

**350mA、微功率、VLDO线性稳压器****UM1650S-xx SOT23-3****UM1750S-xx SOT23-5****UM1750Y-xx SOT89-5****UM1750DA-xx DFN6 2.0×2.0****描述**

UM1650/UM1750系列是超低压差线性稳压器，其专为低功率及便携式应用而设计。典型输出噪声仅为 $195\mu\text{V}_{\text{RMS}}$ ，典型压差在150mA的最大负载电流条件下仅为110mV。内部P沟道MOSFET传输晶体管无需基极电流驱动，最大负载电流为350mA时，芯片的正常工作电流仅为 $190\mu\text{A}$ 。通过关断控制引脚，UM1750在关断模式下的电流消耗小于 $1\mu\text{A}$ 。

其他特点包括高输出电压准确度、卓越的瞬态响应、欠压锁定、使用低至 $1\mu\text{F}$ 的超低ESR陶瓷电容的输出稳定性、短路和过温保护以及输出电流限制。

UM1650系列采用扁平SOT23-3封装。UM1750系列采用扁平SOT23-5、SOT89-5和DFN6 2.0×2.0封装。

**应用**

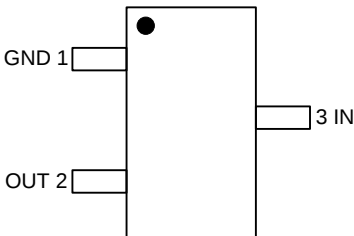
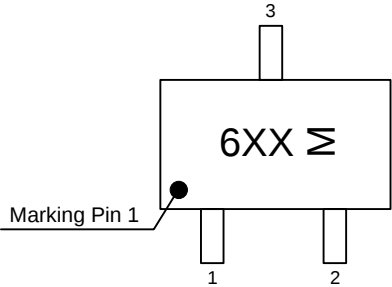
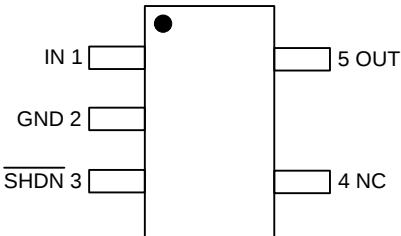
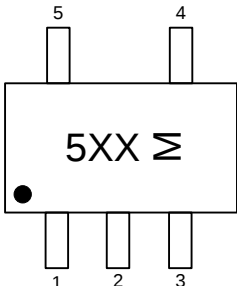
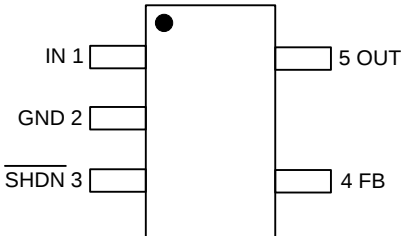
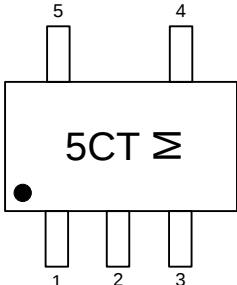
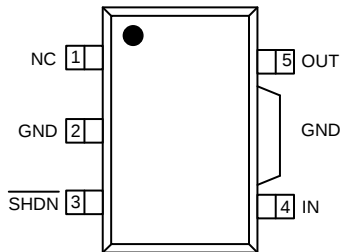
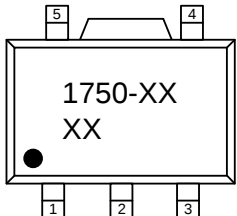
- 蓝牙/802.11 板卡
- PDA 和笔记本电脑
- 便携式仪器和电池供电系统
- 蜂窝电话

**特性**

- 极低压差：在150mA时，最大值为150mV
- 最大输入电压：6.0V
- $V_{\text{OUT}} > 1.5\text{V}$  时，电压准确度为 $\pm 2\%$ ；  
 $V_{\text{OUT}} \leq 1.5\text{V}$  时，电压准确度为 $\pm 30\text{mV}$
- 快速瞬态响应
- 欠压锁定
- UM1650S-xx 和 UM1750S/Y/DA-xx 的固定输出电压范围为1.0V至4.0V，电压步径为0.1V
- UM1750S/Y/DA-00 的可调输出电压范围为1.0V至5.0V
- 输出电流限制
- 采用 $1\mu\text{F}$ 的电容时，输出具有良好的稳定性
- 过温保护和短路保护
- 扁平 SOT23-3、SOT23-5、SOT89-5 和 DFN6 2.0×2.0 封装

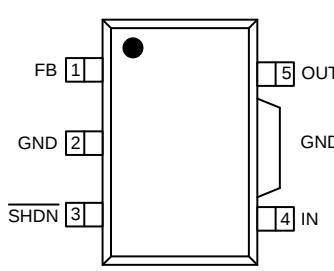
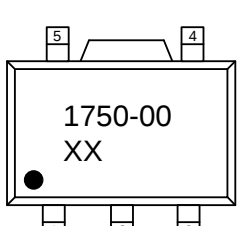
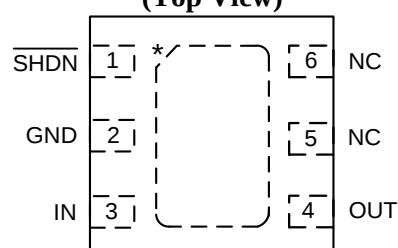
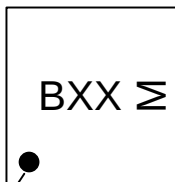
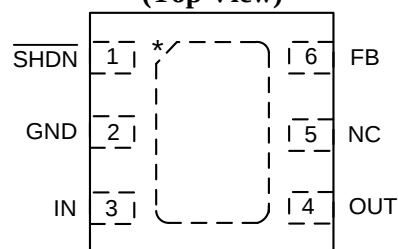
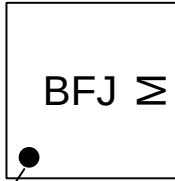
## Pin Configurations

## Top View

|                                                                                     |                                                                                                                                                           |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |  <p><b>M: Month Code</b><br/><b>UM1650S-xx</b><br/><b>SOT23-3</b></p>   |
|   |  <p><b>M: Month Code</b><br/><b>UM1750S-xx</b><br/><b>SOT23-5</b></p>   |
|  |  <p><b>M: Month Code</b><br/><b>UM1750S-00</b><br/><b>SOT23-5</b></p> |
|  |  <p><b>XX: Week Code</b><br/><b>UM1750Y-xx</b><br/><b>SOT89-5</b></p> |

## Pin Configurations (Continued)

## Top View

|                                                                                                              |                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             |  <p><b>XX: Week Code</b><br/><b>UM1750Y-00</b><br/><b>SOT89-5</b></p>          |
| <p><b>(Top View)</b></p>    |  <p><b>M: Month Code</b><br/><b>UM1750DA-xx</b><br/><b>DFN6 2.0×2.0</b></p>   |
| <p><b>(Top View)</b></p>  |  <p><b>M: Month Code</b><br/><b>UM1750DA-00</b><br/><b>DFN6 2.0×2.0</b></p> |

\* The tab on the bottom of the package enhances thermal performance and is electrically connected to GND (substrate level). It is recommended that the tab be connected to the ground plane on the board. If not, the tab can be left open.

