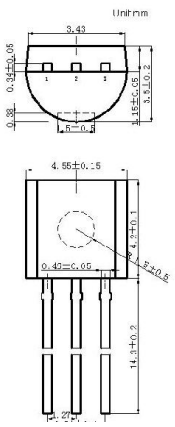
LJ78L00 Series

Three-terminal positive voltage regulator



1. OUT
2. GND
3. IN

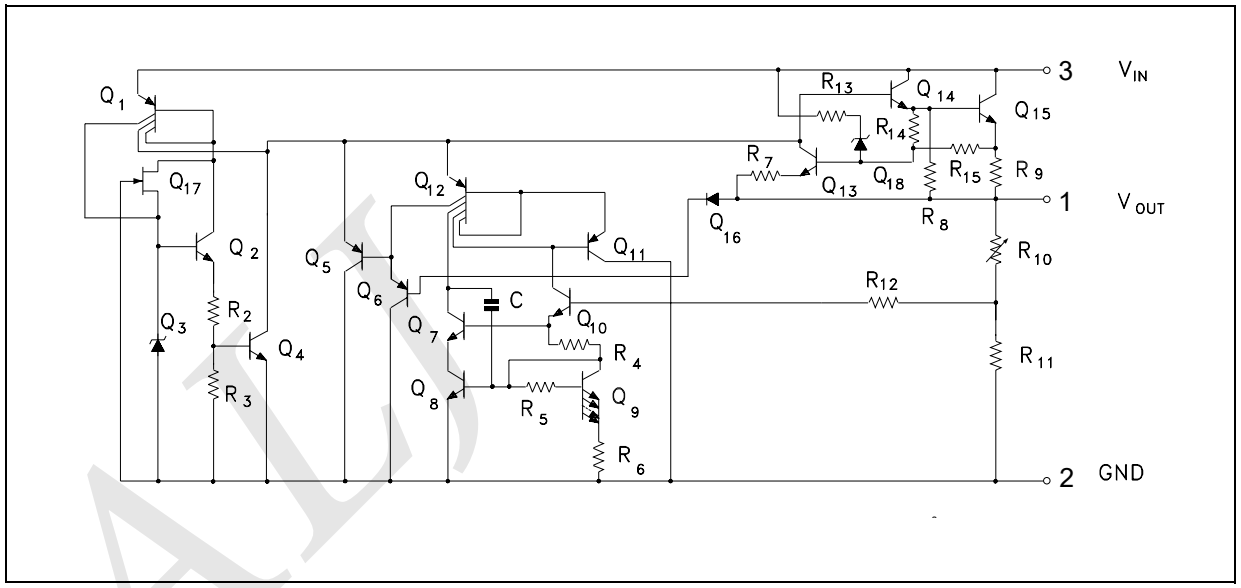
Features:

- OUTPUT CURRENT UP TO 100 mA
- OUTPUT VOLTAGES OF 3.3; 5; 6; 8; 9; 10; 12; 15; 18; 20; 24V
- THERMAL OVERLOAD PROTECTION
- SHORT CIRCUIT PROTECTION
- NO EXTERNAL COMPONENTS ARE REQUIRED
- AVAILABLE IN EITHER ±5% (AC) OR ±10% (C) SELECTION

Description:

The LJ78L00 series of three-terminal positive regulators employ internal current limiting and thermal shutdown, making them essentially indestructible. If adequate heat-sink 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-cardregulation 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 LJ78L00 series used as Zener diode/resistor combination replacement, offers an effective output impedance improvement of typically two orders of magnitude, along with lower quiescent current and lower noise.

