

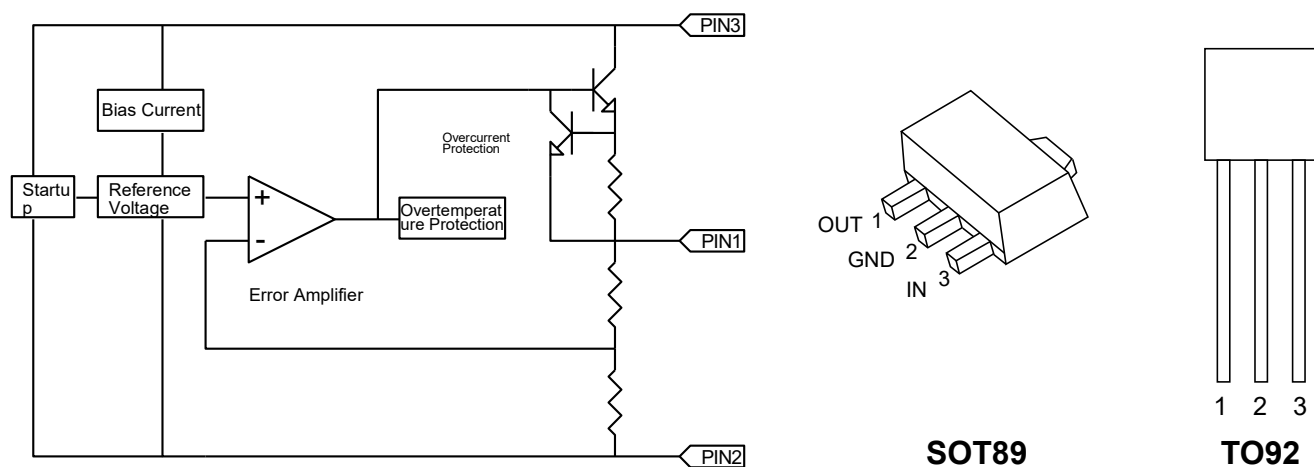
1.Description

78L XX is a low current regulated bipolar integrated circuit with a fixed output voltage.

2.Features

- Maximum output current 0.30A
- Output voltages include 5V, 6V, 7V, 7.5V, 8V, 9V, 12V, 15V, 18V, 24V, etc. Built-in
- overheat protection circuit
- Built-in Overload
- Limit Circuit, Built-in
- Output Short-Circuit Protection
- Package type: SOT-89, TO-92

3.Functional Block Diagram and Pin Functions



Pin description

Pin Number	Symbol	Function
1	OUTPUT	Output
2	GND	Ground
3	INPUT	Input



4. Absolute Maximum Ratings (If not otherwise specified, Tamb=25°C)

Characteristics	Symbol	Value	Units
Input Voltage ($V_O=5V\sim18V$)	V_I	35	V
Input Voltage ($V_O=24V$)		40	V
High power dissipation	P_D	800	mW
Operating Temperature	T_{OPR}	-20 to 120	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Output Current	I_O	0.3	A

5.1 Electrical Characteristics (78L05)

(If otherwise specified, $V_I=10V$, $I_O=10mA$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, $T_{amb}=25^\circ C$)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_O	$T_J=25^\circ C$	4.92	5	5.08	V
		$7V \leq V_I \leq 20V$, $I_O=5mA \sim 200mA$	4.8	5	5.2	V
Load Regulation	ΔV_O	$T_J=25^\circ C$, $I_O=5mA \sim 200mA$			50	mV
		$T_J=25^\circ C$, $I_O=5mA \sim 300mA$			100	mV
Line Regulation	ΔV_O	$7V \leq V_I \leq 25V$, $I_O=150mA$			100	mV
Quiescent Current	I_{q1}	$T_J=25^\circ C$		3.2	6	mA
Quiescent Current Change	ΔI_q	$8V \leq V_I \leq 25V$, $I_O=150mA$			0.8	mA
		$5mA \leq I_O \leq 200mA$			0.5	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$		40		μV
Output Voltage Temperature Drift	$\Delta V_O / \Delta T$	$I_O=0mA$		± 0.2		$mV/^\circ C$
Ripple Rejection Ratio	PSRR	$8V \leq V_I \leq 18V$, $f=120Hz$ $I_O=100mA$, $T_J=25^\circ C$	62	68		dB
Peak Output Current	I_{max}	$T_J=25^\circ C$		500		mA
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		50		mA
Low Dropout Voltage	$V_I - V_O$	$T_J=25^\circ C$, $I_O=300mA$		2		V



