

**1A LOW DROPOUT POSITIVE
 FIXED 3.3V REGULATOR**

FEATURES

- Guaranteed < 1.3V Dropout at Full Load Current
- Fast Transient Response
- 1% Output Voltage Initial Accuracy
- Built-In Thermal Shutdown
- Available in SOT-223, D-Pak, Ultra Thin-Pak™ and 8-Pin SOIC Surface-Mount Packages

APPLICATIONS

- VGA & Sound Card Applications
- Standard 3.3V Chip Set and Logic Applications

DESCRIPTION

The IRU1010-33 is a low dropout three-terminal fixed output regulator with minimum of 1A output current capability. This product is specifically designed to provide well regulated supply for low voltage IC applications such as VGA, sound & DVD cards. The IRU1010-33 is guaranteed to have <1.3V dropout at full load current making it ideal to provide well regulated with 4.75V to 7V input supply. The IRU1010-33 is specifically designed to be stable with low cost aluminum capacitors while maintaining stability with low ESR tantalum caps.

TYPICAL APPLICATION

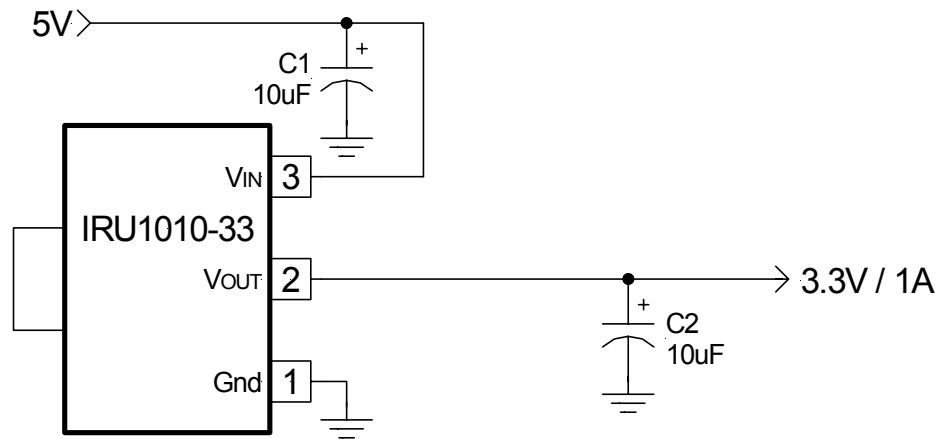


Figure 1 - Typical application of IRU1010-33 in a 5V to 3.3V regulator.

PACKAGE ORDER INFORMATION

Basic Part (Non-Lead Free)

| T _J (°C) | 2-PIN PLASTIC TO-252 (D-Pak) | 2-PIN PLASTIC Ultra Thin-Pak™ (P) | 8-PIN PLASTIC SOIC (S) | 3-PIN PLASTIC SOT-223 (Y) |
|---------------------|---------------------------------|--------------------------------------|---------------------------|------------------------------|
| 0 To 150 | IRU1010-33CD | IRU1010-33CP | IRU1010-33CS | IRU1010-33CY |

Leadfree Part

| T _J (°C) | 2-PIN PLASTIC TO-252 (D-Pak) | 2-PIN PLASTIC Ultra Thin-Pak™ (P) | 8-PIN PLASTIC SOIC (S) | 3-PIN PLASTIC SOT-223 (Y) |
|---------------------|---------------------------------|--------------------------------------|---------------------------|------------------------------|
| 0 To 150 | Not available | Not available | IRU1010-33CSPbF | Not available |

ABSOLUTE MAXIMUM RATINGS

| | |
|--|--------------------|
| Input Voltage (V_{IN}) | 7V |
| Power Dissipation | Internally Limited |
| Storage Temperature Range | -65°C To 150°C |
| Operating Junction Temperature Range | 0°C To 150°C |

PACKAGE INFORMATION

| 2-PIN PLASTIC TO-252 (D-Pak) | 2-PIN ULTRA THIN-PAK™ (P) | 8-PIN PLASTIC SOIC (S) | 3-PIN PLASTIC SOT-223 (Y) |
|---|---|--|---|
| <p>Tab is V_{OUT}.</p> <p>$\theta_{JA}=70^{\circ}\text{C/W}$ for 0.5" Sq pad</p> | <p>Tab is V_{OUT}.</p> <p>$\theta_{JA}=70^{\circ}\text{C/W}$ for 0.5" Sq pad</p> | <p>$\theta_{JA}=55^{\circ}\text{C/W}$ for 1" Sq pad</p> | <p>Tab is V_{OUT}.</p> <p>$\theta_{JA}=90^{\circ}\text{C/W}$ for 0.4" Sq pad</p> |