SCHEMATIC DIAGRAM



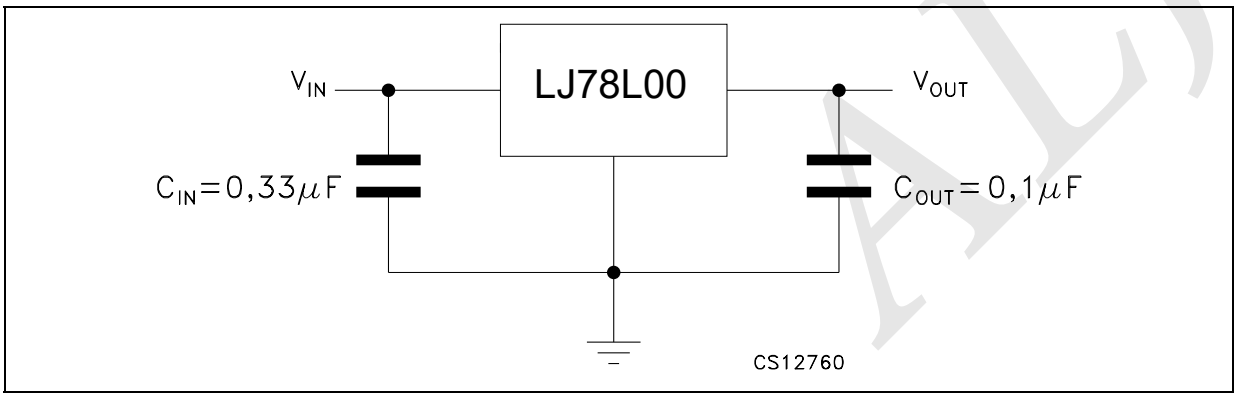
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter[2]		Value	Unit
V_I	DC Input Voltage	V_O = 3.3 to 9 V	30	V
		V_O = 12 to 15 V	35	
		V_O = 18 to 24 V	40	
I_O	Output Current		100	mA
T_{stg}	Storage Temperature Range		-40 to 150	°C
T_{op}	Operating Junction Temperature Range	for LJ78L00AC	0 to 125	°C
		for LJ78L00AB	-40 to 125	

THERMAL DATA

Symbol	Parameter	Min.	Typ.	Max	Unit
$R_{thj\text{-}amb}$	ThermalResistanceJunction-ambient			200	°C/W

TEST CIRCUITS



ORDERING CODES

TO-92(T&R) *	OUTPUT VOLTAGE
L78L33ACZ	3.3 V
L78L33ABZ	3.3 V
L78L05ACZ	5 V
L78L05ABZ	5 V
L78L06ACZ	6 V
L78L06ABZ	6 V
L78L08ACZ	8 V
L78L08ABZ	8 V
L78L09ACZ	9 V
L78L09ABZ	9 V
L78L10ACZ	10 V
L78L10ABZ	10 V
L78L12ACZ	12 V
L78L12ABZ	12 V
L78L15ACZ	15 V
L78L15ABZ	15 V
L78L18ACZ	18 V
L78L18ABZ	18 V
L78L20ACZ	20 V
L78L20ABZ	20 V
L78L24ACZ	24 V
L78L24ABZ	24 V

(*) Available in Ammopak with the suffix "-AP" or in Tape & Reel with the suffix "TR".

