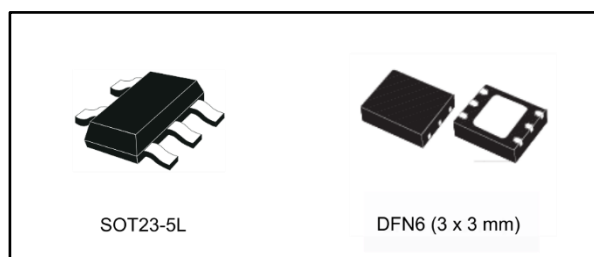


## Very low drop and low noise BiCMOS 300 mA voltage regulator

Datasheet - production data



- Logic-controlled electronic shutdown
- Internal current and thermal limit
- Low output voltage noise: 30  $\mu$  V<sub>RMS</sub> over 10 Hz to 100 kHz
- SVR of 55 dB at 1 kHz, 50 dB at 10 kHz
- Temperature range: - 40 °C to 125 °C
- Automotive grade product available in DFN6 package, temperature range: - 40 °C to 85 °C

### Features

- Input voltage from 2.5 V to 6 V
- Stable with low ESR ceramic capacitors
- Very low dropout voltage (150 mV typ. at 300 mA load, 0.4 mV typ. at 1 mA load)
- Very low quiescent current (85  $\mu$ A typ. at no load, 200  $\mu$ A typ. at 300 mA load; max. 1.5  $\mu$ A in OFF mode)
- Guaranteed output current up to 300 mA
- Wide range of output voltages available on request: fixed from 1.25 V to 5 V with 100 mV step
- Fast turn-on time: typ. 240  $\mu$ s
  - [C<sub>O</sub> = 2.2  $\mu$ F, C<sub>BYP</sub> = 33 nF and I<sub>O</sub> = 1 mA]

### Description

The LDS3985 provides up to 300 mA, from 2.5 V to 6 V input voltage. It is stable with ceramic and high quality tantalum capacitor. The ultra low drop voltage, low quiescent current and low noise make it suitable for low power applications and battery-powered systems. Shutdown logic control function is available, this means that when the device is used as local regulator, it is possible to put a part of the board in standby, decreasing the total power consumption. Typical applications are mobile phones and similar battery-powered wireless systems, portable information appliances.

Table 1: Device summary

| Packages    |                 |                                     | Output voltage (V) |
|-------------|-----------------|-------------------------------------|--------------------|
| SOT23-5L    | DFN6 (3 x 3 mm) | DFN6 (3 x 3 mm)<br>automotive-grade |                    |
| LDS3985M15R | LDS3985PU15R    |                                     | 1.5                |
| LDS3985M18R |                 | LDS3985PU18RY <sup>(1)</sup>        | 1.8                |
| LDS3985M25R |                 |                                     | 2.5                |
| LDS3985M28R | LDS3985PU28R    |                                     | 2.8                |
| LDS3985M30R |                 |                                     | 3.0                |
| LDS3985M33R | LDS3985PU33R    | LDS3985PU33RY <sup>(1)</sup>        | 3.3                |
| LDS3985M50R |                 |                                     | 5.0                |

#### Notes:

<sup>(1)</sup>Qualified and characterized according to AEC Q100 and Q003 or equivalent, advanced screening according to AEC Q001 and Q002 or equivalent.

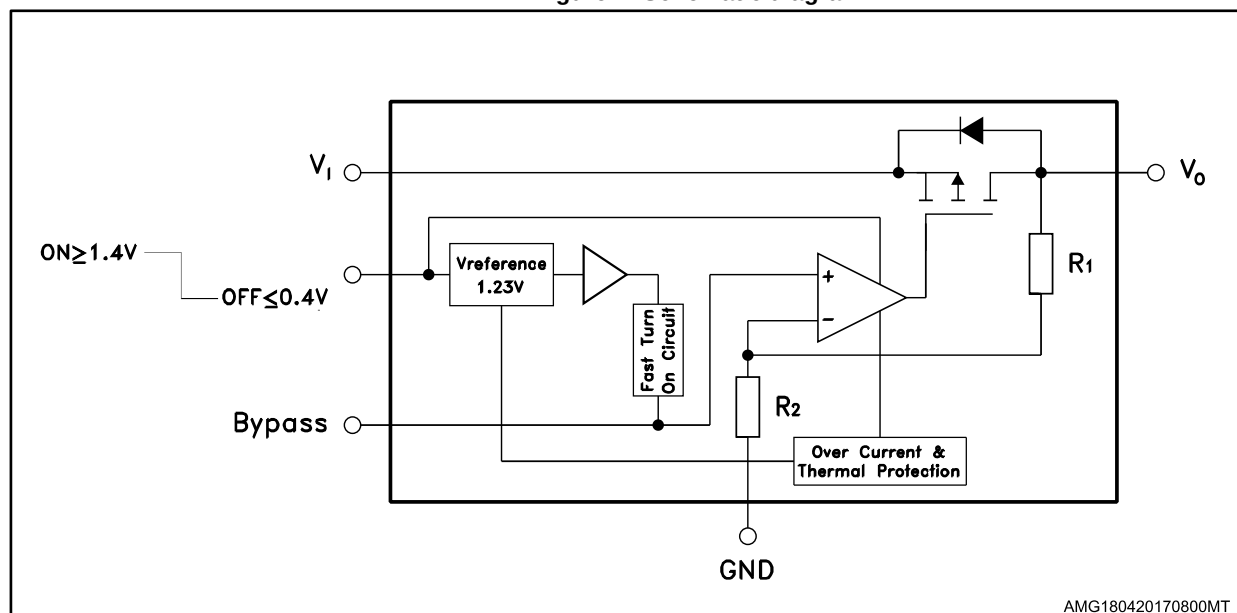
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# 1 Diagram

