

1A 3-TERMINAL POSITIVE VOLTAGE REGULATOR

Description

The AS78XXA series are three terminal positive voltage regulators designed for a wide variety of applications including local, on-card regulation.

The AS78XXA are complete with internal current limiting, thermal shutdown protection, and safe-area compensation which make them virtually immune from output overload. If adequate heat sinking is provided, these regulators can deliver output currents up to 1A.

The AS78XXA are available in TO-252-2 (3), TO-252-2 (4), TO-252-2 (5), TO-220-3 and TO-220F-3 packages.

Applications

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

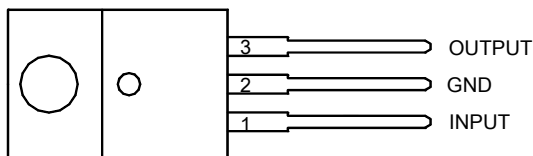
Features

- Output Current up to 1A
- Fixed Output Voltages of 5V, 6V, 8V, 9V, 12V, 15V and 18V
- 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
- TO-220-3 and TO-220F-3
 - **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Lead-Free Packages: TO-252-2 (3), TO-252-2 (4), TO-252-2 (5)
 - **Totally Lead-Free; RoHS Compliant (Notes 4 & 2)**
- Available in "Green" Packages: TO-220-3 and TO-220F-3
 - **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
 - **Halogen and Antimony Free. "Green" Device (Note 3)**
- Lead-Free Packages, Available in "Green" Molding Compound: TO-252-2 (3), TO-252-2 (4), TO-252-2 (5)
 - **Totally Lead-Free & Fully RoHS Compliant (Notes 4 & 2)**
 - **Halogen and Antimony Free. "Green" Device (Note 3)**

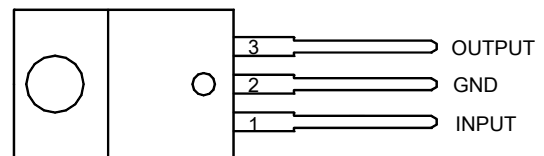
Notes: 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.

Pin Assignments

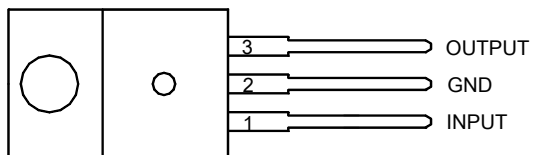
T Package
(TO-220-3) (Option 1)



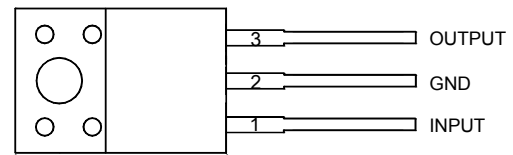
T Package
(TO-220-3) (Option 2)



T Package
(TO-220-3) (Option 3)



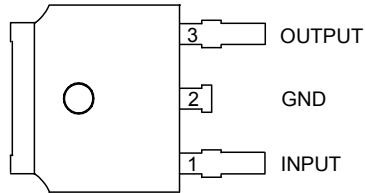
TF Package
(TO-220F-3)



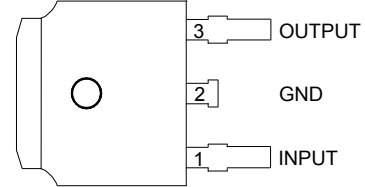
Pin Assignments (Cont.)

D Package

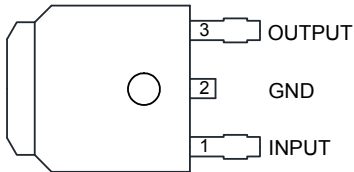
(TO-252-2 (3)) (Option 1)



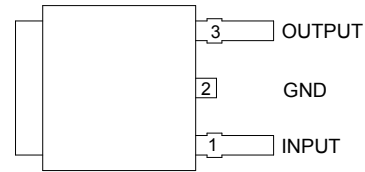
(TO-252-2 (3)) (Option 2)



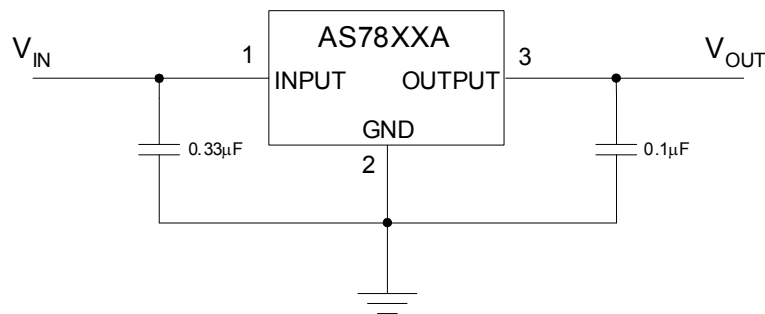
(TO-252-2 (4))



(TO-252-2 (5))



