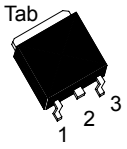
7805A

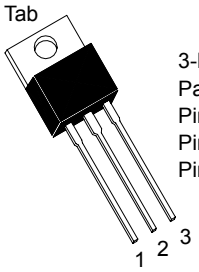
3- Terminal Positive Voltage Regulators

7805AJ Pin Assignment



3-Lead Plastic **TO-252**
Package Code: J
Pin 1: V_{IN}
Pin 2 & Tab: GND
Pin 3: V_{OUT}

7805AE Pin Assignment



3-Lead Plastic **TO-220AB**
Package Code: E
Pin 1: V_{IN}
Pin 2 & Tab: GND
Pin 3: V_{OUT}

Description

The 7805A can provide local on-card regulation, eliminating the distribution problems associated with single point regulation. Each employs internal current limiting, thermal shut-down and safe operating area protection, making it essen-tially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents.

Features

- Output Current In Excess of 1A
- Output Voltage of 5V
- Internal Short-Circuit Current Limiting & Thermal Overload Protection
- Guaranteed In Extended Temperature Range

Absolute Maximum Ratings (T_A=25°C)

Characteristic	Symbol	Rating	Unit
Input Voltage	V_{IN}	40	V
Power Dissipation	P_D	Internally limited (Note)	
Operating Temperature	T_{opr}	-30 to 85	°C
Storage Temperature	T_{stg}	-55 to 150	°C
Junction Temperature	T_j	150	°C

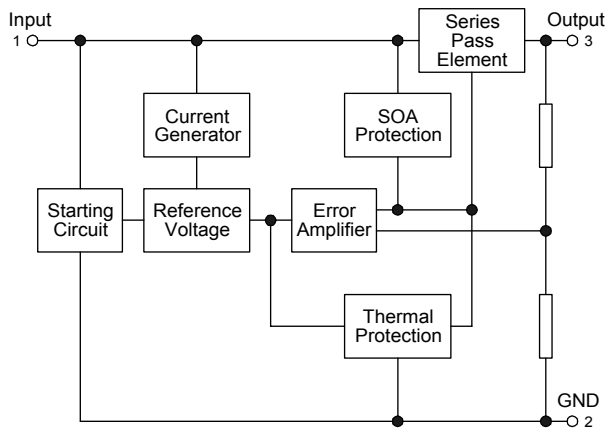
Note: (1)T_A=25°C, , TO-252: 1W, TO-220AB: 2.7W
(2)T_C=25°C, All package: 10W

Thermal Data

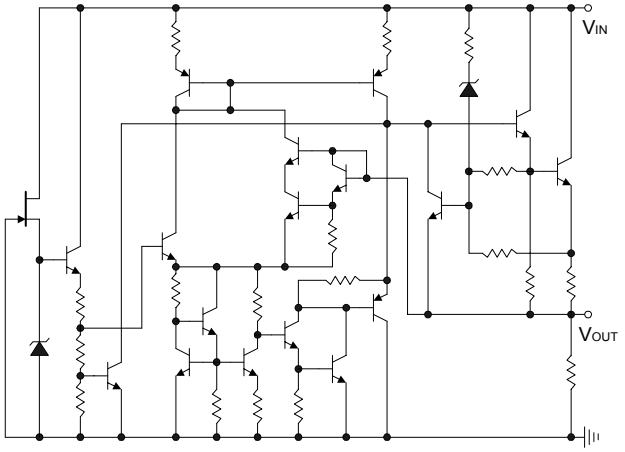
Characteristic	Symbol	TO-252	TO-220AB	Unit
Thermal Resistance Junction-Case	$R_{th(j-c)}$	12.5	12.5	°C/W
Thermal Resistance Junction-Ambient	$R_{th(j-a)}$	125	47	°C/W