ELECTRICAL CHARACTERISTICS OF LJ78L33ACZ (refer to the test circuits, T_J = 0 to 125°C, V_I = 8.3 V, 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	3.036	3.3	3.564	V
V_O	Output Voltage	I_O = 1 to 40 mA V_I = 5.3 to 20 V	2.97		3.63	V
		I_O = 1 to 70 mA V_I = 8.3 V	2.97		3.63	
ΔV_O	Line Regulation	V_I = 5.3 to 20 V T_J = 25°C			150	mV
		V_I = 6.3 to 20 V T_J = 25°C			100	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			60	mV
		I_O = 1 to 40 mA T_J = 25°C			30	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.2	mA
		V_I = 6.3 to 20 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		40		µV
SVR	Supply Voltage Rejection	V_I = 6.3 to 16.3 V f = 120Hz I_O = 40 mA T_J = 25°C	41	49		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L05ACZ (refer to the test circuits, T_J = 0 to 125°C, V_I = 10 V, 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	4.5		5.5	V
		I_O = 1 to 70 mA V_I = 10 V	4.5		5.5	
ΔV_O	Line Regulation	V_I = 8.5 to 20 V T_J = 25°C			200	mV
		V_I = 9 to 20 V T_J = 25°C			150	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			60	mV
		I_O = 1 to 40 mA T_J = 25°C			30	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.2	mA
		V_I = 8 to 20 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		40		µV
SVR	Supply Voltage Rejection	V_I = 9 to 20 V f = 120Hz I_O = 40 mA T_J = 25°C	40	49		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L06ACZ (refer to the test circuits, T_J = 0 to 125°C, V_I = 12 V, 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	5.4		6.6	V
		I_O = 1 to 70 mA V_I = 12 V	5.4		6.6	
ΔV_O	Line Regulation	V_I = 8.5 to 20 V T_J = 25°C			200	mV
		V_I = 9 to 20 V T_J = 25°C			150	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			60	mV
		I_O = 1 to 40 mA T_J = 25°C			30	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.2	mA
		V_I = 8 to 20 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		50		µV
SVR	Supply Voltage Rejection	V_I = 9 to 20 V f = 120Hz I_O = 40 mA T_J = 25°C	38	46		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L08ACZ (refer to the test circuits, T_J = 0 to 125°C, V_I = 14 V, 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	7.2		8.8	V
		I_O = 1 to 70 mA V_I = 14 V	7.2		8.8	
ΔV_O	Line Regulation	V_I = 10.5 to 23 V T_J = 25°C			200	mV
		V_I = 11 to 23 V T_J = 25°C			150	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			80	mV
		I_O = 1 to 40 mA T_J = 25°C			40	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.2	mA
		V_I = 11 to 23 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		60		µV
SVR	Supply Voltage Rejection	V_I = 12 to 23 V f = 120Hz I_O = 40 mA T_J = 25°C	36	45		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L09ACZ (refer to the test circuits, T_J = 0 to 125°C, V_I = 15 V, 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	8.1		9.9	V
		I_O = 1 to 70 mA V_I = 15 V	8.1		9.9	
ΔV_O	Line Regulation	V_I = 11.5 to 23 V T_J = 25°C			250	mV
		V_I = 12 to 23 V T_J = 25°C			200	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			80	mV
		I_O = 1 to 40 mA T_J = 25°C			40	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.2	mA
		V_I = 12 to 23 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		70		µV
SVR	Supply Voltage Rejection	V_I = 12 to 23 V f = 120Hz I_O = 40 mA T_J = 25°C	36	44		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L10ACZ (refer to the test circuits, T_J = 0 to 125°C, V_I = 16 V, 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	9.2	10	10.8	V
V_O	Output Voltage	I_O = 1 to 40 mA V_I =12.5 to 23 V	9		11	V
		I_O = 1 to 70 mA V_I = 16 V	9		11	
ΔV_O	Line Regulation	V_I = 12.5 to 23 V T_J = 25°C			230	mV
		V_I = 13 to 23 V T_J = 25°C			170	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			80	mV
		I_O = 1 to 40 mA T_J = 25°C			40	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 13 to 23 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		60		µV
