

LM2936 Ultra-Low Quiescent Current LDO Voltage Regulator

Check for Samples: [LM2936](#)

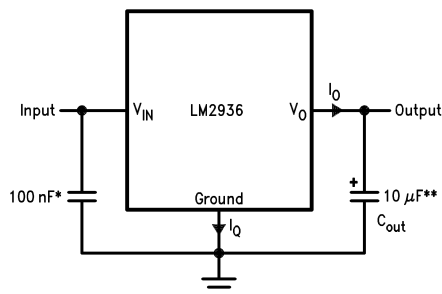
FEATURES

- Ultra Low Quiescent Current ($I_Q \leq 15 \mu\text{A}$ for $I_O = 100 \mu\text{A}$)
- Fixed 3.0V, 3.3V or 5.0V with 50 mA Output
- $\pm 2\%$ Initial Output Tolerance
- $\pm 3\%$ Output Tolerance Over Line, Load, and Temperature
- Dropout Voltage Typically 200 mV @ $I_O = 50 \text{ mA}$
- Reverse Battery Protection
- -50V Reverse Transient Protection
- Internal Short Circuit Current Limit
- Internal Thermal Shutdown Protection
- 40V Operating Voltage Limit
- 60V Operating Voltage Limit for LM2936HV
- Shutdown Pin Available with LM2936BM Package

DESCRIPTION

The LM2936 ultra-low quiescent current regulator features low dropout voltage and low current in the standby mode. With less than $15 \mu\text{A}$ quiescent current at a $100 \mu\text{A}$ load, the LM2936 is ideally suited for automotive and other battery operated systems. The LM2936 retains all of the features that are common to low dropout regulators including a low dropout PNP pass device, short circuit protection, reverse battery protection, and thermal shutdown. The LM2936 has a 40V maximum operating voltage limit, a -40°C to $+125^\circ\text{C}$ operating temperature range, and $\pm 3\%$ output voltage tolerance over the entire output current, input voltage, and temperature range. The LM2936 is available in a TO-92 package, SOIC-8 and SOT-223 surface mount packages, and a PFM surface mount power package.

Typical Application



* Required if regulator is located more than 2" from power supply filter capacitor.

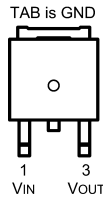
** Required for stability. See [Electrical Characteristics](#) for required values. Must be rated over intended operating temperature range. Effective series resistance (ESR) is critical, see curve. Locate capacitor as close as possible to the regulator output and ground pins. Capacitance may be increased without bound.



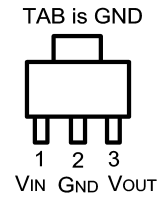
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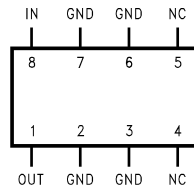
Connection Diagrams



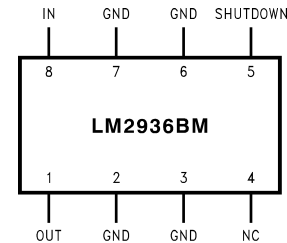
**Figure 1. PFM
Top View**
See Package Number NDP0003B



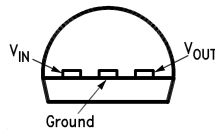
**Figure 2. SOT-223
Top View**
See Package Number DCY0004A



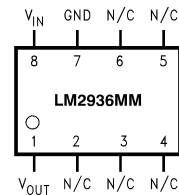
**Figure 3. 8-Pin SOIC (D)
Top View**
See Package Number D0008A



**Figure 4. 8-Pin SOIC (D)
Top View**
See Package Number D0008A



**Figure 5. TO-92
Bottom View**
See Package Number LP0003A



**Figure 6. 8-Pin VSSOP (DGK)
Top View**
See Package Number DGK0008A



These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

Absolute Maximum Ratings ⁽¹⁾⁽²⁾

| | |
|---|--------------------|
| Input Voltage (Survival) | +60V, -50V |
| ESD Susceptibility ⁽³⁾ | 2000V |
| Power Dissipation ⁽⁴⁾ | Internally limited |
| Junction Temperature (T _{Jmax}) | 150°C |
| Storage Temperature Range | -65°C to +150°C |
| Lead Temperature (Soldering, 10 sec.) | 260°C |

- (1) Absolute Maximum Ratings indicate limits beyond which damage to the device may occur. DC and AC electrical specifications do not apply when operating the device beyond its specified operating ratings.
- (2) If Military/Aerospace specified devices are required, please contact the TI Sales Office/ Distributors for availability and specifications.
- (3) Human body model, 100 pF discharge through a 1.5 kΩ resistor.
- (4) The maximum power dissipation is a function of T_{Jmax}, θ_{JA}, and T_A. The maximum allowable power dissipation at any ambient temperature is P_D = (T_{Jmax} - T_A)/θ_{JA}. If this dissipation is exceeded, the die temperature will rise above 150°C and the LM2936 will go into thermal shutdown.

Operating Ratings

| | |
|---|-----------------|
| Operating Temperature Range | -40°C to +125°C |
| Maximum Operating Input Voltage - LM2936 | +40V |
| Maximum Operating Input Voltage - LM2936HV only | +60V |
| Maximum Shutdown Pin Voltage - LM2936BM only | 0V to 40V |
| TO-92 (LP0003A) θ_{JA} | 195°C/W |
| VSSOP-8 (DGK0008A) θ_{JA} | 200°C/W |
| SOIC-8 (D0008A) θ_{JA} | 140°C/W |
| SOIC-8 (D0008A) θ_{JC} | 45°C/W |
| PFM (NDP0003B) θ_{JA} | 136°C/W |
| PFM (NDP0003B) θ_{JC} | 6°C/W |
| SOT-223 (DCY0004A) θ_{JA} | 149°C/W |
| SOT-223 (DCY0004A) θ_{JC} | 36°C/W |

Electrical Characteristics for LM2936–3.0

$V_{IN} = 14V$, $I_O = 10\text{ mA}$, $T_J = 25^\circ\text{C}$, unless otherwise specified. **Boldface** limits apply over entire operating temperature range

| Parameter | Conditions | Min (1) | Typical (2) | Max (1) | Units |
|--|---|--------------|----------------|--------------|------------------|
| LM2936HV–3.0 Only | | | | | |
| Output Voltage | $5.5V \leq V_{IN} \leq 48V$, $100\ \mu\text{A} \leq I_O \leq 50\ \text{mA}$ (3) | 2.910 | 3.000 | 3.090 | V |
| Line Regulation | $6V \leq V_{IN} \leq 60V$, $I_O = 1\text{ mA}$ | | 10 | 30 | mV |
| All LM2936–3.0 | | | | | |
| Output Voltage | $4.0V \leq V_{IN} \leq 26V$, $100\ \mu\text{A} \leq I_O \leq 50\ \text{mA}$ (3) | 2.940 | 3.000 | 3.060 | V |
| | | 2.910 | 3.000 | 3.090 | |
| Quiescent Current | $I_O = 100\ \mu\text{A}$, $8V \leq V_{IN} \leq 24V$ | | 15 | 20 | μA |
| | $I_O = 10\ \text{mA}$, $8V \leq V_{IN} \leq 24V$ | | 0.20 | 0.50 | mA |
| | $I_O = 50\ \text{mA}$, $8V \leq V_{IN} \leq 24V$ | | 1.5 | 2.5 | mA |
| Line Regulation | $9V \leq V_{IN} \leq 16V$ | | 5 | 10 | mV |
| | $6V \leq V_{IN} \leq 40V$, $I_O = 1\ \text{mA}$ | | 10 | 30 | |
| Load Regulation | $100\ \mu\text{A} \leq I_O \leq 5\ \text{mA}$ | | 10 | 30 | mV |
| | $5\ \text{mA} \leq I_O \leq 50\ \text{mA}$ | | 10 | 30 | |
| Dropout Voltage | $I_O = 100\ \mu\text{A}$ | | 0.05 | 0.10 | V |
| | $I_O = 50\ \text{mA}$ | | 0.20 | 0.40 | V |
| Short Circuit Current | $V_O = 0V$ | 65 | 120 | 250 | mA |
| Output Impedance | $I_O = 30\ \text{mAdc}$ and $10\ \text{mArms}$, $f = 1000\ \text{Hz}$ | | 450 | | $\text{m}\Omega$ |
| Output Noise Voltage | 10 Hz–100 kHz | | 500 | | μV |
| Long Term Stability | | | 20 | | mV/1000 Hr |
| Ripple Rejection | $V_{\text{ripple}} = 1V_{\text{rms}}$, $f_{\text{ripple}} = 120\ \text{Hz}$ | -40 | -60 | | dB |
| Reverse Polarity Transient Input Voltage | $R_L = 500\ \Omega$, $T = 1\ \text{ms}$ | -50 | -80 | | V |
| Output Voltage with Reverse Polarity Input | $V_{IN} = -15V$, $R_L = 500\ \Omega$ | | 0.00 | -0.30 | V |
| Maximum Line Transient | $R_L = 500\ \Omega$, $V_O \leq 3.30V$, $T = 40\text{ms}$ | 60 | | | V |
| Output Bypass Capacitance (C_{OUT}) ESR | $C_{OUT} = 22\ \mu\text{F}$ $0.1\ \text{mA} \leq I_{OUT} \leq 50\ \text{mA}$ | 0.3 | | 8 | Ω |
| Shutdown Input – LM2936BM–3.0 Only | | | | | |

(1) Datasheet min/max specification limits are ensured by design, test, or statistical analysis.

(2) Typicals are at 25°C (unless otherwise specified) and represent the most likely parametric norm.

(3) To ensure constant junction temperature, pulse testing is used.