## Pin Description

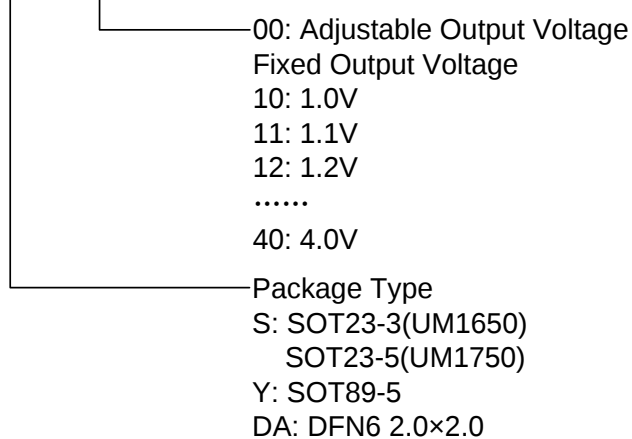
| Pin Number |                                         |                                              | Symbol | Function                                                  |
|------------|-----------------------------------------|----------------------------------------------|--------|-----------------------------------------------------------|
| UM1650S-xx | UM1750S-xx<br>(Fixed V <sub>OUT</sub> ) | UM1750S-00<br>(Adjustable V <sub>OUT</sub> ) |        |                                                           |
| 3          | 1                                       | 1                                            | IN     | Power Supply                                              |
| 1          | 2                                       | 2                                            | GND    | Ground                                                    |
| -          | 3                                       | 3                                            | SHDN   | Shutdown Input:<br>High=Activate LDO,<br>Low=Shutdown LDO |
| -          | 4                                       | -                                            | NC     | Not Connected                                             |
| 2          | 5                                       | 5                                            | OUT    | Voltage Regulated Output                                  |
| -          | -                                       | 4                                            | FB     | Output Voltage Feedback                                   |

## Pin Description (Continued)

| Pin Number                              |                                              |                                          |                                               | Symbol                   | Function                                                  |
|-----------------------------------------|----------------------------------------------|------------------------------------------|-----------------------------------------------|--------------------------|-----------------------------------------------------------|
| UM1750Y-xx<br>(Fixed V <sub>OUT</sub> ) | UM1750Y-00<br>(Adjustable V <sub>OUT</sub> ) | UM1750DA-xx<br>(Fixed V <sub>OUT</sub> ) | UM1750DA-00<br>(Adjustable V <sub>OUT</sub> ) |                          |                                                           |
| 4                                       | 4                                            | 3                                        | 3                                             | IN                       | Power Supply                                              |
| 2                                       | 2                                            | 2                                        | 2                                             | GND                      | Ground                                                    |
| 3                                       | 3                                            | 1                                        | 1                                             | $\overline{\text{SHDN}}$ | Shutdown Input:<br>High=Activate LDO,<br>Low=Shutdown LDO |
| 1                                       | -                                            | 5,6                                      | 5                                             | NC                       | Not Connected                                             |
| 5                                       | 5                                            | 4                                        | 4                                             | OUT                      | Voltage Regulated Output                                  |
| -                                       | 1                                            | -                                        | 6                                             | FB                       | Output Voltage Feedback                                   |

## Naming Information

UM1650/1750□□-□□



## Ordering Information

| Part Number | Output Voltage | Packaging Type | Marking Code | Shipping Qty                 |
|-------------|----------------|----------------|--------------|------------------------------|
| UM1650S-10  | 1.0V           | SOT23-3        | 6AA          | 3000pcs/7Inch<br>Tape & Reel |
| UM1650S-11  | 1.1V           |                | 6AB          |                              |
| UM1650S-12  | 1.2V           |                | 6A2          |                              |
| UM1650S-13  | 1.3V           |                | 6A3          |                              |
| UM1650S-14  | 1.4V           |                | 6A4          |                              |
| UM1650S-15  | 1.5V           |                | 6A5          |                              |
| UM1650S-16  | 1.6V           |                | 6A6          |                              |
| UM1650S-17  | 1.7V           |                | 6A7          |                              |
| UM1650S-18  | 1.8V           |                | 6A8          |                              |
| UM1650S-19  | 1.9V           |                | 6A9          |                              |
| UM1650S-20  | 2.0V           |                | 6BA          |                              |
| UM1650S-21  | 2.1V           |                | 6BB          |                              |
| UM1650S-22  | 2.2V           |                | 6B2          |                              |
| UM1650S-23  | 2.3V           |                | 6B3          |                              |
| UM1650S-24  | 2.4V           |                | 6B4          |                              |
| UM1650S-25  | 2.5V           |                | 6B5          |                              |
| UM1650S-26  | 2.6V           |                | 6B6          |                              |
| UM1650S-27  | 2.7V           |                | 6B7          |                              |
| UM1650S-28  | 2.8V           |                | 6B8          |                              |
| UM1650S-29  | 2.9V           |                | 6B9          |                              |
| UM1650S-30  | 3.0V           |                | 6CA          |                              |
| UM1650S-31  | 3.1V           |                | 6CB          |                              |
| UM1650S-32  | 3.2V           |                | 6C2          |                              |
| UM1650S-33  | 3.3V           |                | 6C3          |                              |
| UM1650S-34  | 3.4V           |                | 6C4          |                              |
| UM1650S-35  | 3.5V           |                | 6C5          |                              |
| UM1650S-36  | 3.6V           |                | 6C6          |                              |
| UM1650S-37  | 3.7V           |                | 6C7          |                              |
| UM1650S-38  | 3.8V           |                | 6C8          |                              |
| UM1650S-39  | 3.9V           |                | 6C9          |                              |
| UM1650S-40  | 4.0V           |                | 6CC          |                              |

## Ordering Information (Continued)

| Part Number | Output Voltage | Packaging Type | Marking Code | Shipping Qty                 |
|-------------|----------------|----------------|--------------|------------------------------|
| UM1750S-00  | ADJ            | SOT23-5        | 5CT          | 3000pcs/7Inch<br>Tape & Reel |
| UM1750S-10  | 1.0V           |                | 5JA          |                              |
| UM1750S-11  | 1.1V           |                | 5JB          |                              |
| UM1750S-12  | 1.2V           |                | 5J2          |                              |
| UM1750S-13  | 1.3V           |                | 5J3          |                              |
| UM1750S-14  | 1.4V           |                | 5J4          |                              |
| UM1750S-15  | 1.5V           |                | 5J5          |                              |
| UM1750S-16  | 1.6V           |                | 5J6          |                              |
| UM1750S-17  | 1.7V           |                | 5J7          |                              |
| UM1750S-18  | 1.8V           |                | 5J8          |                              |
| UM1750S-19  | 1.9V           |                | 5J9          |                              |
| UM1750S-20  | 2.0V           |                | 5NA          |                              |
| UM1750S-21  | 2.1V           |                | 5NB          |                              |
| UM1750S-22  | 2.2V           |                | 5N2          |                              |
| UM1750S-23  | 2.3V           |                | 5N3          |                              |
| UM1750S-24  | 2.4V           |                | 5N4          |                              |
| UM1750S-25  | 2.5V           |                | 5N5          |                              |
| UM1750S-26  | 2.6V           |                | 5N6          |                              |
| UM1750S-27  | 2.7V           |                | 5N7          |                              |
| UM1750S-28  | 2.8V           |                | 5N8          |                              |
| UM1750S-29  | 2.9V           |                | 5N9          |                              |
| UM1750S-30  | 3.0V           |                | 5PA          |                              |
| UM1750S-31  | 3.1V           |                | 5PB          |                              |
| UM1750S-32  | 3.2V           |                | 5HP          |                              |
| UM1750S-33  | 3.3V           |                | 5CU          |                              |
| UM1750S-34  | 3.4V           |                | 5P4          |                              |
| UM1750S-35  | 3.5V           |                | 5P5          |                              |
| UM1750S-36  | 3.6V           |                | 5P6          |                              |
| UM1750S-37  | 3.7V           |                | 5P7          |                              |
| UM1750S-38  | 3.8V           |                | 5P8          |                              |
| UM1750S-39  | 3.9V           |                | 5P9          |                              |
| UM1750S-40  | 4.0V           |                | 5PC          |                              |

