BM78M05A

3-TERMINAL POSITIVE VOLTAGE REGULATORS

Features

- Maximum Output Current of 1A (Tc=25°C)
- Internal Short-Circuit Current Limiting
- Internal Thermal Overload Protection
- 3% Output Tolerance
- TO252 Package

Applications

- PC
- Car electronics

Description

BM78M05A regulators employ internal current-limiting and thermal-shutdown, making them essentially indestructible. They can deliver up to 1000mA output current.

BM78M05A can continuously output 1.0A when +8V input

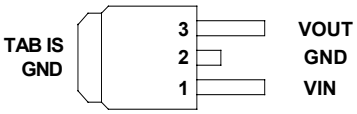
BM78M05A can output larger current than CJ78M05.

BM78M05A can have better regulation output volatge in 4%

Halogen free & PB free

Pin Assignment

TO-252 FRONT VIEW

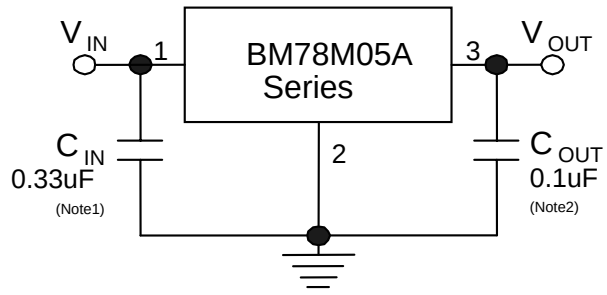


Ordering Information

BM78M05A	1.0A	TO252-2

The marking is BM78M05A , in datacode, it is abcdef(ab=year, cd=weeks, ef=producing number)

Typical Application



Note 1: C_{IN} is required if regulator is located an appreciable distance from power supply filter.

Note 2: C_{OUT} is needed for stability; and it also does improve transient response. Values of less than 0.1uF could cause instability.

Note 3: When choose BM78M05A for tuner in LCD-TV, Cin>10uF , Cout > 10uF , and keep the cap close to BM78M05A to get better ripple.

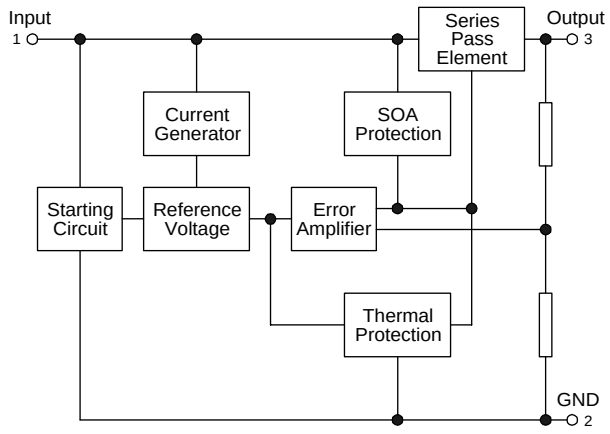
Absolute Maximum Ratings

(Ta=25°C, Unles Otherwise Specified)

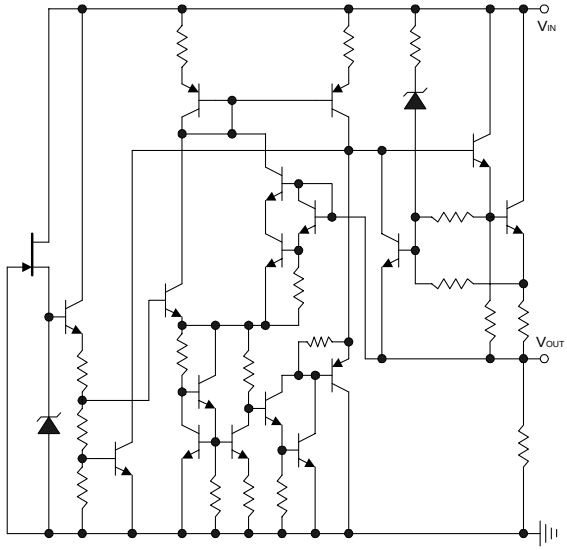
Characteristic	Symbol	Rating		Unit
Input Voltage	V_{IN}	+37		V
Power Dissipation	P_D	TO252	3.0	W
Operating Temperature	T_{opr}	-20 to 85		°C
Storage Temperature	T_{stg}	-55 to 150		°C
Junction Temperature	T_j	150		°C
Thermal Resistance	$R_{th(j-a)}$	208		°C/W

