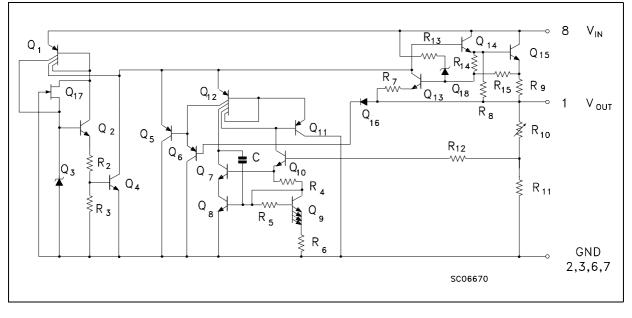
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5	Typical performance
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1 Diagram

Figure 1. Schematic diagram





2 Pin configuration

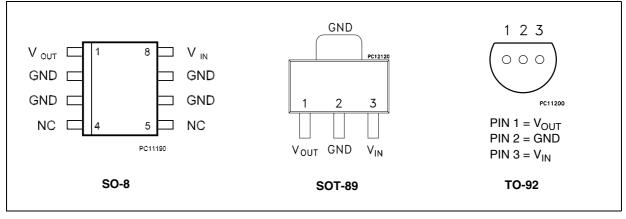
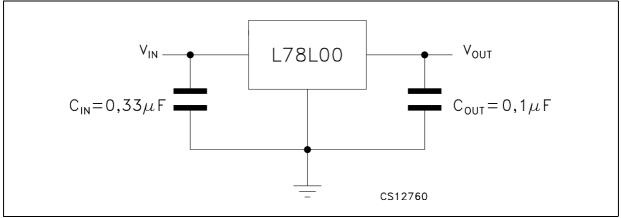


Figure 2. Pin connection (top view, bottom view for TO-92)

Figure 3. Test circuits





3 Maximum ratings

Symbol	Parameter	Value	Unit		
		V _O = 3.3 to 9 V	30		
VI	DC Input voltage	V _O = 12 to 15 V	35	V	
		V _O = 18 to 24 V	40		
Ι _Ο	Output current	current 100		mA	
P _D	Power dissipation		Internally limited ⁽¹⁾	mW	
T _{STG}	Storage temperature range		-65 to 150	°C	
	Operating junction temperature range	for L78L00AC	0 to 125	°C	
T _{OP}		for L78L00AB	-40 to 125		

 Our SO-8 package used for voltage regulators is modified internally to have pins 2, 3, 6 and 7 electrically communed 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 heat-sinking. The external dimensions are the same as for the standard SO-8.

Table 3. Thermal data

Symbol	Parameter	SO-8	TO-92	SOT-89	Unit
R _{thJC}	Thermal resistance junction-case. (max)	20		15	°C/W
R _{thJA}	Thermal resistance junction-ambient. (max)	55 ⁽¹⁾	200	55 ⁽¹⁾	°C/W

1. Considering 6 cm² of copper Board heat-sink.



4 Electrical characteristics

Refer to the test circuits, T_J = 0 to 125 °C, I_O = 40 mA, C_I = 0.33 $\mu F,\,C_O$ = 0.1 μF unless otherwise specified.

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V _O	Output voltage	T _J = 25 °C	3.036	3.3	3.564	V
V		$I_0 = 1$ to 40 mA, $V_1 = 5.3$ to 20 V	2.97		3.63	v
Vo	Output voltage	I _O = 1 to 70 mA, V _I = 8.3 V	2.97		3.63	v
A) (Line regulation	V_{I} = 5.3 to 20 V, T_{J} = 25 °C			150	mV
ΔV_{O}	Line regulation	V_{I} = 6.3 to 20 V, T_{J} = 25 °C			100	IIIV
	Load regulation	I_{O} = 1 to 100 mA, T_{J} = 25 °C			60	- mV
ΔV_{O}		I_{O} = 1 to 40 mA, T_{J} = 25 °C			30	
1	Quiescent current	T _J = 25 °C			6	mA
ا _ط		T _J = 125 °C			5.5	mA
41	Quiescent current change	I _O = 1 to 40 mA			0.2	mA
ΔI_d		V _I = 6.3 to 20 V			1.5	ШA
eN	Output noise voltage	B =10 Hz to 100 kHz, $T_J = 25 \degree C$		40		μV
SVR	Supply voltage rejection	$V_{\rm I}$ = 6.3 to 16.3 V, f = 120 Hz $I_{\rm O}$ = 40 mA, $T_{\rm J}$ = 25 °C	41	49		dB
V _d	Dropout voltage			1.7		V

Table 4.Electrical characteristics of L78L33C (VI = 8.3 V)

Table 5.Electrical characteristics of L78L05C (VI = 10 V)

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
Vo	Output voltage	T _J = 25 °C	4.6	5	5.4	V
V	Output voltage	$I_0 = 1$ to 40 mA, $V_1 = 7$ to 20 V	4.5		5.5	V
Vo	Output voltage	I _O = 1 to 70 mA, V _I = 10 V	4.5		5.5	v
	ΔV _O Line regulation	V_{I} = 8.5 to 20 V, T_{J} = 25 °C			200	mV
ΔvO		$V_{I} = 9$ to 20 V, $T_{J} = 25 \ ^{\circ}C$			150	IIIV
A) (Load regulation	$I_{O} = 1$ to 100 mA, $T_{J} = 25 \ ^{\circ}C$			60	mV
ΔV_O		I_{O} = 1 to 40 mA, T_{J} = 25 °C			30	mv
	Quipagent ourrent	T _J = 25 °C			6	mA
I _d	Quiescent current	T _J = 125 °C			5.5	mA
41		I _O = 1 to 40 mA			0.2	mA
ΔI_d	Quiescent current change	V _I = 8 to 20 V			1.5	ШA
eN	Output noise voltage	B =10 Hz to 100 kHz, T_J = 25 °C		40		μV



Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
SVR	Supply voltage rejection	$V_{I} = 9 \text{ to } 20 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$	40	49		dB
V _d	Dropout voltage			1.7		V

Table 5. Electrical characteristics of L78L05C (V₁ = 10 V) (continued)

Table 6.Electrical characteristics of L78L08C (VI = 14 V)

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V _O	Output voltage	T _J = 25 °C	7.36	8	8.64	V
N.	Output voltage	$I_0 = 1$ to 40 mA, $V_1 = 8.5$ to 20 V	7.2		8.8	V
Vo	Output voltage	I _O = 1 to 70 mA, V _I = 12 V	7.2		8.8	v
	Line regulation	V_{I} = 8.5 to 20 V, T_{J} = 25 °C			200	mV
ΔV _O		$V_{I} = 9$ to 20 V, $T_{J} = 25 \ ^{\circ}C$			150	IIIV
	N _O Load regulation	$I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$			80	mV
ΔvO		$I_{O} = 1$ to 40 mA, $T_{J} = 25 \text{ °C}$			40	
	Quiescent current	T _J = 25 °C			6	mA
ا _ط		T _J = 125 °C			5.5	mA
AL	Ouissesst surrout shows	I _O = 1 to 40 mA			0.2	mA
Δl _d	Quiescent current change	V ₁ = 8 to 20 V			1.5	ША
eN	Output noise voltage	B =10 Hz to 100 kHz, T _J = 25 °C		60		μV
SVR	Supply voltage rejection	V_I = 9 to 20 V, f = 120 Hz I_O = 40 mA, T_J = 25 °C	36	45		dB
V _d	Dropout voltage			1.7		V