**Ordering Information (Continued)**

| Part Number | Output Voltage | Packaging Type | Marking Code | Shipping Qty                 |
|-------------|----------------|----------------|--------------|------------------------------|
| UM1750Y-00  | ADJ            | SOT89-5        | 1750-00      | 1000pcs/7Inch<br>Tape & Reel |
| UM1750Y-10  | 1.0V           |                | 1750-10      |                              |
| UM1750Y-11  | 1.1V           |                | 1750-11      |                              |
| UM1750Y-12  | 1.2V           |                | 1750-12      |                              |
| UM1750Y-13  | 1.3V           |                | 1750-13      |                              |
| UM1750Y-14  | 1.4V           |                | 1750-14      |                              |
| UM1750Y-15  | 1.5V           |                | 1750-15      |                              |
| UM1750Y-16  | 1.6V           |                | 1750-16      |                              |
| UM1750Y-17  | 1.7V           |                | 1750-17      |                              |
| UM1750Y-18  | 1.8V           |                | 1750-18      |                              |
| UM1750Y-19  | 1.9V           |                | 1750-19      |                              |
| UM1750Y-20  | 2.0V           |                | 1750-20      |                              |
| UM1750Y-21  | 2.1V           |                | 1750-21      |                              |
| UM1750Y-22  | 2.2V           |                | 1750-22      |                              |
| UM1750Y-23  | 2.3V           |                | 1750-23      |                              |
| UM1750Y-24  | 2.4V           |                | 1750-24      |                              |
| UM1750Y-25  | 2.5V           |                | 1750-25      |                              |
| UM1750Y-26  | 2.6V           |                | 1750-26      |                              |
| UM1750Y-27  | 2.7V           |                | 1750-27      |                              |
| UM1750Y-28  | 2.8V           |                | 1750-28      |                              |
| UM1750Y-29  | 2.9V           |                | 1750-29      |                              |
| UM1750Y-30  | 3.0V           |                | 1750-30      |                              |
| UM1750Y-31  | 3.1V           |                | 1750-31      |                              |
| UM1750Y-32  | 3.2V           |                | 1750-32      |                              |
| UM1750Y-33  | 3.3V           |                | 1750-33      |                              |
| UM1750Y-34  | 3.4V           |                | 1750-34      |                              |
| UM1750Y-35  | 3.5V           |                | 1750-35      |                              |
| UM1750Y-36  | 3.6V           |                | 1750-36      |                              |
| UM1750Y-37  | 3.7V           |                | 1750-37      |                              |
| UM1750Y-38  | 3.8V           |                | 1750-38      |                              |
| UM1750Y-39  | 3.9V           |                | 1750-39      |                              |
| UM1750Y-40  | 4.0V           |                | 1750-40      |                              |

## Ordering Information (Continued)

| Part Number | Output Voltage | Packaging Type | Marking Code | Shipping Qty                 |
|-------------|----------------|----------------|--------------|------------------------------|
| UM1750DA-00 | ADJ            | DFN6 2.0×2.0   | BFJ          | 3000pcs/7Inch<br>Tape & Reel |
| UM1750DA-10 | 1.0V           |                | BFE          |                              |
| UM1750DA-11 | 1.1V           |                | BFF          |                              |
| UM1750DA-12 | 1.2V           |                | BH2          |                              |
| UM1750DA-13 | 1.3V           |                | BH3          |                              |
| UM1750DA-14 | 1.4V           |                | BH4          |                              |
| UM1750DA-15 | 1.5V           |                | BH5          |                              |
| UM1750DA-16 | 1.6V           |                | BH6          |                              |
| UM1750DA-17 | 1.7V           |                | BH7          |                              |
| UM1750DA-18 | 1.8V           |                | BH8          |                              |
| UM1750DA-19 | 1.9V           |                | BH9          |                              |
| UM1750DA-20 | 2.0V           |                | BHA          |                              |
| UM1750DA-21 | 2.1V           |                | BHB          |                              |
| UM1750DA-22 | 2.2V           |                | BJ2          |                              |
| UM1750DA-23 | 2.3V           |                | BJ3          |                              |
| UM1750DA-24 | 2.4V           |                | BJ4          |                              |
| UM1750DA-25 | 2.5V           |                | BJ5          |                              |
| UM1750DA-26 | 2.6V           |                | BJ6          |                              |
| UM1750DA-27 | 2.7V           |                | BJ7          |                              |
| UM1750DA-28 | 2.8V           |                | BJ8          |                              |
| UM1750DA-29 | 2.9V           |                | BJ9          |                              |
| UM1750DA-30 | 3.0V           |                | BJA          |                              |
| UM1750DA-31 | 3.1V           |                | BJB          |                              |
| UM1750DA-32 | 3.2V           |                | BK2          |                              |
| UM1750DA-33 | 3.3V           |                | BK3          |                              |
| UM1750DA-34 | 3.4V           |                | BK4          |                              |
| UM1750DA-35 | 3.5V           |                | BK5          |                              |
| UM1750DA-36 | 3.6V           |                | BK6          |                              |
| UM1750DA-37 | 3.7V           |                | BK7          |                              |
| UM1750DA-38 | 3.8V           |                | BK8          |                              |
| UM1750DA-39 | 3.9V           |                | BK9          |                              |
| UM1750DA-40 | 4.0V           |                | BJA          |                              |

## Absolute Maximum Ratings (Note 1)

| Symbol                | Parameter                                  |              | Value        | Unit |
|-----------------------|--------------------------------------------|--------------|--------------|------|
| $V_{IN}$              | Supply Voltage on IN Pin                   |              | -0.3 to +7.5 | V    |
| $V_{\overline{SHDN}}$ | Voltage on $\overline{SHDN}$ Pin           |              | -0.3 to +7.5 | V    |
| $V_{FB}$              | Voltage on FB Pin                          |              | -0.3 to +7.5 | V    |
| $V_{OUT}$             | Voltage on OUT Pin                         |              | -0.3 to +7.5 | V    |
|                       | Output Short-Circuit Duration              |              | Indefinite   |      |
| $\theta_{JA}$         | Junction Thermal Resistance<br>(Note 2)    | SOT23-3      | +225         | °C/W |
|                       |                                            | SOT23-5      | +215         |      |
|                       |                                            | SOT89-5      | +66          |      |
|                       |                                            | DFN6 2.0×2.0 | +110         |      |
| $T_J$                 | Operating Junction Temperature (Note 3, 4) |              | -40 to +125  | °C   |
| $T_{STG}$             | Storage Temperature Range                  |              | -65 to +150  | °C   |
| $T_L$                 | Lead Temperature for Soldering 10 Seconds  |              | +300         | °C   |

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

Note 2: The maximum allowable power dissipation of any  $T_A$  (ambient temperature) is  $P_{D(max)} = (T_{J(max)} - T_A) / \theta_{JA}$ . Exceeding the maximum allowable power dissipation will result in excessive die temperature, and the regulator will go into thermal shutdown.

Note 3: The UM1650/UM1750 is tested and specified under pulse load conditions such that  $T_J \approx T_A$ . Specifications over the -40 °C to 125 °C operating junction temperature range are assured by design, characterization and correlation with statistical process controls.

Note 4: This IC includes overtemperature protection that is intended to protect the device during momentary overload conditions. Junction temperature will exceed 125 °C when overtemperature protection is active. Continuous operation above the specified maximum operating junction temperature may impair device reliability.