Electrical Characteristics for LM2936–3.0 (continued)

$V_{IN} = 14V$, $I_O = 10\text{ mA}$, $T_J = 25^\circ\text{C}$, unless otherwise specified. **Boldface** limits apply over entire operating temperature range

| Parameter | Conditions | Min (1) | Typical (2) | Max (1) | Units |
|---|---|------------|----------------|------------|---------------|
| Output Voltage, V_{OUT} | Output Off, $V_{SD}=2.4V$, $R_{LOAD} = 500\Omega$ | | 0 | 0.010 | V |
| Shutdown High Threshold Voltage, V_{IH} | Output Off, $R_{LOAD} = 500\Omega$ | 2.00 | 1.1 | | V |
| Shutdown Low Threshold Voltage, V_{IL} | Output On, $R_{LOAD} = 500\Omega$ | | 1.1 | 0.60 | V |
| Shutdown High Current, I_{IH} | Output Off, $V_{SD} = 2.4V$, $R_{LOAD} = 500\Omega$ | | 12 | | μA |
| Quiescent Current | Output Off, $V_{SD} = 2.4V$, $R_{LOAD} = 500\Omega$ Includes I_{IH} Current | | 30 | | μA |

Electrical Characteristics for LM2936–3.3

$V_{IN} = 14V$, $I_O = 10\text{ mA}$, $T_J = 25^\circ\text{C}$, unless otherwise specified. **Boldface** limits apply over entire operating temperature range

| Parameter | Conditions | Min (1) | Typical (2) | Max (1) | Units |
|---|--|--------------|----------------|--------------|------------------|
| LM2936HV–3.3 Only | | | | | |
| Output Voltage | $5.5V \leq V_{IN} \leq 48V$, $100\ \mu\text{A} \leq I_O \leq 50\text{ mA}$ (3) | 3.201 | 3.300 | 3.399 | V |
| Line Regulation | $6V \leq V_{IN} \leq 60V$, $I_O = 1\text{ mA}$ | | 10 | 30 | mV |
| All LM2936–3.3 | | | | | |
| Output Voltage | $4.0V \leq V_{IN} \leq 26V$, $100\ \mu\text{A} \leq I_O \leq 50\text{ mA}$ (3) | 3.234 | 3.300 | 3.366 | V |
| | | 3.201 | 3.300 | 3.399 | |
| Quiescent Current | $I_O = 100\ \mu\text{A}$, $8V \leq V_{IN} \leq 24V$ | | 15 | 20 | μA |
| | $I_O = 10\text{ mA}$, $8V \leq V_{IN} \leq 24V$ | | 0.20 | 0.50 | mA |
| | $I_O = 50\text{ mA}$, $8V \leq V_{IN} \leq 24V$ | | 1.5 | 2.5 | mA |
| Line Regulation | $9V \leq V_{IN} \leq 16V$ | | 5 | 10 | mV |
| | $6V \leq V_{IN} \leq 40V$, $I_O = 1\text{ mA}$ | | 10 | 30 | |
| Load Regulation | $100\ \mu\text{A} \leq I_O \leq 5\text{ mA}$ | | 10 | 30 | mV |
| | $5\text{ mA} \leq I_O \leq 50\text{ mA}$ | | 10 | 30 | |
| Dropout Voltage | $I_O = 100\ \mu\text{A}$ | | 0.05 | 0.10 | V |
| | $I_O = 50\text{ mA}$ | | 0.20 | 0.40 | V |
| Short Circuit Current | $V_O = 0V$ | 65 | 120 | 250 | mA |
| Output Impedance | $I_O = 30\text{ mAdc}$ and 10 mArms , $f = 1000\text{ Hz}$ | | 450 | | $\text{m}\Omega$ |
| Output Noise Voltage | 10 Hz–100 kHz | | 500 | | μV |
| Long Term Stability | | | 20 | | mV/1000 Hr |
| Ripple Rejection | $V_{\text{ripple}} = 1V_{\text{rms}}$, $f_{\text{ripple}} = 120\text{ Hz}$ | -40 | -60 | | dB |
| Reverse Polarity Transient Input Voltage | $R_L = 500\Omega$, $T = 1\text{ ms}$ | -50 | -80 | | V |
| Output Voltage with Reverse Polarity Input | $V_{IN} = -15V$, $R_L = 500\Omega$ | | 0.00 | -0.30 | V |
| Maximum Line Transient | $R_L = 500\Omega$, $V_O \leq 3.63V$, $T = 40\text{ms}$ | 60 | | | V |
| Output Bypass Capacitance (C_{OUT}) ESR | $C_{OUT} = 22\ \mu\text{F}$ $0.1\text{ mA} \leq I_{OUT} \leq 50\text{ mA}$ | 0.3 | | 8 | Ω |
| Shutdown Input – LM2936BM–3.3 Only | | | | | |
| Output Voltage, V_{OUT} | Output Off, $V_{SD}=2.4V$, $R_{LOAD} = 500\Omega$ | | 0 | 0.010 | V |

(1) Datasheet min/max specification limits are ensured by design, test, or statistical analysis.

(2) Typicals are at 25°C (unless otherwise specified) and represent the most likely parametric norm.

(3) To ensure constant junction temperature, pulse testing is used.

Electrical Characteristics for LM2936–3.3 (continued)
 $V_{IN} = 14V$, $I_O = 10\text{ mA}$, $T_J = 25^\circ\text{C}$, unless otherwise specified. **Boldface** limits apply over entire operating temperature range

| Parameter | Conditions | Min (1) | Typical (2) | Max (1) | Units |
|---|---|------------|----------------|------------|---------------|
| Shutdown High Threshold Voltage, V_{IH} | Output Off, $R_{LOAD} = 500\Omega$ | 2.00 | 1.1 | | V |
| Shutdown Low Threshold Voltage, V_{IL} | Output On, $R_{LOAD} = 500\Omega$ | | 1.1 | 0.60 | V |
| Shutdown High Current, I_{IH} | Output Off, $V_{SD} = 2.4V$, $R_{LOAD} = 500\Omega$ | | 12 | | μA |
| Quiescent Current | Output Off, $V_{SD} = 2.4V$, $R_{LOAD} = 500\Omega$ Includes I_{IH} Current | | 30 | | μA |

Electrical Characteristics for LM2936–5.0
 $V_{IN} = 14V$, $I_O = 10\text{ mA}$, $T_J = 25^\circ\text{C}$, unless otherwise specified. **Boldface** limits apply over entire operating temperature range

| Parameter | Conditions | Min (1) | Typical (2) | Max (1) | Units |
|---|--|-------------|----------------|-------------|---------------|
| LM2936HV–5.0 Only | | | | | |
| Output Voltage | $5.5V \leq V_{IN} \leq 48V$, $100\ \mu\text{A} \leq I_O \leq 50\text{ mA}$ (3) | 4.85 | 5.00 | 5.15 | V |
| Line Regulation | $6V \leq V_{IN} \leq 60V$, $I_O = 1\text{ mA}$ | | 15 | 35 | mV |
| All LM2936–5.0 | | | | | |
| Output Voltage | $5.5V \leq V_{IN} \leq 26V$, $100\ \mu\text{A} \leq I_O \leq 50\text{ mA}$ (3) | 4.90 | 5.00 | 5.10 | V |
| | | 4.85 | 5.00 | 5.15 | |
| Quiescent Current | $I_O = 100\ \mu\text{A}$, $8V \leq V_{IN} \leq 24V$ | | 9 | 15 | μA |
| | $I_O = 10\text{ mA}$, $8V \leq V_{IN} \leq 24V$ | | 0.20 | 0.50 | mA |
| | $I_O = 50\text{ mA}$, $8V \leq V_{IN} \leq 24V$ | | 1.5 | 2.5 | mA |
| Line Regulation | $9V \leq V_{IN} \leq 16V$ | | 5 | 10 | mV |
| | $6V \leq V_{IN} \leq 40V$, $I_O = 1\text{ mA}$ | | 10 | 30 | |
| Load Regulation | $100\ \mu\text{A} \leq I_O \leq 5\text{ mA}$ | | 10 | 30 | mV |
| | $5\text{ mA} \leq I_O \leq 50\text{ mA}$ | | 10 | 30 | |
| Dropout Voltage | $I_O = 100\ \mu\text{A}$ | | 0.05 | 0.10 | V |
| | $I_O = 50\text{ mA}$ | | 0.20 | 0.40 | V |
| Short Circuit Current | $V_O = 0V$ | 65 | 120 | 250 | mA |
| Output Impedance | $I_O = 30\text{ mAdc}$ and 10 mArms , $f = 1000\text{ Hz}$ | | 450 | | m Ω |
| Output Noise Voltage | 10 Hz–100 kHz | | 500 | | μV |
| Long Term Stability | | | 20 | | mV/1000 Hr |
| Ripple Rejection | $V_{\text{ripple}} = 1V_{\text{rms}}$, $f_{\text{ripple}} = 120\text{ Hz}$ | -40 | -60 | | dB |
| Reverse Polarity Transient Input Voltage | $R_L = 500\Omega$, $T = 1\text{ ms}$ | -50 | -80 | | V |
| Output Voltage with Reverse Polarity Input | $V_{IN} = -15V$, $R_L = 500\Omega$ | | 0.00 | -0.30 | V |
| Maximum Line Transient | $R_L = 500\Omega$, $V_O \leq 5.5V$, $T = 40\text{ ms}$ | 60 | | | V |
| Output Bypass Capacitance (C_{OUT}) ESR | $C_{OUT} = 10\ \mu\text{F}$ $0.1\text{ mA} \leq I_{OUT} \leq 50\text{ mA}$ | 0.3 | | 8 | Ω |
| Shutdown Input – LM2936BM–5.0 Only | | | | | |
| Output Voltage, V_{OUT} | Output Off, $V_{SD} = 2.4V$, $R_{LOAD} = 500\Omega$ | | 0 | 0.010 | V |
| Shutdown High Threshold Voltage, V_{IH} | Output Off, $R_{LOAD} = 500\Omega$ | 2.00 | 1.1 | | V |

(1) Datasheet min/max specification limits are ensured by design, test, or statistical analysis.

 (2) Typicals are at 25°C (unless otherwise specified) and represent the most likely parametric norm.

(3) To ensure constant junction temperature, pulse testing is used.

Electrical Characteristics for LM2936–5.0 (continued)
 $V_{IN} = 14V$, $I_O = 10\text{ mA}$, $T_J = 25^\circ\text{C}$, unless otherwise specified. **Boldface** limits apply over entire operating temperature range

| Parameter | Conditions | Min (1) | Typical (2) | Max (1) | Units |
|--|---|------------|----------------|------------|---------------|
| Shutdown Low Threshold Voltage, V_{IL} | Output On, $R_{LOAD} = 500\Omega$ | | 1.1 | 0.60 | V |
| Shutdown High Current, I_{IH} | Output Off, $V_{SD} = 2.4V$, $R_{LOAD} = 500\Omega$ | | 12 | | μA |
| Quiescent Current | Output Off, $V_{SD} = 2.4V$, $R_{LOAD} = 500\Omega$ Includes I_{IH} Current | | 30 | | μA |

Typical Performance Characteristics

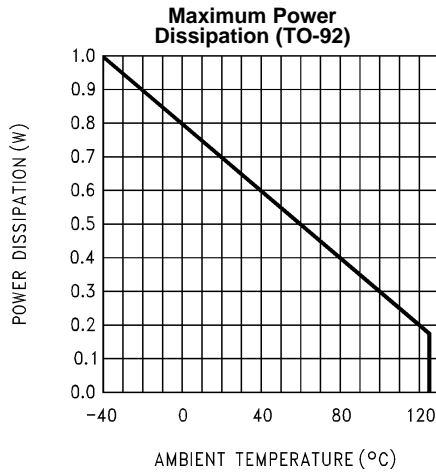


Figure 7.