Table 7. Electrical characteristics of L78L09C (V_I = 15 V)

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
Vo	Output voltage	T _J = 25 °C	8.28	9	9.72	V
N.	Output voltage	$I_{O} = 1$ to 40 mA, $V_{I} = 11.5$ to 23 V	8.1		9.9	V
V _O	Oulput voltage	$I_{O} = 1$ to 70 mA, $V_{I} = 15$ V	8.1		9.9	v
ΔV _O	Line regulation	V_{I} = 11.5 to 23 V, T_{J} = 25 °C			250	mV
		$V_{I} = 12 \text{ to } 23 \text{ V}, \text{ T}_{J} = 25 ^{\circ}\text{C}$			200	IIIV
A) (Load regulation	$I_{O} = 1$ to 100 mA, $T_{J} = 25 \ ^{\circ}C$			80	mV
ΔV _O		I_{O} = 1 to 40 mA, T_{J} = 25 °C			40	IIIV
	Quiescent current	T _J = 25 °C			6	mA
I _d	Quiescent current	T _J = 125 °C			5.5	mA
Δl_d	Quieseent ourrent abange	I _O = 1 to 40 mA			0.2	m 1
	Quiescent current change	V _I = 12 to 23 V			1.5	mA



10010 11							
Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit	
eN	Output noise voltage	B =10 Hz to 100 kHz, T_J = 25 °C		70		μV	
SVR	Supply voltage rejection	V_I = 12 to 23 V, f = 120 Hz I_O = 40 mA, T_J = 25 °C	36	44		dB	
V _d	Dropout voltage			1.7		V	

 Table 7.
 Electrical characteristics of L78L09C (V₁ = 15 V) (continued)

Table 8.	Electrical characteristics of L78L10C (V _I = 16 V)
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Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V _O	Output voltage	T _J = 25 °C	9.2	10	10.8	V
N.		$I_0 = 1$ to 40 mA, $V_1 = 12.5$ to 23 V	9		11	V
Vo	Output voltage	$I_0 = 1$ to 70 mA, $V_1 = 16$ V	9		11	v
		$V_{I} = 12.5$ to 23 V, $T_{J} = 25 \ ^{\circ}C$			230	mV
ΔV _O	Line regulation	V_{I} = 13 to 23 V, T_{J} = 25 °C			170	IIIV
	D Load regulation	$I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$			80	mV
ΔV _O		$I_{O} = 1$ to 40 mA, $T_{J} = 25 \text{ °C}$			40	
	Quiescent current	T _J = 25 °C			6	mA
۱ _d	Quiescent current	T _J = 125 °C			5.5	mA
AL	Quiescent current change	I _O = 1 to 40 mA			0.1	mA
Δl _d	Quescent current change	V _I = 13 to 23 V			1.5	ША
eN	Output noise voltage	B =10Hz to 100kHz, $T_J = 25 \text{ °C}$		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

Table 9.Electrical characteristics of L78L12C (VI = 19 V)

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V _O	Output voltage	T _J = 25 °C	11.1	12	12.9	V
V		$I_0 = 1$ to 40 mA, $V_1 = 14.5$ to 27 V	10.8		13.2	V
V _O	Output voltage $I_0 = 1$	I _O = 1 to 70 mA, V _I = 19 V	10.8		13.2	v
A)/	Line regulation	V_{I} = 14.5 to 27 V, T_{J} = 25 °C			250	mV
ΔV_{O}	Line regulation $V_I = 16 \text{ to } 27 \text{ V}, T_J = 25 \text{ °C}$			200	IIIV	
A) (Lood regulation	$I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$			100	mV
ΔV_{O}	Load regulation	$I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$			50	ΠV
I _d	Quiescent current	T _J = 25 °C			6.5	mA
		T _J = 125 °C			6	mA



Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
41	Quiescent current change	I _O = 1 to 40 mA			0.2	mA
ΔI_d	$V_l = 16 \text{ to } 27 \text{ V}$			1.5	ШA	
eN	Output noise voltage	B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$		80		μV
SVR	Supply voltage rejection	$V_{I} = 15 \text{ to } 25 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$	36	42		dB
V _d	Dropout voltage			1.7		V

Table 9. Electrical characteristics of L78L12C (V₁ = 19 V) (continued)

Table 10. Electrical characteristics of L78L15C (V_I = 23 V)

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
Vo	Output voltage	T _J = 25 °C	13.8	15	16.2	V
V		$I_{O} = 1$ to 40 mA, $V_{I} = 17.5$ to 30 V	13.5		16.5	v
Vo	Output voltage	$I_0 = 1$ to 70 mA, $V_1 = 23$ V	13.5		16.5	v
41/	Line regulation	$V_{I} = 17.5$ to 30 V, $T_{J} = 25 \ ^{\circ}C$			300	mV
ΔV _O	Line regulation	$V_{I} = 20 \text{ to } 30 \text{ V}, \text{ T}_{J} = 25 ^{\circ}\text{C}$			250	ΠV
41/	Lood regulation	$I_{O} = 1$ to 100 mA, $T_{J} = 25 \ ^{\circ}C$			150	mV
ΔV _O	Load regulation	$I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$			75	ΠV
	Quiescent current	T _J = 25 °C			6.5	mA
۱ _d	Quiescent current	T _J = 125 °C			6	mA
AL	Quiescent current change	I _O = 1 to 40 mA			0.2	mA
ΔI_d	Quescent current change	V ₁ = 20 to 30 V			1.5	ША
eN	Output noise voltage	B =10 Hz to 100 kHz, T_J = 25 °C		90		μV
SVR	Supply voltage rejection	$V_{I} = 18.5$ to 28.5 V, f = 120 Hz $I_{O} = 40$ mA, $T_{J} = 25$ °C	33	39		dB
V _d	Dropout voltage			1.7		V

Table 11. Electrical characteristics of L78L18C (V_I = 27 V)

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
Vo	Output voltage	T _J = 25 °C	16.6	18	19.4	V
M	Output voltage	$I_{O} = 1$ to 40 mA, $V_{I} = 22$ to 33 V	16.2		19.8	V
Vo	Oulput voltage	$I_{O} = 1$ to 70 mA, $V_{I} = 27$ V	16.2		19.8	v
A) /	Line regulation	V_{I} = 22 to 33 V, T_{J} = 25 °C			320	mV
ΔV _O	Line regulation	V_{I} = 22 to 33 V, T_{J} = 25 °C			270	IIIV
	Load regulation	I_{O} = 1 to 100 mA, T_{J} = 25 °C			170	mV
ΔV _O	Load regulation	I_{O} = 1 to 40 mA, T_{J} = 25 °C			85	IIIV



Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
	Quipagent ourrent	T _J = 25 °C			6.5	mA
'd	I _d Quiescent current	T _J = 125 °C			6	mA
41		I _O = 1 to 40 mA			0.2	m۸
ΔI_d	Quiescent current change	V ₁ = 23 to 33 V			1.5	mA
eN	Output noise voltage	B =10 Hz to 100 kHz, T_J = 25 °C		120		μV
SVR	Supply voltage rejection	$V_{I} = 23 \text{ to } 33 \text{ V}, f = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, T_{J} = 25 ^{\circ}\text{C}$	32	38		dB
V _d	Dropout voltage			1.7		V

Table 11. Electrical characteristics of L78L18C (V_I = 27 V) (continued)

Table 12.Electrical characteristics of L78L24C (VI = 33 V)

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V _O	Output voltage	T _J = 25 °C	22.1	24	25.9	V
V		$I_0 = 1$ to 40 mA, $V_1 = 27$ to 38 V	21.6		26.4	V
Vo	Output voltage	I _O = 1 to 70 mA, V _I = 33 V	21.6		26.4	v
A) /	Line regulation	$V_{I} = 27$ to 38 V, $T_{J} = 25 \ ^{\circ}C$			350	mV
ΔV _O	Line regulation	$V_1 = 28 \text{ to } 38 \text{ V}, \text{ T}_3 = 25 \ ^\circ\text{C}$			300	IIIV
A) (Lood regulation	$I_0 = 1$ to 100 mA, $T_J = 25 \ ^{\circ}C$			200	mV
ΔV _O	Load regulation	$I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$			100	ΠV
	Quiescent current	T _J = 25 °C			6.5	mA
۱ _d	Quiescent current	T _J = 125 °C			6	mA
41	Quiaccent ourrent change	I _O = 1 to 40 mA			0.2	mA
Δl _d	Quiescent current change	V ₁ = 28 to 38 V			1.5	ШA
eN	Output noise voltage	B =10 Hz to 100 kHz, $T_J = 25 \degree C$		200		μV
SVR	Supply voltage rejection	$V_{I} = 29 \text{ to } 35 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$	30	37		dB
V _d	Dropout voltage			1.7		V

 T_J = 0 to 125 °C for L78L33AC, T_J = -40 to 125 °C for L78L33AB.

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
Vo	Output voltage	T _J = 25 °C	3.168	3.3	3.432	V
V	V _O Output voltage	$I_{O} = 1$ to 40 mA, $V_{I} = 5.3$ to 20 V	3.135		3.465	V
v 0		$I_{O} = 1$ to 70 mA, $V_{I} = 8.3$ V	3.135		3.465	v
A) (V_{I} = 5.3 to 20 V, T_{J} = 25 °C			150	mV
ΔV_O	Line regulation	V_{I} = 6.3 to 20 V, T_{J} = 25 °C			100	mv

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Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
A) (I _O = 1 to 100 mA, T _J = 25 °C			60	
ΔV_O	Load regulation	I_{O} = 1 to 40 mA, T_{J} = 25 °C			30	mV
1		T _J = 25 °C			6	mA
ا _ط	Quiescent current	T _J = 125 °C			5.5	mA
41	Quiescent current change	I _O = 1 to 40 mA			0.1	mA
ΔI_d	Quiescent current change	V ₁ = 6.3 to 20 V			1.5	ШA
eN	Output noise voltage	B =10 Hz to 100 kHz, $T_J = 25 \ ^{\circ}C$		40		μV
SVR	Supply voltage rejection	$V_{I} = 6.3$ to 16.3 V, f = 120 Hz $I_{O} = 40$ mA, $T_{J} = 25 \text{ °C}$	41	49		dB
V _d	Dropout voltage			1.7		V

Table 13.	Electrical characteristics of L78L33AB and L78L33AC ((V	i = 8.3 V) (continued)	
		••	- 0.0 .	/ \		

 T_J = 0 to 125 °C for L78L05AC, T_J = -40 to 125 °C for L78L05AB.

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V _O	Output voltage	T _J = 25 °C	4.8	5	5.2	V
M		$I_0 = 1$ to 40 mA, $V_1 = 7$ to 20 V	4.75		5.25	v
Vo	Output voltage	I _O = 1 to 70 mA, V _I = 10 V	4.75		5.25	v
	Line regulation	$V_{I} = 7 \text{ to } 20 \text{ V}, \text{ T}_{J} = 25 ^{\circ}\text{C}$			150	mV
ΔV_{O}		$V_{I} = 8 \text{ to } 20 \text{ V}, \text{ T}_{J} = 25 \ ^{\circ}\text{C}$			100	IIIV
A) /	Lood regulation	$I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$			60	mV
ΔV_{O}	Load regulation	I _O = 1 to 40 mA, T _J = 25 °C			30	IIIV
	Quiescent current	T _J = 25 °C			6	mA
I _d	Quiescent current	T _J = 125 °C			5.5	mA
41	Quiessent surrent shange	I _O = 1 to 40 mA			0.1	m۸
ΔI_d	Quiescent current change	V _I = 8 to 20 V			1.5	mA
eN	Output noise voltage	B =10 Hz to 100 kHz, $T_J = 25 \ ^{\circ}C$		40		μV
SVR	Supply voltage rejection	$V_{I} = 8 \text{ to } 18 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 ^{\circ}\text{C}$	41	49		dB
V _d	Dropout voltage			1.7		V

Table 14. Electrical characteristics of L78L05AB and L78L05AC ($V_1 = 10 V$)

 T_J = 0 to 125 °C for L78L06AC, T_J = -40 to 125 °C for L78L06AB.



Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V _O	Output voltage	T _J = 25 °C	5.76	6	6.24	V
		I _O = 1 to 40 mA, V _I = 8.5 to 20 V	5.7		6.3	
Vo	Output voltage	$I_0 = 1$ to 70 mA, $V_1 = 12$ V	5.7		6.3	V
A) (Line regulation	$V_{I} = 8.5$ to 20 V, $T_{J} = 25 \ ^{\circ}C$			150	m\/
ΔV_{O}	Line regulation	$V_{I} = 9$ to 20 V, $T_{J} = 25 \ ^{\circ}C$			100	mV
	Load regulation	$I_{O} = 1$ to 100 mA, $T_{J} = 25 \ ^{\circ}C$			60	mV
ΔV_{O}		$I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$			30	IIIV
I _d	Quiescent current	T _J = 25 °C			6	mA
'd		$T_{J} = 125 \ ^{\circ}C$			5.5	mA
ΔI_d	Quiescent current change	I _O = 1 to 40 mA			0.1	mA
∆'d	ducsecht eurent enange	V ₁ = 9 to 20 V			1.5	110.4
eN	Output noise voltage	B =10 Hz to 100 kHz, $T_J = 25 \ ^{\circ}C$		50		μV
SVR	Supply voltage rejection	$V_I = 9$ to 20 V, f = 120 Hz $I_O = 40$ mA, $T_J = 25$ °C	39	46		dB
V _d	Dropout voltage			1.7		V

Table 15. Electrical characteristics of L78L06AB and L78L06AC ($V_1 = 12 V$)

 T_J = 0 to 125 °C for L78L08AC, T_J = -40 to 125 °C for L78L08AB.