Schematic Diagram & Equivalent Circuit

Schematic Diagram



Equivalent Circuit

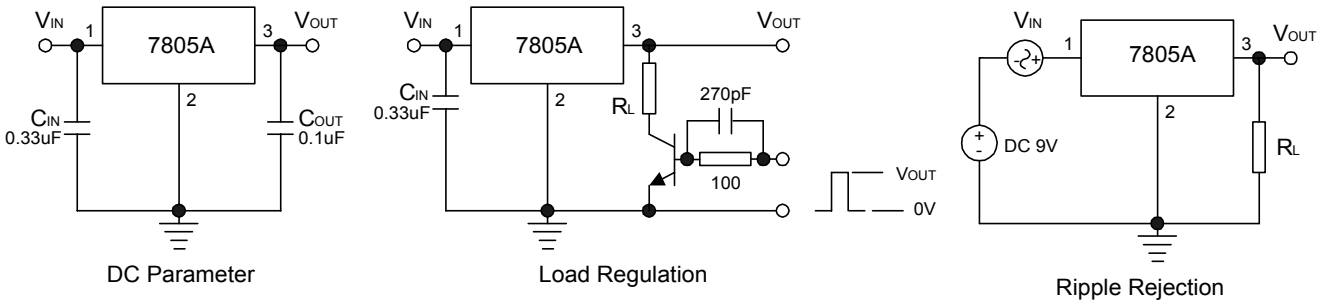


7805A Series Electrical Characteristics

V_{IN}=10V, I_{OUT}=500mA, C_{IN}=0.33uF, C_{OUT}=0.1uF, 0°C≤T_J≤125°C (unless otherwise specified)

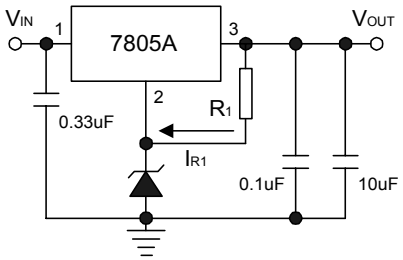
Symbol	Parameter	Conditions	7805AJ/AE			Units
			Min	Typ	Max	
V_O	Output Voltage	T_J=25°C, I_{OUT}=500mA	4.85	5	5.15	V
		5mA≤I_{OUT}≤1A	4.85	5	5.15	
		7V≤V_{IN}≤25V, P_{OUT}≤15W				
ΔV_O	Line Regulation	T_J=25°C, 7V≤V_{IN}≤25V	-	3	50	mV
		T_J=25°C, 8V≤V_{IN}≤12V	-	1	25	
ΔV_O	Load Regulation	T_J=25°C, 5mA≤I_{OUT}≤1A	-	15	100	mV
		T_J=25°C, 250mA≤I_{OUT}≤750mA	-	5	50	
I_B	Quiescent Current	I_{OUT}=5mA, T_J=25°C	-	3.9	8	mA
ΔI_B	Quiescent Current Change	I_{OUT}=500mA, 7V≤V_{IN}≤25V, T_J=25°C	-	-	1.3	mA
		5mA≤I_{OUT}≤1A, V_{IN}=10V, T_J=25°C	-	-	0.5	
eN	Output Noise Voltage	B=10Hz~100KHz, I_{OUT}=50mA, T_J=25°C	-	50	-	uV/V_O
RR	Ripple Rejection	10V≤V_{IN}≤18V, f=120Hz, I_{OUT}=50mA, T_J=25°C	57	73	-	dB
V_D	Dropout Voltage	T_J=25°C, I_{OUT}=1A	-	2	2.5	V
R_O	Output Resistance	f=1KHz	-	17	-	mΩ
I_{SC}	Short Circuit Current	T_J=25°C	-	2.3	2.8	A
$\Delta V_O/\Delta T$	Output Voltage Drift	0°C≤T_J≤125°C	-	-	0.6	mV/°C