SVR	Supply Voltage Rejection	V_I = 14 to 23 V f = 120Hz I_O = 40 mA T_J = 25°C	37	45		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L12ACZ (refer to the test circuits, T_J = 0 to 125°C, V_I = 19 V, 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	10.8		13.2	V
		I_O = 1 to 70 mA V_I = 19 V	10.8		13.2	
ΔV_O	Line Regulation	V_I = 14.5 to 27 V T_J = 25°C			250	mV
		V_I = 16 to 27 V T_J = 25°C			200	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			100	mV
		I_O = 1 to 40 mA T_J = 25°C			50	
I_d	Quiescent Current	T_J = 25°C			6.5	mA
		T_J = 125°C			6	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.2	mA
		V_I = 16 to 27 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		80		µV
SVR	Supply Voltage Rejection	V_I = 15 to 25 V f = 120Hz I_O = 40 mA T_J = 25°C	36	42		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L15ACZ (refer to the test circuits, T_J = 0 to 125°C, V_I = 23 V, 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	13.5		16.5	V
		I_O = 1 to 70 mA V_I = 23 V	13.5		16.5	
ΔV_O	Line Regulation	V_I = 17.5 to 30 V T_J = 25°C			300	mV
		V_I = 20 to 30 V T_J = 25°C			250	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			150	mV
		I_O = 1 to 40 mA T_J = 25°C			75	
I_d	Quiescent Current	T_J = 25°C			6.5	mA
		T_J = 125°C			6	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.2	mA
		V_I = 20 to 30 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		90		µV
SVR	Supply Voltage Rejection	V_I = 18.5 to 28.5 V f = 120Hz I_O = 40 mA T_J = 25°C	33	39		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L18ACZ(refer to the test circuits, T_J = 0 to 125°C, V_I = 27 V, 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	16.2		19.8	V
		I_O = 1 to 70 mA V_I = 27 V	16.2		19.8	
ΔV_O	Line Regulation	V_I = 22 to 33 V T_J = 25°C			320	mV
		V_I = 22 to 33 V T_J = 25°C			270	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			170	mV
		I_O = 1 to 40 mA T_J = 25°C			85	
I_d	Quiescent Current	T_J = 25°C			6.5	mA
		T_J = 125°C			6	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.2	mA
		V_I = 23 to 33 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		120		µV
SVR	Supply Voltage Rejection	V_I = 23 to 33 V f = 120Hz I_O = 40 mA T_J = 25°C	32	38		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L20ACZ (refer to the test circuits, T_J = 0 to 125°C, V_I = 29 V, 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	18.4	20	21.6	V
V_O	Output Voltage	I_O = 1 to 40 mA V_I = 24 to 33 V	18		22	V
		I_O = 1 to 70 mA V_I = 29 V	18		22	
ΔV_O	Line Regulation	V_I = 22.5 to 34 V T_J = 25°C			330	mV
		V_I = 24 to 34 V T_J = 25°C			280	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			180	mV
		I_O = 1 to 40 mA T_J = 25°C			90	
I_d	Quiescent Current	T_J = 25°C			6.5	mA
		T_J = 125°C			6	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.2	mA
		V_I = 25 to 33 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		120		µV
SVR	Supply Voltage Rejection	V_I = 25 to 35 V f = 120Hz I_O = 40 mA T_J = 25°C	31	38		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L24ACZ(refer to the test circuits, T_J = 0 to 125°C, V_I = 3 3 V , I_O = 4 0 m A , C_I = 0 . 3 3 µ F , 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	21.6		26.4	V
		I_O = 1 to 70 mA V_I = 33 V	21.6		26.4	
ΔV_O	Line Regulation	V_I = 27 to 38 V T_J = 25°C			350	mV
		V_I = 28 to 38 V T_J = 25°C			300	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			200	mV
		I_O = 1 to 40 mA T_J = 25°C			100	
I_d	Quiescent Current	T_J = 25°C			6.5	mA
		T_J = 125°C			6	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.2	mA
		V_I = 28 to 38 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		200		µV
SVR	Supply Voltage Rejection	V_I = 29 to 35 V f = 120Hz I_O = 40 mA T_J = 25°C	30	37		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L33ABZ

