



SANYO Semiconductors

## DATA SHEET

# L78M00T Series — 5 to 24V 0.5A 3-Pin Voltage Regulators

Monolithic Linear IC

## Features

- Output voltage  
 L78M05T : 5V    ~~L78M06T : 6V~~    ~~L78M07T : 7V~~  
~~L78M08T : 8V~~    ~~L78M09T : 9V~~    ~~L78M10T : 10V~~  
~~L78M12T : 12V~~    ~~L78M15T : 15V~~    ~~L78M18T : 18V~~  
~~L78M20T : 20V~~    ~~L78M24T : 24V~~
- 500mA output.
- On-chip thermal protector.
- On-chip overcurrent limiter.
- On-chip ASO protector.
- Small-sized power package TP-3H permitting the equipment to be made compact.
- The allowable power dissipation can be increased by being surface-mounted on the board.
- Capable of being mounted in a variety of methods because of various lead forming versions available.

## Specifications

[Common to L78M00T series]

Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	VCC max	Pin 1	35	V
Allowable power dissipation	Pd max	No fin	1.0	W
Operating temperature	Topr		-20 to +80	°C
Storage temperature	Tstg		-40 to +150	°C

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## L78M00T Series

[L78M05T]

### Recommended Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		7.5 to 20.0	V
Output current	$I_{OUT}$		5 to 500	mA

### Operating Characteristics at $T_a=25^\circ\text{C}$ , $V_{IN}=10\text{V}$ , $I_{OUT}=350\text{mA}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	$V_{OUT}$	$T_j=25^\circ\text{C}$	4.8	5.0	5.2	V
Line regulation	$\Delta V_O$ line	$T_j=25^\circ\text{C}$ , $7\text{V}\leq V_{IN}\leq 25\text{V}$ , $I_{OUT}=200\text{mA}$		3.0	50	mV
		$T_j=25^\circ\text{C}$ , $8\text{V}\leq V_{IN}\leq 20\text{V}$ , $I_{OUT}=200\text{mA}$		1.0	25	mV
Load regulation	$\Delta V_O$ load	$T_j=25^\circ\text{C}$ , $5\text{mA}\leq I_{OUT}\leq 500\text{mA}$			100	mV
		$T_j=25^\circ\text{C}$ , $5\text{mA}\leq I_{OUT}\leq 200\text{mA}$			50	mV
Output voltage	$V_{OUT}$	$7\text{V}\leq V_{IN}\leq 20\text{V}$ , $5\text{mA}\leq I_{OUT}\leq 350\text{mA}$	4.75		5.25	V
Current dissipation	$I_{CC}$	$T_j=25^\circ\text{C}$		4.5	6.0	mA
Current dissipation variation (Line)	$\Delta I_{CC}$ line	$8\text{V}\leq V_{IN}\leq 20\text{V}$ , $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	$\Delta I_{CC}$ load	$5\text{mA}\leq I_{OUT}\leq 350\text{mA}$			0.5	mA
Output noise voltage	$V_{NO}$	$10\text{Hz}\leq f\leq 100\text{kHz}$		40		$\mu\text{V}$
Ripple rejection	Rrej	$f=120\text{Hz}$ , $8\text{V}\leq V_{IN}\leq 19\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=100\text{mA}$	62			dB
		$f=120\text{Hz}$ , $8\text{V}\leq V_{IN}\leq 19\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=300\text{mA}$	62	80		dB
Minimum input-output voltage dropout	$V_{drop}$	$I_{OUT}=350\text{mA}$		2.0		V
Short current	$I_{OS}$	$T_j=25^\circ\text{C}$ , $V_{IN}=35\text{V}$ , to GND		300		mA
Peak output current	$I_{OP}$	$T_j=25^\circ\text{C}$		0.7		A

[L78M06T]