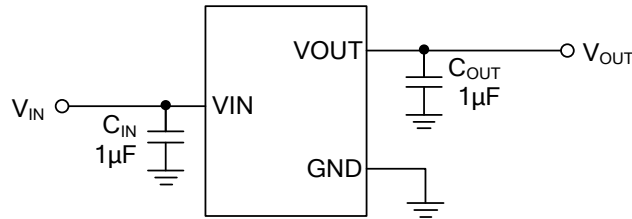
## Electrical Characteristics

$V_{\overline{\text{SHDN}}} = V_{\text{IN}} = V_{\text{OUT}} + 1\text{V}$ ,  $C_{\text{IN}} = C_{\text{OUT}} = 1.0\mu\text{F}$ ,  $T_{\text{A}} = 25^\circ\text{C}$ , unless noted.

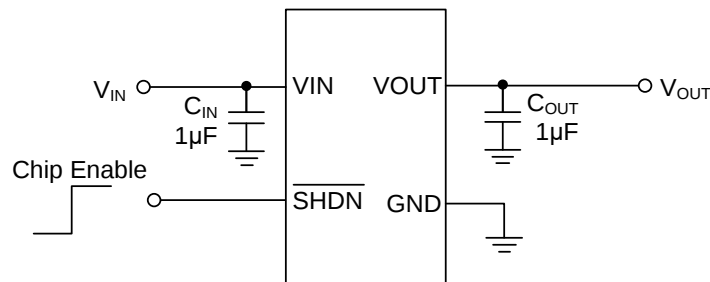
| Symbol                             | Parameter                                   | Test Conditions                                                                                                                                         | Min                               | Typ  | Max  | Unit                       |
|------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------|------|----------------------------|
| $V_{\text{IN}}$                    | Input Voltage Range                         |                                                                                                                                                         | 2.5                               |      | 6.0  | V                          |
| $V_{\text{UVLO}}$                  | Input Under Voltage Lockout                 | $V_{\text{IN}}$ Falling                                                                                                                                 | 1.8                               |      | 2.4  | V                          |
| $I_{\text{Q}}$                     | Operating Quiescent Current                 | $V_{\text{IN}} = 4.3\text{V}$ , $I_{\text{OUT}} = 0\text{mA}$                                                                                           |                                   | 90   | 130  | $\mu\text{A}$              |
|                                    |                                             | $V_{\text{IN}} = 4.3\text{V}$ , $I_{\text{OUT}} = 350\text{mA}$                                                                                         |                                   | 190  | 300  |                            |
| $I_{\overline{\text{SHDN}}}$       | Shutdown Leakage Current                    |                                                                                                                                                         |                                   |      | 1    | $\mu\text{A}$              |
| $I_{\text{OUT}}$                   | Output Current                              |                                                                                                                                                         | 350                               |      |      | mA                         |
| $V_{\text{FB}}$                    | Feedback Reference Voltage                  | $V_{\text{IN}} = 2.5\text{V}$ to $6.0\text{V}$                                                                                                          | 0.98                              | 1.00 | 1.02 | V                          |
|                                    | Output Voltage Accuracy                     | $0\text{mA} \leq I_{\text{OUT}} \leq 350\text{mA}$                                                                                                      | $V_{\text{OUT}} > 1.5\text{V}$    | -2   | +2   | %                          |
|                                    |                                             |                                                                                                                                                         | $V_{\text{OUT}} \leq 1.5\text{V}$ | -30  | +30  | mV                         |
| $\Delta V_{\text{DO}}$<br>(Note 5) | Dropout Voltage                             | $I_{\text{OUT}} = 150\text{mA}$                                                                                                                         |                                   | 110  | 150  | mV                         |
| $I_{\text{LIMIT}}$                 | Output Current Limit                        | $V_{\text{IN}} \geq 2.5\text{V}$                                                                                                                        | 550                               |      |      | mA                         |
| t                                  | Startup Time Response                       | $R_{\text{L}} = 68\Omega$ , $C_{\text{OUT}} = 1\mu\text{F}$                                                                                             |                                   | 44   |      | $\mu\text{s}$              |
| $V_{\text{IL}}$                    | $\overline{\text{SHDN}}$ Input Low Voltage  | $V_{\text{IN}} = 6.0\text{V}$                                                                                                                           |                                   |      | 0.4  | V                          |
| $V_{\text{IH}}$                    | $\overline{\text{SHDN}}$ Input High Voltage | $V_{\text{IN}} = 6.0\text{V}$                                                                                                                           | 2.0                               |      |      | V                          |
|                                    | $\overline{\text{SHDN}}$ Input Current      | $\overline{\text{SHDN}} = V_{\text{IN}}$ or GND                                                                                                         | -1                                |      | +1   | $\mu\text{A}$              |
| $T_{\text{SHDN}}$                  | Thermal-Shutdown Temperature                |                                                                                                                                                         |                                   | 160  |      | $^\circ\text{C}$           |
| $\Delta T_{\text{SHDN}}$           | Thermal-Shutdown Hysteresis                 |                                                                                                                                                         |                                   | 20   |      | $^\circ\text{C}$           |
|                                    | Line Regulation                             | $V_{\text{OUT}} + 1\text{V} \leq V_{\text{IN}} \leq V_{\text{OUT}} + 2\text{V}$ ,<br>$V_{\text{IN}} \geq 2.5\text{V}$<br>$I_{\text{OUT}} = 10\text{mA}$ |                                   | 0.09 |      | %/V                        |
|                                    | Load Regulation                             | $V_{\text{IN}} = V_{\text{OUT}} + 1\text{V}$ , $V_{\text{IN}} \geq 2.5\text{V}$<br>$1\text{mA} \leq I_{\text{OUT}} \leq 150\text{mA}$                   |                                   | 0.2  |      | %                          |
|                                    | Output Voltage Noise                        | 10Hz to 100kHz<br>$C_{\text{IN}} = 1\mu\text{F}$ , $V_{\text{OUT}} = 3.3\text{V}$ ,<br>$I_{\text{OUT}} = 150\text{mA}$                                  |                                   | 195  |      | $\mu\text{V}_{\text{RMS}}$ |
| PSRR                               | Power Supply Ripple Rejection               | $V_{\text{IN}} = V_{\text{OUT}} + 1\text{V}$<br>$I_{\text{OUT}} = 100\text{mA}$                                                                         | f=100Hz                           | 63   |      | dB                         |
|                                    |                                             |                                                                                                                                                         | f=1kHz                            | 55   |      |                            |
|                                    |                                             |                                                                                                                                                         | f=10kHz                           | 40   |      |                            |

Note 5:  $\Delta V_{\text{DO}}$  just defined for device with  $V_{\text{OUT}} \geq 2.5\text{V}$ .