5.2 Electrical Characteristics (78L06)

(If otherwise specified, $V_I=11V$, $I_O=10mA$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, $T_{amb}=25^\circ C$)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_O	$T_J=25^\circ C$	5.91	6	6.09	V
		$8V \leq V_I \leq 21V$, $I_O=5mA \sim 200mA$	5.76	6	6.24	V
Load Regulation	ΔV_O	$T_J=25^\circ C$, $I_O=5mA \sim 200mA$			60	mV
		$T_J=25^\circ C$, $I_O=5mA \sim 300mA$			120	mV
Line Regulation	ΔV_O	$8V \leq V_I \leq 25V$, $I_O=150mA$			120	mV
Quiescent Current	I_{q1}	$T_J=25^\circ C$		3.2	6	mA
Quiescent Current Change	ΔI_q	$9V \leq V_I \leq 25V$, $I_O=150mA$			0.8	mA
		$5mA \leq I_O \leq 200mA$			0.5	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$		45		μV
Output Voltage Temperature Drift	$\Delta V_O / \Delta T$	$I_O=0mA$		± 0.2		$mV/^\circ C$
Ripple Rejection Ratio	PSRR	$9V \leq V_I \leq 19.5V$, $f=120Hz$ $I_O=100mA$, $T_J=25^\circ C$	59	80		dB
Peak Output Current	I_{max}	$T_J=25^\circ C$		500		mA
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		50		mA
Low Dropout Voltage	$V_I - V_O$	$T_J=25^\circ C$, $I_O=300mA$		2		V



5.3 Electrical Characteristics (78L07)

(If otherwise specified, $V_I=14V$, $I_O=10mA$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, $T_{amb}=25^\circ C$)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_O	$T_J=25^\circ C$	6.89	7	7.11	V
		$10.5V \leq V_I \leq 23V$, $I_O=5mA \sim 200mA$	6.72	7	7.28	V
Load Regulation	ΔV_O	$T_J=25^\circ C$, $I_O=5mA \sim 200mA$			80	mV
		$T_J=25^\circ C$, $I_O=5mA \sim 300mA$			160	mV
Line Regulation	ΔV_O	$10.5V \leq V_I \leq 25V$, $I_O=150mA$			160	mV
Quiescent Current	I_{q1}	$T_J=25^\circ C$		3.2	6	mA
Quiescent Current Change	ΔI_q	$10.5V \leq V_I \leq 25V$, $I_O=150mA$			0.8	mA
		$5mA \leq I_O \leq 200mA$			0.5	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$		52		μV
Output Voltage Temperature Drift	$\Delta V_O / \Delta T$	$I_O=0mA$		± 0.2		$mV/^\circ C$
Ripple Rejection Ratio	PSRR	$11V \leq V_I \leq 21V$, $f=120Hz$ $I_O=100mA$, $T_J=25^\circ C$	59	80		dB
Peak Output Current	I_{max}	$T_J=25^\circ C$		500		mA
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		50		mA
Low Dropout Voltage	$V_I - V_O$	$T_J=25^\circ C$, $I_O=300mA$		2		V



5.4 Electrical Characteristics (78L75)

(If otherwise specified, $V_I=14V$, $I_O=10mA$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, $T_{amb}=25^\circ C$)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_O	$T_J=25^\circ C$	7.38	7.5	7.62	V
		$10.5V \leq V_I \leq 23V$, $I_O=5mA \sim 200mA$	7.19	7.5	7.81	V
Load Regulation	ΔV_O	$T_J=25^\circ C$, $I_O=5mA \sim 200mA$			80	mV
		$T_J=25^\circ C$, $I_O=5mA \sim 300mA$			160	mV
Line Regulation	ΔV_O	$10.5V \leq V_I \leq 25V$, $I_O=150mA$			160	mV
Quiescent Current	I_{q1}	$T_J=25^\circ C$		3.2	6	mA
Quiescent Current Change	ΔI_q	$10.5V \leq V_I \leq 25V$, $I_O=150mA$			0.8	mA
		$5mA \leq I_O \leq 200mA$			0.5	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$		52		μV
Output Voltage Temperature Drift	$\Delta V_O / \Delta T$	$I_O=0mA$		± 0.2		$mV/^\circ C$
Ripple Rejection Ratio	PSRR	$11V \leq V_I \leq 21V$, $f=120Hz$ $I_O=100mA$, $T_J=25^\circ C$	59	80		dB
Peak Output Current	I_{max}	$T_J=25^\circ C$		500		mA
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		50		mA
Low Dropout Voltage	$V_I - V_O$	$T_J=25^\circ C$, $I_O=300mA$		2		V