(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 L78L33AC, T_J = -40 to 125°C for L78L33AB, 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	3.135		3.465	V
		I_O = 1 to 70 mA V_I = 8.3 V	3.135		3.465	
ΔV_O	Line Regulation	V_I = 5.3 to 20 V T_J = 25°C			150	mV
		V_I = 6.3 to 20 V T_J = 25°C			100	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			60	mV
		I_O = 1 to 40 mA T_J = 25°C			30	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 6.3 to 20 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		40		µV
SVR	Supply Voltage Rejection	V_I = 6.3 to 16.3 V f = 120Hz I_O = 40 mA T_J = 25°C	41	49		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L05ABZ

(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 L78L05AC, T_J = -40 to 125°C for L78L05AB, 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	4.75		5.25	V
		I_O = 1 to 70 mA V_I = 10 V	4.75		5.25	
ΔV_O	Line Regulation	V_I = 7 to 20 V T_J = 25°C			150	mV
		V_I = 8 to 20 V T_J = 25°C			100	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			60	mV
		I_O = 1 to 40 mA T_J = 25°C			30	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 8 to 20 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		40		µV
SVR	Supply Voltage Rejection	V_I = 8 to 18 V f = 120Hz I_O = 40 mA T_J = 25°C	41	49		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L06ABZ

(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 L78L06AC, T_J = -40 to 125°C for L78L06AB, 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	5.7		6.3	V
		I_O = 1 to 70 mA V_I = 12 V	5.7		6.3	
ΔV_O	Line Regulation	V_I = 8.5 to 20 V T_J = 25°C			150	mV
		V_I = 9 to 20 V T_J = 25°C			100	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			60	mV
		I_O = 1 to 40 mA T_J = 25°C			30	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 9 to 20 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		50		µV
SVR	Supply Voltage Rejection	V_I = 9 to 20 V f = 120Hz I_O = 40 mA T_J = 25°C	39	46		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L08ABZ

(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 L78L08AC, T_J = -40 to 125°C for L78L08AB, 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	7.6		8.4	V
		I_O = 1 to 70 mA V_I = 14 V	7.6		8.4	
ΔV_O	Line Regulation	V_I = 10.5 to 23 V T_J = 25°C			175	mV
		V_I = 11 to 23 V T_J = 25°C			125	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			80	mV
		I_O = 1 to 40 mA T_J = 25°C			40	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 11 to 23 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		60		µV
SVR	Supply Voltage Rejection	V_I = 12 to 23 V f = 120Hz I_O = 40 mA T_J = 25°C	37	45		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L09ABZ

(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 L78L09AC, T_J = -40 to 125°C for L78L09AB, 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	8.55		9.45	V
		I_O = 1 to 70 mA V_I = 15 V	8.55		9.45	
ΔV_O	Line Regulation	V_I = 11.5 to 23 V T_J = 25°C			225	mV
		V_I = 12 to 23 V T_J = 25°C			150	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			80	mV
		I_O = 1 to 40 mA T_J = 25°C			40	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 12 to 23 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		70		µV
SVR	Supply Voltage Rejection	V_I = 12 to 23 V f = 120Hz I_O = 40 mA T_J = 25°C	37	44		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L10ABZ

