

**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  $\pm 4\%$  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

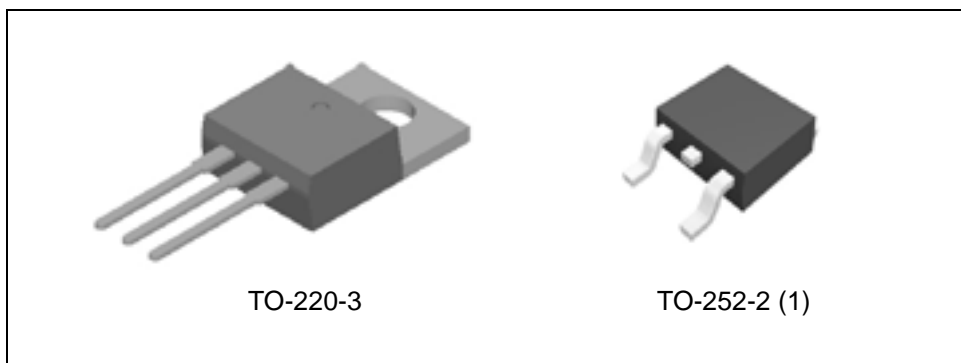


Figure 1. Package Types of AS7805A



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

**AS7805A**

**Pin Configuration**

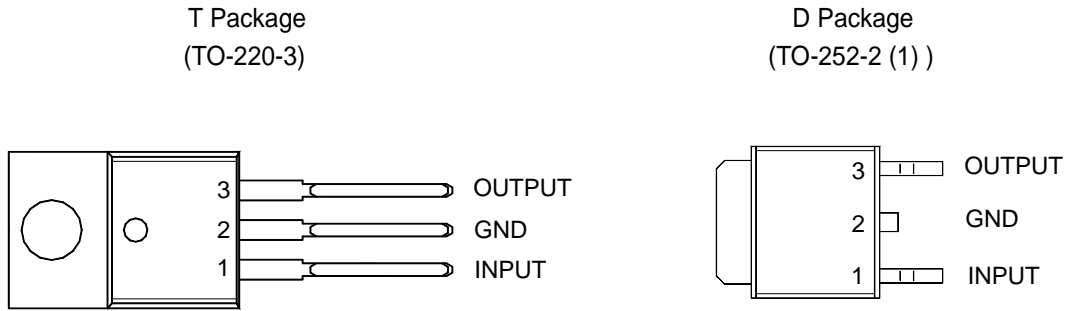


Figure 2. Pin Configuration of AS7805A (Top View)

**Pin Description**

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



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**Functional Block Diagram**

