



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	ΔV_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	ΔV_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)	ΔI_{CC} line	$8\text{V}\leq V_{IN}\leq 20\text{V}$, $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	ΔI_{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		μV
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	ΔV_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	ΔV_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)	ΔI_{CC} line	$9\text{V}\leq V_{IN}\leq 25\text{V}$, $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	ΔI_{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		μV
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	ΔV_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	ΔV_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)	ΔI_{CC} line	$10\text{V} \leq V_{IN} \leq 25\text{V}$, $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	ΔI_{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		μV
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	ΔV_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	ΔV_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)	ΔI_{CC} line	$11\text{V} \leq V_{IN} \leq 25\text{V}$, $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	ΔI_{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		μV
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		μV
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		μV
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	ΔV_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	ΔV_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)	ΔI_{CC} line	$15\text{V} \leq V_{IN} \leq 30\text{V}$, $I_{OUT}=200\text{mA}$			0.8	mA
Current dissipation variation (Load)	ΔI_{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		μV
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	ΔV_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	ΔV_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)	ΔI_{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)	ΔI_{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		μV
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		μV
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		μV
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

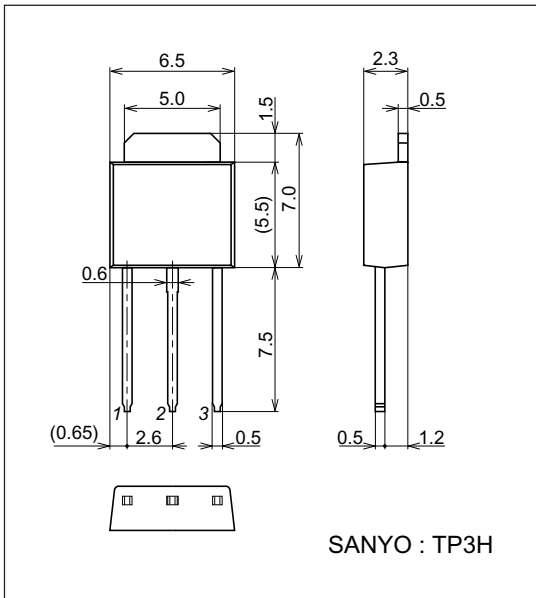
Operating Characteristics at $T_a=25^\circ\text{C}$, $V_{IN}=33\text{V}$, $I_{OUT}=350\text{mA}$, See specified Test Circuit.

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		μV
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

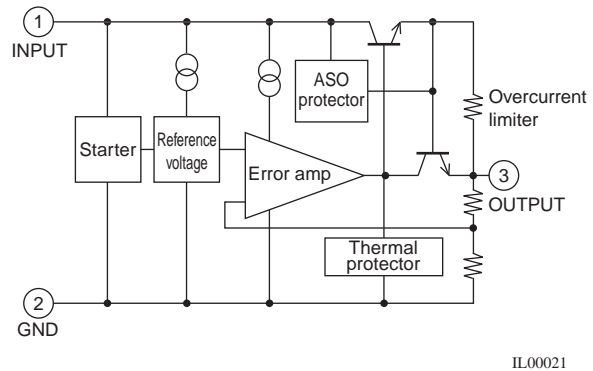
Package Dimensions

unit : mm

3110A

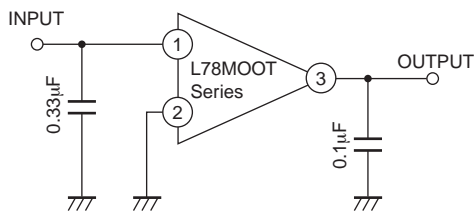


Equivalent Circuit



IL00021

Specified Test Circuit (Common to L78M00T series)

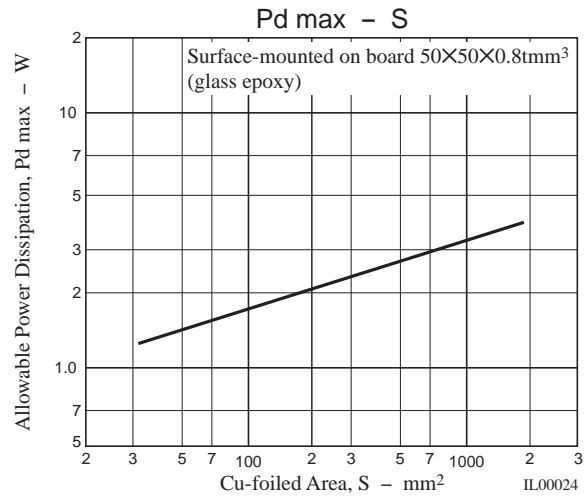
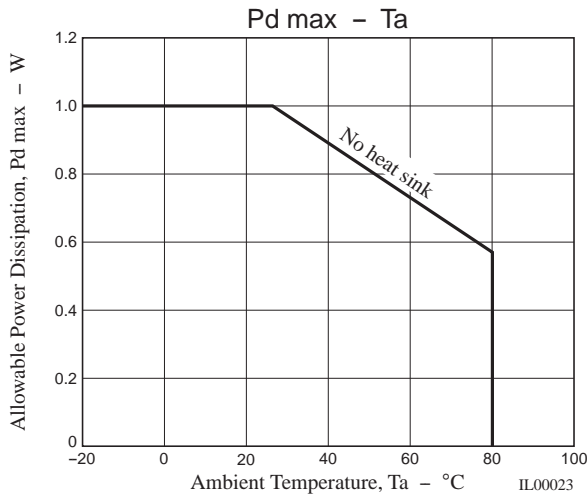


IL00022

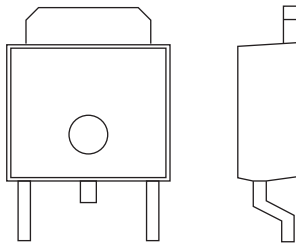
L78M00T Series

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.

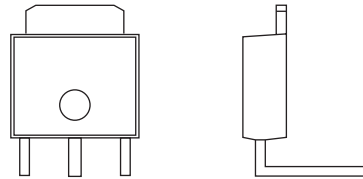
Shown below is the relationship between the Cu-foiled area and the allowable power dissipation when the L78M00T series are surface-mounted on a glass epoxy board ($50\times 50\times 0.8\text{mm}^3$).



Lead Formings



FA formings



LR formings

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