

Low Power, Low Dropout, 500mA RF Linear Regulators

1 FEATURES

- **Low Output Noise**
- **Low Dropout Voltage**
- **Thermal-Overload Protection**
- **Output Current Limit**
- **10nA Logic-Controlled Shutdown**
- **30μA(TYP) Low Supply Current**
- **2.5V to 7.5V Input Voltage Range**
- **500mA Output Current**
- **-40°C to +85°C Operating Temperature Range**
- **Available in Green XDFN1X1-4, SOT23-5, SOT23-3, SC70-5 and SOT89-3(L-Type) Package**

2 APPLICATIONS

- **Cellular Telephones**
- **Camera Modules**
- **Modems**
- **HiFi Audio Radio Transceivers**
- **PLL/Synthesizer, Clocking**
- **Medium-Current, Noise-Sensitive Applications**

3 DESCRIPTIONS

The RS3236 series low-power, low-dropout, CMOS LDO operate from 2.5V to 7.5V input voltage that can supply up to 500mA of output current. Designed to meet the requirements of RF and analog circuits, the RS3236 series device provides low noise, high PSRR, low quiescent current, and low line and load transient response.

The device is designed to work with a 1-μF input and a 1-μF output ceramic capacitor (no separate noise bypass capacitor required). An external noise bypass capacitor connected to the device's BP pin can further reduce the noise level.

Other features include a 10nA logic-controlled shutdown mode, foldback current limit and thermal shutdown protection.

The RS3236 series is available in Green XDFN1X1-4, SOT23-3, SOT23-5, SC70-5 and SOT89-3(L-Type) package. It operates over an ambient temperature range of -40°C to +85°C.

Device Information⁽¹⁾

| PART NUMBER | PACKAGE | BODY SIZE (NOM) |
|-------------|-----------|-----------------|
| RS3236 | XDFN1X1-4 | 1.00mm×1.00mm |
| | SOT23-3 | 1.60mm×2.92mm |
| | SOT23-5 | 1.60mm×2.92mm |
| | SC70-5 | 1.25mm×2.10mm |
| | SOT89-3 | 2.45mm×4.50mm |

(1) For all available packages, see the orderable addendum at the end of the data sheet.

4 Functional Block Diagram

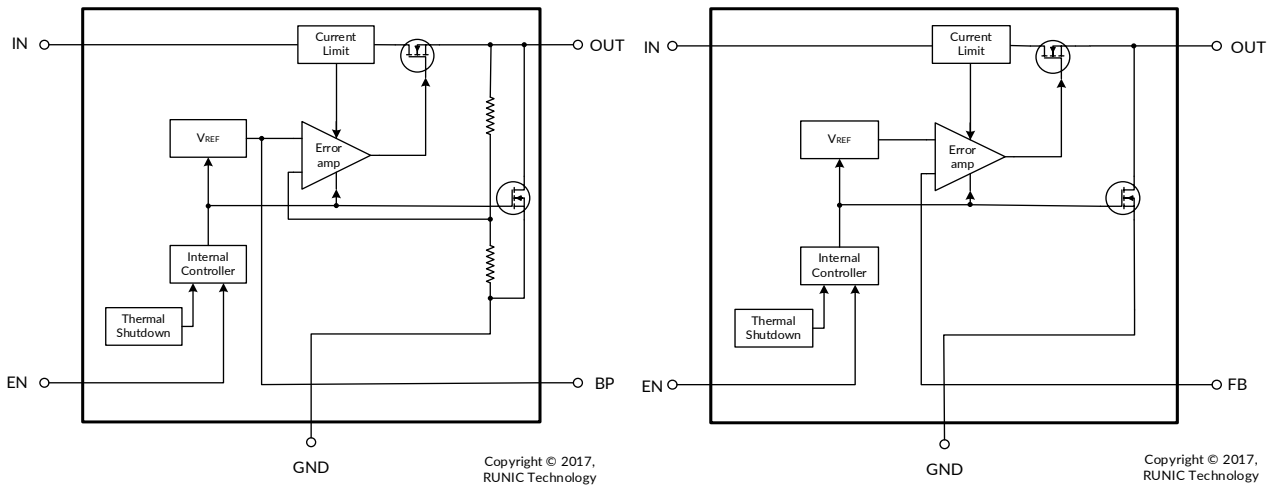


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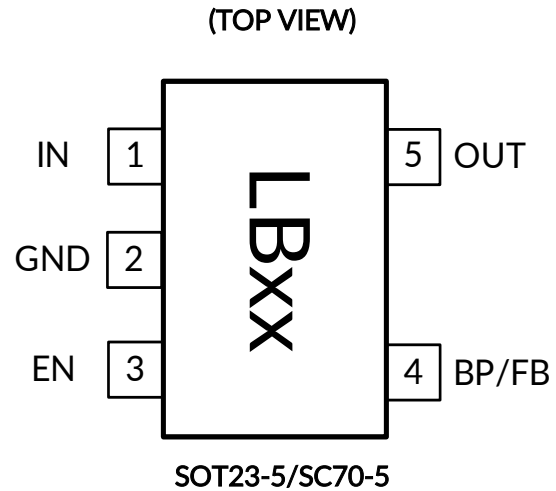
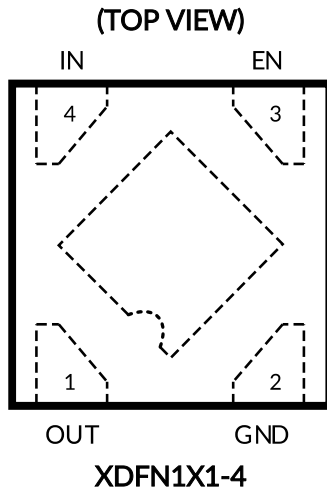
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5 Revision History

Note: Page numbers for previous revisions may differ from page numbers in the current version.

| VERSION | Change Date | Change Item |
|---------|-------------|---|
| A.1 | 2017/06/01 | Initial version completed |
| A.2 | 2018/01/05 | 1) Added output voltage 2) Added SOT89-3 (L) package |
| C.1 | 2019/11/12 | 1) Added output voltage 2) Raise the over temperature protection temperature |
| C.2 | 2020/08/23 | 1) Added output voltage model 2) Optimize noise index |
| C.3 | 2022/09/09 | 1) Added the TAPE AND REEL INFORMATION 2) Modify NC DESCRIPTION on Page 3@RevC.2 |
| C.4 | 2022/09/13 | Modify Load Regulation PARAMETER |
| C.5 | 2023/09/20 | 1) Update ELECTRICAL CHARACTERISTICS 2) Update Input Voltage |
| C.6 | 2023/10/12 | Added RS3236-3.3AYE3L ORDERING NUMBER |
| C.6.1 | 2024/03/07 | Modify packaging naming |

6 Pin Configuration and Functions (Top View)



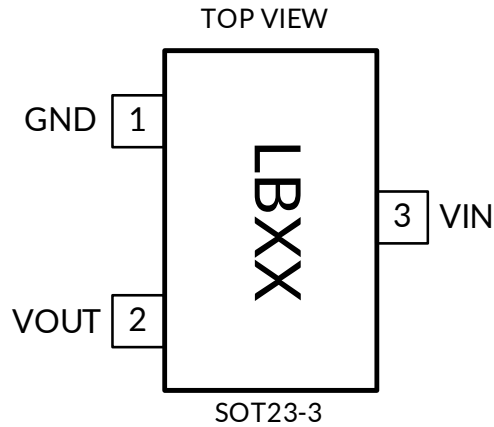
| XDFN1X1-4 | | I/O ⁽¹⁾ | DESCRIPTION |
|-------------|------|--------------------|--|
| NUMBER | NAME | | |
| 1 | OUT | O | Regulator Output. |
| 2 | GND | G | Ground. |
| 3 | EN | I | Enable Input. A logic low reduces the supply current to 10nA. Connect to IN for normal operation. |
| 4 | IN | I | Regulator Input. Supply voltage can range from 2.5V to 7.5V. Bypass with a 1μF capacitor to GND. |
| Thermal Pad | - | - | Connect the thermal pad to a large-area ground plane. This pad is not an electrical connection to the device ground. |