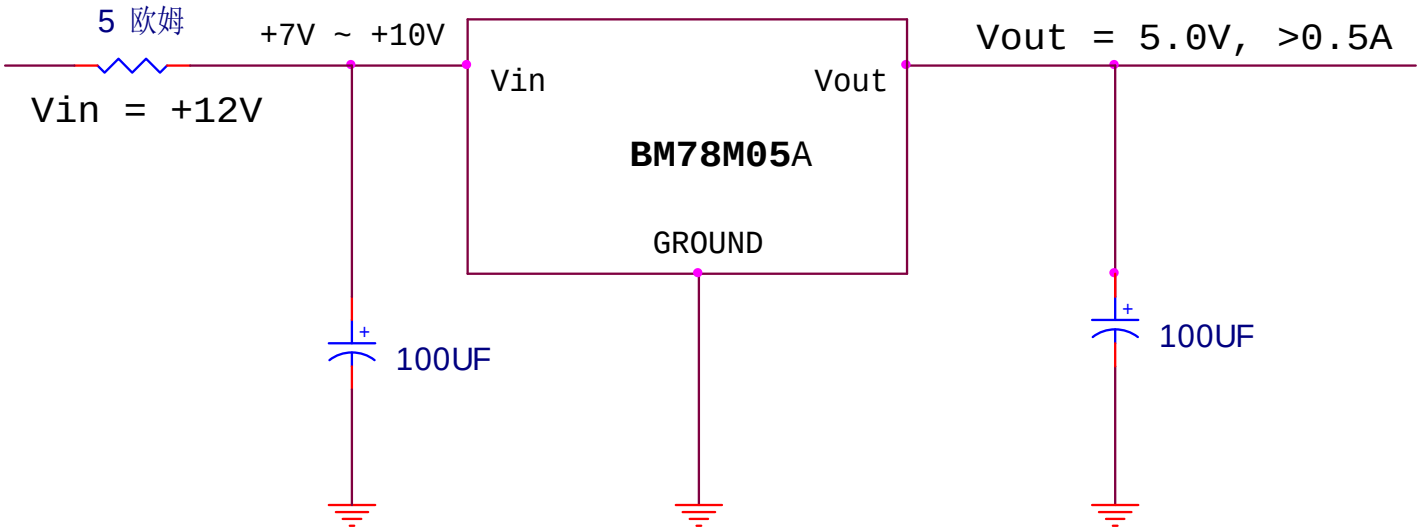
Schematic Diagram & Equivalent Circuit

Schematic Diagram



Equivalent Circuit





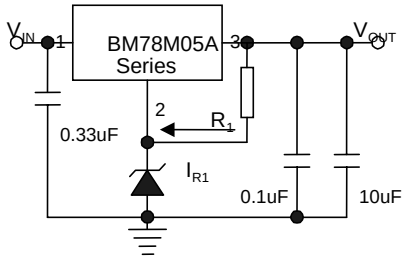
Electrical Characteristics

V_{IN}=10V, I_{OUT}=40mA, C_{IN}=0.33uF, C_{OUT}=0.1uF, 0°C≤T_j≤125°C

Symbol	Parameter	Conditions	BM78M05A			Units
			Min	Typ	Max	
V_O	Output Voltage	T_j=25°C	4.80	5	5.2	V
		1mA≤I_{OUT}≤800mA	4.80	5	5.2	
		7V≤V_{IN}≤18V, 1mA≤I_{OUT}≤40mA				
Reg_{line}	Line Regulation	T_j=25°C, 7V≤V_{IN}≤18V	-	15	150	mV
		T_j=25°C, 8V≤V_{IN}≤18V	-	15	100	
Reg_{load}	Load Regulation	T_j=25°C, 1mA≤I_{OUT}≤500mA	-	11	60	mV
		T_j=25°C, 1mA≤I_{OUT}≤40mA	-	5	30	
I_B	Quiescent Current	I_{OUT}=5mA, T_j=25°C	-	8	10	mA
ΔI_B	Quiescent Current Change	8V≤V_{IN}≤18V, T_j=25°C	-	-	1.5	mA
