



**THE DATASHEET OF  
AP2125N-3.0TRE1**



## Description

The AP2125 series are 300mA, positive voltage regulator ICs fabricated by CMOS process.

Each of these ICs is equipped with a voltage reference, an error amplifier, a resistor network for setting output voltage, a chip enable circuit, a current limit circuit and OTSD (over temperature shut down) circuit to prevent the IC from over current and over temperature.

The AP2125 series have features of high ripple rejection, low dropout voltage, low noise, high output voltage accuracy and low current consumption which make them ideal for use in various battery-powered apparatus.

The AP2125 have 1.8V, 2.5V, 2.8V, 3.0V, 3.3V, 4.15V and 4.2V fixed voltage versions.

These ICs are available in tiny SC-70-5 packages as well as industry standard SOT-23-3 and SOT-23-5 packages.

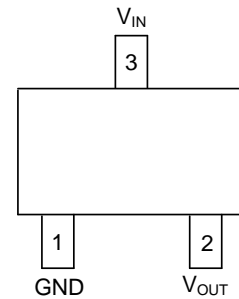
## Features

- Excellent Ripple Rejection: 70dB Typical (1.8V Version)
- Low Dropout Voltage: 65mV ( $I_{OUT}=100mA$ , 3.3V Version)
- Low Standby Current: 0.01 $\mu A$  Typical
- Low Quiescent Current: 60 $\mu A$  Typical
- Extremely Low Noise: 50 $\mu V_{rms}$  Typical
- Maximum Output Current: 300mA (Min.)
- High Output Voltage Accuracy:  $\pm 2\%$
- Compatible with Low ESR Ceramic Capacitor
- Excellent Line/Load Regulation
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](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.

## Pin Assignments

(Top View)



SOT-23-3

(Top View)



SOT-23-5/SC-70-5

## Applications

- CDMA/GSM Cellular Handsets
- Battery-powered Equipments
- Laptops, Palmtops, Notebook Computers
- Hand-held Instruments
- PCMCIA Cards
- Portable Information Appliances

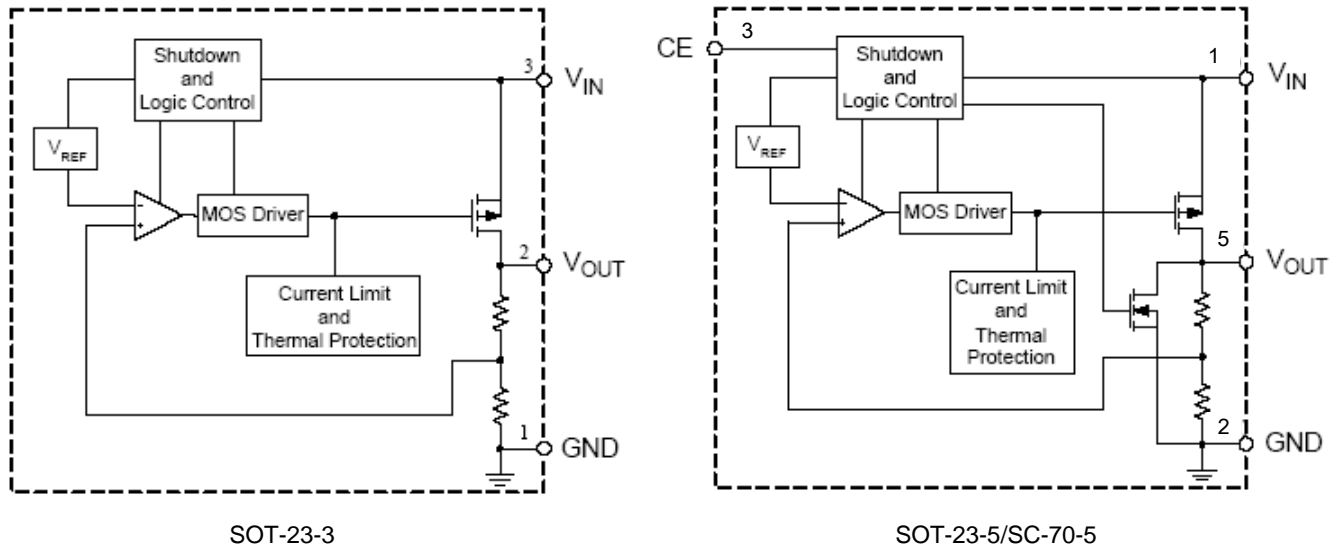
**Typical Applications Circuit**



**Pin Descriptions**

| Pin Number |                  | Pin Name         | Function  |
|------------|------------------|------------------|---|
| SOT-23-3   | SOT-23-5/SC-70-5 |                  |   |
| 3          | 1                | V <sub>IN</sub>  | Input voltage   |
| 1          | 2                | GND              | Ground  |
| –          | 3                | CE               | Active high enable input pin. Logic high=enable, logic low = shutdown |
| –          | 4                | NC               | No connection   |
| 2          | 5                | V <sub>OUT</sub> | Regulated output voltage  |

**Functional Block Diagram**



**Absolute Maximum Ratings** (Note 4)

| Symbol            | Parameter                           | Value                        | Unit |
|-------------------|-------------------------------------|------------------------------|------|
| V <sub>IN</sub>   | Input Voltage                       | 6.5                          | V    |
| V <sub>CE</sub>   | Enable Input Voltage                | -0.3 to V <sub>IN</sub> +0.3 | V    |
| I <sub>OUT</sub>  | Output Current                      | 450                          | mA   |
| T <sub>J</sub>    | Junction Temperature                | +150                         | °C   |
| T <sub>STG</sub>  | Storage Temperature Range           | -65 to +150                  | °C   |
| T <sub>LEAD</sub> | Lead Temperature (Soldering, 10sec) | +260                         | °C   |
| θ <sub>JA</sub>   | Thermal Resistance                  | SOT-23-3                     | 200  |
|                   |                                     | SOT-23-5                     | 200  |
|                   |                                     | SC-70-5                      | 300  |
| ESD               | ESD (Human Body Model)              | 6000                         | V    |
| ESD               | ESD (Machine Model)                 | 400                          | V    |

Note 4: 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 <sub>IN</sub> | Input Voltage                       | V <sub>OUT</sub> +0.5V | 6   | V    |
| T <sub>A</sub>  | Operating Ambient Temperature Range | -40                    | +85 | °C   |

## Electrical Characteristics

**AP2125-1.8 Electrical Characteristics** (@ $V_{IN} = 2.8V$ ,  $T_A = +25^\circ C$ ,  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 1\mu F$ , **Bold** typeface applies over  $-40^\circ C \leq T_J \leq +85^\circ C$ , unless otherwise specified.)