(refer to the test circuits, V_I = 16V, I_O = 40 mA, C_I = 0.33 µF, C_O = 0.1 µF,
T_J = 0 to 125°C for L78L10AC, T_J = -40 to 125°C for L78L10AB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	T_J = 25°C	9.6	10	10.4	V
V_O	Output Voltage	I_O = 1 to 40 mA V_I =12.5 to 23 V	9.5		10.5	V
		I_O = 1 to 70 mA V_I = 16 V	9.5		10.5	
ΔV_O	Line Regulation	V_I = 12.5 to 23 V T_J = 25°C			230	mV
		V_I = 13 to 23 V T_J = 25°C			170	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			80	mV
		I_O = 1 to 40 mA T_J = 25°C			40	
I_d	Quiescent Current	T_J = 25°C			6	mA
		T_J = 125°C			5.5	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 13 to 23 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		60		µV
SVR	Supply Voltage Rejection	V_I = 14 to 23 V f = 120Hz I_O = 40 mA T_J = 25°C	37	45		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L12ABZ

(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 L78L12AC, T_J = -40 to 125°C for L78L12AB, 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	11.4		12.6	V
		I_O = 1 to 70 mA V_I = 19 V	11.4		12.6	
ΔV_O	Line Regulation	V_I = 14.5 to 27 V T_J = 25°C			250	mV
		V_I = 16 to 27 V T_J = 25°C			200	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			100	mV
		I_O = 1 to 40 mA T_J = 25°C			50	
I_d	Quiescent Current	T_J = 25°C			6.5	mA
		T_J = 125°C			6	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 16 to 27 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		80		µV
SVR	Supply Voltage Rejection	V_I = 15 to 25 V f = 120Hz I_O = 40 mA T_J = 25°C	37	42		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L15ABZ

(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 L78L15AC, T_J = -40 to 125°C for L78L15AB, 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	14.25		15.75	V
		I_O = 1 to 70 mA V_I = 23 V	14.25		15.75	
ΔV_O	Line Regulation	V_I = 17.5 to 30 V T_J = 25°C			300	mV
		V_I = 20 to 30 V T_J = 25°C			250	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			150	mV
		I_O = 1 to 40 mA T_J = 25°C			75	
I_d	Quiescent Current	T_J = 25°C			6.5	mA
		T_J = 125°C			6	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 20 to 30 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		90		µV
SVR	Supply Voltage Rejection	V_I = 18.5 to 28.5 V f = 120Hz I_O = 40 mA T_J = 25°C	34	39		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L18ABZ

(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 L78L18AC, T_J = -40 to 125°C for L78L18AB, 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	17.1		18.9	V
		I_O = 1 to 70 mA V_I = 27 V	17.1		18.9	
ΔV_O	Line Regulation	V_I = 22 to 33 V T_J = 25°C			320	mV
		V_I = 22 to 33 V T_J = 25°C			270	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			170	mV
		I_O = 1 to 40 mA T_J = 25°C			85	
I_d	Quiescent Current	T_J = 25°C			6.5	mA
		T_J = 125°C			6	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 23 to 33 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		120		µV
SVR	Supply Voltage Rejection	V_I = 23 to 33 V f = 120Hz I_O = 40 mA T_J = 25°C	33	38		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L20ABZ

(refer to the test circuits, V_I = 29V, I_O = 40 mA, C_I = 0.33 µF, C_O = 0.1 µF,
T_J = 0 to 125°C for L78L20AC, T_J = -40 to 125°C for L78L20AB, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_O	Output Voltage	T_J = 25°C	19.2	20	20.8	V
V_O	Output Voltage	I_O = 1 to 40 mA V_I = 24 to 33 V	19		21	V
		I_O = 1 to 70 mA V_I = 29 V	19		21	
ΔV_O	Line Regulation	V_I = 22.5 to 34 V T_J = 25°C			330	mV
		V_I = 24 to 34 V T_J = 25°C			280	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			180	mV
		I_O = 1 to 40 mA T_J = 25°C			90	
I_d	Quiescent Current	T_J = 25°C			6.5	mA
		T_J = 125°C			6	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 25 to 33 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		120		µV
SVR	Supply Voltage Rejection	V_I = 25 to 35 V f = 120Hz I_O = 40 mA T_J = 25°C	32	38		dB
V_d	Dropout Voltage			1.7		V