		1mA≤I_{OUT}≤40mA, T_j=25°C	-	-	0.1	
V_N	Output Noise Voltage	10Hz≤f≤100KHz, T_j=25°C	-	40	-	uVrms
RR	Ripple Rejection	8V≤V_{IN}≤18V, f=120Hz, T_j=25°C	41	49	-	dB
V_D	Dropout Voltage	T_j=25°C, I_{OUT}=100mA	1.7	2.5		V
R_O	Output Resistance	f=1KHz	-	17	-	mΩ
I_{SC}	Short Circuit Current	V_{IN}=10V, T_j=25°C	-	1.5	2	A
T_{CVO}	Average Temperature Coefficient of Output Voltage	I_{OUT}=5mA	-	-	0.6	mV/°C

Application Circuits

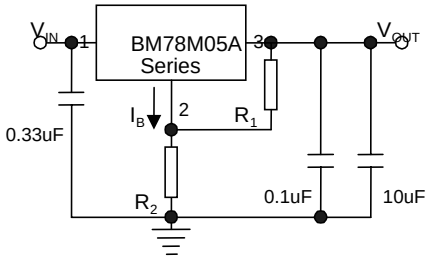
Constant Current Regulator



$V_{OUT}=V_{OUT(IC)}+V_Z$

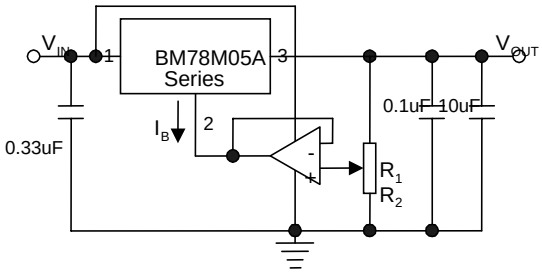
$I_1=V_{OUT(IC)}/R_1$

Circuit for Increasing Output Voltage



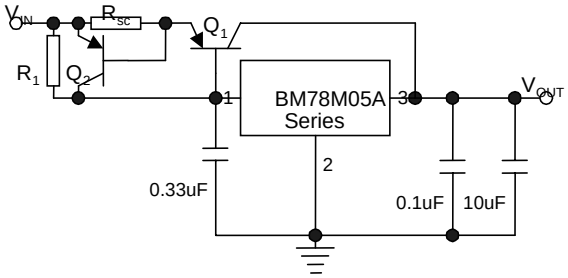
$V_{OUT}=V_{OUT(IC)}(1+R_2/R_1)+R_2*I_B$