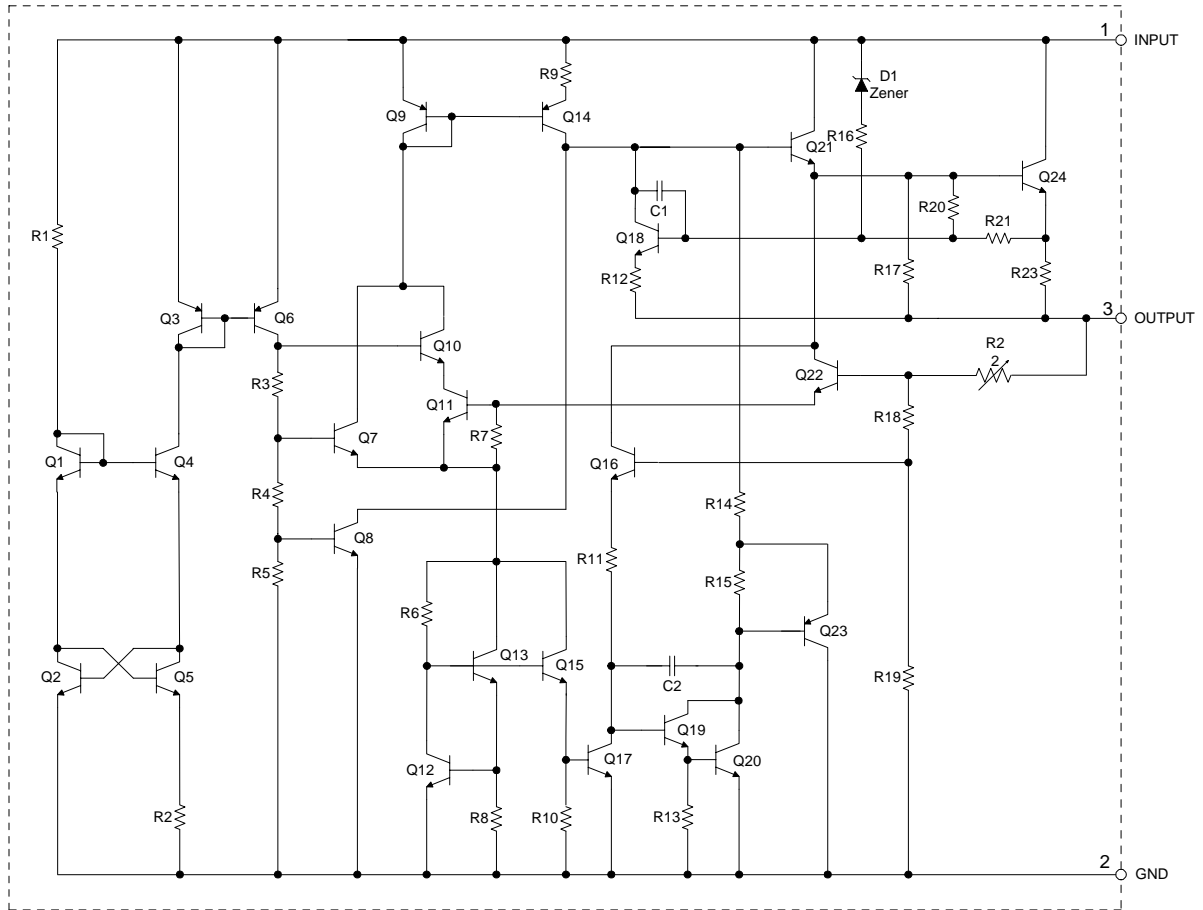
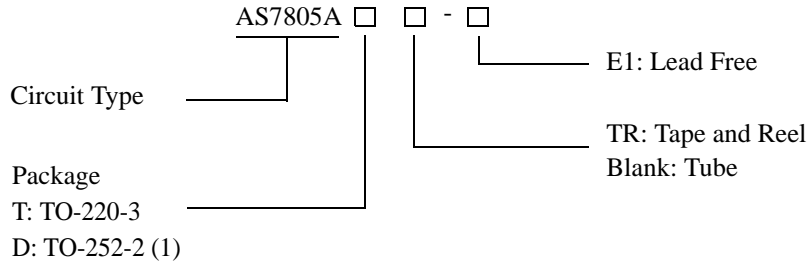


Figure 3. Functional Block Diagram of AS7805A



**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.

**1A 3-TERMINAL POSITIVE VOLTAGE REGULATOR****AS7805A****Absolute Maximum Ratings (Note 1)**

| Parameter                           | Symbol        | Value              |     | Unit |
|-------------------------------------|---------------|--------------------|-----|------|
| Input Voltage                       | $V_{IN}$      | 36                 |     | V    |
| Lead Temperature (Soldering, 10sec) | $T_{LEAD}$    | 260                |     | °C   |
| Power Dissipation                   | $P_D$         | Internally Limited |     | W    |
| Operating Junction Temperature      | $T_J$         | 150                |     | °C   |
| Storage Temperature Range           | $T_{STG}$     | -65 to 150         |     | °C   |
| Thermal Resistance                  | $\theta_{JA}$ | TO-220-3           | 60  | °C/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 | °C   |