| Symbol                              | Parameter                              | Conditions                                       | Min         | Typ                         | Max   | Unit            |    |
|-------------------------------------|--|--|-------------|-----------------------------|-------|-----------------|----|
| $V_{OUT}$                           | Output Voltage                         | $V_{IN} = 2.8V$<br>$1mA \leq I_{OUT} \leq 30mA$  | 1.764       | 1.8                         | 1.836 | V               |    |
| $V_{IN}$                            | Input Voltage                          | –  | –           | –                           | 6     | V               |    |
| $I_{OUT(MAX)}$                      | Maximum Output Current                 | $V_{IN} - V_{OUT} = 1V$ , $V_{OUT} = 1.76V$      | 300         | 360                         | –     | mA              |    |
| $V_{RLOAD}$                         | Load Regulation                        | $V_{IN} = 2.8V$<br>$1mA \leq I_{OUT} \leq 300mA$ | –           | 6                           | 15    | mV              |    |
| $V_{RLINE}$                         | Line Regulation                        | $2.8V \leq V_{IN} \leq 6V$<br>$I_{OUT} = 30mA$   | –           | 1                           | 15    | mV              |    |
| $V_{DROP}$                          | Dropout Voltage                        | $I_{OUT} = 10mA$                                 | –           | 10                          | 12    | mV              |    |
|                                     |  | $I_{OUT} = 100mA$                                | –           | 100                         | 120   |                 |    |
|                                     |  | $I_{OUT} = 300mA$                                | –           | 300                         | 360   |                 |    |
| $I_Q$                               | Quiescent Current                      | $V_{IN} = 2.8V$ , $I_{OUT} = 0mA$                | –           | 60                          | 90    | $\mu A$         |    |
| $I_{STD}$                           | Standby Current                        | $V_{IN} = 2.8V$<br>$V_{CE}$ in OFF mode          | –           | 0.01                        | 1.0   | $\mu A$         |    |
| PSRR                                | Power Supply Rejection Ratio           | Ripple 0.5Vp-p,<br>$V_{IN} = 2.8V$               | $f = 100Hz$ | –                           | 70    | –               | dB |
|                                     |  |  | $f = 1KHz$  | –                           | 70    | –               | dB |
| $(\Delta V_{OUT}/V_{OUT})/\Delta T$ | Output Voltage Temperature Coefficient | $I_{OUT} = 30mA$                                 | –           | <b><math>\pm 100</math></b> | –     | ppm/ $^\circ C$ |    |
| $I_{SHORT}$                         | Short Current Limit                    | $V_{OUT} = 0V$                                   | –           | 50                          | –     | mA              |    |
| $V_{NOISE}$                         | RMS Output Noise                       | $10Hz \leq f \leq 100kHz$                        | –           | 50                          | –     | $\mu V_{rms}$   |    |
| –                                   | CE "High" Voltage                      | CE input voltage "High"                          | 1.5         | –                           | –     | V               |    |
| –                                   | CE "Low" Voltage                       | CE input voltage "Low"                           | –           | –                           | 0.4   | V               |    |
| –                                   | Thermal Shutdown                       | –  | –           | +160                        | –     | $^\circ C$      |    |
| –                                   | Thermal Shutdown Hysteresis            | –  | –           | +25                         | –     | $^\circ C$      |    |

## Electrical Characteristics (Cont.)

**AP2125-2.5 Electrical Characteristics** (@ $V_{IN} = 3.5V$ ,  $T_A = +25^\circ C$ ,  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 1\mu F$ , **Bold** typeface applies over  $-40^\circ C \leq T_J \leq +85^\circ C$ , unless otherwise specified.)

| Symbol                              | Parameter                              | Conditions                                       | Min         | Typ                         | Max  | Unit            |    |
|-------------------------------------|--|--|-------------|-----------------------------|------|-----------------|----|
| $V_{OUT}$                           | Output Voltage                         | $V_{IN} = 3.5V$<br>$1mA \leq I_{OUT} \leq 30mA$  | 2.45        | 2.5                         | 2.55 | V               |    |
| $V_{IN}$                            | Input Voltage                          | –  | –           | –                           | 6    | V               |    |
| $I_{OUT(MAX)}$                      | Maximum Output Current                 | $V_{IN} - V_{OUT} = 1V$ , $V_{OUT} = 2.45V$      | 300         | 360                         | –    | mA              |    |
| $V_{RLOAD}$                         | Load Regulation                        | $V_{IN} = 3.5V$<br>$1mA \leq I_{OUT} \leq 300mA$ | –           | 10                          | 15   | mV              |    |
| $V_{RLINE}$                         | Line Regulation                        | $3.5V \leq V_{IN} \leq 6V$<br>$I_{OUT} = 30mA$   | –           | 1                           | 15   | mV              |    |
| $V_{DROP}$                          | Dropout Voltage                        | $I_{OUT} = 10mA$                                 | –           | 6.5                         | 10   | mV              |    |
|                                     |  | $I_{OUT} = 100mA$                                | –           | 65                          | 100  |                 |    |
|                                     |  | $I_{OUT} = 300mA$                                | –           | 200                         | 300  |                 |    |
| $I_Q$                               | Quiescent Current                      | $V_{IN} = 3.5V$ , $I_{OUT} = 0mA$                | –           | 60                          | 90   | $\mu A$         |    |
| $I_{STD}$                           | Standby Current                        | $V_{IN} = 3.5V$<br>$V_{CE}$ in OFF mode          | –           | 0.01                        | 1.0  | $\mu A$         |    |
| PSRR                                | Power Supply Rejection Ratio           | Ripple 0.5Vp-p,<br>$V_{IN} = 3.5V$               | $f = 100Hz$ | –                           | 65   | –               | dB |
|                                     |  |  | $f = 1KHz$  | –                           | 65   | –               | dB |
| $(\Delta V_{OUT}/V_{OUT})/\Delta T$ | Output Voltage Temperature Coefficient | $I_{OUT} = 30mA$                                 | –           | <b><math>\pm 100</math></b> | –    | ppm/ $^\circ C$ |    |
| $I_{SHORT}$                         | Short Current Limit                    | $V_{OUT} = 0V$                                   | –           | 50                          | –    | mA              |    |
| $V_{NOISE}$                         | RMS Output Noise                       | $10Hz \leq f \leq 100kHz$                        | –           | 50                          | –    | $\mu V_{rms}$   |    |
| –                                   | CE "High" Voltage                      | CE input voltage "High"                          | 1.5         | –                           | –    | V               |    |
| –                                   | CE "Low" Voltage                       | CE input voltage "Low"                           | –           | –                           | 0.4  | V               |    |
| –                                   | Thermal Shutdown                       | –  | –           | +160                        | –    | $^\circ C$      |    |
| –                                   | Thermal Shutdown Hysteresis            | –  | –           | +25                         | –    | $^\circ C$      |    |

## Electrical Characteristics (Cont.)

**AP2125-2.8 Electrical Characteristics** (@ $V_{IN} = 3.8V$ ,  $T_A = +25^{\circ}C$ ,  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 1\mu F$ , **Bold** typeface applies over  $-40^{\circ}C \leq T_J \leq +85^{\circ}C$ , unless otherwise specified.)

| Symbol                              | Parameter                              | Conditions                                       | Min       | Typ                         | Max   | Unit             |    |
|-------------------------------------|--|--|-----------|-----------------------------|-------|------------------|----|
| $V_{OUT}$                           | Output Voltage                         | $V_{IN} = 3.8V$<br>$1mA \leq I_{OUT} \leq 30mA$  | 2.744     | 2.8                         | 2.856 | V                |    |
| $V_{IN}$                            | Input Voltage                          | –  | –         | –                           | 6     | V                |    |
| $I_{OUT(MAX)}$                      | Maximum Output Current                 | $V_{IN} - V_{OUT} = 1V$ , $V_{OUT} = 2.74V$      | 300       | 360                         | –     | mA               |    |
| $V_{RLOAD}$                         | Load Regulation                        | $V_{IN} = 3.8V$<br>$1mA \leq I_{OUT} \leq 300mA$ | –         | 11                          | 15    | mV               |    |
| $V_{RLINE}$                         | Line Regulation                        | $3.8V \leq V_{IN} \leq 6V$<br>$I_{OUT} = 30mA$   | –         | 1                           | 15    | mV               |    |
| $V_{DROP}$                          | Dropout Voltage                        | $I_{OUT} = 10mA$                                 | –         | 6.5                         | 10    | mV               |    |
|                                     |  | $I_{OUT} = 100mA$                                | –         | 65                          | 100   |                  |    |
|                                     |  | $I_{OUT} = 300mA$                                | –         | 200                         | 300   |                  |    |
| $I_Q$                               | Quiescent Current                      | $V_{IN} = 3.8V$ , $I_{OUT} = 0mA$                | –         | 60                          | 90    | $\mu A$          |    |
| $I_{STD}$                           | Standby Current                        | $V_{IN} = 3.8V$<br>$V_{CE}$ in OFF mode          | –         | 0.01                        | 1.0   | $\mu A$          |    |
| PSRR                                | Power Supply Rejection Ratio           | Ripple 0.5Vp-p,<br>$V_{IN} = 3.8V$               | f = 100Hz | –                           | 65    | –                | dB |
|                                     |  |  | f = 1KHz  | –                           | 65    | –                | dB |
| $(\Delta V_{OUT}/V_{OUT})/\Delta T$ | Output Voltage Temperature Coefficient | $I_{OUT} = 30mA$                                 | –         | <b><math>\pm 100</math></b> | –     | ppm/ $^{\circ}C$ |    |
| $I_{SHORT}$                         | Short Current Limit                    | $V_{OUT} = 0V$                                   | –         | 50                          | –     | mA               |    |
| $V_{NOISE}$                         | RMS Output Noise                       | $10Hz \leq f \leq 100kHz$                        | –         | 50                          | –     | $\mu V_{rms}$    |    |
| –                                   | CE "High" Voltage                      | CE input voltage "High"                          | 1.5       | –                           | –     | V                |    |
| –                                   | CE "Low" Voltage                       | CE input voltage "Low"                           | –         | –                           | 0.4   | V                |    |
| –                                   | Thermal Shutdown                       | –  | –         | +160                        | –     | $^{\circ}C$      |    |
| –                                   | Thermal Shutdown Hysteresis            | –  | –         | +25                         | –     | $^{\circ}C$      |    |