Adjustable Output Regulator



$V_{OUT}=V_{OUT(IC)}(1+R_2/R_1)$

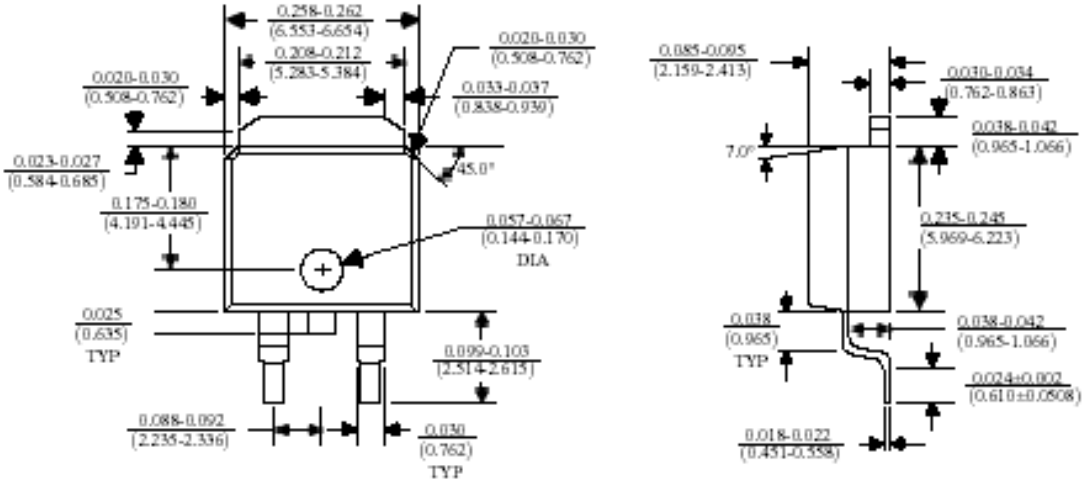
High Output Current with Short-circuit Protection



$R_1 \leq V_{BE1}/I_{B(max)}$

$R_{SC}=V_{BE2}/I_{SC}$, I_{SC}: Short-Circuit Current

TO252-2 Dimension

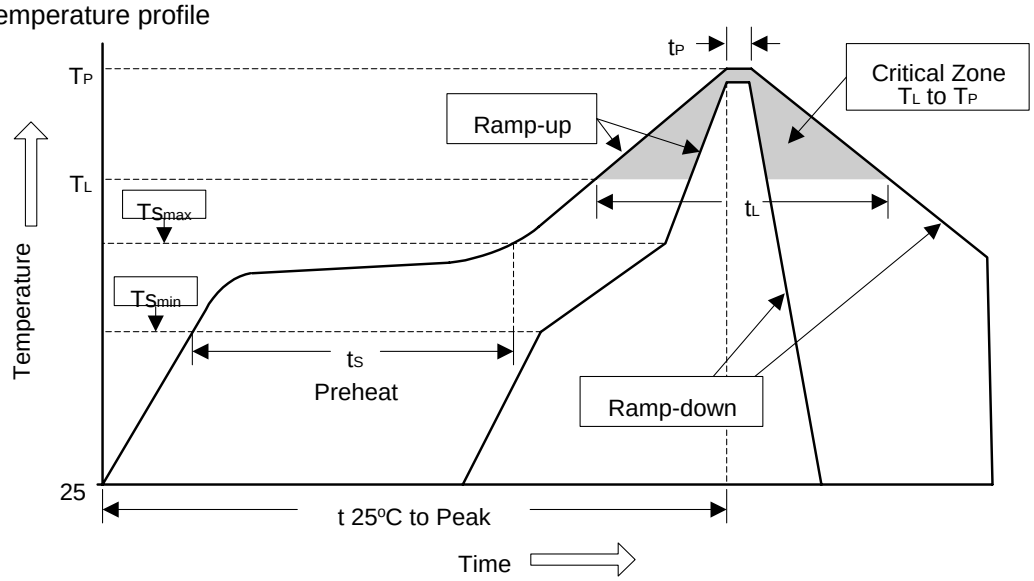


Soldering Methods

1. Storage environment: Temperature=10°C~35°C Humidity=65%±15%

2. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	<3°C/sec	<3°C/sec
Preheat - Temperature Min (Ts_{min}) - Temperature Max (Ts_{max}) - Time (min to max) (ts)	 100°C 150°C 60~120 sec	 150°C 200°C 60~180 sec
Tsmax to T_L - Ramp-up Rate	 <3°C/sec	 <3°C/sec
Time maintained above: - Temperature (T_L) - Time (t_L)	 183°C 60~150 sec	 217°C 60~150 sec
Peak Temperature (T_P)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (t_P)	10~30 sec	20~40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak temperature	Dipping time
Pb devices. STOPPED		
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec