

5 to 24V 0.5A 3-Pin Voltage Regulators

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

[Common to L78M00T series]

axi	mum Ratings at Ta=25°C				unit
Ma:	ximum Supply Voltage	V_{CC} max	Pin 1	35	V
Al:	lowable Power Dissipation		No fin	1.0	W
qO	erating Temperature	Topr		-20 to +80	°C
St	orage Temperature	Tstg		-40 to +150	o _C

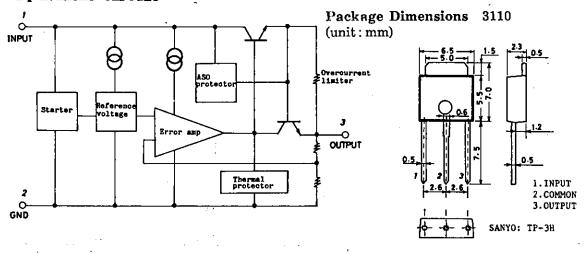
[L78M05T]

Recommended Operating	Conditions at Ta=25°C		unit
Input Voltage	<u>v</u> in	7.5 to 2	0 V
Output Current	IOUT	5 to 50	0 mA

Operating Characteristics at $Ta=25^{\circ}C$, $V_{\text{IN}}=10V$, $I_{\text{OUT}}=350\text{mA}$,

'	See a	specified Test Circuit.	min	typ	max	unit
Output Voltage	ν _{ουτ} .	Tj=25°C	4.8	5.0	5.2	V
Line Regulation	$V_{\c OUT}$	$Tj=25^{\circ}C,7V \le V_{IN} \le 25V,I_{OUT}=200mA$ $Tj=25^{\circ}C,8V \le V_{IN} \le 20V,I_{OUT}=200mA$		3.0	50	mV
		$T_{j=25}^{\circ}C$, $8V \le V_{TN} \le 20V$, $I_{OUT} = 200 \text{mA}$		1.0	25	mV

Equivalent Circuit Continued on next page.



Continued from precedi	ng page.	min typ	more undt
Load Regulation	$^{ riangle V}$ oload		max unit 100 mV
_	oload	Tj=25°C,5mASIOUTS200mA	50 mV
Output Voltage	VOUT	$7V \le V_{IN} \le 20V$, $5mA \le 10UT \le 350mA$ 4.75 5	.25 V
Current Dissipation	±CC	Tj=25°C 4.5	6.0 mA
Current Dissipation Variation (Line)	△Ĭ _{CCline}	$8V \le V_{IN} \le 25V$, $I_{OUT} = 200mA$	0.8 mA
Current Dissipation		ı	0.5 mA
Variation (Load)	CCload	5mA≤I _{OUT} ≤350mA	0.5 mA
Output Noise Voltage	V _{NO}	10Hz≤f≤100kHz 40	uV
Ripple Rejection	R _{rej}	$f = 120 \text{Hz}$ $I_{\text{OUT}} = 100 \text{mA}$ 62	dB
		$\begin{bmatrix} 8V \le V_{TN} \le 19V & I_{OUT} = 300 \text{mA} \\ T = 25 \text{ C} \end{bmatrix} $ 62 80	đВ
Management Towns Co. 1		Ųrj=25~0	
Minimum Input-Output Voltage Drop	^V drop	I _{OUT} =350mA 2.0	V
Short Current	T	Tj=25°C, V _{IN} =35V, to GND 300	mA
Peak Output Current	Ios I	Tj=25°C 0.7	MA A
	Iop		
[L78M06T]		_	
Recommended Operating			
Input Voltage	V _{IN}	8.5 to 21 V	
Output Current	TOUT	5 to 500 mA	
Operating Characterist	ies at Ta:	=25°C, V _{IN} =11V, I _{QUT} =350mA,	
	See si	pecified Test Circuit. min typ m	nax unit
Output Voltage	V _{QUT}	Tj=25°C 5.75 6.0 6	
Line Regulation	\triangle^{V} oline	Ti=25°C.8V <v-v<25v.iovm=200ma 5.0<="" td=""><td>60 mV</td></v-v<25v.iovm=200ma>	60 mV
		$Tj=25^{\circ}C,9V \le V_{IN} \le 20V,I_{OUT} = 200mA$ 1.5	30 mV
Load Regulation	$^{ riangle extsf{V}}$ oload	Tj=25°C,9V\(\frac{1}{1}\)\(\frac{1}{2}\)\(\frac{1}{	120 mV
Output Waltons		17=52 C'2myZ1UILZ500my	60 mV
Output Voltage Current Dissipation	V _{OUT}		6.3 V
Current Dissipation	I _{CC}		6.0 mA 0.8 mA
Variation (Line)	△Ĭ _{CCline}	$9V \leq V_{IN} \leq 25V, I_{OUT} = 200mA$). О ш <u>и</u>
Current Dissipation	$^{\Delta \mathbf{I}}_{\texttt{CCload}}$	5mA≤I _{OUT} ≤350mA	0.5 mA
Variation (Load)			
Output Noise Voltage	V _{NO}	10Hz≤f≤100kHz 45	uV
Ripple Rejection	^R rej	f=120Hz I _{OUT} =100mA 59	₫B
		9V V V V V V V V V V V V V V V V V V V	dB
Minimum Input-Output	V.	$\begin{bmatrix} Tj = 25^{\circ}C & & & \\ T_{OUT} = 350mA & & 2.0 \end{bmatrix}$	V
Voltage Drop	'drop	I _{OUT} =350mA 2.0	٧
Short Current	Ios	$Tj=25^{\circ}C, V_{IN}=35V, to GND 300$	mA
Peak Output Current	Iop	Tj=25°C 0.7	A
Fr =:0x2===3	~F		
[L78M07T]	O	m- or0a	
Recommended Operating (Input Voltage			•
Output Current	V _{IN}	9.5 to 22 V 5 to 500 mA	•
- material mays a gasta	TOUT	5 to 500 mA	•