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V _O	Output voltage	T _J = 25 °C	7.68	8	8.32	V
V		$I_{O} = 1$ to 40 mA, $V_{I} = 10.5$ to 23 V	7.6		8.4	v
Vo	Output voltage	I _O = 1 to 70 mA, V _I = 14 V	7.6		8.4	v
A) /	Line regulation	V_{I} = 10.5 to 23 V, T_{J} = 25 °C			175	mV
ΔV_{O}	Line regulation	V_{I} = 11 to 23 V, T_{J} = 25 °C			125	
A) /	Lood regulation	$I_{\rm O}$ = 1 to 100 mA, $T_{\rm J}$ = 25 °C			80	mV
ΔV_{O}	Load regulation	$I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$			40	
	Quiescent current	T _J = 25 °C			6	mA
I _d	Quiescent current	T _J = 125 °C			5.5	mA
41	Quiescent current change	I _O = 1 to 40 mA			0.1	mA
ΔI_d	Quescent current change	V _I = 11 to 23 V			1.5	ША
eN	Output noise voltage	B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$		60		μV
SVR	Supply voltage rejection	V_{I} = 12 to 23 V, f = 120 Hz I_{O} = 40 mA, T_{J} = 25 °C	37	45		dB
V _d	Dropout voltage			1.7		V

Table 16.	Electrical characteristics of L78L08AB and L78L08AC (Vi :	= 14 \	(∖



 T_J = 0 to 125 °C for L78L09AC, T_J = -40 to 125 °C for L78L09AB.

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
Vo	Output voltage	T _J = 25 °C	8.64	9	9.36	V
V		$I_0 = 1$ to 40 mA, $V_1 = 11.5$ to 23 V	8.55		9.45	V
V _O	Output voltage	I _O = 1 to 70 mA, V _I = 15 V	8.55		9.45	v
A) (Line regulation	$V_{\rm I} = 11.5$ to 23 V, $T_{\rm J} = 25 \ ^{\circ}{\rm C}$			225 mV	m\/
ΔV_O	Line regulation	V_{I} = 12 to 23 V, T_{J} = 25 °C			150	
A) (Lood regulation	$I_{O} = 1$ to 100 mA, $T_{J} = 25 \ ^{\circ}C$			80	80 40 mV
ΔV_O	Load regulation	$I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$			40	
1	Quiescent current	T _J = 25 °C			6	mA
I _d	Quescent current	T _J = 125 °C			5.5	mA
41	Quipagent ourrant change	I _O = 1 to 40 mA			0.1	mA
ΔI_d	Quiescent current change	V _I = 12 to 23 V			1.5	ША
eN	Output noise voltage	B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$		70		μV
SVR	Supply voltage rejection	$V_{I} = 12 \text{ to } 23 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$	37	44		dB
V _d	Dropout voltage			1.7		V

Table 17.	Electrical characteristics of L78L09AB and L78L09AC (V ₁ = 15 V)
-----------	---

 T_J = 0 to 125 °C for L78L10AC, T_J = -40 to 125 °C for L78L10AB.

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V _O	Output voltage	T _J = 25 °C	9.6	10	10.4	V
M	Output voltage	$I_{O} = 1$ to 40 mA, $V_{I} = 12.5$ to 23 V	9.5		10.5 V	V
V _O	Output voltage	I _O = 1 to 70 mA, V _I = 16 V	9.5		10.5	v
A)/ .	Line regulation	$V_{\rm I}$ = 12.5 to 23 V, $T_{\rm J}$ = 25 °C			230	mV
ΔV_{O}	Line regulation	V_{I} = 13 to 23 V, T_{J} = 25 °C			170	
41/	Lood regulation	I_{O} = 1 to 100 mA, T_{J} = 25 °C			80	— mV
ΔV_O	Load regulation	$I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$			40	
1	Quiescent current	T _J = 25 °C			6	mA
l _d		T _J = 125 °C			5.5	mA
41	Quiaccent ourrent change	I _O = 1 to 40 mA			0.1	m۸
ΔI_d	Quiescent current change	V _I = 13 to 23 V			1.5	- mA
eN	Output noise voltage	B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$		60		μV
SVR	Supply voltage rejection	$V_{I} = 14 \text{ to } 23 \text{ V}, f = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, T_{J} = 25 \text{ °C}$	37	45		dB
V _d	Dropout voltage			1.7		V

Table 18.Electrical characteristics of L78L10AC ($V_1 = 16 V$)



$T_{J} = 0$ to 125 °C for L78L12AC, T_{J}	= -40 to 125 °C for L78L12AB.

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
Vo	Output voltage	T _J = 25 °C	11.5	12	12.5	V
V		$I_{O} = 1$ to 40 mA, $V_{I} = 14.5$ to 27 V	11.4		12.6	v
V _O	Output voltage	I _O = 1 to 70 mA, V _I = 19 V	11.4		12.6	v
A) (Line regulation	$V_{\rm I}$ = 14.5 to 27 V, $T_{\rm J}$ = 25 °C			250	m\/
ΔV_O	Line regulation	V_{I} = 16 to 27 V, T_{J} = 25 °C			200	200 mV
437	Lood regulation	I_{O} = 1 to 100 mA, T_{J} = 25 °C			100	mV
ΔV_{O}	Load regulation	$I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$			50	
1	Quiescent current	T _J = 25 °C			6.5	mA
I _d	Quiescent current	T _J = 125 °C			6	mA
41	Quipagent ourrant 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 =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$		80		μV
SVR	Supply voltage rejection	$V_{I} = 15 \text{ to } 25 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$	37	42		dB
V _d	Dropout voltage			1.7		V

Table 19.	Electrical characteristics of L78L12AB and L78L12AC (V _I = 19 V)
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 T_J = 0 to 125 °C for L78L15AC, T_J = -40 to 125 °C for L78L15AB.

Table 20. Electrical characteristics of L78L15AB and L78L15AC ($V_1 = 23 V$)
--

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
V _O	Output voltage	T _J = 25 °C	14.4	15	15.6	V
N.	Output voltage	$I_0 = 1$ to 40 mA, $V_1 = 17.5$ to 30 V	14.25		15.75	V
Vo	Output voltage	$I_0 = 1$ to 70 mA, $V_1 = 23$ V	14.25		15.75	v
ΔV _O	Line regulation	V_{I} = 17.5 to 30 V, T_{J} = 25 °C			300	mV
ΔvO	Line regulation	V_{I} = 20 to 30 V, T_{J} = 25 °C			250	
	Load regulation	I_{O} = 1 to 100 mA, T_{J} = 25 °C			150	mV
ΔV _O	Load regulation	I_{O} = 1 to 40 mA, T_{J} = 25 °C			75	111V
	Quiescent current	$T_{\rm J} = 25 \ ^{\circ}{\rm C}$			6.5	mA
۱ _d		T _J = 125 °C			6	mA
41	Quiescent current change	I _O = 1 to 40 mA			0.1	mA
Δl _d	Quiescent current change	V ₁ = 20 to 30 V			1.5	ША
eN	Output noise voltage	B =10 Hz to 100 kHz, T_J = 25 °C		90		μV
SVR	Supply voltage rejection	V_{I} = 18.5 to 28.5 V, f = 120 Hz I_{O} = 40 mA, T _J = 25 °C	34	39		dB
V _d	Dropout voltage			1.7		V



 T_J = 0 to 125 °C for L78L18AC, T_J = -40 to 125 °C for L78L18AB.

