



LINEAR INTEGRATED CIRCUIT 3-TERMINAL 0.5A POSITIVE VOLTAGE REGULATOR

Description

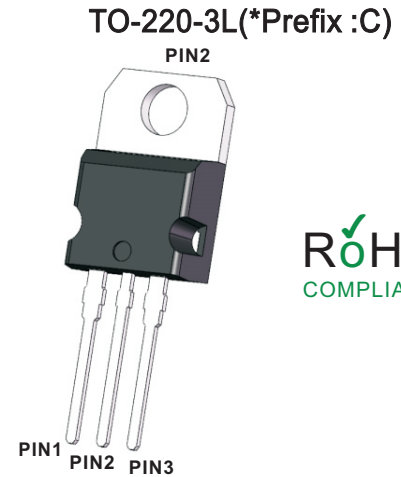
The 78MXXC family is monolithic fixed voltage regulator integrated circuit. They are suitable for applications that required supply current up to 0.5A.

Features

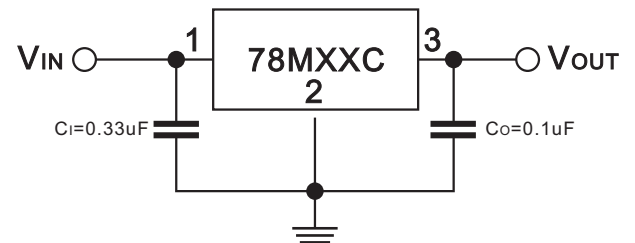
- Output current up to 0.5A
- Fixed output voltage of 5V, 6V, 8V, 9V, 12V, 15V available
- Thermal overload shutdown protection
- Output transistor SOA protection

Mechanical data

- Case: TO-220-3L
- Approx. Weight: 2.04g (0.072oz)
- Lead free finish, RoHS compliant
- Case Material: "Green" molding compound, UL flammability classification 94V-0, "Halogen-free".



APPLICATION CIRCUIT



Packing Marking And Ordering Information

Device Package	Device	Marking	Packing Type	QTY Per Tube	Inner box	Per Carton
TO-220-3L	78MXXC	78MXXC	Tube	50 Pcs	2,500 Pcs	5,000 Pcs

■ ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

PARAMETER		SYMBOLS	RATINGS	UNIT
Drain-Source Voltage	$V_{OUT}=5\sim 15V$	V_{IN}	35	V
Output Current		I_{OUT}	0.5	A
Power Dissipation		P_D	15	W
Junction Temperature		T_J	+150	°C
Operating Temperature		T_{OPR}	-40 ~ +85	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Note: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. The maximum steady state usable output current are dependent on input voltage, heat sinking, lead length of the package and copper pattern of PCB. The data are showed as electrical characteristics table represents pulse test conditions with junction temperatures specified at the initiation of test.

■ THERMAL DATA

PARAMETER	SYMBOLS	RATINGS	UNIT
Junction to Ambient	R_{thJA}	65	°C/W
Junction to Case	R_{thJC}	5	°C/W



ELECTRICAL CHARACTERISTICS

(T_J=25°C, C_I=0.33uF, C_O=0.1uF, P_D≤15W, unless otherwise specified)

78M05C(V_{IN}=10V,I_{OUT}=0.5A)

PARAMETER	SYMBOL	TEST CONDITIONS	Min	Typ	Max	UNIT
Output Voltage	V _{OUT}	V _{IN} =10V,I _{OUT} =350mA	4.8	5.00	5.2	V
		V _{IN} =7~20V, I _{OUT} =5mA~350mA	4.75		5.25	V
Load Regulation	Δ V _{OUT}	V _{IN} =10V,I _{OUT} =5mA~0.5A			100	mV
		V _{IN} =10V,I _{OUT} =5mA~0.2A			50	mV
Line Regulation	Δ V _{OUT}	V _{IN} =7~25V,I _{OUT} =200mA			100	mV
		V _{IN} =8~25V,I _{OUT} =200mA			50	mV
Quiescent Current	I _Q	I _{OUT} =350mA,V _i =10V			6.0	mA
Quiescent Current Change	Δ I _Q	V _{IN} =8~25V,I _o =200mA			0.8	mA
		I _{OUT} =5mA~350mA,V _i =10V			0.5	mA
Peak Output Current	I _{PEAK}	V _{IN} =10V		2.0		A
Short-Circuit Current	I _{sc}	V _{IN} =35V		200		mA
Dropout Voltage	V _D			2.0		V

78M06C(V_{IN}=11V,I_{OUT}=0.5A)