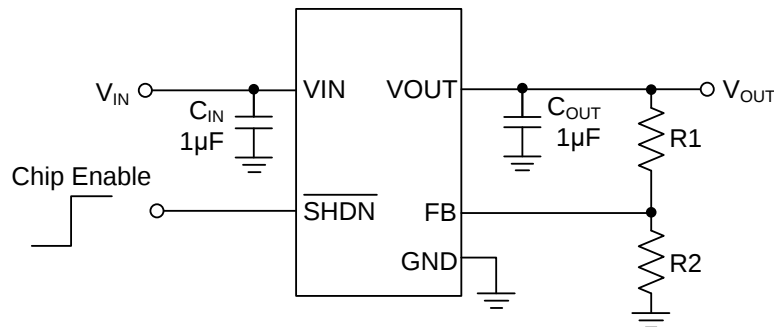
## Typical Application Circuit



**Figure 1. UM1650S-xx Typical Application Circuit**



**Figure 2. UM1750S-xx/UM1750Y-xx/UM1750DA-xx (Fixed V<sub>OUT</sub>) Typical Application Circuit**



**Figure 3. UM1750S-00/UM1750Y-00/UM1750DA-00 (Adjustable V<sub>OUT</sub>) Typical Application Circuit**

## UM1750S-00/UM1750Y-00/UM1750DA-00 Output Voltage Setting

The output voltage of the UM1750 adjustable regulator is programmed using an external resistor divider as shown in Figure 3. The output voltage is calculated using:

$$V_{OUT} = V_{FB} \left( 1 + \frac{R1}{R2} \right)$$

Where:  $V_{FB}$  = 1.00V (Typ) (the internal reference voltage)

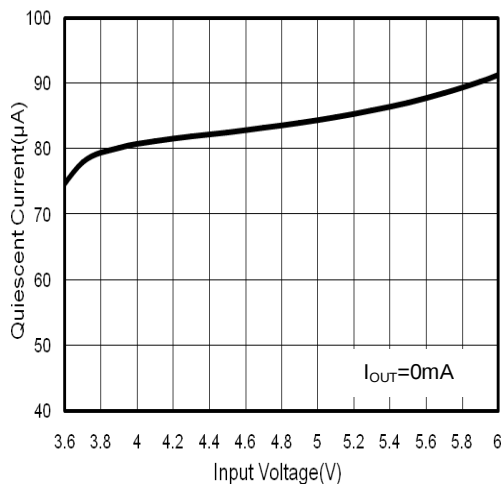
Resistors R1 and R2 should be chosen for approximately 3-5µA divider current. Lower value resistors can be used but offer no inherent advantage and waste more power. Higher values should be avoided, as leakage currents at FB increase the output voltage error. The recommended design procedure is to choose  $R2 = 200k\Omega$  to set the divider current at 5µA and then calculate R1 using:

$$R1 = \left( \frac{V_{OUT}}{V_{FB}} - 1 \right) \times R2$$

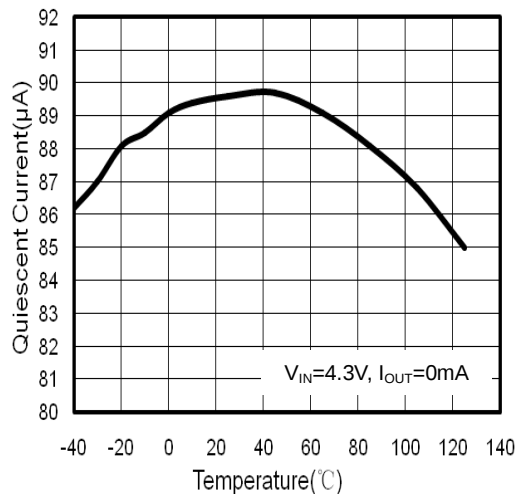
Where:  $V_{FB}$  = 1.00V (Typ).

## Typical Performance Characteristics (Shown for 3.3V Output Option)

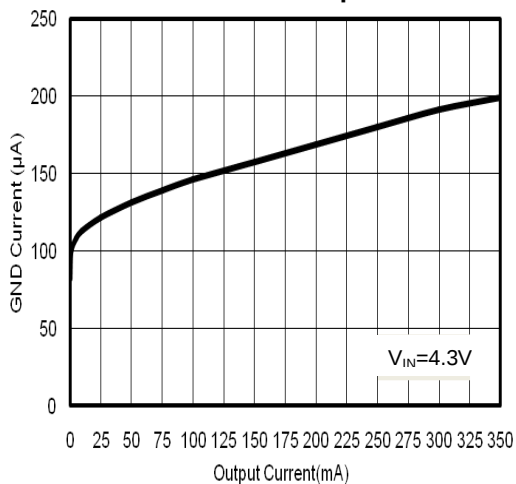
### Quiescent Current vs. Input Voltage



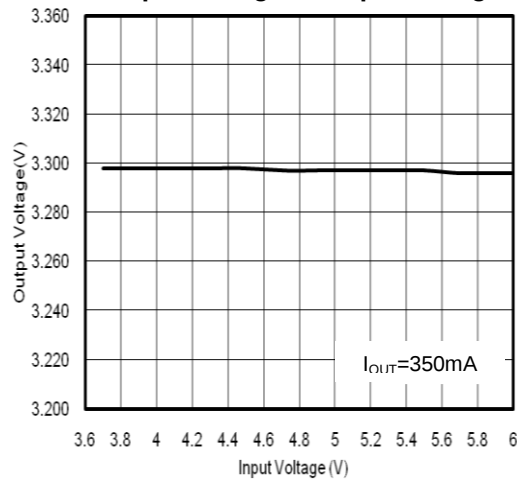
### Quiescent Current vs. Temperature



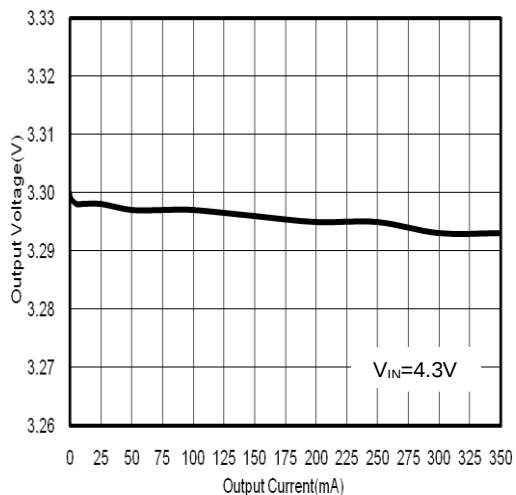
### GND Current vs. Output Current



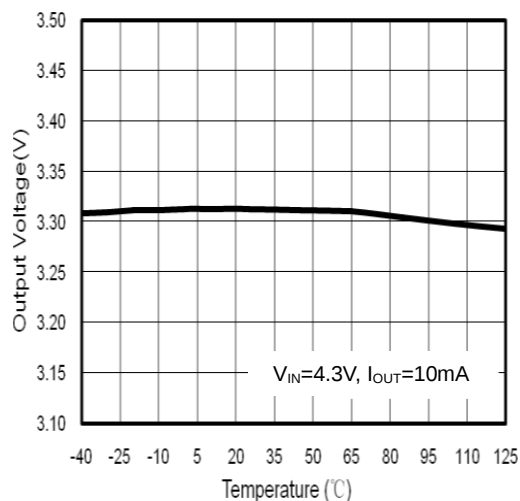
### Output Voltage vs. Input Voltage



### Output Voltage vs. Output Current



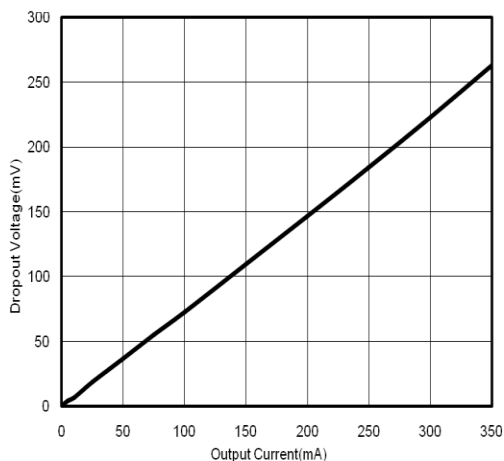
### Output Voltage vs. Temperature



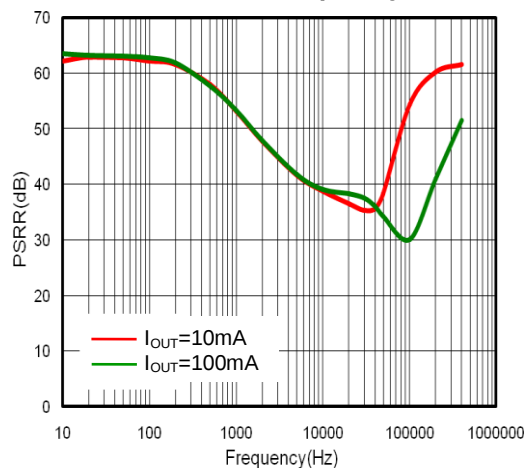
## Typical Performance Characteristics (Continued)