Figure 1: Schematic diagram



## 2 Pin configuration

Figure 2: Pin connections (top view for SOT23-5L, and for DFN6 (3 x 3 mm))

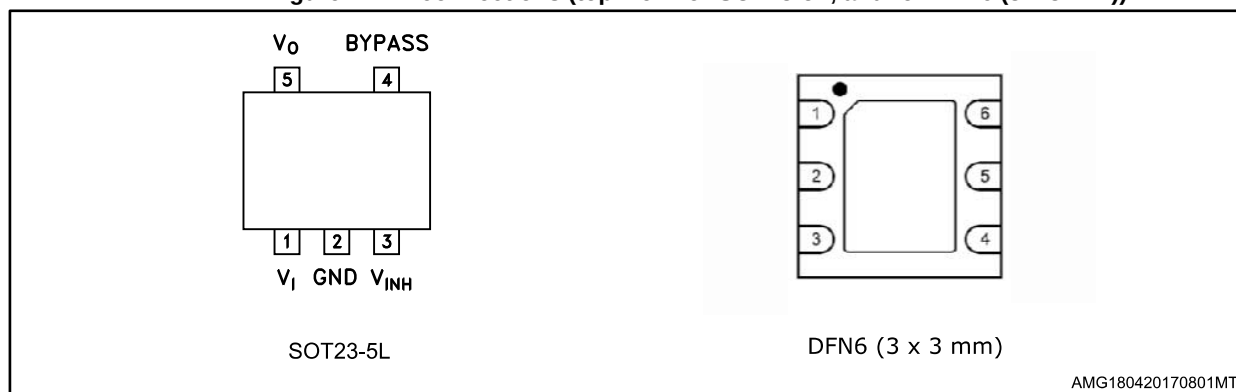


Table 2: Pin description

| Pin for SOT23-5L | Pin for DFN6 (3 x 3 mm) | Symbol    | Name and function                                                                                                                                            |
|------------------|-------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                | 1                       | $V_I$     | LDO input voltage                                                                                                                                            |
| 2                | 5                       | GND       | Common ground                                                                                                                                                |
| 3                | 6                       | $V_{INH}$ | Inhibit input voltage: ON mode when $V_{INH} \geq 1.2$ V, OFF mode when $V_{INH} \leq 0.4$ V (do not leave it floating; it is not internally pulled down/up) |
| 4                | 4                       | Bypass    | Bypass pin: an external capacitor to be connected (usually 10 nF) to minimize noise voltage                                                                  |
| 5                | 3                       | $V_O$     | LDO output voltage                                                                                                                                           |
| -                | 2                       | N.C.      | Not connected                                                                                                                                                |

### 3 Maximum ratings

Table 3: Absolute maximum ratings

| Symbol    | Parameter                                                      | Value                    | Unit |
|-----------|----------------------------------------------------------------|--------------------------|------|
| $V_I$     | DC input voltage                                               | -0.3 to 6 <sup>(1)</sup> | V    |
| $V_O$     | DC output voltage                                              | -0.3 to $V_I + 0.3$      | V    |
| $V_{INH}$ | Inhibit input voltage                                          | -0.3 to $V_I + 0.3$      | V    |
| $I_O$     | Output current                                                 | Internally limited       |      |
| $P_D$     | Power dissipation                                              | Internally limited       |      |
| $T_{STG}$ | Storage temperature range                                      | -65 to 150               | °C   |
| $T_{OP}$  | Operating junction temperature range                           | -40 to 125               | °C   |
|           | Operating junction temperature range, automotive grade version | - 40 to 85               | °C   |

**Notes:**

<sup>(1)</sup>The input pin is able to withstand non repetitive spike of 6.5 V for 200 ms.



Absolute maximum ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

Table 4: Thermal data

| Symbol     | Parameter                           | SOT23-5L | DFN6 (3 x 3 mm) | Unit |
|------------|-------------------------------------|----------|-----------------|------|
| $R_{thJC}$ | Thermal resistance junction-case    | 81       | 10              | °C/W |
| $R_{thJA}$ | Thermal resistance junction-ambient | 255      | 55              | °C/W |

## 4 Electrical characteristics

$T_J = 25\text{ }^{\circ}\text{C}$ ,  $V_I = V_{O(NOM)} + 0.5\text{ V}$ ,  $C_I = 1\text{ }\mu\text{F}$ ,  $C_O = 2.2\text{ }\mu\text{F}$ ,  $C_{BYP} = 33\text{ nF}$ ,  $I_O = 1\text{ mA}$ ,  
 $V_{INH} = 1.4\text{ V}$ , unless otherwise specified.

Table 5: LDS3985 electrical characteristics

| Symbol       | Parameter                                           | Test condition                                                                                                                           | Min.          | Typ.   | Max.        | Unit              |
|--------------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------|-------------|-------------------|
| $V_I$        | Operating input voltage                             |                                                                                                                                          | 2.5           |        | 6           | V                 |
| $V_O$        | Output voltage < 2.5 V                              | $I_O = 1\text{ mA}$<br>$T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$                                                                 | -50<br>-75    |        | 50<br>75    | mV                |
| $V_O$        | Output voltage $\geq 2.5\text{ V}$                  | $I_O = 1\text{ mA}$<br>$T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$                                                                 | -2<br>-3      |        | 2<br>3      | %<br>$V_{O(NOM)}$ |
| $\Delta V_O$ | Line regulation <sup>(1)</sup>                      | $V_I = V_{O(NOM)} + 0.5\text{ to }6\text{ V}$ ,<br>$T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$<br>$V_O = 4.7\text{ to }5\text{ V}$ | -0.1<br>-0.19 |        | 0.1<br>0.19 | %/V               |
| $\Delta V_O$ | Load regulation                                     | $I_O = 1\text{ mA to }300\text{ mA}$ ,<br>$V_O \leq 2.5\text{ V}$<br>$T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$                   |               | 0.005  | 0.01        | %/mA              |
| $\Delta V_O$ | Load regulation                                     | $I_O = 1\text{ mA to }300\text{ mA}$ ,<br>$V_O \geq 2.5\text{ V}$<br>$T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$                   |               | 0.0008 | 0.004       | %/mA              |
| $\Delta V_O$ | Output AC line regulation <sup>(2)</sup>            | $V_I = V_{O(NOM)} + 1\text{ V}$ ,<br>$I_O = 300\text{ mA}$ ,<br>$t_R = t_F = 30\text{ }\mu\text{s}$                                      |               | 5      |             | mV <sub>PP</sub>  |
| $I_Q$        | Quiescent current ON mode: $V_{INH} = 1.4\text{ V}$ | $I_O = 0$                                                                                                                                |               | 85     |             | $\mu\text{A}$     |
|              |                                                     | $I_O = 0$ ,<br>$T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$                                                                         |               |        | 150         |                   |
|              |                                                     | $I_O = 0\text{ to }300\text{ mA}$                                                                                                        |               | 200    |             |                   |
|              |                                                     | $I_O = 0\text{ to }300\text{ mA}$ ,<br>$T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$                                                 |               |        | 300         |                   |
|              | OFF mode:<br>$V_{INH} = 0.4\text{ V}$               | $T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$                                                                                        |               | 0.003  | 1.5         |                   |
| $V_{DROP}$   | Dropout voltage <sup>(3)</sup>                      | $I_O = 1\text{ mA}$                                                                                                                      |               | 0.4    |             | mV                |
|              |                                                     | $I_O = 1\text{ mA}$ ,<br>$T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$                                                               |               |        | 2           |                   |
|              |                                                     | $I_O = 150\text{ mA}$                                                                                                                    |               | 60     |             |                   |
|              |                                                     | $I_O = 150\text{ mA}$ ,<br>$T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$                                                             |               |        | 100         |                   |
|              |                                                     | $I_O = 300\text{ mA}$                                                                                                                    |               | 150    |             |                   |
|              |                                                     | $I_O = 300\text{ mA}$ ,<br>$T_J = -40\text{ to }125\text{ }^{\circ}\text{C}$                                                             |               |        | 250         |                   |

| Symbol             | Parameter                   | Test condition                                                                                                                                                        |            | Min. | Typ. | Max. | Unit              |
|--------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|------|------|-------------------|
| I <sub>SC</sub>    | Short-circuit current       | R <sub>L</sub> = 0                                                                                                                                                    |            |      | 600  |      | mA                |
| SVR                | Supply voltage rejection    | V <sub>I</sub> = V <sub>O(NOM)</sub> + 0.25 V ± V <sub>ripple</sub> = 0.1 V,<br>I <sub>O</sub> = 50 mA<br>For V <sub>O(NOM)</sub> < 2.5 V,<br>V <sub>I</sub> = 2.55 V | f = 1 kHz  |      | 55   |      | dB                |
|                    |                             |                                                                                                                                                                       | f = 10 kHz |      | 50   |      |                   |
| I <sub>O(PK)</sub> | Peak output current         | V <sub>O</sub> ≥ V <sub>O(NOM)</sub> - 5%                                                                                                                             |            | 300  | 550  |      | mA                |
| V <sub>INH</sub>   | Inhibit input logic low     | V <sub>I</sub> = 2.5 V to 6 V,                                                                                                                                        |            |      |      | 0.4  | V                 |
|                    | Inhibit input logic high    | T <sub>J</sub> = - 40 to 125 °C                                                                                                                                       |            | 1.4  |      |      |                   |
| I <sub>INH</sub>   | Inhibit input current       | V <sub>INH</sub> = 0.4 V, V <sub>I</sub> = 6 V                                                                                                                        |            |      | ±1   |      | nA                |
| eN                 | Output noise voltage        | B <sub>W</sub> = 10 Hz to 100 kHz,<br>C <sub>O</sub> = 2.2 µF                                                                                                         |            |      | 30   |      | µV <sub>RMS</sub> |
| t <sub>ON</sub>    | Turn-on time <sup>(4)</sup> | C <sub>BYP</sub> = 33 nF                                                                                                                                              |            |      | 240  |      | µs                |
| T <sub>SHDN</sub>  | Thermal shutdown            | <sup>(5)</sup>                                                                                                                                                        |            |      | 160  |      | °C                |
| C <sub>O</sub>     | Output capacitor            | Capacitance                                                                                                                                                           |            | 2.2  |      | 22   | µF                |
|                    |                             | ESR                                                                                                                                                                   |            | 5    |      | 5000 | mΩ                |

**Notes:**

<sup>(1)</sup>For V<sub>O(NOM)</sub> < 2 V, V<sub>I</sub> = 2.5 V.

<sup>(2)</sup>For V<sub>O(NOM)</sub> = 1.25 V, V<sub>I</sub> = 2.5 V.

<sup>(3)</sup>Dropout voltage is the input-to-output voltage difference at which the output voltage is 100 mV below its nominal value. This specification does not apply to input voltages below 2.5 V.