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

**Electrical Characteristics**

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

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



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

**AS7805A**

**Typical Performance Characteristics**

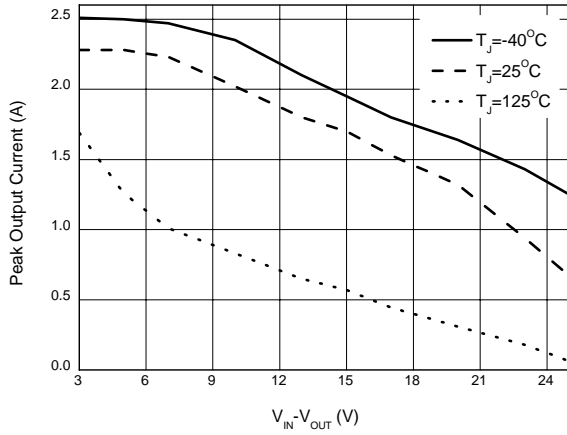


Figure 4. Peak Output Current vs. Input/Output Differential Voltage

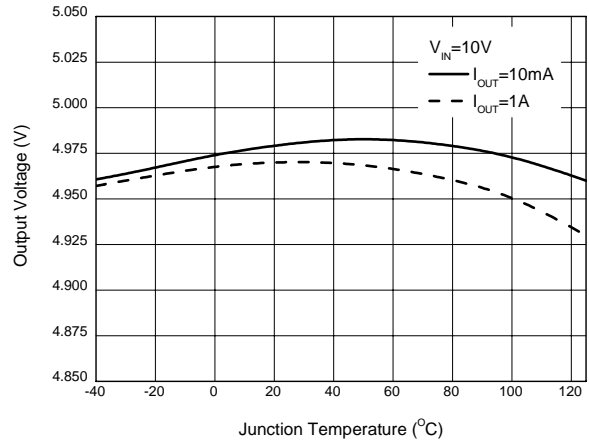


Figure 5. Output Voltage vs. Junction Temperature

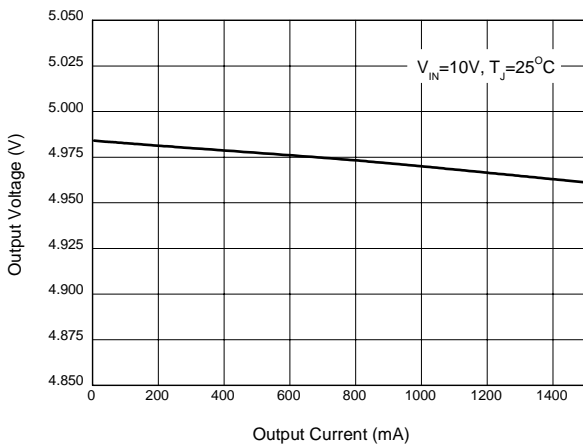


Figure 6. Output Voltage vs. Output Current

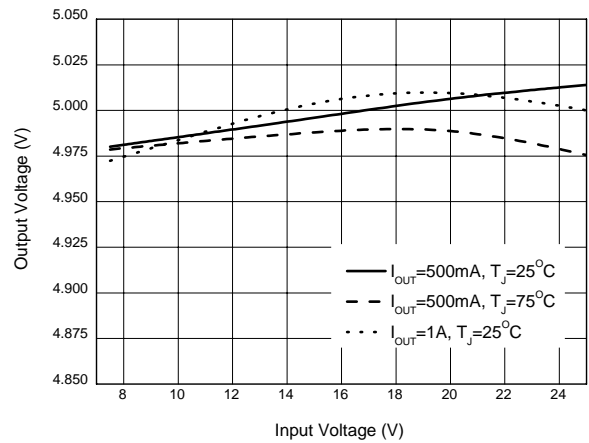


Figure 7. Output Voltage vs. Input Voltage



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

**AS7805A**

**Typical Performance Characteristics (Continued)**

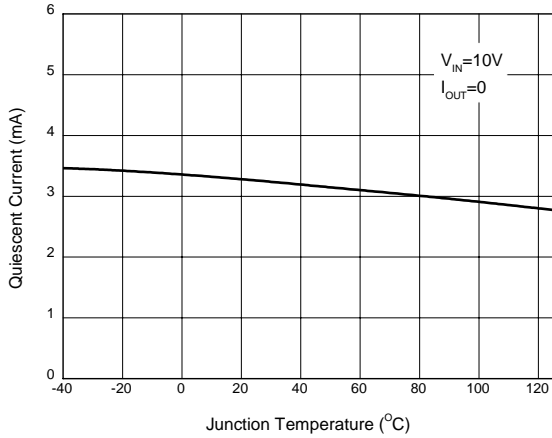