(Shown for 3.3V Output Option)

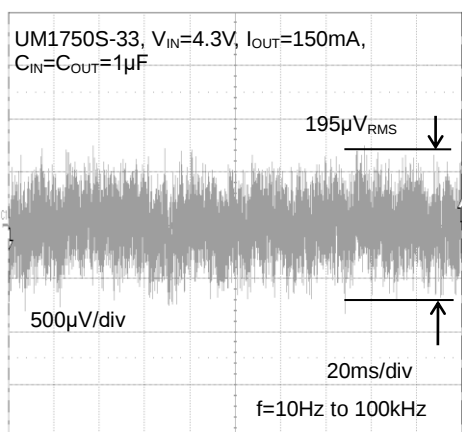
### Dropout Voltage vs. Output Current



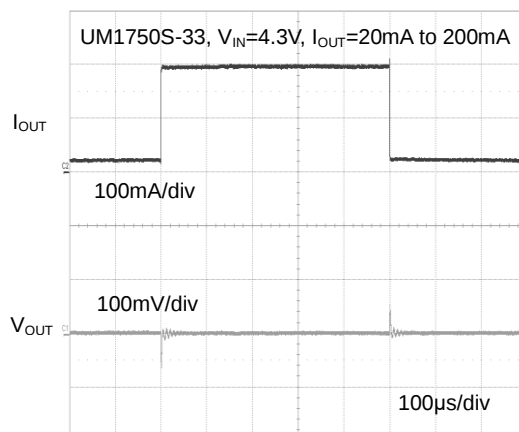
### PSRR vs. Frequency



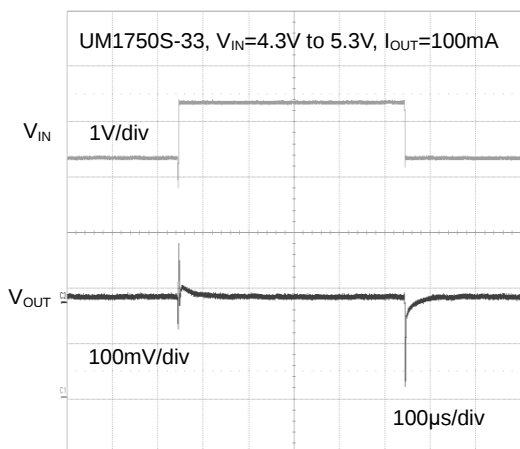
### Noise



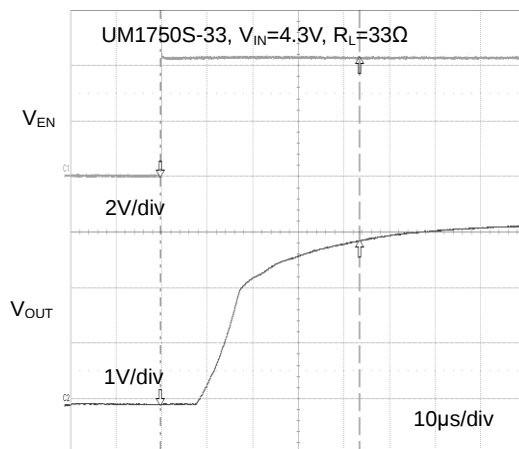
### Load Transient Response



### Line Transient Response



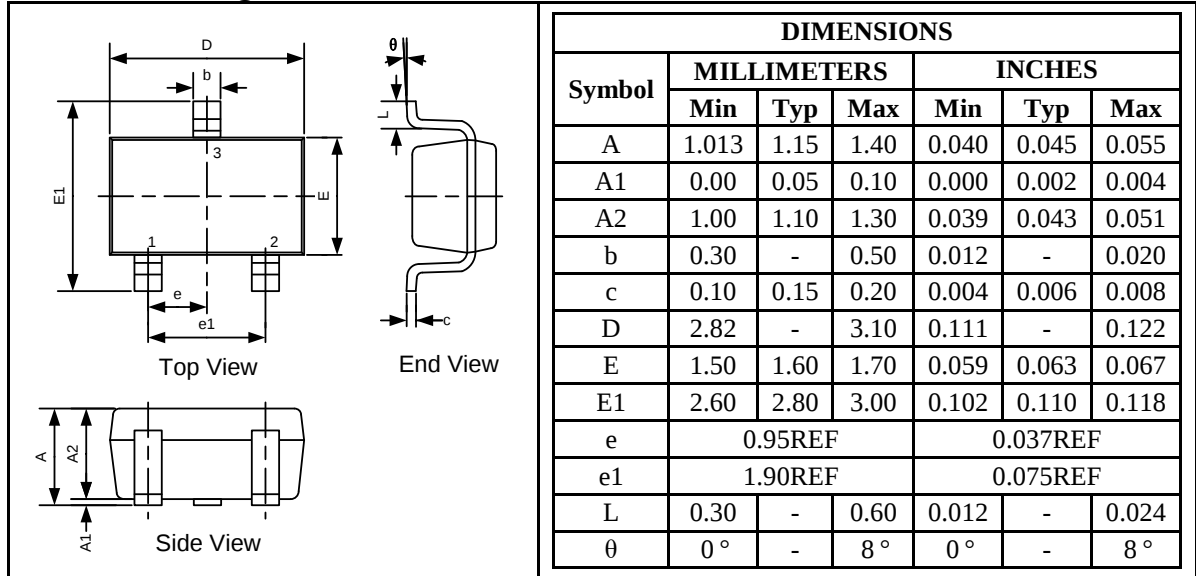
### Startup Waveform



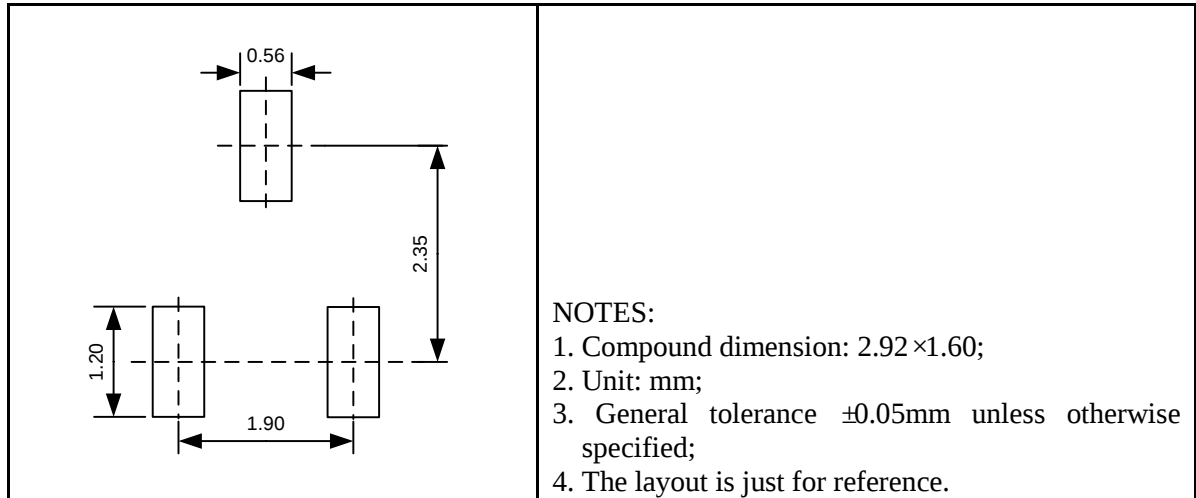