ELECTRICAL SPECIFICATIONS

Unless otherwise specified, these specifications apply over $C_{IN}=1\mu\text{F}$, $V_{IN}=5\text{V}$, $C_{OUT}=10\mu\text{F}$, and $T_J=0$ to 125°C. Typical values refer to $T_J=25^{\circ}\text{C}$.

| PARAMETER | SYM | TEST CONDITION | MIN | TYP | MAX | UNITS |
|--------------------------|-------|---|----------------|----------------|----------------|---------|
| Output Voltage | V_o | $I_o=10\text{mA}$, $T_J=25^{\circ}\text{C}$ $I_o=10\text{mA}$ | 3.267 3.235 | 3.300 3.300 | 3.333 3.365 | V |
| Line Regulation | | $I_o=10\text{mA}$, $4.75\text{V}<V_{IN}<7\text{V}$ | | | 7 | mV |
| Load Regulation (Note 1) | | $10\text{mA}<I_o<1\text{A}$ | | | 17 | mV |
| Dropout Voltage (Note 2) | | $I_o=1\text{A}$ | | | 1.3 | V |
| Current Limit | | $\Delta V_o=100\text{mV}$ | 1.1 | | | A |
| Thermal Regulation | | 30ms Pulse, $I_o=1\text{A}$ | | 0.01 | 0.02 | %/W |
| Ripple Rejection | | $f=120\text{Hz}$, $C_o=25\mu\text{F}$ Tantalum, $I_o=0.5\text{A}$ | 60 | 70 | | dB |
| Temperature Stability | | $I_o=10\text{mA}$ | | 0.5 | | % |
| Long Term Stability | | $T_J=125^{\circ}\text{C}$, 1000Hrs | | 0.3 | 1 | % |
| RMS Output Noise | | $T_J=25^{\circ}\text{C}$, $10\text{Hz}<f<10\text{KHz}$ | | 0.003 | | % V_o |

Note 1: Low duty cycle pulse testing with Kelvin connections is required in order to maintain accurate data.

Note 2: Dropout voltage is defined as the minimum differential voltage between V_{IN} and V_{OUT} required to maintain regulation at V_{OUT} . It is measured when the output voltage drops 1% below its nominal value.

PIN DESCRIPTIONS

| PIN# | PIN SYMBOL | PIN DESCRIPTION |
|------|------------------|--|
| 1 | Gnd | Ground pin. This pin must be connected to ground plane using a low inductance short connection. |
| 2 | V _{OUT} | The output of the regulator. This pin is also connected to the tab of the package. An output capacitor must be connected to this pin to insure stability of the regulator. |
| 3 | V _{IN} | Input pin of the regulator. |