(1) I = Input, O = Output, P = Power, G=Ground.

| SOT23-5/SC70-5 | | I/O ⁽¹⁾ | DESCRIPTION |
|----------------|-------|--------------------|---|
| NUMBER | NAME | | |
| 1 | IN | I | Regulator Input. Supply voltage can range from 2.5V to 7.5V. Bypass with a 1μF capacitor to GND. |
| 2 | GND | G | Ground. |
| 3 | EN | I | Enable Input. A logic low reduces the supply current to 10nA. Connect to IN for normal operation. |
| 4 | BP/NC | O | For internal use, floating and do not connect any pins (fixed voltage version only). |
| | FB | | Feedback Pin (adjustable voltage version only). This is used to set the output voltage of the device. |
| 5 | OUT | O | Regulator Output. |

(1) I = Input, O = Output, P = Power, G=Ground.

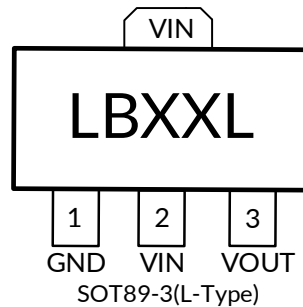
Pin Configuration and Functions (Top View)



NOTE:XX indicate Output Voltage,xx indicate DataCode
For example:LB33(V_{OUT}=3.3V)

| SOT23-3 | | I/O ⁽¹⁾ | DESCRIPTION |
|---------|------|--------------------|--|
| NUMBER | NAME | | |
| 1 | GND | G | Ground. |
| 2 | OUT | O | Regulator Output. |
| 3 | IN | I | Regulator Input. Supply voltage can range from 2.5V to 7.5V. Bypass with a 1μF capacitor to GND. |

(1) I = Input, O = Output, P = Power, G=Ground.



| SOT89-3(L-Type) | | I/O ⁽¹⁾ | DESCRIPTION |
|-----------------|------|--------------------|--|
| NUMBER | NAME | | |
| 1 | GND | G | Ground. |
| 2 | IN | I | Regulator Input. Supply voltage can range from 2.5V to 7.5V. Bypass with a 1μF capacitor to GND. |
| 3 | OUT | O | Regulator Output. |

(1) I = Input, O = Output, P = Power, G=Ground.

7 PACKAGE/ORDERING INFORMATION

| PRODUCT | ORDERING NUMBER ⁽²⁾ | V _{OUT} (V) | V _{OUT} Accuracy | PACKAGE LEAD | PACKAGE MARKING ⁽¹⁾ | PACKAGE OPTION |
|-------------|--------------------------------|----------------------|---------------------------|-----------------------|--------------------------------|---------------------|
| RS3236-0.75 | RS3236-0.75UTDN4 | 0.75V | ±2.5% | XDFN1X1-4 | BA | Tape and Reel,10000 |
| | RS3236-0.75YF5 | 0.75V | ±2.5% | SOT23-5 | LB075 | Tape and Reel,3000 |
| | RS3236-0.75YC5 | 0.75V | ±2.5% | SC70-5 ⁽³⁾ | LB075 | Tape and Reel,3000 |
| | RS3236-0.75YF3 | 0.75V | ±2.5% | SOT23-3 | LB075 | Tape and Reel,3000 |
| RS3236-1.0 | RS3236-1.0YUTDN4 | 1.0V | ±2.5% | XDFN1X1-4 | BB | Tape and Reel,10000 |
| | RS3236-1.0YF5 | 1.0V | ±2.5% | SOT23-5 | LB10 | Tape and Reel,3000 |
| | RS3236-1.0YC5 | 1.0V | ±2.5% | SC70-5 ⁽³⁾ | LB10 | Tape and Reel,3000 |
| | RS3236-1.0YF3 | 1.0V | ±2.5% | SOT23-3 | LB10 | Tape and Reel,3000 |
| RS3236-1.2 | RS3236-1.2YUTDN4 | 1.2V | ±2.5% | XDFN1X1-4 | BC | Tape and Reel,10000 |
| | RS3236-1.2YF5 | 1.2V | ±2.5% | SOT23-5 | LB12 | Tape and Reel,3000 |
| | RS3236-1.2YC5 | 1.2V | ±2.5% | SC70-5 ⁽³⁾ | LB12 | Tape and Reel,3000 |
| | RS3236-1.2YF3 | 1.2V | ±2.5% | SOT23-3 | LB12 | Tape and Reel,3000 |
| RS3236-1.5 | RS3236-1.5YUTDN4 | 1.5V | ±2.5% | XDFN1X1-4 | BD | Tape and Reel,10000 |
| | RS3236-1.5YF5 | 1.5V | ±2.5% | SOT23-5 | LB15 | Tape and Reel,3000 |
| | RS3236-1.5YC5 | 1.5V | ±2.5% | SC70-5 ⁽³⁾ | LB15 | Tape and Reel,3000 |
| | RS3236-1.5YF3 | 1.5V | ±2.5% | SOT23-3 | LB15 | Tape and Reel,3000 |
| RS3236-1.8 | RS3236-1.8YUTDN4 | 1.8V | ±2.5% | XDFN1X1-4 | BE | Tape and Reel,10000 |
| | RS3236-1.8YF5 | 1.8V | ±2.5% | SOT23-5 | LB18 | Tape and Reel,3000 |
| | RS3236-1.8YC5 | 1.8V | ±2.5% | SC70-5 ⁽³⁾ | LB18 | Tape and Reel,3000 |
| | RS3236-1.8YF3 | 1.8V | ±2.5% | SOT23-3 | LB18 | Tape and Reel,3000 |
| | RS3236-1.8YE3L | 1.8V | ±2.5% | SOT89-3(L-Type) | LB18L | Tape and Reel,1000 |
| RS3236-2.05 | RS3236-2.05YUTDN4 | 2.05V | ±2.5% | XDFN1X1-4 | BF | Tape and Reel,10000 |
| | RS3236-2.05YF5 | 2.05V | ±2.5% | SOT23-5 | LB205 | Tape and Reel,3000 |
| | RS3236-2.05YC5 | 2.05V | ±2.5% | SC70-5 ⁽³⁾ | LB205 | Tape and Reel,3000 |
| | RS3236-2.05YF3 | 2.05V | ±2.5% | SOT23-3 | LB205 | Tape and Reel,3000 |
| RS3236-2.5 | RS3236-2.5YUTDN4 | 2.5V | ±2.5% | XDFN1X1-4 | BG | Tape and Reel,10000 |
| | RS3236-2.5YF5 | 2.5V | ±2.5% | SOT23-5 | LB25 | Tape and Reel,3000 |
| | RS3236-2.5YC5 | 2.5V | ±2.5% | SC70-5 ⁽³⁾ | LB25 | Tape and Reel,3000 |
| | RS3236-2.5YF3 | 2.5V | ±2.5% | SOT23-3 | LB25 | Tape and Reel,3000 |
| RS3236-2.8 | RS3236-2.8YUTDN4 | 2.8V | ±2.5% | XDFN1X1-4 | BH | Tape and Reel,10000 |
| | RS3236-2.8YF5 | 2.8V | ±2.5% | SOT23-5 | LB28 | Tape and Reel,3000 |