## Package Information

### UM1650S-xx: SOT23-3

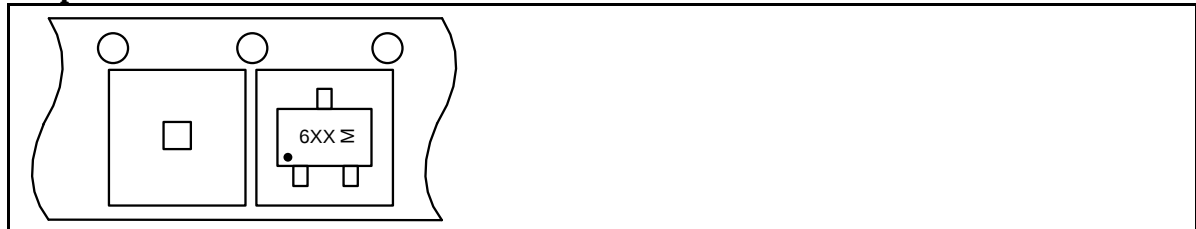
#### Outline Drawing



#### Land Pattern

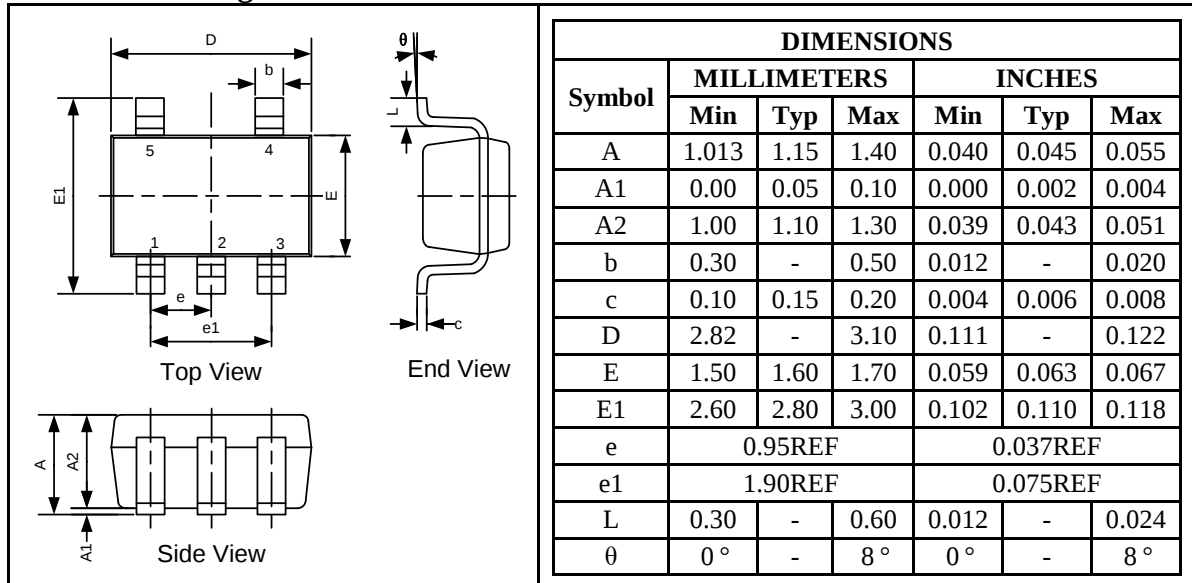


#### Tape and Reel Orientation

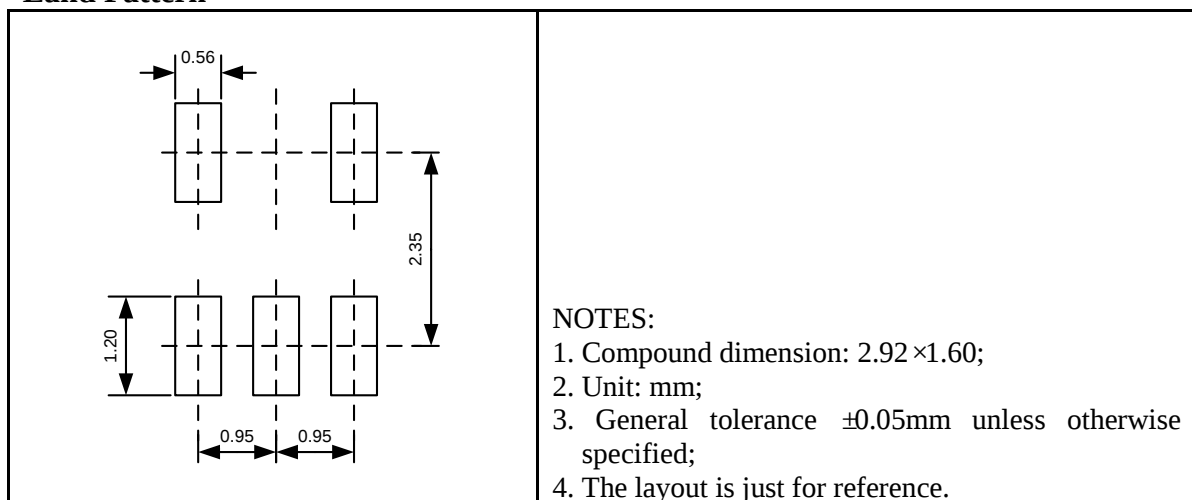


## UM1750S-xx: SOT23-5

### Outline Drawing



### Land Pattern

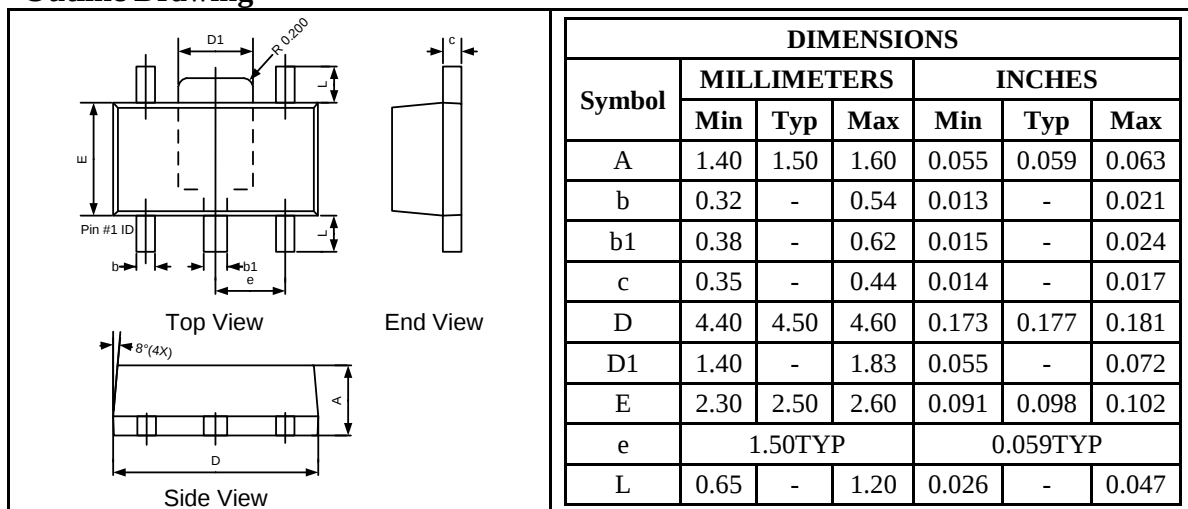