Operating Characterist	ics at Ta	=25°C, V _{IN} =12V, I _{OUT} =350mA,			
	See 8	pecified Test Circuit. min	typ		unit
Output Voltage	$\mathbf{v}_{\mathtt{OUT}}$	$Tj=25^{\circ}C$ 6.72	•	7.28	V
Line Regulation	$\triangle V$ oline	$Tj=25^{\circ}C,9V \leq V_{IN} \leq 25V, I_{OUT}=200mA$	6.0	60	mV
		$Tj=25^{\circ}C$, $10V \le V_{TN} \le 20V$, $I_{OHT} = 200mA$	2.0	30	mV
Load Regulation	$^{ riangle extsf{V}}$ oload	$T_{j=25}^{\circ}C$, $10V_{2}V_{1N} \le 20V$, $I_{OUT} = 200mA$ $T_{j=25}^{\circ}C$, $5mA \le I_{OUT} \le 500mA$		140	mV
•		1.]=25 C.DMAS151mS2UUMA		70	m٧
Output Voltage	V _{OUT}	9 V ≤ V _{TN} ≤22 V ,5mA≤T _{OUT} ≤350mA 6.6 Tj=25°C		7.4	V
Current Dissipation	$\mathbf{I}_{\mathbf{CC}}$	Tj=25°C	4.6	6.0	mA
Current Dissipation Variation (Line)	△Ĭ _{CCline}	10V _≦ V _{IN} ≤25V, I _{OUT} =200mA		0.8	mA
Current Dissipation Variation (Load)	$^{ riangle extsf{I}}$ CCload	5mA≤I _{OUT} ≤350mA		0.5	mA
Output Noise Voltage	NO	10Hz≤f≤100kHz	48		u₹
Ripple Rejection	R _{rej}	$f = 12\overline{0}H\overline{z}$ $I_{OUT} = 100mA$ 58			ďΒ
		10V \(\sqrt{V}_{\text{IN}} \) \(\left(21V \) I_{\text{OUT}} = 300 \text{mA} \) 58	80		dB
Minimum Input-Output Voltage Drop	$v_{\tt drop}$	I _{OUT} =350mA	2.0		V
Short Current	Ios	Tj=25°C, V _{IN} =35V, to GND	300		mA
Peak Output Current	Iop	Tj=25°C IN	0.7		A
	ор	•			
[L78M08T]	_	•			
Recommended Operating	Condition				
Input Voltage	V _{IN}	10.5 to 23 V		F.	
Output Current	IOUT	5 to 500 mA			
Operating Characterist		=25°C, V _{IN} =15V, I _{QUT} =350mA,			
•	See s	pecified Test Circuit. min	typ	max	unit
Output Voltage	VOUT	$T_{i=25}^{\circ}C$ 7.7		8.3	V
Line Regulation	$^{\triangle V}$ oline	Tj=25°C, 10.5V\(\frac{1}{2}\)V_{IN}\(\frac{1}{2}\)25V, I _{OUT} =200mA Tj=25°C, 11V\(\frac{1}{2}\)V_{IN}\(\frac{1}{2}\)20V, I _{OUT} =200mA Tj=25°C, 5mA\(\frac{1}{2}\)OUT\(\frac{1}{2}\)500mA	6.0	60	mV
_	orine	T1=25°C.11V <v-x<20v.iovm=200ma< td=""><td>2.0</td><td>30</td><td>mV</td></v-x<20v.iovm=200ma<>	2.0	30	mV
Load Regulation	$^{ riangle V}$ oload	T 1=25°C.5mACI	_,,	160	mV
	oload	Tj=25°C,5mA≤IOUT≤200mA		80	mV
Output Voltage	V	10.5V5V _{IN} 223V, 5mA \(\frac{1}{2}\) OUT \(\frac{2}{2}\) 350mA 7.6		8.4	W V
Current Dissipation	V _{OUT}	Tj=25°C	4.6	6.0	mA.
Current Dissipation	^I CC △I		7.0	0.8	mA
Variation (Line)	△Ĭ _{CCline}	11V≦V _{IN} ≦25V,I _{OUT} =200mA			
Current Dissipation : Variation (Load)	CCload	2myZrOALZ220my		0.5	mA
Output Noise Voltage	v _{no}	10Hz≤f≤100kHz	50		u₹
Ripple Rejection	R _{rej}	T=120Hz I _{OUT} =100mA 56	-		ďΒ
,	rej	11.5V\(\sqrt{V}\)\(\sqrt{1N}\)\(\sqrt{22V}\)\ \(\sqrt{1}\)\(\sqrt{UT}\)=300mA\\ T j = 25 C	80	•	dB
Minimum Input-Output Voltage Drop	Vdrop	I _{OUT} =350mA	2.0		V
Short Current	Ioo	$Tj=25^{\circ}C$, $V_{IN}=35V$, to GND	300		mA
Peak Output Current	I _{op}	Tj=25°C	0.7		A
Lt 46MVVWJ					
[L78M09T] Recommended Operating (Conditto	2 2+ T2π2Ε ⁰ C			
Input Voltage	'			-	
Output Current	VIN T	12 to 25 V	•		
	IOUT	5 to 500 mA		•	
	- * '				

