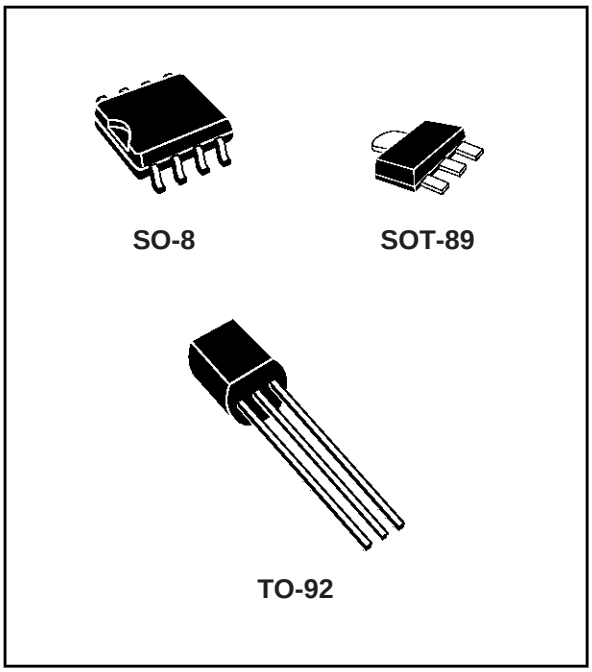
3-TERMINAL 0.1A POSITIVE VOLTAGE REGULATORS

- OUTPUT CURRENT UP TO 100 mA
- OUTPUT VOLTAGES OF 3.3; 5; 6; 8; 9; 12; 15; 18; 24V
- THERMAL OVERLOAD PROTECTION
- SHORT CIRCUIT PROTECTION
- NO EXTERNAL COMPONENTS ARE REQUIRED
- AVAILABLE IN EITHER ± 5% (AC) OR ± 10% (C) SELECTION

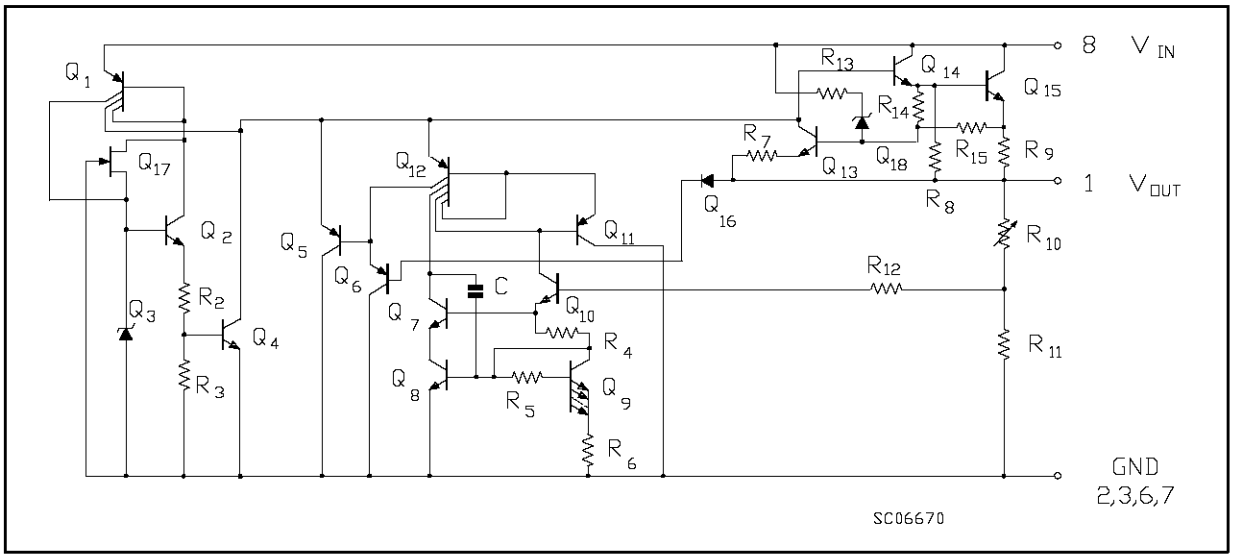


DESCRIPTION

The 78LXX series of three-terminal positive regulators employ internal current limiting and thermal shutdown, making them essentially indestructible. If adequate heatsink is provided, they can deliver up to 100 mA output current. They are intended as fixed voltage regulators in a wide range of applications including local or 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.

The 78LXX series used as Zener diode/resistor combination replacement, offers an effective output impedance improvement of typically two orders of magnetude, along with lower quiescent current and lower noise.

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATING

Symbol	Parameter		Value	Unit
V_i	DC Input Voltage	V_o = 3.3 V to 9 V	30	V
		V_o = 12 V to 15 V	35	V
		V_o = 18 V to 24 V	40	V
I_o	Output Current		100	mA
P_{tot}	Power Dissipation		Internally limited (*)	
T_{stg}	Storage Temperature Range		- 40 to 150	^oC
T_{op}	Operating Junction Temperature RangeFor 78LXXC, 78LXXAC For 78LXXAB		0 to 125 - 40 to 125	^oC ^oC