Test Circuits



Application Circuits

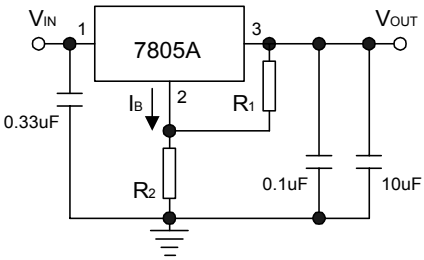
Constant Current Regulator



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

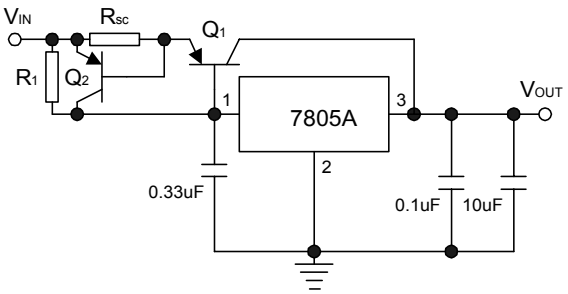
$I_1=V_{OUT(IC)}/R_1$

Circuit for Increasing Output Voltage



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

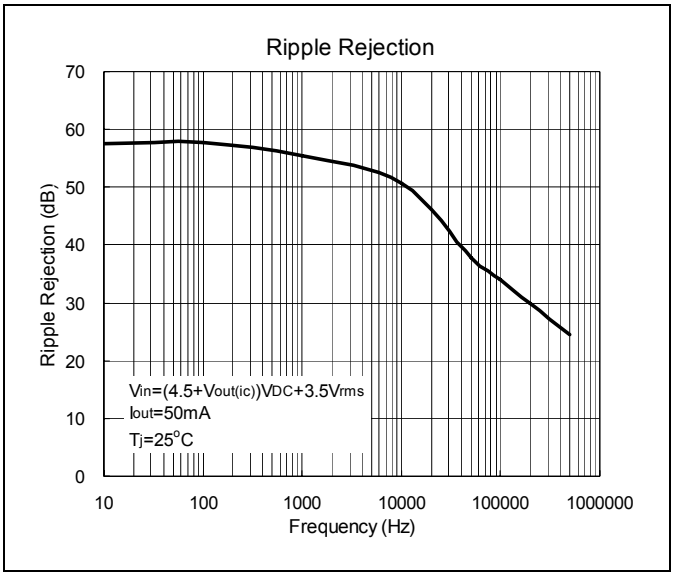
High Output Current with Short-circuit Protection

