


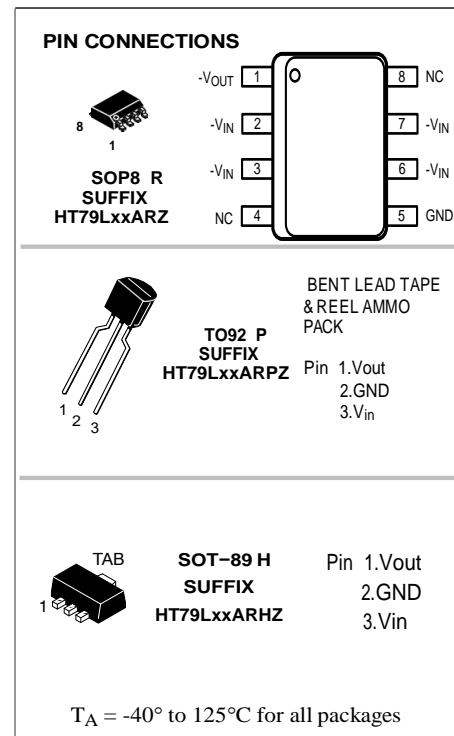
## Negative-Voltage Regulators

### 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 for 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.

- 3-Terminal Regulators
- Output Current Up to 100mA
- No External Components
- Internal Thermal Overload Protection
- Internal Short-Circuit Limiting
- Direct Replacement for Motorola MC79L00 Series

Nominal output voltage	Regulator	
-5V	HT79L05	
-6V	HT79L06	
-8V	HT79L08	
-12V	HT79L12	
-15V	HT79L15	
-18V	HT79L18	
-24V	HT79L24	



### Absolute maximum ratings over operating temperature range (unless otherwise noted)

	HT79L05 thru	HT79L12 thru	HT79L24	UNIT
Input voltage	-30	-35	-40	V
Operating free-air, case, or virtual junction temperature range	0 to 150	0 to 150	0 to 150	
Storage temperature range	-65 to 150	-65 to 150	-65 to 150	°C
Lead temperature 1.6 mm (1/16 inch) from case for 10 seconds	260	260	260	

### Recommended operating conditions

Parameter		MIN	MAX	UNIT
Input voltage, V <sub>I</sub>	HT79L05	-7	-20	V
	HT79L06	-8	-20	
	HT79L08	-10.5	-23	
	HT79L12	-14.5	-27	
	HT79L15	-17.5	-30	
	HT79L18	-20.5	-33	
HT79L24	-27	-38		
Output current, I <sub>O</sub>			100	mA
Operating temperature range, T <sub>J</sub>		-40	125	°C

**HT79L05 electrical characteristics at specified virtual junction temperature,  $V_I=-10V$ ,  $I_O=40mA$  (unless otherwise noted)**

PARAMETER	TEST CONDITIONS*		HT79			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-4.8	-5	-5.2	V
	$I_O=1mA$ to 40mA $V_I=-7V$ to -20V	0 to 125 °C	-4.75	-5	-5.25	
	$I_O=1mA$ to 70mA		-4.75	-5	-5.25	
Input regulation	$V_I=-7V$ to -20V	25°C		15	150	mV
	$V_I=-8V$ to -20V			12	100	
Ripple rejection	$V_I=-8V$ to -18V, $f=120Hz$	25°C	41	49		dB
Output regulation	$I_O=1mA$ to 100mA	25°C		20	60	mV
	$I_O=1mA$ to 40mA			10	30	
Output noise voltage	$f=10Hz-100Hz$	25°C		40		μV
Dropout voltage		25°C		1.7		V
Bias current		25°C		3.8	6	mA
		125°C			5.5	
Bias current change	$V_I=-8V$ to -20V	0 to 125 °C			1.5	
	$I_O=1mA$ to 40mA				0.1	

**HT79L06 electrical characteristics at specified virtual junction temperature,  $V_I=-11V$ ,  $I_O=40mA$  (unless otherwise noted)**