### Recommended Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		8.5 to 21	V
Output current	$I_{OUT}$		5 to 500	mA

### Operating Characteristics at $T_a=25^\circ\text{C}$ , $V_{IN}=11\text{V}$ , $I_{OUT}=350\text{mA}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	$V_{OUT}$	$T_j=25^\circ\text{C}$	5.75	6.0	6.25	V
Line regulation	$\Delta V_O$ line	$T_j=25^\circ\text{C}$ , $8\text{V}\leq V_{IN}\leq 25\text{V}$ , $I_{OUT}=200\text{mA}$		5.0	60	mV
		$T_j=25^\circ\text{C}$ , $9\text{V}\leq V_{IN}\leq 20\text{V}$ , $I_{OUT}=200\text{mA}$		1.5	30	mV
Load regulation	$\Delta V_O$ load	$T_j=25^\circ\text{C}$ , $5\text{mA}\leq I_{OUT}\leq 500\text{mA}$			120	mV
		$T_j=25^\circ\text{C}$ , $5\text{mA}\leq I_{OUT}\leq 200\text{mA}$			60	mV
Output voltage	$V_{OUT}$	$8\text{V}\leq V_{IN}\leq 21\text{V}$ , $5\text{mA}\leq I_{OUT}\leq 350\text{mA}$	5.7		6.3	V
Current dissipation	$I_{CC}$	$T_j=25^\circ\text{C}$		4.5	6.0	mA
Current dissipation variation (Line)	$\Delta I_{CC}$ line	$9\text{V}\leq V_{IN}\leq 25\text{V}$ , $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	$\Delta I_{CC}$ load	$5\text{mA}\leq I_{OUT}\leq 350\text{mA}$			0.5	mA
Output noise voltage	$V_{NO}$	$10\text{Hz}\leq f\leq 100\text{kHz}$		45		$\mu\text{V}$
Ripple rejection	Rrej	$f=120\text{Hz}$ , $9\text{V}\leq V_{IN}\leq 20\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=100\text{mA}$	59			dB
		$f=120\text{Hz}$ , $9\text{V}\leq V_{IN}\leq 20\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=300\text{mA}$	59	80		dB
Minimum input-output voltage dropout	$V_{drop}$	$I_{OUT}=350\text{mA}$		2.0		V
Short current	$I_{OS}$	$T_j=25^\circ\text{C}$ , $V_{IN}=35\text{V}$ , to GND		300		mA
Peak output current	$I_{OP}$	$T_j=25^\circ\text{C}$		0.7		A

## L78M00T Series

[L78M07T]

### Recommended Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		9.5 to 22	V
Output current	$I_{OUT}$		5 to 500	mA

### Operating Characteristics at $T_a=25^\circ\text{C}$ , $V_{IN}=12\text{V}$ , $I_{OUT}=350\text{mA}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	$V_{OUT}$	$T_j=25^\circ\text{C}$	6.72	7.0	7.28	V
Line regulation	$\Delta V_O$ line	$T_j=25^\circ\text{C}$ , $9\text{V} \leq V_{IN} \leq 25\text{V}$ , $I_{OUT}=200\text{mA}$		6.0	60	mV
		$T_j=25^\circ\text{C}$ , $10\text{V} \leq V_{IN} \leq 20\text{V}$ , $I_{OUT}=200\text{mA}$		2.0	30	mV
Load regulation	$\Delta V_O$ load	$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 500\text{mA}$			140	mV
		$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 200\text{mA}$			70	mV
Output voltage	$V_{OUT}$	$9\text{V} \leq V_{IN} \leq 22\text{V}$ , $5\text{mA} \leq I_{OUT} \leq 350\text{mA}$	6.6		7.4	V
Current dissipation	$I_{CC}$	$T_j=25^\circ\text{C}$		4.6	6.0	mA
Current dissipation variation (Line)	$\Delta I_{CC}$ line	$10\text{V} \leq V_{IN} \leq 25\text{V}$ , $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	$\Delta I_{CC}$ load	$5\text{mA} \leq I_{OUT} \leq 350\text{mA}$			0.5	mA
Output noise voltage	$V_{NO}$	$10\text{Hz} \leq f \leq 100\text{kHz}$		48		$\mu\text{V}$
Ripple rejection	Rrej	$f=120\text{Hz}$ , $10\text{V} \leq V_{IN} \leq 21\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=100\text{mA}$	58			dB
		$f=120\text{Hz}$ , $10\text{V} \leq V_{IN} \leq 21\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=300\text{mA}$	58	80		dB
Minimum input-output voltage dropout	$V_{drop}$	$I_{OUT}=350\text{mA}$		2.0		V
Short current	$I_{OS}$	$T_j=25^\circ\text{C}$ , $V_{IN}=35\text{V}$ , to GND		300		mA
Peak output current	$I_{OP}$	$T_j=25^\circ\text{C}$		0.7		A