| | | | | | | |
|-------------|-------------------|-------|-------|-----------------------|-------|---------------------|
| | RS3236-2.8YC5 | 2.8V | ±2.5% | SC70-5 ⁽³⁾ | LB28 | Tape and Reel,3000 |
| | RS3236-2.8YF3 | 2.8V | ±2.5% | SOT23-3 | LB28 | Tape and Reel,3000 |
| RS3236-3.0 | RS3236-3.0YUTDN4 | 3.0V | ±2.5% | XDFN1X1-4 | BI | Tape and Reel,10000 |
| | RS3236-3.0YF5 | 3.0V | ±2.5% | SOT23-5 | LB30 | Tape and Reel,3000 |
| | RS3236-3.0YC5 | 3.0V | ±2.5% | SC70-5 ⁽³⁾ | LB30 | Tape and Reel,3000 |
| | RS3236-3.0YF3 | 3.0V | ±2.5% | SOT23-3 | LB30 | Tape and Reel,3000 |
| RS3236-3.3 | RS3236-3.3YUTDN4 | 3.3V | ±2.5% | XDFN1X1-4 | BJ | Tape and Reel,10000 |
| | RS3236-3.3YF5 | 3.3V | ±2.5% | SOT23-5 | LB33 | Tape and Reel,3000 |
| | RS3236-3.3YC5 | 3.3V | ±2.5% | SC70-5 ⁽³⁾ | LB33 | Tape and Reel,3000 |
| | RS3236-3.3YF3 | 3.3V | ±2.5% | SOT23-3 | LB33 | Tape and Reel,3000 |
| | RS3236-3.3YE3L | 3.3V | ±2.5% | SOT89-3(L-Type) | LB33L | Tape and Reel,1000 |
| RS3236-3.6 | RS3236-3.6YUTDN4 | 3.6V | ±2.5% | XDFN1X1-4 | BK | Tape and Reel,10000 |
| | RS3236-3.6YF5 | 3.6V | ±2.5% | SOT23-5 | LB36 | Tape and Reel,3000 |
| | RS3236-3.6YC5 | 3.6V | ±2.5% | SC70-5 ⁽³⁾ | LB36 | Tape and Reel,3000 |
| | RS3236-3.6YF3 | 3.6V | ±2.5% | SOT23-3 | LB36 | Tape and Reel,3000 |
| RS3236-4.0 | RS3236-4.0YUTDN4 | 4.0V | ±2.5% | XDFN1X1-4 | BL | Tape and Reel,10000 |
| | RS3236-4.0YF5 | 4.0V | ±2.5% | SOT23-5 | LB40 | Tape and Reel,3000 |
| | RS3236-4.0YC5 | 4.0V | ±2.5% | SC70-5 ⁽³⁾ | LB40 | Tape and Reel,3000 |
| | RS3236-4.0YF3 | 4.0V | ±2.5% | SOT23-3 | LB40 | Tape and Reel,3000 |
| | RS3236-4.0YE3L | 4.0V | ±2.5% | SOT89-3(L-Type) | LB40L | Tape and Reel,1000 |
| RS3236-5.0 | RS3236-5.0YUTDN4 | 5.0V | ±2.5% | XDFN1X1-4 | BM | Tape and Reel,10000 |
| | RS3236-5.0YF5 | 5.0V | ±2.5% | SOT23-5 | LB50 | Tape and Reel,3000 |
| | RS3236-5.0YC5 | 5.0V | ±2.5% | SC70-5 ⁽³⁾ | LB50 | Tape and Reel,3000 |
| | RS3236-5.0YF3 | 5.0V | ±2.5% | SOT23-3 | LB50 | Tape and Reel,3000 |
| RS3236-1.35 | RS3236-1.35YUTDN4 | 1.35V | ±2.5% | XDFN1X1-4 | BN | Tape and Reel,10000 |
| RS3236-1.85 | RS3236-1.85YUTDN4 | 1.85V | ±2.5% | XDFN1X1-4 | BO | Tape and Reel,10000 |
| RS3236-2.7 | RS3236-2.7YF5 | 2.7V | ±2.5% | SOT23-5 | LB27 | Tape and Reel,3000 |
| RS3236-2.1 | RS3236-2.1YF5 | 2.1V | ±2.5% | SOT23-5 | LB21 | Tape and Reel,3000 |
| RS3236-2.85 | RS3236-2.85YF5 | 2.85V | ±2.5% | SOT23-5 | LB285 | Tape and Reel,3000 |

| PRODUCT | ORDERING NUMBER (2) | V _{OUT} (V) | V _{OUT} Accuracy | PACKAGE LEAD | PACKAGE MARKING (1) | PACKAGE OPTION |
|------------|------------------------|----------------------|------------------------------|---------------------|---------------------------|---------------------|
| RS3236-3.3 | RS3236-3.3AYUTDN4 | 3.3V | ±1% | XDFN1X1-4 | B \bar{J} | Tape and Reel,10000 |
| RS3236-3.3 | RS3236-3.3AYF5 | 3.3V | ±1% | SOT23-5 | LB33A | Tape and Reel, 3000 |
| RS3236-3.3 | RS3236-3.3AYE3L | 3.3V | ±1% | SOT89-3 (L-Type) | LB33A | Tape and Reel,1000 |
| RS3236-5.0 | RS3236-5.0AYF5 | 5.0V | ±1% | SOT23-5 | LB50A | Tape and Reel, 3000 |

| MODEL | V _{FB} (V) | PIN-PACKAGE | ORDERING NUMBER | PACKAGE MARKING (1) | PACKAGE OPTION |
|-------------|---------------------|-------------|--------------------|------------------------|---------------------|
| RS3236-ADJ8 | 0.81 | SOT23-5 | RS3236-ADJ8YF5 | LBAD8 | Tape and Reel, 3000 |
| | | SC70-5 (3) | RS3236-ADJ8YC5 | LBAD8 | Tape and Reel, 3000 |
| RS3236-ADJC | 1.21 | SOT23-5 | RS3236-ADJCYF5 | LBADC | Tape and Reel, 3000 |
| | | SC70-5 (3) | RS3236-ADJCYC5 | LBADC | Tape and Reel, 3000 |

NOTE:

(1) There may be additional marking, which relates to the lot trace code information(include data code and vendor code), the logo or the environmental category on the device.

(2) RS3236-□□□□

Package Type
 YUTDN4: XDFN1X1-4
 YF5:SOT23-5
 YC5:SC70-5
 YF3:SOT23-3
 YE3L:SOT89-3(L-Type)

None:2.5% VOUT Accuracy
 A:1% VOUT Accuracy

Output Voltage
 0.75:0.75V
 1.0:1.0V
 :
 5.0:5.0V

(3) Equivalent to SOT353.

8 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted) ⁽¹⁾⁽²⁾

| | | MIN | MAX | UNIT |
|------------------|---|--------------------|-----------------|------|
| V _{IN} | Input voltage | -0.3 | 8 | V |
| V _{EN} | Enable input voltage | -0.3 | V _{IN} | V |
| θ _{JA} | Package thermal impedance ⁽³⁾ | SOT23-5 | | 230 |
| | | SOT23-3 | | 295 |
| | | XDFN1X1-4 | | 315 |
| | | SC70-5 | | 380 |
| | | SOT89-3 (L-Type) | | 210 |
| T _J | Junction temperature ⁽⁴⁾ | -40 | 150 | °C |
| P _D | Continuous power dissipation ⁽⁵⁾ | Internally Limited | | W |
| T _{stg} | Storage temperature | -65 | 150 | °C |

- (1) Stresses beyond 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-rated conditions for extended periods may affect device reliability.
- (2) All voltages are with respect to the GND pin.
- (3) The package thermal impedance is calculated in accordance with JESD-51.
- (4) The maximum power dissipation is a function of T_{J(MAX)}, R_{θJA}, and T_A. The maximum allowable power dissipation at any ambient temperature is P_D = (T_{J(MAX)} - T_A) / R_{θJA}. All numbers apply for packages soldered directly onto a PCB.
- (5) Internal thermal shutdown circuitry protects the device from permanent damage.