PARAMETER	SYMBOL	TEST CONDITIONS	Min	Typ	Max	UNIT
Output Voltage	V _{OUT}	V _{IN} =11V,I _{OUT} =350mA	5.75	6.00	6.25	V
		V _{IN} =8~21V, I _{OUT} =5mA~350mA	5.7		6.3	V
Load Regulation	Δ V _{OUT}	V _{IN} =11V,I _{OUT} =5mA~0.5A			120	mV
		V _{IN} =11V,I _{OUT} =5mA~0.2A			60	mV
Line Regulation	Δ V _{OUT}	V _{IN} =8~25V,I _{OUT} =200mA			100	mV
		V _{IN} =9~20V,I _{OUT} =200mA			50	mV
Quiescent Current	I _Q	I _{OUT} =350mA,V _i =10V			6.0	mA
Quiescent Current Change	Δ I _Q	V _{IN} =9~25V,I _o =200mA			0.8	mA
		I _{OUT} =5mA~350mA,V _i =14V			0.5	mA
Peak Output Current	I _{PEAK}	V _{IN} =10V		2.0		A
Short-Circuit Current	I _{sc}	V _{IN} =35V		200		mA
Dropout Voltage	V _D			2.0		V



78M08C(V_{IN}=14V,I_{OUT}=0.5A)

PARAMETER	SYMBOL	TEST CONDITIONS	Min	Typ	Max	UNIT
Output Voltage	V _{OUT}	V _{IN} =14V,I _{OUT} =350mA	7.7	8.00	8.3	V
		V _{IN} =10.5~23V, I _o =5mA~350mA	7.6		8.4	V
Load Regulation	Δ V _{OUT}	V _{IN} =14V,I _{OUT} =5mA~0.5A			160	mV
		V _{IN} =14V,I _{OUT} =5mA~0.2A			80	mV
Line Regulation	Δ V _{OUT}	V _{IN} =10.5~25V,I _{OUT} =200mA			100	mV
		V _{IN} =11~25V,I _{OUT} =200mA			50	mV
Quiescent Current	I _Q	I _{OUT} =350mA,V _i =14V			6.0	mA
Quiescent Current Change	Δ I _Q	V _{IN} =10.5~25V,I _o =200mA			0.8	mA
		I _{OUT} =5mA~350mA,V _i =14V			0.5	mA
Peak Output Current	I _{PEAK}	V _{IN} =10V		2.0		A
Short-Circuit Current	I _{sc}	V _{IN} =35V		200		mA
Dropout Voltage	V _D			2.0		V

78M09C(V_{IN}=16V,I_{OUT}=0.5A)

PARAMETER	SYMBOL	TEST CONDITIONS	Min	Typ	Max	UNIT
Output Voltage	V _{OUT}	V _{IN} =16V,I _{OUT} =350mA	8.73	9.00	9.27	V
		V _{IN} =11.5~24V, I _o =5mA~350mA	8.55		9.45	V
Load Regulation	Δ V _{OUT}	V _{IN} =15V,I _{OUT} =5mA~0.5A			180	mV
		V _{IN} =15V,I _{OUT} =5mA~0.2A			90	mV
Line Regulation	Δ V _{OUT}	V _{IN} =11.5~25V,I _{OUT} =200mA			100	mV
		V _{IN} =12~25V,I _{OUT} =200mA			50	mV
Quiescent Current	I _Q	I _{OUT} =350mA,V _i =10V			6.0	mA
Quiescent Current Change	Δ I _Q	V _{IN} =11.5~25V,I _o =200mA			0.8	mA
		I _{OUT} =5mA~350mA,V _i =15V			0.5	mA
Peak Output Current	I _{PEAK}	V _{IN} =10V		2.0		A
Short-Circuit Current	I _{sc}	V _{IN} =35V		200		mA
Dropout Voltage	V _D			2.0		V



78M12C(V_{IN}=19V,I_{OUT}=0.5A)