Figure 8. Quiescent Current vs. Junction Temperature

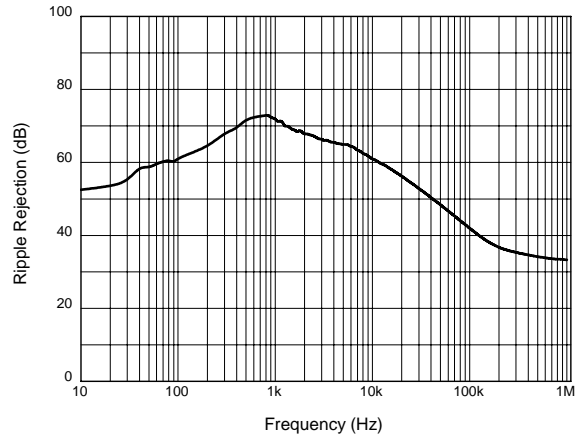


Figure 9. Ripple Rejection vs. Frequency

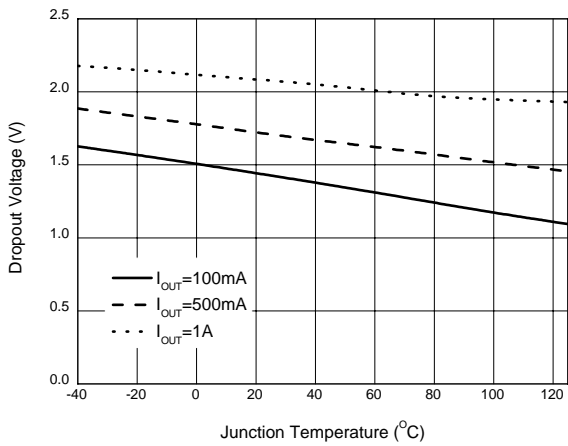


Figure 10. Dropout Voltage vs. Junction Temperature

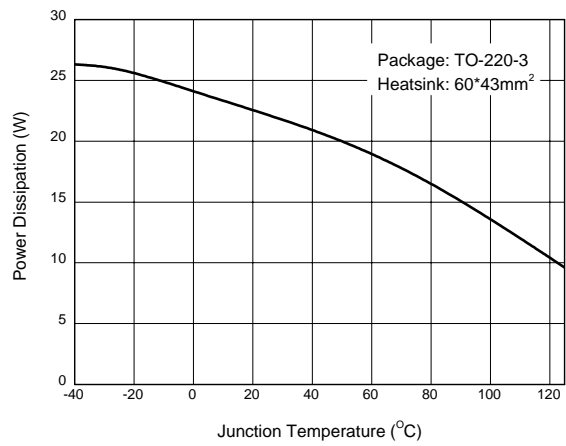


Figure 11. Power Dissipation vs. Junction Temperature





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

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**Typical Performance Characteristics (Continued)**

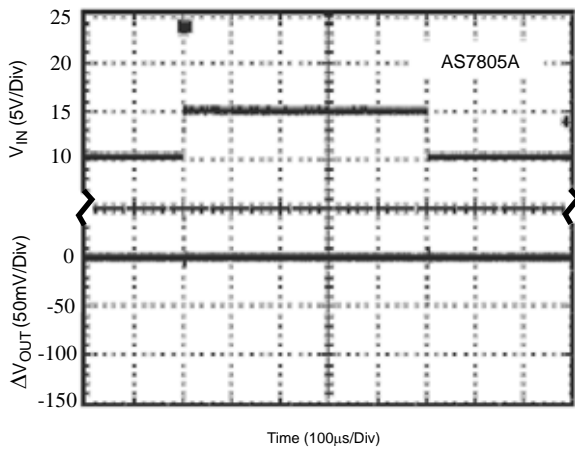


Figure 12. Line Transient  
(Conditions:  $I_{OUT}=500\text{mA}$ ,  $C_{OUT}=0.1\mu\text{F}$ )

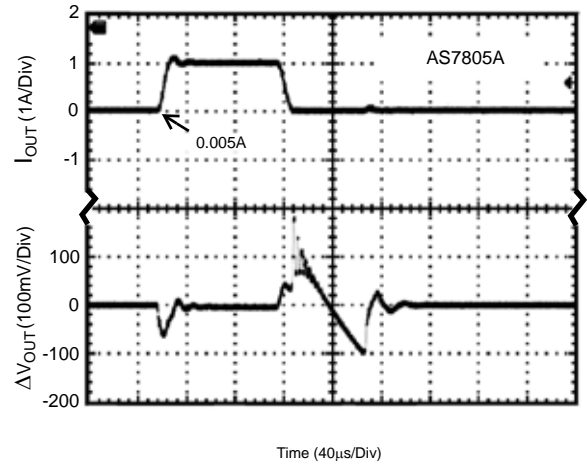


Figure 13. Load Transient  
(Conditions:  $V_{IN}=10\text{V}$ ,  $C_{IN}=0.33\mu\text{F}$ ,  $C_{OUT}=0.1\mu\text{F}$ )