[L78M08T]

### Recommended Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		10.5 to 23	V
Output current	$I_{OUT}$		5 to 500	mA

### Operating Characteristics at $T_a=25^\circ\text{C}$ , $V_{IN}=15\text{V}$ , $I_{OUT}=350\text{mA}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	$V_{OUT}$	$T_j=25^\circ\text{C}$	7.7	8.0	8.3	V
Line regulation	$\Delta V_O$ line	$T_j=25^\circ\text{C}$ , $10.5\text{V} \leq V_{IN} \leq 25\text{V}$ , $I_{OUT}=200\text{mA}$		6.0	60	mV
		$T_j=25^\circ\text{C}$ , $11\text{V} \leq V_{IN} \leq 20\text{V}$ , $I_{OUT}=200\text{mA}$		2.0	30	mV
Load regulation	$\Delta V_O$ load	$T_j=25^\circ\text{C}$ , $3\text{mA} \leq I_{OUT} \leq 500\text{mA}$			160	mV
		$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 200\text{mA}$			80	mV
Output voltage	$V_{OUT}$	$10.5\text{V} \leq V_{IN} \leq 23\text{V}$ , $5\text{mA} \leq I_{OUT} \leq 350\text{mA}$	7.6		8.4	V
Current dissipation	$I_{CC}$	$T_j=25^\circ\text{C}$		4.6	6.0	mA
Current dissipation variation (Line)	$\Delta I_{CC}$ line	$11\text{V} \leq V_{IN} \leq 25\text{V}$ , $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	$\Delta I_{CC}$ load	$5\text{mA} \leq I_{OUT} \leq 350\text{mA}$			0.5	mA
Output noise voltage	$V_{NO}$	$10\text{Hz} \leq f \leq 100\text{kHz}$		50		$\mu\text{V}$
Ripple rejection	Rrej	$f=120\text{Hz}$ , $11.5\text{V} \leq V_{IN} \leq 22\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=100\text{mA}$	56			dB
		$f=120\text{Hz}$ , $11.5\text{V} \leq V_{IN} \leq 22\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=300\text{mA}$	56	80		dB
Minimum input-output voltage dropout	$V_{drop}$	$I_{OUT}=350\text{mA}$		2.0		V
Short current	$I_{OS}$	$T_j=25^\circ\text{C}$ , $V_{IN}=35\text{V}$ , to GND		300		mA
Peak output current	$I_{OP}$	$T_j=25^\circ\text{C}$		0.7		A

## L78M00T Series

[L78M09T]

### Recommended Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		12 to 25	V
Output current	$I_{OUT}$		5 to 500	mA

### Operating Characteristics at $T_a=25^\circ\text{C}$ , $V_{IN}=16\text{V}$ , $I_{OUT}=350\text{mA}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	$V_{OUT}$	$T_j=25^\circ\text{C}$	8.6	9.0	9.4	V
Line regulation	$\Delta V_{O \text{ line}}$	$T_j=25^\circ\text{C}$ , $11.5\text{V} \leq V_{IN} \leq 25\text{V}$ , $I_{OUT}=200\text{mA}$		6.0	100	mV
		$T_j=25^\circ\text{C}$ , $12\text{V} \leq V_{IN} \leq 20\text{V}$ , $I_{OUT}=200\text{mA}$		2.0	50	mV
Load regulation	$\Delta V_{O \text{ load}}$	$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 500\text{mA}$			180	mV
		$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 200\text{mA}$			90	mV
Output voltage	$V_{OUT}$	$11.5\text{V} \leq V_{IN} \leq 24\text{V}$ , $5\text{mA} \leq I_{OUT} \leq 350\text{mA}$	8.5		9.5	V
Current dissipation	$I_{CC}$	$T_j=25^\circ\text{C}$		4.6	6.0	mA
Current dissipation variation (Line)	$\Delta I_{CC \text{ line}}$	$12.5\text{V} \leq V_{IN} \leq 25\text{V}$ , $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	$\Delta I_{CC \text{ load}}$	$5\text{mA} \leq I_{OUT} \leq 350\text{mA}$			0.5	mA
Output noise voltage	$V_{NO}$	$10\text{Hz} \leq f \leq 100\text{kHz}$		60		$\mu\text{V}$
Ripple rejection	Rrej	$f=120\text{Hz}$ , $12\text{V} \leq V_{IN} \leq 23\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=100\text{mA}$	56			dB
		$f=120\text{Hz}$ , $12\text{V} \leq V_{IN} \leq 23\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=300\text{mA}$	56	80		dB
Minimum input-output voltage dropout	$V_{drop}$	$I_{OUT}=350\text{mA}$		2.0		V
Short current	$I_{OS}$	$T_j=25^\circ\text{C}$ , $V_{IN}=35\text{V}$ , to GND		300		mA
Peak output current	$I_{OP}$	$T_j=25^\circ\text{C}$		0.7		A