8.1 ESD Ratings

The following ESD information is provided for handling of ESD-sensitive devices in an ESD protected area only.

| | | VALUE | UNIT |
|--|---|-------|------|
| V _(ESD) Electrostatic discharge | Human-body model (HBM), per ANSI/ESDA/JEDEC JS-001 ⁽¹⁾ | ±6000 | V |
| | Machine model (MM) | ±400 | V |

- (1) JEDEC document JEP155 states that 500 V HBM allows safe manufacturing with a standard ESD control process.



ESD SENSITIVITY CAUTION

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

8.2 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted) ⁽¹⁾

| | | MIN | MAX | UNIT |
|------------------|-----------------------|-----|-----------------|------|
| V _{IN} | Input supply voltage | 2.5 | 7.5 | V |
| V _{EN} | Enable input voltage | 0 | V _{IN} | V |
| I _{OUT} | Output current | 0 | 500 | mA |
| T _A | Operating temperature | -40 | +85 | °C |

- (1) All voltages are with respect to the GND pin.

8.3 ELECTRICAL CHARACTERISTICS

($V_{IN} = V_{OUT(NOMINAL)} + 0.5V^{(1)}$, Full = $-40^{\circ}C$ to $+85^{\circ}C$, unless otherwise noted.)

| PARAMETER | SYMBOL | CONDITIONS | | TEMP | MIN | TYP | MAX | UNITS |
|--|--|---|----------------|----------------|--------------------|------|------|------------------|
| Input Voltage | V_{IN} | | | $+25^{\circ}C$ | 2.5 ⁽¹⁾ | | 7.5 | V |
| Output Voltage Accuracy | | $I_{OUT} = 0.1mA$ | | $+25^{\circ}C$ | -2.5 | | 2.5 | % |
| | | $I_{OUT} = 0.1mA$, RS3236-xxA | | $+25^{\circ}C$ | -1 | | 1 | % |
| Feedback Voltage | V_{FB} | $I_{OUT} = 0.1mA$, RS3236-ADJ8 | | $+25^{\circ}C$ | 0.79 | 0.81 | 0.83 | V |
| | | $I_{OUT} = 0.1mA$, RS3236-ADJC | | $+25^{\circ}C$ | 1.18 | 1.21 | 1.24 | V |
| Maximum Output Current | | | | $+25^{\circ}C$ | 500 | | | mA |
| Current Limit | I_{LIM} | | | $+25^{\circ}C$ | 500 | 800 | | mA |
| Ground Pin Current | I_Q | No load | | $+25^{\circ}C$ | | 30 | 40 | μA |
| Dropout Voltage ⁽²⁾ | V_{DROP} | $I_{OUT} = 500mA$ | $V_{OUT}=1.2V$ | $+25^{\circ}C$ | | 900 | | mV |
| | | | $V_{OUT}=1.5V$ | | | 630 | | |
| | | | $V_{OUT}=3.3V$ | | | 450 | 600 | |
| Line Regulation | ΔV_{LNR} | $V_{IN} = (V_{OUT} + 0.5V)$ to 5.5V, $I_{OUT} = 1mA$ | | $+25^{\circ}C$ | | 0.1 | 0.2 | %/V |
| Load Regulation | ΔV_{OUT} | $I_{OUT} = 0.1mA$ to 500mA, $C_{OUT} = 1\mu F$ | | $+25^{\circ}C$ | | 30 | 60 | mV |
| | | $I_{OUT} = 0.1mA$ to 500mA, $C_{OUT} = 1\mu F$, RS3236-ADJ | | $+25^{\circ}C$ | | 0.5 | 10 | mV |
| Output Voltage Noise | e_n | $f = 10Hz$ to 100kHz, $C_{BP} = 0.01\mu F$, $C_{OUT} = 10\mu F$, $I_{OUT}=30mA$ | | $+25^{\circ}C$ | | 68 | | $\mu VRMS$ |
| Output Voltage Temperature Coefficient | $\frac{\Delta V_{OUT}}{\Delta T_A \times V_{OUT}}$ | $I_{LOAD} = 0.1mA$ | | FULL | | 35 | | ppm/ $^{\circ}C$ |
| Power Supply Rejection Ratio | PSRR | $C_{BP} = 0\mu F$, $I_{LOAD} = 30mA$, $C_{OUT} = 1\mu F$, $V_{IN} = V_{OUT}+1V$ $\Delta V_{RIPPLE}=0.2V_{P-P}$ | $f = 217Hz$ | $+25^{\circ}C$ | | 72 | | dB |
| | | | $f = 1kHz$ | | | 70 | | |
| | | $C_{BP} = 10nF$, $I_{LOAD} = 30mA$, $C_{OUT} = 1\mu F$, $V_{IN} = V_{OUT}+1V$ $\Delta V_{RIPPLE}=0.2V_{P-P}$ | $f = 217Hz$ | $+25^{\circ}C$ | | 74 | dB | |
| | | | $f = 1kHz$ | | | 70 | | |
| SHUTDOWN | | | | | | | | |
| EN Input Threshold | V_{IH} | $V_{IN} = 2.5V$ | | Full | 1.4 | | | V |
| | V_{IL} | | | Full | | | 0.4 | |
| EN Input Threshold | V_{IH} | $V_{IN} = 7.5V$ | | Full | 2.3 | | | V |
| | V_{IL} | | | Full | | | 0.8 | |
| EN Input Bias Current | I_{BH} | $EN = 7.5V$ | | $+25^{\circ}C$ | | 0.01 | 1 | μA |
| | I_{BL} | $EN = 0V$ | | Full | | 0.01 | | |
| Shutdown Supply Current | $I_{Q(SHDN)}$ | $EN = 0V$ | | Full | | 0.01 | 1 | μA |
| Start-Up Time ⁽³⁾ | t_{STR} | $C_{OUT} = 1\mu F$, No Load | | $+25^{\circ}C$ | | 180 | | μs |
| R_{ON} of Discharge MOSFET | | $V_{IN} = 4.0V$, $V_{EN} = 0V$ | | $+25^{\circ}C$ | | 260 | | Ω |
| THERMAL PROTECTION | | | | | | | | |
| Thermal Shutdown Temperature | T_{SHDN} | | | | | 150 | | $^{\circ}C$ |
| Thermal Shutdown Hysteresis | ΔT_{SHDN} | | | | | 15 | | $^{\circ}C$ |

NOTES:

1. $V_{IN} = V_{OUT(NOMINAL)} + 0.5V$ or $2.5V$, whichever is greater.
2. The dropout voltage is defined as $V_{IN} - V_{OUT}$, when V_{OUT} is $100mV$ below the value of V_{OUT} for $V_{IN} = V_{OUT} + 0.5V$.
3. Time needed for V_{OUT} to reach 90% of final value.

8.4 TYPICAL APPLICATION CIRCUIT

| | |
|---|---|
| <p style="text-align: center;">Typical Circuit</p> <p style="text-align: center;">RS3236</p> <p style="text-align: center;">SOT23-5/SOT353(SC70-5)</p> | <p style="text-align: center;">Typical Circuit</p> <p style="text-align: center;">RS3236</p> <p style="text-align: center;">SOT23-5/SOT353(SC70-5)</p> |
| <p style="text-align: center;">Typical Circuit</p> <p style="text-align: center;">RS3236-ADJ8</p> <p style="text-align: center;">SOT23-5/SOT353(SC70-5)</p> | <p style="text-align: center;">Typical Circuit</p> <p style="text-align: center;">RS3236-ADJC</p> <p style="text-align: center;">SOT23-5/SOT353(SC70-5)</p> |
| <p>NOTE: Choose R₂ = 160kΩ to maintain a 5μA minimum load. Calculate the value for R₁ using the following equation:</p> $R_1 = R_2 * \left(\frac{V_{OUT}}{0.81} - 1 \right)$ | <p>NOTE: Choose R₂ = 240kΩ to maintain a 5μA minimum load. Calculate the value for R₁ using the following equation:</p> $R_1 = R_2 * \left(\frac{V_{OUT}}{1.21} - 1 \right)$ |
| <p style="text-align: center;">Typical Circuit</p> <p style="text-align: center;">RS3236</p> <p style="text-align: center;">UTDFN-1x1-4</p> | |

8.5 TYPICAL PERFORMANCE CHARACTERISTICS

NOTE: The graphs and tables provided following this note are a statistical summary based on a limited number of samples and are provided for informational purposes only.

$V_{IN} = V_{OUT (NOMINAL)} + 0.5V$, $V_{OUT}=3.3V$, $C_{IN} = 1\mu F$, $C_{OUT} = 1\mu F$, $C_{BP} = 0\mu F$, $T_A = +25^{\circ}C$, unless otherwise noted.

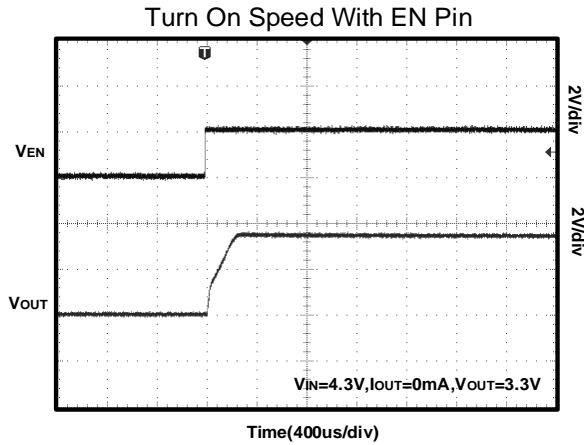


Figure 1. Turn on Speed with EN Pin

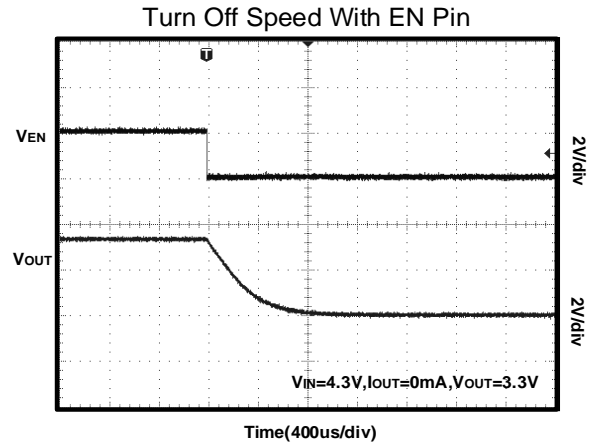


Figure 2. Turn Off Speed with EN Pin

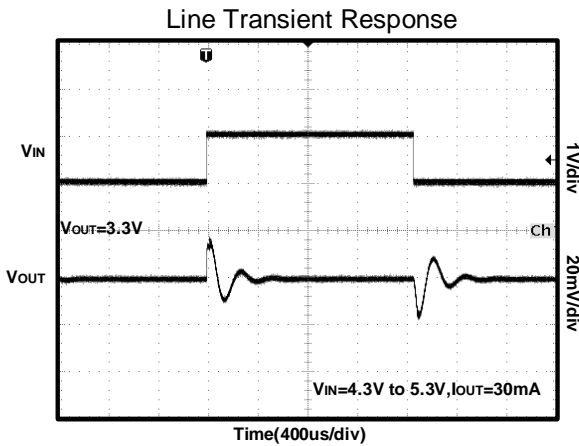


Figure 3. Line Transient Response

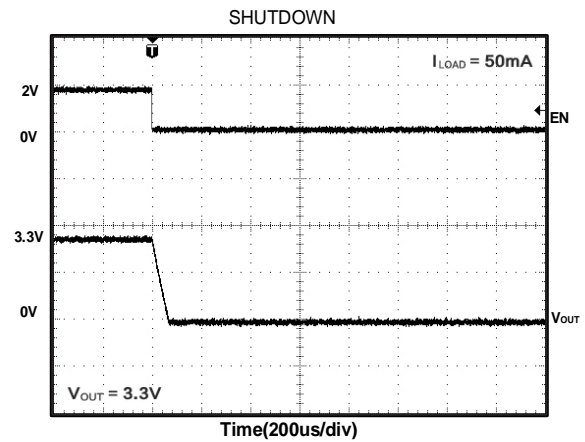


Figure 4. SHUTDOWN

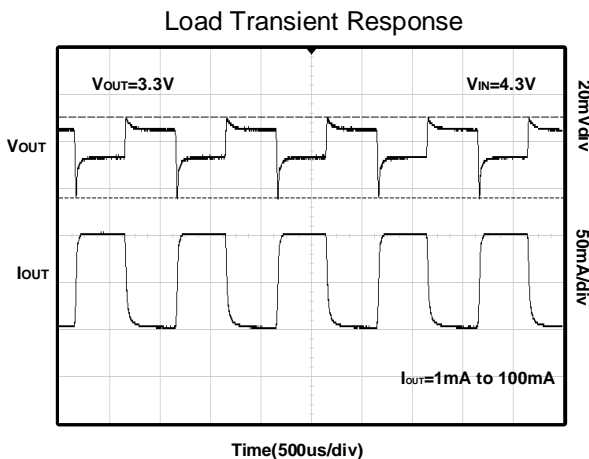


Figure 5. Load Transient Response

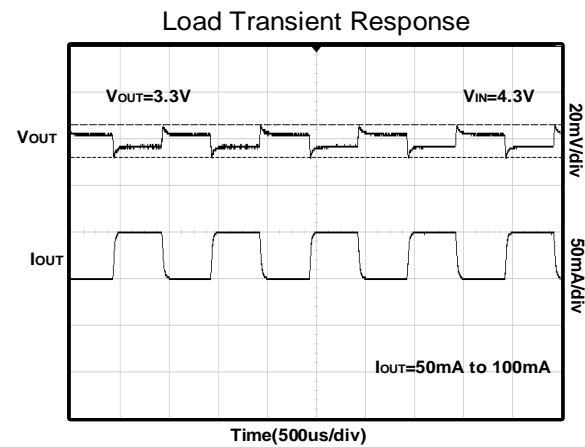


Figure 6. Load Transient Response

TYPICAL PERFORMANCE CHARACTERISTICS

NOTE: The graphs and tables provided following this note are a statistical summary based on a limited number of samples and are provided for informational purposes only.

$V_{IN} = V_{OUT (NOMINAL)} + 0.5V$, $V_{OUT}=3.3V$, $C_{IN} = 1\mu F$, $C_{OUT} = 1\mu F$, $C_{BP} = 0.1\mu F$, $T_A = +25^\circ C$, unless otherwise noted.