## Electrical Characteristics (Cont.)

**AP2125-3.0 Electrical Characteristics** (@ $V_{IN} = 4.0V$ ,  $T_A = +25^\circ C$ ,  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 1\mu F$ , **Bold** typeface applies over  $-40^\circ C \leq T_J \leq +85^\circ C$ , unless otherwise specified.)

| Symbol                              | Parameter                              | Conditions                                       | Min         | Typ                         | Max  | Unit            |    |
|-------------------------------------|--|--|-------------|-----------------------------|------|-----------------|----|
| $V_{OUT}$                           | Output Voltage                         | $V_{IN} = 4.0V$<br>$1mA \leq I_{OUT} \leq 30mA$  | 2.94        | 3.0                         | 3.06 | V               |    |
| $V_{IN}$                            | Input Voltage                          | –  | –           | –                           | 6    | V               |    |
| $I_{OUT(MAX)}$                      | Maximum Output Current                 | $V_{IN} - V_{OUT} = 1V$ , $V_{OUT} = 2.94V$      | 300         | 360                         | –    | mA              |    |
| $V_{RLOAD}$                         | Load Regulation                        | $V_{IN} = 4.0V$<br>$1mA \leq I_{OUT} \leq 300mA$ | –           | 12                          | 15   | mV              |    |
| $V_{RLINE}$                         | Line Regulation                        | $4.0V \leq V_{IN} \leq 6V$<br>$I_{OUT} = 30mA$   | –           | 1                           | 15   | mV              |    |
| $V_{DROP}$                          | Dropout Voltage                        | $I_{OUT} = 10mA$                                 | –           | 6.5                         | 10   | mV              |    |
|                                     |  | $I_{OUT} = 100mA$                                | –           | 65                          | 100  |                 |    |
|                                     |  | $I_{OUT} = 300mA$                                | –           | 200                         | 300  |                 |    |
| $I_Q$                               | Quiescent Current                      | $V_{IN} = 4.0V$ , $I_{OUT} = 0mA$                | –           | 60                          | 90   | $\mu A$         |    |
| $I_{STD}$                           | Standby Current                        | $V_{IN} = 4.0V$<br>$V_{CE}$ in OFF mode          | –           | 0.01                        | 1.0  | $\mu A$         |    |
| PSRR                                | Power Supply Rejection Ratio           | Ripple 0.5Vp-p,<br>$V_{IN} = 4.0V$               | $f = 100Hz$ | –                           | 65   | –               | dB |
|                                     |  |  | $f = 1KHz$  | –                           | 65   | –               | dB |
| $(\Delta V_{OUT}/V_{OUT})/\Delta T$ | Output Voltage Temperature Coefficient | $I_{OUT} = 30mA$                                 | –           | <b><math>\pm 100</math></b> | –    | ppm/ $^\circ C$ |    |
| $I_{SHORT}$                         | Short Current Limit                    | $V_{OUT} = 0V$                                   | –           | 50                          | –    | mA              |    |
| $V_{NOISE}$                         | RMS Output Noise                       | $10Hz \leq f \leq 100kHz$                        | –           | 50                          | –    | $\mu V_{rms}$   |    |
| –                                   | CE "High" Voltage                      | CE input voltage "High"                          | 1.5         | –                           | –    | V               |    |
| –                                   | CE "Low" Voltage                       | CE input voltage "Low"                           | –           | –                           | 0.4  | V               |    |
| –                                   | Thermal Shutdown                       | –  | –           | +160                        | –    | $^\circ C$      |    |
| –                                   | Thermal Shutdown Hysteresis            | –  | –           | +25                         | –    | $^\circ C$      |    |

## Electrical Characteristics (Cont.)

**AP2125-3.3 Electrical Characteristics** (@ $V_{IN} = 4.3V$ ,  $T_A = +25^\circ C$ ,  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 1\mu F$ , **Bold** typeface applies over  $-40^\circ C \leq T_J \leq +85^\circ C$ , unless otherwise specified.)

| Symbol                              | Parameter                              | Conditions                                       | Min         | Typ                         | Max   | Unit            |    |
|-------------------------------------|--|--|-------------|-----------------------------|-------|-----------------|----|
| $V_{OUT}$                           | Output Voltage                         | $V_{IN} = 4.3V$<br>$1mA \leq I_{OUT} \leq 30mA$  | 3.234       | 3.3                         | 3.366 | V               |    |
| $V_{IN}$                            | Input Voltage                          | –  | –           | –                           | 6     | V               |    |
| $I_{OUT(MAX)}$                      | Maximum Output Current                 | $V_{IN} - V_{OUT} = 1V$ , $V_{OUT} = 3.23V$      | 300         | 360                         | –     | mA              |    |
| $V_{RLOAD}$                         | Load Regulation                        | $V_{IN} = 4.3V$<br>$1mA \leq I_{OUT} \leq 300mA$ | –           | 13                          | 15    | mV              |    |
| $V_{RLINE}$                         | Line Regulation                        | $4.3V \leq V_{IN} \leq 6V$<br>$I_{OUT} = 30mA$   | –           | 1                           | 15    | mV              |    |
| $V_{DROP}$                          | Dropout Voltage                        | $I_{OUT} = 10mA$                                 | –           | 6.5                         | 10    | mV              |    |
|                                     |  | $I_{OUT} = 100mA$                                | –           | 65                          | 100   |                 |    |
|                                     |  | $I_{OUT} = 300mA$                                | –           | 200                         | 300   |                 |    |
| $I_Q$                               | Quiescent Current                      | $V_{IN} = 4.3V$ , $I_{OUT} = 0mA$                | –           | 60                          | 90    | $\mu A$         |    |
| $I_{STD}$                           | Standby Current                        | $V_{IN} = 4.3V$<br>$V_{CE}$ in OFF mode          | –           | 0.01                        | 1.0   | $\mu A$         |    |
| PSRR                                | Power Supply Rejection Ratio           | Ripple 0.5Vp-p,<br>$V_{IN} = 4.3V$               | $f = 100Hz$ | –                           | 65    | –               | dB |
|                                     |  |  | $f = 1KHz$  | –                           | 65    | –               | dB |
| $(\Delta V_{OUT}/V_{OUT})/\Delta T$ | Output Voltage Temperature Coefficient | $I_{OUT} = 30mA$                                 | –           | <b><math>\pm 100</math></b> | –     | ppm/ $^\circ C$ |    |
| $I_{SHORT}$                         | Short Current Limit                    | $V_{OUT} = 0V$                                   | –           | 50                          | –     | mA              |    |
| $V_{NOISE}$                         | RMS Output Noise                       | $10Hz \leq f \leq 100kHz$                        | –           | 50                          | –     | $\mu V_{rms}$   |    |
| –                                   | CE "High" Voltage                      | CE input voltage "High"                          | 1.5         | –                           | –     | V               |    |
| –                                   | CE "Low" Voltage                       | CE input voltage "Low"                           | –           | –                           | 0.4   | V               |    |
| –                                   | Thermal Shutdown                       | –  | –           | +160                        | –     | $^\circ C$      |    |
| –                                   | Thermal Shutdown Hysteresis            | –  | –           | +25                         | –     | $^\circ C$      |    |

## Electrical Characteristics (Cont.)

**AP2125-4.15 Electrical Characteristics** (@ $V_{IN} = 5.15V$ ,  $T_A = +25^\circ C$ ,  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 1\mu F$ , **Bold** typeface applies over  $-40^\circ C \leq T_J \leq +85^\circ C$ , unless otherwise specified.)

| Symbol                              | Parameter                              | Conditions  | Min         | Typ                         | Max   | Unit            |    |
|-------------------------------------|--|---|-------------|-----------------------------|-------|-----------------|----|
| $V_{OUT}$                           | Output Voltage                         | $V_{IN} = 5.15V$<br>$1mA \leq I_{OUT} \leq 30mA$  | 4.067       | 4.15                        | 4.233 | V               |    |
| $V_{IN}$                            | Input Voltage                          | –   | –           | –                           | 6     | V               |    |
| $I_{OUT(MAX)}$                      | Maximum Output Current                 | $V_{IN} - V_{OUT} = 1V$ , $V_{OUT} = 4.06V$       | 300         | 360                         | –     | mA              |    |
| $V_{RLOAD}$                         | Load Regulation                        | $V_{IN} = 5.15V$<br>$1mA \leq I_{OUT} \leq 300mA$ | –           | 13                          | 15    | mV              |    |
| $V_{RLINE}$                         | Line Regulation                        | $5.15V \leq V_{IN} \leq 6V$<br>$I_{OUT} = 30mA$   | –           | 1                           | 15    | mV              |    |
| $V_{DROP}$                          | Dropout Voltage                        | $I_{OUT} = 10mA$                                  | –           | 6.5                         | 10    | mV              |    |
|                                     |  | $I_{OUT} = 100mA$                                 | –           | 65                          | 100   |                 |    |
|                                     |  | $I_{OUT} = 300mA$                                 | –           | 200                         | 300   |                 |    |
| $I_Q$                               | Quiescent Current                      | $V_{IN} = 5.15V$ , $I_{OUT} = 0mA$                | –           | 60                          | 90    | $\mu A$         |    |
| $I_{STD}$                           | Standby Current                        | $V_{IN} = 5.15V$<br>$V_{CE}$ in OFF mode          | –           | 0.01                        | 1.0   | $\mu A$         |    |
| PSRR                                | Power Supply Rejection Ratio           | Ripple 0.5Vp-p,<br>$V_{IN} = 5.15V$               | $f = 100Hz$ | –                           | 65    | –               | dB |
|                                     |  |   | $f = 1KHz$  | –                           | 65    | –               | dB |
| $(\Delta V_{OUT}/V_{OUT})/\Delta T$ | Output Voltage Temperature Coefficient | $I_{OUT} = 30mA$                                  | –           | <b><math>\pm 100</math></b> | –     | ppm/ $^\circ C$ |    |
| $I_{SHORT}$                         | Short Current Limit                    | $V_{OUT} = 0V$                                    | –           | 50                          | –     | mA              |    |
| $V_{NOISE}$                         | RMS Output Noise                       | $10Hz \leq f \leq 100kHz$                         | –           | 50                          | –     | $\mu V_{rms}$   |    |
| –                                   | CE "High" Voltage                      | CE input voltage "High"                           | 1.5         | –                           | –     | V               |    |
| –                                   | CE "Low" Voltage                       | CE input voltage "Low"                            | –           | –                           | 0.4   | V               |    |
| –                                   | Thermal Shutdown                       | –   | –           | +160                        | –     | $^\circ C$      |    |
| –                                   | Thermal Shutdown Hysteresis            | –   | –           | +25                         | –     | $^\circ C$      |    |

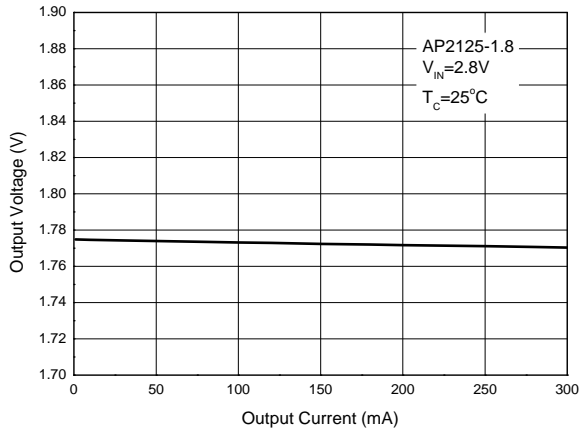
## Electrical Characteristics (Cont.)

**AP2125-4.2 Electrical Characteristics** (@ $V_{IN} = 5.2V$ ,  $T_A = +25^\circ C$ ,  $C_{IN} = 1\mu F$ ,  $C_{OUT} = 1\mu F$ , **Bold** typeface applies over  $-40^\circ C \leq T_J \leq +85^\circ C$ , unless otherwise specified.)

| Symbol                              | Parameter                              | Conditions                                       | Min         | Typ                         | Max   | Unit            |    |
|-------------------------------------|--|--|-------------|-----------------------------|-------|-----------------|----|
| $V_{OUT}$                           | Output Voltage                         | $V_{IN} = 5.2V$<br>$1mA \leq I_{OUT} \leq 30mA$  | 4.116       | 4.2                         | 4.284 | V               |    |
| $V_{IN}$                            | Input Voltage                          | –  | –           | –                           | 6     | V               |    |
| $I_{OUT(MAX)}$                      | Maximum Output Current                 | $V_{IN} - V_{OUT} = 1V$ , $V_{OUT} = 4.12V$      | 300         | 360                         | –     | mA              |    |
| $V_{RLOAD}$                         | Load Regulation                        | $V_{IN} = 5.2V$<br>$1mA \leq I_{OUT} \leq 300mA$ | –           | 13                          | 15    | mV              |    |
| $V_{RLINE}$                         | Line Regulation                        | $5.2V \leq V_{IN} \leq 6V$<br>$I_{OUT} = 30mA$   | –           | 1                           | 15    | mV              |    |
| $V_{DROP}$                          | Dropout Voltage                        | $I_{OUT} = 10mA$                                 | –           | 6.5                         | 10    | mV              |    |
|                                     |  | $I_{OUT} = 100mA$                                | –           | 65                          | 100   |                 |    |
|                                     |  | $I_{OUT} = 300mA$                                | –           | 200                         | 300   |                 |    |
| $I_Q$                               | Quiescent Current                      | $V_{IN} = 5.2V$ , $I_{OUT} = 0mA$                | –           | 60                          | 90    | $\mu A$         |    |
| $I_{STD}$                           | Standby Current                        | $V_{IN} = 5.2V$<br>$V_{CE}$ in OFF mode          | –           | 0.01                        | 1.0   | $\mu A$         |    |
| PSRR                                | Power Supply Rejection Ratio           | Ripple 0.5Vp-p,<br>$V_{IN} = 5.2V$               | $f = 100Hz$ | –                           | 65    | –               | dB |
|                                     |  |  | $f = 1KHz$  | –                           | 65    | –               | dB |
| $(\Delta V_{OUT}/V_{OUT})/\Delta T$ | Output Voltage Temperature Coefficient | $I_{OUT} = 30mA$                                 | –           | <b><math>\pm 100</math></b> | –     | ppm/ $^\circ C$ |    |
| $I_{SHORT}$                         | Short Current Limit                    | $V_{OUT} = 0V$                                   | –           | 50                          | –     | mA              |    |
| $V_{NOISE}$                         | RMS Output Noise                       | $10Hz \leq f \leq 100kHz$                        | –           | 50                          | –     | $\mu V_{rms}$   |    |
| –                                   | CE "High" Voltage                      | CE input voltage "High"                          | 1.5         | –                           | –     | V               |    |
| –                                   | CE "Low" Voltage                       | CE input voltage "Low"                           | –           | –                           | 0.4   | V               |    |
| –                                   | Thermal Shutdown                       | –  | –           | +160                        | –     | $^\circ C$      |    |
| –                                   | Thermal Shutdown Hysteresis            | –  | –           | +25                         | –     | $^\circ C$      |    |

**Performance Characteristics**

**Output Voltage vs. Output Current**



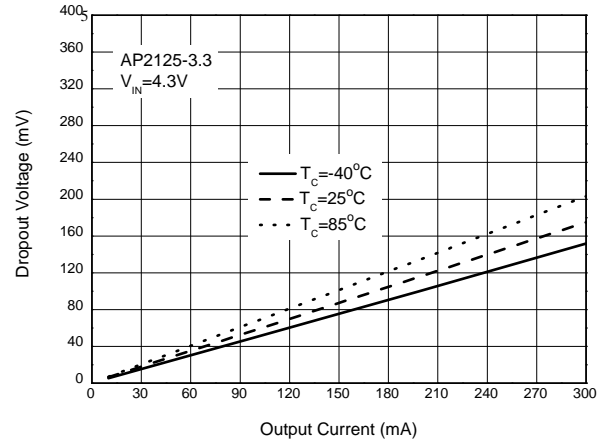
**Output Voltage vs. Output Current**



**Dropout Voltage vs. Output Current**



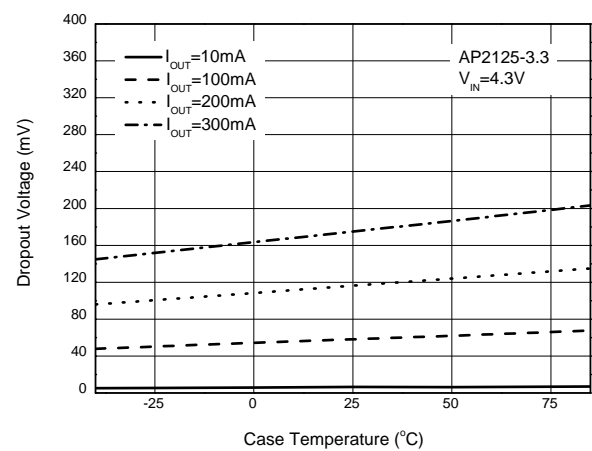
**Dropout Voltage vs. Output Current**



**Dropout Voltage vs. Case Temperature**

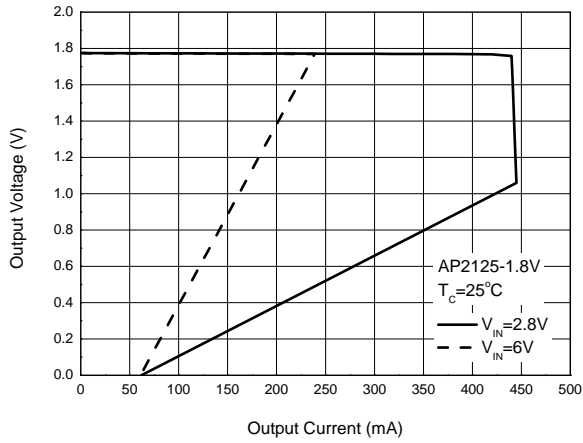


**Dropout Voltage vs. Case Temperature**

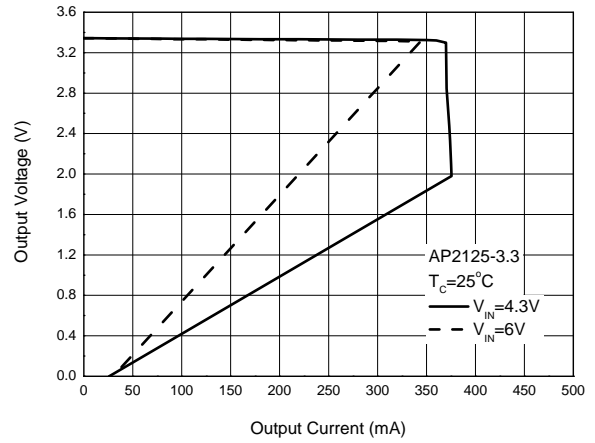


**Performance Characteristics (Cont.)**

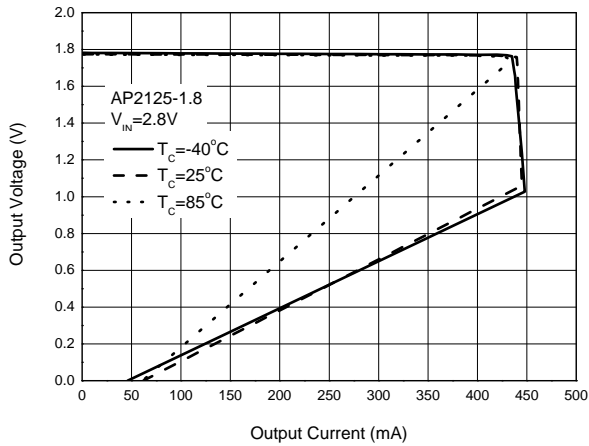
**Current Limit**



**Current Limit**



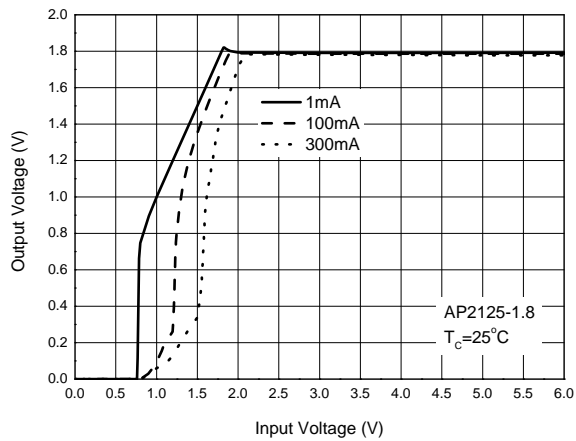
**Current Limit**



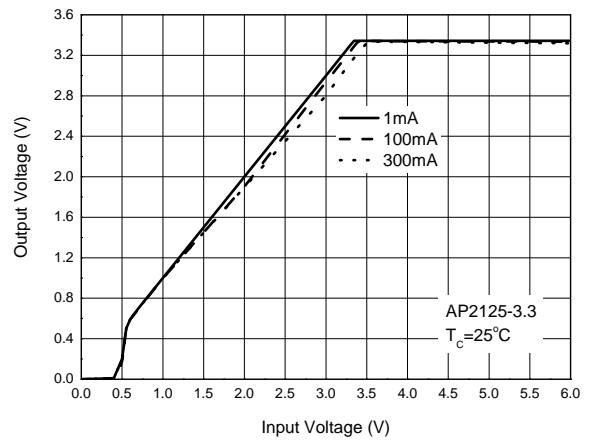
**Current Limit**



**Output Voltage vs. Input Voltage**



**Output Voltage vs. Input Voltage**



**Performance Characteristics (Cont.)**

**Output Voltage vs. Input Voltage**



**Output Voltage vs. Input Voltage**



**Output Voltage vs. Case Temperature**



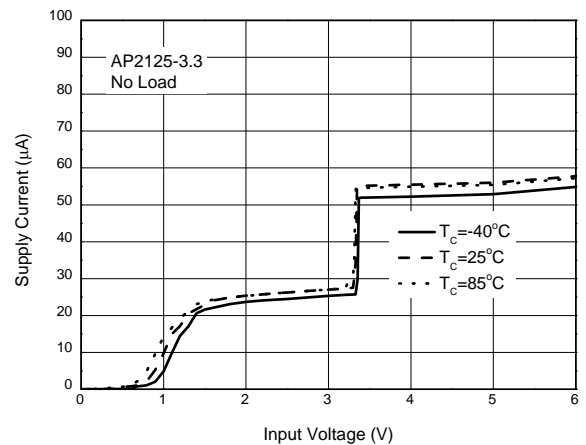
**Output Voltage vs. Case Temperature**



**Supply Current vs. Input Voltage**



**Supply Current vs. Input Voltage**

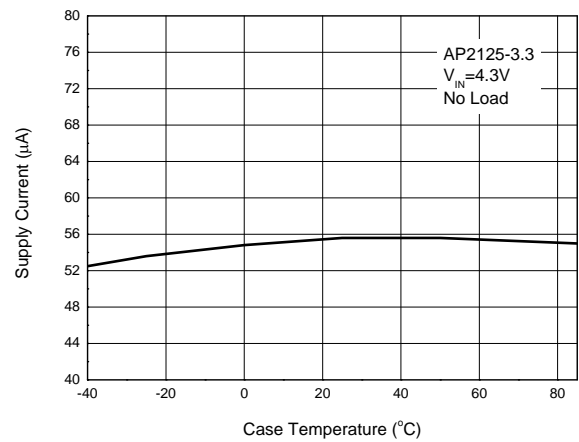


**Performance Characteristics (Cont.)**

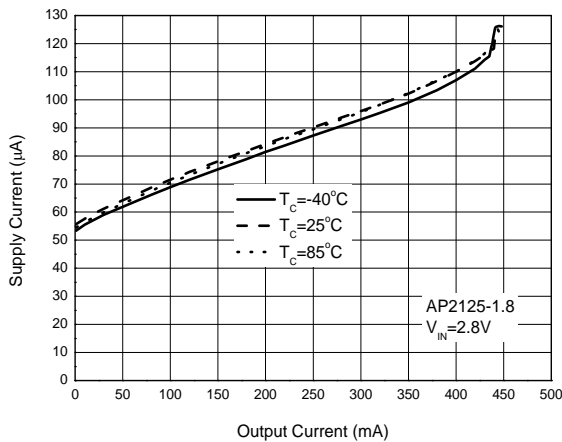
**Supply Current vs. Case Temperature**



**Supply Current vs. Case Temperature**



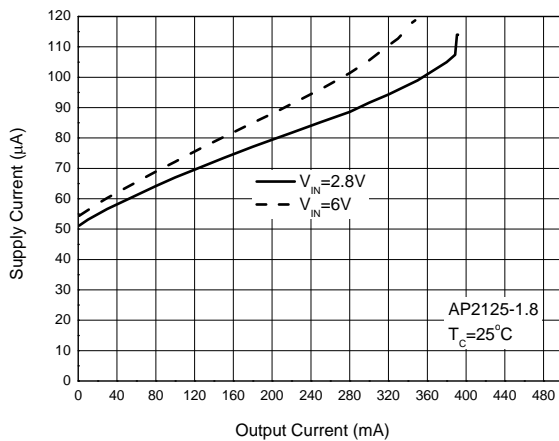
**Supply Current vs. Output Current**



**Supply Current vs. Output Current**



**Supply Current vs. Output Current**



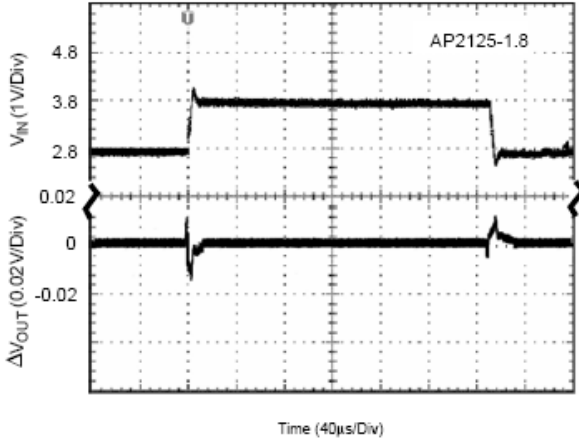
**Supply Current vs. Output Current**



**Performance Characteristics (Cont.)**

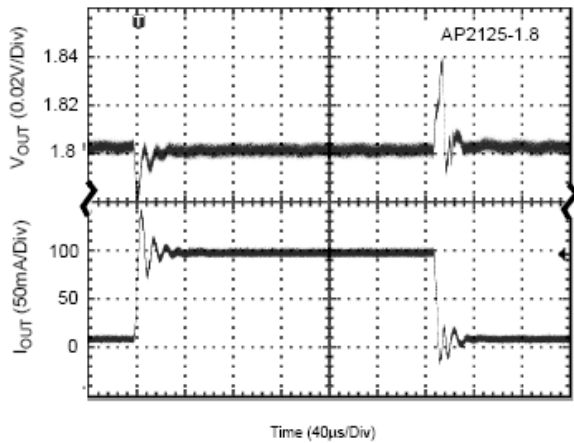
**Line Transient**

(Conditions:  $I_{OUT} = 30\text{mA}$ ,  $C_{OUT} = 1\mu\text{F}$ ,  $V_{IN} = 2.8\text{V to } 3.8\text{V}$ )



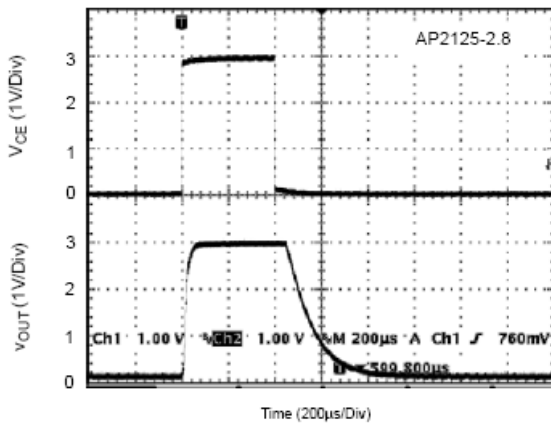
**Load Transient**

(Conditions:  $I_{OUT} = 10 \text{ to } 100\text{mA}$ ,  $C_{IN} = 1\mu\text{F}$ ,  $C_{OUT} = 1\mu\text{F}$ ,  $V_{IN} = 2.8\text{V}$ )



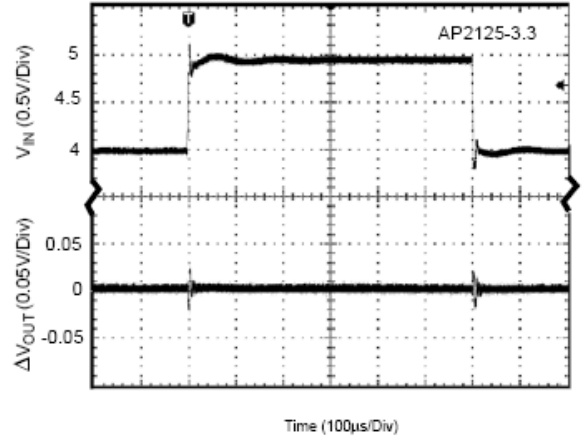
**Enable Input Response and Auto-discharge**

(Conditions:  $V_{CE} = 0 \text{ to } 3\text{V}$ ,  $C_{IN} = 1\mu\text{F}$ ,  $C_{OUT} = 1\mu\text{F}$ ,  $V_{IN} = 3\text{V}$ , no Load)



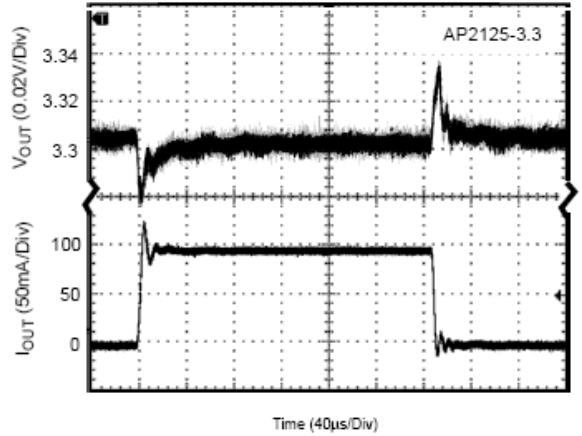
**Line Transient**

(Conditions:  $I_{OUT} = 30\text{mA}$ ,  $C_{OUT} = 1\mu\text{F}$ ,  $V_{IN} = 4\text{V to } 5\text{V}$ )

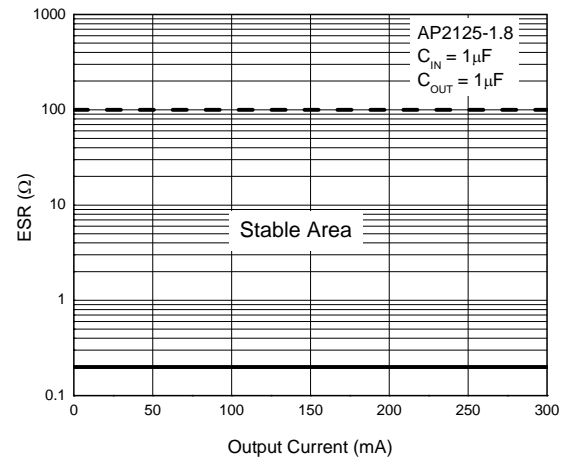


**Load Transient**

(Conditions:  $I_{OUT} = 10 \text{ to } 100\text{mA}$ ,  $C_{IN} = 1\mu\text{F}$ ,  $C_{OUT} = 1\mu\text{F}$ ,  $V_{IN} = 4.3\text{V}$ )

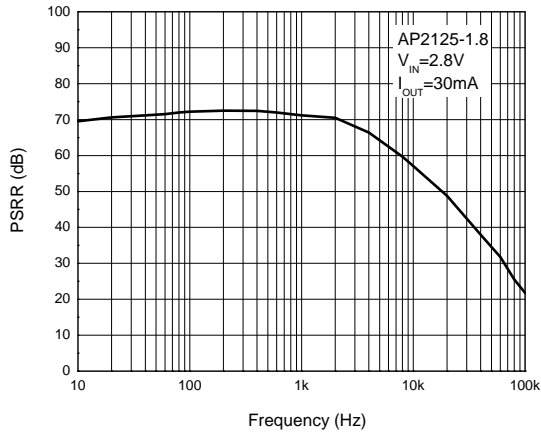


**ESR vs. Output Current**

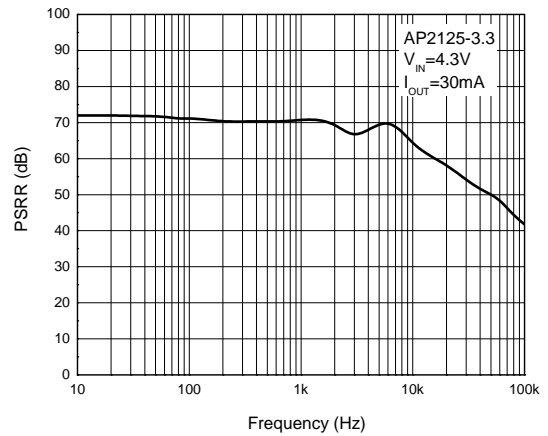


**Performance Characteristics (Cont.)**

**PSRR**



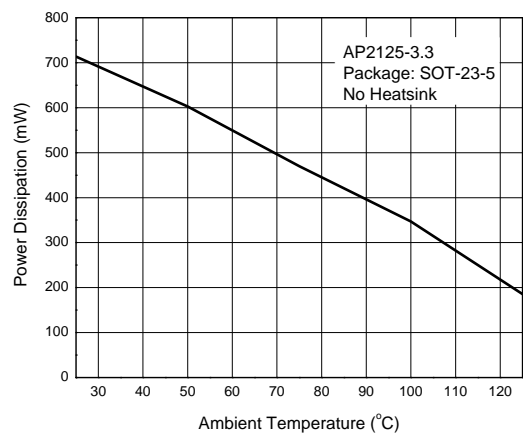
**PSRR**



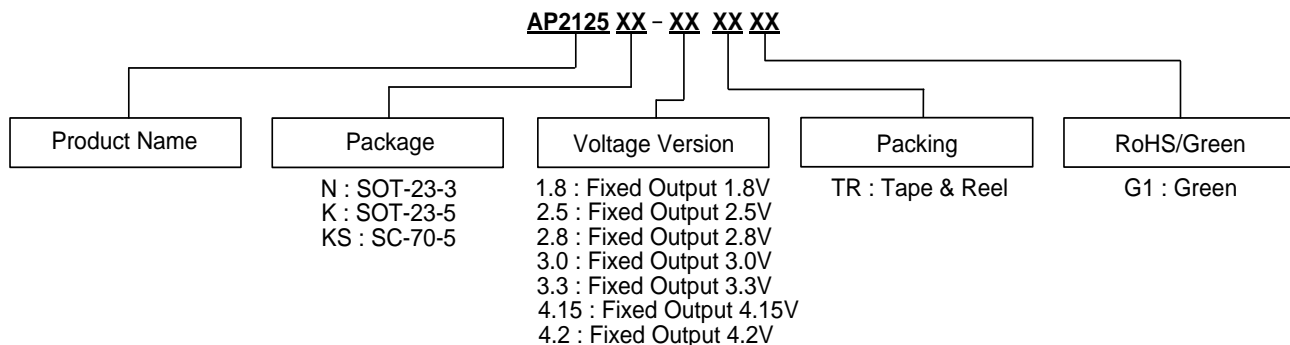
**Power Dissipation vs. Ambient Temperature**



**Power Dissipation vs. Ambient Temperature**



## Ordering Information



| Package  | Temperature Range | Part Number      | Marking ID | Packing          |
|----------|-------------------|------------------|------------|------------------|
| SOT-23-3 | -40 to +85°C      | AP2125N-1.8TRG1  | GJ2        | 3000/Tape & Reel |
|          |                   | AP2125N-2.5TRG1  | GJ4        | 3000/Tape & Reel |
|          |                   | AP2125N-2.8TRG1  | GJ5        | 3000/Tape & Reel |
|          |                   | AP2125N-3.0TRG1  | GJ6        | 3000/Tape & Reel |
|          |                   | AP2125N-3.3TRG1  | GJ7        | 3000/Tape & Reel |
|          |                   | AP2125N-4.2TRG1  | GJ3        | 3000/Tape & Reel |
| SOT-23-5 | -40 to +85°C      | AP2125K-1.8TRG1  | GCB        | 3000/Tape & Reel |
|          |                   | AP2125K-2.5TRG1  | GCD        | 3000/Tape & Reel |
|          |                   | AP2125K-2.8TRG1  | GCE        | 3000/Tape & Reel |
|          |                   | AP2125K-3.0TRG1  | GCF        | 3000/Tape & Reel |
|          |                   | AP2125K-3.3TRG1  | GCG        | 3000/Tape & Reel |
|          |                   | AP2125K-4.15TRG1 | GCJ        | 3000/Tape & Reel |
| SC-70-5  | -40 to +85°C      | AP2125KS-1.8TRG1 | B6         | 3000/Tape & Reel |
|          |                   | AP2125KS-2.5TRG1 | C5         | 3000/Tape & Reel |
|          |                   | AP2125KS-2.8TRG1 | B7         | 3000/Tape & Reel |
|          |                   | AP2125KS-3.0TRG1 | C6         | 3000/Tape & Reel |
|          |                   | AP2125KS-3.3TRG1 | B8         | 3000/Tape & Reel |
|          |                   | AP2125KS-4.2TRG1 | C4         | 3000/Tape & Reel |

**Marking Information**

(1) SOT-23-3



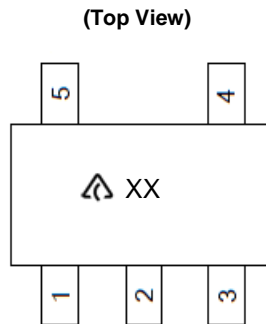
 : Logo  
 XXX: Marking ID  
 (See Ordering Information)

(2) SOT-23-5



 : Logo  
 XXX: Marking ID  
 (See Ordering Information)