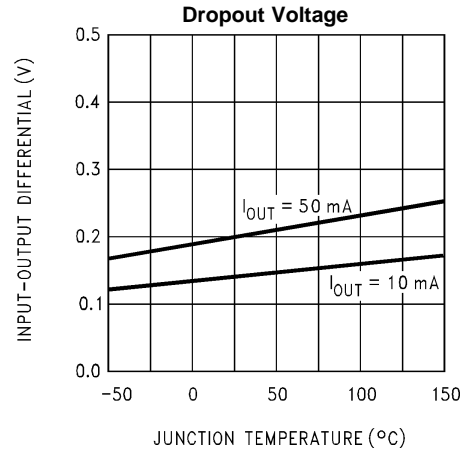


Figure 8.

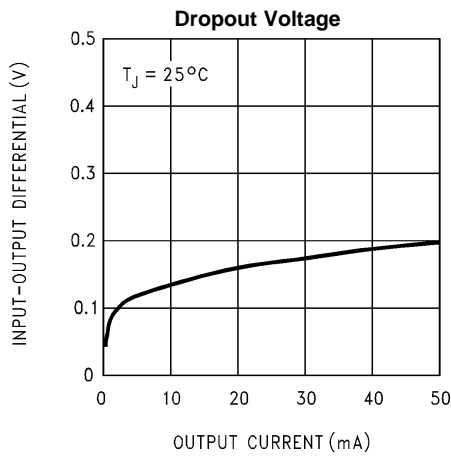


Figure 9.

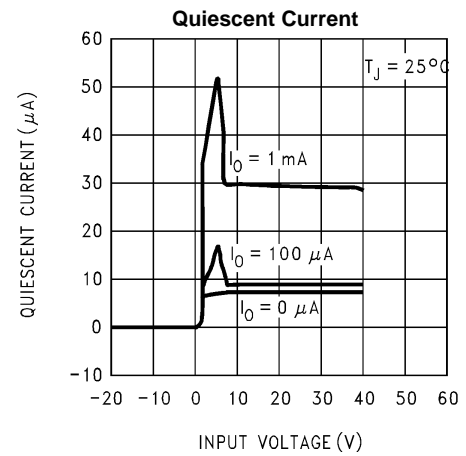


Figure 10.

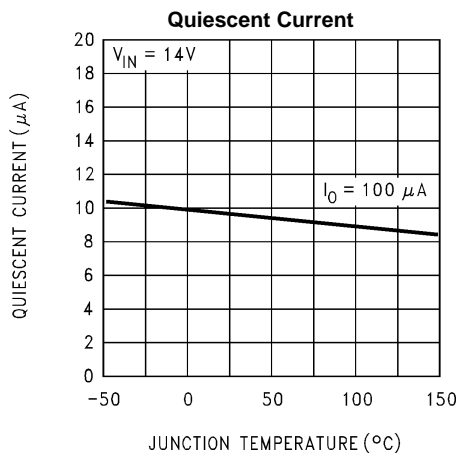


Figure 11.

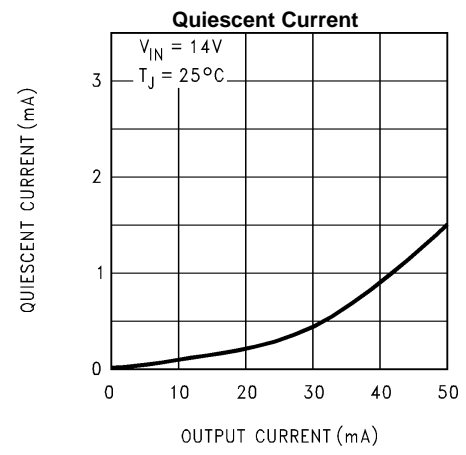


Figure 12.

Typical Performance Characteristics (continued)

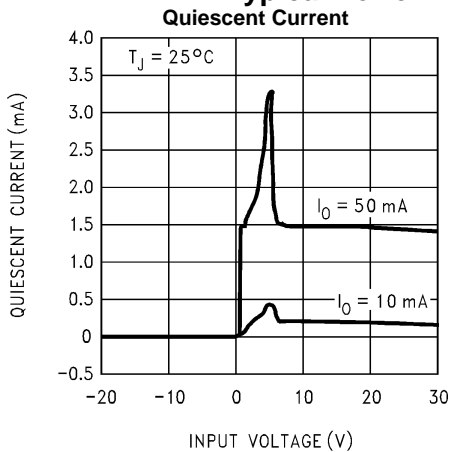


Figure 13.

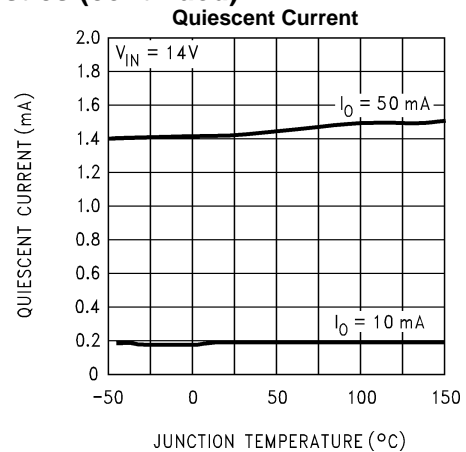


Figure 14.

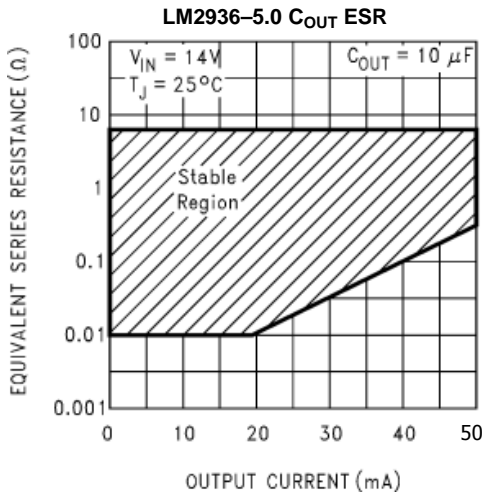


Figure 15.

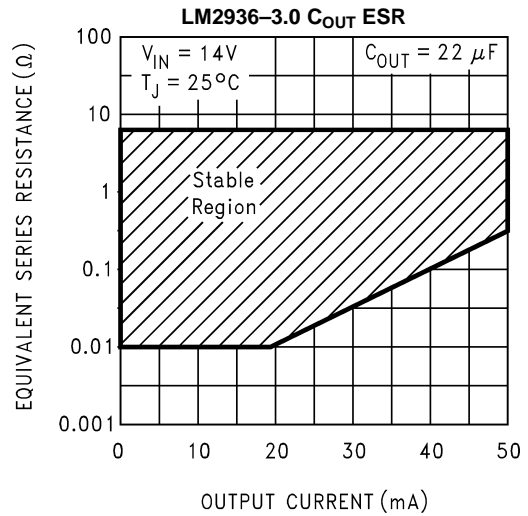


Figure 16.

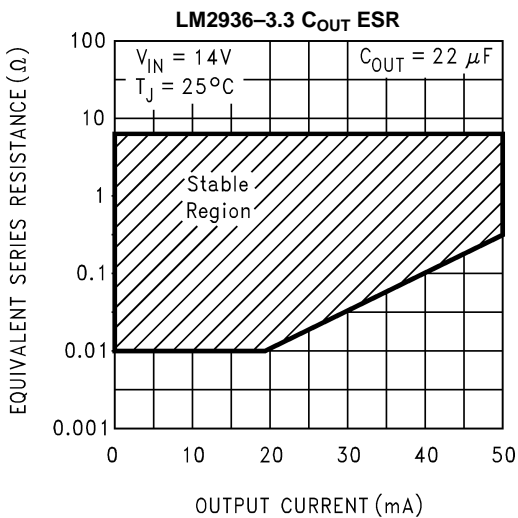


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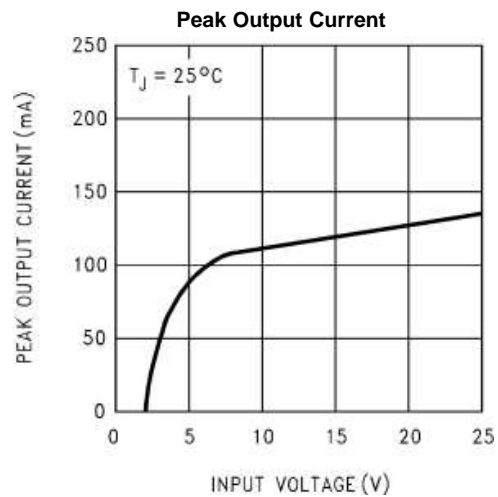


Figure 18.

Typical Performance Characteristics (continued)

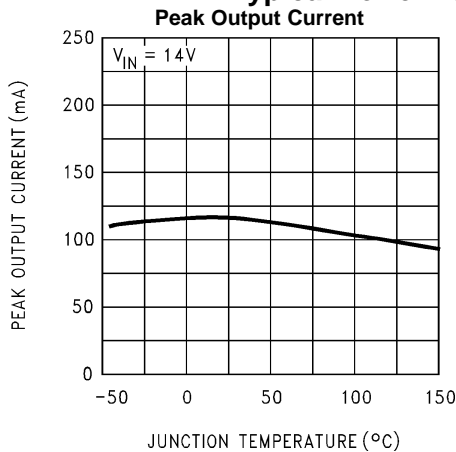


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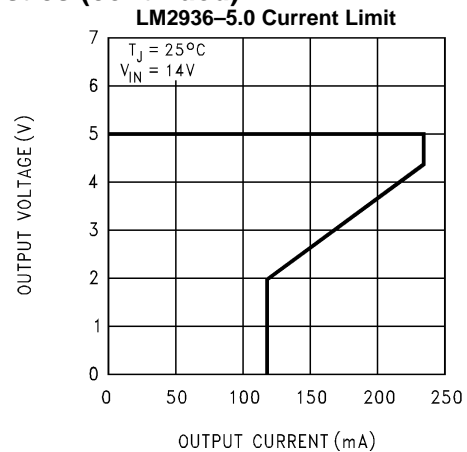


Figure 20.

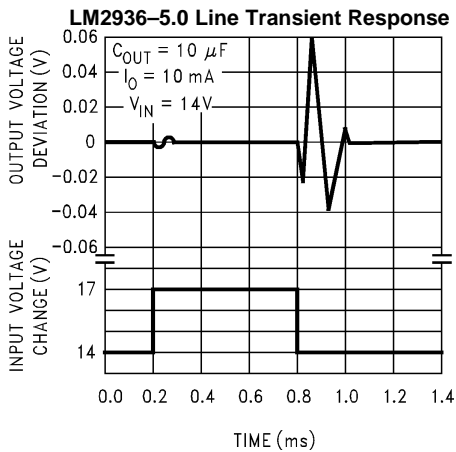


Figure 21.