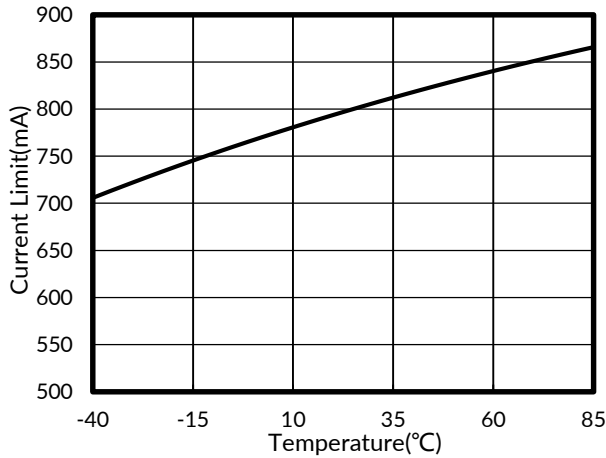


Figure 7. Current Limit vs Temperature

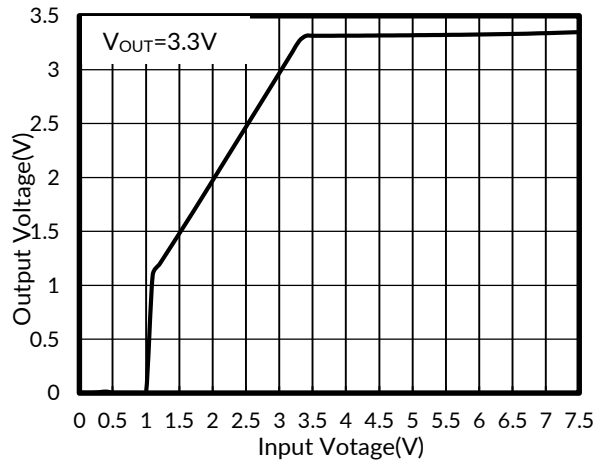


Figure 8. Output Voltage vs Input Voltage

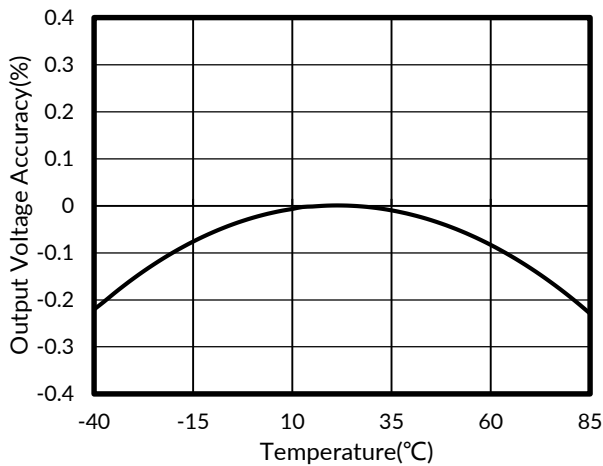


Figure 9. Output Voltage Accuracy vs Temperature

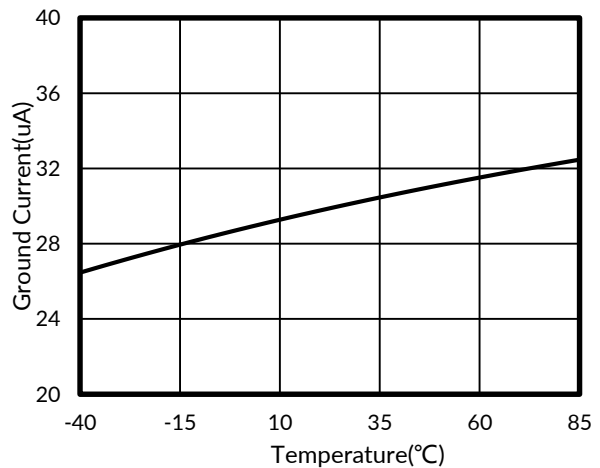


Figure 10. Ground Current vs Temperature

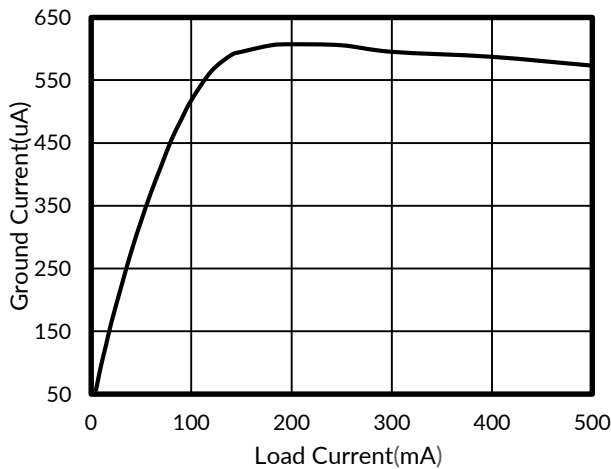
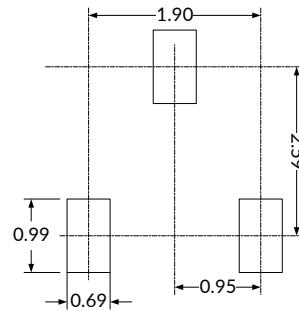
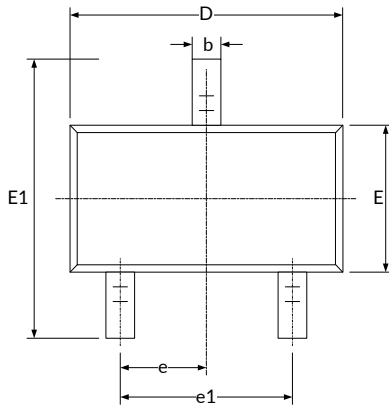


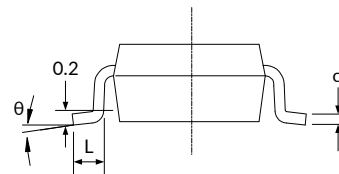
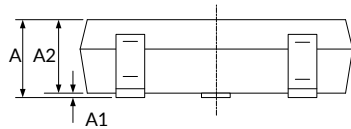
Figure 11. Ground Current vs Load Current

9 PACKAGE OUTLINE DIMENSIONS

SOT23-3⁽³⁾



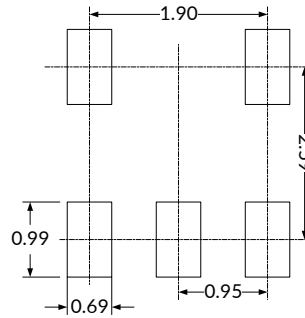
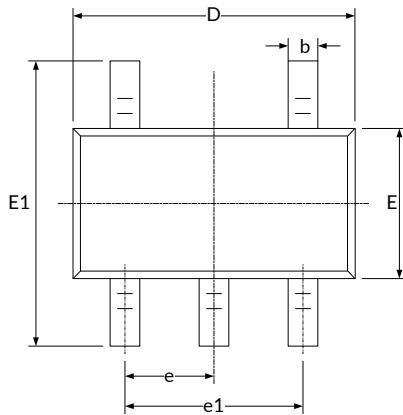
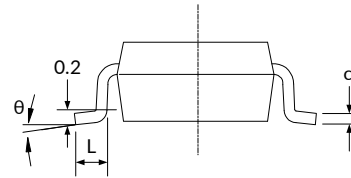
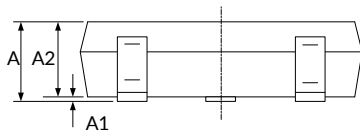
RECOMMENDED LAND PATTERN (Unit: mm)