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

**Typical Application**

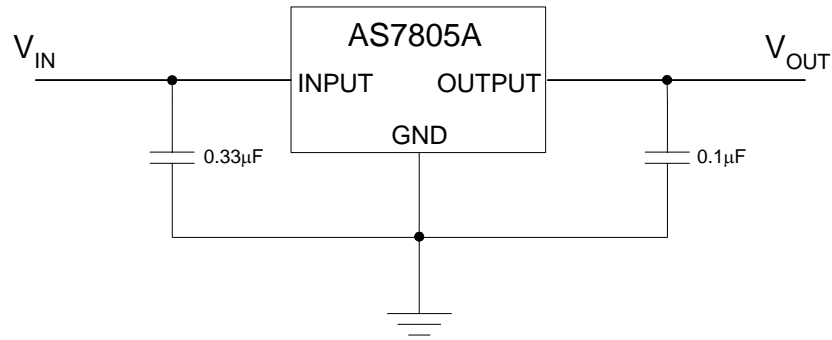


Figure 14. Typical Application of AS7805A



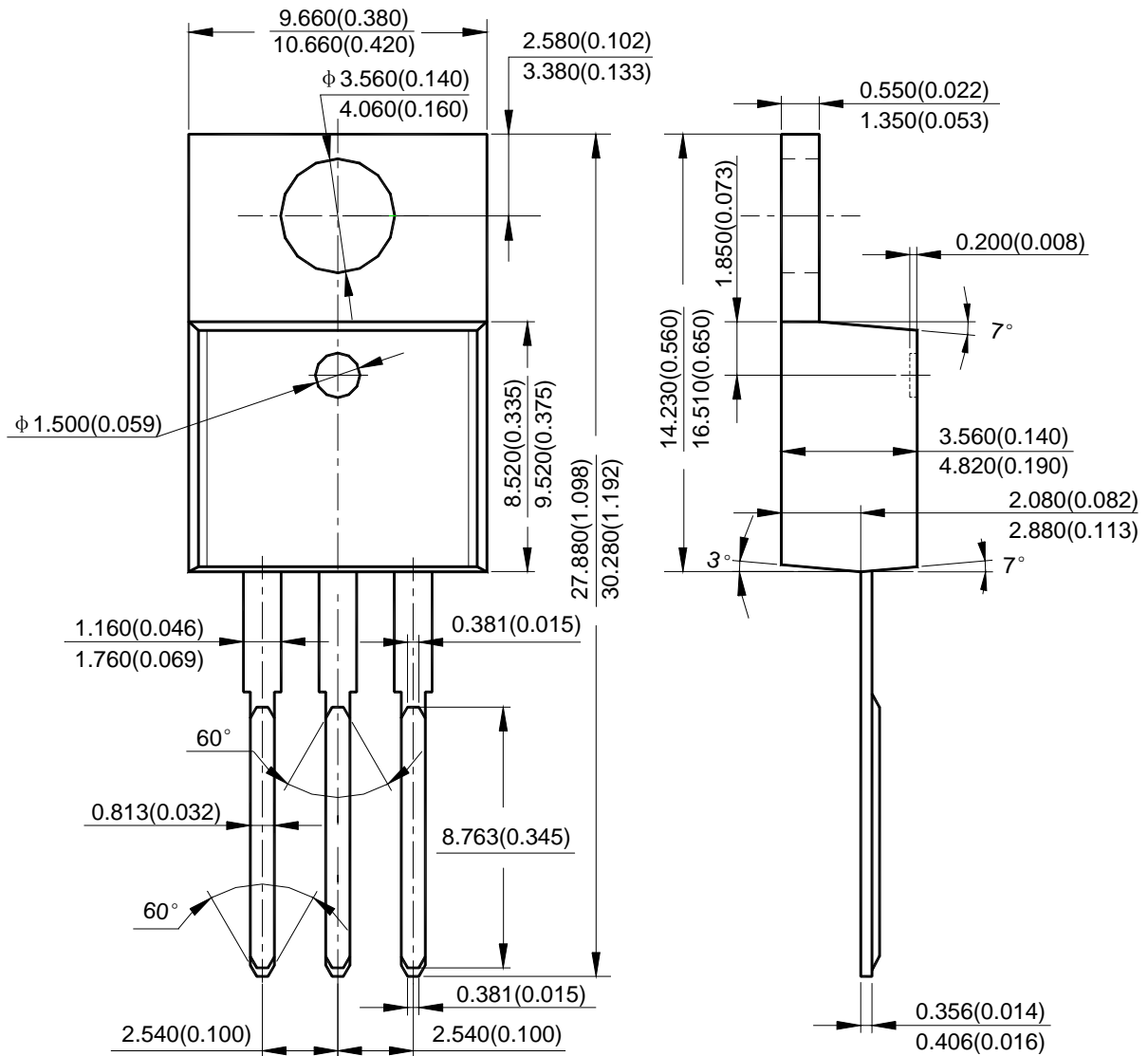
**1A 3-TERMINAL POSITIVE VOLTAGE REGULATOR**