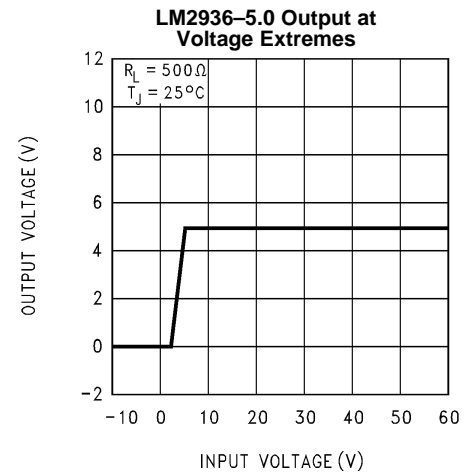


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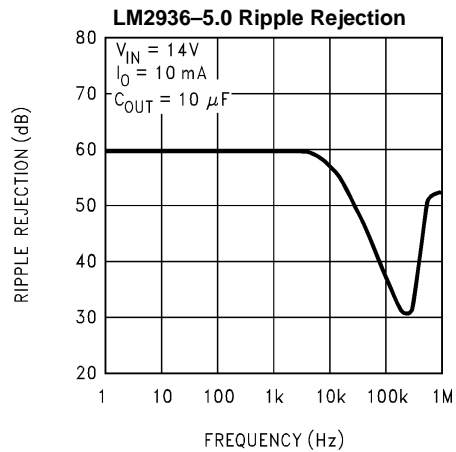


Figure 23.

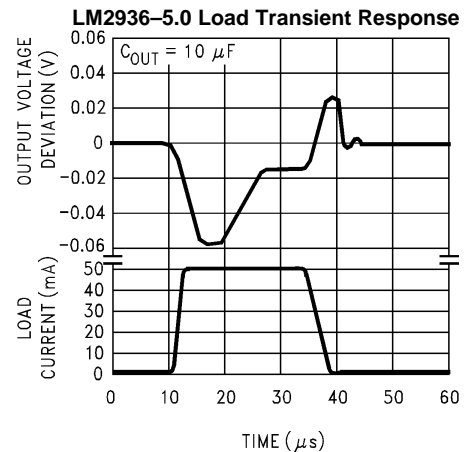
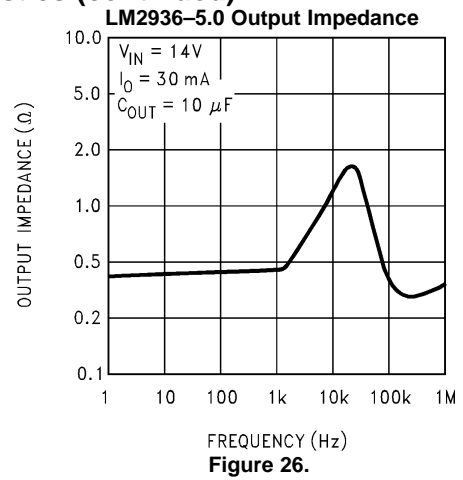
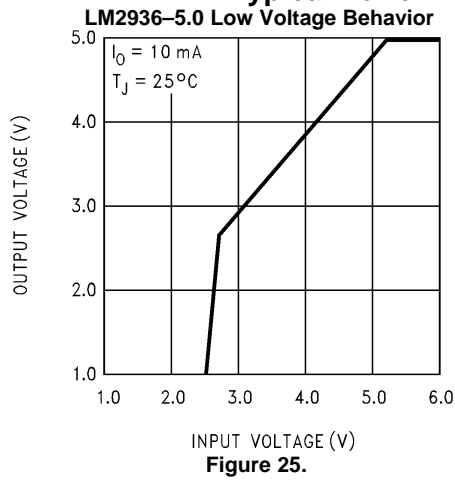


Figure 24.

Typical Performance Characteristics (continued)



APPLICATIONS INFORMATION

Unlike other PNP low dropout regulators, the LM2936 remains fully operational to 40V. Owing to power dissipation characteristics of the available packages, full output current cannot be ensured for all combinations of ambient temperature and input voltage. As an example, consider an LM2936Z–5.0 operating at 25°C ambient. Using the formula for maximum allowable power dissipation given in ⁽¹⁾, we find that $P_{Dmax} = 641 \text{ mW}$ at 25°C. Including the small contribution of the quiescent current to total power dissipation the maximum input voltage (while still delivering 50 mA output current) is 17.3V. The LM2936Z–5.0 will go into thermal shutdown if it attempts to deliver full output current with an input voltage of more than 17.3V. Similarly, at 40V input and 25°C ambient the LM2936Z–5.0 can deliver 18 mA maximum.

Under conditions of higher ambient temperatures, the voltage and current calculated in the previous examples will drop. For instance, at the maximum ambient of 125°C the LM2936Z–5.0 can only dissipate 128 mW, limiting the input voltage to 7.34V for a 50 mA load, or 3.5 mA output current for a 40V input.

The junction to ambient thermal resistance θ_{JA} rating has two distinct components: the junction to case thermal resistance rating θ_{JC} ; and the case to ambient thermal resistance rating θ_{CA} . The relationship is defined as: $\theta_{JA} = \theta_{JC} + \theta_{CA}$.

For the SOIC-8 and PFM surface mount packages the θ_{JA} rating can be improved by using the copper mounting pads on the printed circuit board as a thermal conductive path to extract heat from the package.

On the SOIC-8 package the four ground pins are thermally connected to the backside of the die. Adding approximately 0.04 square inches of 2 oz. copper pad area to these four pins will improve the θ_{JA} rating to approximately 110°C/W. If this extra pad are is placed directly beneath the package there should not be any impact on board density.

On the PFM package the ground tab is thermally connected to the backside of the die. Adding 1 square inch of 2 oz. copper pad area directly under the ground tab will improve the θ_{JA} rating to approximately 50°C/W.

While the LM2936 has an internally set thermal shutdown point of typically 160°C, this is intended as a safety feature only. Continuous operation near the thermal shutdown temperature should be avoided as it may have a negative affect on the life of the device.

While the LM2936 maintains regulation to 60V, it will not withstand a short circuit above 40V because of safe operating area limitations in the internal PNP pass device. Above 60V the LM2936 will break down with catastrophic effects on the regulator and possibly the load as well. Do not use this device in a design where the input operating voltage may exceed 40V, or where transients are likely to exceed 60V.

SHUTDOWN PIN

The LM2936BM has a pin for shutting down the regulator output. Applying a Logic Level High (>2.0V) to the Shutdown pin will cause the output to turn off. Leaving the Shutdown pin open, connecting it to Ground, or applying a Logic Level Low (<0.6V) will allow the regulator output to turn on.

(1) The maximum power dissipation is a function of T_{Jmax} , θ_{JA} , and T_A . The maximum allowable power dissipation at any ambient temperature is $P_D = (T_{Jmax} - T_A)/\theta_{JA}$. If this dissipation is exceeded, the die temperature will rise above 150°C and the LM2936 will go into thermal shutdown.

Equivalent Schematic Diagram

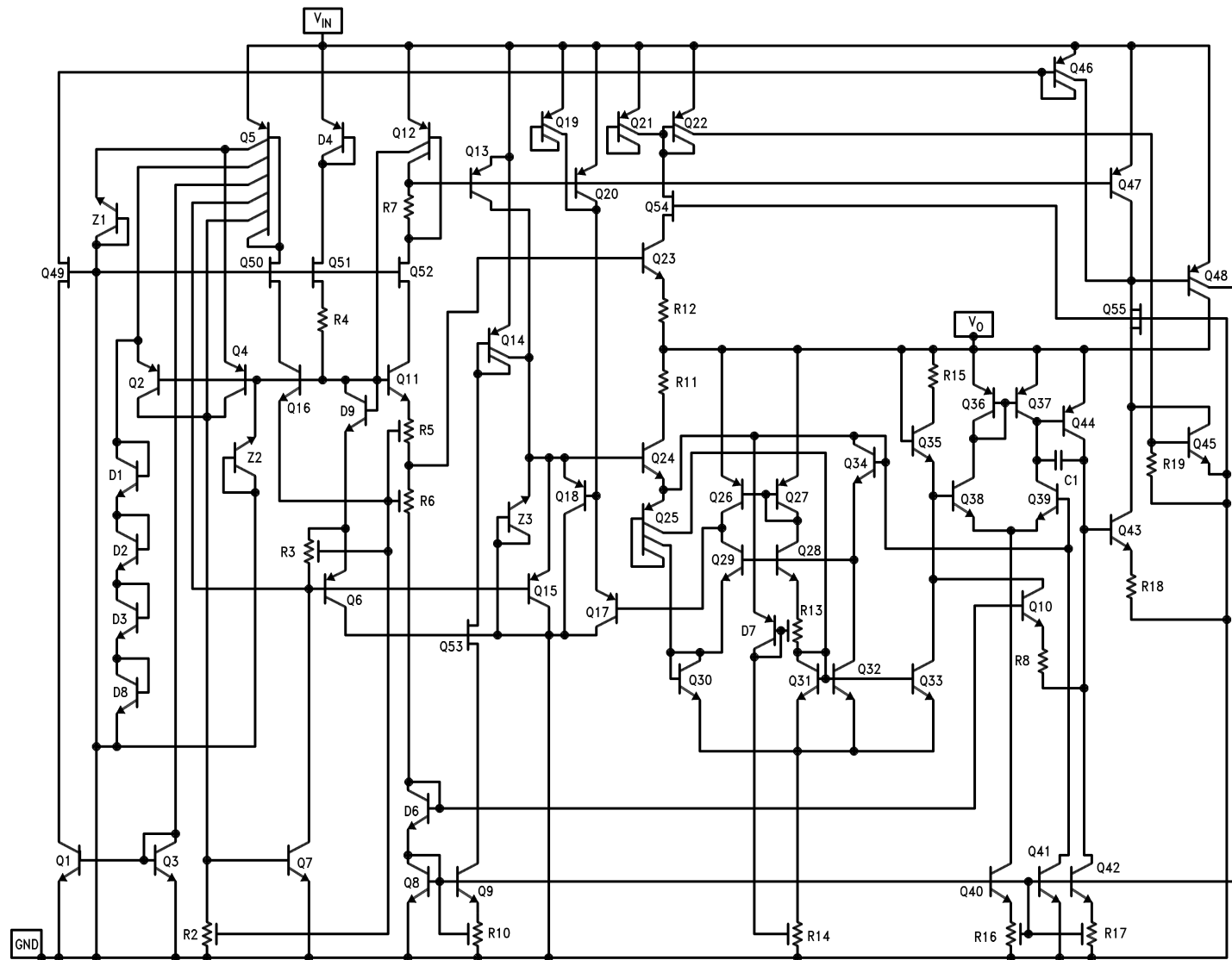


Figure 27.