ELECTRICAL CHARACTERISTICS OF L78L24ABZ

(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 L78L24AC, T_J = -40 to 125°C for L78L24AB, 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	22.8		25.2	V
		I_O = 1 to 70 mA V_I = 33 V	22.8		25.2	
ΔV_O	Line Regulation	V_I = 27 to 38 V T_J = 25°C			350	mV
		V_I = 28 to 38 V T_J = 25°C			300	
ΔV_O	Load Regulation	I_O = 1 to 100 mA T_J = 25°C			200	mV
		I_O = 1 to 40 mA T_J = 25°C			100	
I_d	Quiescent Current	T_J = 25°C			6.5	mA
		T_J = 125°C			6	mA
ΔI_d	Quiescent Current Change	I_O = 1 to 40 mA			0.1	mA
		V_I = 28 to 38 V			1.5	
eN	Output Noise Voltage	B =10Hz to 100KHz T_J = 25°C		200		µV
SVR	Supply Voltage Rejection	V_I = 23 to 33 V f = 120Hz I_O = 40 mA T_J = 25°C	31	37		dB
V_d	Dropout Voltage			1.7		V

Figure 1 : LJ78L05/12 Output Voltage vs Ambient Temperature

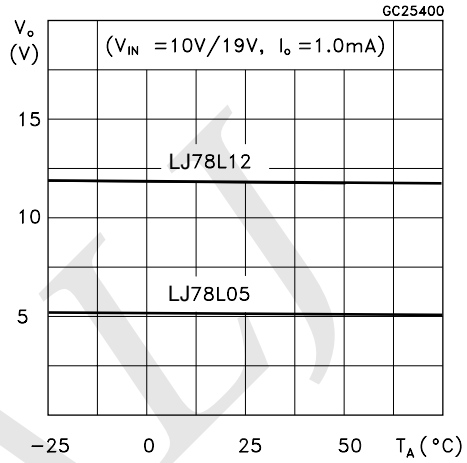


Figure 2 : LJ78L05/12/24 Load Characteristics

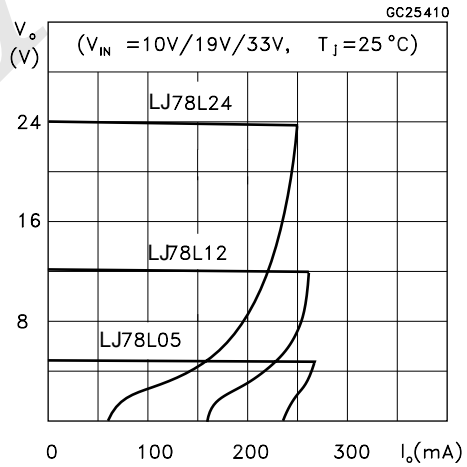


Figure 3 : LJ78L05/12/24 Thermal Shutdown

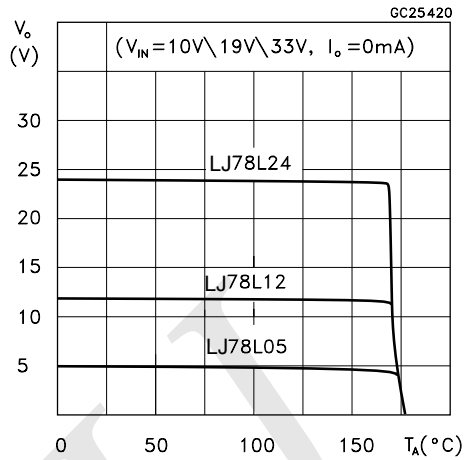


Figure 4 : LJ78L05/12 Quiescent Current vs Output Current

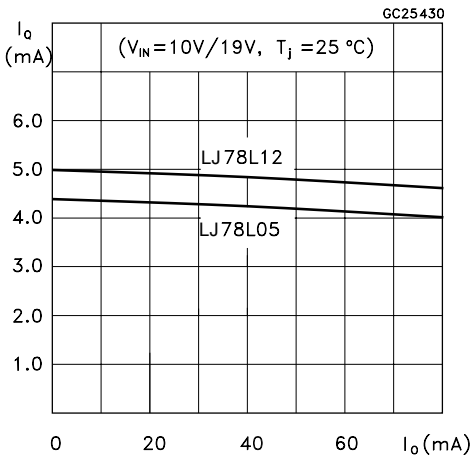


Figure 5 : LJ78L05 Quiescent Current vs Input Voltage

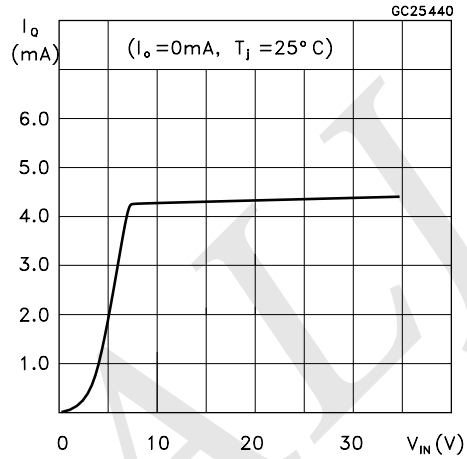


Figure 6 : LJ78L05/12/24 Output Characteristics

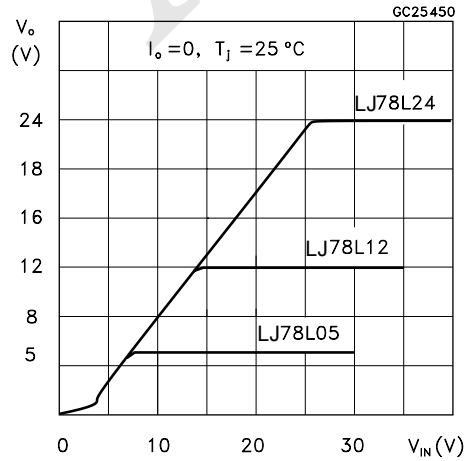


Figure 7 : LJ78L05/12/24 Ripple Rejection

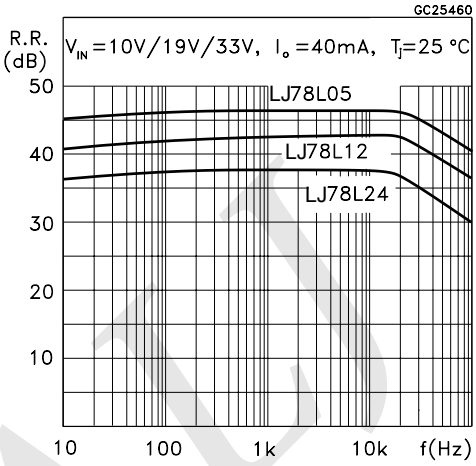


Figure 8 : LJ78L05 Dropout Characteristics

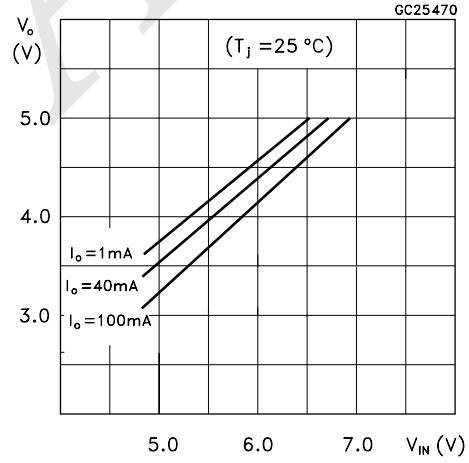
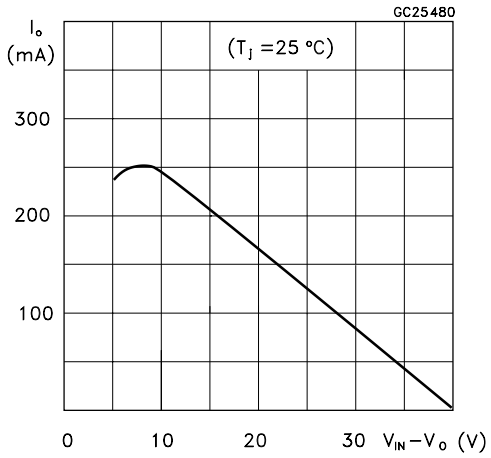