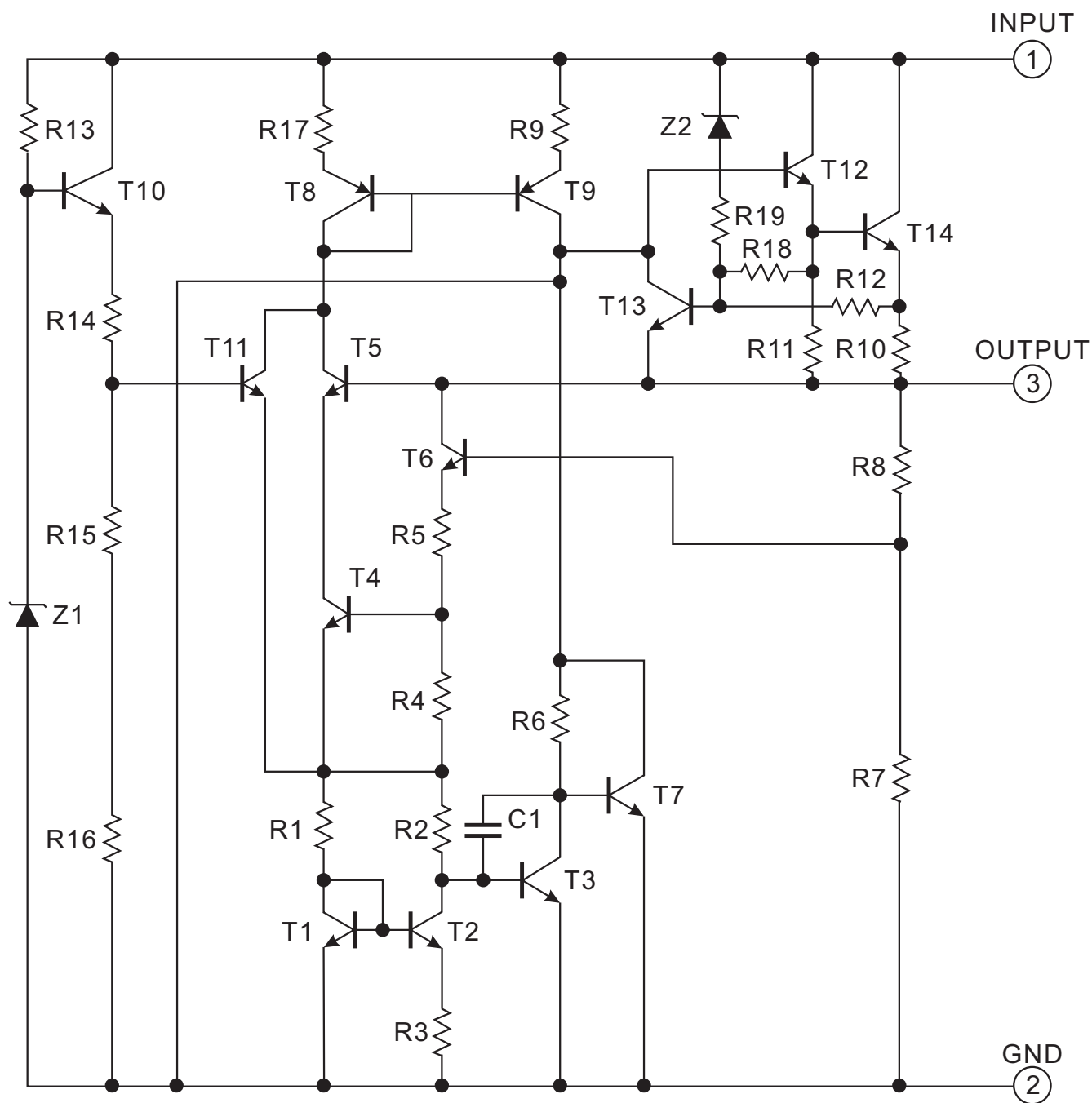
PARAMETER	SYMBOL	TEST CONDITIONS	Min	Typ	Max	UNIT
Output Voltage	V _{OUT}	V _{IN} =19V,I _{OUT} =350mA	11.5	12.0	12.5	V
		V _{IN} =14.5~27V, I _o =5mA~350mA	11.4		12.6	V
Load Regulation	Δ V _{OUT}	V _{IN} =19V,I _{OUT} =5mA~0.5A			240	mV
		V _{IN} =19V,I _{OUT} =5mA~0.2A			120	mV
Line Regulation	Δ V _{OUT}	V _{IN} =14.5~30V,I _{OUT} =200mA			100	mV
		V _{IN} =16~30V,I _{OUT} =200mA			50	mV
Quiescent Current	I _Q	I _{OUT} =350mA, V _i =19V			6.0	mA
Quiescent Current Change	Δ I _Q	V _{IN} =14.5~30V,I _o =200mA			0.8	mA
		I _{OUT} =5mA~350mA, V _i =19V			0.5	mA
Peak Output Current	I _{PEAK}	V _{IN} =10V		2.0		A
Short-Circuit Current	I _{SC}	V _{IN} =35V		200		mA
Dropout Voltage	V _D			2.0		V

78M15C(V_{IN}=23V,I_{OUT}=0.5A)

PARAMETER	SYMBOL	TEST CONDITIONS	Min	Typ	Max	UNIT
Output Voltage	V _{OUT}	V _{IN} =23V,I _{OUT} =350mA	14.5	15.0	15.5	V
		V _{IN} =17.5~30V, I _o =5mA~350mA	14.4		15.6	V
Load Regulation	Δ V _{OUT}	V _{IN} =23V,I _{OUT} =5mA~0.5A			300	mV
		V _{IN} =23V,I _{OUT} =5mA~0.2A			150	mV
Line Regulation	Δ V _{OUT}	V _{IN} =17.5~30V,I _{OUT} =200mA			100	mV
		V _{IN} =20~30V,I _{OUT} =200mA			50	mV
Quiescent Current	I _Q	I _{OUT} =350mA, V _i =23V			6.0	mA
Quiescent Current Change	Δ I _Q	V _{IN} =17.5~30V,I _o =200mA			0.8	mA
		I _{OUT} =5mA~350mA, V _i =23V			0.5	mA
Peak Output Current	I _{PEAK}	V _{IN} =10V		2.0		A
Short-Circuit Current	I _{SC}	V _{IN} =35V		200		mA
Dropout Voltage	V _D			2.0		V