REVISION HISTORY

| Changes from Revision M (March 2013) to Revision N | Page |
|--|--------------------------|
| <hr/> <ul style="list-style-type: none">• Changed layout of National Data Sheet to TI format | <hr/> 12 |

PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|--------------------|---------------|--------------|-----------------|------|-------------|----------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| LM2936BM-3.3 | ACTIVE | SOIC | D | 8 | 95 | TBD | Call TI | Call TI | -40 to 125 | LM293 6B3.3 | Samples |
| LM2936BM-3.3/NOPB | ACTIVE | SOIC | D | 8 | 95 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | LM293 6B3.3 | Samples |
| LM2936BM-5.0 | ACTIVE | SOIC | D | 8 | 95 | TBD | Call TI | Call TI | -40 to 125 | LM293 6B5.0 | Samples |
| LM2936BM-5.0/NOPB | ACTIVE | SOIC | D | 8 | 95 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | LM293 6B5.0 | Samples |
| LM2936BMX-3.3 | ACTIVE | SOIC | D | 8 | 2500 | TBD | Call TI | Call TI | -40 to 125 | LM293 6B3.3 | Samples |
| LM2936BMX-3.3/NOPB | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | LM293 6B3.3 | Samples |
| LM2936BMX-5.0 | ACTIVE | SOIC | D | 8 | 2500 | TBD | Call TI | Call TI | -40 to 125 | LM293 6B5.0 | Samples |
| LM2936BMX-5.0/NOPB | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | LM293 6B5.0 | Samples |
| LM2936DT-3.0 | ACTIVE | TO-252 | NDP | 3 | 75 | TBD | Call TI | Call TI | -40 to 125 | LM2936D T-3.0 | Samples |
| LM2936DT-3.0/NOPB | ACTIVE | TO-252 | NDP | 3 | 75 | Green (RoHS & no Sb/Br) | CU SN | Level-2-260C-1 YEAR | -40 to 125 | LM2936D T-3.0 | Samples |
| LM2936DT-3.3 | ACTIVE | TO-252 | NDP | 3 | 75 | TBD | Call TI | Call TI | -40 to 125 | LM2936D T-3.3 | Samples |
| LM2936DT-3.3/NOPB | ACTIVE | TO-252 | NDP | 3 | 75 | Green (RoHS & no Sb/Br) | CU SN | Level-2-260C-1 YEAR | -40 to 125 | LM2936D T-3.3 | Samples |
| LM2936DT-5.0 | ACTIVE | TO-252 | NDP | 3 | 75 | TBD | Call TI | Call TI | -40 to 125 | LM2936D T-5.0 | Samples |
| LM2936DT-5.0/NOPB | ACTIVE | TO-252 | NDP | 3 | 75 | Green (RoHS & no Sb/Br) | CU SN | Level-2-260C-1 YEAR | -40 to 125 | LM2936D T-5.0 | Samples |
| LM2936DTX-3.0/NOPB | ACTIVE | TO-252 | NDP | 3 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-2-260C-1 YEAR | -40 to 125 | LM2936D T-3.0 | Samples |
| LM2936DTX-3.3 | ACTIVE | TO-252 | NDP | 3 | 2500 | TBD | Call TI | Call TI | -40 to 125 | | Samples |
| LM2936DTX-3.3/NOPB | ACTIVE | TO-252 | NDP | 3 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-2-260C-1 YEAR | -40 to 125 | LM2936D T-3.3 | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|----------------------|---------------|--------------|-----------------|------|-------------|----------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| LM2936DTX-5.0 | ACTIVE | TO-252 | NDP | 3 | 2500 | TBD | Call TI | Call TI | -40 to 125 | LM2936D T-5.0 | Samples |
| LM2936DTX-5.0/NOPB | ACTIVE | TO-252 | NDP | 3 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-2-260C-1 YEAR | -40 to 125 | LM2936D T-5.0 | Samples |
| LM2936HVBMA-3.3 | ACTIVE | SOIC | D | 8 | 95 | TBD | Call TI | Call TI | -40 to 125 | 2936H BM3.3 | Samples |
| LM2936HVBMA-3.3/NOPB | ACTIVE | SOIC | D | 8 | 95 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | 2936H BM3.3 | Samples |
| LM2936HVBMA-5.0 | ACTIVE | SOIC | D | 8 | 95 | TBD | Call TI | Call TI | -40 to 125 | 2936H BM5.0 | Samples |
| LM2936HVBMA-5.0/NOPB | ACTIVE | SOIC | D | 8 | 95 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | 2936H BM5.0 | Samples |
| LM2936HVBMAX3.3 | ACTIVE | SOIC | D | 8 | 2500 | TBD | Call TI | Call TI | | 2936H BM3.3 | Samples |
| LM2936HVBMAX3.3/NOPB | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | | 2936H BM3.3 | Samples |
| LM2936HVBMAX5.0 | ACTIVE | SOIC | D | 8 | 2500 | TBD | Call TI | Call TI | | 2936H BM5.0 | Samples |
| LM2936HVBMAX5.0/NOPB | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | | 2936H BM5.0 | Samples |
| LM2936HVMA-5.0 | ACTIVE | SOIC | D | 8 | 95 | TBD | Call TI | Call TI | -40 to 125 | 2936H M-5.0 | Samples |
| LM2936HVMA-5.0/NOPB | ACTIVE | SOIC | D | 8 | 95 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | 2936H M-5.0 | Samples |
| LM2936HVMAX-5.0 | ACTIVE | SOIC | D | 8 | 2500 | TBD | Call TI | Call TI | -40 to 125 | 2936H M-5.0 | Samples |
| LM2936HVMAX-5.0/NOPB | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | 2936H M-5.0 | Samples |
| LM2936M-3.0 | ACTIVE | SOIC | D | 8 | 95 | TBD | Call TI | Call TI | -40 to 125 | LM293 6M-3 | Samples |
| LM2936M-3.0/NOPB | ACTIVE | SOIC | D | 8 | 95 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | LM293 6M-3 | Samples |
| LM2936M-3.3 | ACTIVE | SOIC | D | 8 | 95 | TBD | Call TI | Call TI | -40 to 125 | LM293 6-3.3 | Samples |
| LM2936M-3.3/NOPB | ACTIVE | SOIC | D | 8 | 95 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | LM293 6-3.3 | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|--------------------|---------------|--------------|-----------------|------|-------------|-------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| LM2936M-5.0 | ACTIVE | SOIC | D | 8 | 95 | TBD | Call TI | Call TI | -40 to 125 | LM2936M-5 | Samples |
| LM2936M-5.0/NOPB | ACTIVE | SOIC | D | 8 | 95 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | LM2936M-5 | Samples |
| LM2936MM-3.0 | ACTIVE | VSSOP | DGK | 8 | 1000 | TBD | Call TI | Call TI | -40 to 125 | KBC | Samples |
| LM2936MM-3.0/NOPB | ACTIVE | VSSOP | DGK | 8 | 1000 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | KBC | Samples |
| LM2936MM-3.3 | ACTIVE | VSSOP | DGK | 8 | 1000 | TBD | Call TI | Call TI | -40 to 125 | KBB | Samples |
| LM2936MM-3.3/NOPB | ACTIVE | VSSOP | DGK | 8 | 1000 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | KBB | Samples |
| LM2936MM-5.0 | ACTIVE | VSSOP | DGK | 8 | 1000 | TBD | Call TI | Call TI | -40 to 125 | KBA | Samples |
| LM2936MM-5.0/NOPB | ACTIVE | VSSOP | DGK | 8 | 1000 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | KBA | Samples |
| LM2936MMX-3.3 | ACTIVE | VSSOP | DGK | 8 | 3500 | TBD | Call TI | Call TI | -40 to 125 | KBB | Samples |
| LM2936MMX-3.3/NOPB | ACTIVE | VSSOP | DGK | 8 | 3500 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | KBB | Samples |
| LM2936MMX-5.0 | ACTIVE | VSSOP | DGK | 8 | 3500 | TBD | Call TI | Call TI | -40 to 125 | KBA | Samples |
| LM2936MMX-5.0/NOPB | ACTIVE | VSSOP | DGK | 8 | 3500 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | KBA | Samples |
| LM2936MP-3.0 | ACTIVE | SOT-223 | DCY | 4 | 1000 | TBD | Call TI | Call TI | | KACA | Samples |
| LM2936MP-3.0/NOPB | ACTIVE | SOT-223 | DCY | 4 | 1000 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | | KACA | Samples |
| LM2936MP-3.3 | ACTIVE | SOT-223 | DCY | 4 | 1000 | TBD | Call TI | Call TI | -40 to 125 | KABA | Samples |
| LM2936MP-3.3/NOPB | ACTIVE | SOT-223 | DCY | 4 | 1000 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | KABA | Samples |
| LM2936MP-5.0 | ACTIVE | SOT-223 | DCY | 4 | 1000 | TBD | Call TI | Call TI | -40 to 125 | KAAA | Samples |
| LM2936MP-5.0/NOPB | ACTIVE | SOT-223 | DCY | 4 | 1000 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | KAAA | Samples |
| LM2936MPX-3.0 | ACTIVE | SOT-223 | DCY | 4 | 2000 | TBD | Call TI | Call TI | -40 to 125 | KACA | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|--------------------|---------------|--------------|-----------------|------|-------------|-------------------------|------------------|----------------------|--------------|-------------------------|-------------------------|
| LM2936MPX-3.0/NOPB | ACTIVE | SOT-223 | DCY | 4 | 2000 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | KACA | Samples |
| LM2936MPX-3.3 | ACTIVE | SOT-223 | DCY | 4 | 2000 | TBD | Call TI | Call TI | -40 to 125 | KABA | Samples |
| LM2936MPX-3.3/NOPB | ACTIVE | SOT-223 | DCY | 4 | 2000 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | KABA | Samples |
| LM2936MPX-5.0 | ACTIVE | SOT-223 | DCY | 4 | 2000 | TBD | Call TI | Call TI | -40 to 125 | KAAA | Samples |
| LM2936MPX-5.0/NOPB | ACTIVE | SOT-223 | DCY | 4 | 2000 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | KAAA | Samples |
| LM2936MX-3.3 | ACTIVE | SOIC | D | 8 | 2500 | TBD | Call TI | Call TI | -40 to 125 | LM293 6-3.3 | Samples |
| LM2936MX-3.3/NOPB | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | LM293 6-3.3 | Samples |
| LM2936MX-5.0 | ACTIVE | SOIC | D | 8 | 2500 | TBD | Call TI | Call TI | -40 to 125 | LM293 6M-5 | Samples |
| LM2936MX-5.0/NOPB | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU SN | Level-1-260C-UNLIM | -40 to 125 | LM293 6M-5 | Samples |
| LM2936Z-3.0/NOPB | ACTIVE | TO-92 | LP | 3 | 1800 | Green (RoHS & no Sb/Br) | SNCU | Level-1-NA-UNLIM | -40 to 125 | LM2936 Z-3 | Samples |
| LM2936Z-3.3/NOPB | ACTIVE | TO-92 | LP | 3 | 1800 | Green (RoHS & no Sb/Br) | SNCU | Level-1-NA-UNLIM | -40 to 125 | LM2936 Z-3.3 | Samples |
| LM2936Z-5.0/LFT1 | ACTIVE | TO-92 | LP | 3 | 2000 | Green (RoHS & no Sb/Br) | SNCU | Level-1-NA-UNLIM | | LM293 6Z-5 | Samples |
| LM2936Z-5.0/LFT3 | ACTIVE | TO-92 | LP | 3 | 2000 | Green (RoHS & no Sb/Br) | SNCU | Level-1-NA-UNLIM | | LM293 6Z-5 | Samples |
| LM2936Z-5.0/LFT4 | ACTIVE | TO-92 | LP | 3 | 2000 | Green (RoHS & no Sb/Br) | SNCU | Level-1-NA-UNLIM | | LM293 6Z-5 | Samples |
| LM2936Z-5.0/NOPB | ACTIVE | TO-92 | LP | 3 | 1800 | Green (RoHS & no Sb/Br) | SNCU | Level-1-NA-UNLIM | -40 to 125 | LM293 6Z-5 | Samples |

