Advanced Analog Circuits

Preliminary Datasheet

1A 3-TERMINAL POSITIVE VOLTAGE REGULATOR AS7805A

General Description

The AS7805A is a three terminal positive regulator designed for a wide variety of applications including local, on-card regulation.

The AS7805A is complete with internal current limiting, thermal shutdown protection, and safe-area compensation which make it virtually immune from output overload. If adequate heat sinking is provided, this IC can deliver output current up to 1A.

The AS7805A is available in TO-220-3 and TO-252-2 (1) packages.

Features

- Output Current up to 1A
- Fixed Output Voltage of 5V
- Output Voltage Accuracy of ±4% over the Full Temperature Range
- Internal Short Circuit Current Limiting
- Internal Thermal Overload Protection
- Output Transistor Safe-area Protection
- Low Load Regulation
- Stable Performance in High Temperature

Applications

- High Efficiency Linear Regulator
- Post Regulation for Switching Supply
- Microprocessor Power Supply
- Mother Board

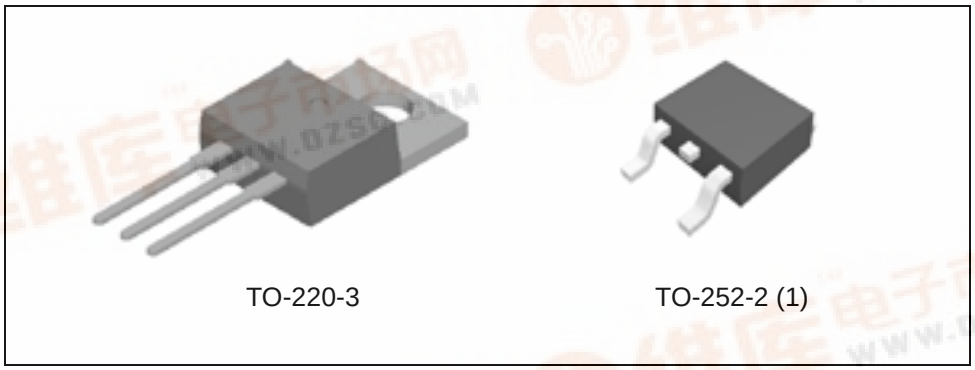
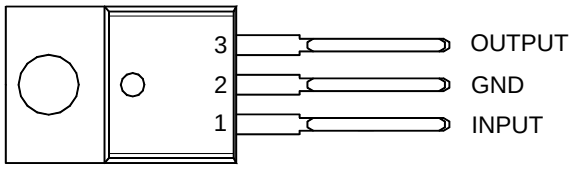


Figure 1. Package Types of AS7805A

1A 3-TERMINAL POSITIVE VOLTAGE REGULATOR AS7805A

Pin Configuration

T Package
(TO-220-3)



D Package
(TO-252-2 (1))

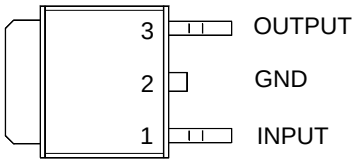


Figure 2. Pin Configuration of AS7805A (Top View)

Pin Description

Pin Number	Pin Name	Function
1	INPUT	Voltage Input
2	GND	Ground
3	OUTPUT	Voltage Output

