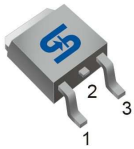


**TO-252
(DPAK)**

Pin Definition:

1. Input
2. Ground (tab)
3. Output

General Description

The TS78M05A Series positive voltage regulators are identical to the popular TS7805 Series devices, except that they are specified for only half the output current. Like the TS7805 devices, the TS78M05A Series 3-Terminal regulators are intended for local, on-card voltage regulation.

Internal current limiting, thermal shutdown circuitry and safe-area compensation for the internal pass transistor combine to make these devices remarkably rugged under most operating conditions. Maximum output current with adequate heatsink is 500mA

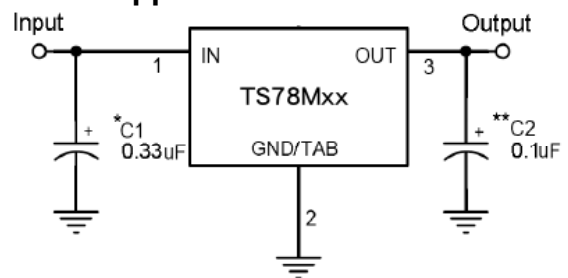
Features

- Output Voltage 5V
- Output current up to 500mA
- Internal thermal overload protection
- Internal short-circuit current limiting
- Output transistor safe-area compensation
- Output voltage offered in 2% tolerance

Ordering Information

Part No.	Package	Packing
TS78M05ACP RO	TO-252	2.5Kpcs / 13" Reel

Standard Application Circuit



A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0V above the output voltage even during the low point on the Input ripple voltage.

XX = these two digits of the type number indicate voltage.

* = C_{in} is required if regulator is located an appreciable distance from power supply filter.

** = C_o is not needed for stability; however, it does improve transient response.

Absolute Maximum Rating (T_a = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Input Voltage	V _{IN} *	35	V
Power Dissipation	P _D	Internal Limited	W
Operating Junction Temperature	T _J	0~+125	°C
Storage Temperature Range	T _{STG}	-65~+150	°C
Thermal Resistance - Junction to Case	R θ _{JC}	8	°C/W
Thermal Resistance - Junction to Ambient	R θ _{JA}	100	°C/W

TS78M05A Electrical Characteristics

($V_{in}=10V$, $I_{out}=350mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$, $C_{in}=0.33\mu F$, $C_{out}=0.1\mu F$; unless otherwise specified.)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Output voltage	V_{out}	$T_j=25^{\circ}C$		4.90	5	5.10	V
		$7.5V \leq V_{in} \leq 20V$, $5mA \leq I_{out} \leq 350mA$		4.80	5	5.20	
Line Regulation	REG _{line}	$T_j=25^{\circ}C$	$7.5V \leq V_{in} \leq 25V$	--	3	100	mV
			$8V \leq V_{in} \leq 12V$	--	1	50	
Load Regulation	REG _{load}	$T_j=25^{\circ}C$	$5mA \leq I_{out} \leq 500mA$	--	15	100	
			$5mA \leq I_{out} \leq 200mA$	--	5	50	
Quiescent Current	I_q	$I_{out}=0$, $T_j=25^{\circ}C$		--	3	6	mA
Quiescent Current Change	ΔI_q	$7.5V \leq V_{in} \leq 25V$		--	--	0.8	
		$5mA \leq I_{out} \leq 350mA$		--	--	0.5	
Output Noise Voltage	V_n	$10Hz \leq f \leq 100KHz$, $T_j=25^{\circ}C$		--	40	--	μV
Ripple Rejection Ratio	RR	$f=120Hz$, $8V \leq V_{in} \leq 18V$		62	78	--	dB
Voltage Drop	V_{drop}	$I_{out}=500mA$, $T_j=25^{\circ}C$		--	2	--	V
Output Resistance	R_{out}	$f=1KHz$		--	17	--	$m\Omega$
Output Short Circuit Current	I_{os}	$T_j=25^{\circ}C$		--	50	--	mA
Peak Output Current	$I_{o peak}$	$T_j=25^{\circ}C$		--	0.7	--	A
Temperature Coefficient of Output Voltage	$\Delta V_{out} / \Delta T_j$	$I_{out}=5mA$, $0^{\circ}C \leq T_j \leq 125^{\circ}C$		--	-0.2	--	$mV/^{\circ}C$