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBsolete: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

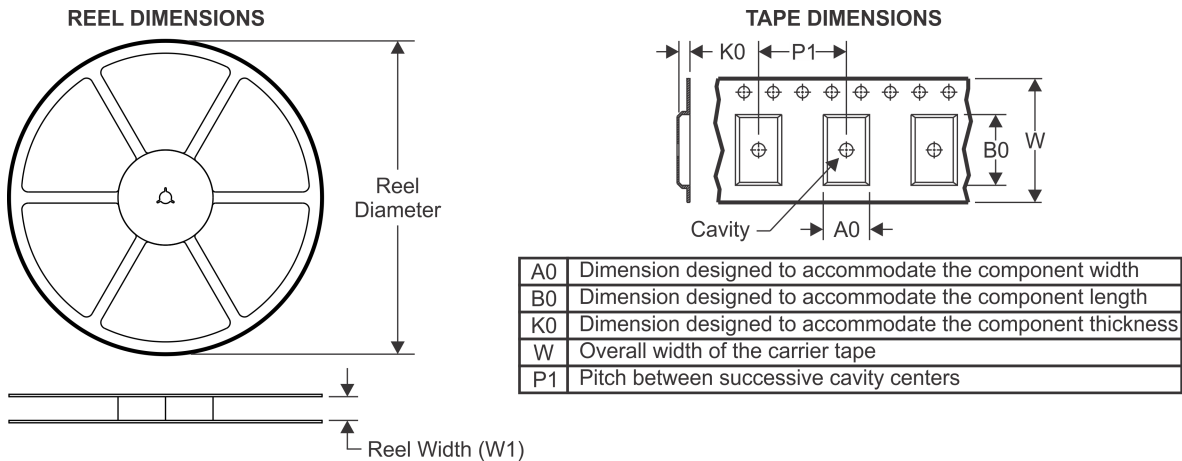
⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

⁽⁴⁾ There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

⁽⁵⁾ Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

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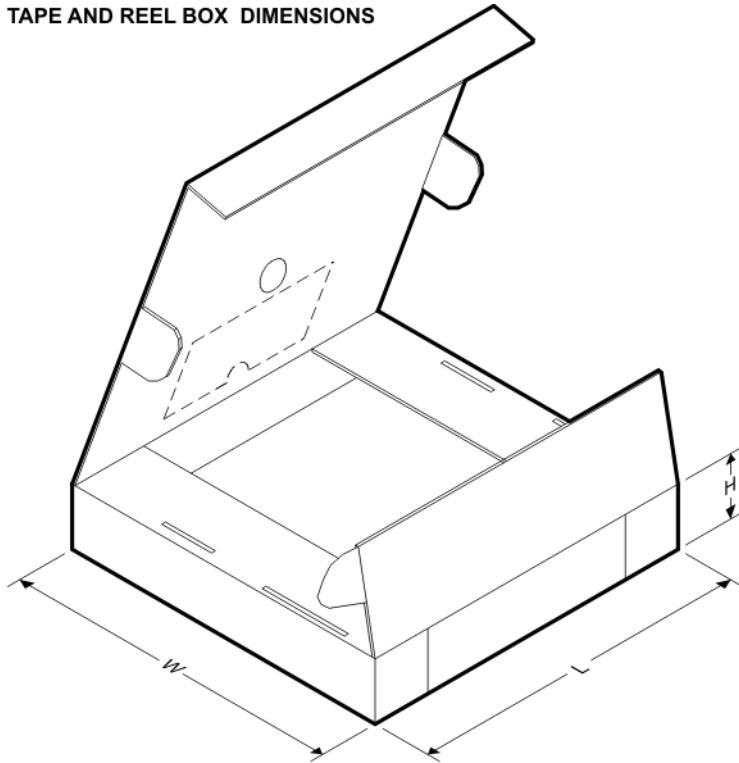
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TAPE AND REEL INFORMATION

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE


*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|----------------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| LM2936BMX-3.3 | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936BMX-3.3/NOPB | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936BMX-5.0 | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936BMX-5.0/NOPB | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936DTX-3.0/NOPB | TO-252 | NDP | 3 | 2500 | 330.0 | 16.4 | 6.9 | 10.5 | 2.7 | 8.0 | 16.0 | Q2 |
| LM2936DTX-3.3/NOPB | TO-252 | NDP | 3 | 2500 | 330.0 | 16.4 | 6.9 | 10.5 | 2.7 | 8.0 | 16.0 | Q2 |
| LM2936DTX-5.0 | TO-252 | NDP | 3 | 2500 | 330.0 | 16.4 | 6.9 | 10.5 | 2.7 | 8.0 | 16.0 | Q2 |
| LM2936DTX-5.0/NOPB | TO-252 | NDP | 3 | 2500 | 330.0 | 16.4 | 6.9 | 10.5 | 2.7 | 8.0 | 16.0 | Q2 |
| LM2936HVBMAX3.3 | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936HVBMAX3.3/NOPB | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936HVBMAX5.0 | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936HVBMAX5.0/NOPB | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936HVMAX-5.0 | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936HVMAX-5.0/NOPB | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936MM-3.0 | VSSOP | DGK | 8 | 1000 | 178.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| LM2936MM-3.0/NOPB | VSSOP | DGK | 8 | 1000 | 178.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |

| Device | Package Type | Package Drawing | Pins | SPQ | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|--------------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| LM2936MM-3.3 | VSSOP | DGK | 8 | 1000 | 178.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| LM2936MM-3.3/NOPB | VSSOP | DGK | 8 | 1000 | 178.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| LM2936MM-5.0 | VSSOP | DGK | 8 | 1000 | 178.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| LM2936MM-5.0/NOPB | VSSOP | DGK | 8 | 1000 | 178.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| LM2936MMX-3.3 | VSSOP | DGK | 8 | 3500 | 330.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| LM2936MMX-3.3/NOPB | VSSOP | DGK | 8 | 3500 | 330.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| LM2936MMX-5.0 | VSSOP | DGK | 8 | 3500 | 330.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| LM2936MMX-5.0/NOPB | VSSOP | DGK | 8 | 3500 | 330.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| LM2936MP-3.0 | SOT-223 | DCY | 4 | 1000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MP-3.0/NOPB | SOT-223 | DCY | 4 | 1000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MP-3.3 | SOT-223 | DCY | 4 | 1000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MP-3.3/NOPB | SOT-223 | DCY | 4 | 1000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MP-5.0 | SOT-223 | DCY | 4 | 1000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MP-5.0/NOPB | SOT-223 | DCY | 4 | 1000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MPX-3.0 | SOT-223 | DCY | 4 | 2000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MPX-3.0/NOPB | SOT-223 | DCY | 4 | 2000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MPX-3.3 | SOT-223 | DCY | 4 | 2000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MPX-3.3/NOPB | SOT-223 | DCY | 4 | 2000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MPX-5.0 | SOT-223 | DCY | 4 | 2000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MPX-5.0/NOPB | SOT-223 | DCY | 4 | 2000 | 330.0 | 16.4 | 7.0 | 7.5 | 2.2 | 12.0 | 16.0 | Q3 |
| LM2936MX-3.3 | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936MX-3.3/NOPB | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936MX-5.0 | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |
| LM2936MX-5.0/NOPB | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.5 | 5.4 | 2.0 | 8.0 | 12.0 | Q1 |

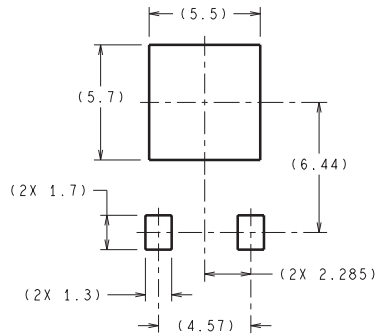
TAPE AND REEL BOX DIMENSIONS


*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|----------------------|--------------|-----------------|------|------|-------------|------------|-------------|
| LM2936BMX-3.3 | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936BMX-3.3/NOPB | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936BMX-5.0 | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936BMX-5.0/NOPB | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936DTX-3.0/NOPB | TO-252 | NDP | 3 | 2500 | 367.0 | 367.0 | 38.0 |
| LM2936DTX-3.3/NOPB | TO-252 | NDP | 3 | 2500 | 367.0 | 367.0 | 38.0 |
| LM2936DTX-5.0 | TO-252 | NDP | 3 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936DTX-5.0/NOPB | TO-252 | NDP | 3 | 2500 | 367.0 | 367.0 | 38.0 |
| LM2936HVBMAX3.3 | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936HVBMAX3.3/NOPB | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936HVBMAX5.0 | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936HVBMAX5.0/NOPB | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936HVMAX-5.0 | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936HVMAX-5.0/NOPB | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936MM-3.0 | VSSOP | DGK | 8 | 1000 | 210.0 | 185.0 | 35.0 |
| LM2936MM-3.0/NOPB | VSSOP | DGK | 8 | 1000 | 210.0 | 185.0 | 35.0 |
| LM2936MM-3.3 | VSSOP | DGK | 8 | 1000 | 210.0 | 185.0 | 35.0 |
| LM2936MM-3.3/NOPB | VSSOP | DGK | 8 | 1000 | 210.0 | 185.0 | 35.0 |
| LM2936MM-5.0 | VSSOP | DGK | 8 | 1000 | 210.0 | 185.0 | 35.0 |