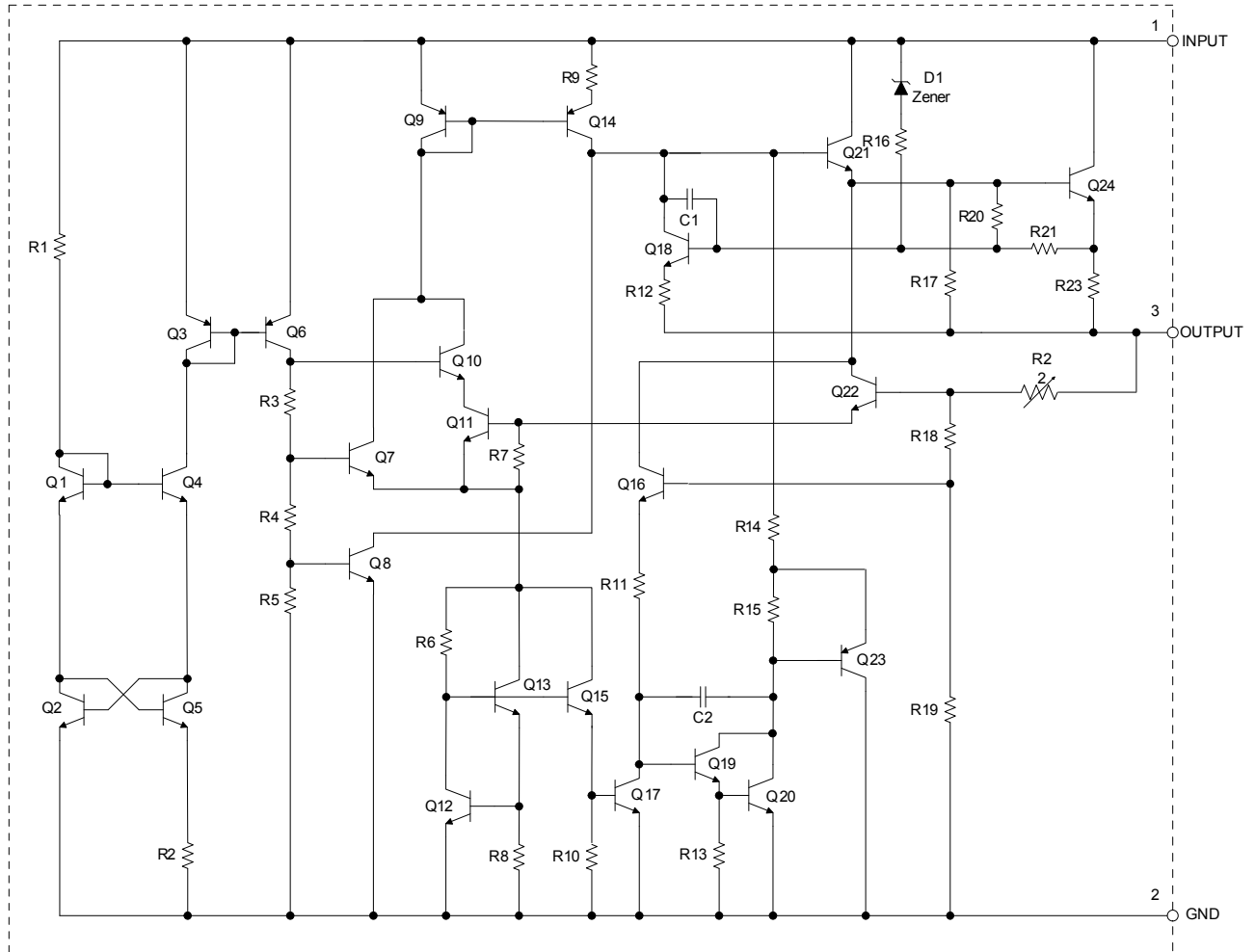
Typical Applications Circuit



Pin Descriptions

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

Functional Block Diagram



Absolute Maximum Ratings (Note 5)

| Symbol | Parameter | Rating | Unit | |
|---------------|-------------------------------------|--|------|------|
| V_{IN} | Input Voltage | 36 | V | |
| T_{LEAD} | Lead Temperature (Soldering, 10sec) | +260 | °C | |
| P_D | Power Dissipation | Internally Limited | W | |
| T_J | Operating Junction Temperature | +150 | °C | |
| T_{STG} | Storage Temperature Range | -65 to +150 | °C | |
| θ_{JA} | Thermal Resistance | TO-220-3 | 60 | °C/W |
| | | TO-252-2 (3)/TO-252-2 (4)/TO-252-2 (5) | 100 | |
| | | TO-220F-3 | 60 | |
| ESD | ESD (Human Body Model) | 6000 | V | |
| ESD | ESD (Machine Model) | 500 | V | |

Note 5: 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

| Symbol | Parameter | Min | Max | Unit | |
|----------|--------------------------------------|---------|------|------|---|
| V_{IN} | Input Voltage | AS7805A | – | 25 | V |
| | | AS7806A | – | 26 | |
| | | AS7808A | – | 28 | |
| | | AS7809A | – | 29 | |
| | | AS7812A | – | 32 | |
| | | AS7815A | – | 32 | |
| | | AS7818A | – | 32 | |
| T_J | Operating Junction Temperature Range | -40 | +125 | °C | |

Electrical Characteristics

AS7805A (@ $V_{IN} = 10V$, $I_{OUT} = 1A$, $T_J = -40$ to $+125^\circ C$, unless otherwise specified.)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--|---|-----|------|-----|-----------------|
| V_{OUT} | Output Voltage | $T_J = +25^\circ C$ | 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 | |
| V_{RLINE} | Line Regulation | $V_{IN} = 7.5V$ to $20V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 25 | 50 | mV |
| V_{RLOAD} | Load Regulation | $V_{IN} = 10V$, $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 20 | 50 | mV |
| I_Q | Quiescent Current | $V_{IN} = 10V$, $I_{OUT} = 0$ | – | 3.2 | 6 | mA |
| ΔI_Q | Quiescent Current Change | $V_{IN} = 8V$ 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 | |
| PSRR | Ripple Rejection | $V_{IN} = 8V$ to $18V$, $f = 120Hz$, $I_{OUT} = 500mA$ | – | 70 | – | dB |
| V_{DROP} | Dropout Voltage | $\Delta V_{OUT} = 1\%$, $I_{OUT} = 1A$, $T_J = +25^\circ C$ | – | 2 | – | V |
| N_O | Output Noise Voltage | $f = 10Hz$ to $100kHz$, $T_A = +25^\circ C$ | – | 10 | – | $\mu V/V_O$ |
| R_O | Output Resistance | $f = 1kHz$ | – | 10 | – | m Ω |
| I_{SC} | Short Circuit Current | $V_{IN} = 35V$, $T_A = +25^\circ C$ | – | 0.05 | – | A |
| I_{PK} | Peak Output Current | $V_{IN} = 10V$, $T_J = +25^\circ C$ | – | 2.2 | – | A |
| $\frac{\Delta V_{OUT}}{\Delta T}$ | Output Voltage Temperature Coefficient | – | – | 0.4 | – | mV/ $^\circ C$ |
| $\frac{(\Delta V_{OUT}/V_{OUT})/\square}{\Delta T}$ | | – | – | 80 | – | ppm/ $^\circ C$ |
| θ_{JC} | Thermal Resistance | TO-220-3 | – | 9 | – | $^\circ C/W$ |
| | | TO-252-2 (3)/ TO-252-2 (4)/ TO-252-2 (5) | – | 16 | – | |
| | | TO-220F-3 | – | 9 | – | |
| | | – | – | – | – | |

Electrical Characteristics (Cont.)

AS7806A (@ $V_{IN} = 11V$, $I_{OUT} = 1A$, $T_J = -40$ to $+125^\circ C$, unless otherwise specified.)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--|---|------|------|------|-----------------|
| V_{OUT} | Output Voltage | $T_J = +25^\circ C$ | 5.88 | 6 | 6.12 | V |
| | | $I_{OUT} = 5mA$ to $1A$, $V_{IN} = 8.6V$ to $21V$, $P_D \leq 15W$ | 5.76 | – | 6.24 | |
| V_{RLINE} | Line Regulation | $V_{IN} = 8.6V$ to $21V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 25 | 60 | mV |
| V_{RLOAD} | Load Regulation | $V_{IN} = 11V$, $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 20 | 60 | mV |
| I_Q | Quiescent Current | $V_{IN} = 11V$, $I_{OUT} = 0$ | – | 3.2 | 6 | mA |
| ΔI_Q | Quiescent Current Change | $V_{IN} = 8.6V$ to $21V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 0.3 | 0.8 | mA |
| | | $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 0.08 | 0.5 | |
| PSRR | Ripple Rejection | $V_{IN} = 9.5V$ to $19.5V$, $f = 120Hz$, $I_{OUT} = 500mA$ | – | 65 | – | dB |
| V_{DROP} | Dropout Voltage | $\Delta V_{OUT} = 1\%$, $I_{OUT} = 1A$, $T_J = +25^\circ C$ | – | 2 | – | V |
| N_O | Output Noise Voltage | $f = 10Hz$ to $100kHz$, $T_A = 25^\circ C$ | – | 10 | – | $\mu V/V_O$ |
| R_O | Output Resistance | $f = 1kHz$ | – | 10 | – | m Ω |
| I_{SC} | Short Circuit Current | $V_{IN} = 35V$, $T_A = +25^\circ C$ | – | 0.2 | – | A |
| I_{PK} | Peak Output Current | $V_{IN} = 11V$, $T_J = +25^\circ C$ | – | 2.2 | – | A |
| $\frac{\Delta V_{OUT}}{\Delta T}$ | Output Voltage Temperature Coefficient | – | – | 0.5 | – | mV/ $^\circ C$ |
| $\frac{(\Delta V_{OUT}/V_{OUT})/\square}{\Delta T}$ | | – | – | 80 | – | ppm/ $^\circ C$ |
| θ_{JC} | Thermal Resistance | TO-220-3 | – | 9 | – | $^\circ C/W$ |
| | | TO-252-2 (3)/ TO-252-2 (4)/ TO-252-2 (5) | – | 16 | – | |
| | | TO-220F-3 | – | 9 | – | |
| | | | – | | | |

Electrical Characteristics (Cont.)