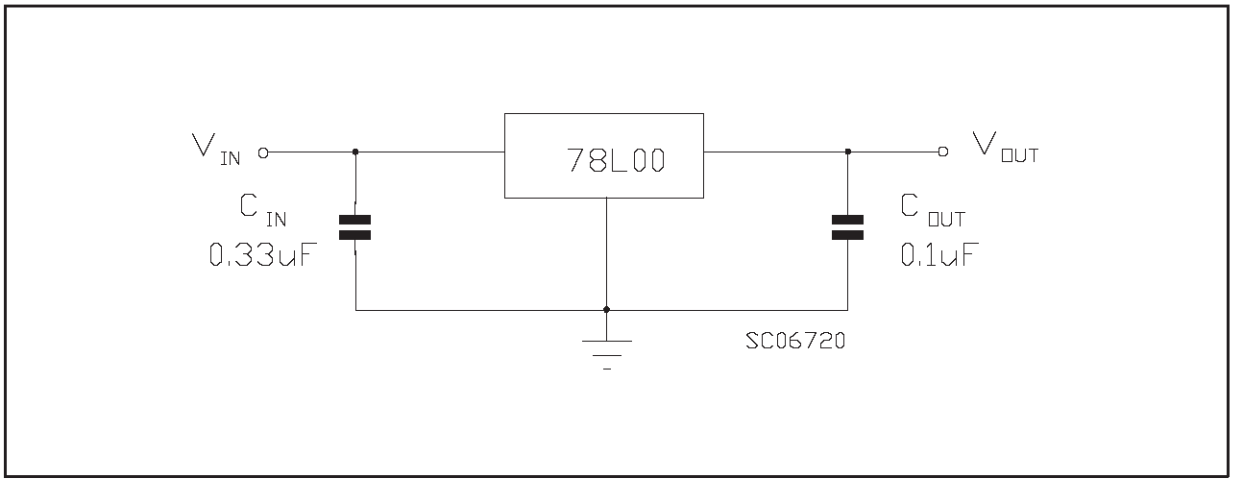
(*) Our SO-8 package used for Voltage Regulators is modified internally to have pins 2, 3, 6 and 7 electrically commoned to the die attach flag. This particular frame decreases the total thermal resistance of the package and increases its ability to dissipate power when an appropriate area of copper on the printed circuit board is available for heatsinking. The external dimensions are the same as for the standard SO-8

THERMAL DATA

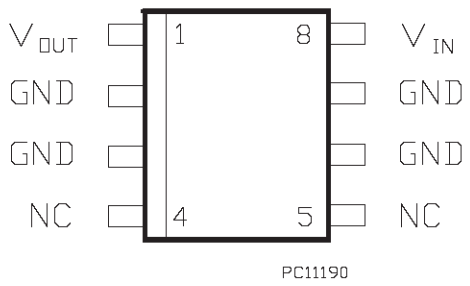
Symbol	Parameter		SO-8	TO-92	SOT-89	Unit
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	20		15	$^oC/W$
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	55 (*)	200		$^oC/W$

(*) Considering 6cm^2 of copper Board heat-sink

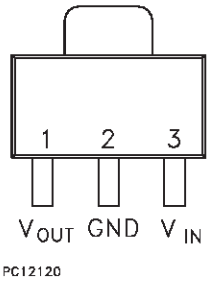
TEST CIRCUITS



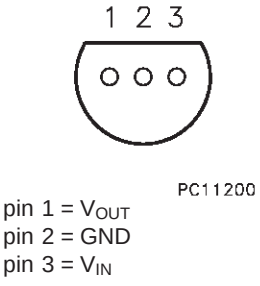
CONNECTION DIAGRAM AND ORDERING NUMBERS (top view)



SO-8



SOT-89



TO-92

BOTTOM VIEW

ORDERING NUMBERS

Type	SO-8	TO-92	SOT-89	Output Voltage
78L33AC	78L33ACD	78L33ACZ	78L33ACU	3.3 V
78L33AB	78L33ABD	78L33ABZ	78L33ABU	3.3 V
78L05C	78L05CD	78L05CZ		5 V
78L05AC	78L05ACD	78L05ACZ	78L05ACU	5 V
78L05AB	78L05ABD	78L05ABZ	78L05ABU	5 V
78L06C	78L06CD	78L06CZ		6 V
78L06AC	78L06ACD	78L06ACZ	78L06ACU	6 V
78L06AB	78L06ABD	78L06ABZ	78L06ABU	6 V
78L08C	78L08CD	78L08CZ		8 V
78L08AC	78L08ACD	78L08ACZ	78L08ACU	8 V
78L08AB	78L08ABD	78L08ABZ	78L08ABU	8 V
78L09C	78L09CD	78L09CZ		9 V
78L09AC	78L09ACD	78L09ACZ	78L09ACU	9 V
78L09AB	78L09ABD	78L09ABZ	78L09ABU	9 V
78L12C	78L12CD	78L12CZ		12 V
78L12AC	78L12ACD	78L12ACZ	78L12ACU	12 V
78L12AB	78L12ABD	78L12ABZ	78L12ABU	12 V
78L15C	78L15CD	78L15CZ		15 V
78L15AC	78L15ACD	78L15ACZ	78L15ACU	15 V
78L15AB	78L15ABD	78L15ABZ	78L15ABU	15 V
78L18C	78L18CD	78L18CZ		18 V
78L18AC	78L18ACD	78L18ACZ	78L18ACU	18 V
78L18AB	78L18ABD	78L18ABZ	78L18ABU	18 V
78L24C	78L24CD	78L24CZ		24 V
78L24AC	78L24ACD	78L24ACZ	78L24ACU	24 V
78L24AB	78L24ABD	78L24ABZ	78L24ABU	24 V