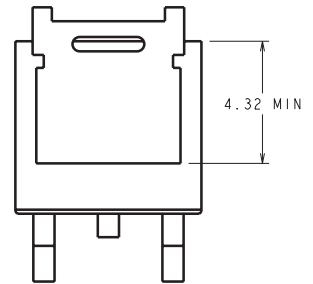
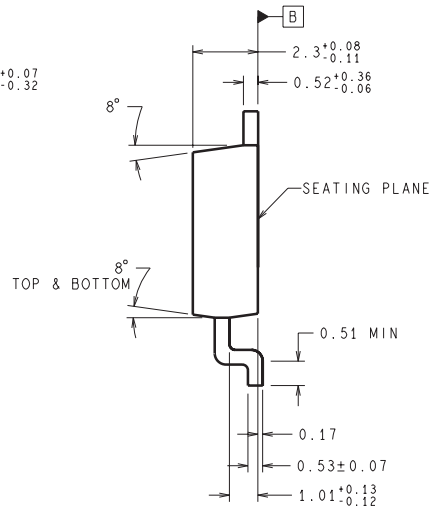
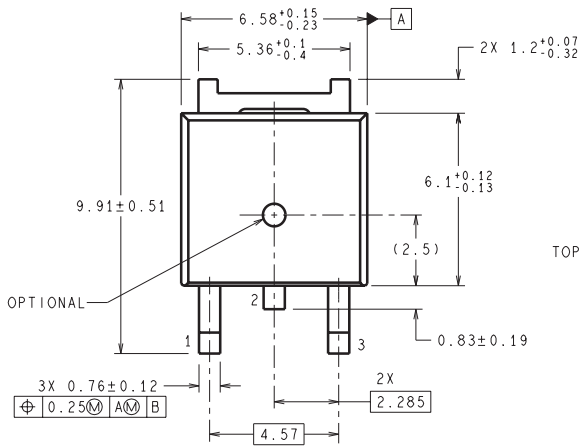
| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|--------------------|--------------|-----------------|------|------|-------------|------------|-------------|
| LM2936MM-5.0/NOPB | VSSOP | DGK | 8 | 1000 | 210.0 | 185.0 | 35.0 |
| LM2936MMX-3.3 | VSSOP | DGK | 8 | 3500 | 367.0 | 367.0 | 35.0 |
| LM2936MMX-3.3/NOPB | VSSOP | DGK | 8 | 3500 | 367.0 | 367.0 | 35.0 |
| LM2936MMX-5.0 | VSSOP | DGK | 8 | 3500 | 367.0 | 367.0 | 35.0 |
| LM2936MMX-5.0/NOPB | VSSOP | DGK | 8 | 3500 | 367.0 | 367.0 | 35.0 |
| LM2936MP-3.0 | SOT-223 | DCY | 4 | 1000 | 367.0 | 367.0 | 35.0 |
| LM2936MP-3.0/NOPB | SOT-223 | DCY | 4 | 1000 | 367.0 | 367.0 | 35.0 |
| LM2936MP-3.3 | SOT-223 | DCY | 4 | 1000 | 367.0 | 367.0 | 35.0 |
| LM2936MP-3.3/NOPB | SOT-223 | DCY | 4 | 1000 | 367.0 | 367.0 | 35.0 |
| LM2936MP-5.0 | SOT-223 | DCY | 4 | 1000 | 367.0 | 367.0 | 35.0 |
| LM2936MP-5.0/NOPB | SOT-223 | DCY | 4 | 1000 | 367.0 | 367.0 | 35.0 |
| LM2936MPX-3.0 | SOT-223 | DCY | 4 | 2000 | 367.0 | 367.0 | 35.0 |
| LM2936MPX-3.0/NOPB | SOT-223 | DCY | 4 | 2000 | 367.0 | 367.0 | 35.0 |
| LM2936MPX-3.3 | SOT-223 | DCY | 4 | 2000 | 367.0 | 367.0 | 35.0 |
| LM2936MPX-3.3/NOPB | SOT-223 | DCY | 4 | 2000 | 367.0 | 367.0 | 35.0 |
| LM2936MPX-5.0 | SOT-223 | DCY | 4 | 2000 | 367.0 | 367.0 | 35.0 |
| LM2936MPX-5.0/NOPB | SOT-223 | DCY | 4 | 2000 | 367.0 | 367.0 | 35.0 |
| LM2936MX-3.3 | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936MX-3.3/NOPB | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936MX-5.0 | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |
| LM2936MX-5.0/NOPB | SOIC | D | 8 | 2500 | 367.0 | 367.0 | 35.0 |

NDP0003B



DIMENSIONS ARE IN MILLIMETERS
DIMENSIONS IN () FOR REFERENCE ONLY

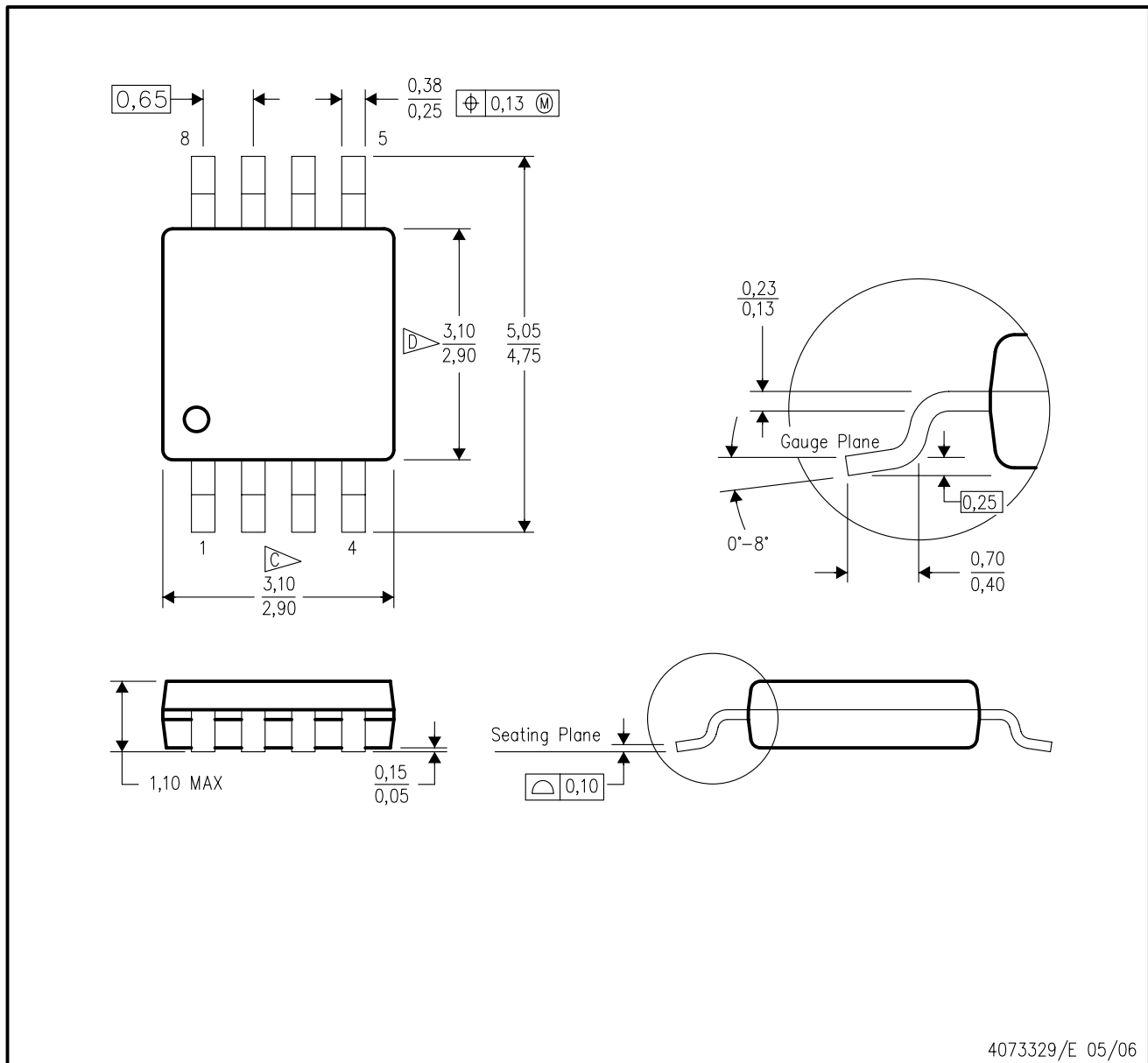
LAND PATTERN RECOMMENDATION



TD03B (Rev F)

DGK (S-PDSO-G8)