[L78M10T]

### Recommended Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		13 to 25	V
Output current	$I_{OUT}$		5 to 500	mA

### Operating Characteristics at $T_a=25^\circ\text{C}$ , $V_{IN}=17\text{V}$ , $I_{OUT}=350\text{mA}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	$V_{OUT}$	$T_j=25^\circ\text{C}$	9.6	10.0	10.4	V
Line regulation	$\Delta V_{O \text{ line}}$	$T_j=25^\circ\text{C}$ , $12.5\text{V} \leq V_{IN} \leq 25\text{V}$ , $I_{OUT}=200\text{mA}$		7.0	100	mV
		$T_j=25^\circ\text{C}$ , $13\text{V} \leq V_{IN} \leq 22\text{V}$ , $I_{OUT}=200\text{mA}$		2.0	50	mV
Load regulation	$\Delta V_{O \text{ load}}$	$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 500\text{mA}$			200	mV
		$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 200\text{mA}$			100	mV
Output voltage	$V_{OUT}$	$12.5\text{V} \leq V_{IN} \leq 25\text{V}$ , $5\text{mA} \leq I_{OUT} \leq 350\text{mA}$	9.5		10.5	V
Current dissipation	$I_{CC}$	$T_j=25^\circ\text{C}$		4.6	6.0	mA
Current dissipation variation (Line)	$\Delta I_{CC \text{ line}}$	$13.5\text{V} \leq V_{IN} \leq 25\text{V}$ , $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	$\Delta I_{CC \text{ load}}$	$5\text{mA} \leq I_{OUT} \leq 350\text{mA}$			0.5	mA
Output noise voltage	$V_{NO}$	$10\text{Hz} \leq f \leq 100\text{kHz}$		65		$\mu\text{V}$
Ripple rejection	Rrej	$f=120\text{Hz}$ , $13\text{V} \leq V_{IN} \leq 25\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=100\text{mA}$	55			dB
		$f=120\text{Hz}$ , $13\text{V} \leq V_{IN} \leq 25\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=300\text{mA}$	55	80		dB
Minimum input-output voltage dropout	$V_{drop}$	$I_{OUT}=350\text{mA}$		2.0		V
Short current	$I_{OS}$	$T_j=25^\circ\text{C}$ , $V_{IN}=35\text{V}$ , to GND		300		mA
Peak output current	$I_{OP}$	$T_j=25^\circ\text{C}$		0.7		A

## L78M00T Series

[L78M12T]