ELECTRICAL CHARACTERISTICS FOR 78L05 (refer to the test circuits, T_j = 0 to 125 °C, V_i = 10V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	4.6	5	5.4	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 7 to 20 V I_o = 1 to 70 mA V_i = 10 V	4.5 4.5		5.5 5.5	V V
ΔV_o	Line Regulation	V_i = 7 to 20 V T_j = 25 °C V_i = 8 to 20 V T_j = 25 °C			200 150	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			60 30	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6 5.5	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.2	mA
ΔI_d	Quiescent Current Change	V_i = 8 to 20 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		40		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 8 to 18 V	40	49		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L06 (refer to the test circuits, T_j = 0 to 125 °C, V_i = 12V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	5.52	6	6.48	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 8.5 to 20 V I_o = 1 to 70 mA V_i = 12 V	5.4 5.4		6.6 6.6	V V
ΔV_o	Line Regulation	V_i = 8.5 to 20 V T_j = 25 °C V_i = 9 to 20 V T_j = 25 °C			200 150	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			60 30	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6 5.5	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.2	mA
ΔI_d	Quiescent Current Change	V_i = 8 to 20 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		50		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 9 to 20 V	38	46		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L08 (refer to the test circuits, T_j = 0 to 125 °C, V_i = 14V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	7.36	8	8.64	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 10.5 to 23 V I_o = 1 to 70 mA V_i = 14 V	7.2 7.2		8.8 8.8	V V
ΔV_o	Line Regulation	V_i = 10.5 to 23 V T_j = 25 °C V_i = 11 to 23 V T_j = 25 °C			200 150	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			80 40	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6 5.5	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.2	mA
ΔI_d	Quiescent Current Change	V_i = 11 to 23 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		60		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 12 to 23 V	36	45		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L09 (refer to the test circuits, T_j = 0 to 125 °C, V_i = 15V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	8.28	9	9.72	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 11.5 to 23 V I_o = 1 to 70 mA V_i = 15 V	8.1 8.1		9.9 9.9	V V
ΔV_o	Line Regulation	V_i = 11.5 to 23 V T_j = 25 °C V_i = 12 to 23 V T_j = 25 °C			250 200	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			80 40	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6 5.5	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.2	mA
ΔI_d	Quiescent Current Change	V_i = 12 to 23 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		70		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 12 to 23 V	36	44		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L12 (refer to the test circuits, T_j = 0 to 125 °C, V_i = 19V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	11.1	12	12.9	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 14.5 to 27 V I_o = 1 to 70 mA V_i = 19 V	10.8 10.8		13.2 13.2	V V
ΔV_o	Line Regulation	V_i = 14.5 to 27 V T_j = 25 °C V_i = 16 to 27 V T_j = 25 °C			250 200	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			100 50	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6.5 6	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.2	mA
ΔI_d	Quiescent Current Change	V_i = 16 to 27 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		80		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 15 to 25 V	36	42		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L15 (refer to the test circuits, T_j = 0 to 125 °C, V_i = 23V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	13.8	15	16.2	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 17.5 to 30 V I_o = 1 to 70 mA V_i = 23 V	13.5 13.5		16.5 16.5	V V
ΔV_o	Line Regulation	V_i = 17.5 to 30 V T_j = 25 °C V_i = 20 to 30 V T_j = 25 °C			300 250	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			150 75	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6.5 6	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.2	mA
ΔI_d	Quiescent Current Change	V_i = 20 to 30 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		90		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 18.5 to 28.5 V	33	39		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L18 (refer to the test circuits, T_j = 0 to 125 °C, V_i = 27V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	16.6	18	19.4	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 22 to 33 V I_o = 1 to 70 mA V_i = 27 V	16.2 16.2		19.8 19.8	V V
ΔV_o	Line Regulation	V_i = 22 to 33 V T_j = 25 °C V_i = 22 to 33 V T_j = 25 °C			320 270	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			170 85	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6.5 6	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.2	mA
ΔI_d	Quiescent Current Change	V_i = 23 to 33 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		120		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 23 to 33 V	32	38		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L24 (refer to the test circuits, T_j = 0 to 125 °C, V_i = 33V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	22.1	24	25.9	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 27 to 38 V I_o = 1 to 70 mA V_i = 33 V	21.6 21.6		26.4 26.4	V V
ΔV_o	Line Regulation	V_i = 27 to 38 V T_j = 25 °C V_i = 28 to 38 V T_j = 25 °C			350 300	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			200 100	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6.5 6	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.2	mA
ΔI_d	Quiescent Current Change	V_i = 28 to 38 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		200		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 29 to 35 V	30	37		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L33AB AND 78L33AC

(refer to the test circuits, V_i = 8.3V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF,
T_j = 0 to 125 °C for 78L33AC, T_j = -40 to 125 °C for 78L33AB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	3.168	3.3	3.432	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 5.3 to 20 V I_o = 1 to 70 mA V_i = 8.3 V	3.135 3.135		3.465 3.465	V V
ΔV_o	Line Regulation	V_i = 5.3 to 20 V T_j = 25 °C V_i = 6.3 to 20 V T_j = 25 °C			150 100	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			60 30	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6 5.5	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.1	mA
ΔI_d	Quiescent Current Change	V_i = 6.3 to 20 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		40		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 6.3 to 16.3 V	41	49		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L05AB AND 78L05AC