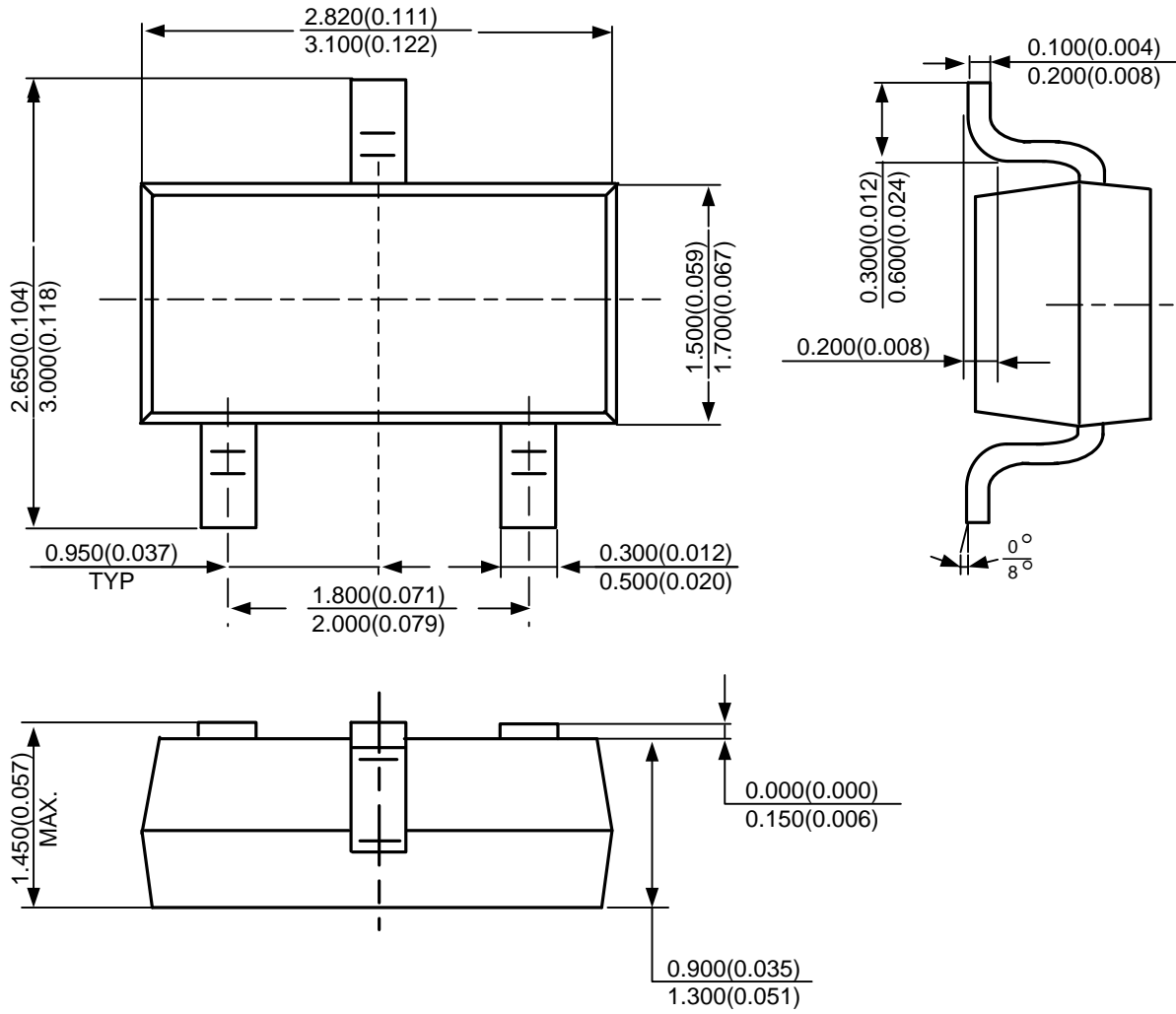
(3) SC-70-5



 : Logo  
 XX: Marking ID  
 (See Ordering Information)

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

(1) Package Type: SOT-23-3



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

(2) Package Type: SOT-23-5



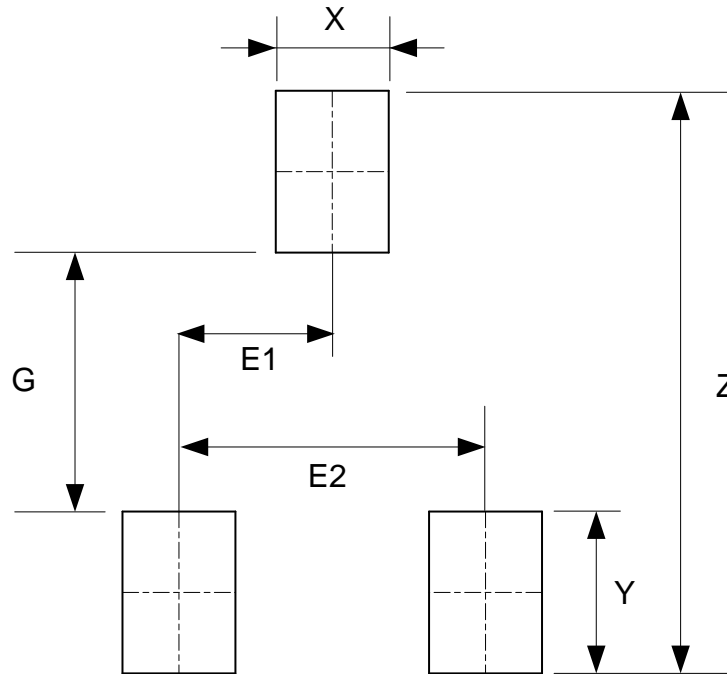
**Package Outline Dimensions** (Cont. All dimensions in mm(inch).)

(3) Package Type: SC-70-5



**Suggested Pad Layout**

(1) Package Type: SOT-23-3



| Dimensions | Z<br>(mm)/(inch) | G<br>(mm)/(inch) | X<br>(mm)/(inch) | Y<br>(mm)/(inch) | E1<br>(mm)/(inch) | E2<br>(mm)/(inch) |
|------------|------------------|------------------|------------------|------------------|-------------------|-------------------|
| Value      | 3.600/0.142      | 1.600/0.063      | 0.700/0.028      | 1.000/0.039      | 0.950/0.037       | 1.900/0.075       |

**Suggested Pad Layout (Cont.)**

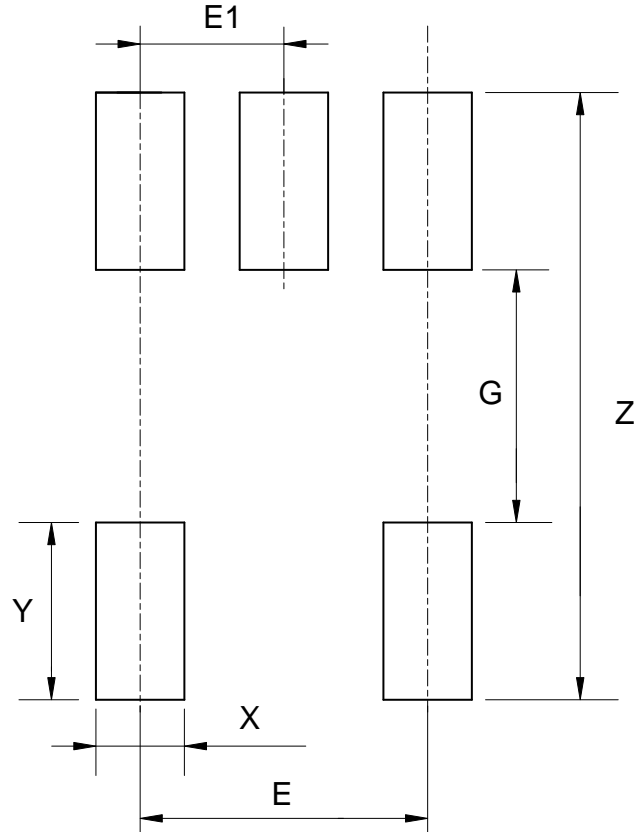
(2) Package Type: SOT-23-5



| Dimensions | Z<br>(mm)/(inch) | G<br>(mm)/(inch) | X<br>(mm)/(inch) | Y<br>(mm)/(inch) | E1<br>(mm)/(inch) | E2<br>(mm)/(inch) |
|------------|------------------|------------------|------------------|------------------|-------------------|-------------------|
| Value      | 3.600/0.142      | 1.600/0.063      | 0.700/0.028      | 1.000/0.039      | 0.950/0.037       | 1.900/0.075       |

**Suggested Pad Layout** (Cont.)

(3) Package Type: SC-70-5



| Dimensions | Z<br>(mm)/(inch) | G<br>(mm)/(inch) | X<br>(mm)/(inch) | Y<br>(mm)/(inch) | E<br>(mm)/(inch) | E1<br>(mm)/(inch) |
|------------|------------------|------------------|------------------|------------------|------------------|-------------------|
| Value      | 2.740/0.108      | 1.140/0.045      | 0.400/0.016      | 0.800/0.031      | 1.300/0.051      | 0.650/0.026       |

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