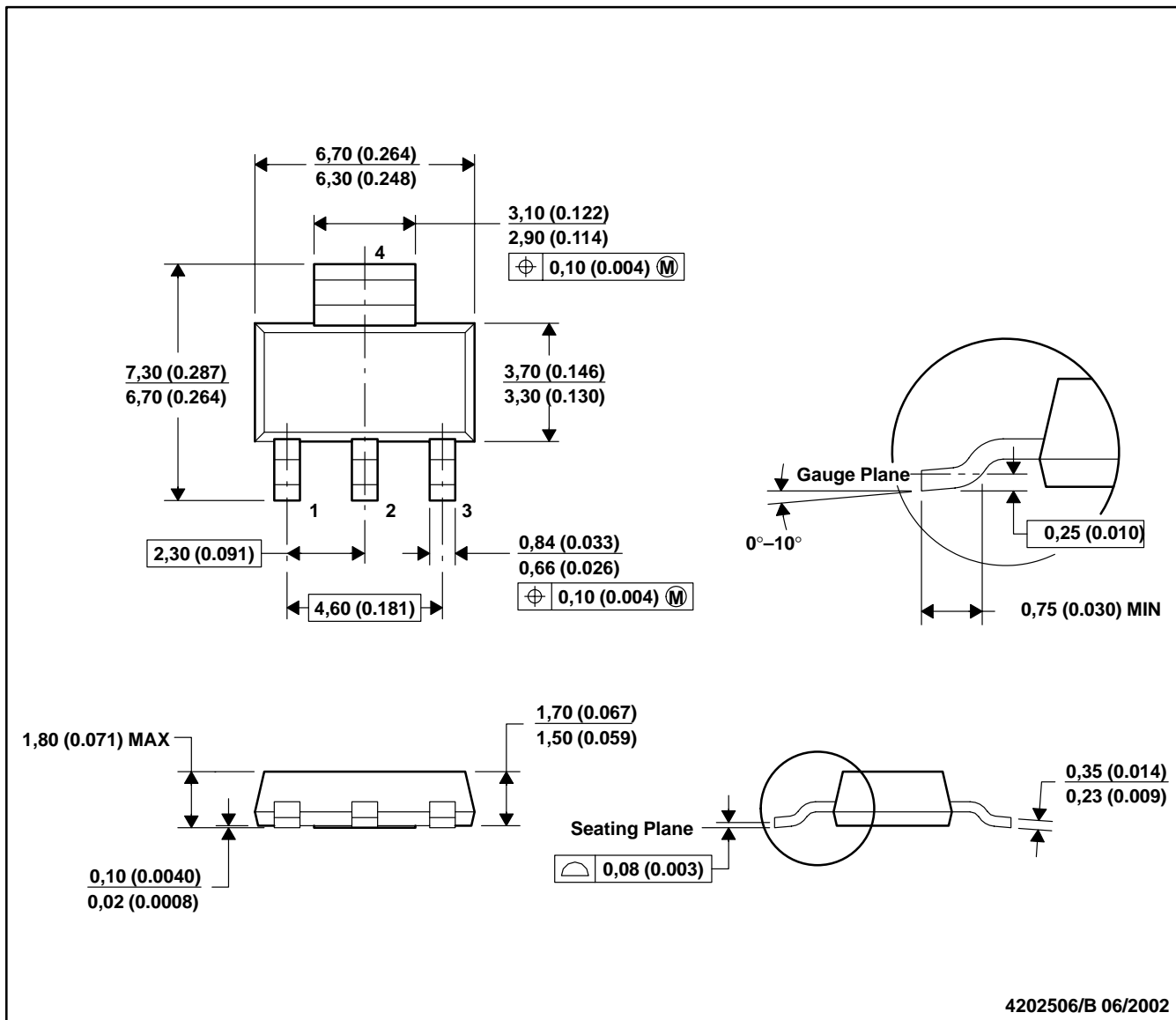
PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 per end.
 - D. Body width does not include interlead flash. Interlead flash shall not exceed 0.50 per side.
 - E. Falls within JEDEC MO-187 variation AA, except interlead flash.

DCY (R-PDSO-G4)

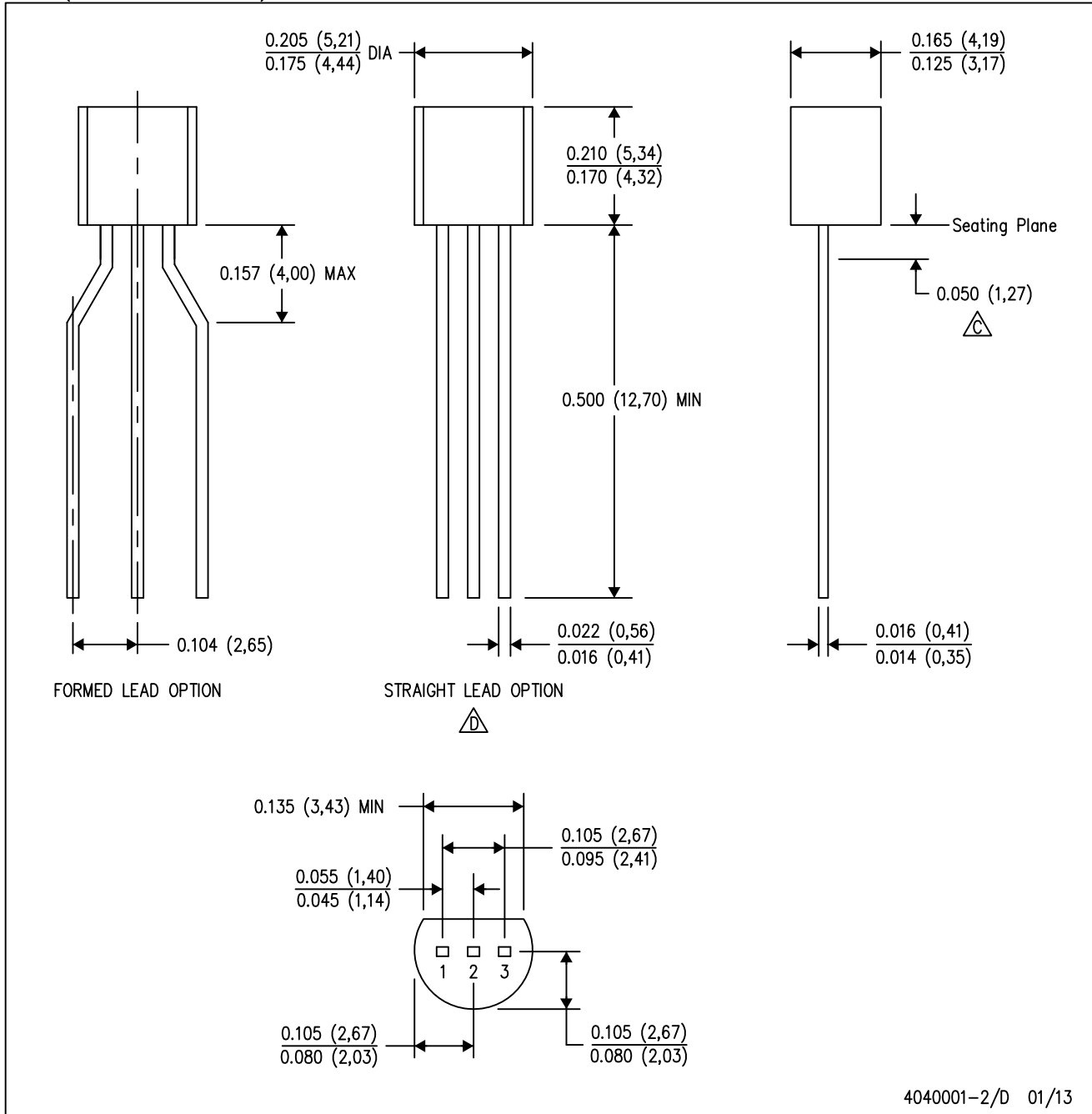
PLASTIC SMALL-OUTLINE



- NOTES: A. All linear dimensions are in millimeters (inches).
 B. This drawing is subject to change without notice.
 C. Body dimensions do not include mold flash or protrusion.
 D. Falls within JEDEC TO-261 Variation AA.

LP (O-PBCY-W3)

PLASTIC CYLINDRICAL PACKAGE



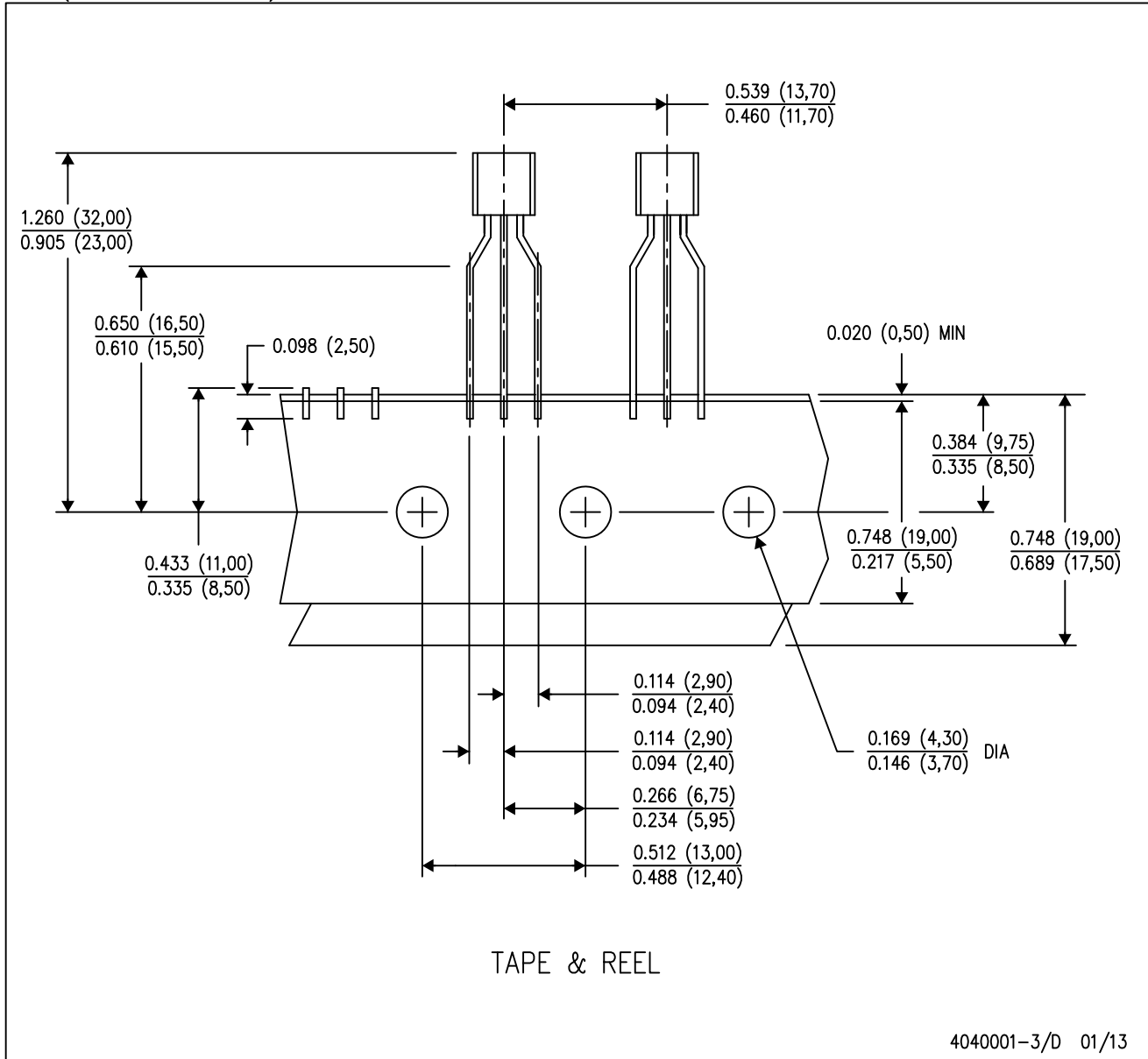
4040001-2/D 01/13

- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - Lead dimensions are not controlled within this area.
 - Falls within JEDEC TO-226 Variation AA (TO-226 replaces TO-92).
 - Shipping Method:
 - Straight lead option available in either bulk pack or tape & reel.
 - Formed lead option available in tape & reel or ammo pack.
 - Specific products can be offered in limited combinations of shipping mediums and lead options.
 - Consult product folder for more information on available options.

MECHANICAL DATA

LP (O-PBCY-W3)

PLASTIC CYLINDRICAL PACKAGE



- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - Tape and Reel information for the Formed Lead Option package.

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