Operating Characterist	ics at Ta	=25°C, V _{IN} =16V, I _{QUT} =350mA,				
	See s	pecified Test Circuit.	min	.typ	max	unit
Output Voltage	VOUT	Tj=25 ^O C	8.6	9.0	9.4	V
Line Regulation	$^{ riangle V}$ oline	Ti=25°C.11.5V <v,<25v.i.< td=""><td>_=200mA</td><td>6.0</td><td>100</td><td>mV</td></v,<25v.i.<>	_=200mA	6.0	100	mV
	orme	Tj=25°C.12V <v-v<20v.ioum=< td=""><td>200mA</td><td>2.0</td><td>50</td><td>mV</td></v-v<20v.ioum=<>	200mA	2.0	50	mV
Load Regulation	△V - 3 3	Tj=25°C,12V\(\frac{1}{2}\)V,I\(\frac{1}{2}\)UV\(\frac{1}{2}\)V,I\(\frac{1}{2}\)UT\(\frac{1}\)UT\(\frac{1}{2}\)UT\(\frac{1}{2}\)UT\(\frac{1}{2}\)UT\(\frac{1}{2}\)UT\(\frac{1}{2}\)UT\(\frac{1}{2}\)UT\(\frac{1}{2}\)UT\(\frac{1}{2}\)UT\(\frac{1}\)UT\(\fra			180	mV
	$^{ riangle V}$ oload	T 1=25°C.5mA <t<200ma< td=""><td></td><td></td><td>90</td><td>mV</td></t<200ma<>			90	mV
Output Voltage	V	11.5V(V(2) V 5mA(T(35	OmA 8.5		9.5	v
Current Dissipation	V _{OUT}	11.5V\(\sqrt{V}\)\(\leq 2\frac{4}{V}\),5\(\leq 4\sqrt{DUT}\)\(\leq 35\)\(T\)\(\leq 2\frac{4}{V}\)\(\leq 5\leq 4\sqrt{N}\)\(\leq 2\frac{4}{V}\)\(\leq 2	OMA 0.5	4.6	6.0	mA
Current Dissipation	^I cc △T			7.0	0.8	mA
Variation (Line)	△I _{CCline}	12.5V <u>≤</u> V _{IN} <u>≤</u> 25V,I _{OUT} =200mA			0.0	ImM
Current Dissipation	۸۲	5m4 <t <250m4<="" td=""><td></td><td></td><td>0.5</td><td>- A</td></t>			0.5	- A
Variation (Load)	CCload	5mA≤I _{OUT} ≤350mA			0.5	mA
Output Noise Voltage	v	10Hz≤f≤100kHz		60		1.17
Ripple Rejection	110		56	00		uV
wibbie welection	R _{rej}		50			dB
		12V \(\frac{V_{IN}}{23V} \text{I_{OUT}} = 300mA	56	80		đВ
Minimum Input-Output	Vdrop	I _{OUT} =350mA		2.0		V
Voltage Drop	2. op	•				
Short Current	<u> I</u> os	Tj=25°C, V _{IN} =35V, to GND		300		$\mathbf{m}\mathbf{A}$
Peak Output Current	Iop	Tj=25°C		0.7		A
•	Op					
[L78M10T]						
Recommended Operating	Conditions	s at Ta=25 ⁰ C	unit			
Input Voltage	V _{TN}	13 to 25				
Input Voltage Output Current	V _{IN}	13 to 25 5 to 500	V	ÿ.		•
Output Current	TUOT	5 to 500	V	Þ		
Output Current	¹ 0UT ics at Ta:	5 to 500 =25 ⁰ C,V _{IN} =17V,I _{OUT} =350mA,	V	5		•
Output Current Operating Characterist	¹ OUT ics at Ta: See sp	5 to 500 =25 ^o C,V _{IN} =17V,I _{OUT} =350mA, pecified Test Circuit.	V mA min	typ	max	unit
Output Current Operating Characterist Output Voltage	¹ OUT ics at Ta: See sp ^V OUT	5 to 500 =25 ^O C,V _{IN} =17V,I _{OUT} =350mA, pecified Test Circuit. Tj=25 ^O C	win 9.6	typ 10.0		unit V
Output Current Operating Characterist	¹ OUT ics at Ta: See sp ^V OUT	5 to 500 =25°C, V _{IN} =17V, I _{OUT} =350mA, pecified Test Circuit. Tj=25°C Tj=25°C, 12.5V\V _{IN} \(25V, I _{OUT} \)	win 9.6			
Output Current Operating Characterist Output Voltage	IOUT ics at Ta: See sp VOUT ^Voline	5 to 500 =25°C, V _{IN} =17V, I _{OUT} =350mA, pecified Test Circuit. Tj=25°C Tj=25°C, 12.5V \(\frac{1}{2} \) \(\frac{1} \) \(\frac{1}{2}	win 9.6	10.0	10.4	V
Output Current Operating Characterist Output Voltage	IOUT ics at Ta: See sp VOUT ^Voline	5 to 500 $=25^{\circ}\text{C}, V_{\text{IN}}=17\text{V}, I_{\text{OUT}}=350\text{mA},$ $=25^{\circ}\text{C} \text{ Test Circuit.}$ $=25^{\circ}\text{C}$ $=25^{\circ}\text{C}, 12.5\text{V} \leq V_{\text{IN}} \leq 25\text{V}, I_{\text{OUT}} \leq 25\text{V}, I$	win 9.6	10.0 7.0	10.4 100	w V
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation	¹ OUT ics at Ta: See sp ^V OUT	5 to 500 =25°C, V_{IN} =17 V , I_{OUT} =350mA, pecified Test Circuit. Tj=25°C Tj=25°C, 12.5 V $\leq V_{IN}$ $\leq 25V$, I_{OUT} $\leq 25V$, I_{OUT} $\leq 25V$ C, 5mA $\leq I_{OUT}$ ≤ 500 mA Tj=25°C, 5mA $\leq I_{OUT}$ ≤ 500 mA	V mA min 9.6 T=200mA 200mA	10.0 7.0	10.4 100 50	V mV mV
Output Current Operating Characterist Output Voltage Line Regulation	$^{ m L}$ OUT ics at Ta: See synomics $^{ m V}$ OUT $^{ m \triangle V}$ oline $^{ m \triangle V}$ oload	5 to 500 =25°C, V_{IN} =17 V , I_{OUT} =350mA, pecified Test Circuit. Tj=25°C Tj=25°C, 12.5 V $\leq V_{IN}$ $\leq 25V$, I_{OUT} $\leq 25V$, I_{OUT} $\leq 25V$ C, 5mA $\leq I_{OUT}$ ≤ 500 mA Tj=25°C, 5mA $\leq I_{OUT}$ ≤ 500 mA	V mA min 9.6 T=200mA 200mA	10.0 7.0	10.4 100 50 200	V mV mV
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation	IOUT ics at Ta: See sp VOUT CVoline CVoload VOUT ICC	5 to 500 constraints to 500 constraints and the second state of t	V mA min 9.6 T=200mA 200mA	10.0 7.0	10.4 100 50 200 100	V mV mV mV
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage	IOUT ics at Ta: See sp VOUT CVoline CVoload VOUT ICC	5 to 500 constraints to 500 constraints and the second state of t	V mA min 9.6 T=200mA 200mA	10.0 7.0 2.0	10.4 100 50 200 100 10.5	V mV mV mV v
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation	IOUT ics at Ta: See sp VOUT CVOLINE CVOLOAD VOUT	5 to 500 constraints to 500 constraints and the second state of t	V mA min 9.6 T=200mA 200mA	10.0 7.0 2.0	10.4 100 50 200 100 10.5 6.0	V mV mV mV v mA
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line)	IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline	$\begin{array}{c} 5 \text{ to } 500 \\ = 25^{\circ}\text{C}, V_{\text{IN}} = 17\text{V}, I_{\text{OUT}} = 350\text{mA}, \\ \text{pecified Test Circuit.} \\ \text{Tj} = 25^{\circ}\text{C} \\ \text{Tj} = 25^{\circ}\text{C}, 12.5\text{V} \leq \text{V}_{\text{IN}} \leq 25\text{V}, I_{\text{OUT}} \leq 125^{\circ}\text{C}, 13\text{V} \leq \text{V}_{\text{IN}} \leq 22\text{V}, I_{\text{OUT}} \leq 125^{\circ}\text{C}, 5\text{mA} \leq \text{I}_{\text{OUT}} \leq 200\text{mA} \\ \text{Tj} = 25^{\circ}\text{C}, 5\text{mA} \leq \text{I}_{\text{OUT}} \leq 200\text{mA} \\ 12.5\text{V} \leq \text{V}_{\text{IN}} \leq 25\text{V}, 5\text{mA} \leq \text{I}_{\text{OUT}} \leq 35^{\circ}\text{C} \\ \text{Tj} = 25^{\circ}\text{C} \\ 13.5\text{V} \leq \text{V}_{\text{IN}} \leq 25\text{V}, I_{\text{OUT}} = 200\text{mA} \end{array}$	V mA min 9.6 T=200mA 200mA	10.0 7.0 2.0	10.4 100 50 200 100 10.5 6.0 0.8	V mV mV mV V mA
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load)	IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload	$\begin{array}{c} 5 \text{ to } 500 \\ = 25^{\circ}\text{C}, V_{\text{IN}} = 17\text{V}, I_{\text{OUT}} = 350\text{mA}, \\ \text{pecified Test Circuit.} \\ \text{Tj} = 25^{\circ}\text{C} \\ \text{Tj} = 25^{\circ}\text{C}, 12.5\text{V} \leq \text{V}_{\text{IN}} \leq 25\text{V}, I_{\text{OUT}} \leq 125^{\circ}\text{C}, 13\text{V} \leq \text{V}_{\text{IN}} \leq 22\text{V}, I_{\text{OUT}} \leq 125^{\circ}\text{C}, 5\text{mA} \leq \text{I}_{\text{OUT}} \leq 200\text{mA} \\ \text{Tj} = 25^{\circ}\text{C}, 5\text{mA} \leq \text{I}_{\text{OUT}} \leq 200\text{mA} \\ 12.5\text{V} \leq \text{V}_{\text{IN}} \leq 25\text{V}, 5\text{mA} \leq \text{I}_{\text{OUT}} \leq 35^{\circ}\text{C} \\ \text{Tj} = 25^{\circ}\text{C} \\ 13.5\text{V} \leq \text{V}_{\text{IN}} \leq 25\text{V}, I_{\text{OUT}} = 200\text{mA} \end{array}$	V mA min 9.6 T=200mA 200mA	10.0 7.0 2.0	10.4 100 50 200 100 10.5 6.0	V mV mV mV v mA