BLOCK DIAGRAM

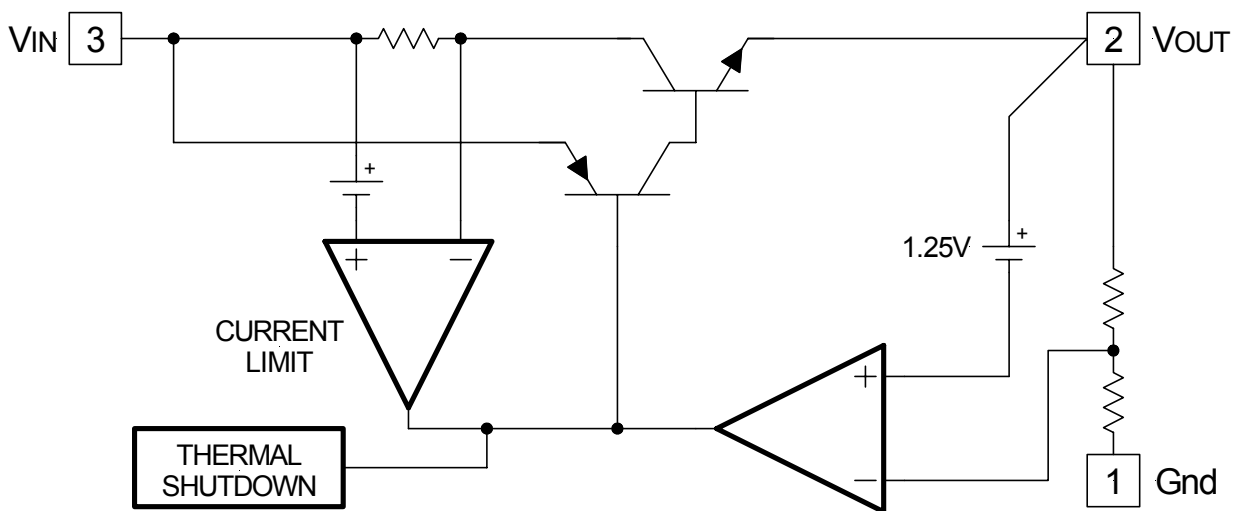
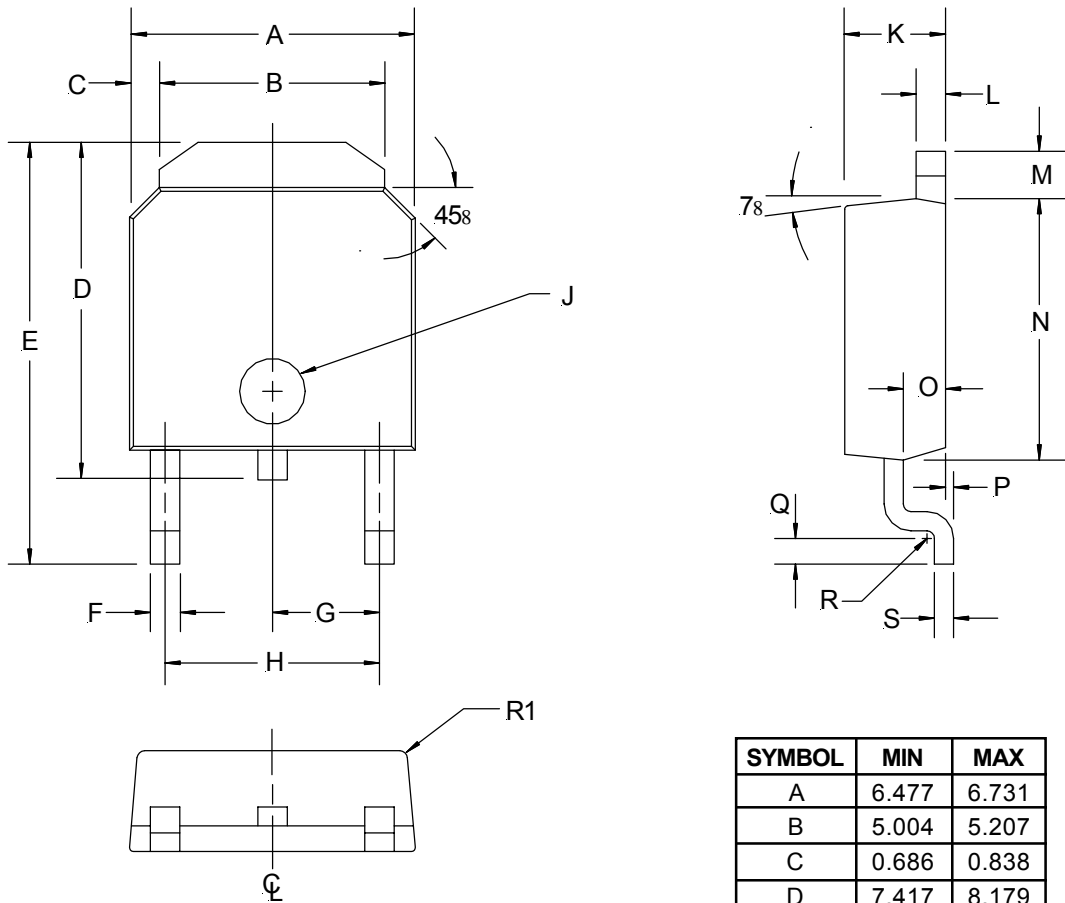


Figure 2 - Simplified block diagram of the IRU1010-33.