<sup>(4)</sup>Turn-on time is time measured between the enable input just exceeding V<sub>INH</sub> high value and the output voltage just reaching 95% of its nominal value.

<sup>(5)</sup>Typical thermal protection hysteresis is 20 °C.

Table 6: LDS3985 (automotive grade) electrical characteristics

| Symbol       | Parameter                                            | Test condition                                                                                                                                                  |                      | Min.  | Typ.   | Max.  | Unit             |
|--------------|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------|--------|-------|------------------|
| $V_I$        | Operating input voltage                              |                                                                                                                                                                 |                      | 2.5   |        | 6     | V                |
| $V_O$        | Output voltage < 2.5 V                               | $I_O = 1 \text{ mA}$                                                                                                                                            |                      | -50   |        | 50    | mV               |
|              |                                                      | $T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$                                                                                                               |                      | -75   |        | 75    |                  |
| $V_O$        | Output voltage $\geq 2.5 \text{ V}$                  | $I_O = 1 \text{ mA}$                                                                                                                                            |                      | -2    |        | 2     | %                |
|              |                                                      | $T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$                                                                                                               |                      | -3    |        | 3     |                  |
| $\Delta V_O$ | Line regulation <sup>(1)</sup>                       | $V_I = V_{O(NOM)} + 0.5 \text{ to } 6 \text{ V},$<br>$T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$                                                          |                      | -0.1  |        | 0.1   | %/V              |
|              |                                                      | $V_O = 4.7 \text{ to } 5 \text{ V}$                                                                                                                             |                      | -0.19 |        | 0.19  |                  |
| $\Delta V_O$ | Load regulation                                      | $I_O = 1 \text{ mA to } 300 \text{ mA},$<br>$V_O \leq 2.5 \text{ V}$<br>$T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$                                       |                      |       | 0.005  | 0.01  | %/mA             |
| $\Delta V_O$ | Load regulation                                      | $I_O = 1 \text{ mA to } 300 \text{ mA},$<br>$V_O \geq 2.5 \text{ V}$<br>$T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$                                       |                      |       | 0.0008 | 0.004 | %/mA             |
| $\Delta V_O$ | Output AC line regulation <sup>(2)</sup>             | $V_I = V_{O(NOM)} + 1 \text{ V},$<br>$I_O = 300 \text{ mA}$<br>$t_R = t_F = 30 \text{ } \mu\text{s}$                                                            |                      |       | 5      |       | mV <sub>PP</sub> |
| $I_Q$        | Quiescent current ON mode: $V_{INH} = 1.4 \text{ V}$ | $I_O = 0$                                                                                                                                                       |                      |       | 85     |       | $\mu\text{A}$    |
|              |                                                      | $I_O = 0,$<br>$T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$                                                                                                 |                      |       |        | 150   |                  |
|              |                                                      | $I_O = 0 \text{ to } 300 \text{ mA}$                                                                                                                            |                      |       | 200    |       |                  |
|              |                                                      | $I_O = 0 \text{ to } 300 \text{ mA},$<br>$T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$                                                                      |                      |       |        | 300   |                  |
|              | OFF mode:<br>$V_{INH} = 0.4 \text{ V}$               |                                                                                                                                                                 |                      |       | 0.003  |       |                  |
|              |                                                      | $T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$                                                                                                               |                      |       |        | 1.5   |                  |
| $V_{DROP}$   | Dropout voltage <sup>(3)</sup>                       | $I_O = 1 \text{ mA}$                                                                                                                                            |                      |       | 0.4    |       | mV               |
|              |                                                      | $I_O = 1 \text{ mA},$<br>$T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$                                                                                      |                      |       |        | 2     |                  |
|              |                                                      | $I_O = 150 \text{ mA}$                                                                                                                                          |                      |       | 60     |       |                  |
|              |                                                      | $I_O = 150 \text{ mA},$<br>$T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$                                                                                    |                      |       |        | 100   |                  |
|              |                                                      | $I_O = 300 \text{ mA}$                                                                                                                                          |                      |       | 150    |       |                  |
|              |                                                      | $I_O = 300 \text{ mA},$<br>$T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$                                                                                    |                      |       |        | 250   |                  |
| $I_{SC}$     | Short-circuit current                                | $R_L = 0$                                                                                                                                                       |                      |       | 600    |       | mA               |
| SVR          | Supply voltage rejection                             | $V_I = V_{O(NOM)} + 0.25 \text{ V} \pm$<br>$V_{RIPPLE} = 0.1 \text{ V},$<br>$I_O = 50 \text{ mA}$<br>For $V_{O(NOM)} < 2.5 \text{ V}$<br>$V_I = 2.55 \text{ V}$ | $f = 1 \text{ kHz}$  |       | 55     |       | dB               |
|              |                                                      |                                                                                                                                                                 | $f = 10 \text{ kHz}$ |       | 50     |       |                  |