### Recommended Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		15 to 25	V
Output current	$I_{OUT}$		5 to 500	mA

### Operating Characteristics at $T_a=25^\circ\text{C}$ , $V_{IN}=19\text{V}$ , $I_{OUT}=350\text{mA}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	$V_{OUT}$	$T_j=25^\circ\text{C}$	11.5	12.0	12.5	V
Line regulation	$\Delta V_O$ line	$T_j=25^\circ\text{C}$ , $14.5\text{V} \leq V_{IN} \leq 30\text{V}$ , $I_{OUT}=200\text{mA}$		8.0	100	mV
		$T_j=25^\circ\text{C}$ , $16\text{V} \leq V_{IN} \leq 25\text{V}$ , $I_{OUT}=200\text{mA}$		2.0	50	mV
Load regulation	$\Delta V_O$ load	$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 500\text{mA}$			240	mV
		$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 200\text{mA}$			120	mV
Output voltage	$V_{OUT}$	$14.5\text{V} \leq V_{IN} \leq 27\text{V}$ , $5\text{mA} \leq I_{OUT} \leq 350\text{mA}$	11.4		12.6	V
Current dissipation	$I_{CC}$	$T_j=25^\circ\text{C}$		4.8	6.0	mA
Current dissipation variation (Line)	$\Delta I_{CC}$ line	$15\text{V} \leq V_{IN} \leq 30\text{V}$ , $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	$\Delta I_{CC}$ load	$5\text{mA} \leq I_{OUT} \leq 350\text{mA}$			0.5	mA
Output noise voltage	$V_{NO}$	$10\text{Hz} \leq f \leq 100\text{kHz}$		75		$\mu\text{V}$
Ripple rejection	Rrej	$f=120\text{Hz}$ , $15\text{V} \leq V_{IN} \leq 25\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=100\text{mA}$	55			dB
		$f=120\text{Hz}$ , $15\text{V} \leq V_{IN} \leq 25\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=300\text{mA}$	55	80		dB
Minimum input-output voltage dropout	$V_{drop}$	$I_{OUT}=350\text{mA}$		2.0		V
Short current	$I_{OS}$	$T_j=25^\circ\text{C}$ , $V_{IN}=35\text{V}$ , to GND		300		mA
Peak output current	$I_{OP}$	$T_j=25^\circ\text{C}$		0.7		A

[L78M15T]

### Recommended Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		18 to 30	V
Output current	$I_{OUT}$		5 to 500	mA

### Operating Characteristics at $T_a=25^\circ\text{C}$ , $V_{IN}=23\text{V}$ , $I_{OUT}=350\text{mA}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	$V_{OUT}$	$T_j=25^\circ\text{C}$	14.4	15.0	15.6	V
Line regulation	$\Delta V_O$ line	$T_j=25^\circ\text{C}$ , $17.5\text{V} \leq V_{IN} \leq 30\text{V}$ , $I_{OUT}=200\text{mA}$		10.0	100	mV
		$T_j=25^\circ\text{C}$ , $19\text{V} \leq V_{IN} \leq 30\text{V}$ , $I_{OUT}=200\text{mA}$		3.0	50	mV
Load regulation	$\Delta V_O$ load	$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 500\text{mA}$			300	mV
		$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 200\text{mA}$			150	mV
Output voltage	$V_{OUT}$	$17.5\text{V} \leq V_{IN} \leq 30\text{V}$ , $5\text{mA} \leq I_{OUT} \leq 350\text{mA}$	14.25		15.75	V
Current dissipation	$I_{CC}$	$T_j=25^\circ\text{C}$		4.8	6.0	mA
Current dissipation variation (Line)	$\Delta I_{CC}$ line	$17.5\text{V} \leq V_{IN} \leq 30\text{V}$ , $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	$\Delta I_{CC}$ load	$5\text{mA} \leq I_{OUT} \leq 350\text{mA}$			0.5	mA
Output noise voltage	$V_{NO}$	$10\text{Hz} \leq f \leq 100\text{kHz}$		90		$\mu\text{V}$
Ripple rejection	Rrej	$f=120\text{Hz}$ , $18.5\text{V} \leq V_{IN} \leq 28.5\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=100\text{mA}$	54			dB
		$f=120\text{Hz}$ , $18.5\text{V} \leq V_{IN} \leq 28.5\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=300\text{mA}$	54	70		dB
Minimum input-output voltage dropout	$V_{drop}$	$I_{OUT}=350\text{mA}$		2.0		V
Short current	$I_{OS}$	$T_j=25^\circ\text{C}$ , $V_{IN}=35\text{V}$ , to GND		300		mA
Peak output current	$I_{OP}$	$T_j=25^\circ\text{C}$		0.7		A

## L78M00T Series

[L78M18T]