AS7808A (@ $V_{IN} = 14V$, $I_{OUT} = 1A$, $T_J = -40$ to $+125^\circ C$, unless otherwise specified.)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--|--|------|------|------|-----------------|
| V_{OUT} | Output Voltage | $T_J = +25^\circ C$ | 7.84 | 8 | 8.16 | V |
| | | $I_{OUT} = 5mA$ to $1A$, $V_{IN} = 10.6V$ to $23V$, $P_D \leq 15W$ | 7.7 | – | 8.3 | |
| V_{RLINE} | Line Regulation | $V_{IN} = 10.6V$ to $23V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 25 | 75 | mV |
| V_{RLOAD} | Load Regulation | $V_{IN} = 14V$, $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 25 | 75 | mV |
| I_q | Quiescent Current | $V_{IN} = 14V$, $I_{OUT} = 0$ | – | 3.2 | 6 | mA |
| ΔI_q | Quiescent Current Change | $V_{IN} = 10.6V$ to $23V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 0.3 | 0.8 | mA |
| | | $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 0.08 | 0.5 | |
| PSRR | Ripple Rejection | $V_{IN} = 11.5V$ to $21.5V$, $f = 120Hz$, $I_{OUT} = 500mA$ | – | 62 | – | dB |
| V_{DROP} | Dropout Voltage | $\Delta V_{OUT} = 1\%$, $I_{OUT} = 1A$, $T_J = +25^\circ C$ | – | 2 | – | V |
| N_O | Output Noise Voltage | $f = 10Hz$ to $100kHz$, $T_A = +25^\circ C$ | – | 10 | – | $\mu V/V_O$ |
| R_O | Output Resistance | $f = 1kHz$ | – | 10 | – | m Ω |
| I_{SC} | Short Circuit Current | $V_{IN} = 35V$, $T_A = +25^\circ C$ | – | 0.2 | – | A |
| I_{PK} | Peak Output Current | $V_{IN} = 14V$, $T_J = +25^\circ C$ | – | 2.2 | – | A |
| $\Delta V_{OUT}/\Delta T$ | Output Voltage Temperature Coefficient | – | – | 0.64 | – | mV/ $^\circ C$ |
| $(\Delta V_{OUT}/V_{OUT})/\square \Delta T$ | | – | – | 80 | – | ppm/ $^\circ C$ |
| θ_{JC} | Thermal Resistance | TO-220-3 | – | 9 | – | $^\circ C/W$ |
| | | TO-252-2 (3)/ TO-252-2 (4)/ TO-252-2 (5) | – | 16 | – | |
| | | TO-220F-3 | – | 9 | – | |
| | | | – | | | |

Electrical Characteristics (Cont.)

AS7809A (@ $V_{IN} = 15V$, $I_{OUT} = 1A$, $T_J = -40$ to $+125^\circ C$, unless otherwise specified.)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--|--|------|------|------|-----------------|
| V_{OUT} | Output Voltage | $T_J = +25^\circ C$ | 8.82 | 9 | 9.18 | V |
| | | $I_{OUT} = 5mA$ to $1A$, $V_{IN} = 11.5V$ to $23V$, $P_D \leq 15W$ | 8.65 | – | 9.35 | |
| V_{RLINE} | Line Regulation | $V_{IN} = 11.5V$ to $23V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 25 | 90 | mV |
| V_{RLOAD} | Load Regulation | $V_{IN} = 14V$, $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 25 | 100 | mV |
| I_Q | Quiescent Current | $V_{IN} = 15V$, $I_{OUT} = 0$ | – | 3.2 | 6 | mA |
| ΔI_Q | Quiescent Current Change | $V_{IN} = 11.5V$ to $23V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 0.3 | 0.8 | mA |
| | | $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 0.08 | 0.5 | |
| PSRR | Ripple Rejection | $V_{IN} = 11.5V$ to $21.5V$, $f = 120Hz$, $I_{OUT} = 500mA$ | – | 61 | – | dB |
| V_{DROP} | Dropout Voltage | $\Delta V_{OUT} = 1\%$, $I_{OUT} = 1A$, $T_J = +25^\circ C$ | – | 2 | – | V |
| N_O | Output Noise Voltage | $f = 10Hz$ to $100kHz$, $T_A = +25^\circ C$ | – | 10 | – | $\mu V/V_O$ |
| R_O | Output Resistance | $f = 1kHz$ | – | 10 | – | m Ω |
| I_{SC} | Short Circuit Current | $V_{IN} = 35V$, $T_A = +25^\circ C$ | – | 0.2 | – | A |
| I_{PK} | Peak Output Current | $V_{IN} = 15V$, $T_J = +25^\circ C$ | – | 2.2 | – | A |
| $\Delta V_{OUT}/\Delta T$ | Output Voltage Temperature Coefficient | – | – | 0.72 | – | mV/ $^\circ C$ |
| $(\Delta V_{OUT}/V_{OUT})/\square \Delta T$ | | – | – | 80 | – | ppm/ $^\circ C$ |
| θ_{JC} | Thermal Resistance | TO-220-3 | – | 9 | – | $^\circ C/W$ |
| | | TO-252-2 (3)/ TO-252-2 (4)/ TO-252-2 (5) | – | 16 | – | |
| | | TO-220F-3 | – | 9 | – | |
| | | – | – | – | – | |

Electrical Characteristics (Cont.)

AS7812A (@ $V_{IN} = 19V$, $I_{OUT} = 1A$, $T_J = -40$ to $+125^\circ C$, unless otherwise specified.)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--|--|-------|------|-------|-----------------|
| V_{OUT} | Output Voltage | $T_J = +25^\circ C$ | 11.75 | 12 | 12.25 | V |
| | | $I_{OUT} = 5mA$ to $1A$, $V_{IN} = 14.8V$ to $27V$, $P_D \leq 15W$ | 11.5 | – | 12.5 | |
| V_{RLINE} | Line Regulation | $V_{IN} = 14.8V$ to $27V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 25 | 120 | mV |
| V_{RLOAD} | Load Regulation | $V_{IN} = 19V$, $I_{OUT} = 5mA$ to $1A$, $T_J = 25^\circ C$ | – | 40 | 120 | mV |
| I_Q | Quiescent Current | $V_{IN} = 19V$, $I_{OUT} = 0$ | – | 3.4 | 6 | mA |
| ΔI_Q | Quiescent Current Change | $V_{IN} = 14.8V$ to $30V$, $I_{OUT} = 500mA$, $T_J = 25^\circ C$ | – | 0.3 | 0.8 | mA |
| | | $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 0.08 | 0.5 | |
| PSRR | Ripple Rejection | $V_{IN} = 15V$ to $25V$, $f = 120Hz$, $I_{OUT} = 500mA$ | – | 60 | – | dB |
| V_{DROP} | Dropout Voltage | $\Delta V_{OUT} = 1\%$, $I_{OUT} = 1A$, $T_J = +25^\circ C$ | – | 2 | – | V |
| N_O | Output Noise Voltage | $f = 10Hz$ to $100kHz$, $T_A = +25^\circ C$ | – | 10 | – | $\mu V/V_O$ |
| R_O | Output Resistance | $f = 1kHz$ | – | 11 | – | m Ω |
| I_{SC} | Short Circuit Current | $V_{IN} = 35V$, $T_A = +25^\circ C$ | – | 0.2 | – | A |
| I_{PK} | Peak Output Current | $V_{IN} = 18V$, $T_J = +25^\circ C$ | – | 2.2 | – | A |
| $\Delta V_{OUT}/\Delta T$ | Output Voltage Temperature Coefficient | – | – | 0.96 | – | mV/ $^\circ C$ |
| $(\Delta V_{OUT}/V_{OUT})/\square \Delta T$ | | – | – | 80 | – | ppm/ $^\circ C$ |
| θ_{JC} | Thermal Resistance | TO-220-3 | – | 9 | – | $^\circ C/W$ |
| | | TO-252-2 (3)/ TO-252-2 (4)/ TO-252-2 (5) | – | 16 | – | |
| | | TO-220F-3 | – | 9 | – | |
| | | | – | | | |

Electrical Characteristics (Cont.)

AS7815A (@ $V_{IN} = 23V$, $I_{OUT} = 1A$, $T_J = -40$ to $+125^\circ C$, unless otherwise specified.)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--|--|------|------|------|-----------------|
| V_{OUT} | Output Voltage | $T_J = +25^\circ C$ | 14.7 | 15 | 15.3 | V |
| | | $I_{OUT} = 5mA$ to $1A$, $V_{IN} = 17.9V$ to $30V$, $P_D \leq 15W$ | 14.4 | – | 15.6 | |
| V_{RLINE} | Line Regulation | $V_{IN} = 17.9V$ to $30V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 35 | 150 | mV |
| V_{RLOAD} | Load Regulation | $V_{IN} = 23V$, $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 70 | 150 | mV |
| I_Q | Quiescent Current | $V_{IN} = 23V$, $I_{OUT} = 0$ | – | 3.4 | 6 | mA |
| ΔI_Q | Quiescent Current Change | $V_{IN} = 17.9V$ to $30V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 0.3 | 0.8 | mA |
| | | $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 0.08 | 0.5 | |
| PSRR | Ripple Rejection | $V_{IN} = 18.5V$ to $28.5V$, $f = 120Hz$, $I_{OUT} = 500mA$ | – | 58 | – | dB |
| V_{DROP} | Dropout Voltage | $\Delta V_{OUT} = 1\%$, $I_{OUT} = 1A$, $T_J = +25^\circ C$ | – | 2 | – | V |
| N_O | Output Noise Voltage | $f = 10Hz$ to $100kHz$, $T_A = +25^\circ C$ | – | 10 | – | $\mu V/V_O$ |
| R_O | Output Resistance | $f = 1kHz$ | – | 11 | – | m Ω |
| I_{SC} | Short Circuit Current | $V_{IN} = 35V$, $T_A = +25^\circ C$ | – | 0.2 | – | A |
| I_{PK} | Peak Output Current | $V_{IN} = 21V$, $T_J = +25^\circ C$ | – | 2.2 | – | A |
| $\Delta V_{OUT}/\Delta T$ | Output Voltage Temperature Coefficient | – | – | 1.2 | – | mV/ $^\circ C$ |
| $(\Delta V_{OUT}/V_{OUT})/\square \Delta T$ | | – | – | 80 | – | ppm/ $^\circ C$ |
| θ_{JC} | Thermal Resistance | TO-220-3 | – | 9 | – | $^\circ C/W$ |
| | | TO-252-2 (3)/ TO-252-2 (4)/ TO-252-2 (5) | – | 16 | – | |
| | | TO-220F-3 | – | 9 | – | |
| | | | – | | | |

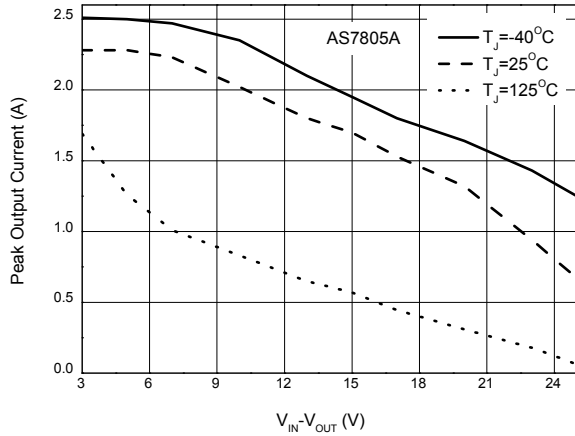
Electrical Characteristics (Cont.)

AS7818A (@ $V_{IN} = 27V$, $I_{OUT} = 1A$, $T_J = -40$ to $+125^\circ C$, unless otherwise specified.)

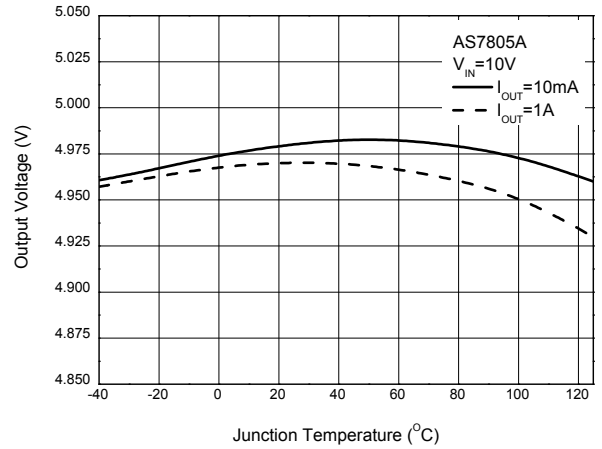
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|--|--|-------|------|-------|-----------------|
| V_{OUT} | Output Voltage | $T_J = +25^\circ C$ | 17.64 | 18 | 18.36 | V |
| | | $I_{OUT} = 5mA$ to $1A$, $V_{IN} = 21V$ to $33V$, $P_D \leq 15W$ | 17.3 | – | 18.7 | |
| V_{RLINE} | Line Regulation | $V_{IN} = 21V$ to $33V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 45 | 180 | mV |
| V_{RLOAD} | Load Regulation | $V_{IN} = 27V$, $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 85 | 180 | mV |
| I_Q | Quiescent Current | $V_{IN} = 27V$, $I_{OUT} = 0$ | – | 3.6 | 6 | mA |
| ΔI_Q | Quiescent Current Change | $V_{IN} = 21V$ to $33V$, $I_{OUT} = 500mA$, $T_J = +25^\circ C$ | – | 0.3 | 0.8 | mA |
| | | $I_{OUT} = 5mA$ to $1A$, $T_J = +25^\circ C$ | – | 0.08 | 0.5 | |
| PSRR | Ripple Rejection | $V_{IN} = 22V$ to $32V$, $f = 120Hz$, $I_{OUT} = 500mA$ | – | 57 | – | dB |
| V_{DROP} | Dropout Voltage | $\Delta V_{OUT} = 1\%$, $I_{OUT} = 1A$, $T_J = +25^\circ C$ | – | 2 | – | V |
| N_O | Output Noise Voltage | $f = 10Hz$ to $100kHz$, $T_A = +25^\circ C$ | – | 10 | – | $\mu V/V_O$ |
| R_O | Output Resistance | $f = 1kHz$ | – | 11 | – | m Ω |
| I_{SC} | Short Circuit Current | $V_{IN} = 35V$, $T_A = +25^\circ C$ | – | 0.2 | – | A |
| I_{PK} | Peak Output Current | $V_{IN} = 24V$, $T_J = +25^\circ C$ | – | 2.2 | – | A |
| $\Delta V_{OUT}/\Delta T$ | Output Voltage Temperature Coefficient | – | – | 1.44 | – | mV/ $^\circ C$ |
| $(\Delta V_{OUT}/V_{OUT})/\square \Delta T$ | | – | – | 80 | – | ppm/ $^\circ C$ |
| θ_{JC} | Thermal Resistance | TO-220-3 | – | 9 | – | $^\circ C/W$ |
| | | TO-252-2 (3)/ TO-252-2 (4)/ TO-252-2 (5) | – | 16 | – | |
| | | TO-220F-3 | – | 9 | – | |
| | | | – | | | |