| Symbol      | Parameter                   | Test condition                                                                              | Min. | Typ.    | Max. | Unit                |
|-------------|-----------------------------|---------------------------------------------------------------------------------------------|------|---------|------|---------------------|
| $I_{O(PK)}$ | Peak output current         | $V_O \geq V_{O(NOM)} - 5\%$                                                                 | 300  | 550     |      | mA                  |
| $V_{INH}$   | Inhibit input logic low     | $V_I = 2.5 \text{ V to } 6 \text{ V},$<br>$T_J = -40 \text{ to } 85 \text{ }^\circ\text{C}$ |      |         | 0.4  | V                   |
|             | Inhibit input logic high    |                                                                                             | 1.4  |         |      |                     |
| $I_{INH}$   | Inhibit input current       | $V_{INH} = 0.4 \text{ V},$<br>$V_I = 6 \text{ V}$                                           |      | $\pm 1$ |      | nA                  |
| eN          | Output noise voltage        | $B_W = 10 \text{ Hz to } 100 \text{ kHz},$<br>$C_O = 2.2 \text{ } \mu\text{F}$              |      | 30      |      | $\mu\text{V}_{RMS}$ |
| $t_{ON}$    | Turn-on time <sup>(4)</sup> | $C_{BYP} = 33 \text{ nF}$                                                                   |      | 240     |      | $\mu\text{s}$       |
| $T_{SHDN}$  | Thermal shutdown            | <sup>(5)</sup>                                                                              |      | 160     |      | $^\circ\text{C}$    |
| $C_O$       | Output capacitor            | Capacitance                                                                                 | 2.2  |         | 22   | $\mu\text{F}$       |
|             |                             | ESR                                                                                         | 5    |         | 5000 | m $\Omega$          |

**Notes:**

<sup>(1)</sup>For  $V_{O(NOM)} < 2 \text{ V}$ ,  $V_I = 2.5 \text{ V}$ .

<sup>(2)</sup>For  $V_{O(NOM)} = 1.25 \text{ V}$ ,  $V_I = 2.5 \text{ V}$ .

<sup>(3)</sup>Dropout voltage is the input-to-output voltage difference at which the output voltage is 100 mV below its nominal value. This specification does not apply to input voltages below 2.5 V.

<sup>(4)</sup>Turn-on time is time measured between the enable input just exceeding  $V_{INH}$  high value and the output voltage just reaching 95% of its nominal value.

<sup>(5)</sup>Typical thermal protection hysteresis is 20  $^\circ\text{C}$ .

## 5 Typical performance characteristics

$T_J = 25\text{ }^{\circ}\text{C}$ ,  $V_I = V_{O(\text{NOM})} + 0.5\text{ V}$ ,  $C_I = 1\text{ }\mu\text{F}$ ,  $C_O = 2.2\text{ }\mu\text{F}$ ,  $C_{\text{BYP}} = 33\text{ nF}$ ,  $I_O = 1\text{ mA}$ ,  $V_{\text{INH}} = 1.4\text{ V}$ , unless otherwise specified.

Figure 3: Output voltage vs temperature  $V_O = 1.35\text{ V}$

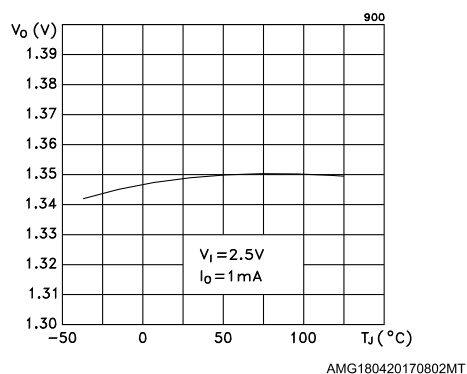


Figure 4: Output voltage vs temperature  $V_O = 2.8\text{ V}$

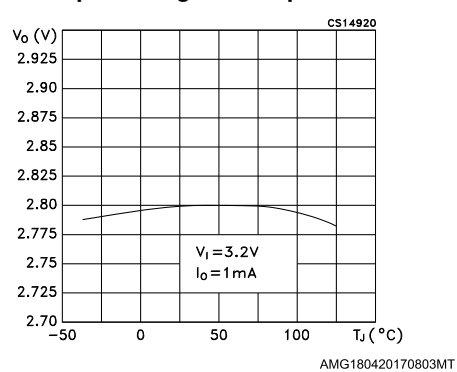


Figure 5: Output voltage vs temperature  $V_O = 3.3\text{ V}$

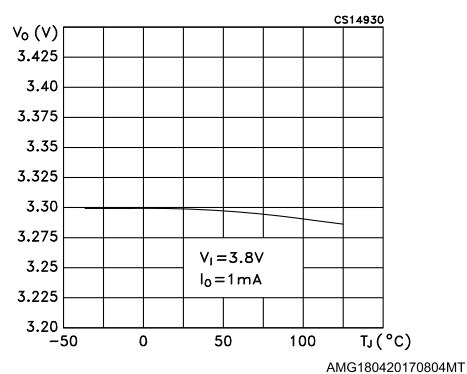


Figure 6: Inhibit voltage vs temperature  $V_O = 1.35\text{ V}$

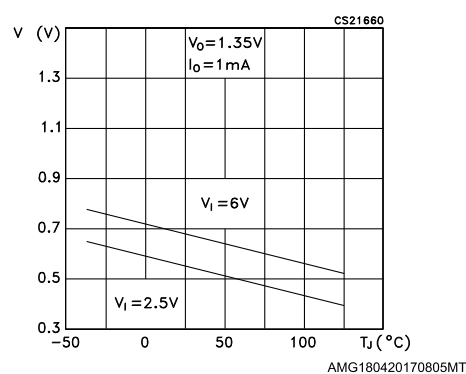


Figure 7: Inhibit voltage vs temperature ( $V_O = 3.3\text{ V}$ )

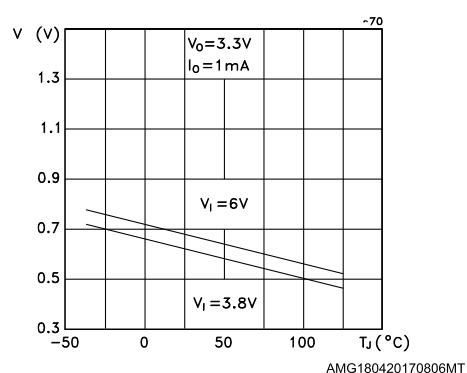


Figure 8: Line regulation vs temperature ( $V_I = 2.5\text{ V to }6\text{ V}$ )