### Recommended Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		21 to 33	V
Output current	$I_{OUT}$		5 to 500	mA

### Operating Characteristics at $T_a=25^\circ\text{C}$ , $V_{IN}=27\text{V}$ , $I_{OUT}=350\text{mA}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	$V_{OUT}$	$T_j=25^\circ\text{C}$	17.3	18.0	18.7	V
Line regulation	$\Delta V_{O \text{ line}}$	$T_j=25^\circ\text{C}$ , $21\text{V} \leq V_{IN} \leq 33\text{V}$ , $I_{OUT}=200\text{mA}$		10.0	100	mV
		$T_j=25^\circ\text{C}$ , $22\text{V} \leq V_{IN} \leq 35\text{V}$ , $I_{OUT}=200\text{mA}$		5.0	50	mV
Load regulation	$\Delta V_{O \text{ load}}$	$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 500\text{mA}$			360	mV
		$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 200\text{mA}$			180	mV
Output voltage	$V_{OUT}$	$21\text{V} \leq V_{IN} \leq 33\text{V}$ , $5\text{mA} \leq I_{OUT} \leq 350\text{mA}$	17.1		18.9	V
Current dissipation	$I_{CC}$	$T_j=25^\circ\text{C}$		4.9	6.0	mA
Current dissipation variation (Line)	$\Delta I_{CC \text{ line}}$	$21\text{V} \leq V_{IN} \leq 33\text{V}$ , $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	$\Delta I_{CC \text{ load}}$	$5\text{mA} \leq I_{OUT} \leq 350\text{mA}$			0.5	mA
Output noise voltage	$V_{NO}$	$10\text{Hz} \leq f \leq 100\text{kHz}$		100		$\mu\text{V}$
Ripple rejection	Rrej	$f=120\text{Hz}$ , $22\text{V} \leq V_{IN} \leq 33\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=100\text{mA}$	53			dB
		$f=120\text{Hz}$ , $22\text{V} \leq V_{IN} \leq 33\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=300\text{mA}$	53	70		dB
Minimum input-output voltage dropout	$V_{drop}$	$I_{OUT}=350\text{mA}$		2.0		V
Short current	$I_{OS}$	$T_j=25^\circ\text{C}$ , $V_{IN}=35\text{V}$ , to GND		300		mA
Peak output current	$I_{OP}$	$T_j=25^\circ\text{C}$		0.7		A

[L78M20T]

### Recommended Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		23 to 35	V
Output current	$I_{OUT}$		5 to 500	mA

### Operating Characteristics at $T_a=25^\circ\text{C}$ , $V_{IN}=29\text{V}$ , $I_{OUT}=350\text{mA}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	$V_{OUT}$	$T_j=25^\circ\text{C}$	19.2	20.0	20.8	V
Line regulation	$\Delta V_{O \text{ line}}$	$T_j=25^\circ\text{C}$ , $23\text{V} \leq V_{IN} \leq 35\text{V}$ , $I_{OUT}=200\text{mA}$		10.0	100	mV
		$T_j=25^\circ\text{C}$ , $24\text{V} \leq V_{IN} \leq 35\text{V}$ , $I_{OUT}=200\text{mA}$		5.0	50	mV
Load regulation	$\Delta V_{O \text{ load}}$	$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 500\text{mA}$			400	mV
		$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 200\text{mA}$			200	mV
Output voltage	$V_{OUT}$	$23\text{V} \leq V_{IN} \leq 35\text{V}$ , $5\text{mA} \leq I_{OUT} \leq 350\text{mA}$	19.0		21.0	V
Current dissipation	$I_{CC}$	$T_j=25^\circ\text{C}$		4.9	6.0	mA
Current dissipation variation (Line)	$\Delta I_{CC \text{ line}}$	$23\text{V} \leq V_{IN} \leq 35\text{V}$ , $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	$\Delta I_{CC \text{ load}}$	$5\text{mA} \leq I_{OUT} \leq 350\text{mA}$			0.5	mA
Output noise voltage	$V_{NO}$	$10\text{Hz} \leq f \leq 100\text{kHz}$		110		$\mu\text{V}$
Ripple rejection	Rrej	$f=120\text{Hz}$ , $24\text{V} \leq V_{IN} \leq 34\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=100\text{mA}$	53			dB
		$f=120\text{Hz}$ , $24\text{V} \leq V_{IN} \leq 34\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=300\text{mA}$	53	70		dB
Minimum input-output voltage dropout	$V_{drop}$	$I_{OUT}=350\text{mA}$		2.0		V
Short current	$I_{OS}$	$T_j=25^\circ\text{C}$ , $V_{IN}=35\text{V}$ , to GND		300		mA
Peak output current	$I_{OP}$	$T_j=25^\circ\text{C}$		0.7		A