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
Vo	Output voltage	T _J = 25 °C	17.3	18	18.7	V
N.	Output voltage	$I_{O} = 1$ to 40 mA, $V_{I} = 22$ to 33 V	17.1		18.9	V
Vo	Output voltage	I _O = 1 to 70 mA, V _I = 27 V	17.1		18.9	v
	Line regulation	$V_{I} = 22 \text{ to } 33 \text{ V}, \text{ T}_{J} = 25 ^{\circ}\text{C}$			320	— mV
ΔV _O	Line regulation	$V_{I} = 22$ to 33 V, $T_{J} = 25 \ ^{\circ}C$			270	
41/	Lood regulation	$I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$			170	mV
ΔV _O	Load regulation	$I_{O} = 1$ to 40 mA, $T_{J} = 25 \ ^{\circ}C$			85	
	Quiescent current	T _J = 25 °C			6.5	mA
۱ _d		T _J = 125 °C			6	mA
41	Quiessent current change	I _O = 1 to 40 mA			0.1	mA
Δl _d	Quiescent current change	V ₁ = 23 to 33 V			1.5	ШA
eN	Output noise voltage	B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$		120		μV
SVR	Supply voltage rejection	$V_{I} = 23 \text{ to } 33 \text{ V}, \text{ f} = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, \text{ T}_{J} = 25 \text{ °C}$	33	38		dB
V _d	Dropout voltage			1.7		V

Table 21. Electrical characteristics of L78L18AC ($V_1 = 27 V$)

 T_J = 0 to 125 °C for L78L24AC, T_J = -40 to 125 °C for L78L24AB.

Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit	
Vo	Output voltage	T _J = 25 °C	23	24	25	V	
V		$I_0 = 1$ to 40 mA, $V_1 = 27$ to 38 V	22.8		25.2	v	
Vo	Output voltage	$I_{O} = 1$ to 70 mA, $V_{I} = 33$ V	22.8		25.2	v	
A) (Line regulation	$V_{\rm I}$ = 27 to 38 V, $T_{\rm J}$ = 25 °C			350 m)	m)/	
ΔV_O	Line regulation	V_{I} = 28 to 38 V, T_{J} = 25 °C			300	mV 300	
A) (Lood regulation	$I_{O} = 1$ to 100 mA, $T_{J} = 25 \text{ °C}$			200		
ΔV_O	Load regulation	I_{O} = 1 to 40 mA, T_{J} = 25 °C			100	mV	
	Quiescent current	T _J = 25 °C			6.5	mA	
I _d	Quiescent current	T _J = 125 °C			6	mA	
41	Quipagent ourrent change	I _O = 1 to 40 mA			0.1	mA	
ΔI_d	Quiescent current change	V _I = 28 to 38 V			1.5	ШA	
eN	Output noise voltage	B =10 Hz to 100 kHz, $T_J = 25 \text{ °C}$		200		μV	
SVR	Supply voltage rejection	$V_{I} = 29 \text{ to } 33 \text{ V}, f = 120 \text{ Hz}$ $I_{O} = 40 \text{ mA}, T_{J} = 25 ^{\circ}\text{C}$	31	37		dB	
V _d	Dropout voltage			1.7		V	

Table 22. Electrical characteristics of L78L24AB and L78L24AC (V₁ = 33 V)



Figure 4.

5 Typical performance

L78L05/12 output voltage vs.

 ambient temperature

 CC25400

 V°
 (V) $(V_{IN} = 10V/19V, I_o = 1.0mA)$

 15
 10
 15

 10
 10
 10

 5
 10
 178L05

 5
 10
 178L05

 -25
 0
 25
 50

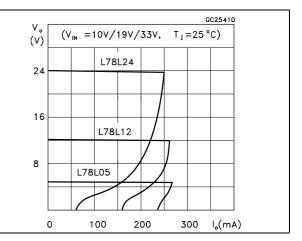
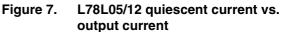
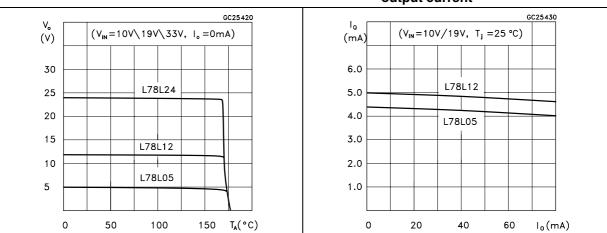


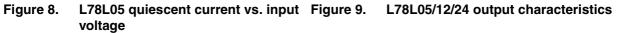
Figure 5. L78L05/12/24 load characteristics

Figure 6. L78L05/12/24 thermal shutdown









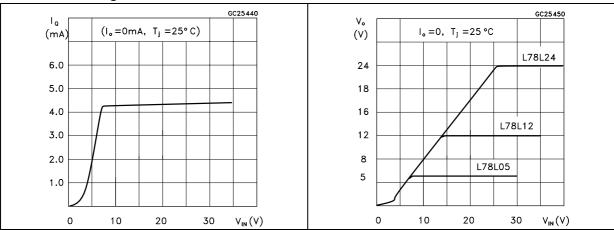


Figure 11. L78L05 dropout characteristics

Figure 10. L78L05/12/24 ripple rejection

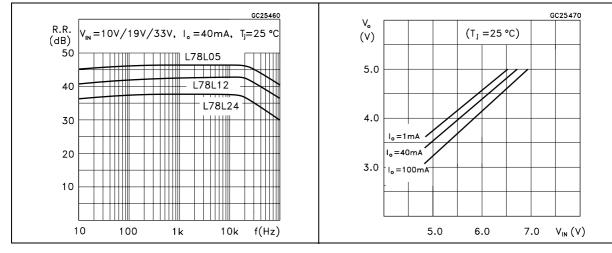
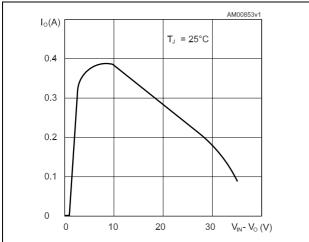