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load)	IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload	$\begin{array}{c} 5 \text{ to } 500 \\ = 25^{\circ}\text{C}, V_{\text{IN}} = 17\text{V}, I_{\text{OUT}} = 350\text{mA}, \\ \text{pecified Test Circuit.} \\ \text{Tj} = 25^{\circ}\text{C} \\ \text{Tj} = 25^{\circ}\text{C}, 12.5\text{V} \leq \text{V}_{\text{IN}} \leq 25\text{V}, I_{\text{OUT}} \\ \text{Tj} = 25^{\circ}\text{C}, 13\text{V} \leq \text{V}_{\text{IN}} \leq 22\text{V}, I_{\text{OUT}} \\ \text{Tj} = 25^{\circ}\text{C}, 5\text{mA} \leq \text{I}_{\text{OUT}} \leq 500\text{mA} \\ \text{Tj} = 25^{\circ}\text{C}, 5\text{mA} \leq \text{I}_{\text{OUT}} \leq 200\text{mA} \\ 12.5\text{V} \leq \text{V}_{\text{IN}} \leq 25\text{V}, 5\text{mA} \leq \text{I}_{\text{OUT}} \leq 35\text{C} \\ \text{Tj} = 25^{\circ}\text{C} \\ 13.5\text{V} \leq \text{V}_{\text{IN}} \leq 25\text{V}, I_{\text{OUT}} = 200\text{mA} \\ \\ 5\text{mA} \leq \text{I}_{\text{OUT}} \leq 350\text{mA} \\ \end{array}$	V mA min 9.6 T=200mA 200mA	10.0 7.0 2.0 4.6	10.4 100 50 200 100 10.5 6.0 0.8	V mV mV mV V mA mA
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load) Output Noise Voltage	IOUT ics at Ta: See sy VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO	$\begin{array}{c} 5 \text{ to } 500 \\ = 25^{\circ}\text{C}, V_{\text{IN}} = 17\text{V}, I_{\text{OUT}} = 350\text{mA}, \\ \text{pecified Test Circuit.} \\ \text{Tj} = 25^{\circ}\text{C} \\ \text{Tj} = 25^{\circ}\text{C}, 12.5\text{V} \leq V_{\text{IN}} \leq 25\text{V}, I_{\text{OUT}} \\ \text{Tj} = 25^{\circ}\text{C}, 13\text{V} \leq V_{\text{IN}} \leq 22\text{V}, I_{\text{OUT}} = 100\text{mA} \\ \text{Tj} = 25^{\circ}\text{C}, 5\text{mA} \leq I_{\text{OUT}} \leq 500\text{mA} \\ \text{Tj} = 25^{\circ}\text{C}, 5\text{mA} \leq I_{\text{OUT}} \leq 200\text{mA} \\ 12.5\text{V} \leq V_{\text{IN}} \leq 25\text{V}, 5\text{mA} \leq I_{\text{OUT}} \leq 35\text{C} \\ \text{Tj} = 25^{\circ}\text{C} \\ 13.5\text{V} \leq V_{\text{IN}} \leq 25\text{V}, I_{\text{OUT}} = 200\text{mA} \\ 5\text{mA} \leq I_{\text{OUT}} \leq 350\text{mA} \\ 10\text{Hz} \leq f \leq 100\text{kHz} \\ \text{ff} = 120\text{Hz} \\ \end{array}$	W mA min 9.6 T=200mA 200mA 9.5	10.0 7.0 2.0	10.4 100 50 200 100 10.5 6.0 0.8	V mV mV mV V mA mA
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load)	IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO	5 to 500 =25°C, V _{IN} =17V, I _{OUT} =350mA, pecified Test Circuit. Tj=25°C Tj=25°C, 12.5V\(\sum_{\text{N}}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{IN}\)\(\tex	W mA min 9.6 T=200mA 200mA 9.5	10.0 7.0 2.0 4.6	10.4 100 50 200 100 10.5 6.0 0.8	V mV mV mV v mA mA mA
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load) Output Noise Voltage Ripple Rejection	IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO Rrej	5 to 500 =25°C, V _{IN} =17V, I _{OUT} =350mA, pecified Test Circuit. Tj=25°C Tj=25°C, 12.5V\(\sum_{\text{N}}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{IN}\)\(\tex	W mA min 9.6 T=200mA 200mA 9.5	10.0 7.0 2.0 4.6	10.4 100 50 200 100 10.5 6.0 0.8	V mV mV mV V mA mA
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load) Output Noise Voltage Ripple Rejection	IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO Rrej	5 to 500 =25°C, V _{IN} =17V, I _{OUT} =350mA, pecified Test Circuit. Tj=25°C Tj=25°C, 12.5V\(\frac{2}{2}\)V _{IN} \(\frac{2}{2}\)EV, I _{OUT} Tj=25°C, 13V\(\frac{2}{2}\)V _{IN} \(\frac{2}{2}\)EV, I _{OUT} Tj=25°C, 5mA\(\frac{2}{2}\)IOUT\(\frac{2}{2}\)OUMA 12.5V\(\frac{2}{2}\)V _{IN} \(\frac{2}{2}\)EV, 5mA\(\frac{2}{2}\)IOUT\(\frac{2}{2}\)ST Tj=25°C 13.5V\(\frac{2}{2}\)V _{IN} \(\frac{2}{2}\)EV, I _{OUT} =200mA 5mA\(\frac{2}{2}\)IOUT\(\frac{2}{2}\)SOMA 10Hz\(\frac{2}{2}\)SOMA 10Hz\(\frac{2}{2}\)SOMA 10Hz\(\frac{2}{2}\)SOMA 10UT=100mA 13V\(\frac{2}{2}\)SOMA Tj=25°C	W mA min 9.6 T=200mA 200mA 9.5	10.0 7.0 2.0 4.6	10.4 100 50 200 100 10.5 6.0 0.8	W mV mV mV mV mA mA mA
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load) Output Noise Voltage Ripple Rejection Minimum Input-Output	IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO Rrej	5 to 500 =25°C, V _{IN} =17V, I _{OUT} =350mA, pecified Test Circuit. Tj=25°C Tj=25°C, 12.5V\(\sum_{\text{N}}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{V}\)\(\text{IN}\)\(\sum_{25}\)\(\text{IN}\)\(\tex	W mA min 9.6 T=200mA 200mA 9.5	10.0 7.0 2.0 4.6	10.4 100 50 200 100 10.5 6.0 0.8	V mV mV mV v mA mA mA
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load) Output Noise Voltage Ripple Rejection Minimum Input-Output Voltage Drop	IOUT ics at Ta: See sy VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO Rrej Vdrop	5 to 500 =25°C, V _{IN} =17V, I _{OUT} =350mA, pecified Test Circuit. Tj=25°C Tj=25°C, 12.5V \(\) V _{IN} \(\) 25V, I _{OUT} Tj=25°C, 13V \(\) V _{IN} \(\) 22V, I _{OUT} Tj=25°C, 5mA \(\) I _{OUT} \(\) 500mA Tj=25°C, 5mA \(\) I _{OUT} \(\) 200mA 12.5V \(\) V _{IN} \(\) 25V, 5mA \(\) I _{OUT} \(\) 35 Tj=25°C 13.5V \(\) V _{IN} \(\) 25V, I _{OUT} = 200mA 5mA \(\) I _{OUT} \(\) 350mA 10Hz \(\) f \(\) 100kHz f=120Hz 13V \(\) V _{IN} \(\) 25V Tj=25°C I _{OUT} = 350mA	W mA min 9.6 T=200mA 200mA 9.5	10.0 7.0 2.0 4.6 65 80 2.0	10.4 100 50 200 100 10.5 6.0 0.8	V mV mV mV v mA mA uV dB dB
Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load) Output Noise Voltage Ripple Rejection Minimum Input-Output	IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO Rrej	5 to 500 =25°C, V _{IN} =17V, I _{OUT} =350mA, pecified Test Circuit. Tj=25°C Tj=25°C, 12.5V\(\frac{2}{2}\)V _{IN} \(\frac{2}{2}\)EV, I _{OUT} Tj=25°C, 13V\(\frac{2}{2}\)V _{IN} \(\frac{2}{2}\)EV, I _{OUT} Tj=25°C, 5mA\(\frac{2}{2}\)IOUT\(\frac{2}{2}\)OUMA 12.5V\(\frac{2}{2}\)V _{IN} \(\frac{2}{2}\)EV, 5mA\(\frac{2}{2}\)IOUT\(\frac{2}{2}\)ST Tj=25°C 13.5V\(\frac{2}{2}\)V _{IN} \(\frac{2}{2}\)EV, I _{OUT} =200mA 5mA\(\frac{2}{2}\)IOUT\(\frac{2}{2}\)SOMA 10Hz\(\frac{2}{2}\)SOMA 10Hz\(\frac{2}{2}\)SOMA 10Hz\(\frac{2}{2}\)SOMA 10UT=100mA 13V\(\frac{2}{2}\)SOMA Tj=25°C	W mA min 9.6 T=200mA 200mA 9.5	10.0 7.0 2.0 4.6	10.4 100 50 200 100 10.5 6.0 0.8	W mV mV mV mV mA mA mA