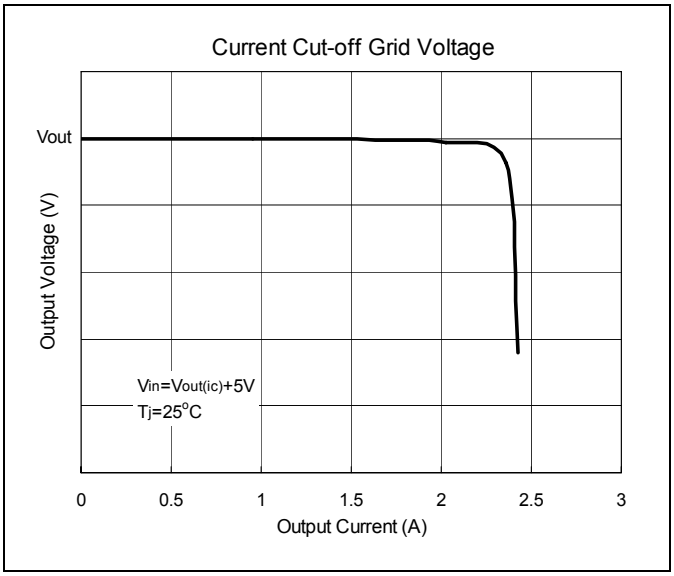


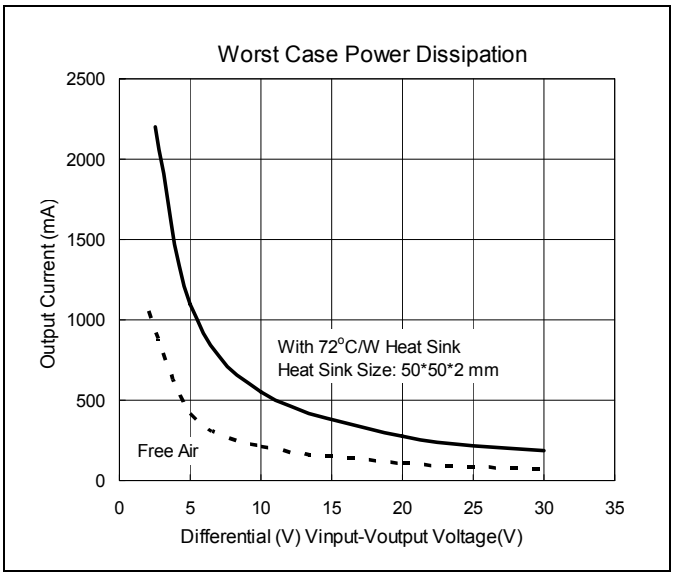
$R_1 \le V_{BE1}/I_{B(max)}$

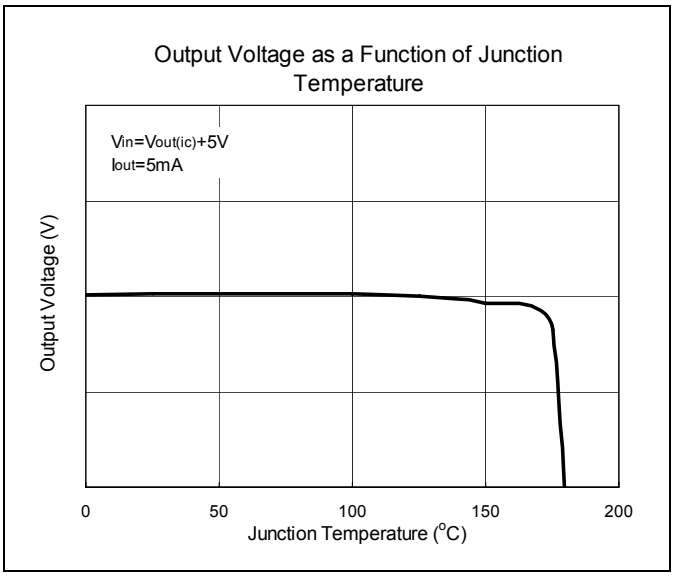
$R_{SC}=V_{BE2}/I_{SC}$, I_{SC}: Short-Circuit Current

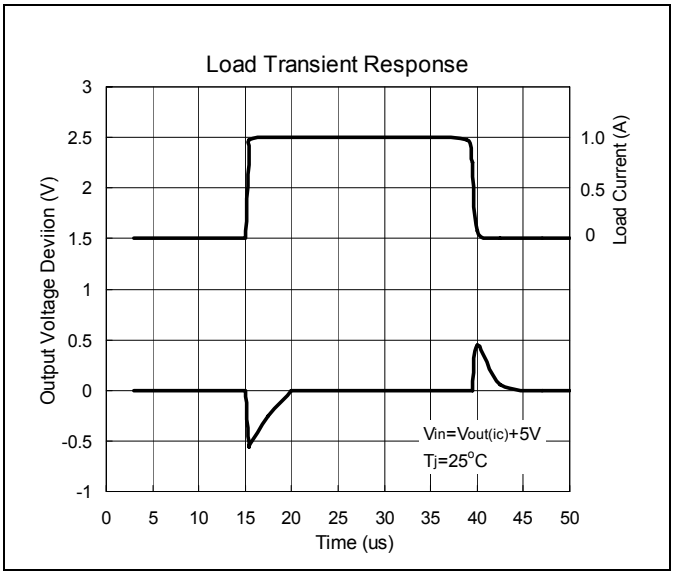
Characteristics Curve

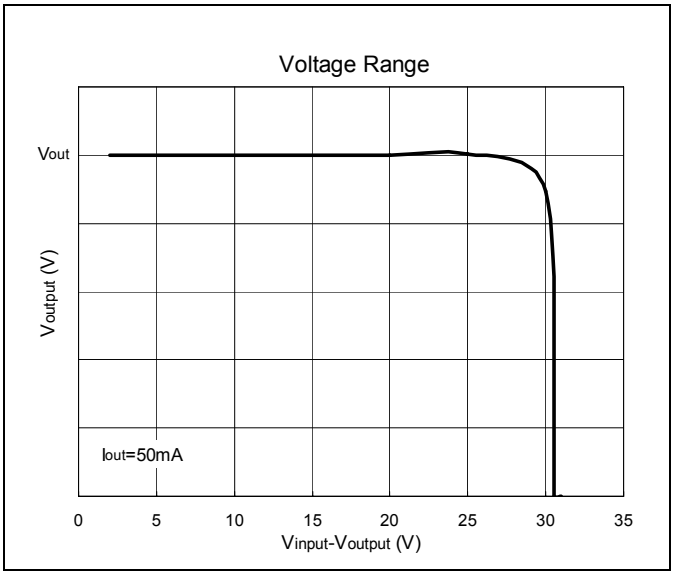




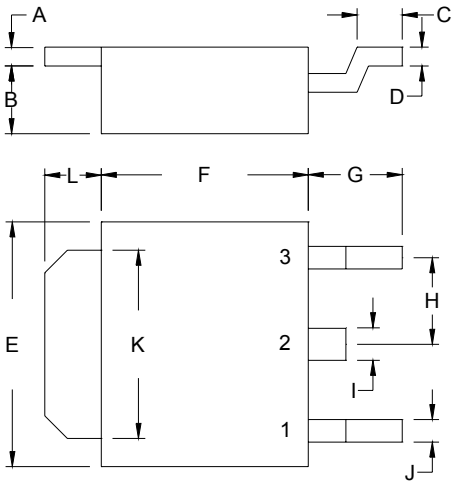




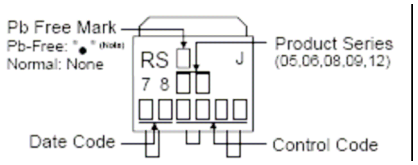




TO-252 Dimension



Marking:



Note: Green label is used for pb-free packing

Pin Style: 1.Input 2.Ground 3.Output

Material:
- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

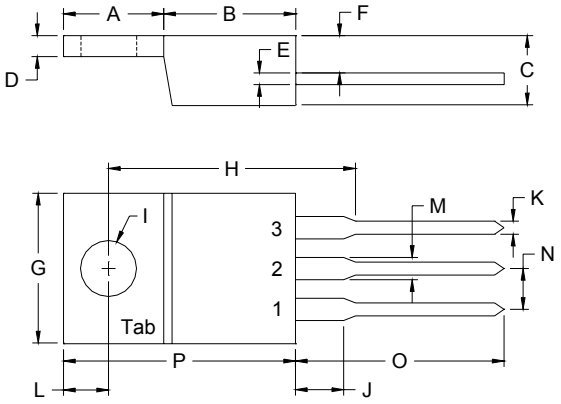
DIM	Min.	Max.
A	0.45	0.55
B	1.70	1.90
C	0.90	1.50
D	0.45	0.60
E	6.40	6.80
F	5.40	5.80
G	2.20	2.80
H	-	*2.30
I	0.70	0.90
J	-	0.90
K	5.20	5.50
L	1.40	1.60

*: Typical, Unit: mm

3-Lead TO-252 Plastic
Surface Mount Package
Package Code: J

Now all products are Pb-Free Packaged

TO-220AB Dimension



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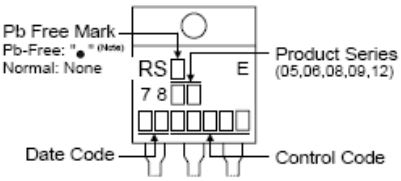


Note: Green label is used for pb-free packing

Pin Style: 1.Input 2.Ground 3.Output

Material:
- Lead solder plating: Sn60/Pb40 (Normal), Sn/3.0Ag/0.5Cu or Pure-Tin (Pb-free)
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

DIM	Min.	Max.
A	5.58	7.49
B	8.38	8.90
C	4.40	4.70
D	1.15	1.39
E	0.35	0.60
F	2.03	2.92
G	9.66	10.28
H	-	*16.25
I	-	*3.83
J	3.00	4.00
K	0.75	0.95
L	2.54	3.42
M	1.14	1.40
N	-	*2.54
O	12.70	14.27
P	14.48	15.87

*: Typical, Unit: mm

3-Lead TO-220AB
Plastic Package
Package Code: E

Now all products are Pb-Free Packaged

Ordering Information

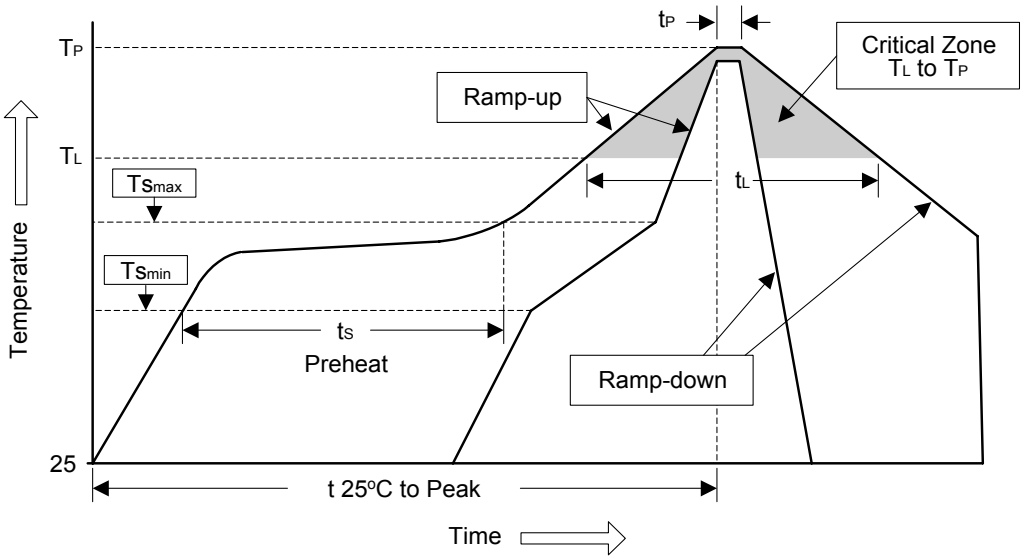
Part Number	V_{OUT}:	Package
7805AJ	5V±0.15V	TO-252
7805AE	5V±0.15V	TO-220AB

Soldering Methods for Orister's Products

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.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec