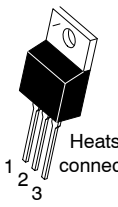
# *Negative-Voltage Regulators*

## DESCRIPTION

This series of fixed-negative voltage monolithic integrated circuit voltage regulators is designed to complement Series μA7800 in a wide range of applications. These applications include on-card regulation for elimination of noise and distribution problems associated with single-point regulation. Each of these regulators can deliver up to 1.5A of output current. The internal limiting and termal shutdown features of these regulators make them essentially immune to overload. In addition to use as fixed-voltage regulators, these devices can be used with external components to obtain adjustable output voltages and current and also as the power pass element in precision regulators.

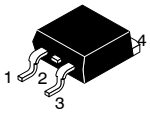
- **3-Terminal Regulators**
- **Output Current Up to 1.5 A**
- **No External Components**
- **Internal Thermal Overload Protection**
- **High Power Dissipation Capability**
- **Internal Short-Circuit Current Limiting**
- **Output Transistor Safe-Area Compensation**

| Nominal output voltage | Regulator RoHS |
|---|---|
| -5V | 7905A |
| -6V | 7906A |
| -8V | 7908A |
| -9V | 7909A |
| -12V | 7912A |
| -15V | 7915A |
| -18V | 7918A |
| -24V | 7924A |



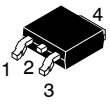

Heatsink surface connected to Pin 2.

**TO-220**
**T SUFFIX**
**HT7905ATZ**




Pin 1. Ground
2. Input
3. Output

**TO263-3 S SUFFIX**
**HT7905ARSZ**




**TO252-3 M SUFFIX**
**HT7905ARMZ**

Heatsink surface (shown as terminal 4 in case outline drawing) is connected to Pin 2.

**Absolute maximum ratings over operating temperature range (unless otherwise noted)**

| | | 79-- A | UNIT |
|---|---|---|---|
| Input voltage | 7924A | -40 | V |
| | All others | -35 | |
| Continuous total dissipation at 25 °C free-air temperature | | 2 | W |
| Continuous total dissipation at (or bellow) 25 °C case temperature | | 15 | |
| Operating free-air, case, or virtual junctions temperature range | | 0 to 150 | °C |
| Storage temperature range | | -65 to 150 | |
| Lead temperature 3.2 mm (1/8 inch) from case for 10 seconds | | 260 | |

**Recommended operating conditions**

| PARAMETER | | MIN | MAX | UNIT |
|---|---|---|---|---|
| Input voltage $V_I$ | 7905A | -7 | -25 | V |
| | 7906A | -8 | -25 | |
| | 7908A | -10.5 | -25 | |
| | 7912A | -14.5 | -30 | |
| | 7915A | -17.5 | -30 | |
| | 7918A | -21 | -33 | |
| | 7924A | -27 | -38 | |
| Output current, $I_O$ | | | 1.5 | A |
| Operating virtual junction temperature, $T_J$ | | 0 | 125 | °C |

**7905A electrical characteristics at specified virtual junction temperature, $V_I$= -10V, $I_O$=500mA (unless otherwise noted)**

| PARAMETER | TEST CONDITIONS* | | 7905A | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage** | | 25°C | -4.8 | -5 | -5.2 | V |
| | $I_O$= 5mA to 1A, $V_I$= -7V to -20V, P≤15W | 0°C to 125°C | -4.75 | -5 | -5.25 | |
| Input regulation | $V_I$= -7V to -25V | 25°C | | 12.5 | 50 | mV |
| | $V_I$= -8V to -12V | | | 4 | 15 | |
| Ripple rejection | $V_I$= -8V to -18V, f= 120Hz | 0°C to 125°C | 54 | 60 | | dB |
| Output regulation | $I_O$= 5mA to 1.5A | 25°C | | 15 | 100 | mV |
| | $I_O$= 250mA to 750mA | | | 5 | 50 | |
| Temperature coefficient of output voltage | $I_O$= 5mA | 0°C to 125°C | | -0.4 | | mV/°C |
| Output noise voltage | f= 10 Hz to 100 KHz | 25°C | | 125 | | μV |
| Dropout voltage | $I_O$= 1A | 25°C | | 1.6 | | V |
| Bias current | | 25°C | | 1.5 | 2 | mA |
| Bias current change | $V_I$= -7V to -25V | 0°C to 125°C | | 0.15 | 0.5 | |
| | $I_O$= 5mA to 1A | | | 0.08 | 0.5 | |
| Peak output current | | 25°C | | 2.1 | | A |

**7906A electrical characteristics at specified virtual junction temperature, $V_I$= -11V, $I_O$= 500mA (unless otherwise noted)**

| PARAMETER | TEST CONDITIONS* | | 7906A | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage** | | 25°C | -5.75 | -6 | -6.25 | V |
| | $I_O$= 5mA to 1A, $V_I$= -8V to -21V, P≤15W | 0°C to 125°C | -5.7 | -6 | -6.3 | |
| Input regulation | $V_I$= -8V to -25V | 25°C | | 12.5 | 120 | mV |
| | $V_I$= -9V to -13V | | | 4 | 60 | |
| Ripple rejection | $V_I$= -9V to -19V, f= 120Hz | 0°C to 125°C | 54 | 60 | | dB |
| Output regulation | $I_O$= 5mA to 1.5A | 25°C | | 15 | 120 | mV |
| | $I_O$= 250mA to 750mA | | | 5 | 60 | |
| Temperature coefficient of output voltage | $I_O$= 5mA | 0°C to 125°C | | -0.4 | | mV/°C |
| Output noise voltage | f= 10 Hz to 100 KHz | 25°C | | 150 | | μV |
| Dropout voltage | $I_O$= 1A | 25°C | | 1.6 | | V |
| Bias current | | 25°C | | 1.5 | 2 | mA |
| Bias current change | $V_I$= -8V to -25V | 0°C to 125°C | | 0.15 | 1.3 | |
| | $I_O$= 5mA to 1A | | | 0.08 | 0.5 | |
| Peak output current | | 25°C | | 2.1 | | A |

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.

** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

**7908A electrical characteristics at specified virtual junction temperature, $V_I$= -14V, $I_O$= 500mA (unless otherwise noted)**

| PARAMETER | TEST CONDITIONS* | | 7908A | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage** | | 25°C | -7.7 | -8 | -8.3 | V |
| | $I_O$= 5mA to 1A, $V_I$= -10.5V to -23V, P≤15W | 0°C to 125°C | -7.6 | -8 | -8.4 | |
| Input regulation | $V_I$= -10.5V to -25V | 25°C | | 12.5 | 160 | mV |
| | $V_I$= -11V to -17V | | | 4 | 80 | |
| Ripple rejection | $V_I$= -11.5V to -21.5V, f= 120Hz | 0°C to 125°C | 54 | 60 | | dB |
| Output regulation | $I_O$= 5mA to 1.5A | 25°C | | 15 | 160 | mV |
| | $I_O$= 250mA to 750mA | | | 5 | 80 | |
| Temperature coefficient of output voltage | $I_O$= 5mA | 0°C to 125°C | | -0.8 | | mV/°C |
| Output noise voltage | f= 10Hz to 100 KHz | 25°C | | 200 | | μV |
| Dropout voltage | $I_O$= 1A | 25°C | | 1.6 | | V |
| Bias current | | 25°C | | 1.5 | 2 | mA |
| Bias current change | $V_I$= -10.5V to -25V | 0°C to 125°C | | 0.15 | 1 | |
| | $I_O$= 5mA to 1A | | | 0.08 | 0.5 | |
| Peak output current | | 25°C | | 2.1 | | A |

**7909A electrical characteristics at specified virtual junction temperature, $V_I$=-15V, $I_O$=500mA (unless otherwise noted)**

| PARAMETER | TEST CONDITIONS* | | 7909A | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| **Output voltage**** | | **25°C** | **-8.64** | **-9** | **-9.36** | **V** |
| | **$I_O$=5mA to 1A $V_I$=-11.5V to -25V P≤15W** | **0 to 125 °C** | **-8.55** | **-9** | **-9.45** | |
| **Input regulation** | **$V_I$=-11.5V to -25V** | **25°C** | | **12.5** | **180** | **mV** |
| | **$V_I$=-12V to -22.5V** | | | **4** | **90** | |
| **Ripple rejection** | **$V_I$=-12.5V to -22.5V, f=120Hz** | **25°C** | **54** | **60** | | **dB** |
| **Output regulation** | **$I_O$=5mA to 1.5A** | **25°C** | | **15** | **180** | **mV** |
| | **$I_O$=250mA to 750mA** | | | **5** | **90** | |
| **Temperature coefficient of output voltage** | **$I_O$=5mA** | **0 to 125 °C** | | **-0.8** | | **mV/°C** |
| **Output noise voltage** | **f=10Hz-100Hz** | **25°C** | | **225** | | **μV** |
| **Dropout voltage** | **$I_O$=1A** | **25°C** | | **1.6** | | **V** |
| **Bias current** | | **25°C** | | **1.5** | **2** | **mA** |
| **Bias current change** | **$V_I$=-11.5V to -25V** | **0 to 125 °C** | | **0.15** | **1** | |
| | **$I_O$=5mA to 1A** | | | **0.08** | **0.5** | |
| **Peak output current** | | **25°C** | | **2.1** | | **A** |

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.
** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

**7912A electrical characteristics at specified virtual junction temperature, $V_I$= -19V, $I_O$= 500mA (unless otherwise noted)**

| PARAMETER | TEST CONDITIONS* | | 7912A | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage** | | 25°C | -11.5 | -12 | -12.5 | V |
| | $I_O$= 5mA to 1A, $V_I$= -14.5V to -27V, P≤15W | 0°C to 125°C | -11.4 | -12 | -12.6 | |
| Input regulation | $V_I$= -14.5V to -30V | 25°C | | 5 | 80 | mV |
| | $V_I$= -16V to -22V | | | 3 | 30 | |
| Ripple rejection | $V_I$= -15V to -25V, f= 120Hz | 0°C to 125°C | 54 | 60 | | dB |
| Output regulation | $I_O$= 5mA to 1.5A | 25°C | | 15 | 200 | mV |
| | $I_O$= 250mA to 750mA | | | 5 | 75 | |
| Temperature coefficient of output voltage | $I_O$= 5mA | 0°C to 125°C | | -0.8 | | mV/°C |
| Output noise voltage | f= 10 Hz to 100 KHz | 25°C | | 300 | | μV |
| Dropout voltage | $I_O$= 1A | 25°C | | 1.6 | | V |
| Bias current | | 25°C | | 2 | 3 | mA |
| Bias current change | $V_I$= -14.5V to -30V | 0°C to 125°C | | 0.04 | 0.5 | |
| | $I_O$= 5mA to 1A | | | 0.06 | 0.5 | |
| Peak output current | | 25°C | | 2.1 | | A |

**7915A electrical characteristics at specified virtual junction temperature, $V_I$= -23V, $I_O$=500mA (unless otherwise noted)**

| PARAMETER | TEST CONDITIONS* | | 7915A | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage** | | 25°C | -14.4 | -15 | -15.6 | V |
| | $I_O$= 5mA to 1A, $V_I$= -17.5V to -30V, P≤15W | 0°C to 125°C | -14.25 | -15 | -15.75 | |
| Input regulation | $V_I$= -17.5V to -30V | 25°C | | 5 | 100 | mV |
| | $V_I$= -20V to -26V | | | 3 | 50 | |
| Ripple rejection | $V_I$= -18.5V to -28.5V, f= 120Hz | 0°C to 125°C | 54 | 60 | | dB |
| Output regulation | $I_O$= 5mA to 1.5A | 25°C | | 15 | 200 | mV |
| | $I_O$= 250mA to 750mA | | | 5 | 75 | |
| Temperature coefficient of output voltage | $I_O$= 5mA | 0°C to 125°C | | -1 | | mV/°C |
| Output noise voltage | f= 10 Hz to 100 KHz | 25°C | | 375 | | μV |
| Dropout voltage | $I_O$= 1A | 25°C | | 1.6 | | V |
| Bias current | | 25°C | | 2 | 3 | mA |
| Bias current change | $V_I$= -17.5V to -30V | 0°C to 125°C | | 0.04 | 0.5 | |
| | $I_O$= 5mA to 1A | | | 0.06 | 0.5 | |
| Peak output current | | 25°C | | 2.1 | | A |

* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.
** This specification applies only for dc power dissipation permitted by absolute maximum ratings.

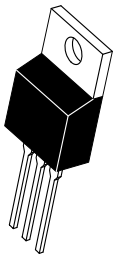
**7918A electrical characteristics at specified virtual junction temperature, $V_I$= -27V, $I_O$=500mA (unless otherwise noted)**

| PARAMETER | TEST CONDITIONS* | | 7918A | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage** | | 25°C | -17.3 | -18 | -18.7 | V |
| | $I_O$= 5mA to 1A, $V_I$= -21V to -33V, P≤15W | 0°C to 125°C | -17.1 | -18 | -18.9 | |
| Input regulation | $V_I$= -21V to -33V | 25°C | | 5 | 360 | mV |
| | $V_I$= -24V to -30V | | | 3 | 180 | |
| Ripple rejection | $V_I$= -22V to -32V, f= 120Hz | 0°C to 125°C | 54 | 60 | | dB |
| Output regulation | $I_O$= 5mA to 1.5A | 25°C | | 30 | 360 | mV |
| | $I_O$= 250mA to 750mA | | | 10 | 180 | |
| Temperature coefficient of output voltage | $I_O$= 5mA | 0°C to 125°C | | -1.0 | | mV/°C |
| Output noise voltage | f= 10Hz to 100 KHz | 25°C | | 450 | | μV |
| Dropout voltage | $I_O$= 1A | 25°C | | 1.6 | | V |
| Bias current | | 25°C | | 2 | 3 | mA |
| Bias current change | $V_I$= -21V to -33V | 0°C to 125°C | | 0.04 | 1 | |
| | $I_O$= 5mA to 1A | | | 0.06 | 0.5 | |
| Peak output current | | 25°C | | 2.1 | | A |

**7924A electrical characteristics at specified virtual junction temperature, $V_I$= -33V, $I_O$=500mA (unless otherwise noted)**

| PARAMETER | TEST CONDITIONS* | | 7924A | | | UNIT |
|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | |
| Output voltage** | | 25°C | -23 | -24 | -25 | V |
| | $I_O$= 5mA to 1A, $V_I$= -27V to -38V, P≤15W | 0°C to 125°C | -22.8 | -24 | -25.2 | |
| Input regulation | $V_I$= -27V to -38V | 25°C | | 5 | 480 | mV |
| | $V_I$= -30V to -36V | | | 3 | 240 | |
| Ripple rejection | $V_I$= -28V to -38V, f= 120Hz | 0°C to 125°C | 54 | 60 | | dB |
| Output regulation | $I_O$= 5mA to 1.5A | 25°C | | 85 | 480 | mV |
| | $I_O$= 250mA to 750mA | | | 25 | 240 | |
| Temperature coefficient of output voltage | $I_O$= 5mA | 0°C to 125°C | | -1 | | mV/°C |
| Output noise voltage | f= 10Hz to 100 KHz | 25°C | | 600 | | μV |
| Dropout voltage | $I_O$= 1A | 25°C | | 1.6 | | V |
| Bias current | | 25°C | | 2 | 3 | mA |
| Bias current change | $V_I$= -27V to -38V | 0°C to 125°C | | 0.04 | 1 | |
| | $I_O$= 5mA to 1A | | | 0.06 | 0.5 | |
| Peak output current | | 25°C | | 2.1 | | A |

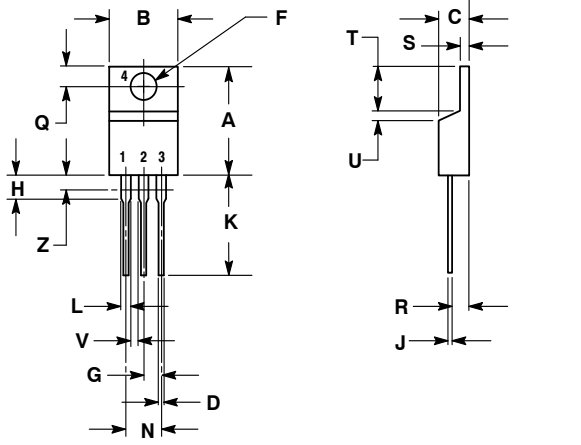
* Pulse testing techniques are used to maintain the junction temperature as close to the ambient temperature as possible. Thermal effects must be taken into account separately.
** This specification applies only for dc power dissipation permitted by absolute maximum ratings.



SCALE 1:1

**TO−220, SINGLE GAUGE**
CASE 221AB−01
ISSUE A

DATE 16 NOV 2010




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.
4. PRODUCT SHIPPED PRIOR TO 2008 HAD DIMENSIONS S = 0.045 − 0.055 INCHES (1.143 − 1.397 MM)

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.570 | 0.620 | 14.48 | 15.75 |
| B | 0.380 | 0.405 | 9.66 | 10.28 |
| C | 0.160 | 0.190 | 4.07 | 4.82 |
| D | 0.025 | 0.035 | 0.64 | 0.88 |
| F | 0.142 | 0.147 | 3.61 | 3.73 |
| G | 0.095 | 0.105 | 2.42 | 2.66 |
| H | 0.110 | 0.155 | 2.80 | 3.93 |
| J | 0.018 | 0.025 | 0.46 | 0.64 |
| K | 0.500 | 0.562 | 12.70 | 14.27 |
| L | 0.045 | 0.060 | 1.15 | 1.52 |
| N | 0.190 | 0.210 | 4.83 | 5.33 |
| Q | 0.100 | 0.120 | 2.54 | 3.04 |
| R | 0.080 | 0.110 | 2.04 | 2.79 |
| S | 0.020 | 0.024 | 0.508 | 0.61 |
| T | 0.235 | 0.255 | 5.97 | 6.47 |
| U | 0.000 | 0.050 | 0.00 | 1.27 |
| V | 0.045 | --- | 1.15 | --- |
| Z | --- | 0.080 | --- | 2.04 |

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 2:
PIN 1. BASE
2. EMITTER
3. COLLECTOR
4. EMITTER

STYLE 3:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 4:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. MAIN TERMINAL 2

STYLE 5:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

STYLE 6:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

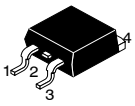
STYLE 7:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. ANODE

STYLE 8:
PIN 1. CATHODE
2. ANODE
3. EXTERNAL TRIP/DELAY
4. ANODE

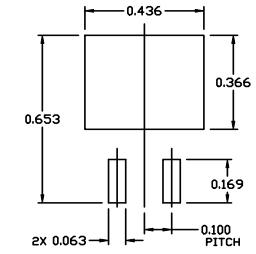
STYLE 9:
PIN 1. GATE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 10:
PIN 1. GATE
2. SOURCE
3. DRAIN
4. SOURCE

STYLE 11:
PIN 1. DRAIN
2. SOURCE
3. GATE
4. SOURCE




**(TO-263, 3-LEAD)** CASE
418AJ
ISSUE E



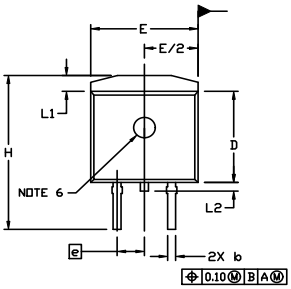

RECOMMENDED
MOUNTING FOOTPRINT

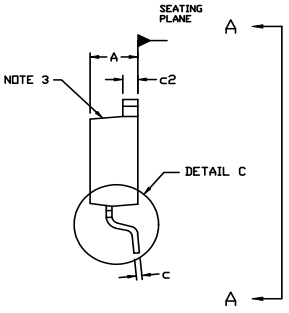
* For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

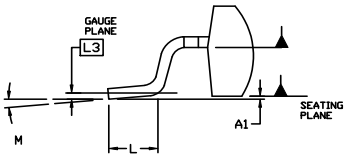
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: INCHES
3. CHAMFER OPTIONAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.005 PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY AT DATUM H.
5. THERMAL PAD CONTOUR IS OPTIONAL WITHIN DIMENSIONS E, L1, D1, AND E1.
6. OPTIONAL MOLD FEATURE.
7. ①, ② ... OPTIONAL CONSTRUCTION FEATURE CALL OUTS.

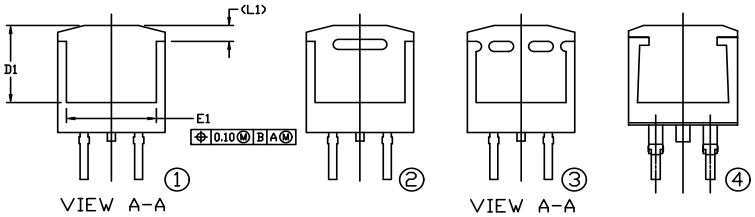
| DIM | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.160 | 0.190 | 4.06 | 4.83 |
| A1 | 0.000 | 0.010 | 0.00 | 0.25 |
| b | 0.020 | 0.039 | 0.51 | 0.99 |
| c | 0.012 | 0.029 | 0.30 | 0.74 |
| c2 | 0.045 | 0.065 | 1.14 | 1.65 |
| D | 0.330 | 0.380 | 8.38 | 9.65 |
| D1 | 0.260 | --- | 6.60 | --- |
| E | 0.380 | 0.420 | 9.65 | 10.67 |
| E1 | 0.245 | --- | 6.22 | --- |
| e | 0.100 BSC | | 2.54 BSC | |
| H | 0.575 | 0.625 | 14.60 | 15.88 |
| L | 0.070 | 0.110 | 1.78 | 2.79 |
| L1 | --- | 0.066 | --- | 1.68 |
| L2 | --- | 0.070 | --- | 1.78 |
| L3 | 0.010 BSC | | 0.25 BSC | |
| M | -8° | 8° | -8° | 8° |



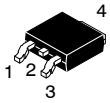




DETAIL C
TIP LEADFORM
ROTATED 90° CW




VIEW A-A

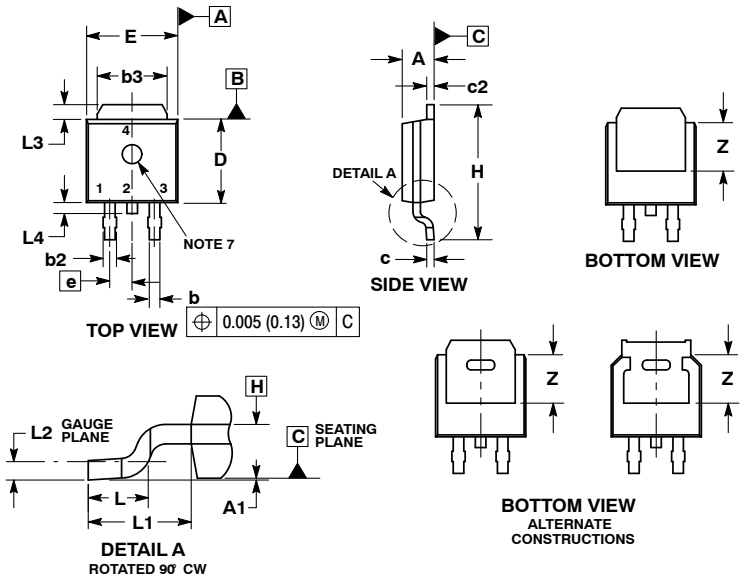
VIEW A-A
OPTIONAL CONSTRUCTIONS




SCALE 1:1

**TO252 (SINGLE GAUGE)** CASE 369C
ISSUE F

DATE 21 JUL 2015




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3 and Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.
7. OPTIONAL MOLD FEATURE.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.086 | 0.094 | 2.18 | 2.38 |
| A1 | 0.000 | 0.005 | 0.00 | 0.13 |
| b | 0.025 | 0.035 | 0.63 | 0.89 |
| b2 | 0.028 | 0.045 | 0.72 | 1.14 |
| b3 | 0.180 | 0.215 | 4.57 | 5.46 |
| c | 0.018 | 0.024 | 0.46 | 0.61 |
| c2 | 0.018 | 0.024 | 0.46 | 0.61 |
| D | 0.235 | 0.245 | 5.97 | 6.22 |
| E | 0.250 | 0.265 | 6.35 | 6.73 |
| e | 0.090 BSC | | 2.29 BSC | |
| H | 0.370 | 0.410 | 9.40 | 10.41 |
| L | 0.055 | 0.070 | 1.40 | 1.78 |
| L1 | 0.114 REF | | 2.90 REF | |
| L2 | 0.020 BSC | | 0.51 BSC | |
| L3 | 0.035 | 0.050 | 0.89 | 1.27 |
| L4 | --- | 0.040 | --- | 1.01 |
| Z | 0.155 | --- | 3.93 | --- |

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 2:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

STYLE 3:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 4:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 5:
PIN 1. GATE
2. ANODE
3. CATHODE
4. ANODE

STYLE 6:
PIN 1. MT1
2. MT2
3. GATE
4. MT2

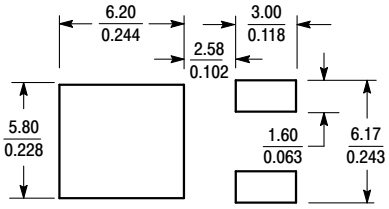
STYLE 7:
PIN 1. GATE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 8:
PIN 1. N/C
2. CATHODE
3. ANODE
4. CATHODE

STYLE 9:
PIN 1. ANODE
2. CATHODE
3. RESISTOR ADJUST
4. CATHODE

STYLE 10:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. ANODE

## SOLDERING FOOTPRINT*




SCALE 3:1 (mm / inches)

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.