Functional Block Diagram

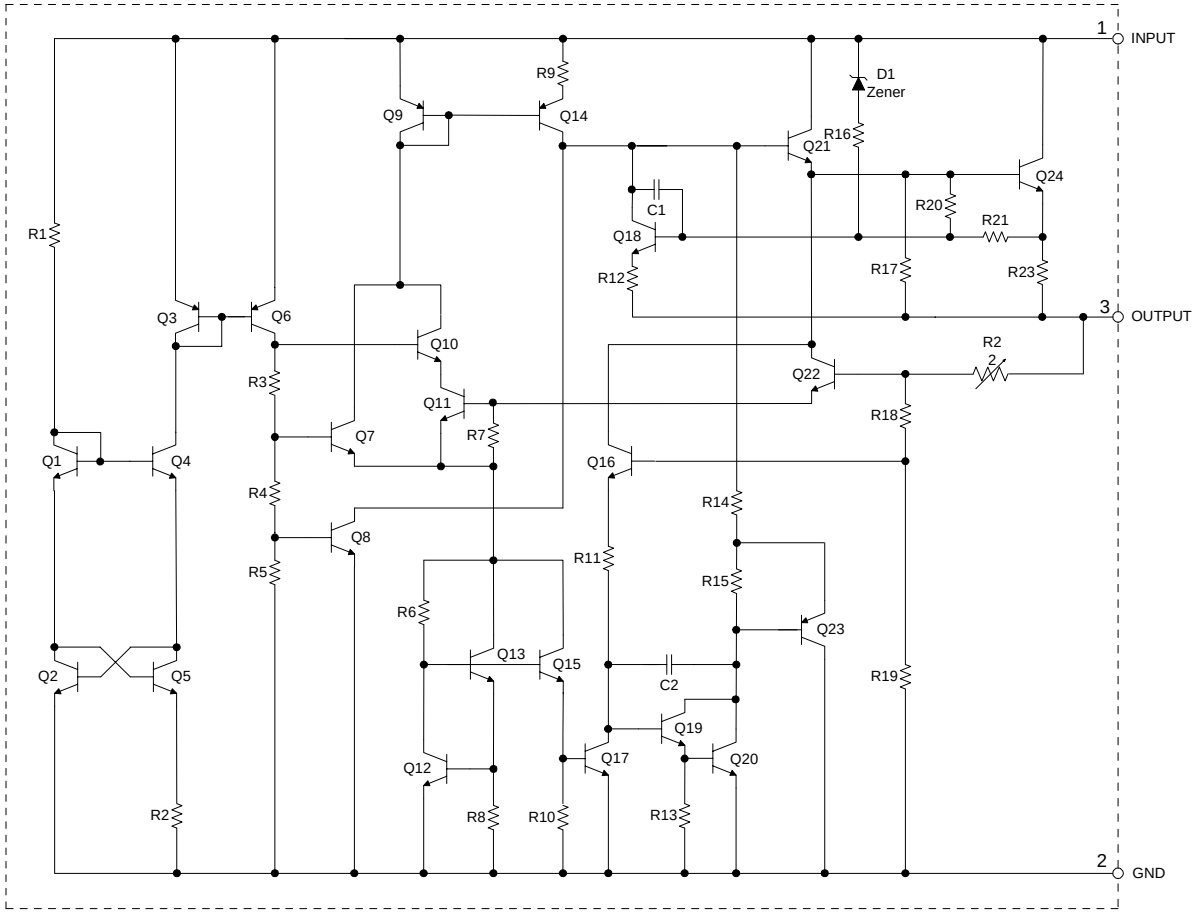
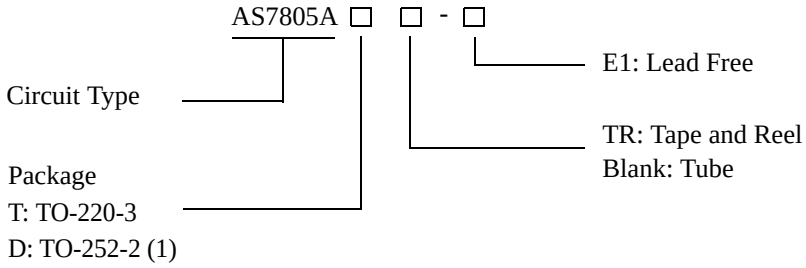


Figure 3. Functional Block Diagram of AS7805A

1A 3-TERMINAL POSITIVE VOLTAGE REGULATOR AS7805A

Ordering Information



Package	Temperature Range	Part Number	Marking ID	Packing Type
TO-220-3	-40 to 125°C	AS7805AT-E1	AS7805AT-E1	Tube
TO-252-2 (1)	-40 to 125°C	AS7805AD-E1	AS7805AD-E1	Tube
		AS7805ADTR-E1	AS7805AD-E1	Tape & Reel

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant.