[L78M12T] Recommended Operating	Condition	s at Ta=25 ⁰ C	:	unit			
Input Voltage	V _{IN}		15 to 25	V			•
Output Current	IOUT		5 to 500	mA			
Operating Characterist	ics at Ta	=25 ⁰ C,V _{IN} =19V,I pecified Test C	OUT=350mA,	min	typ	max	unit
Output Voltage	VOUT	Tj=25°C		11.5		12.5	V
Line Regulation	∆V.	Tj=25°C,14.5V	V<30V-I		8.0	100	тV
	△Voline	T 1=25°C. 16V(V-	**************************************	OOmA	2.0	50	mV
Load Regulation	$^{ riangle V}$ oload	$Tj=25^{\circ}C, 16V \le V_{I}$ $Tj=25^{\circ}C, 5mA \le I_{O}$	N≥-549-001			240	mV
	oToad	T 1=25°C.5mA <i< td=""><td>UT≦200mA</td><td></td><td></td><td>120</td><td>mV</td></i<>	UT≦200mA			120	mV
Output Voltage	V _{OUT}	Tj=25°C,5mASIO 14.5VSVINS27V,	UT=~~~~	mA 11.4		12.6	v
Current Dissipation	ICC	T.j=25°C IN=-11,	2-00T-522		4.8	6.0	mA
Current Dissipation	-UC ∆I0014		=200mA			0.8	mA
Variation (Line)	△ĬCCline	.a.a.TNaa.i.O	0T-230				
Current Dissipation	$\triangle \mathbf{I}_{\mathtt{CCload}}$	5mA≤I _{OUT} ≤350mA				0.5	mA
Variation (Load)	CCTOAG	= 001=000					
Output Noise Voltage	A _{NO}	10Hz≤f≤100kHz		•	75		u₹
Ripple Rejection	R _{rej}	f=120Hz	I _{OUT} =100mA	55	• -		dB
	rej	15V <u>≤</u> V _{IN} <u>≤</u> 25V	I _{OUT} =300mA	55	80		đΒ
		[Tj=2560] =	1 001				
Minimum Input-Output Voltage Drop	V _{drop}	I _{OUT} =350mA			2.0		٧
Short Current	<u> I</u> os	Tj=25°C, V _{IN} =35° Tj=25°C	V, to GND		300		mA
Peak Output Current	Iop	Tj=25°C			0.7		A
[L78M15T] Recommended Operating		s at Ta=25 ⁰ C		unit			
Input Voltage	v _{in}		18 to 30	. V		-	
Output Current	IOUT		5 to 500	mA			
Operating Characterist	ics at Ta: See sp	=25 ⁰ C,V _{IN} =23V,I pecified Test C	OUT=350mA, ircuit.	min	typ	max	unit
Output Voltage	V _{QUT}	Tj=25 ⁰ C		14.4	15.0	15.6	V
Line Regulation	$\triangle V$ oline	Tj=25°C, 17.5V≤	V _{TN} <30V,I _{OUT}	=200mA	10.0	100	mV
	OZZIIO	TJ=25~C.19VSV-	1530V.I∩11m=2	OOmA.	3.0	50	mV
Load Regulation	$^{\Delta V}$ oload	IJ=ZD U, DWASIN	AMOUCZTII			300	mV
* .	Oload	$Tj=25^{\circ}C,5mA \le I_{\odot}$	ՄТ- ՄТ- ⊆200mA	•		150	mV
Output Voltage	VOUT	17.5VSV _{TN} S30V ₃	Šṁ̃Ā⊊I _{∩IJ™} ≤350ı	nA 14.25	1	15.75	V
Current Dissipation	ICC	Tj=25 ⁰ C ^{IN=0}	- 001-		4.8	6.0	mA
Current Dissipation	△ĬCCline	17.5V <u>≤</u> V _{TN} <u>≤</u> 30V,	I _{OUT} =200mA			0.8	mA
Variation (Line)	0022110	- 44-	001				
Current Dissipation Variation (Load)		5mA≤I _{OUT} ≤350mA				0.5	mA
Output Noise Voltage	NO	10Hz ≤f≤1 00kHz			90		uV.
Ripple Rejection	R _{rej}	f=120Hz	I _{OUT} =100mA	54			dB
	J	f=120Hz 18.5V\V_IN\\(28.5\) Tj=250C	V I _{OUT} =300mA	54	70		dB
Minimum Input-Output		T 050 4					77
voltage Drop	V _{drop}	I _{OUT} =350mA			2.0		V
Voltage Drop Short Current	V _{drop}	Tj=25°C, V _{TN} =35°	V,to GND		300		mA.
voltage Drop	V _{drop}		V, to GND				

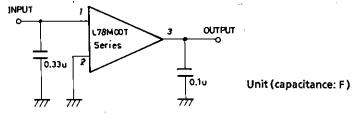
[L78M18T] Recommended Operating	Condition	s at Ta=25 ⁰ C		unit			
Input Voltage	VIN		21 to 33	v		_	
Output Current	TOUT	,	5 to 500	mA			
Operating Characterist	ics at Ta	=25 ⁰ C,V _{IN} =27V,I _C pecified Test Ci	OUT=350mA,	m 1 m	+ •••	m 0 *r	
Output Voltage		pecified lest ci Tj=25 ⁰ C	rcult.	min 17 2	typ 18.0	max	unit
Line Regulation	V _{OUT}		/25V T =2	ነበ። ለ	10.0	100	V
220 110841401011	△Voline	Tj=25°C,21V <u>S</u> V _{IN}	(327) TOUT=2	JUWN JUMN	5.0	50	mV mV
Load Regulation	^ V	Tj=25°C,22V\(\frac{1}{2}\)\\ Tj=25°C,5mA\(\frac{1}{2}\)\\ Tj=25°C,5mA\(\frac{1}{2}\)\\	-<500mA	ООЩА	5.0	360	mV
	$^{ riangle V}$ oload	$Tj=25^{\circ}C,5mA \le I_{OU}$	T≧500mA			180	mV
Output Voltage	VOUT	21V <v<33v-5ma< td=""><td>ZI~~~<350mA</td><td>17.1</td><td></td><td>18.9</td><td>v</td></v<33v-5ma<>	ZI~~~<350mA	17.1		18.9	v
Current Dissipation	I _C C	21V V TN 33V, 5mA	=-001=22	,, , ,	4.9	6.0	mA
Current Dissipation	ΔĬcc14πa	21v _v _{in} ≤33v,i _{ou}				0.8	mA
Variation (Line)	COLLING	= IN=22 , OO	1				
Current Dissipation Variation (Load)	$^{\Delta I}$ CCload	5mA≤I _{OUT} ≤350mA	•			0.5	mA
Output Noise Voltage	v _{NO}	10Hz≤f≤100kHz			100		u₹
Ripple Rejection	R _{rej}	f=120Hz	I _{OUT} =100mA	53			dB
	rej	22 V <u>I</u> N <u></u> <u>2</u> 33V	I _{OUT} =300mA	53	70		đΒ
Mindrum Tools Outrol	17	(Tj=25°C	1 001 5				
Minimum Input-Output Voltage Drop	$v_{\tt drop}$	I _{OUT} =350mA			2.0		V
Short Current	I _{os}	Tj=25°C, V _{IN} =35V	.to GND		300		mA
Peak Output Current	Iop	Tj=25°C	•		0.7		A
P	Op.						
[L78M2OT] Recommended Operating	Condition	n of To-2500		und+			
Recommended Operating		s at Ta=25°C	22 +0 25	unit			
Recommended Operating Input Voltage	v _{IN}	s at Ta=25 ⁰ C	23 to 35	V			
Recommended Operating Input Voltage Output Current	V _{IN} I _{OUT}		5 to 500	-			
Recommended Operating Input Voltage	V _{IN} I _{OUT} ics at Ta:	=25 ⁰ C,V _{TN} =29V,I _O	5 to 500	V mA	tun	, may	unit
Recommended Operating Input Voltage Output Current Operating Characterist	V _{IN} I _{OUT} ics at Ta: See sp	=25 ⁰ C,V _{IN} =29V,I _O pecified Test Ci Ti=25 ⁰ C	5 to 500 UT=350mA, reuit.	V mA min 19.2	typ 20.0	max 20.8	unit V
Recommended Operating Input Voltage Output Current Operating Characterist Output Voltage	V _{IN} I _{OUT} ics at Ta: See sp V _{OUT}	=25 ⁰ C,V _{IN} =29V,I _O pecified Test Ci Ti=25 ⁰ C	5 to 500 UT=350mA, reuit.	V mA min 19.2	20.0	20.8	V
Recommended Operating Input Voltage Output Current Operating Characterist	V _{IN} I _{OUT} ics at Ta: See sp	=25 ⁰ C,V _{IN} =29V,I _O pecified Test Ci Ti=25 ⁰ C	5 to 500 UT=350mA, reuit.	V mA min 19.2	20.0	20.8 100	V mV
Recommended Operating Input Voltage Output Current Operating Characterist Output Voltage	V _{IN} I _{OUT} ics at Ta: See sp V _{OUT} △Voline	=25°C,V _{IN} =29V,I _O pecified Test Ci Tj=25°C Tj=25°C,23V\(\frac{1}{2}\) Tj=25°C,24V\(\frac{1}{2}\) Tj=25°C,5mA\(\frac{1}{2}\)	5 to 500 UT=350mA, reuit. ≤35V,I _{OUT} =20 ≤35V,I _{OUT} =20 ≤35V,I _{OUT} =20	V mA min 19.2	20.0	20.8 100	V mV mV
Recommended Operating Input Voltage Output Current Operating Characterist Output Voltage Line Regulation	V _{IN} I _{OUT} ics at Ta: See sp V _{OUT}	=25°C,V _{IN} =29V,I _O pecified Test Ci Tj=25°C Tj=25°C,23V\(\frac{1}{2}\) Tj=25°C,24V\(\frac{1}{2}\) Tj=25°C,5mA\(\frac{1}{2}\)	5 to 500 UT=350mA, reuit. ≤35V,I _{OUT} =20 ≤35V,I _{OUT} =20 ≤35V,I _{OUT} =20	V mA min 19.2	20.0	20.8 100 50	V mV
Input Voltage Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage	VIN IOUT ics at Ta: See sp VOUT ^Voline ^Voload	=25 $^{\circ}$ C, V_{IN} =29 V , I_{O} pecified Test Ci Tj=25 $^{\circ}$ C Tj=25 $^{\circ}$ C,23 $V \le V_{IN}$ Tj=25 $^{\circ}$ C,24 $V \le V_{IN}$ Tj=25 $^{\circ}$ C,5 $M \le I_{OU}$ Tj=25 $^{\circ}$ C,5 $M \le I_{OU}$ 23 $V \le V_{TN} \le 35V$,5 $M \le I_{OU}$	5 to 500 UT=350mA, reuit. ≤35V,I _{OUT} =20 ≤35V,I _{OUT} =20 T≤500mA T≤200mA	V mA min 19.2	20.0	20.8 100 50 400	V mV mV
Input Voltage Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation	V _{IN} I _{OUT} ics at Ta: See sp V _{OUT} △Voline ^{ΔV} oload V _{OUT}	=25°C,V _{IN} =29V,I _O pecified Test Ci Tj=25°C Tj=25°C,23V\(_\)\ Tj=25°C,24V\(_\)\ Tj=25°C,5mA\(_\)\ Tj=25°C,5mA\(_\)\ Tj=25°C,5mA\(_\)\ Tj=25°C,5mA\(_\)\ Tj=25°C	5 to 500 UT=350mA, reuit. ≤35V,I _{OUT} =20 ≤35V,I _{OUT} =20 T≤500mA T≤200mA ≤1 _{OUT} ≤350mA	V mA min 19.2 OOmA	20.0	20.8 100 50 400 200	V mV mV mV
Input Voltage Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation	VIN IOUT ics at Ta: See sp VOUT ^Voline ^Voload	=25 $^{\circ}$ C, V_{IN} =29 V , I_{O} pecified Test Ci Tj=25 $^{\circ}$ C Tj=25 $^{\circ}$ C,23 $V \le V_{IN}$ Tj=25 $^{\circ}$ C,24 $V \le V_{IN}$ Tj=25 $^{\circ}$ C,5 $mA \le I_{OU}$ 23 $V \le V_{IN} \le 35V$,5 mA	5 to 500 UT=350mA, reuit. ≤35V,I _{OUT} =20 ≤35V,I _{OUT} =20 T≤500mA T≤200mA ≤1 _{OUT} ≤350mA	V mA min 19.2 OOmA	20.0 10.0 5.0	20.8 100 50 400 200 21.0	V mV mV mV v
Input Voltage Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation	VIN IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC AICCline	=25 $^{\circ}$ C, V_{IN} =29 V , I_{O} pecified Test Ci Tj=25 $^{\circ}$ C Tj=25 $^{\circ}$ C,23 $V \le V_{IN}$ Tj=25 $^{\circ}$ C,24 $V \le V_{IN}$ Tj=25 $^{\circ}$ C,5 $mA \le I_{OU}$ 23 $V \le V_{IN} \le 35V$,5 mA	5 to 500 UT=350mA, reuit. ≤35V,I _{OUT} =20 ≤35V,I _{OUT} =20 T≤500mA T≤200mA ≤1 _{OUT} ≤350mA	V mA min 19.2 OOmA	20.0 10.0 5.0	20.8 100 50 400 200 21.0 6.0	V mV mV mV v mV
Input Voltage Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load)	VIN IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload	$=25^{\circ}\text{C}, V_{\text{IN}} = 29\text{V}, I_{\text{O}}$ eccified Test C1 Tj=25°C Tj=25°C, 23V \leq V_{\text{IN}} Tj=25°C, 5mA \leq I_{OU} Tj=25°C, 5mA \leq I_{OU} 23V \leq V_{\text{IN}}\leq 35\text{V}, 5mA Tj=25°C \rightarrow 5mA}\leq I_{\text{OUT}}\leq 35\text{V}, I_{\text{OU}}	5 to 500 UT=350mA, reuit. ≤35V,I _{OUT} =20 ≤35V,I _{OUT} =20 T≤500mA T≤200mA ≤1 _{OUT} ≤350mA	V mA min 19.2 OOmA	20.0 10.0 5.0	20.8 100 50 400 200 21.0 6.0 0.8	V mV mV mV V mA mA
Input Voltage Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load) Output Noise Voltage	VIN IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO	=25°C, V_{IN} =29V, I_{O} pecified Test Ci Tj=25°C Tj=25°C,23V \leq V_{IN} Tj=25°C,24V \leq V_{IN} Tj=25°C,5mA \leq I_{OU} 23V \leq V_{IN} \leq 35V,5mA Tj=25°C 23V \leq V_{IN} \leq 35V, I_{OU} 5mA \leq I_{OUT} \leq 350mA	5 to 500 UT=350mA, reuit. \$35V,IOUT=20 \$35V,IOUT=20 T\$500mA T\$200mA \$10UT\$350mA T=200mA	W mA min 19.2 DOMA DOMA 19.0	20.0 10.0 5.0	20.8 100 50 400 200 21.0 6.0 0.8	V mV mV mV V mA mA
Input Voltage Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load)	VIN IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO	=25°C, V_{IN} =29 V , I_{O} eccified Test Ci Tj=25°C Tj=25°C,23 V \leq V $_{IN}$ Tj=25°C,5 M \leq I $_{OU}$ Tj=25°C,5 M \leq I $_{OU}$ 23 V \leq V $_{IN}$ \leq 35 V ,5 M \leq 1 \leq 23 V \leq V $_{IN}$ \leq 35 V , I_{OU} 5 M \leq 1 \leq 1 \leq 100 K d	5 to 500 UT=350mA, reuit. \$35V,I_OUT=20 \$35V,I_OUT=20 T\$500mA T\$200mA \$10UT\$350mA T=200mA	W mA min 19.2 00mA 19.0	20.0 10.0 5.0 4.9	20.8 100 50 400 200 21.0 6.0 0.8	W mV mV mV wA mA mA
Input Voltage Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load) Output Noise Voltage Ripple Rejection	VIN IOUT ics at Ta: See sy VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO Rrej	=25°C, V_{IN} =29 V , I_{O} eccified Test Ci Tj=25°C Tj=25°C,23 V \leq V $_{IN}$ Tj=25°C,5 M \leq I $_{OU}$ Tj=25°C,5 M \leq I $_{OU}$ 23 V \leq V $_{IN}$ \leq 35 V ,5 M \leq 1 \leq 23 V \leq V $_{IN}$ \leq 35 V , I_{OU} 5 M \leq 1 \leq 1 \leq 100 K d	5 to 500 UT=350mA, reuit. \$35V,IOUT=20 \$35V,IOUT=20 T\$500mA T\$200mA \$10UT\$350mA T=200mA	W mA min 19.2 DOMA DOMA 19.0	20.0 10.0 5.0	20.8 100 50 400 200 21.0 6.0 0.8	V mV mV mV V mA mA
Input Voltage Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load) Output Noise Voltage	VIN IOUT ics at Ta: See sy VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO Rrej	=25°C, V_{IN} =29V, I_{O} pecified Test Ci Tj=25°C Tj=25°C,23V \leq V_{IN} Tj=25°C,24V \leq V_{IN} Tj=25°C,5mA \leq I_{OU} 23V \leq V_{IN} \leq 35V,5mA Tj=25°C 23V \leq V_{IN} \leq 35V, I_{OU} 5mA \leq I_{OUT} \leq 350mA	5 to 500 UT=350mA, reuit. \$35V,I_OUT=20 \$35V,I_OUT=20 T\$500mA T\$200mA \$10UT\$350mA T=200mA	W mA min 19.2 00mA 19.0	20.0 10.0 5.0 4.9	20.8 100 50 400 200 21.0 6.0 0.8	W mV mV mV wA mA mA
Input Voltage Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load) Output Noise Voltage Ripple Rejection	VIN IOUT ics at Ta: See sp VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO Rrej Vdrop	=25°C,V _{IN} =29V,I _O pecified Test Ci Tj=25°C Tj=25°C,23V\(\frac{2}{3}\)V _{IN} Tj=25°C,24V\(\frac{2}{3}\)V _{IN} Tj=25°C,5mA\(\frac{2}{3}\)U _{IN} \(\frac{2}{3}\)SV,5mA Tj=25°C 23V\(\frac{2}{3}\)V _{IN} \(\frac{2}{3}\)SV,1 _{OU} 5mA\(\frac{2}{3}\)U _{IN} \(\frac{2}{3}\)SOmA 10Hz\(\frac{2}{3}\)SOmA 10Hz\(\frac{2}{3}\)U _{IN} \(\frac{2}{3}\)SOmA 10Hz\(\frac{2}{3}\)U _{IN} \(\frac{2}{3}\)SOmA 10Hz\(\frac{2}{3}\)U _{IN} \(\frac{2}{3}\)SOmA 10Hz\(\frac{2}{3}\)U _{IN} \(\frac{2}{3}\)SOmA 10Hz\(\frac{2}{3}\)U _{IN} \(\frac{2}{3}\)U _{IN} \(\frac{2}3\)U _{IN}	5 to 500 UT=350mA, reuit. \$35V,IOUT=20 \$35V,IOUT=20 T\$500mA T\$200mA \$\$IOUT\$350mA T=200mA \$\$IOUT\$350mA	W mA min 19.2 00mA 19.0	20.0 10.0 5.0 4.9 110 70 2.0	20.8 100 50 400 200 21.0 6.0 0.8	W mV mV mV mA mA mA dB dB
Input Voltage Output Current Operating Characterist Output Voltage Line Regulation Load Regulation Output Voltage Current Dissipation Current Dissipation Variation (Line) Current Dissipation Variation (Load) Output Noise Voltage Ripple Rejection Minimum Input-Output Voltage Drop	VIN IOUT ics at Ta: See sy VOUT ^Voline ^Voload VOUT ICC ^ICCline ^ICCload VNO Rrej	=25°C, V _{IN} =29V, I _O pecified Test Ci Tj=25°C Tj=25°C, 23V\(\frac{2}{2}\)V_IN Tj=25°C, 24V\(\frac{2}{2}\)V_IN Tj=25°C, 5mA\(\frac{2}{2}\)IN\(\frac{2}{2}\)SV, 5mA Tj=25°C 23V\(\frac{2}{2}\)V_IN\(\frac{2}{2}\)SOmA 10Hz\(\frac{2}{2}\)SOmA 10Hz\(\frac{2}{2}\)IOOkHz \(\frac{2}{2}\)T\(\frac{2}{2}\)SOmA	5 to 500 UT=350mA, reuit. \$35V,IOUT=20 \$35V,IOUT=20 T\$500mA T\$200mA \$\$IOUT\$350mA T=200mA \$\$IOUT\$350mA	W mA min 19.2 00mA 19.0	20.0 10.0 5.0 4.9	20.8 100 50 400 200 21.0 6.0 0.8	MV mV mV mV mV mA mA dB dB