Figure 12. L78Lxx short-circuit output current



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6 **Typical application**

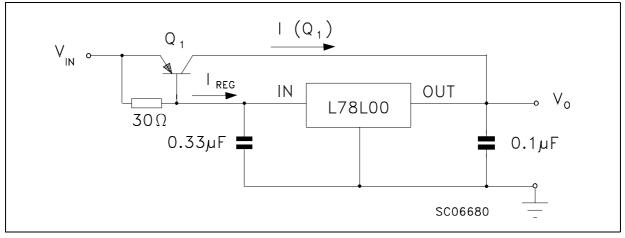
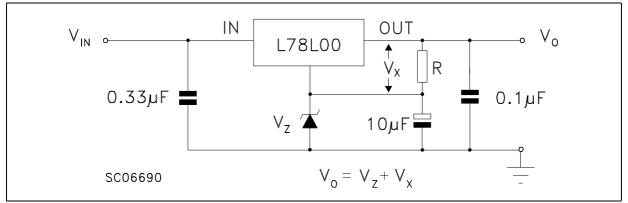
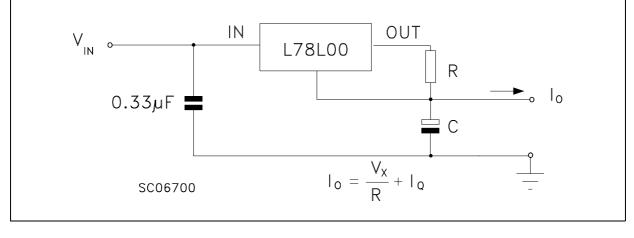


Figure 13. High output current short-circuit protected

Figure 14. Edit boost circuit

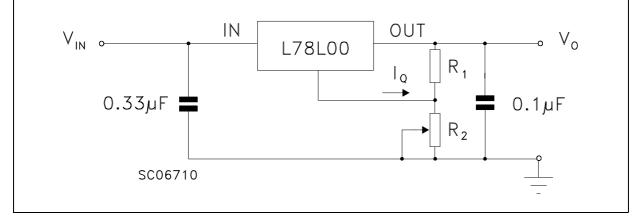






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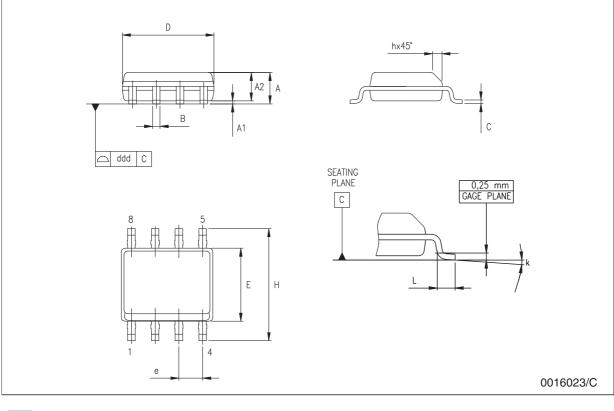
7 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK[®] is an ST trademark.



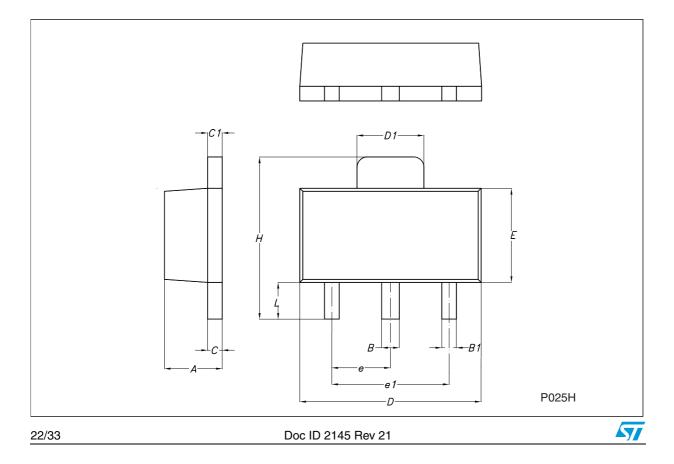
Dim.		mm.		inch.		
Dim.	Min.	Тур.	Max.	Min.	Тур.	Max.
А	1.35		1.75	0.053		0.069
A1	0.10		0.25	0.04		0.010
A2	1.10		1.65	0.043		0.065
В	0.33		0.51	0.013		0.020
С	0.19		0.25	0.007		0.010
D	4.80		5.00	0.189		0.197
E	3.80		4.00	0.150		0.157
е		1.27			0.050	
Н	5.80		6.20	0.228		0.244
h	0.25		0.50	0.010		0.020
L	0.40		1.27	0.016		0.050
k		•	8° (1	max.)	· · · · · · · · · · · · · · · · · · ·	
ddd			0.1			0.04







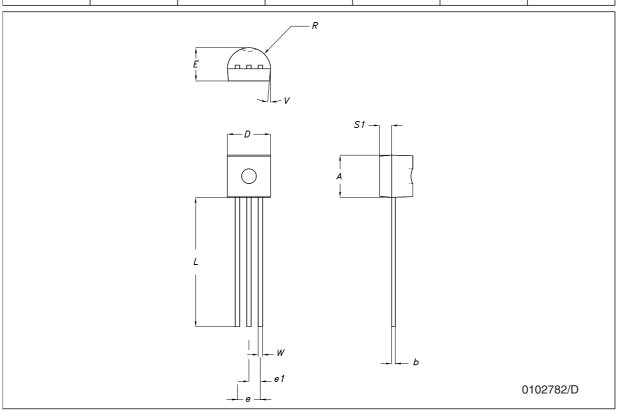
Dim.		mm.		mils.			
Dini.	Min.	Тур.	Max.	Min.	Тур.	Max.	
А	1.4		1.6	55.1		63.0	
В	0.44		0.56	17.3		22.0	
B1	0.36		0.48	14.2		18.9	
С	0.35		0.44	13.8		17.3	
C1	0.35		0.44	13.8		17.3	
D	4.4		4.6	173.2		181.1	
D1	1.62		1.83	63.8		72.0	
E	2.29		2.6	90.2		102.4	
е	1.42		1.57	55.9		61.8	
e1	2.92		3.07	115.0		120.9	
Н	3.94		4.25	155.1		167.3	
L	0.89		1.2	35.0		47.2	



SO1	Г-89	mec	hanica	data
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Dim.		mm.			mils.	
Dini.	Min.	Тур.	Max.	Min.	Тур.	Max.
А	4.32		4.95	170.1		194.9
b	0.36		0.51	14.2		20.1
D	4.45		4.95	175.2		194.9
E	3.30		3.94	129.9		155.1
е	2.41		2.67	94.9		105.1
e1	1.14		1.40	44.9		55.1
L	12.7		15.49	500.0		609.8
R	2.16		2.41	85.0		94.9
S1	0.92		1.52	36.2		59.8
W	0.41		0.56	16.1		22.0