5.5 Electrical Characteristics (78L08)

(If otherwise specified, $V_I=14V$, $I_O=10mA$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, $T_{amb}=25^\circ C$)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_O	$T_J=25^\circ C$	7.88	8	8.12	V
		$10.5V \leq V_I \leq 23V$, $I_O=5mA \sim 200mA$	7.68	8	8.32	V
Load Regulation	ΔV_O	$T_J=25^\circ C$, $I_O=5mA \sim 200mA$			80	mV
		$T_J=25^\circ C$, $I_O=5mA \sim 300mA$			160	mV
Line Regulation	ΔV_O	$10.5V \leq V_I \leq 25V$, $I_O=150mA$			160	mV
Quiescent Current	I_{q1}	$T_J=25^\circ C$		3.2	6	mA
Quiescent Current Change	ΔI_q	$10.5V \leq V_I \leq 25V$, $I_O=150mA$			0.8	mA
		$5mA \leq I_O \leq 200mA$			0.5	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$		52		μV
Output Voltage Temperature Drift	$\Delta V_O / \Delta T$	$I_O=0mA$		± 0.2		$mV/^\circ C$
Ripple Rejection Ratio	PSRR	$11.5V \leq V_I \leq 21.5V$, $f=120Hz$ $I_O=100mA$, $T_J=25^\circ C$	56	80		dB
Peak Output Current	I_{max}	$T_J=25^\circ C$		500		mA
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		50		mA
Low Dropout Voltage	$V_I - V_O$	$T_J=25^\circ C$, $I_O=300mA$		2		V



5.6 Electrical Characteristics (78L09)

(If otherwise specified, $V_I=15V$, $I_O=10mA$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, $T_{amb}=25^\circ C$)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_O	$T_J=25^\circ C$	8.86	9	9.14	V
		$11.5V \leq V_I \leq 23V$, $I_O=5mA \sim 200mA$	8.63	9	9.37	V
Load Regulation	ΔV_O	$T_J=25^\circ C$, $I_O=5mA \sim 200mA$			90	mV
		$T_J=25^\circ C$, $I_O=5mA \sim 300mA$			180	mV
Line Regulation	ΔV_O	$11.5V \leq V_I \leq 25V$, $I_O=150mA$			180	mV
Quiescent Current	I_{q1}	$T_J=25^\circ C$		3.2	6	mA
Quiescent Current Change	ΔI_q	$11.5V \leq V_I \leq 25V$, $I_O=150mA$			0.8	mA
		$5mA \leq I_O \leq 200mA$			0.5	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$		52		μV
Output Voltage Temperature Drift	$\Delta V_O / \Delta T$	$I_O=0mA$		± 0.2		$mV/^\circ C$
Ripple Rejection Ratio	PSRR	$12.5V \leq V_I \leq 22.5V$, $f=120Hz$ $I_O=100mA$, $T_J=25^\circ C$	56	80		dB
Peak Output Current	I_{max}	$T_J=25^\circ C$		500		mA
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		50		mA
Low Dropout Voltage	$V_I - V_O$	$T_J=25^\circ C$, $I_O=300mA$		2		V



5.7 Electrical Characteristics (78L12)

(If otherwise specified, $V_I=19V$, $I_O=10mA$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, $T_{amb}=25^\circ C$)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_O	$T_J=25^\circ C$	11.82	12	12.18	V
		$14.5V \leq V_I \leq 27V$, $I_O=5mA \sim 200mA$	11.5	12	12.5	V
Load Regulation	ΔV_O	$T_J=25^\circ C$, $I_O=5mA \sim 200mA$			120	mV
		$T_J=25^\circ C$, $I_O=5mA \sim 300mA$			240	mV
Line Regulation	ΔV_O	$14.5V \leq V_I \leq 30V$, $I_O=150mA$		3.2	240	mV
Quiescent Current	I_{q1}	$T_J=25^\circ C$			6	mA
Quiescent Current Change	ΔI_q	$15V \leq V_I \leq 30V$, $I_O=150mA$			0.8	mA
		$5mA \leq I_O \leq 200mA$		75	0.5	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$		± 0.3		μV
Output Voltage Temperature Drift	$\Delta V_O / \Delta T$	$I_O=0mA$				$mV/^\circ C$
Ripple Rejection Ratio	PSRR	$15V \leq V_I \leq 25V$, $f=120Hz$ $I_O=100mA$, $T_J=25^\circ C$	55	80		dB
Peak Output Current	I_{max}	$T_J=25^\circ C$		500		mA
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		50		mA
Low Dropout Voltage	$V_I - V_O$	$T_J=25^\circ C$, $I_O=300mA$		2		V