# L78M00T Series

[L78M24T]

## Recommended Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Input voltage	$V_{IN}$		27 to 35	V
Output current	$I_{OUT}$		5 to 500	mA

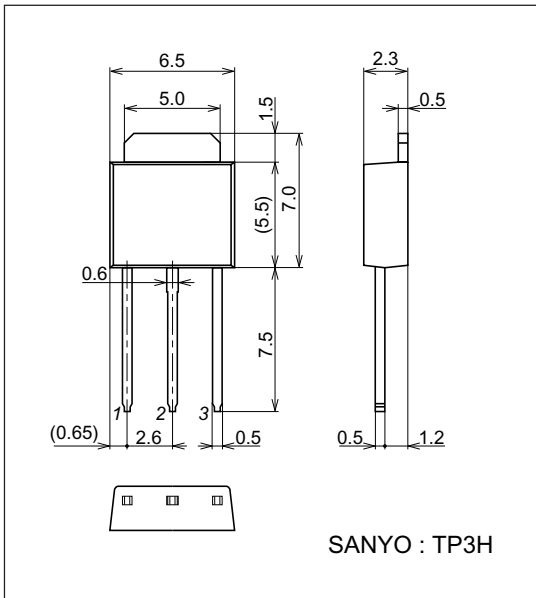
## Operating Characteristics at $T_a=25^\circ\text{C}$ , $V_{IN}=33\text{V}$ , $I_{OUT}=350\text{mA}$ , See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Output voltage	$V_{OUT}$	$T_j=25^\circ\text{C}$	23.0	24.0	25.0	V
Line regulation	$\Delta V_{O \text{ line}}$	$T_j=25^\circ\text{C}$ , $27\text{V} \leq V_{IN} \leq 35\text{V}$ , $I_{OUT}=200\text{mA}$		10.0	100	mV
		$T_j=25^\circ\text{C}$ , $28\text{V} \leq V_{IN} \leq 35\text{V}$ , $I_{OUT}=200\text{mA}$		5.0	50	mV
Load regulation	$\Delta V_{O \text{ load}}$	$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 500\text{mA}$			480	mV
		$T_j=25^\circ\text{C}$ , $5\text{mA} \leq I_{OUT} \leq 200\text{mA}$			240	mV
Output voltage	$V_{OUT}$	$27\text{V} \leq V_{IN} \leq 35\text{V}$ , $5\text{mA} \leq I_{OUT} \leq 350\text{mA}$	22.8		25.2	V
Current dissipation	$I_{CC}$	$T_j=25^\circ\text{C}$		5.0	6.0	mA
Current dissipation variation (Line)	$\Delta I_{CC \text{ line}}$	$27\text{V} \leq V_{IN} \leq 35\text{V}$ , $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	$\Delta I_{CC \text{ load}}$	$5\text{mA} \leq I_{OUT} \leq 350\text{mA}$			0.5	mA
Output noise voltage	$V_{NO}$	$10\text{Hz} \leq f \leq 100\text{kHz}$		170		$\mu\text{V}$
Ripple rejection	Rrej	$f=120\text{Hz}$ , $28\text{V} \leq V_{IN} \leq 35\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=100\text{mA}$	50			dB
		$f=120\text{Hz}$ , $28\text{V} \leq V_{IN} \leq 35\text{V}$ , $T_j=25^\circ\text{C}$ , $I_{OUT}=300\text{mA}$	50	70		dB
Minimum input-output voltage dropout	$V_{drop}$	$I_{OUT}=350\text{mA}$		2.0		V
Short current	$I_{OS}$	$T_j=25^\circ\text{C}$ , $V_{IN}=35\text{V}$ , to GND		300		mA
Peak output current	$I_{OP}$	$T_j=25^\circ\text{C}$		0.7		A