Figure 9 : LJ78L00 Series Short Circuit Output Current



TYPICAL APPLICATIONS

Table 10 : High Output Current Short Circuit Protected

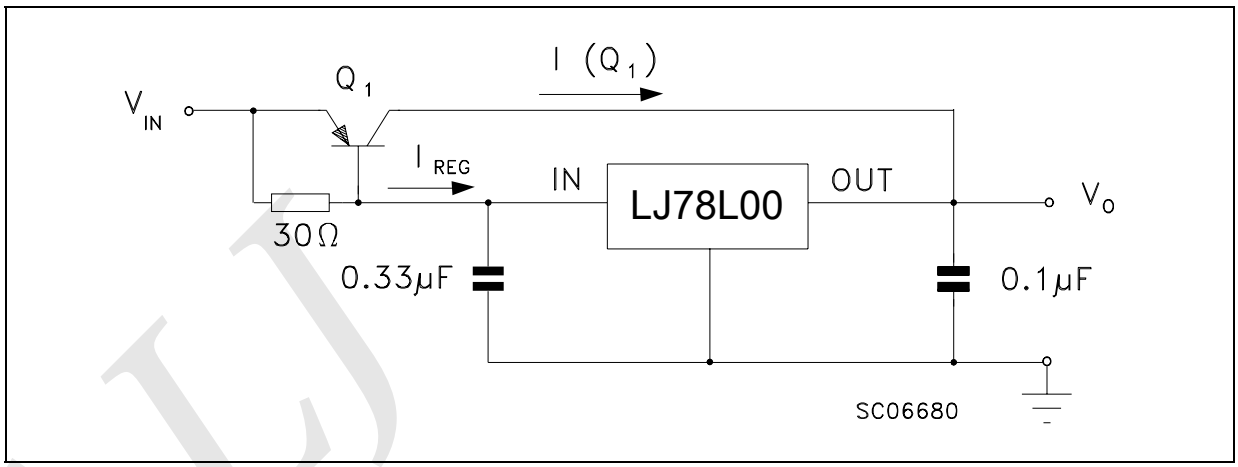


Figure 11 : Edit Boost Circuit

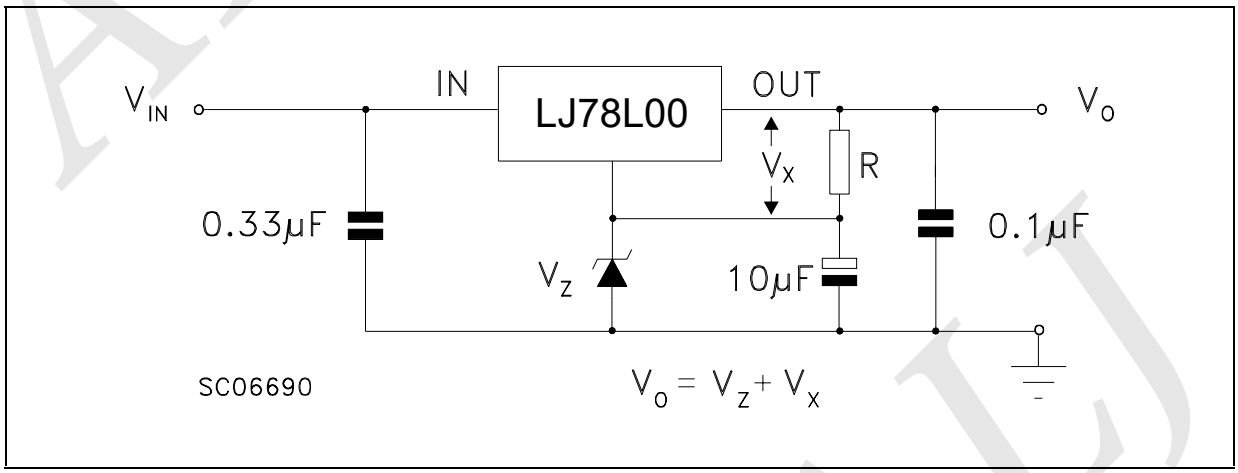


Figure 12 : Current Regulator

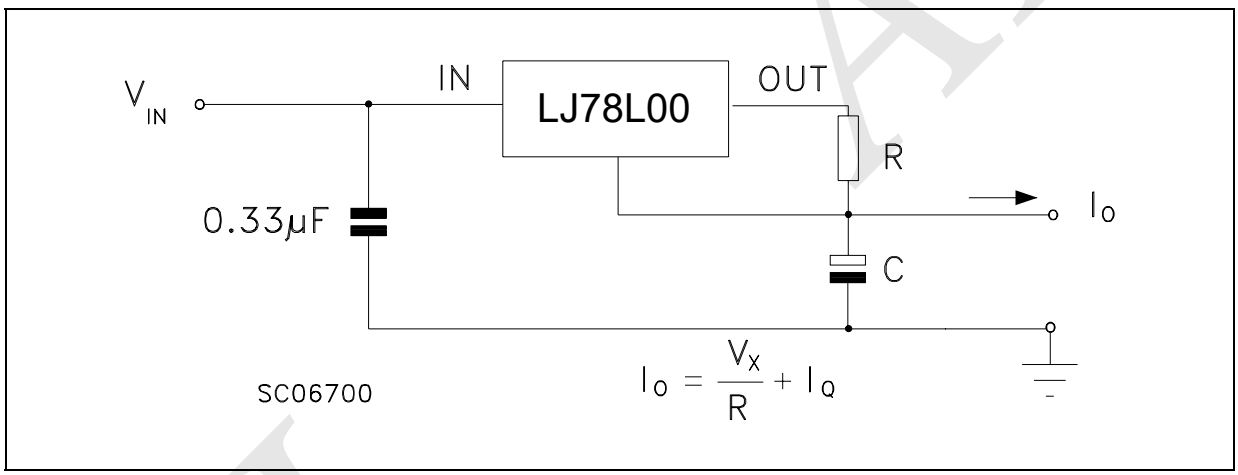


Figure 13 : Adjustable Output Regulator