5.8 Electrical Characteristics (78L15)

(If otherwise specified, $V_I=23V$, $I_O=10mA$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, $T_{amb}=25^\circ C$)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_O	$T_J=25^\circ C$	14.77	15	15.23	V
		$17.5V \leq V_I \leq 30V$, $I_O=5mA \sim 200mA$	14.4	15	15.6	V
Load Regulation	ΔV_O	$T_J=25^\circ C$, $I_O=5mA \sim 200mA$			150	mV
		$T_J=25^\circ C$, $I_O=5mA \sim 300mA$			300	mV
Line Regulation	ΔV_O	$17.5V \leq V_I \leq 30V$, $I_O=150mA$		3.2	300	mV
Quiescent Current	I_{q1}	$T_J=25^\circ C$			6	mA
Quiescent Current Change	ΔI_q	$17.5V \leq V_I \leq 30V$, $I_O=150mA$			0.8	mA
		$5mA \leq I_O \leq 200mA$		52	0.5	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$		± 0.3		μV
Output Voltage Temperature Drift	$\Delta V_O / \Delta T$	$I_O=0mA$				$mV/^\circ C$
Ripple Rejection Ratio	PSRR	$18.5V \leq V_I \leq 28.5V$, $f=120Hz$ $I_O=100mA$, $T_J=25^\circ C$	56	80		dB
Peak Output Current	I_{max}	$T_J=25^\circ C$		500		mA
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		50		mA
Low Dropout Voltage	$V_I - V_O$	$T_J=25^\circ C$, $I_O=300mA$		2		V



5.9 Electrical Characteristics (78L18)

(If otherwise specified, $V_I=27V$, $I_O=10mA$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, $T_{amb}=25^\circ C$)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_O	$T_J=25^\circ C$	17.73	18	18.27	V
		$21V \leq V_I \leq 33V$, $I_O=5mA \sim 200mA$	17.28	18	18.72	V
Load Regulation	ΔV_O	$T_J=25^\circ C$, $I_O=5mA \sim 200mA$			180	mV
		$T_J=25^\circ C$, $I_O=5mA \sim 300mA$			360	mV
Line Regulation	ΔV_O	$21V \leq V_I \leq 33V$, $I_O=150mA$		3.2	360	mV
Quiescent Current	I_{q1}	$T_J=25^\circ C$			6.5	mA
Quiescent Current Change	ΔI_q	$21V \leq V_I \leq 33V$, $I_O=150mA$			0.8	mA
		$5mA \leq I_O \leq 200mA$		100	0.5	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$		± 0.3		μV
Output Voltage Temperature Drift	$\Delta V_O / \Delta T$	$I_O=0mA$				$mV/^\circ C$
Ripple Rejection Ratio	PSRR	$22V \leq V_I \leq 32V$, $f=120Hz$ $I_O=100mA$, $T_J=25^\circ C$	53	70		dB
Peak Output Current	I_{max}	$T_J=25^\circ C$		500		mA
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		50		mA
Low Dropout Voltage	$V_I - V_O$	$T_J=25^\circ C$, $I_O=300mA$		2		V

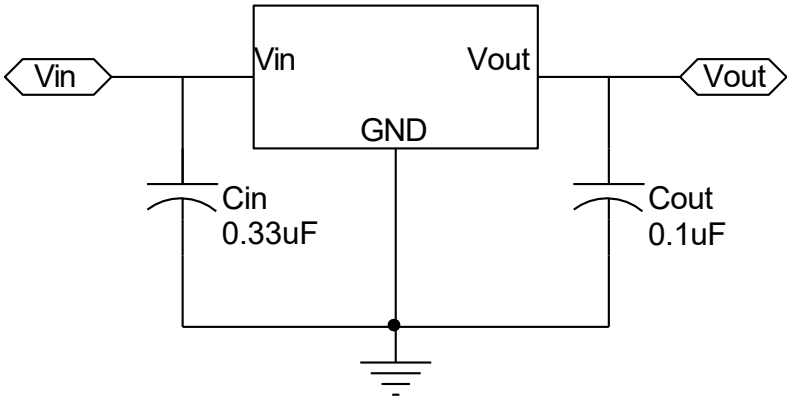


5.10 Electrical Characteristics (78L24)

(If otherwise specified, $V_I=33V$, $I_O=10mA$, $C_I=0.33\mu F$, $C_O=0.1\mu F$, $T_{amb}=25^{\circ}C$)