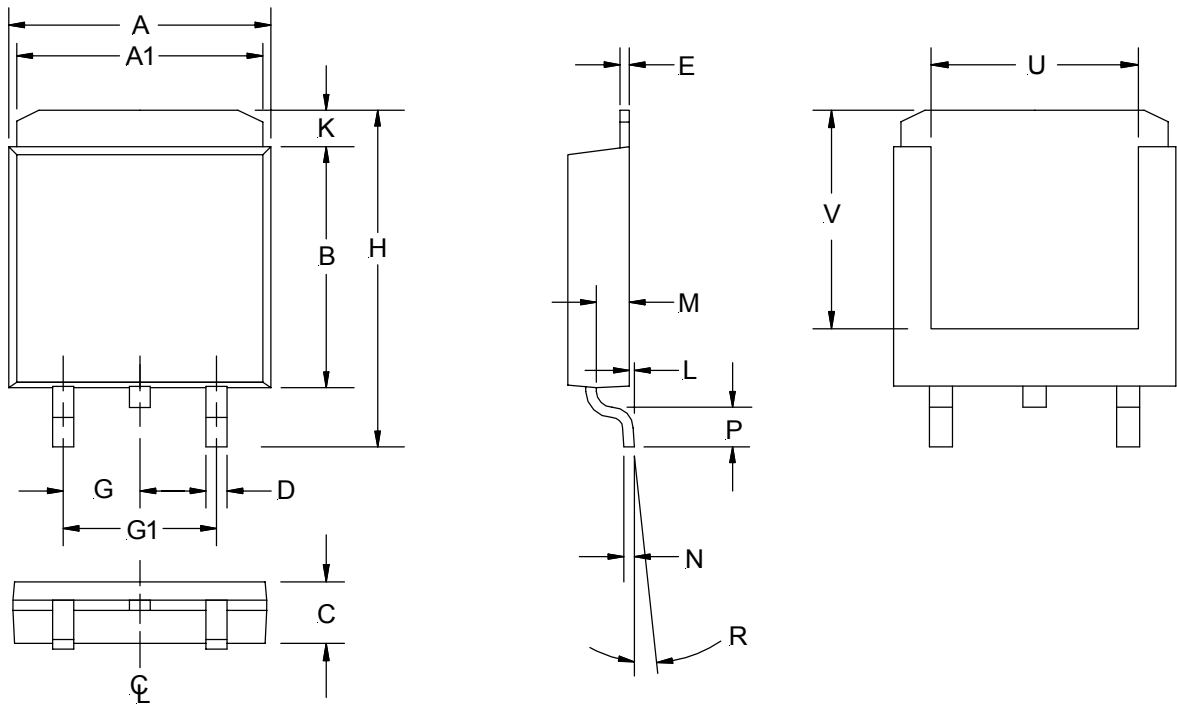
**(D) TO-252 Package
 2-Pin**



| SYMBOL | MIN | MAX |
|--------|-----------|--------|
| A | 6.477 | 6.731 |
| B | 5.004 | 5.207 |
| C | 0.686 | 0.838 |
| D | 7.417 | 8.179 |
| E | 9.703 | 10.084 |
| F | 0.635 | 0.889 |
| G | 2.286 BSC | |
| H | 4.521 | 4.623 |
| J | &1.52 | &1.62 |
| K | 2.184 | 2.388 |
| L | 0.762 | 0.864 |
| M | 1.016 | 1.118 |
| N | 5.969 | 6.223 |
| O | 1.016 | 1.118 |
| P | 0 | 0.102 |
| Q | 0.534 | 0.686 |
| R | R0.31 TYP | |
| R1 | R0.51 TYP | |
| S | 0.428 | 0.588 |

NOTE: ALL MEASUREMENTS
 ARE IN MILLIMETERS.