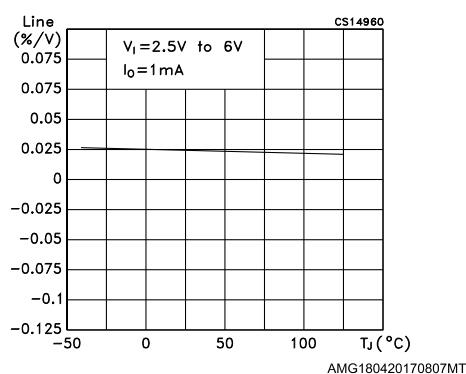


**Figure 9: Line regulation vs temperature**  
( $V_I = 3.2\text{ V to }6\text{ V}$ )

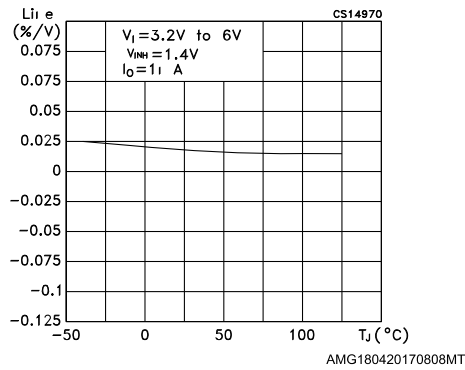


**Figure 10: Line regulation vs temperature**  
( $V_I = 3.8\text{ V to }6\text{ V}$ )

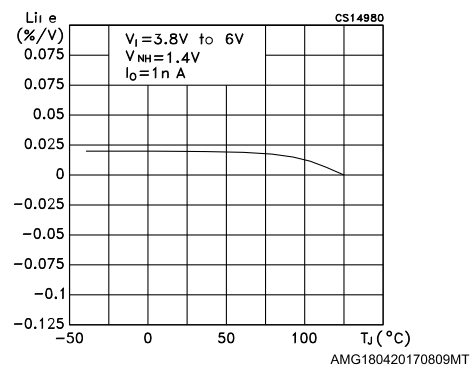


**Figure 11: Quiescent current vs temperature**  
( $V_I = 2.5\text{ V}$ )

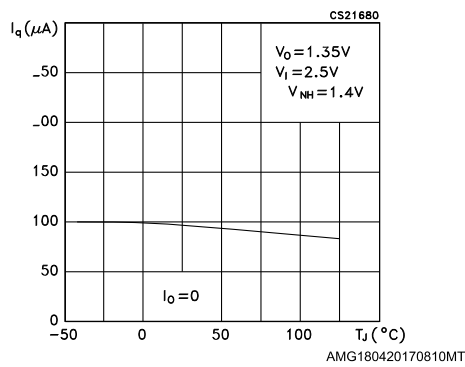


**Figure 12: Quiescent current vs temperature**  
( $V_I = 6\text{ V}$ )

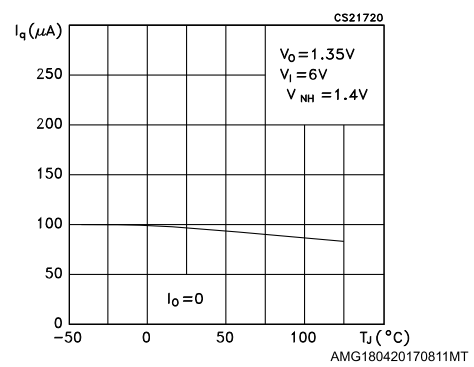


**Figure 13: Quiescent current vs temperature**  
( $V_I = 3.4\text{ V}$ )

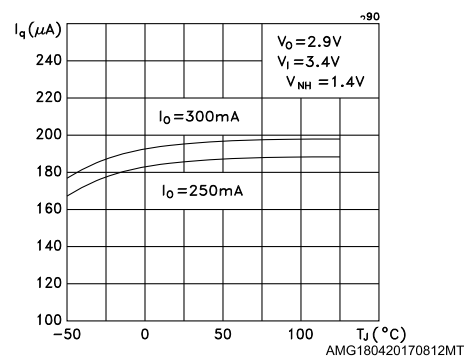


**Figure 14: Supply voltage rejection vs frequency**

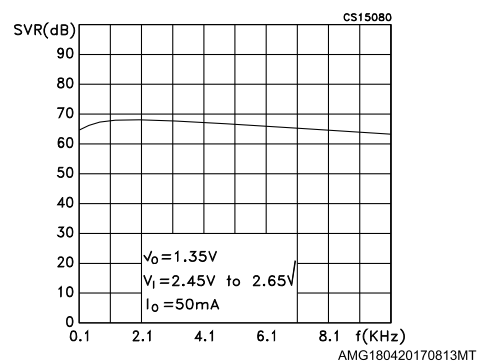