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|------------------|---------------------------|-------|---------------------------|-------|
| | Min | Max | Min | Max |
| A ⁽¹⁾ | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D ⁽¹⁾ | 2.820 | 3.020 | 0.111 | 0.119 |
| E ⁽¹⁾ | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) ⁽²⁾ | | 0.037(BSC) ⁽²⁾ | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |

NOTE:

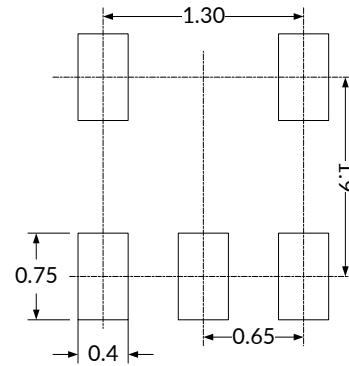
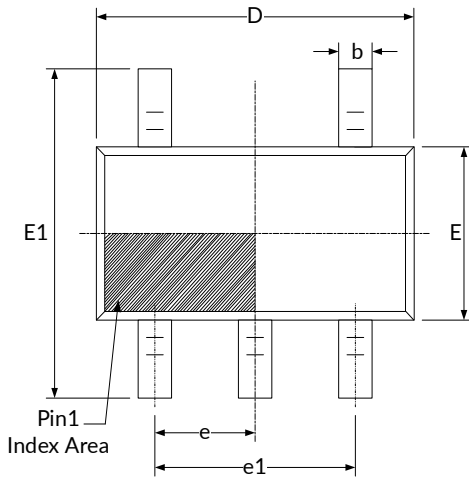
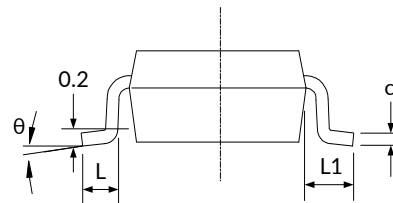
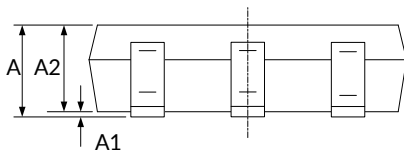
1. Plastic or metal protrusions of 0.15mm maximum per side are not included.
2. BSC (Basic Spacing between Centers), "Basic" spacing is nominal.
3. This drawing is subject to change without notice.

SOT23-5⁽³⁾

RECOMMENDED LAND PATTERN (Unit: mm)


| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|------------------|---------------------------|-------|---------------------------|-------|
| | Min | Max | Min | Max |
| A ⁽¹⁾ | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D ⁽¹⁾ | 2.820 | 3.020 | 0.111 | 0.119 |
| E ⁽¹⁾ | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) ⁽²⁾ | | 0.037(BSC) ⁽²⁾ | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |

NOTE:

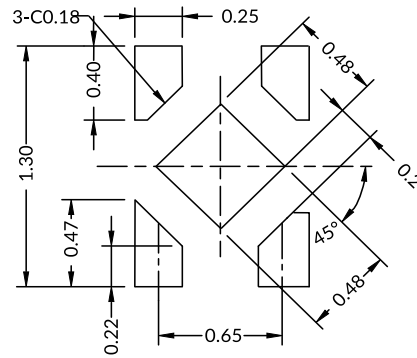
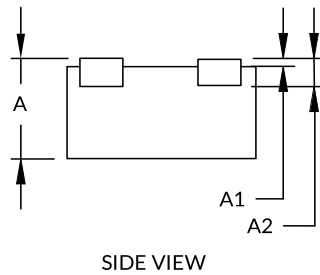
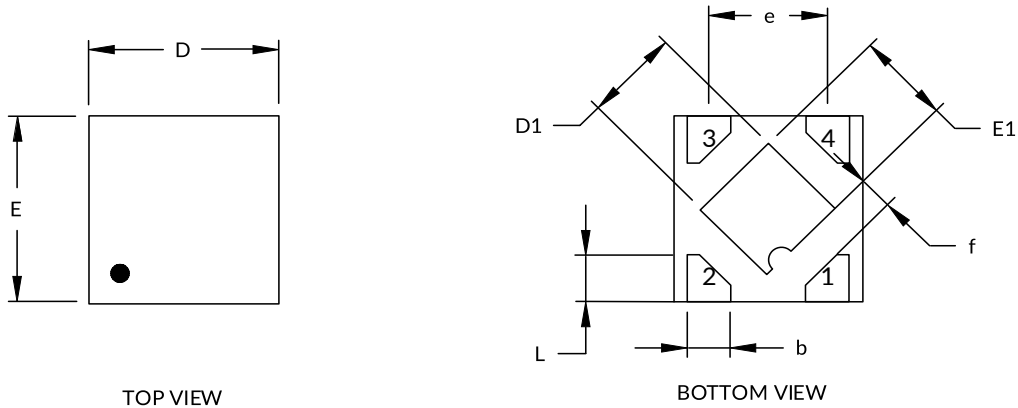
1. Plastic or metal protrusions of 0.15mm maximum per side are not included.
2. BSC (Basic Spacing between Centers), "Basic" spacing is nominal.
3. This drawing is subject to change without notice.

SC70-5⁽³⁾

RECOMMENDED LAND PATTERN (Unit: mm)


| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|------------------|---------------------------|-------|---------------------------|-------|
| | Min | Max | Min | Max |
| A ⁽¹⁾ | 0.900 | 1.100 | 0.035 | 0.043 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.000 | 0.035 | 0.039 |
| b | 0.150 | 0.350 | 0.006 | 0.014 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D ⁽¹⁾ | 2.000 | 2.200 | 0.079 | 0.087 |
| E ⁽¹⁾ | 1.150 | 1.350 | 0.045 | 0.053 |
| E1 | 2.150 | 2.450 | 0.085 | 0.096 |
| e | 0.650(BSC) ⁽²⁾ | | 0.026(BSC) ⁽²⁾ | |
| e1 | 1.300(BSC) ⁽²⁾ | | 0.051(BSC) ⁽²⁾ | |
| L | 0.260 | 0.460 | 0.010 | 0.018 |
| L1 | 0.525 | | 0.021 | |
| θ | 0° | 8° | 0° | 8° |

NOTE:

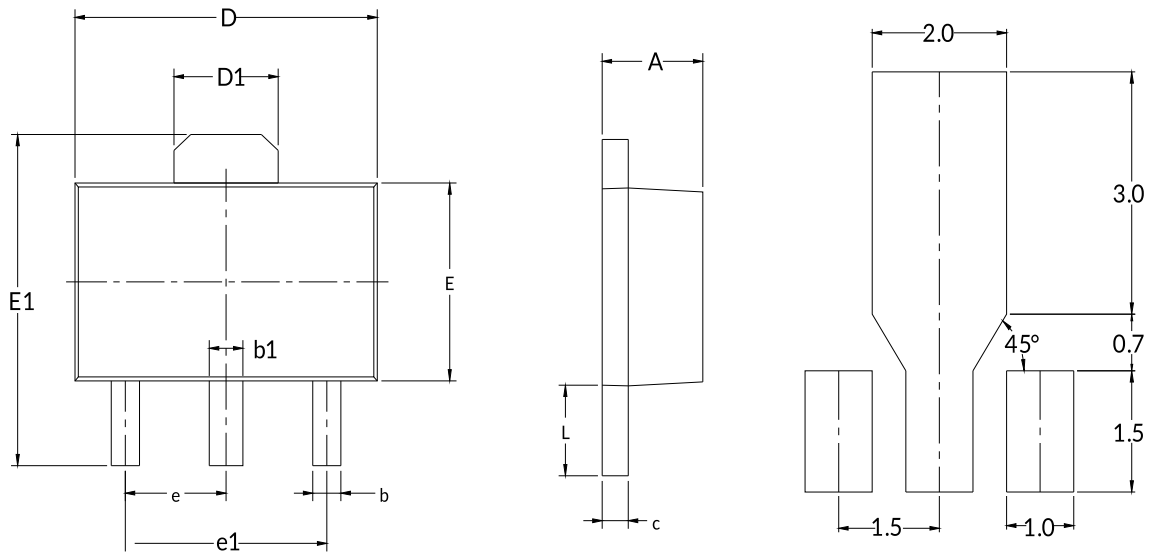
1. Plastic or metal protrusions of 0.15mm maximum per side are not included.
2. BSC (Basic Spacing between Centers), "Basic" spacing is nominal.
3. This drawing is subject to change without notice.