(refer to the test circuits, V_i = 10V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF,
T_j = 0 to 125 °C for 78L05AC, T_j = -40 to 125 °C for 78L05AB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	4.8	5	5.2	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 7 to 20 V I_o = 1 to 70 mA V_i = 10 V	4.75 4.75		5.25 5.25	V V
ΔV_o	Line Regulation	V_i = 7 to 20 V T_j = 25 °C V_i = 8 to 20 V T_j = 25 °C			150 100	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			60 30	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6 5.5	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.1	mA
ΔI_d	Quiescent Current Change	V_i = 8 to 20 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		40		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 8 to 18 V	41	49		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L06AB AND 78L06AC

(refer to the test circuits, V_i = 12V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF,
T_j = 0 to 125 °C for 78L06AC, T_j = -40 to 125 °C for 78L06AB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	5.76	6	6.24	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 8.5 to 20 V I_o = 1 to 70 mA V_i = 12 V	5.7 5.7		6.3 6.3	V V
ΔV_o	Line Regulation	V_i = 8.5 to 20 V T_j = 25 °C V_i = 9 to 20 V T_j = 25 °C			150 100	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			60 30	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6 5.5	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.1	mA
ΔI_d	Quiescent Current Change	V_i = 9 to 20 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		50		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 9 to 20 V	39	46		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L08AB AND 78L08AC

(refer to the test circuits, V_i = 14V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF,
T_j = 0 to 125 °C for 78L08AC, T_j = -40 to 125 °C for 78L08AB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	7.68	8	8.32	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 10.5 to 23 V I_o = 1 to 70 mA V_i = 14 V	7.6 7.6		8.4 8.4	V V
ΔV_o	Line Regulation	V_i = 10.5 to 23 V T_j = 25 °C V_i = 11 to 23 V T_j = 25 °C			175 125	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			80 40	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6 5.5	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.1	mA
ΔI_d	Quiescent Current Change	V_i = 11 to 23 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		60		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 12 to 23 V	37	45		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L09AB AND 78L09AC

(refer to the test circuits, V_i = 15V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF,
T_j = 0 to 125 °C for 78L09AC, T_j = -40 to 125 °C for 78L09AB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	8.64	9	9.36	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 11.5 to 23 V I_o = 1 to 70 mA V_i = 15 V	8.55 8.55		9.45 9.45	V V
ΔV_o	Line Regulation	V_i = 11.5 to 23 V T_j = 25 °C V_i = 12 to 23 V T_j = 25 °C			225 150	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			80 40	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6 5.5	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.1	mA
ΔI_d	Quiescent Current Change	V_i = 12 to 23 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		70		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 12 to 23 V	37	44		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L12AB AND 78L12AC

(refer to the test circuits, V_i = 19V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF,
T_j = 0 to 125 °C for 78L12AC, T_j = -40 to 125 °C for 78L12AB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	11.5	12	12.5	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 14.5 to 27 V I_o = 1 to 70 mA V_i = 19 V	11.4 11.4		12.6 12.6	V V
ΔV_o	Line Regulation	V_i = 14.5 to 27 V T_j = 25 °C V_i = 16 to 27 V T_j = 25 °C			250 200	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			100 50	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6.5 6	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.1	mA
ΔI_d	Quiescent Current Change	V_i = 16 to 27 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		80		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 15 to 25 V	37	42		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L15AB AND 78L15AC

(refer to the test circuits, V_i = 23V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF,
T_j = 0 to 125 °C for 78L15AC, T_j = -40 to 125 °C for 78L15AB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	14.4	15	15.6	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 17.5 to 30 V I_o = 1 to 70 mA V_i = 23 V	14.25 14.25		15.75 15.75	V V
ΔV_o	Line Regulation	V_i = 17.5 to 30 V T_j = 25 °C V_i = 20 to 30 V T_j = 25 °C			300 250	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			150 75	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6.5 6	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.1	mA
ΔI_d	Quiescent Current Change	V_i = 20 to 30 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		90		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 18.5 to 28.5 V	34	39		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L18AB AND 78L18AC

(refer to the test circuits, V_i = 27V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF,
T_j = 0 to 125 °C for 78L18AC, T_j = -40 to 125 °C for 78L18AB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	17.3	18	18.7	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 22 to 33 V I_o = 1 to 70 mA V_i = 27 V	17.1 17.1		18.9 18.9	V V
ΔV_o	Line Regulation	V_i = 22 to 33 V T_j = 25 °C V_i = 22 to 33 V T_j = 25 °C			320 270	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			170 85	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6.5 6	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.1	mA
ΔI_d	Quiescent Current Change	V_i = 23 to 33 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		120		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 23 to 33 V	33	38		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS FOR 78L24AB AND 78L24AC