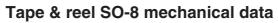


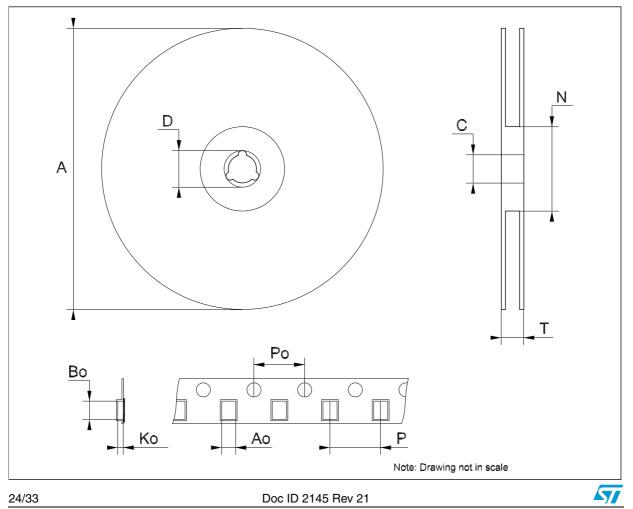


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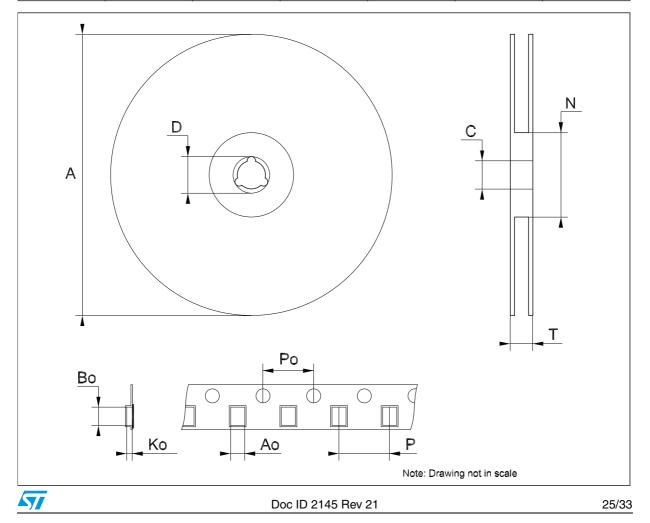
Dim.		mm.			inch.	
Dini.	Min.	Тур.	Max.	Min.	Тур.	Max.
А			330			12.992
С	12.8		13.2	0.504		0.519
D	20.2			0.795		
Ν	60			2.362		
Т			22.4			0.882
Ao	8.1		8.5	0.319		0.335
Во	5.5		5.9	0.216		0.232
Ko	2.1		2.3	0.082		0.090
Po	3.9		4.1	0.153		0.161
Р	7.9		8.1	0.311		0.319





		mm.		inch.		
Dim.	Min.	Тур.	Max.	Min.	Тур.	Max.
А			180			7.086
С	12.8	13.0	13.2	0.504	0.512	0.519
D	20.2			0.795		
Ν	60			2.362		
Т			14.4			0.567
Ao	4.70	4.80	4.90	0.185	0.189	0.193
Во	4.30	4.40	4.50	0.169	0.173	0.177
Ko	1.70	1.80	1.90	0.067	0.071	0.075
Po	3.9	4.0	4.1	0.153	0.157	0.161
Р	7.9	8.0	8.1	0.311	0.315	0.319





Dim		mm.			inch.			
Dim.	Min.	Тур.	Max.	Min.	Тур.	Max.		
A1 ⁽¹⁾		4.80			0.189			
T ⁽¹⁾		3.80			0.150			
T1		1.60			0.063			
T2		2.30			0.091			
d		0.48			0.019			
P0	12.5		12.9	0.492		0.508		
P2	5.65		7.05	0.222		0.278		
F1, F2	2.44	2.54	2.94	0.096	0.100	0.116		
delta H		±2			0.079			
W	17.5	18.00	19.0	0.689	0.709	0.748		
W0	5.7		6.3	0.224		0.248		
W1	8.5		9.25	0.335		0.364		
W2		0.50			0.20			
Н		18.50	18.70		0.728	0.726		
H0	15.50		16.50	0.610		0.650		
H1		25.00			0.984			
D0	3.8		4.2	0.150		0.165		
t		0.90			0.035			
L1		3			0.118			
delta P		±1			0.039			
u		50			1.968			
Φ1		360			14.173			
Φ2		30			1.181			

Table 23. Tape and reel TO-92 mechanical data

1. For the MAX and MIN values refer to the TO-92 mechanical data on page 23.



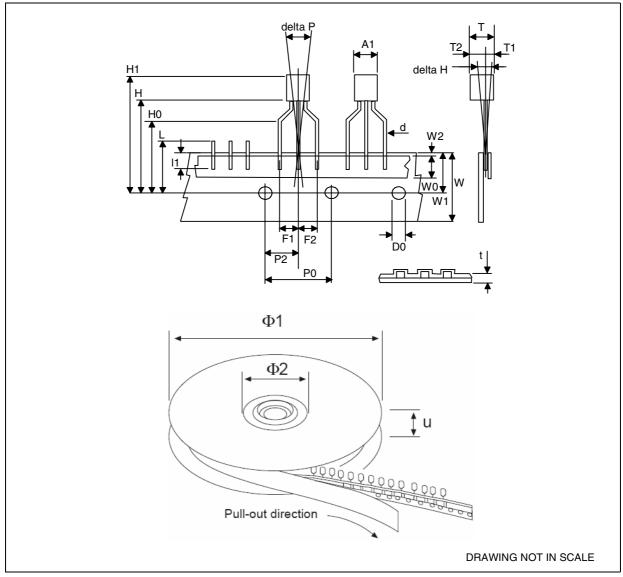


Figure 17. Tape and reel TO-92 drawing dimension



8 Order codes

Table 24.Order codes

Part numbers		Packages	- Output voltages	
Part numbers	SO-8	TO92 (BAG) ⁽¹⁾	SOT-89	
L78L33C	L78L33CD-TR			3.3 V
L78L33AC	L78L33ACD13TR	L78L33ACZ	L78L33ACUTR	3.3 V
L78L33AB	L78L33ABD-TR	L78L33ABZ	L78L33ABUTR	3.3 V
L78L05C	L78L05CD13TR	L78L05CZ		5 V
L78L05AC	L78L05ACD13TR	L78L05ACZ	L78L05ACUTR	5 V
L78L05AB	L78L05ABD13TR	L78L05ABZ	L78L05ABUTR	5 V
L78L06AC	L78L06ACD13TR	L78L06ACZ	L78L06ACUTR	6 V
L78L06AB	L78L06ABD13TR	L78L06ABZ	L78L06ABUTR	6 V
L78L08C	L78L08CD13TR			8 V
L78L08AC	L78L08ACD13TR	L78L08ACZ	L78L08ACUTR	8 V
L78L08AB	L78L08ABD13TR	L78L08ABZ	L78L08ABUTR	8 V
L78L09C	L78L09CD13TR			9 V
L78L09AC	L78L09ACD13TR	L78L09ACZ	L78L09ACUTR	9 V
L78L09AB	L78L09ABD13TR	L78L09ABZ	L78L09ABUTR	9 V
L78L10AC			L78L10ACUTR	10 V
L78L12C	L78L12CD13TR			12 V
L78L12AC	L78L12ACD13TR	L78L12ACZ	L78L12ACUTR	12 V
L78L12AB	L78L12ABD-TR	L78L12ABZ	L78L12ABUTR	12 V
L78L15C	L78L15CD-TR			15 V
L78L15AC	L78L15ACD13TR	L78L15ACZ	L78L15ACUTR	15 V
L78L15AB		L78L15ABZ	L78L15ABUTR	15 V
L78L18C	L78L18CD13TR			18 V
L78L18AC			L78L18ACUTR	18 V
L78L24C	L78L24CD-TR			24 V
L78L24AC		L78L24ACZ	L78L24ACUTR	24 V
L78L24AB		L78L24ABZ		24 V

1. Available in Ammopak with the suffix "-AP" or in tape and reel with the suffix "TR". Please note that in these cases pins are shaped according to tape and reel specifications.