Performance Characteristics

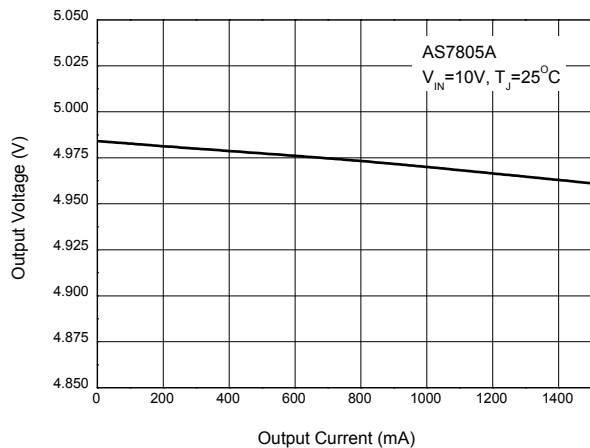
Peak Output Current vs. Input/Output Differential Voltage



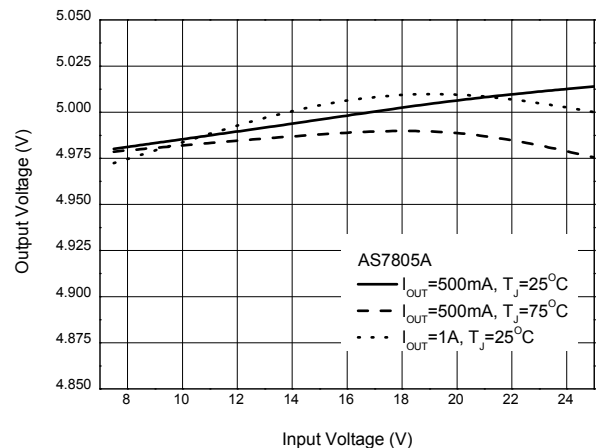
Output Voltage vs. Junction Temperature



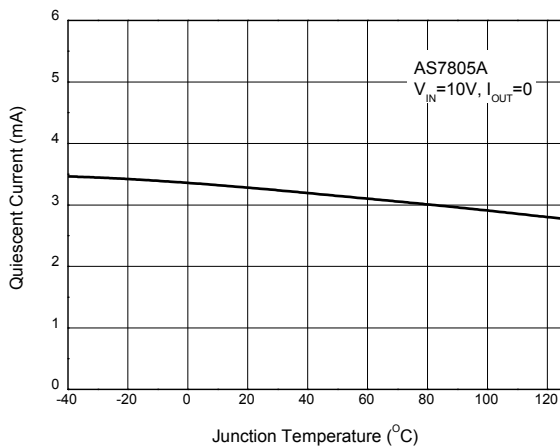
Output Voltage vs. Output Current



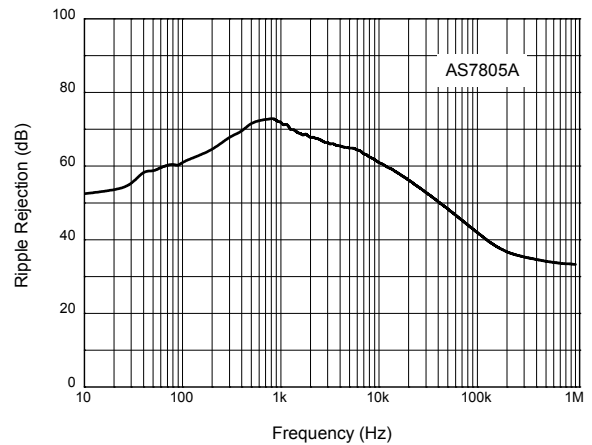
Output Voltage vs. Input Voltage



Quiescent Current vs. Junction Temperature

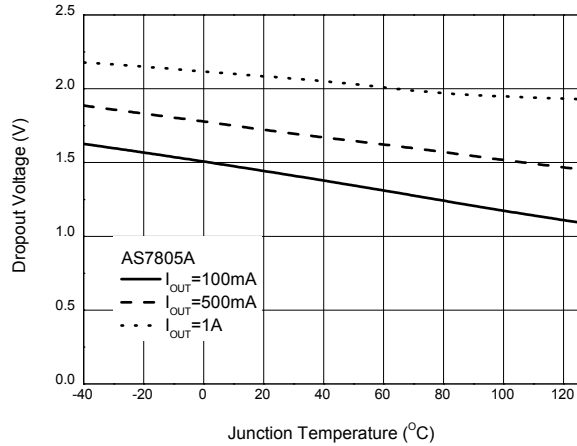


Ripple Rejection vs. Frequency

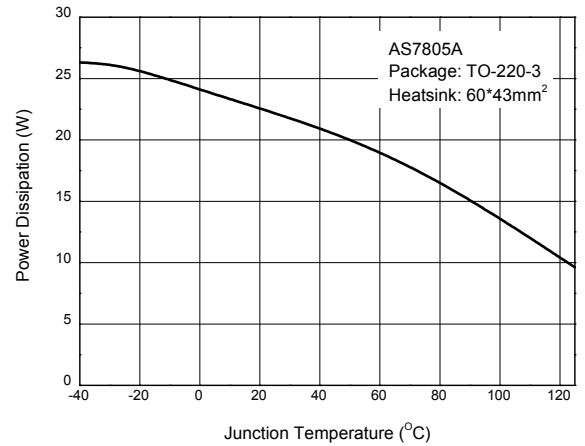


Performance Characteristics (Cont.)

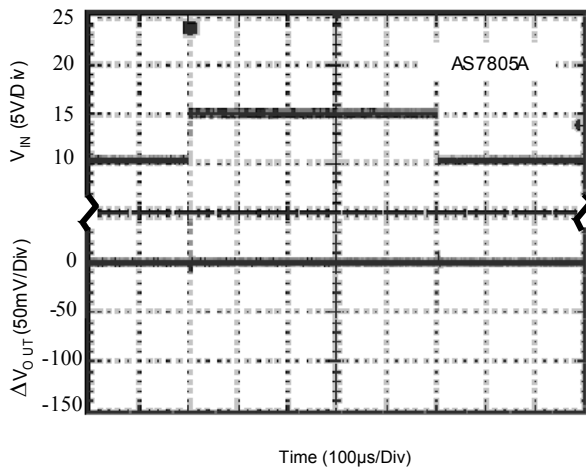
Dropout Voltage vs. Junction Temperature



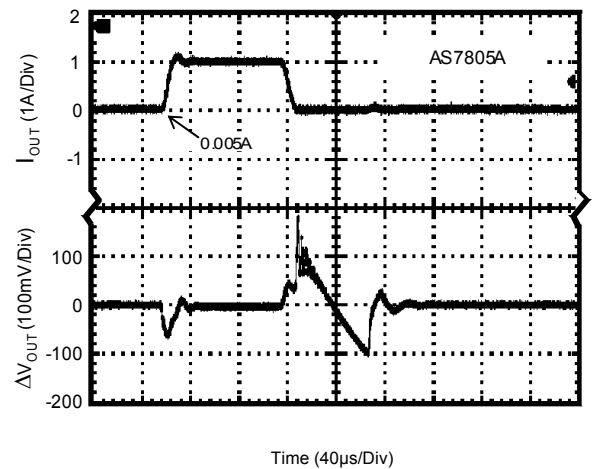
Power Dissipation vs. Junction Temperature



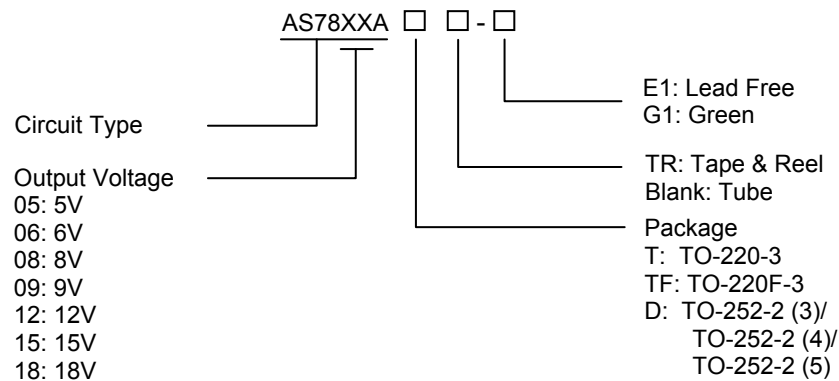
Line Transient
 (Conditions: $I_{OUT} = 500mA$, $C_{OUT} = 0.1\mu F$)



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



Ordering Information

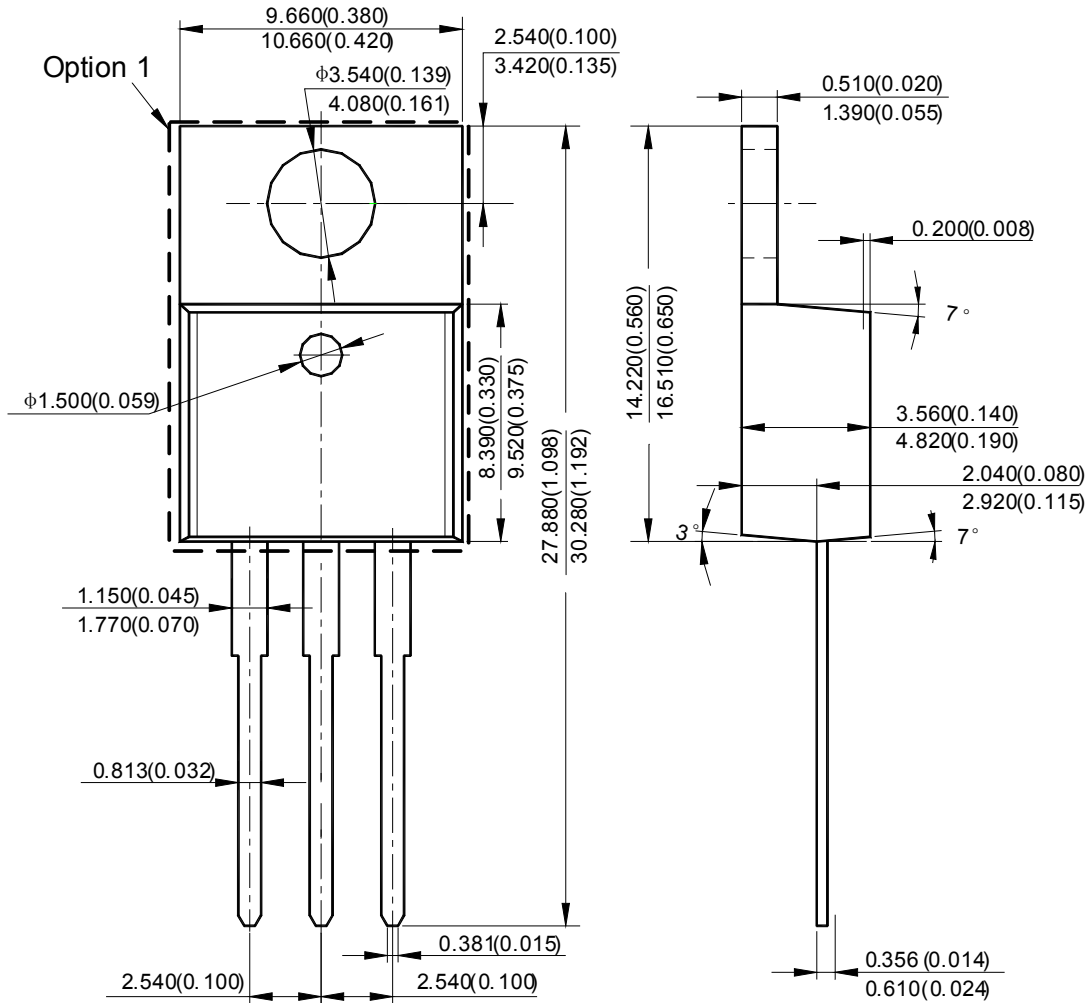


| Package | Temperature Range | Part Number | | Marking ID | | Packing Type |
|--|-------------------|---------------|---------------|--------------|--------------|--------------|
| | | Lead Free | Green | Lead Free | Green | |
| TO-220-3 | -40 to +125°C | AS7805AT-E1 | AS7805AT-G1 | AS7805AT-E1 | AS7805AT-G1 | Tube |
| | | AS7806AT-E1 | AS7806AT-G1 | AS7806AT-E1 | AS7806AT-G1 | Tube |
| | | AS7808AT-E1 | AS7808AT-G1 | AS7808AT-E1 | AS7808AT-G1 | Tube |
| | | AS7809AT-E1 | AS7809AT-G1 | AS7809AT-E1 | AS7809AT-G1 | Tube |
| | | AS7812AT-E1 | AS7812AT-G1 | AS7812AT-E1 | AS7812AT-G1 | Tube |
| | | AS7815AT-E1 | AS7815AT-G1 | AS7815AT-E1 | AS7815AT-G1 | Tube |
| TO-220F-3 | -40 to +125°C | AS7805ATF-E1 | AS7805ATF-G1 | AS7805ATF-E1 | AS7805ATF-G1 | Tube |
| | | AS7806ATF-E1 | AS7806ATF-G1 | AS7806ATF-E1 | AS7806ATF-G1 | Tube |
| | | AS7808ATF-E1 | AS7808ATF-G1 | AS7808ATF-E1 | AS7808ATF-G1 | Tube |
| | | AS7809ATF-E1 | AS7809ATF-G1 | AS7809ATF-E1 | AS7809ATF-G1 | Tube |
| | | AS7812ATF-E1 | AS7812ATF-G1 | AS7812ATF-E1 | AS7812ATF-G1 | Tube |
| | | AS7815ATF-E1 | AS7815ATF-G1 | AS7815ATF-E1 | AS7815ATF-G1 | Tube |
| Lead-Free Lead-free Green TO-252-2 (3)/ TO-252-2 (4)/ TO-252-2 (5) | -40 to +125°C | AS7805ADTR-E1 | AS7805ADTR-G1 | AS7805AD-E1 | AS7805AD-G1 | Tape & Reel |
| | | AS7806ADTR-E1 | AS7806ADTR-G1 | AS7806AD-E1 | AS7806AD-G1 | Tape & Reel |
| | | AS7808ADTR-E1 | AS7808ADTR-G1 | AS7808AD-E1 | AS7808AD-G1 | Tape & Reel |
| | | AS7809ADTR-E1 | AS7809ADTR-G1 | AS7809AD-E1 | AS7809AD-G1 | Tape & Reel |
| | | AS7812ADTR-E1 | AS7812ADTR-G1 | AS7812AD-E1 | AS7812AD-G1 | Tape & Reel |
| | | AS7815ADTR-E1 | AS7815ADTR-G1 | AS7815AD-E1 | AS7815AD-G1 | Tape & Reel |
| AS7818ADTR-E1 | AS7818ADTR-G1 | AS7818AD-E1 | AS7818AD-G1 | Tape & Reel | | |

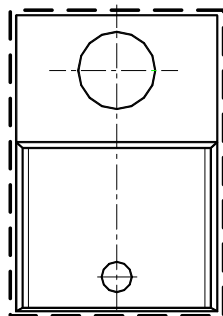
BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant. Products with "G1" suffix are available in green packages.

Package Outline Dimensions (All dimensions in mm(inch).)