(refer to the test circuits, V_i = 33V, I_o = 40 mA, C_i = 0.33 µF, C_o = 0.1 µF,
T_j = 0 to 125 °C for 78L24AC, T_j = -40 to 125 °C for 78L24AB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_o	Output Voltage	T_j = 25 °C	23	24	25	V
V_o	Output Voltage	I_o = 1 to 40 mA V_i = 27 to 38 V I_o = 1 to 70 mA V_i = 33 V	22.8 22.8		25.2 25.2	V V
ΔV_o	Line Regulation	V_i = 27 to 38 V T_j = 25 °C V_i = 28 to 38 V T_j = 25 °C			350 300	mV mV
ΔV_o	Load Regulation	I_o = 1 to 100 mA T_j = 25 °C I_o = 1 to 40 mA T_j = 25 °C			200 100	mV mV
I_d	Quiescent Current	T_j = 25 °C T_j = 125 °C			6.5 6	mA mA
ΔI_d	Quiescent Current Change	I_o = 1 to 40 mA			0.1	mA
ΔI_d	Quiescent Current Change	V_i = 28 to 38 V			1.5	mA
eN	Output Noise Voltage	B = 10Hz to 100KHz T_j = 25 °C		200		µV
SVR	Supply Voltage Rejection	I_o = 40 mA f = 120 Hz T_j = 25 °C V_i = 29 to 35 V	31	37		dB
V_d	Dropout Voltage			1.7		V

Figure 1: 78L05/12 Output Voltage vs Ambient Temperature

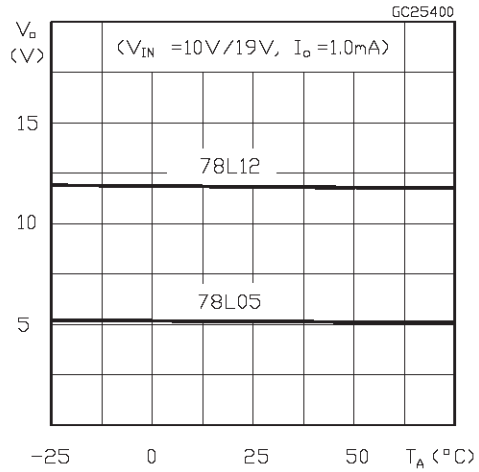


Figure 2 : 78L05/12/24 Load Characteristics.

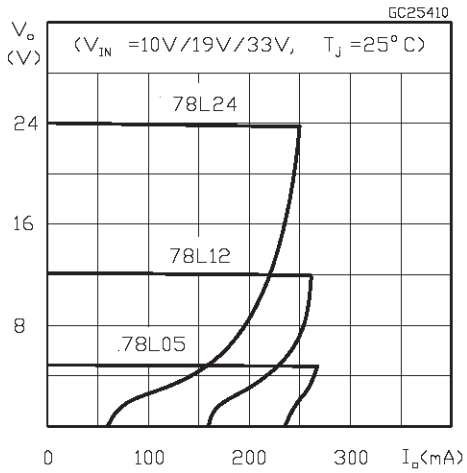


Figure 3 : 78L05/12/24 Thermal Shutdown.

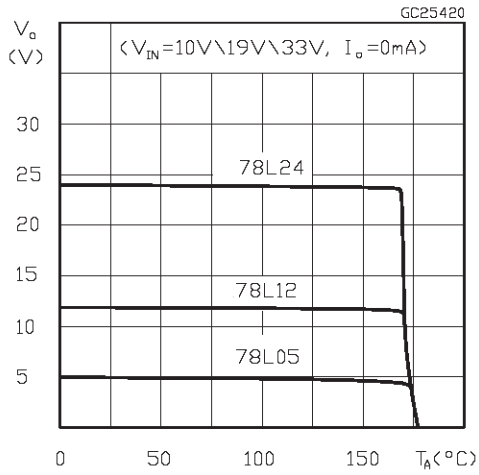


Figure 4 : 78L05/12 Quiescent Current vs Output Current

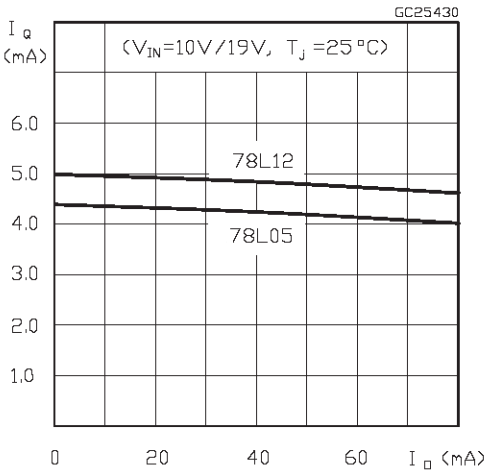


Figure 5 : 78L05 Quiescent Current vs Input Voltage.

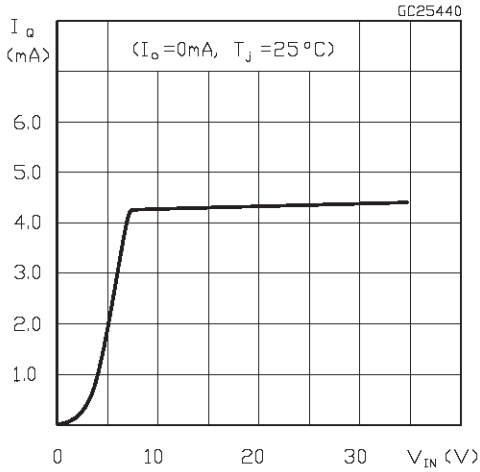


Figure 6 : 78L05/12/24 Output Characteristics.