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value		Unit
Input Voltage	V_{IN}	36		V
Lead Temperature (Soldering, 10sec)	T_{LEAD}	260		^oC
Power Dissipation	P_D	Internally Limited		W
Operating Junction Temperature	T_J	150		^oC
Storage Temperature Range	T_{STG}	-65 to 150		^oC
Thermal Resistance	θ_{JA}	TO-220-3	60	$^oC/W$
		TO-252-2 (1)	100	
ESD (Human Body Model)	ESD	6000		V
ESD (Machine Model)	ESD	500		V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Input Voltage	V_{IN}		25	V
Operating Junction Temperature Range	T_J	-40	125	^oC

Electrical Characteristics

V_{IN}=10V, I_{OUT}=1A, T_J=-40 to 125°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output Voltage	V_{OUT}	T_J=25°C	4.9	5	5.1	V
		I_{OUT}=5mA to 1A, V_{IN}=7.5V to 20V, P_D≤15W	4.8		5.2	
Line Regulation	V_{RLINE}	V_{IN}=7.5V to 20V, I_{OUT}=500mA, T_J=25°C		25	50	mV
		V_{IN}=7.5V to 20V, I_{OUT}=500mA, T_J=75°C		15	40	mV
Load Regulation	V_{RLOAD}	V_{IN}=10V, I_{OUT}=5mA to 1A, T_J=25°C		20	50	mV
Quiescent Current	I_Q	V_{IN}=10V, I_{OUT}=0		3.2	6	mA
Quiescent Current Change	ΔI_Q	V_{IN}=8V to 25V, I_{OUT}=500mA, T_J=25°C		0.3	0.8	mA
		I_{OUT}=5mA to 1A, T_J=25°C		0.08	0.5	
Ripple Rejection	PSRR	V_{IN}=8V to 18V, f=120Hz, I_{OUT}=500mA		70		dB
Dropout Voltage	V_{DROP}	ΔV_{OUT}=1%, I_{OUT}=1A, T_J=25°C		2		V
Output Noise Voltage	N_O	f=10Hz to 100kHz, T_A=25°C		10		$\mu V/V_O$
Output Resistance	R_O	f=1kHz		10		mΩ
Short Circuit Current	I_{SC}	V_{IN}=35V, T_A=25°C		0.05		A
Peak Output Current	I_{PK}	V_{IN}=10V, T_J=25°C		2.2		A
Output Voltage Temperature Coefficient	$\Delta V_{OUT}/\Delta T$			0.4		mV/°C
	$(\Delta V_{OUT}/V_{OUT})/\Delta T$			80		ppm/°C

Typical Performance Characteristics

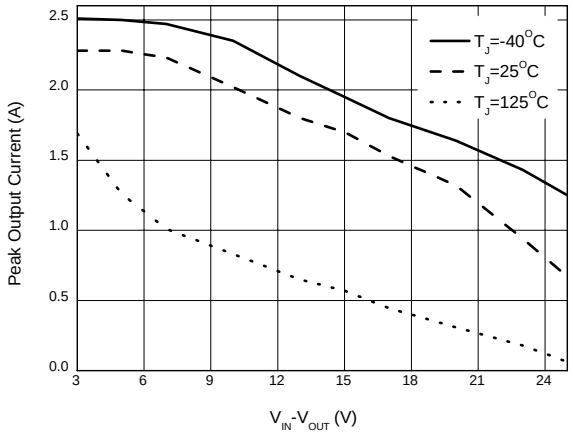


Figure 4. Peak Output Current vs. Input/Output Differential Voltage

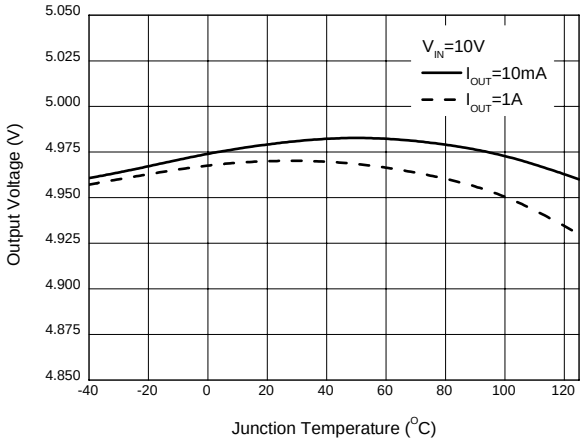


Figure 5. Output Voltage vs. Junction Temperature

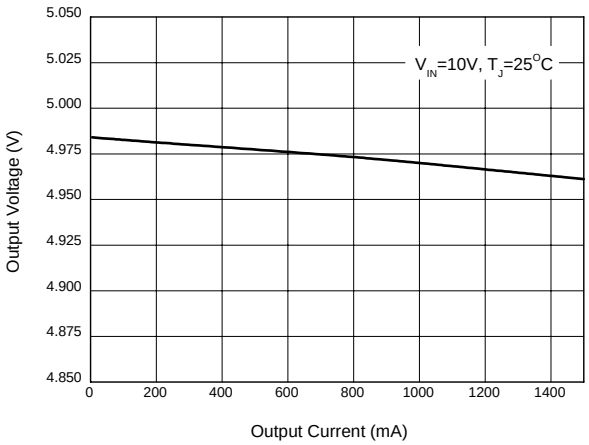


Figure 6. Output Voltage vs. Output Current

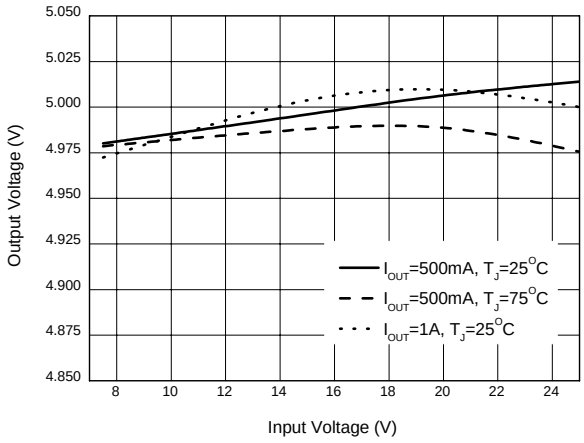


Figure 7. Output Voltage vs. Input Voltage

Typical Performance Characteristics (Continued)

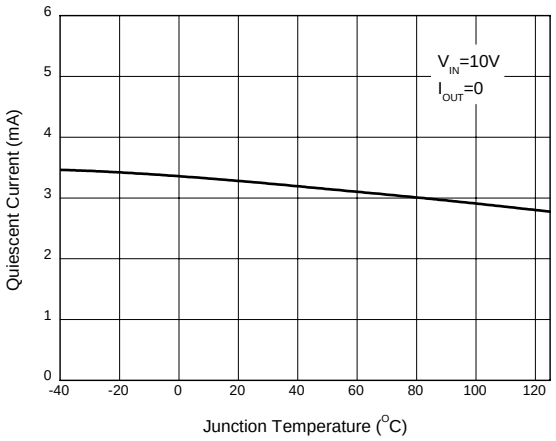


Figure 8. Quiescent Current vs. Junction Temperature

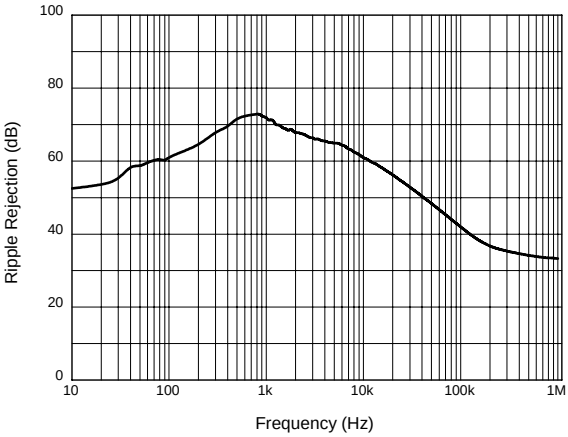


Figure 9. Ripple Rejection vs. Frequency

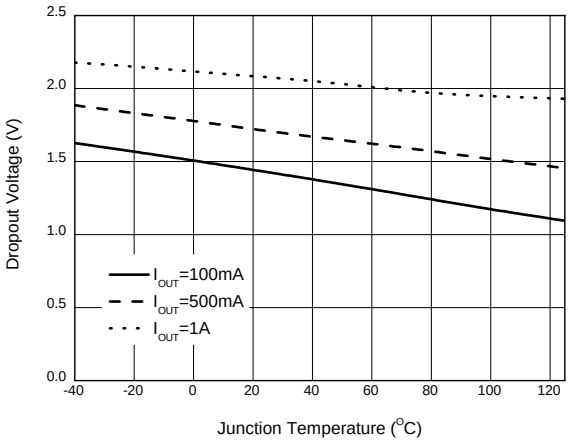


Figure 10. Dropout Voltage vs. Junction Temperature

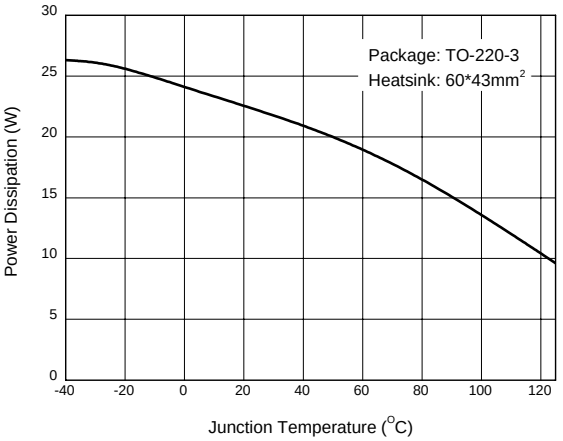


Figure 11. Power Dissipation vs. Junction Temperature

Typical Performance Characteristics (Continued)

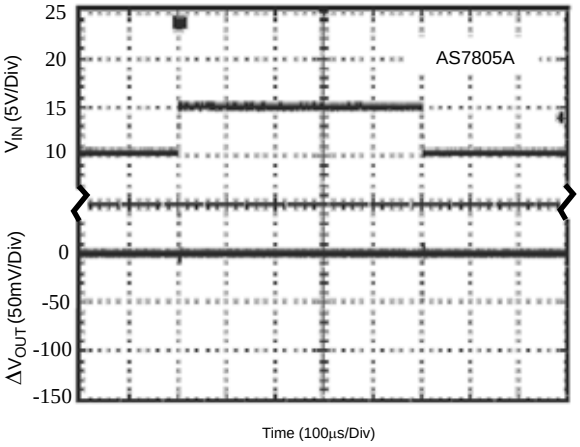


Figure 12. Line Transient
(Conditions: I_{OUT}=500mA, C_{OUT}=0.1μF)

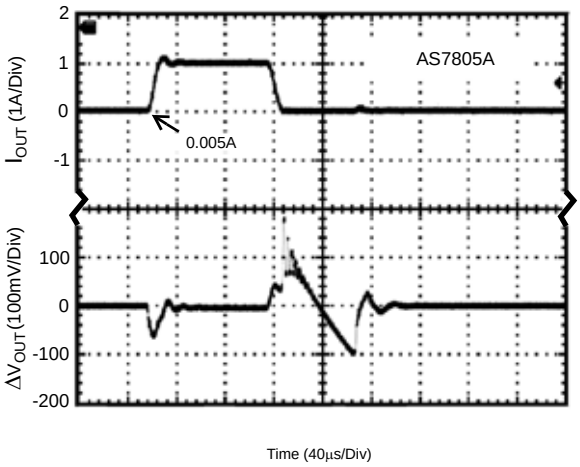


Figure 13. Load Transient
(Conditions: V_{IN}=10V, C_{IN}=0.33μF, C_{OUT}=0.1μF)

Typical Application

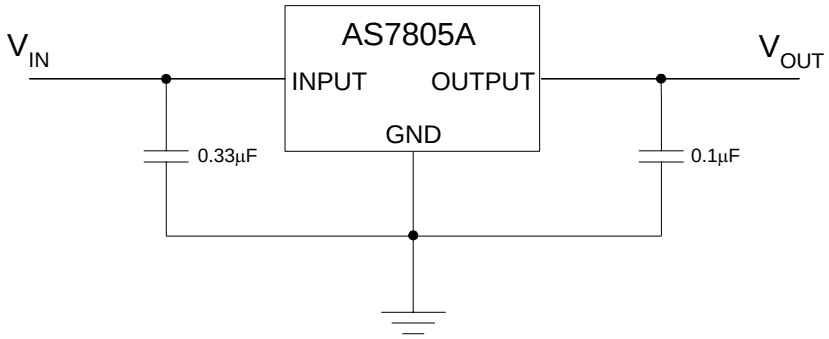
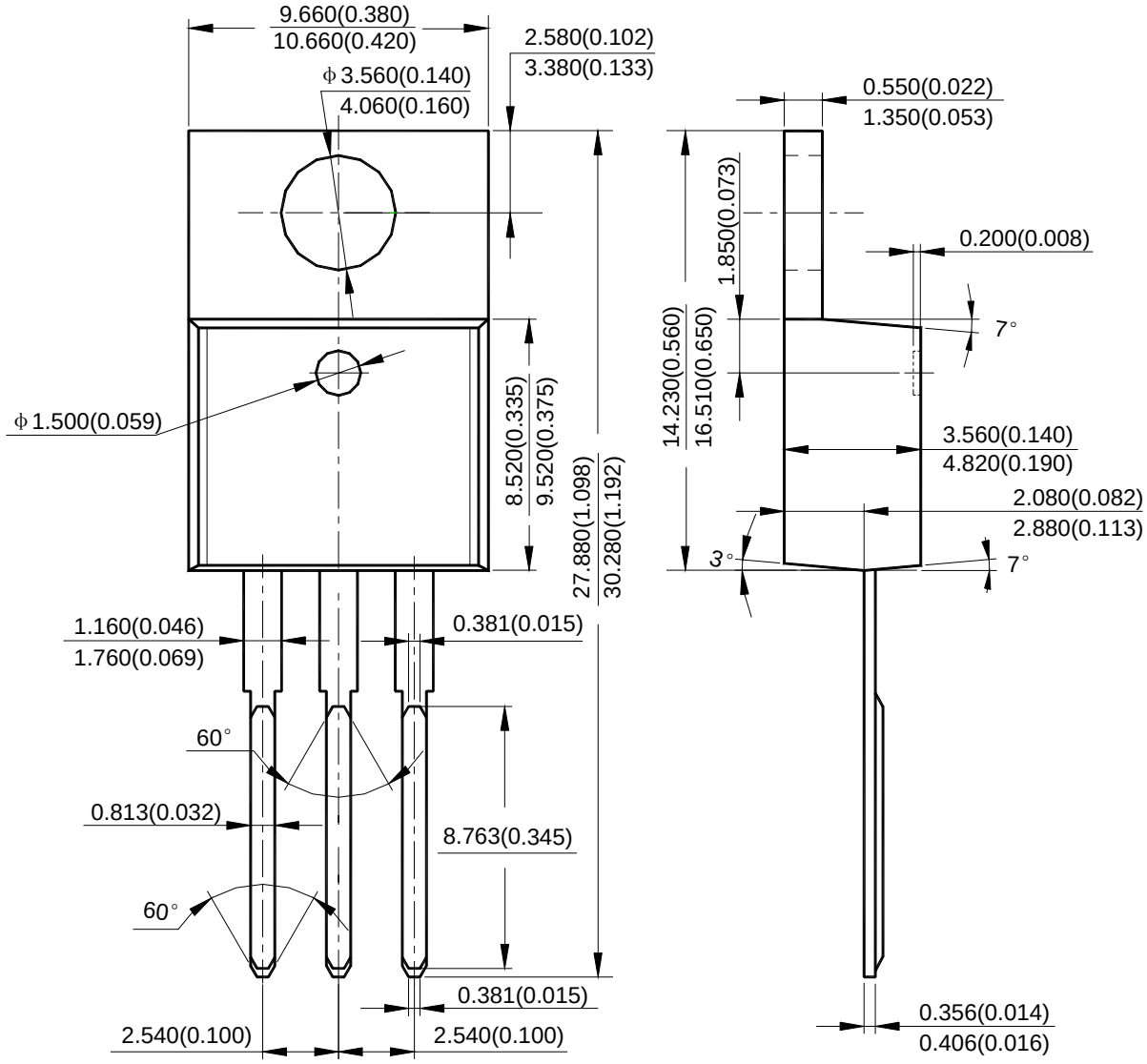