**AS7805A**

**Mechanical Dimensions**

**TO-220-3**

**Unit: mm(inch)**





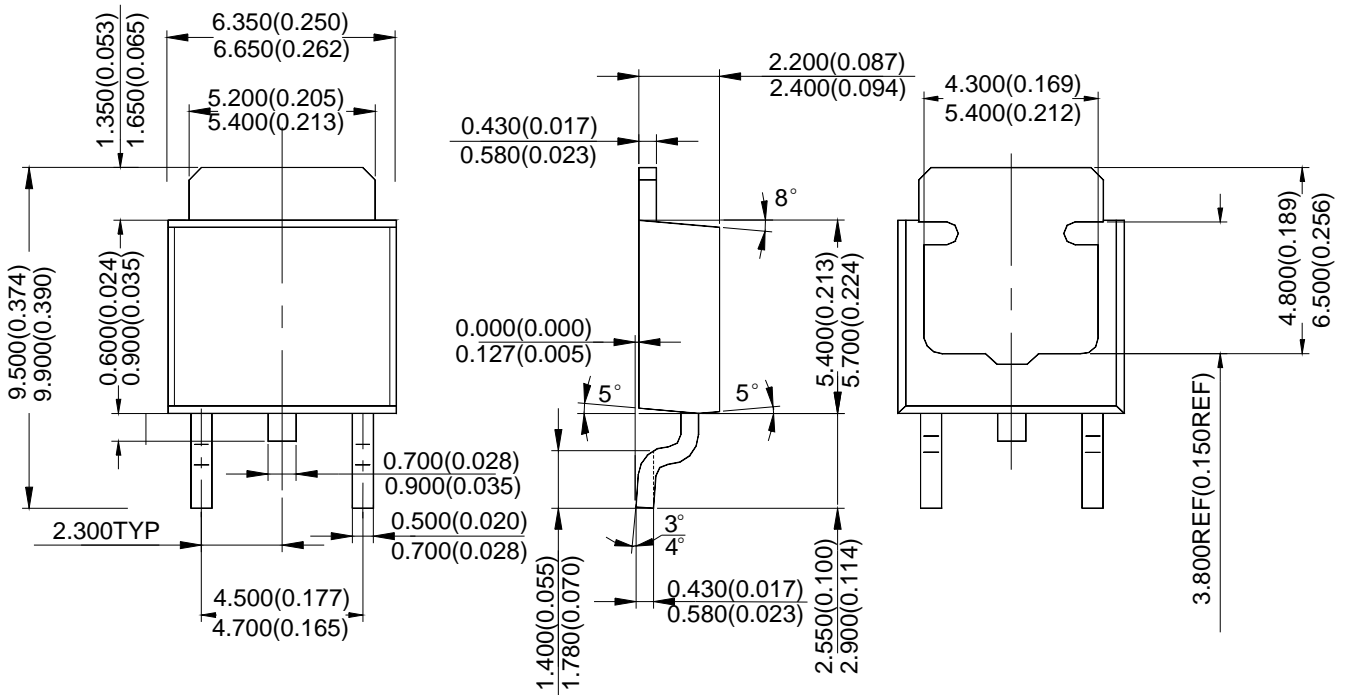
**1A 3-TERMINAL POSITIVE VOLTAGE REGULATOR**

**AS7805A**

**Mechanical Dimensions (Continued)**

**TO-252-2(1)**

**Unit: mm(inch)**





BCD Semiconductor Manufacturing Limited

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