PARAMETER	TEST CONDITIONS*		HT79			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-5.75	-6	-6.25	V
	$I_O=1mA$ to 40mA $V_I=-8V$ to -20V	0 to 125 °C	-5.7	-6	-6.3	
	$I_O=1mA$ to 70mA		-5.7	-6	-6.3	
Input regulation	$V_I=-8V$ to -20V	25°C		20	175	mV
	$V_I=-9V$ to -20V			15	125	
Ripple rejection	$V_I=-9V$ to -19V, $f=120Hz$	25°C	40	48		dB
Output regulation	$I_O=1mA$ to 100mA	25°C		21	80	mV
	$I_O=1mA$ to 40mA			11	40	
Output noise voltage	$f=10Hz-100Hz$	25°C		44		μV
Dropout voltage		25°C		1.7		V
Bias current		25°C			6	mA
		125°C			5.5	
Bias current change	$V_I=-9V$ to -20V	0 to 125 °C			1.5	
	$I_O=1mA$ to 40mA				0.1	

\*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. All characteristics are measured with a 0.33μF capacitor across the input and a 0.1μF capacitor across the output.

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

**HT79L08 electrical characteristics at specified virtual junction temperature,  $V_I=-14V$ ,**
 **$I_O=40mA$  (unless otherwise noted)**

PARAMETER	TEST CONDITIONS*		HT79			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-7.7	-8	-8.3	V
	$I_O=1mA$ to 40mA $V_I=-10.5V$ to -23V	0 to 125 °C	-7.6	-8	-8.4	
	$I_O=1mA$ to 70mA		-7.6	-8	-8.4	
Input regulation	$V_I=-10.5V$ to -23V	25°C		42	200	mV
	$V_I=-11V$ to -23V			36	150	
Ripple rejection	$V_I=-13V$ to -23V, $f=120Hz$	25°C	37	46		dB
Output regulation	$I_O=1mA$ to 100mA	25°C		30	100	mV
	$I_O=1mA$ to 40mA			15	50	
Output noise voltage	$f=10Hz-100Hz$	25°C		54		μV
Dropout voltage		25°C		1.7		V
Bias current		25°C			6	mA
		125°C			5.5	
Bias current change	$V_I=-11V$ to -23V	0 to 125 °C			1.5	
	$I_O=1mA$ to 40mA				0.1	

**HT79L12 electrical characteristics at specified virtual junction temperature,  $V_I=-19V$ ,**
 **$I_O=40mA$  (unless otherwise noted)**

PARAMETER	TEST CONDITIONS*		HT79			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-11.5	-12	-12.5	V
	$I_O=1mA$ to 40mA $V_I=-14V$ to -27V	0 to 125 °C	-11.4	-12	-12.6	
	$I_O=1mA$ to 70mA		-11.4	-12	-12.6	
Input regulation	$V_I=-14V$ to -27V	25°C		50	250	mV
	$V_I=-16V$ to -27V			40	200	
Ripple rejection	$V_I=-15V$ to -25V, $f=120Hz$	25°C	37	42		dB
Output regulation	$I_O=1mA$ to 100mA	25°C		24	100	mV
	$I_O=1mA$ to 40mA			15	50	
Output noise voltage	$f=10Hz-100Hz$	25°C		80		μV
Dropout voltage		25°C		1.7		V
Bias current		25°C			6.5	mA
		125°C			6	
Bias current change	$V_I=-16V$ to -27V	0 to 125 °C			1.5	
	$I_O=1mA$ to 40mA				0.1	

\*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. All characteristics are measured with a 0.33μF capacitor across the input and a 0.1μF capacitor across the output.

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

**HT79L15 electrical characteristics at specified virtual junction temperature,  $V_I=-23V$ ,  $I_O=40mA$  (unless otherwise noted)**

PARAMETER	TEST CONDITIONS*		HT79			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-14.4	-15	-15.6	V
	$I_O=1mA$ to 40mA $V_I=-17.5V$ to -30V	0 to 125 °C	-14.25	-15	-15.75	
	$I_O=1mA$ to 70mA		-14.25	-15	-15.75	
Input regulation	$V_I=-17.5V$ to -30V	25°C		65	300	mV
	$V_I=-19V$ to -30V			50	250	
Ripple rejection	$V_I=-18.5V$ to -28.5V, $f=120Hz$	25°C	34	39		dB
Output regulation	$I_O=1mA$ to 100mA	25°C		25	150	mV
	$I_O=1mA$ to 40mA			15	75	
Output noise voltage	$f=10Hz-100Hz$	25°C		90		µV
Dropout voltage		25°C		1.7		V
Bias current		25°C			6.5	mA
		125°C			6	
Bias current change	$V_I=-19V$ to -30V	0 to 125 °C			1.5	
	$I_O=1mA$ to 40mA				0.1	

**HT79L18 electrical characteristics at specified virtual junction temperature,  $V_I=-26V$ ,  $I_O=40mA$  (unless otherwise noted)**

PARAMETER	TEST CONDITIONS*		HT79			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-17.3	-18	-18.7	V
	$I_O=1mA$ to 40mA $V_I=-20.5V$ to -33V	0 to 125 °C	-17.1	-18	-18.9	
	$I_O=1mA$ to 70mA		-17.1	-18	-18.9	
Input regulation	$V_I=-20.5V$ to -33V	25°C		70	325	mV
	$V_I=-22V$ to -33V			60	275	
Ripple rejection	$V_I=-21.5V$ to -31.5V, $f=120Hz$	25°C	33	48		dB
Output regulation	$I_O=1mA$ to 100mA	25°C		27	170	mV
	$I_O=1mA$ to 40mA			19	85	
Output noise voltage	$f=10Hz-100Hz$	25°C		150		µV
Dropout voltage		25°C		1.7		V
Bias current		25°C			6.5	mA
		125°C			6	
Bias current change	$V_I=-22V$ to -33V	0 to 125 °C			1.5	
	$I_O=1mA$ to 40mA				0.1	

\*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. All characteristics are measured with a 0.33µF capacitor across the input and a 0.1µF capacitor across the output.

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

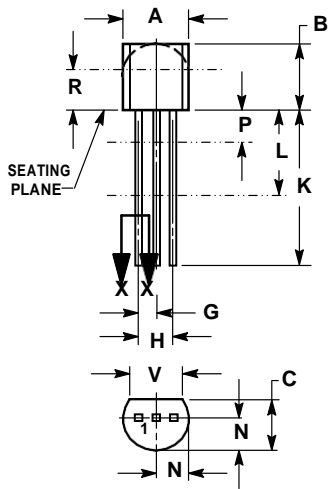
**HT79L24 electrical characteristics at specified virtual junction temperature,  $V_I=-33V$ ,  $I_O=40mA$  (unless otherwise noted)**

PARAMETER	TEST CONDITIONS*		HT79			UNIT
			MIN	TYP	MAX	
Output voltage**		25°C	-23	-24	-25	V
	$I_O=1mA$ to 40mA $V_I=-27V$ to -38V	0 to 125 °C	-22.8	-24	-25.2	
	$I_O=1mA$ to 70mA		-22.8	-24	-25.2	
Input regulation	$V_I=-27V$ to -38V	25°C		90	350	mV
	$V_I=-28V$ to -38V			75	300	
Ripple rejection	$V_I=-29V$ to -35V, $f=120Hz$	25°C	31	47		dB
Output regulation	$I_O=1mA$ to 100mA	25°C		40	200	mV
	$I_O=1mA$ to 40mA			25	100	
Output noise voltage	$f=10Hz-100Hz$	25°C		200		μV
Dropout voltage		25°C		1.7		V
Bias current		25°C			6.5	mA
		125°C			6	
Bias current change	$V_I=-28V$ to -38V	0 to 125 °C			1.5	
	$I_O=1mA$ to 40mA				0.1	

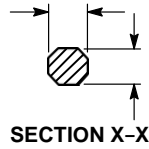
\*Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately. All characteristics are measured with a 0.33μF capacitor across the input and a 0.1μF capacitor across the output.