Figure 14. Typical Application of AS7805A

1A 3-TERMINAL POSITIVE VOLTAGE REGULATOR AS7805A

Mechanical Dimensions

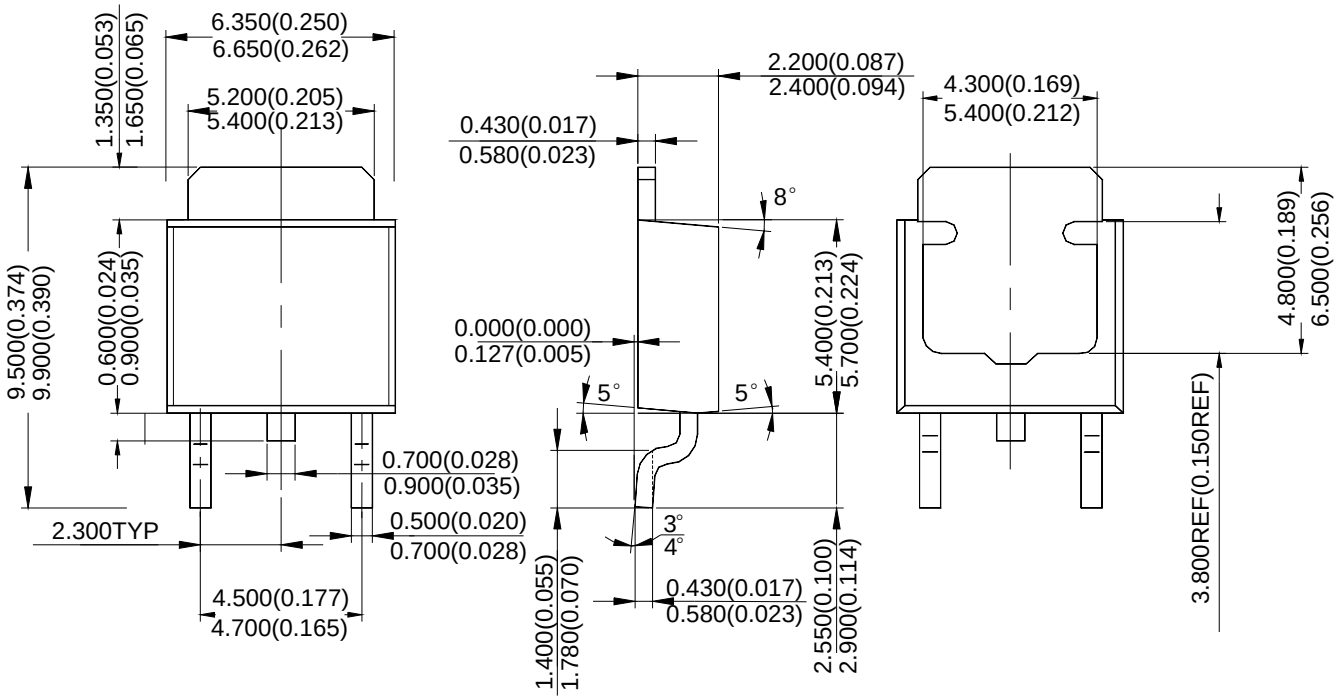
TO-220-3 **Unit: mm(inch)**



1A 3-TERMINAL POSITIVE VOLTAGE REGULATOR **AS7805A**

Mechanical Dimensions (Continued)

TO-252-2(1) **Unit: mm(inch)**



BCD Semiconductor Manufacturing Limited

http://www.bcdsemi.com

IMPORTANT NOTICE

BCD Semiconductor Manufacturing Limited reserves the right to make changes without further notice to any products or specifications herein. BCD Semiconductor Manufacturing Limited does not assume any responsibility for use of any its products for any particular purpose, nor does BCD Semiconductor Manufacturing Limited assume any liability arising out of the application or use of any its products or circuits. BCD Semiconductor Manufacturing Limited does not convey any license under its patent rights or other rights nor the rights of others.

MAIN SITE

BCD Semiconductor Manufacturing Limited
- Wafer Fab
Shanghai SIM-BCD Semiconductor Manufacturing Limited
800, Yi Shan Road, Shanghai 200233, China
Tel: +86-21-6485 1491, Fax: +86-21-5450 0008

BCD Semiconductor Manufacturing Limited
- IC Design Group
Advanced Analog Circuits (Shanghai) Corporation
8F, Zone B, 900, Yi Shan Road, Shanghai 200233, China
Tel: +86-21-6495 9539, Fax: +86-21-6485 9673

REGIONAL SALES OFFICE

Shenzhen Office
Shanghai SIM-BCD Semiconductor Manufacturing Co., Ltd. Shenzhen Office
Advanced Analog Circuits (Shanghai) Corporation Shenzhen Office
Room E, 5F, Noble Center, No.1006, 3rd Fuzhong Road, Futian District, Shenzhen 518026, China
Tel: +86-755-8826 7951
Fax: +86-755-8826 7865

Taiwan Office
BCD Semiconductor (Taiwan) Company Limited
4F, 298-1, Rui Guang Road, Nei-Hu District, Taipei, Taiwan
Tel: +886-2-2656 2808
Fax: +886-2-2656 2806

USA Office
BCD Semiconductor Corporation
30920 Huntwood Ave. Hayward, CA 94544, U.S.A
Tel : +1-510-324-2988
Fax: +1-510-324-2788