Electrical Characteristics Curve

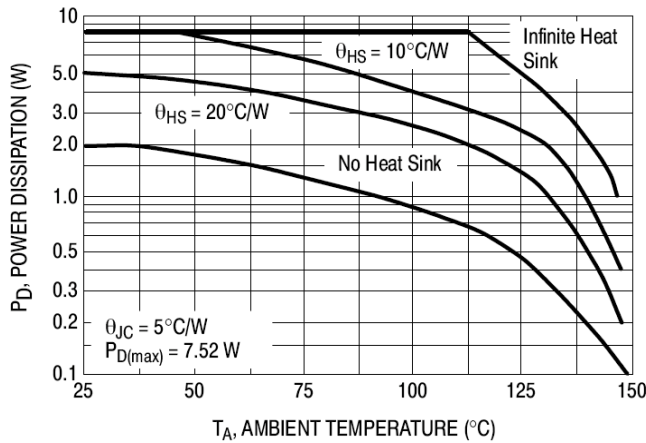


Figure 1. Worst Case Power Dissipation vs. Ambient Temperature (TO-220)

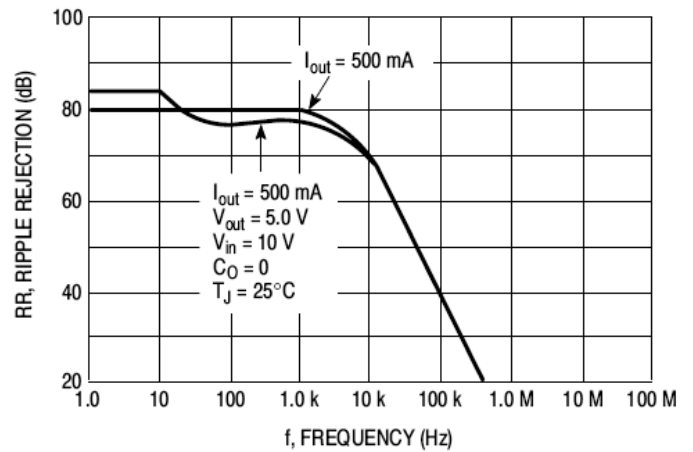


Figure 3. Ripple Rejection vs. Frequency

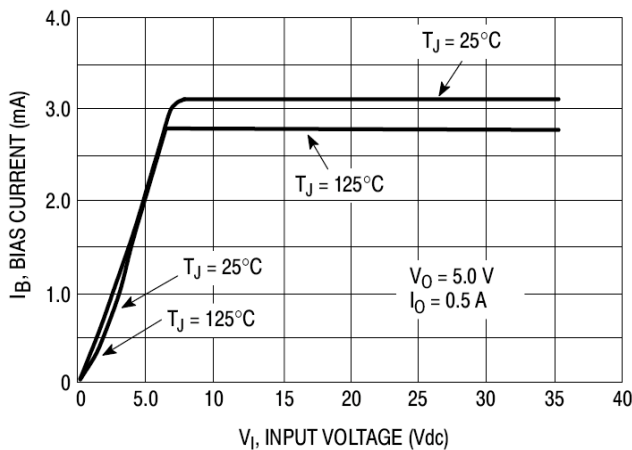


Figure 3. Bias Current vs. Input Voltage

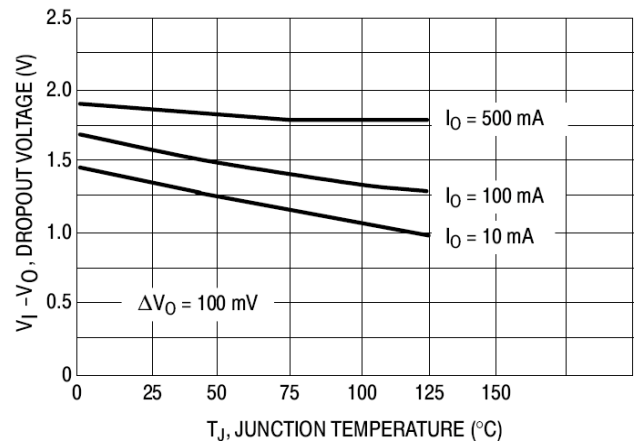


Figure 4. Dropout Voltage vs. Junction Temperature

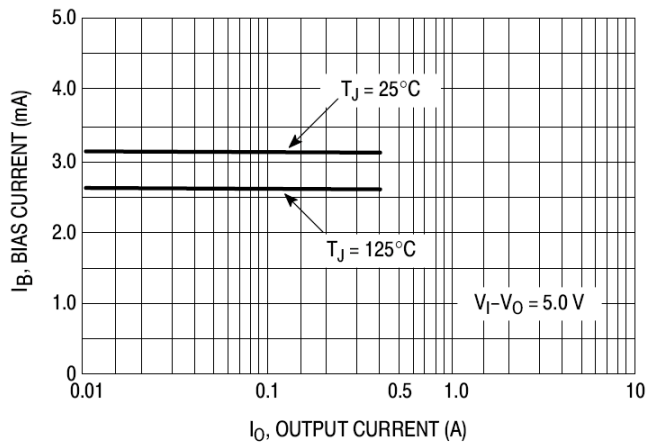
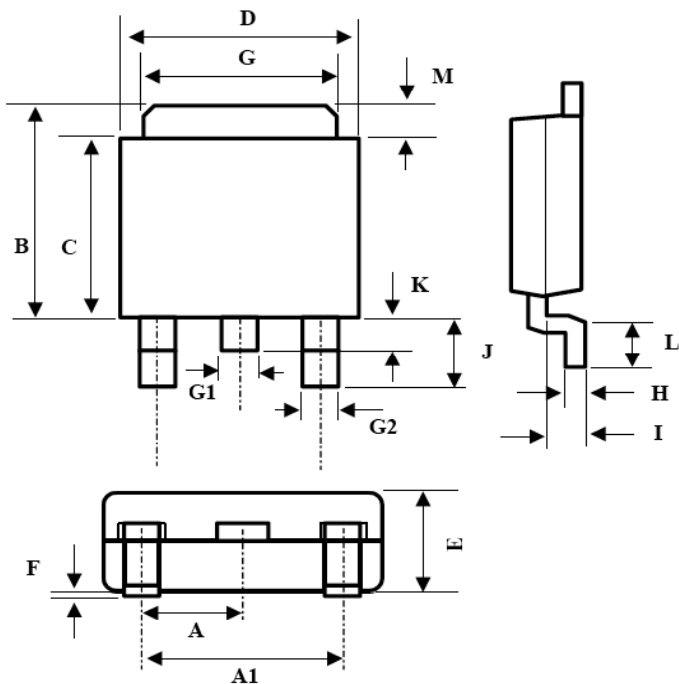


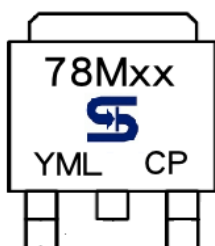
Figure 5. Bias Current vs. Output Current

TO-252 Mechanical Drawing



TO-252 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.3BSC		0.09BSC	
A1	4.6BSC		0.18BSC	
B	6.80	7.20	0.268	0.283
C	5.40	5.60	0.213	0.220
D	6.40	6.65	0.252	0.262
E	2.20	2.40	0.087	0.094
F	0.00	0.20	0.000	0.008
G	5.20	5.40	0.205	0.213
G1	0.75	0.85	0.030	0.033
G2	0.55	0.65	0.022	0.026
H	0.35	0.65	0.014	0.026
I	0.90	1.50	0.035	0.059
J	2.20	2.80	0.087	0.110
K	0.50	1.10	0.020	0.043
L	0.90	1.50	0.035	0.059
M	1.30	1.70	0.051	0.67

Marking Diagram



- XX = Output Voltage
(05=5V)
- Y = Year Code
- M = Month Code
(A=Jan, B=Feb, C=Mar, D=Apr, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
- L = Lot Code
- CP = Package Code for TO-252

TS78M05A

3-Terminal 500mA Positive Voltage Regulator

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