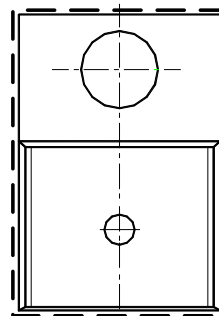
TO-220-3



Option 2

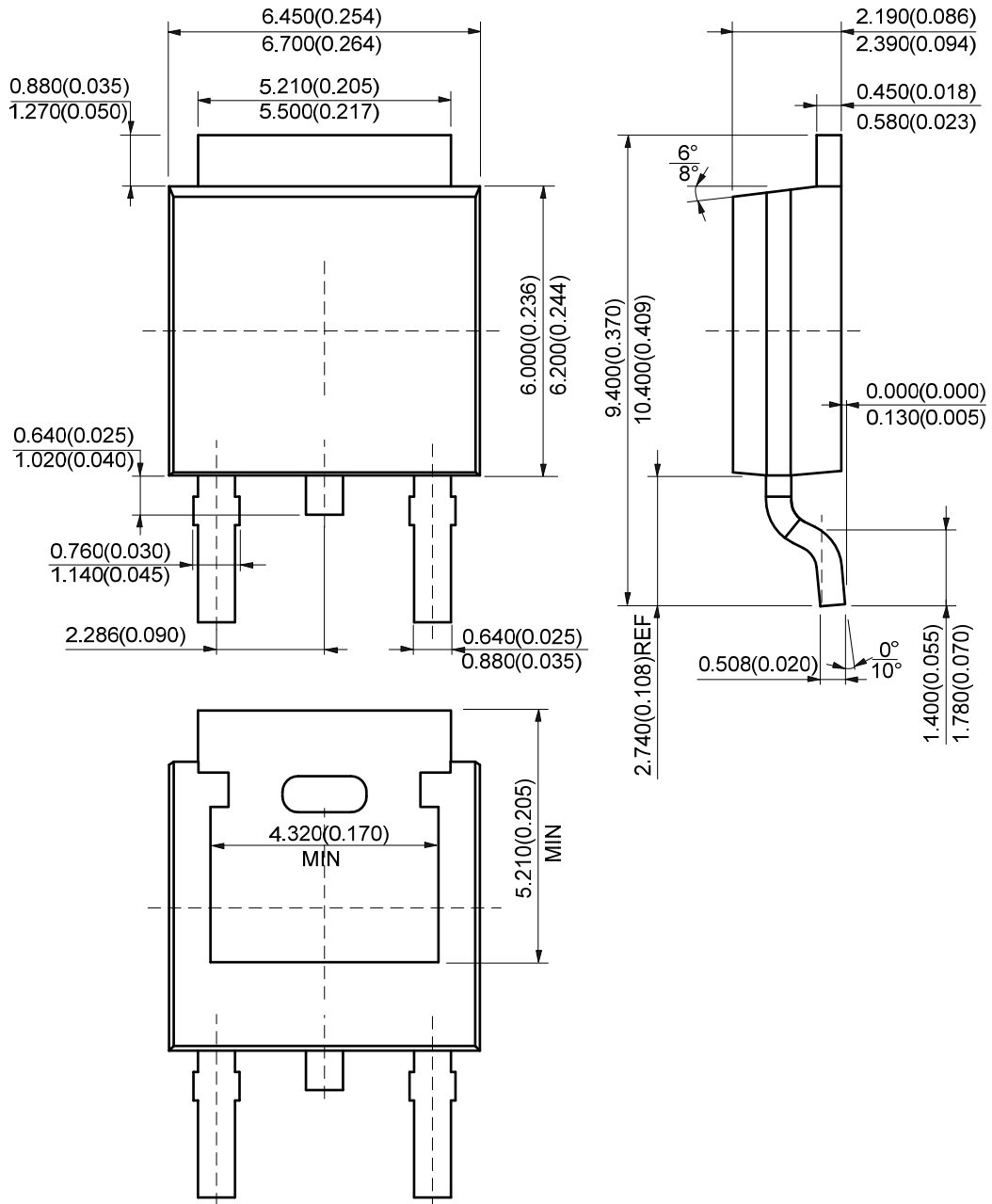


Option 3



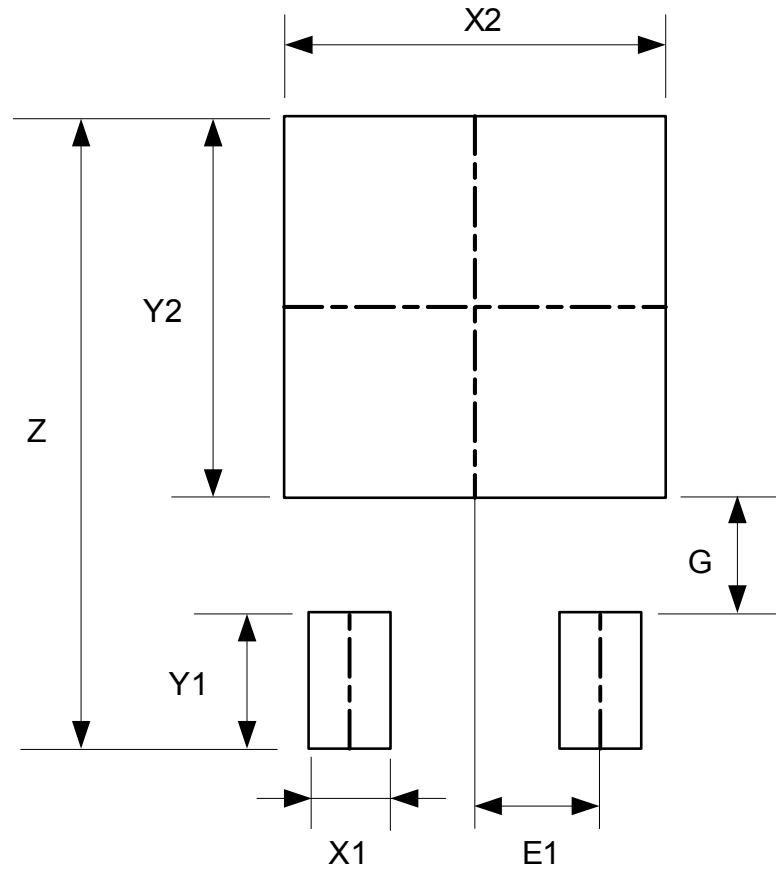
Package Outline Dimensions (Cont. All dimensions in mm(inch).)

TO-252-2 (5)



Suggested Pad Layout

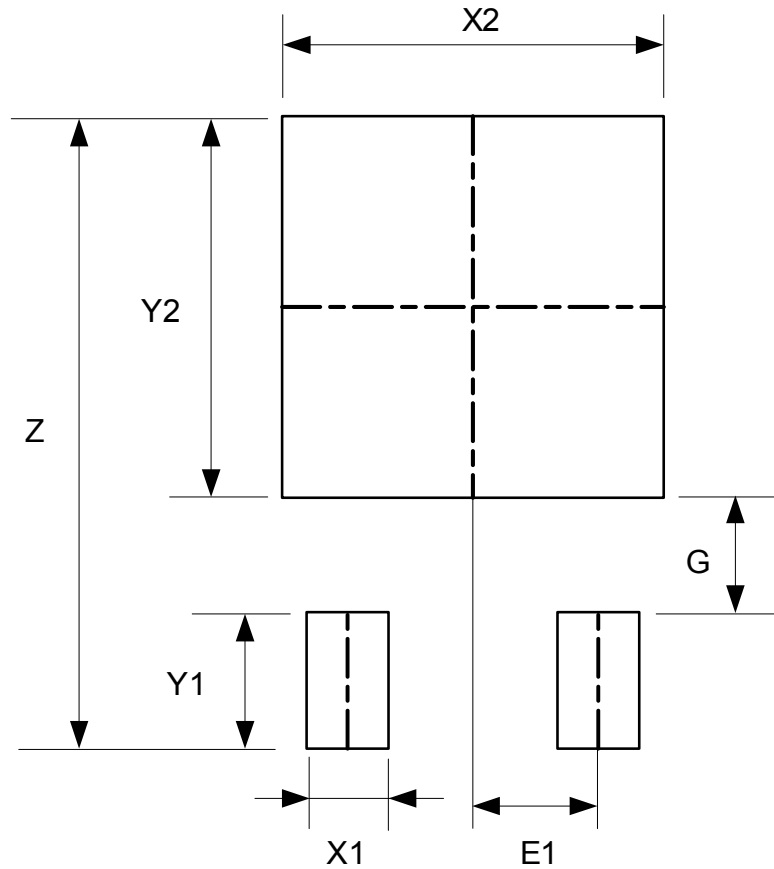
TO-252-2 (3)



| Dimensions | Z (mm)/(inch) | X1 (mm)/(inch) | X2 = Y2 (mm)/(inch) | Y1 (mm)/(inch) | G (mm)/(inch) | E1 (mm)/(inch) |
|------------|------------------|-------------------|------------------------|-------------------|------------------|-------------------|
| Value | 11.600/0.457 | 1.500/0.059 | 7.000/0.276 | 2.500/0.098 | 2.100/0.083 | 2.300/0.091 |

Suggested Pad Layout (Cont.)

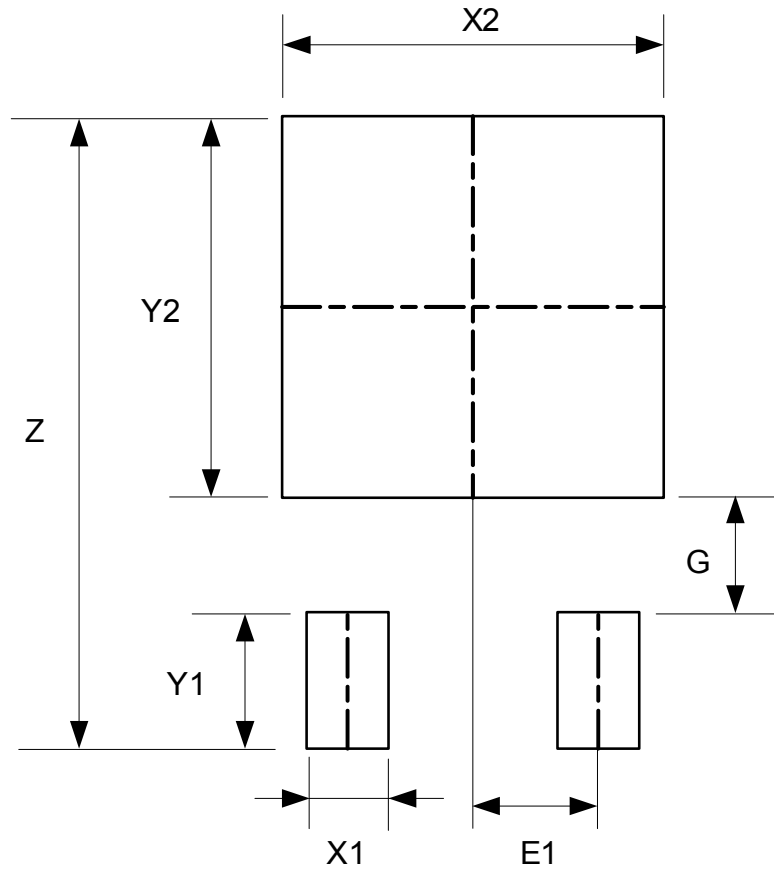
TO-252-2 (4)



| Dimensions | Z (mm)/(inch) | X1 (mm)/(inch) | X2 = Y2 (mm)/(inch) | Y1 (mm)/(inch) | G (mm)/(inch) | E1 (mm)/(inch) |
|------------|------------------|-------------------|------------------------|-------------------|------------------|-------------------|
| Value | 11.600/0.457 | 1.500/0.059 | 7.000/0.276 | 2.500/0.098 | 2.100/0.083 | 2.300/0.091 |

Suggested Pad Layout (Cont.)

TO-252-2 (5)



| Dimensions | Z (mm)/(inch) | X1 (mm)/(inch) | X2 = Y2 (mm)/(inch) | Y1 (mm)/(inch) | G (mm)/(inch) | E1 (mm)/(inch) |
|------------|------------------|-------------------|------------------------|-------------------|------------------|-------------------|
| Value | 11.600/0.457 | 1.500/0.059 | 7.000/0.276 | 2.500/0.098 | 2.100/0.083 | 2.300/0.091 |

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