XDFN1X1-4⁽³⁾

RECOMMENDED LAND PATTERN (Unit: mm)

| Symbol | Dimensions In Millimeters | | | Dimensions In Inches | | |
|------------------|---------------------------|-------|-------|--------------------------|-------|-------|
| | MIN | TYP | MAX | MIN | TYP | MAX |
| A ⁽¹⁾ | 0.340 | 0.370 | 0.400 | 0.013 | 0.015 | 0.016 |
| A1 | 0.000 | 0.020 | 0.050 | 0.000 | 0.001 | 0.002 |
| A2 | 0.100 REF ⁽²⁾ | | | 0.004 REF ⁽²⁾ | | |
| D ⁽¹⁾ | 0.950 | 1.000 | 1.050 | 0.037 | 0.039 | 0.041 |
| D1 | 0.430 | 0.480 | 0.530 | 0.017 | 0.019 | 0.021 |
| E ⁽¹⁾ | 0.950 | 1.000 | 1.050 | 0.037 | 0.039 | 0.041 |
| E1 | 0.430 | 0.480 | 0.530 | 0.017 | 0.019 | 0.021 |
| b | 0.170 | 0.220 | 0.270 | 0.007 | 0.009 | 0.011 |
| e | 0.600 | 0.650 | 0.700 | 0.024 | 0.026 | 0.028 |
| f | 0.195 REF ⁽²⁾ | | | 0.008 REF ⁽²⁾ | | |
| L | 0.200 | 0.250 | 0.300 | 0.008 | 0.010 | 0.012 |

NOTE:

1. Plastic or metal protrusions of 0.075mm maximum per side are not included.
2. REF is the abbreviation for Reference.
3. This drawing is subject to change without notice.

SOT89-3⁽⁴⁾

RECOMMENDED LAND PATTERN (Unit: mm)

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|------------------|---------------------------|-------|--------------------------|-------|
| | Min | Max | Min | Max |
| A ⁽¹⁾ | 1.400 | 1.600 | 0.055 | 0.063 |
| b | 0.320 | 0.520 | 0.013 | 0.020 |
| b1 | 0.400 | 0.580 | 0.016 | 0.023 |
| c | 0.350 | 0.440 | 0.014 | 0.017 |
| D ⁽¹⁾ | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 1.550 REF ⁽²⁾ | | 0.061 REF ⁽²⁾ | |
| E ⁽¹⁾ | 2.300 | 2.600 | 0.091 | 0.102 |
| E1 | 3.940 | 4.250 | 0.155 | 0.167 |
| e | 1.500 BSC ⁽³⁾ | | 0.060 BSC ⁽³⁾ | |
| e1 | 3.000 BSC ⁽³⁾ | | 0.118 BSC ⁽³⁾ | |
| L | 0.900 | 1.200 | 0.035 | 0.047 |

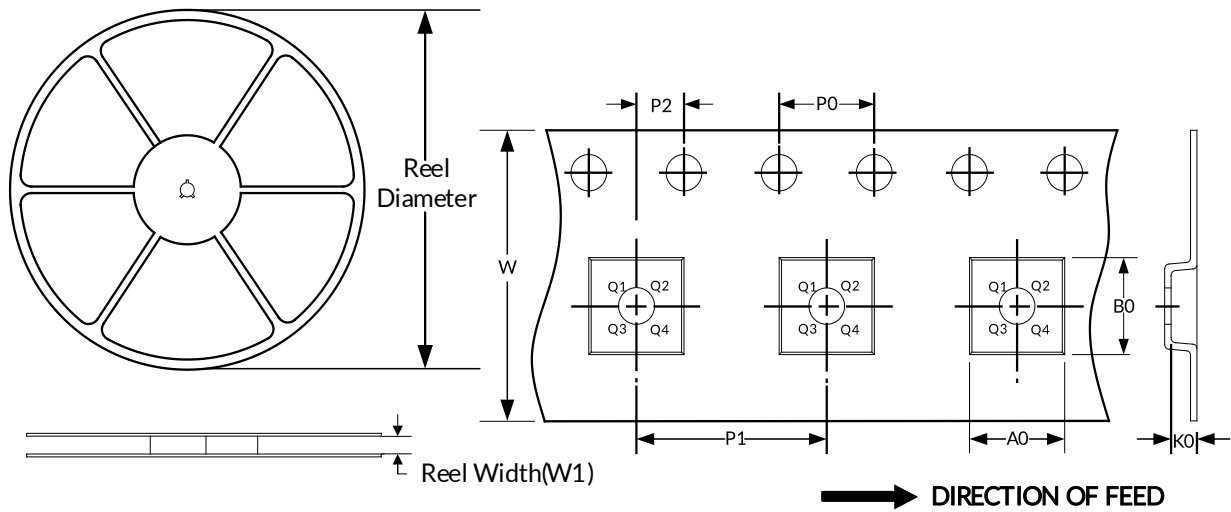
NOTE:

1. Plastic or metal protrusions of 0.15mm maximum per side are not included.
2. REF is the abbreviation for Reference.
3. BSC (Basic Spacing between Centers), "Basic" spacing is nominal.
4. This drawing is subject to change without notice.

10 TAPE AND REEL INFORMATION

REEL DIMENSIONS

TAPE DIMENSION



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

| Package Type | Reel Diameter | Reel Width(mm) | A0 (mm) | B0 (mm) | K0 (mm) | P0 (mm) | P1 (mm) | P2 (mm) | W (mm) | Pin1 Quadrant |
|--------------|---------------|----------------|---------|---------|---------|---------|---------|---------|--------|---------------|
| XDFN1X1-4 | 7" | 9.5 | 1.16 | 1.16 | 0.5 | 4.0 | 4.0 | 2.0 | 8.0 | Q1 |
| SOT23-3 | 7" | 9.0 | 3.20 | 3.30 | 1.30 | 4.0 | 4.0 | 2.0 | 8.0 | Q3 |
| SOT23-5 | 7" | 9.5 | 3.20 | 3.20 | 1.40 | 4.0 | 4.0 | 2.0 | 8.0 | Q3 |
| SC70-5 | 7" | 9.5 | 2.25 | 2.55 | 1.20 | 4.0 | 4.0 | 2.0 | 8.0 | Q3 |
| SOT89-3 | 7" | 13.2 | 4.85 | 4.45 | 1.85 | 4.0 | 8.0 | 2.0 | 12.0 | Q3 |

NOTE:

1. All dimensions are nominal.
2. Plastic or metal protrusions of 0.15mm maximum per side are not included.

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