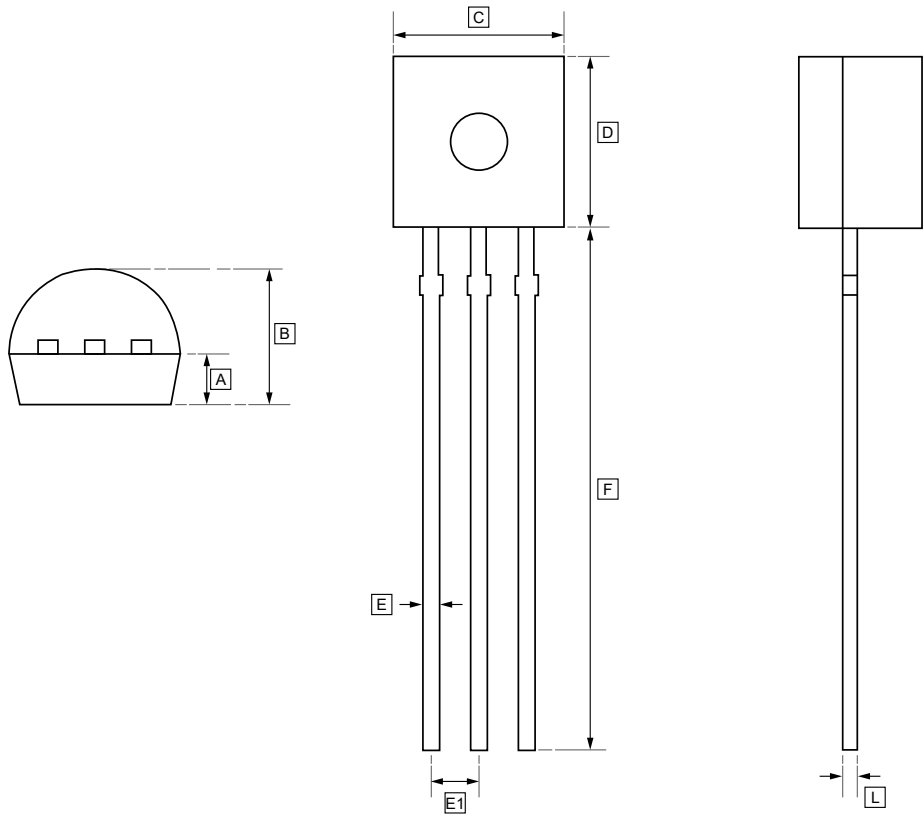
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Output Voltage	V_O	$T_J=25^{\circ}C$	23.64	24	24.36	V
		$27V \leq V_I \leq 38V$, $I_O=5mA \sim 200mA$	23	24	25	V
Load Regulation	ΔV_O	$T_J=25^{\circ}C$, $I_O=5mA \sim 200mA$			240	mV
		$T_J=25^{\circ}C$, $I_O=5mA \sim 300mA$			480	mV
Line Regulation	ΔV_O	$27V \leq V_I \leq 38V$, $I_O=150mA$		3.2	480	mV
Quiescent Current	I_{q1}	$T_J=25^{\circ}C$			7	mA
Quiescent Current Change	ΔI_q	$27V \leq V_I \leq 38V$, $I_O=150mA$			0.8	mA
		$5mA \leq I_O \leq 200mA$		170	0.5	mA
Output Noise Voltage	V_N	$10Hz \leq f \leq 100kHz$		± 0.5		μV
Output Voltage Temperature Drift	$\Delta V_O / \Delta T$	$I_O=0mA$				$mV/^{\circ}C$
Ripple Rejection Ratio	PSRR	$28V \leq V_I \leq 38V$, $f=120Hz$ $I_O=200mA$, $T_J=25^{\circ}C$	50	70		dB
Peak Output Current	I_{max}	$T_J=25^{\circ}C$		500		mA
Short-Circuit Current	I_{SC}	$V_{IN}=35V$		50		mA
Low Dropout Voltage	V_I-V_O	$T_J=25^{\circ}C$, $I_O=300mA$		2		V