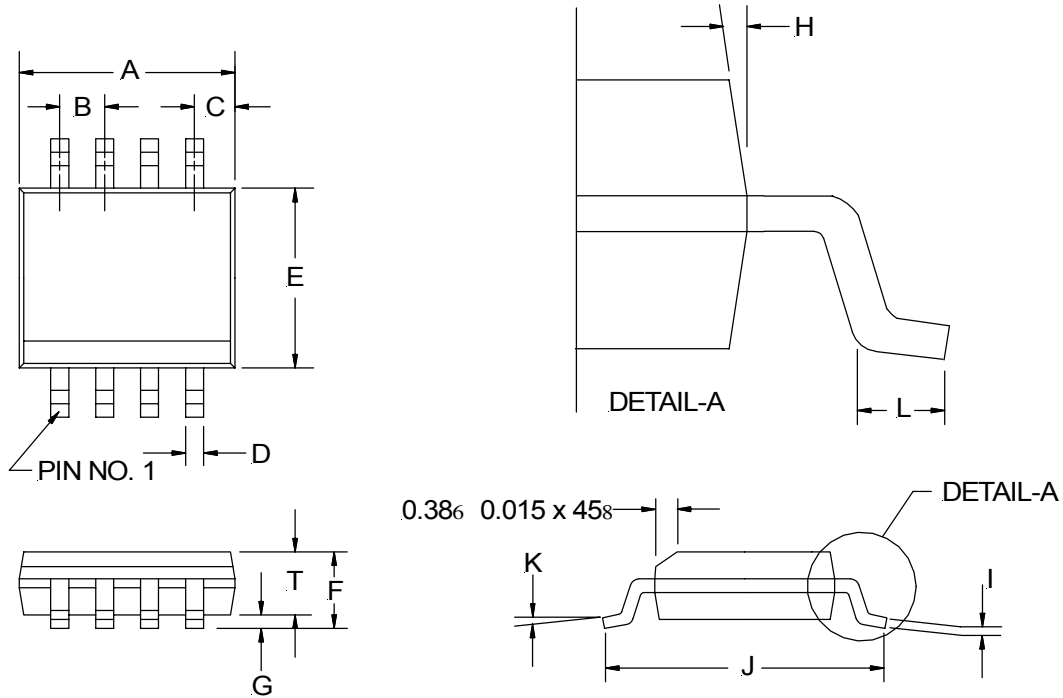
**(P) Ultra Thin-Pak™
 2-Pin**



| SYMBOL | MIN | MAX |
|--------|----------|------|
| A | 5.91 | 6.17 |
| A1 | 5.54 | 5.79 |
| B | 6.02 | 6.27 |
| C | 1.70 | 2.03 |
| D | 0.63 | 0.79 |
| E | 0.17 | 0.33 |
| G | 2.16 | 2.41 |
| G1 | 4.45 | 4.70 |
| H | 9.42 | 9.68 |
| K | 0.76 | 1.27 |
| L | 0.02 | 0.13 |
| M | 0.89 | 1.14 |
| N | 0.25 | 0.25 |
| P | 0.94 | 1.19 |
| R | 28 | 68 |
| U | 2.92 | 3.30 |
| V | 5.08 NOM | |

NOTE: ALL MEASUREMENTS
 ARE IN MILLIMETERS.

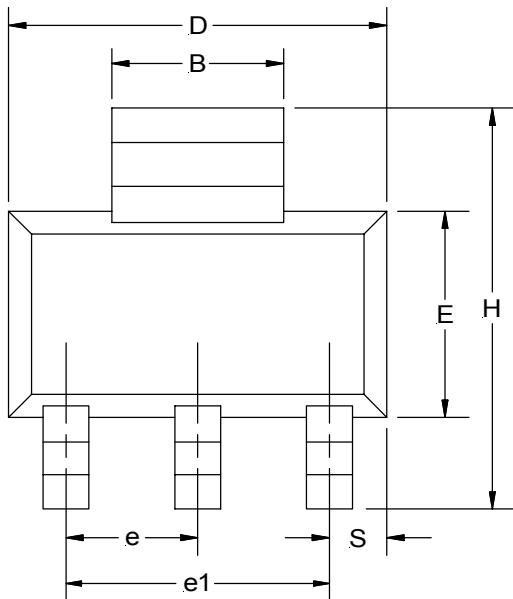
(S) SOIC Package
8-Pin Surface Mount, Narrow Body



| 8-PIN | | |
|--------|----------|------|
| SYMBOL | MIN | MAX |
| A | 4.80 | 4.98 |
| B | 1.27 BSC | |
| C | 0.53 REF | |
| D | 0.36 | 0.46 |
| E | 3.81 | 3.99 |
| F | 1.52 | 1.72 |
| G | 0.10 | 0.25 |
| H | 78 BSC | |
| I | 0.19 | 0.25 |
| J | 5.80 | 6.20 |
| K | Ø8 | Ø8 |
| L | 0.41 | 1.27 |
| T | 1.37 | 1.57 |