Figure 15: Dropout voltage vs temperature

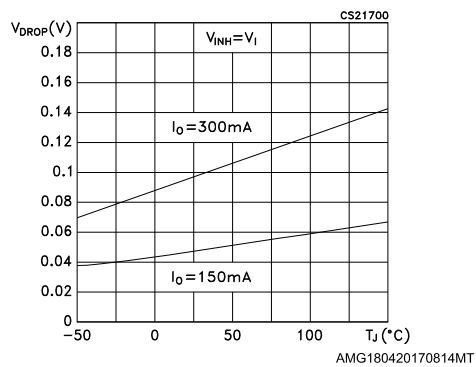


Figure 16: Dropout voltage vs output current

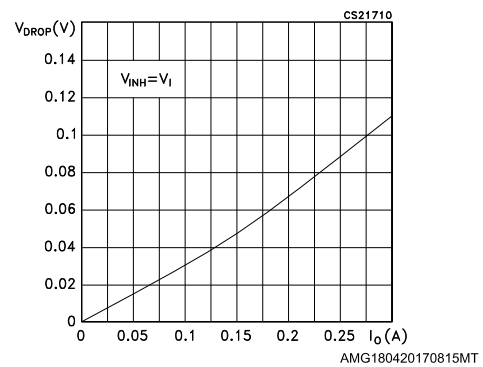
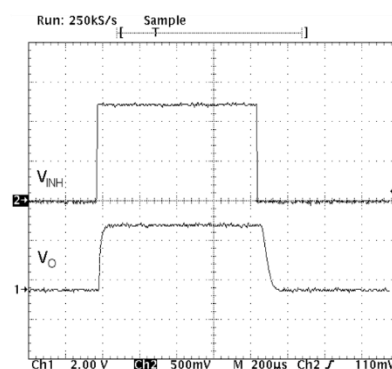


Figure 17: Inhibit transient



$V_I = 5\text{V}$ ,  $I_O = 1\text{mA}$ ,  $V_{INH} = 0\text{ to }1.2\text{V}$ ,  $C_I = C_O = 1\mu\text{F (cer)}$ ,  $C_{BYP} = 10\text{nF}$ ,  $T_R = T_F = 1\mu\text{s}$

AMG180420170816MT

## 6 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK® is an ST trademark.

### 6.1 SOT23-5L package information

Figure 18: SOT23-5L package outline

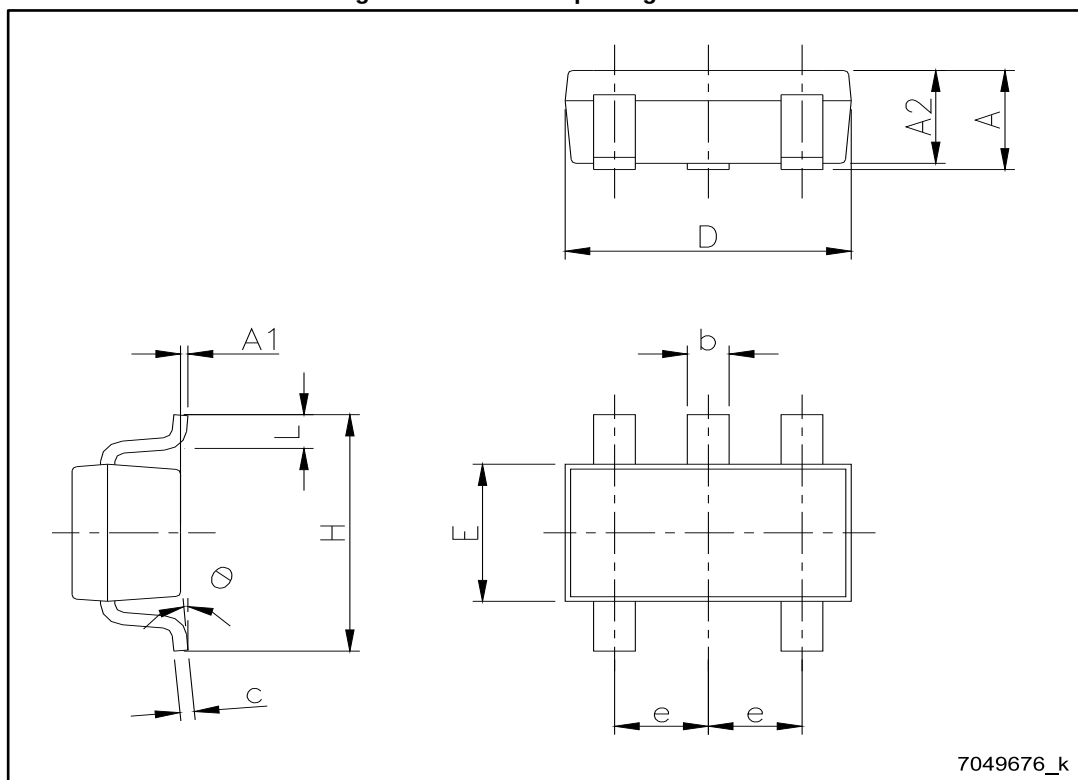
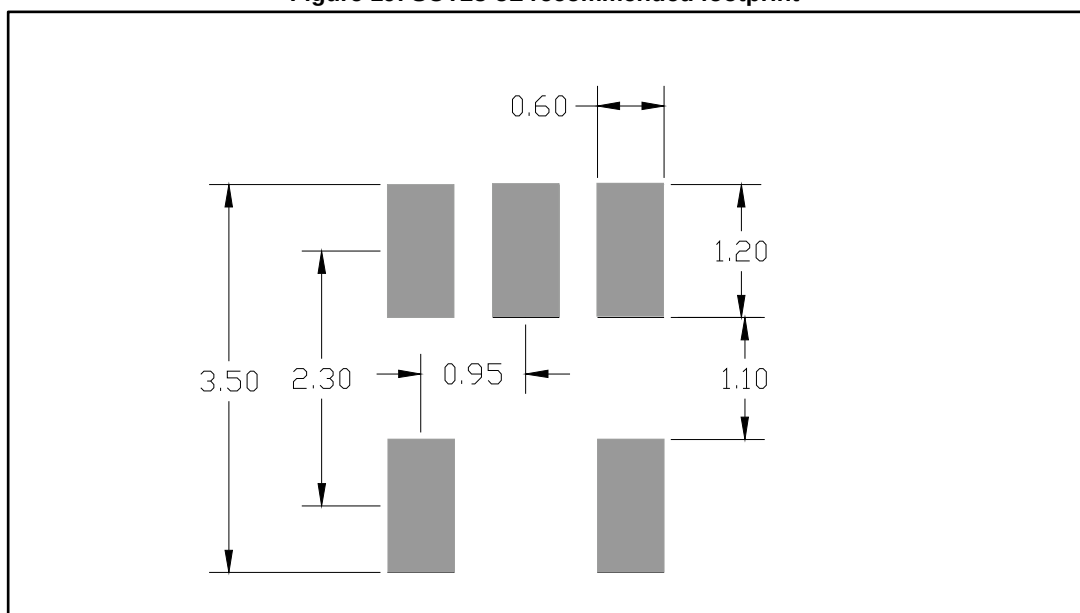