[L78M24T]

Recommended Operating	Conditions at Ta=25°C		unit
Input Voltage	V _{IN}	27 to 35	V
Output Current	IOUT	5 to 500	mA

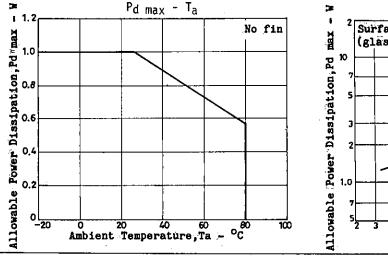
Operating Characteristics at Ta=25 $^{\rm O}$ C, V_{IN}=33V, I_{OUT}=350mA, See specified Test Circuit. unit min typ Tj=25°C Output Voltage v_{QUT} 23.0 24.0 25.0 Tj=25°C,27V\(\sqrt{V}\)\(\sqrt{1}\)\(\sqrt{2}\)\(\sqrt{1}\)\(\sqrt{2}\)\(\sqrt{1}\)\(\sqrt{2}\)\(\sqrt{3}\)\(\sqrt{1}\)\(\sqrt{2}\)\(\sqrt{2}\)\(\sqrt{3}\)\(\sqrt{1}\)\(\sqrt{2}\)\(\sqrt V Line Regulation 10.0 100 mV oline 50 5.0 mVLoad Regulation 480 mV240 mΥ Output Voltage 25.2 22.8 VOUT V Current Dissipation 6.0 5.0 mΑ Current Dissipation △Ĭ_{CCline} 27V≦V_{IN}≦35V,I_{OUT}=200mA 0.8 mΑ Variation (Line) Current Dissipation △I_{CCload} 5mA≤I_{OUT}≤350mA 0.5 mΑ Variation (Load) Output Noise Voltage V_{NO} 10Hz≤f≤100kHz 170 uV I_{OUT}=100mA I_{OUT}=300mA Ripple Rejection f=120Hz 50 ^Rrej dΒ 28V<u>S</u>V_{TN}<u>S</u>35V Tj=25°C 50 70 dB Minimum Input-Output Vdrop I_{OUT}=350mA 2.0 V Voltage Drop $Tj=25^{\circ}C$, $V_{IN}=35V$, to GND $Tj=25^{\circ}C$ Short Current 300 mA Peak Output Current Iop 0.7 A

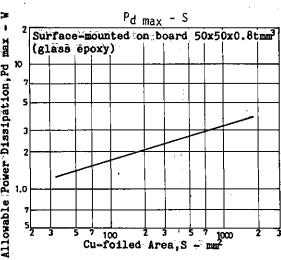
Specified Test Circuit (Common to L78M00T series)



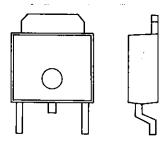
The allowable power dissipation (Pd max) is 1.0W (Ta=25°C) with no fin attached. When the L78M00T series are surface-mounted on a hybrid IC board or printed circuit board, a high allowable power dissipation can be obtained, though they are placed in a small-sized package.

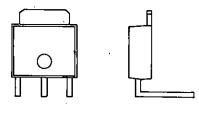
Shown below is the relationship between the Cu-foiled area and the allowable power dissipation when the L78M00T series are surface-mounted on a glass epoxy board $(50x50x0.8tmm^3)$.





Lead Formings





FA forming

LR forming

- No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/orime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.
- Anyone purchasing any products described or contained herein for an above-mentioned use shall:
 - Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use:
 - Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.