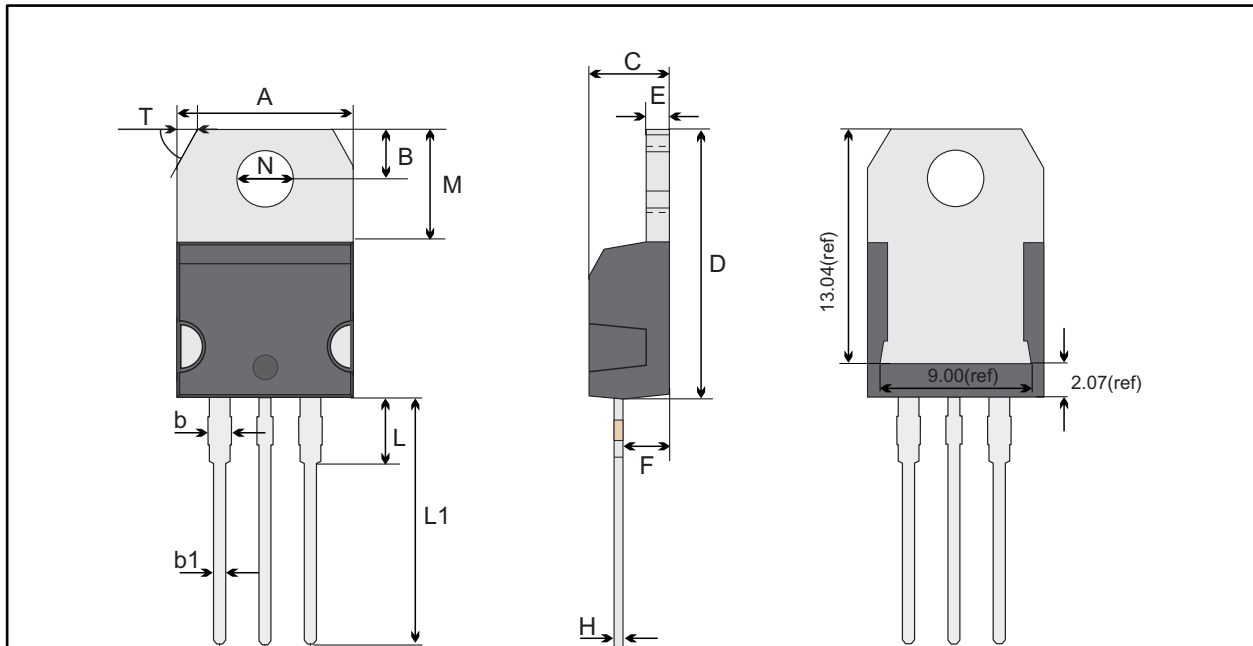
■ Test Circuits





Package Outline
Through Hole Package ; 3 leads

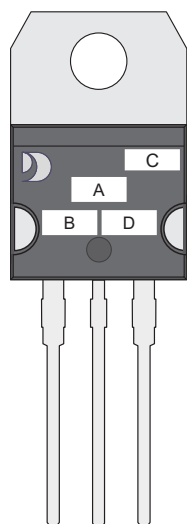
TO-220-3L



TO-220-3L mechanical data

UNIT		A	B	b	b1	C	D	E	F	G	H	L	L1	M	N	T
mm	max	10.28	2.84	1.67	0.9	4.65	15.54	1.37	2.79	2.64	0.6	3.88	13.13	6.39	3.82 typ.	1.19 58° ref.
	typ	10.18	2.74	1.47	0.8	4.45	15.34	1.27	2.59	2.54	0.5	3.68	12.93	6.19		
	min	10.08	2.64	1.27	0.7	4.25	15.14	1.17	2.39	2.44	0.4	3.48	12.73	5.99		
mil	max	405	112	66	35	183	612	54	110	104	24	153	517	252	150 typ.	47 58° ref.
	typ	401	108	58	31	175	604	50	102	100	20	145	509	244		
	min	397	104	50	28	167	596	46	94	92	16	137	501	236		

Marking Diagram



- Unmarkable Surfacea
- Marking Composition Field
- a: Ejector Pin Mark
- A: Marking Area
- B: Lot Code
- C: Additional Information
- D: Date Code (YWW)
- Y: Years(0~9)
- WW: Week



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