Part numbers	Marking	Packages	Output voltages
L78L05ABD	78L05B	SO8	5 V
L78L05ABUTR	8C	SOT 89	5 V
L78L05ABZ	L78L05	TO 92	5 V
L78L05ABZ-AP	L78L05	TO 92	5 V
L78L05ABZ-TR	L78L05	TO 92	5 V
L78L05ACD	78L05A	SO8	5 V
L78L05ACUTR	8C	SOT 89	5 V
L78L05ACZ	L78L05	TO 92	5 V
L78L05ACZ-AP	L78L05	TO 92	5 V
L78L05ACZTR	L78L05	TO 92	5 V
L78L05CD	78L05	SO8	5 V
L78L05CZ	L78L05	TO 92	5 V
L78L06ABD	78L06B	SO8	6 V
L78L06ABUTR	8E	SOT 89	6 V
L78L06ABZ	L78L06	TO 92	6 V
L78L06ACD	78L06A	SO8	6 V
L78L06ACUTR	8E	SOT 89	6 V
L78L06ACZ	L78L06	TO 92	6 V
L78L06ACZ-AP	L78L06	TO 92	6 V
L78L06ACZ-TR	L78L06	TO 92	6 V
L78L06CD	78L06	SO8	6 V
L78L08ABD	78L08B	SO8	8 V
L78L08ABUTR	8G	SOT 89	8 V
L78L08ABZ	L78L08	TO 92	8 V
L78L08ABZ-AP	L78L08	TO 92	8 V
L78L08ABZTR	L78L08	TO 92	8 V
L78L08ACD	78L08A	SO8	8 V
L78L08ACUTR	8G	SOT 89	8 V
L78L08ACZ	L78L08	TO 92	8 V
L78L08ACZ-AP	L78L08	TO 92	8 V
L78L08ACZTR	L78L08	TO 92	8 V
L78L08CD	78L08	SO8	8 V
L78L09ABD	78L09B	SO8	9 V
L78L09ABUTR	8H	SOT 89	9 V
L78L09ABZ	L78L09	TO 92	9 V

Table 25.Marking information



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Part numbers	Marking	Packages	Output voltages
L78L09ACD	78L09A	SO8	9 V
L78L09ACUTR	8H	SOT 89	9 V
L78L09ACZ	L78L09	TO 92	9 V
L78L09ACZ-AP	L78L09	TO 92	9 V
L78L09ACZ-TR	L78L09	TO 92	9 V
L78L09CD	78L09	SO8	9 V
L78L10ACUTR	81	SOT 89	10 V
L78L12ABD	78L12B	SO8	12 V
L78L12ABUTR	8K	SOT 89	12 V
L78L12ABZ	L78L12	TO 92	12 V
L78L12ABZ-AP	L78L12	TO 92	12 V
L78L12ACD	78L12A	SO8	12 V
L78L12ACUTR	8K	SOT 89	12 V
L78L12ACZ	L78L12	TO 92	12 V
L78L12ACZ-AP	L78L12	TO 92	12 V
L78L12ACZ-TR	L78L12	TO 92	12 V
L78L12CD	78L12	SO8	12 V
L78L15ABD	78L15B	SO8	15 V
L78L15ABUTR	8L	SOT 89	15 V
L78L15ABZ	L78L15	TO 92	15 V
L78L15ABZ-AP	L78L15	TO 92	15 V
L78L15ACD	78L15A	SO8	15 V
L78L15ACUTR	8L	SOT 89	15 V
L78L15ACZ	L78L15	TO 92	15 V
L78L15ACZ-AP	L78L15	TO 92	15 V
L78L15ACZ-TR	L78L15	TO 92	15 V
L78L15CD	78L15	SO8	15 V
L78L15CD-TR	78L15A	SO8	15 V
L78L18ACUTR	8B	SOT 89	18 V
L78L24ABD	78L24B	SO8	24 V
L78L24ABUTR	8P	SOT 89	24 V
L78L24ABZ-TR	L78L24	TO 92	24 V
L78L24ACD	78L24A	SO8	24 V
L78L24ACUTR	8P	SOT 89	24 V
L78L24ACZ	L78L24	TO 92	24 V
L78L24ACZ-AP	L78L24	TO 92	24 V

 Table 25.
 Marking information (continued)

Part numbers	Marking	Packages	Output voltages
L78L24CD	78L24	SO8	24 V
L78L33ABD	78L33B	SO8	3.3 V
L78L33ABUTR	8A	SOT 89	3.3 V
L78L33ABZ-AP	L78L33	TO 92	3.3 V
L78L33ACD	78L33A	SO8	3.3 V
L78L33ACD13TR	78L33A	SO8	3.3 V
L78L33ACUTR	8A	SOT 89	3.3 V
L78L33ACZ	L78L33	TO 92	3.3 V
L78L33ACZ-AP	L78L33	TO 92	3.3 V
L78L33ACZTR	L78L33	TO 92	3.3 V
L78L33CD	78L33	SO8	3.3 V
L78L33CD-TR	78L33	SO8	3.3 V

 Table 25.
 Marking information (continued)



9 Revision history

Table 26.	Document revision history
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Date	Revision	Changes
14-Mar-2005	9	Add tape and reel for TO-92.
15-Mar-2005	10	Add note on Table 3.
23-Dec-2005	11	Mistake on ordering Table in header.
12-Sep-2006	12	Order codes updated.
07-Jun-2007	13	Order codes updated.
18-Sep-2007	14	Added Table 1 in cover page.
15-Jul-2008	15	Modified: Table 1 on page 1 and Table 24 on page 28.
18-Aug-2008	16	Modified Figure 12 on page 17.
03-Apr-2009	17	Added: R _{thJA} value for SOT-89 <i>Table 3 on page 5</i> .
08-Feb-2011	18	Added note Table 23 on page 26
21-Feb-2012	19	Modified: SOT-89 <i>Figure 2 on page 4</i> .
14-Aug-2012	20	Updated T _{OP} value for L78L00AC in <i>Table 2 on page 5</i> . Minor text changes.
07-Sep-2012	21	Added: Table 25 on page 29.



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