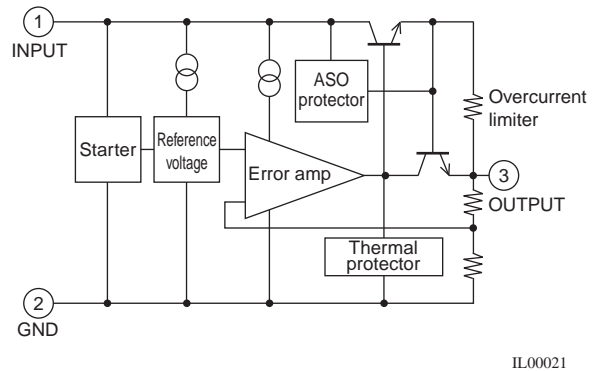
## Package Dimensions

unit : mm

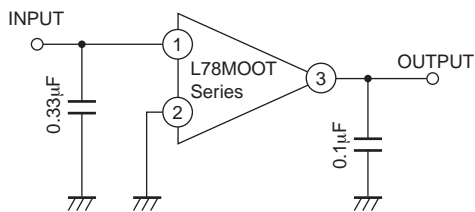
3110A



## Equivalent Circuit



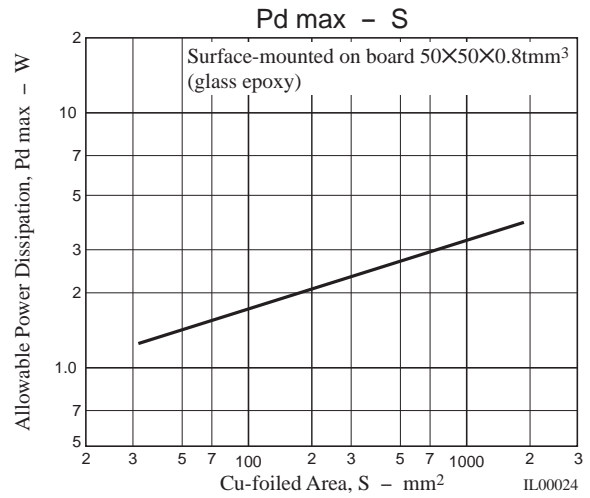
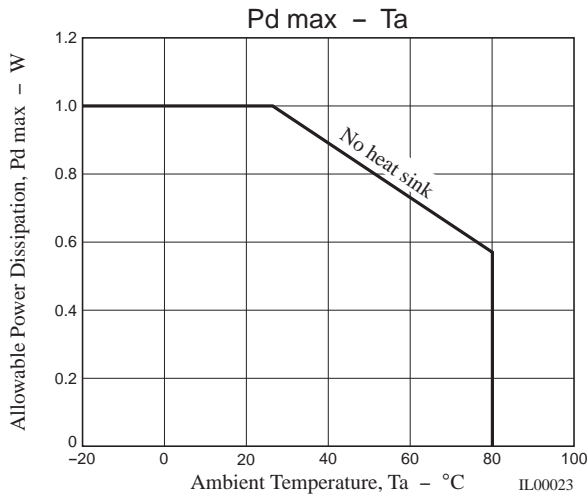
## Specified Test Circuit (Common to L78M00T series)



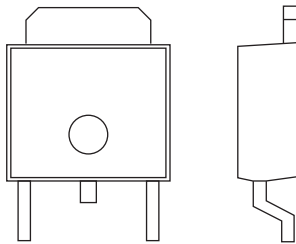
## L78M00T Series

The allowable power dissipation ( $P_d \max$ ) is 1.0W ( $T_a=25^\circ\text{C}$ ) with no fin attached. When the L78M00T series are surface-mounted on a hybrid IC board or printed circuit board, a high allowable power dissipation can be obtained, though they are placed in a small-sized package.

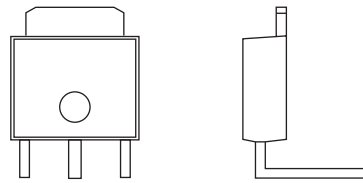
Shown below is the relationship between the Cu-foiled area and the allowable power dissipation when the L78M00T series are surface-mounted on a glass epoxy board ( $50\times 50\times 0.8\text{mm}^3$ ).



### Lead Formings



FA formings



LR formings

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