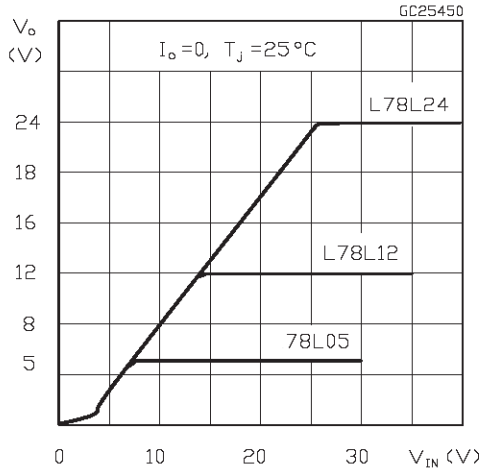


Figure 7 : 78L05/12/24 Ripple Rejection.

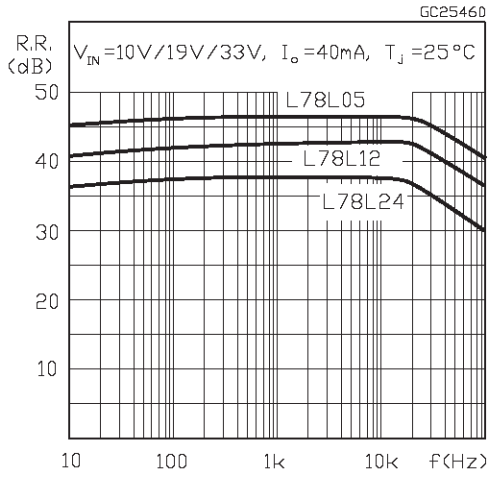


Figure 8 : 78L05 Dropout Characteristics.

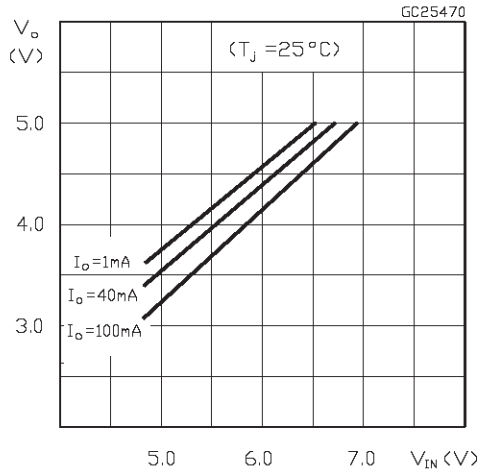
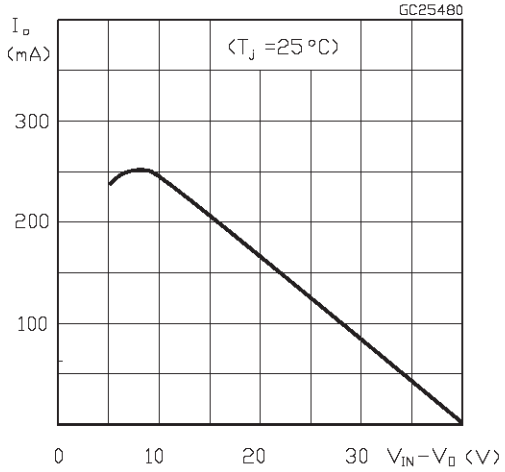


Figure 9 : 78LXX Series Short Circuit Output Current.



TYPICAL APPLICATIONS:

Figure 10: High Output Current Short Circuit Protected

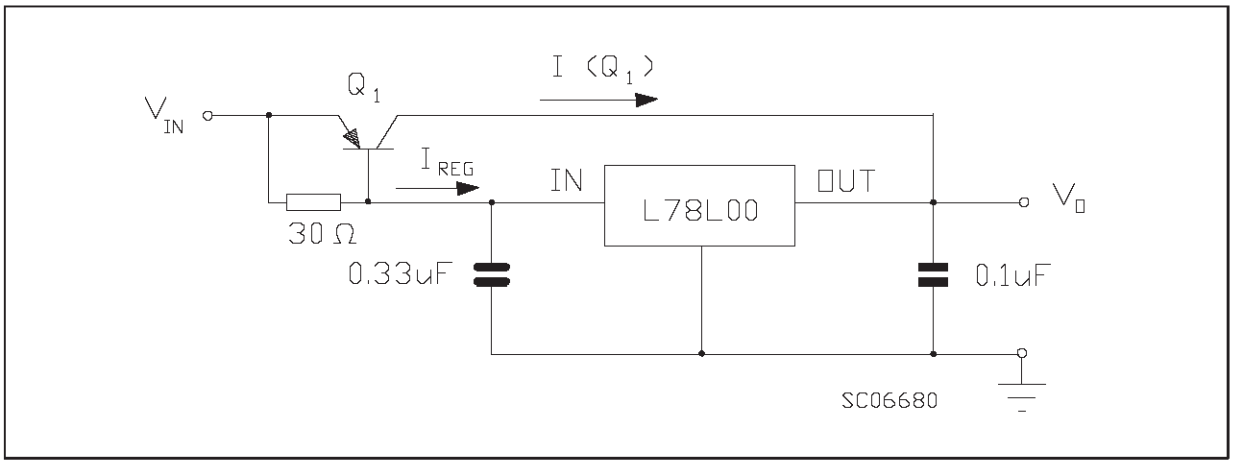


Figure 11 : Output Boost Circuit.

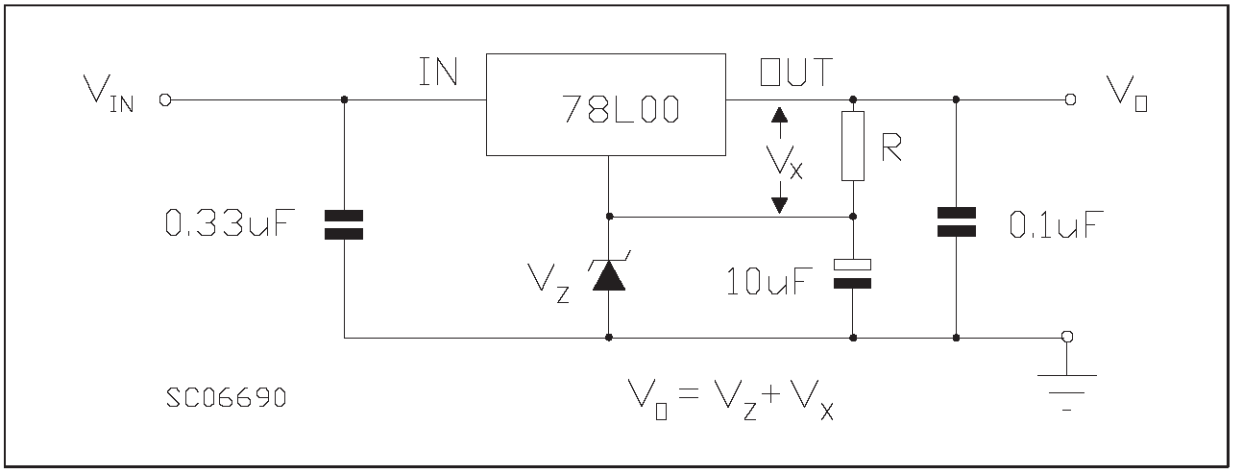


Figure 12 : Current Regulator.

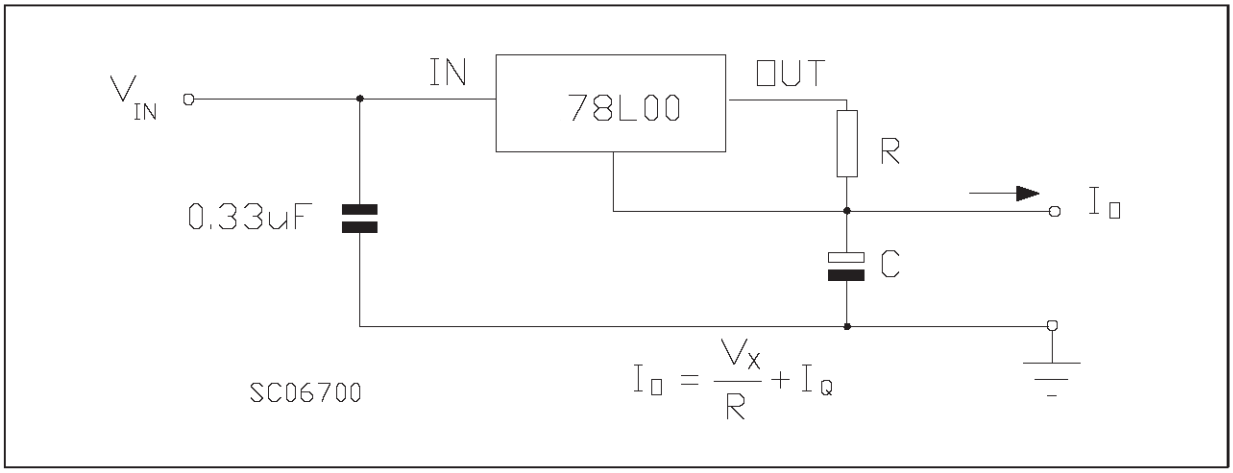
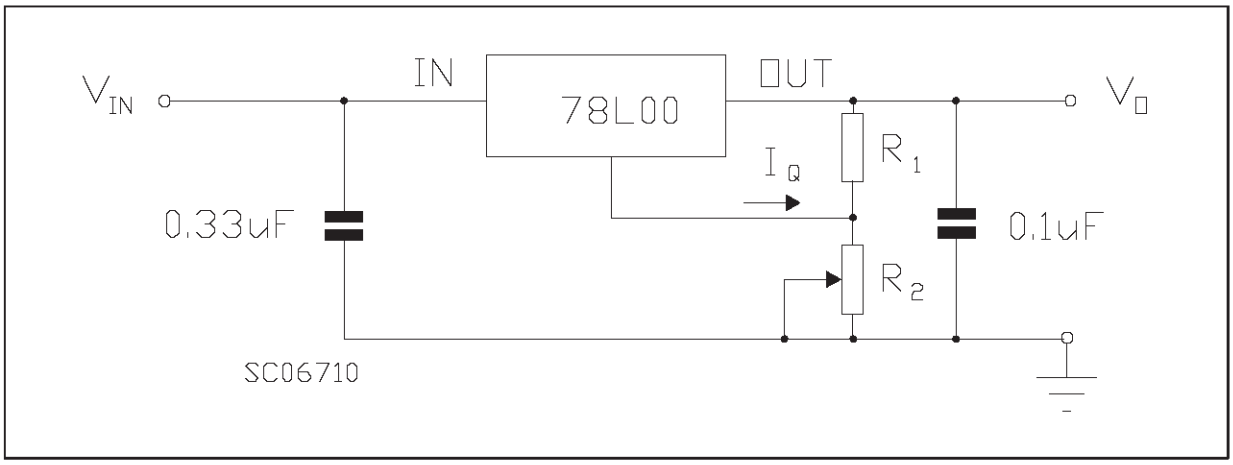
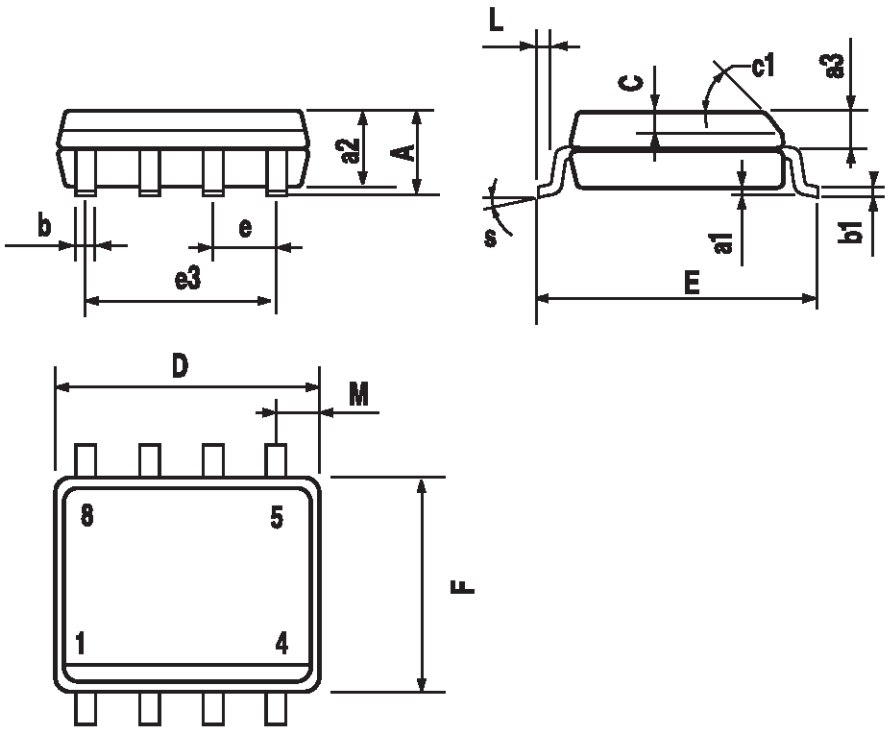


Figure 13: Adjustable Output Regulator



SO-8 MECHANICAL DATA

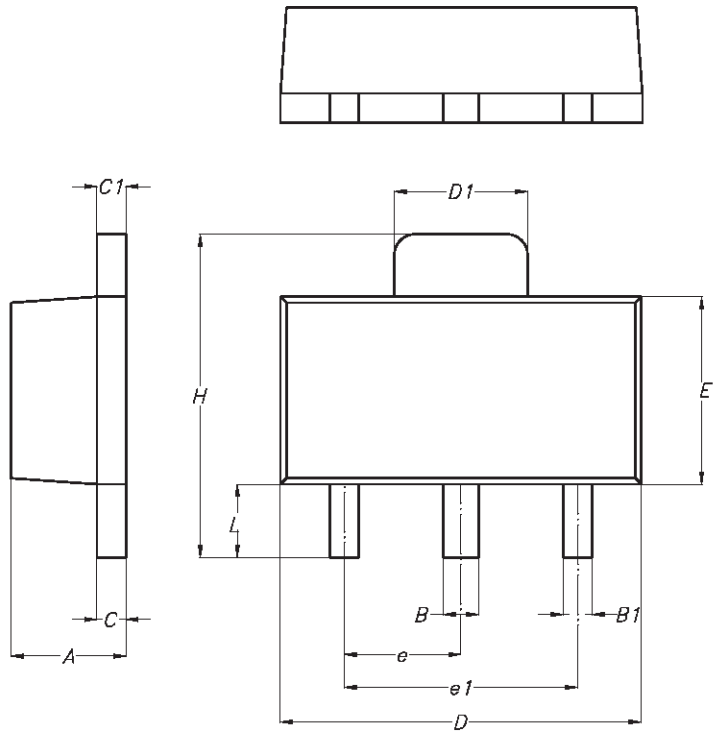
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.25	0.003		0.009
a2			1.65			0.064
a3	0.65		0.85	0.025		0.033
b	0.35		0.48	0.013		0.018
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.019
c1	45 (typ.)					
D	4.8		5.0	0.188		0.196
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.14		0.157
L	0.4		1.27	0.015		0.050
M			0.6			0.023
S	8 (max.)					



0016023

SOT-89 MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.4		1.6	55.1		63.0
B	0.44		0.56	17.3		22.0
B1	0.36		0.48	14.2		18.9
C	0.35		0.44	13.8		17.3
C1	0.35		0.44	13.8		17.3
D	4.4		4.6	173.2		181.1
D1	1.62		1.83	63.8		72.0
E	2.29		2.6	90.2		102.4
e	1.42		1.57	55.9		61.8
e1	2.92		3.07	115.0		120.9
H	3.94		4.25	155.1		167.3
L	0.89		1.2	35.0		47.2



P025H

TO-92 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.58		5.33	0.180		0.210
B	4.45		5.2	0.175		0.204
C	3.2		4.2	0.126		0.165
D	12.7			0.500		
E		1.27			0.050	
F	0.4		0.51	0.016		0.020
G	0.35			0.14