### Tape and Reel Orientation

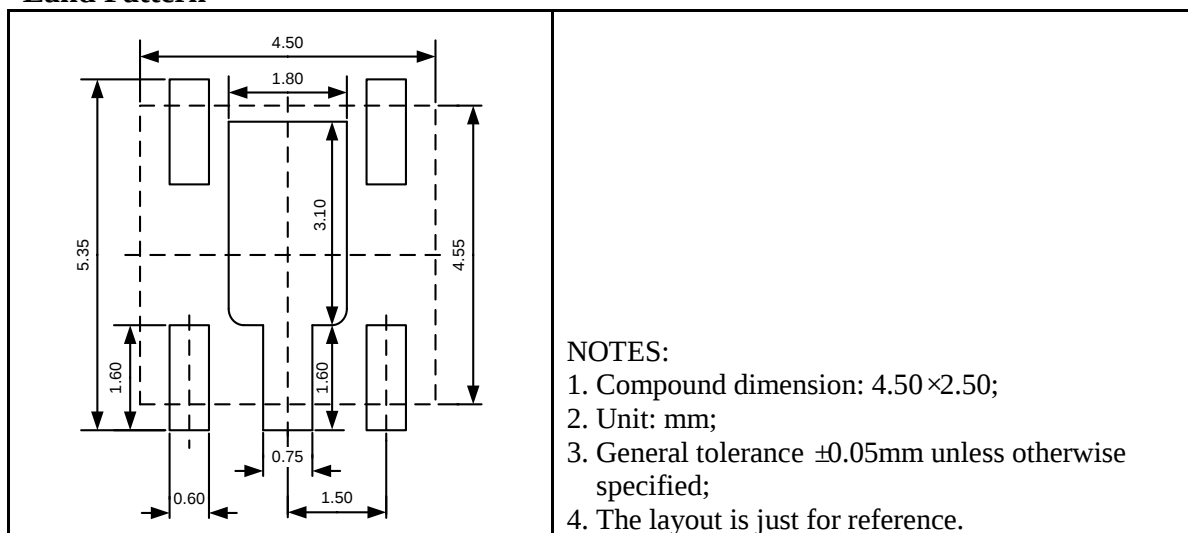


## UM1750Y-xx: SOT89-5

### Outline Drawing



### Land Pattern

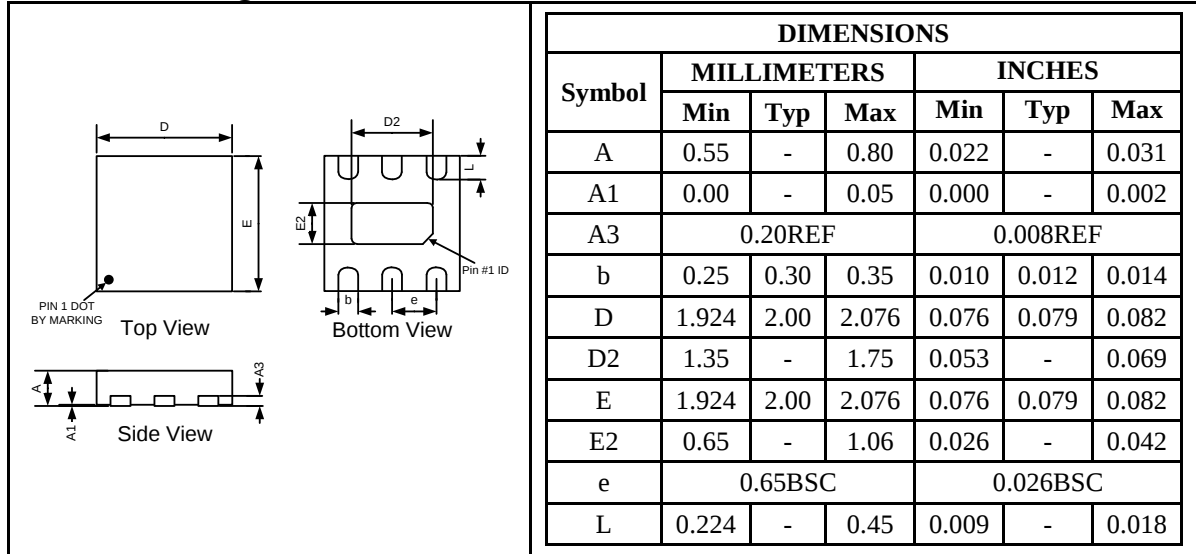


### Tape and Reel Orientation

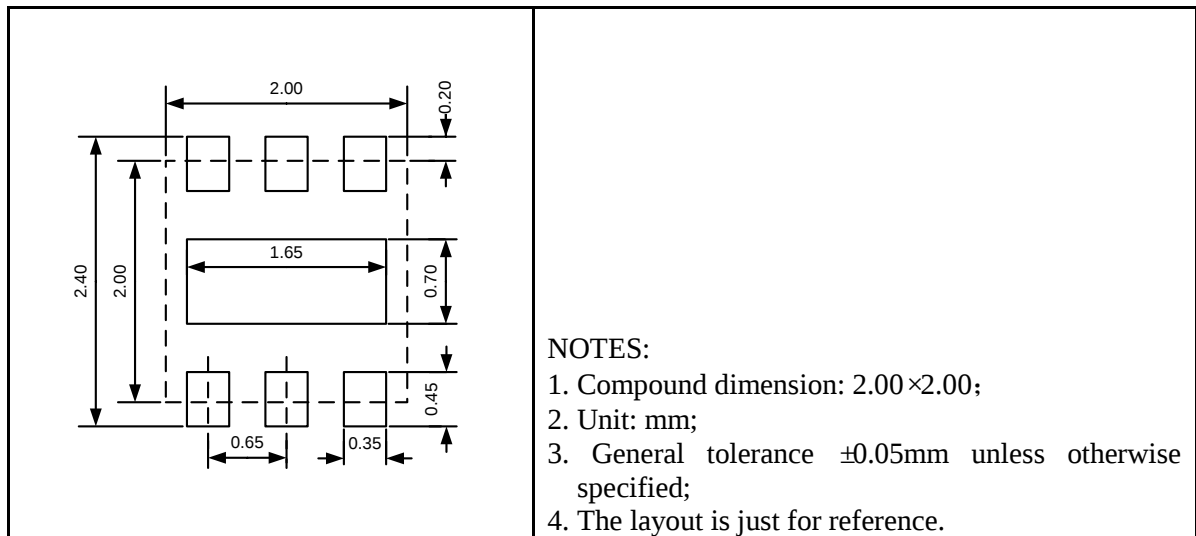


## UM1750DA-xx: DFN6 2.0×2.0

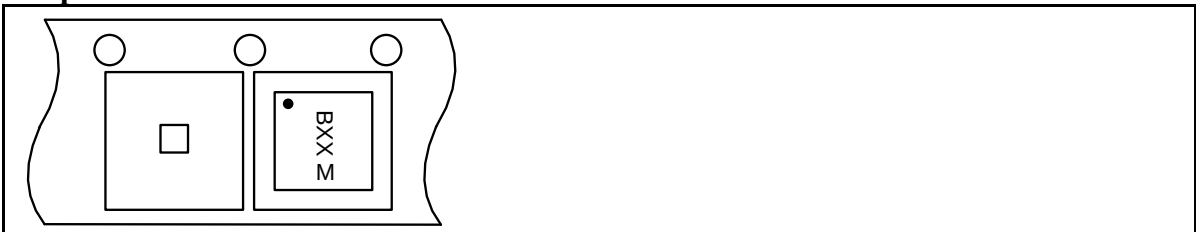
### Outline Drawing



### Land Pattern



### Tape and Reel Orientation



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