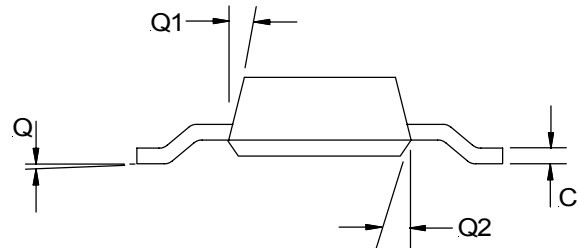
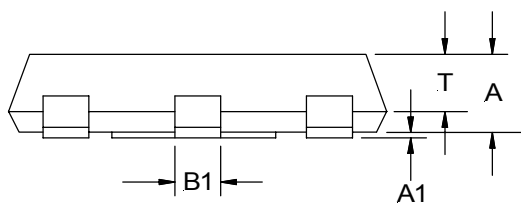
NOTE: ALL MEASUREMENTS
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**(Y) SOT-223 Package
 3-Pin**



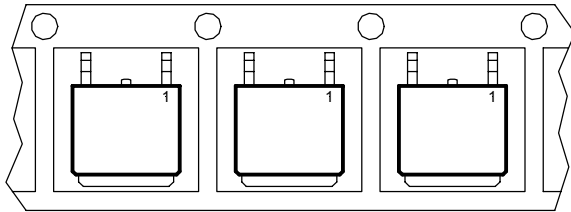
| SYMBOL | MIN | MAX |
|--------|-------|-------|
| A | 1.498 | 1.702 |
| A1 | 0.02 | 0.11 |
| B | 2.895 | 3.15 |
| B1 | 0.637 | 0.85 |
| C | 0.239 | 0.381 |
| D | 6.299 | 6.706 |
| E | 3.30 | 3.708 |
| e | 2.209 | 2.953 |
| e1 | 4.496 | 4.699 |
| H | 6.70 | 7.30 |
| Q | Ø8 | 108 |
| Q1 | 78 | 168 |
| Q2 | 78 | 168 |
| S | 0.838 | 1.05 |
| T | 1.092 | 1.30 |

NOTE: ALL MEASUREMENTS
 ARE IN MILLIMETERS.

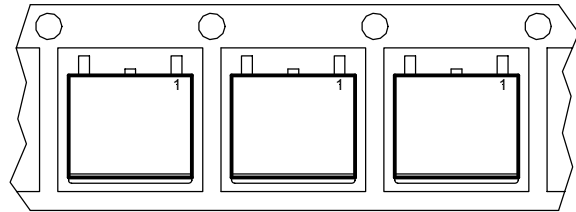


PACKAGE SHIPMENT METHOD

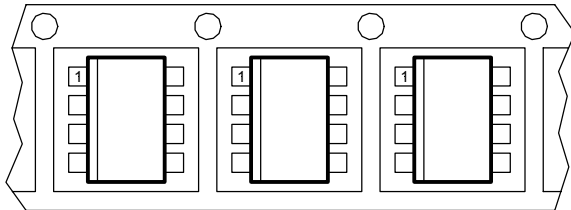
| PKG DESIG | PACKAGE DESCRIPTION | PIN COUNT | PARTS PER TUBE | PARTS PER REEL | T & R Orientation |
|-----------|---------------------|-----------|----------------|----------------|-------------------|
| D | TO-252, (D-Pak) | 2 | 75 | 2500 | Fig A |
| P | Ultra Thin-Pak™ | 2 | 75 | 2500 | Fig B |
| S | SOIC, Narrow Body | 8 | 95 | 2500 | Fig C |
| Y | SOT-223 | 3 | 80 | 2500 | Fig D |



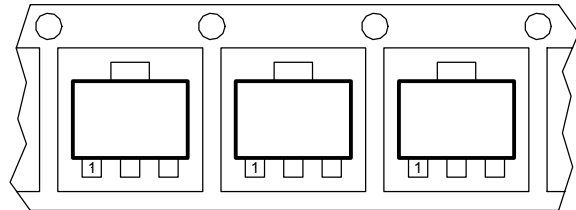
Feed Direction
Figure A



Feed Direction
Figure B



Feed Direction
Figure C



Feed Direction
Figure D