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

**TO-92**

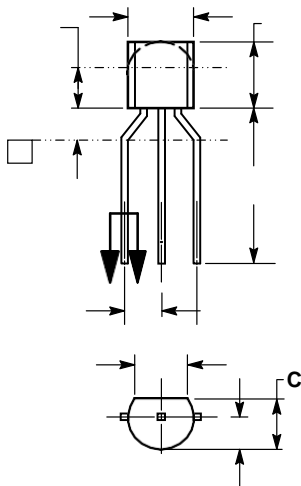


**STRAIGHT LEAD  
 BULK PACK**

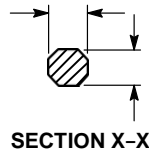


**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

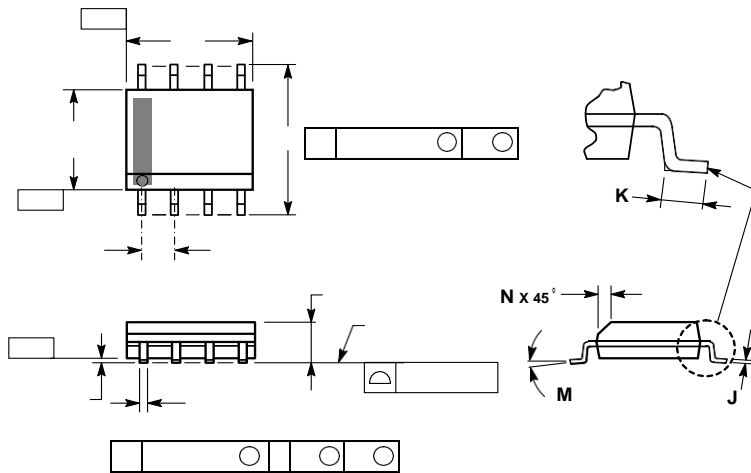



**BENT LEAD  
 TAPE & REEL  
 AMMO PACK**

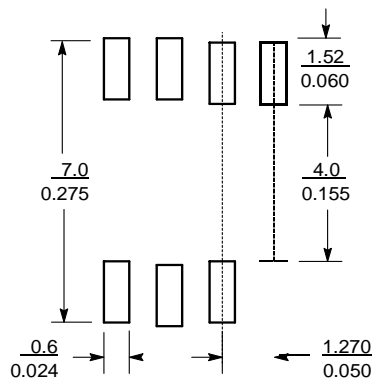


**NOTES:**

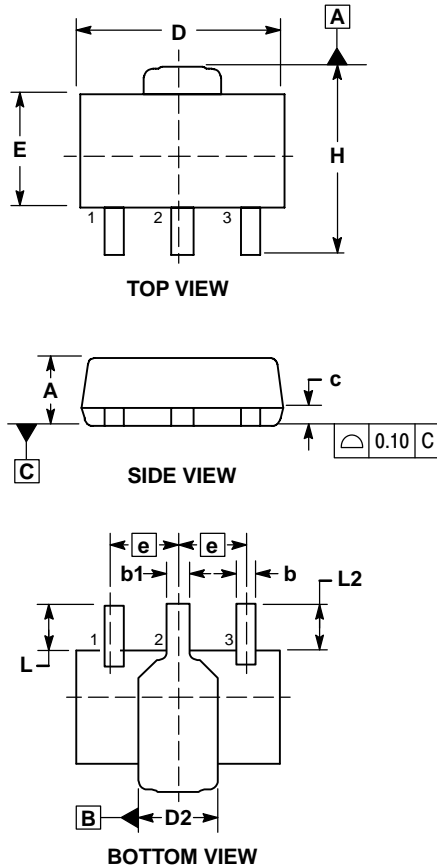
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.


**SOIC-8**


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.

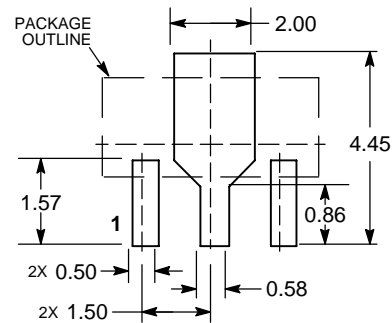

**SOLDERING FOOTPRINT\***

 SCALE 6:1  $\frac{\text{mm}}{\text{inches}}$ 

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

**SOT-89**

**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. LEAD THICKNESS INCLUDES LEAD FINISH.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
5. DIMENSIONS L, L2, D2, AND H ARE MEASURED AT DATUM PLANE C.
6. CENTER LEAD CONTOUR MAY VARY WITHIN THE REGION DEFINED BY DIMENSION E.
7. DIMENSION D2 IS DEFINED AT ITS WIDEST POINT.

DIM	MILLIMETERS	
	MIN	MAX
A	1.40	1.60
b	0.38	0.47
b1	0.46	0.55
c	0.40	0.44
D	4.40	4.60
D2	1.60	1.90
E	2.40	2.60
e	1.50 BSC	
H	4.05	4.25
L	0.89	1.20

**RECOMMENDED MOUNTING FOOTPRINT\***


DIMENSIONS: MILLIMETERS

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



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[XC6206P332MR](#) [CJ6211B12F](#)