6.Application Circuit





7.1 TO-92 Package Outline Dimensions

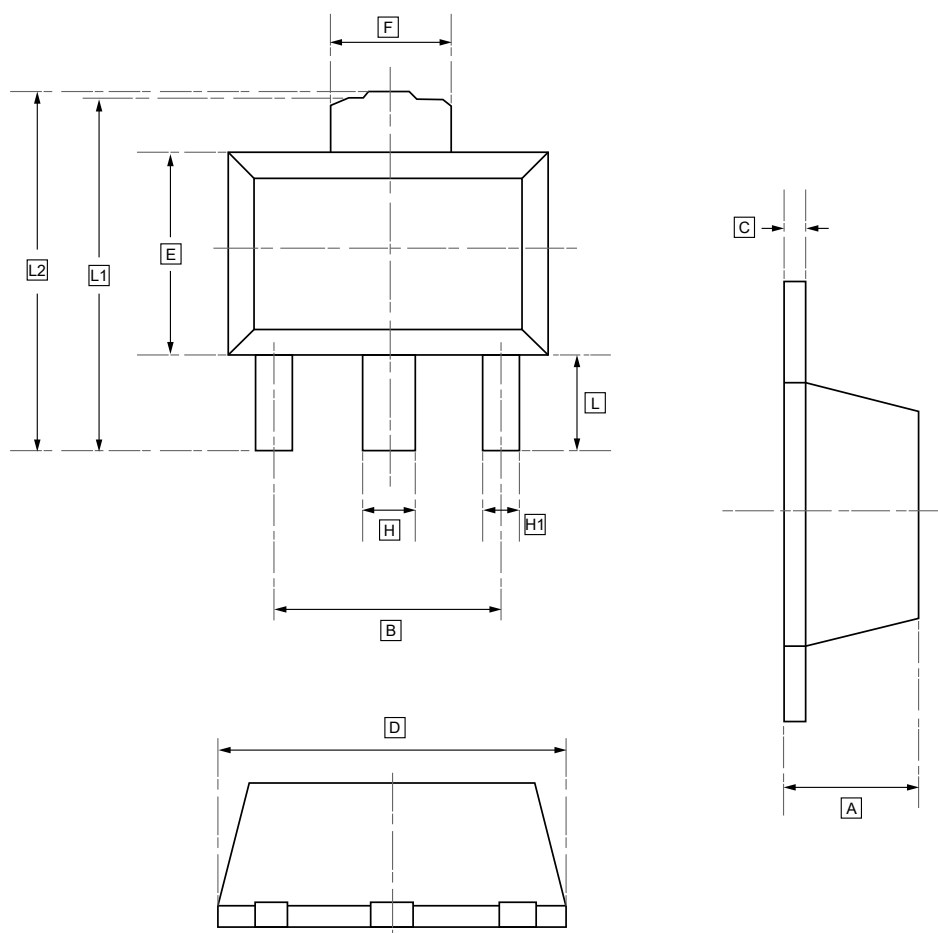


DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	D	E	E1	F	L
Min	1.10	3.50	4.50	4.40	0.35	1.27	13.50	0.35
Max	1.30	3.90	4.90	4.90	0.45	TYP	14.50	0.40



7.2 SOT-89 Package Outline Dimensions

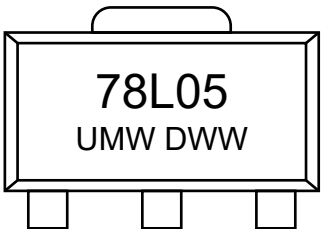


DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	D	E	F	H	H1	L	L1	L2
Min	1.450	2.950	0.330	4.450	2.450	1.650	0.450	0.370	0.900	4.100	4.100
Max	1.550	3.050	0.430	4.550	2.550	1.750	0.580	0.480	1.000	4.300	4.350



8.Ordering Information



DWW: Batch Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW 78L05-300	78L05	SOT-89	1000	Tape and reel
UMW 78L06-300	78L06	SOT-89	1000	Tape and reel
UMW 78L08-300	78L08	SOT-89	1000	Tape and reel



9.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.