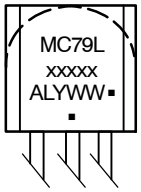
STRAIGHT LEAD
BULK PACK



BENT LEAD
TAPE & REEL
AMMO PACK

TO−92
P SUFFIX
CASE 29

Pin 1. Ground
2. Input
3. Output



xxx	= Specific Device Code
A	= Assembly Location
L	= Wafer Lot
Y	= Year
W, WW	= Work Week
y	= B or C
▪	= Pb−Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

Publication Order Number:
MC79L00/D

MAXIMUM RATINGS (T_A = +25°C, unless otherwise noted.)

Rating	Symbol	Value	Unit
Input Voltage (–5 V) (–12, –15, –18 V) (–24 V)	V_I	–30 –35 –40	Vdc
Power Dissipation Case 29 (TO–92 Type) T_A = 25°C Thermal Resistance, Junction–to–Ambient Thermal Resistance, Junction–to–Case Case 751 (SOIC–8 Type) (Note 1) T_A = 25°C Thermal Resistance, Junction–to–Ambient Thermal Resistance, Junction–to–Case	 PD $R_{\theta JA}$ $R_{\theta JC}$ PD $R_{\theta JA}$ $R_{\theta JC}$	 Internally Limited 160 83 Internally Limited 180 45	 W °C/W °C/W W °C/W °C/W
Storage Temperature Range	T_{stg}	–65 to +150	°C
Junction Temperature	T_J	+150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. SOIC–8 Junction–to–Ambient Thermal Resistance is for minimum recommended pad size. Refer to Figure 9 for Thermal Resistance variation versus pad size.

*This device series contains ESD protection and exceeds the following tests:
Human Body Model 2000 V per MIL_STD_883, Method 3015
Machine Model Method 200 V.

ELECTRICAL CHARACTERISTICS (V_I = –10 V, I_O = 40 mA, C_I = 0.33 μF, C_O = 0.1 μF, –40°C < T_J +125°C (for MC79LXXAB), 0°C < T_J < +125°C (for MC79LXXAC)).

Characteristics	Symbol	MC79L05AC, AB			Unit
		Min	Typ	Max	
Output Voltage (T_J = +25°C)	V_O	–4.8	–5.0	–5.2	Vdc
Input Regulation (T_J = +25°C) –7.0 Vdc ≥ V_I ≥ –20 Vdc –8.0 Vdc ≥ V_I ≥ –20 Vdc	Reg_{line}	 – –	 – –	 150 100	mV
Load Regulation T_J = +25°C, 1.0 mA ≤ I_O ≤ 100 mA 1.0 mA ≤ I_O ≤ 40 mA	Reg_{load}	 – –	 – –	 60 30	mV
Output Voltage –7.0 Vdc ≥ V_I ≥ –20 Vdc, 1.0 mA ≤ I_O ≤ 40 mA V_I = –10 Vdc, 1.0 mA ≤ I_O ≤ 70 mA	V_O	 –4.75 –4.75	 – –	 –5.25 –5.25	Vdc
Input Bias Current (T_J = +25°C) (T_J = +125°C)	I_{IB}	 – –	 – –	 6.0 5.5	mA
Input Bias Current Change –8.0 Vdc ≥ V_I ≥ –20 Vdc 1.0 mA ≤ I_O ≤ 40 mA	I_{IB}	 – –	 – –	 1.5 0.1	mA
Output Noise Voltage (T_A = +25°C, 10 Hz ≤ f ≤ 100 kHz)	V_n	–	40	–	μV
Ripple Rejection (–8.0 ≥ V_I ≥ –18 Vdc, f = 120 Hz, T_J = +25°C)	RR	41	49	–	dB
Dropout Voltage (I_O = 40 mA, T_J = +25°C)	$\|V_I–V_O\|$	–	1.7	–	Vdc

ELECTRICAL CHARACTERISTICS (V_I = −19 V, I_O = 40 mA, C_I = 0.33 μF, C_O = 0.1 μF, −40°C < T_J +125°C (for MC79LXXAB), 0°C < T_J < +125°C (for MC79LXXAC)).

Characteristics	Symbol	MC79L12AC, AB			Unit
		Min	Typ	Max	
Output Voltage (T_J = +25°C)	V_O	−11.5	−12	−12.5	Vdc
Input Regulation (T_J = +25°C) −14.5 Vdc ≥ V_I ≥ −27 Vdc −16 Vdc ≥ V_I ≥ −27 Vdc	Reg_{line}	 – –	 – –	 250 200	mV
Load Regulation T_J = +25°C, 1.0 mA ≤ I_O ≤ 100 mA 1.0 mA ≤ I_O ≤ 40 mA	Reg_{load}	 – –	 – –	100 50	mV
Output Voltage −14.5 Vdc ≥ V_I ≥ −27 Vdc, 1.0 mA ≤ I_O ≤ 40 mA V_I = −19 Vdc, 1.0 mA ≤ I_O ≤ 70 mA	V_O	−11.4 −11.4	 – –	−12.6 −12.6	Vdc
Input Bias Current (T_J = +25°C) (T_J = +125°C)	I_{IB}	 – –	 – –	 6.5 6.0	mA
Input Bias Current Change −16 Vdc ≥ V_I ≥ −27 Vdc 1.0 mA ≤ I_O ≤ 40 mA	I_{IB}	 – –	 – –	1.5 0.2	mA
Output Noise Voltage (T_A = +25°C, 10 Hz ≤ f ≤ 100 kHz)	V_n	–	80	–	μV
Ripple Rejection (−15 ≤ V_I ≤ −25 Vdc, f = 120 Hz, T_J = +25°C)	RR	37	42	–	dB
Dropout Voltage (I_O = 40 mA, T_J = +25°C)	$\|V_I–V_O\|$	–	1.7	–	Vdc

ELECTRICAL CHARACTERISTICS (V_I = −23 V, I_O = 40 mA, C_I = 0.33 μF, C_O = 0.1 μF, −40°C < T_J +125°C (for MC79LXXAB), 0°C < T_J < +125°C (for MC79LXXAC)).

Characteristics	Symbol	MC79L15AC, AB			Unit
		Min	Typ	Max	
Output Voltage (T_J = +25°C)	V_O	−14.4	−15	−15.6	Vdc
Input Regulation (T_J = +25°C) −17.5 Vdc ≥ V_I ≥ −30 Vdc −20 Vdc ≥ V_I ≥ −30 Vdc	Reg_{line}	 – –	 – –	 300 250	mV
Load Regulation T_J = +25°C, 1.0 mA ≤ I_O ≤ 100 mA 1.0 mA ≤ I_O ≤ 40 mA	Reg_{load}	 – –	 – –	 150 75	mV
Output Voltage −17.5 Vdc ≥ V_I ≥ −Vdc, 1.0 mA ≤ I_O ≤ 40 mA V_I = −23 Vdc, 1.0 mA ≤ I_O ≤ 70 mA	V_O	 −14.25 −14.25	 – –	 −15.75 −15.75	Vdc
Input Bias Current (T_J = +25°C) (T_J = +125°C)	I_{IB}	 – –	 – –	 6.5 6.0	mA
Input Bias Current Change −20 Vdc ≥ V_I ≥ −30 Vdc 1.0 mA ≤ I_O ≤ 40 mA	ΔI_{IB}	 – –	 – –	 1.5 0.1	mA
Output Noise Voltage (T_A = +25°C, 10 Hz ≤ f ≤ 100 kHz)	V_N	–	90	–	μV
Ripple Rejection (−18.5 ≤ V_I ≤ −28.5 Vdc, f = 120 Hz)	RR	34	39	–	dB
Dropout Voltage I_O = 40 mA, T_J = +25°C	$\|V_I–V_O\|$	–	1.7	–	Vdc

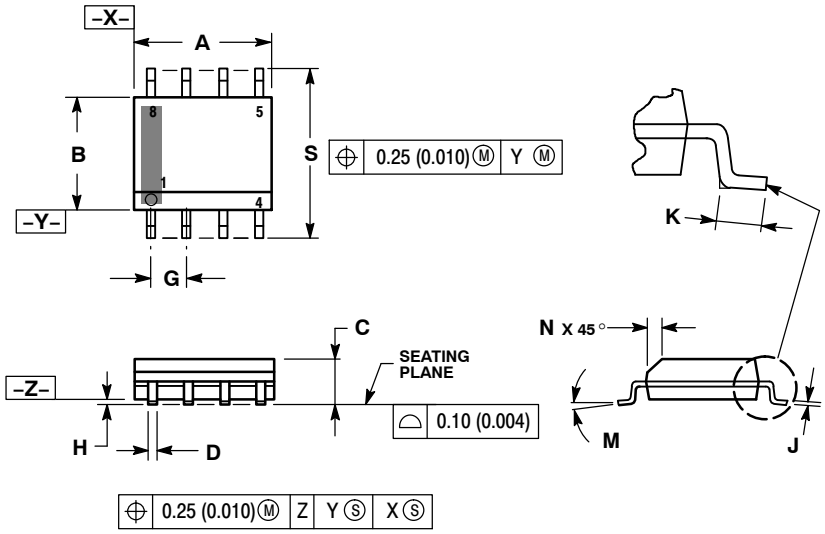
ORDERING INFORMATION

Device	Nominal Voltage	Operating Temperature Range	Package	Shipping†
MC79L12ACD	−12 V	TJ = 0° to +125°C	SOIC−8	98 Units / Rail
MC79L12ACDG			SOIC−8 (Pb−Free)	98 Units / Rail
MC79L12ACDR2			SOIC−8	2500 / Tape & Reel
MC79L12ACDR2G			SOIC−8 (Pb−Free)	2500 / Tape & Reel
MC79L12ACP			TO−92	2000 Units / Bag
MC79L12ACPG			TO−92 (Pb−Free)	2000 Units / Bag
MC79L12ACPRA			TO−92	2000 / Tape & Reel
MC79L12ACPRAG			TO−92 (Pb−Free)	2000 / Tape & Reel
MC79L12ACPRP			TO−92	2000 / Tape & Ammo Box
MC79L12ACPRPG			TO−92 (Pb−Free)	2000 / Tape & Ammo Box
MC79L15ABD	−15 V	TJ = −40° to +125°C	SOIC−8	98 Units / Rail
MC79L15ABDG			SOIC−8 (Pb−Free)	98 Units / Rail
MC79L15ABDR2			SOIC−8	2500 / Tape & Reel
MC79L15ABDR2G			SOIC−8 (Pb−Free)	2500 / Tape & Reel
MC79L15ABP			TO−92	2000 Units / Bag
MC79L15ABPG			TO−92 (Pb−Free)	2000 Units / Bag
MC79L15ABPRP			TO−92	2000 / Tape & Ammo Box
MC79L15ABPRPG			TO−92 (Pb−Free)	2000 / Tape & Ammo Box
MC79L15ACD		TJ = 0° to +125°C	SOIC−8	98 Units / Rail
MC79L15ACDG			SOIC−8 (Pb−Free)	98 Units / Rail
MC79L15ACDR2			SOIC−8	2500 / Tape & Reel
MC79L15ACDR2G			SOIC−8 (Pb−Free)	2500 / Tape & Reel
MC79L15ACP			TO−92	2000 Units / Bag
MC79L15ACPG			TO−92 (Pb−Free)	2000 Units / Bag
MC79L15ACPRA			TO−92	2000 / Tape & Reel
MC79L15ACPRAG			TO−92 (Pb−Free)	2000 / Tape & Reel
MC79L15ACPRE			TO−92	2000 / Tape & Reel
MC79L15ACPREG			TO−92 (Pb−Free)	2000 / Tape & Reel
MC79L15ACPRP			TO−92	2000 / Tape & Ammo Box
MC79L15ACPRPG			TO−92 (Pb−Free)	2000 / Tape & Ammo Box

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

PACKAGE DIMENSIONS

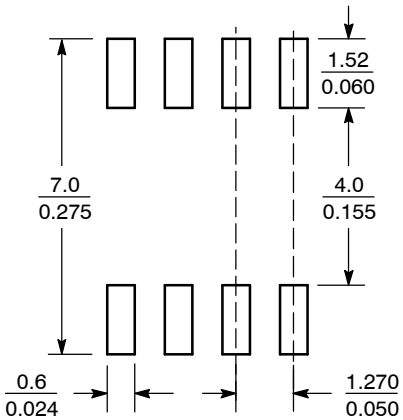
SOIC−8
CASE 751−07
ISSUE AJ



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751−01 THRU 751−06 ARE OBSOLETE. NEW STANDARD IS 751−07.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.33	0.51	0.013	0.020
G	1.27 BSC		0.050 BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0 °	8 °	0 °	8 °
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244

SOLDERING FOOTPRINT*



SCALE 6:1 (mm / inches)

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.