Table 7: SOT23-5L package mechanical data

| Dim.     | mm   |      |      |
|----------|------|------|------|
|          | Min. | Typ. | Max. |
| A        | 0.90 |      | 1.45 |
| A1       | 0    |      | 0.15 |
| A2       | 0.90 |      | 1.30 |
| b        | 0.30 |      | 0.50 |
| c        | 0.09 |      | 0.20 |
| D        |      | 2.95 |      |
| E        |      | 1.60 |      |
| e        |      | 0.95 |      |
| H        |      | 2.80 |      |
| L        | 0.30 |      | 0.60 |
| $\theta$ | 0°   |      | 8°   |

Figure 19: SOT23-5L recommended footprint



Dimensions are in mm

## 6.2 SOT23-5L packing information

Figure 20: SOT23-5L tape and reel outline

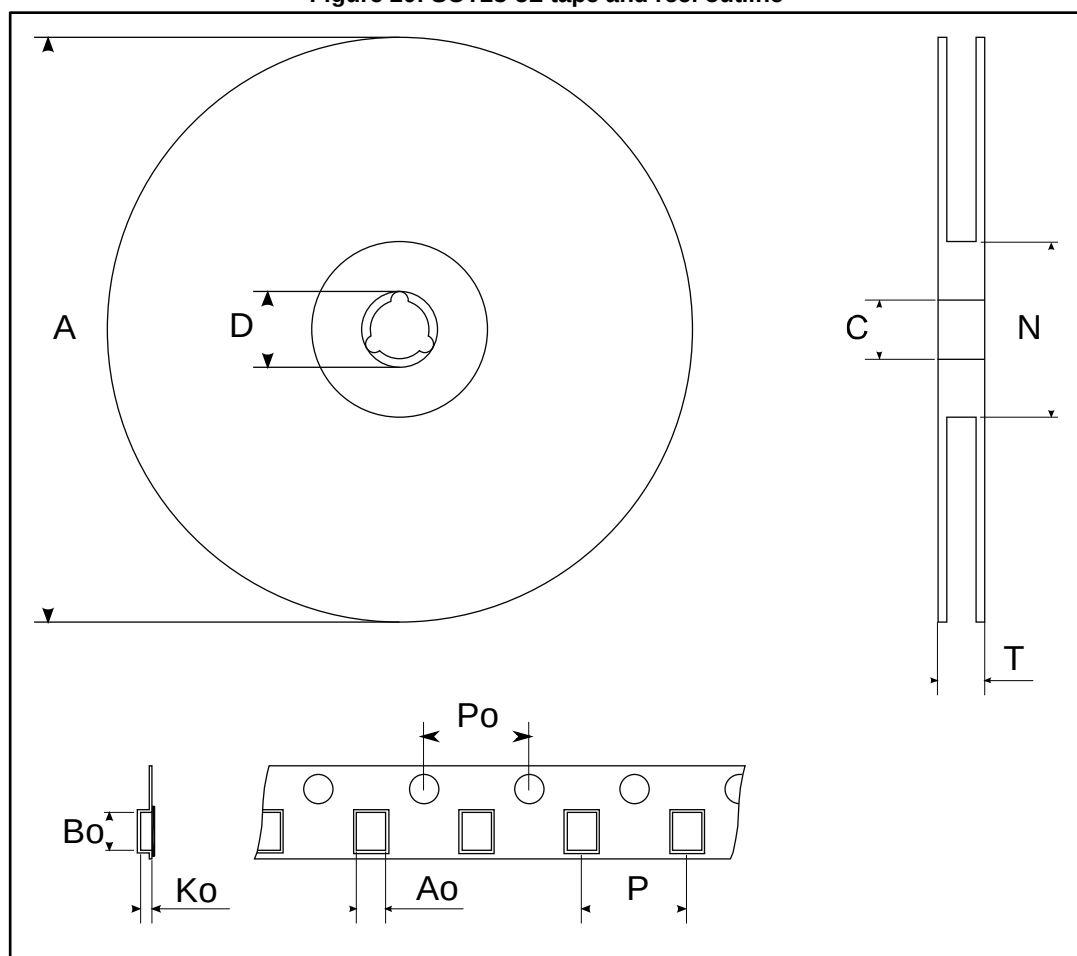


Table 8: SOT23-5L tape and reel mechanical data

| Dim. | mm   |      |      |
|------|------|------|------|
|      | Min. | Typ. | Max. |
| A    |      |      | 180  |
| C    | 12.8 | 13.0 | 13.2 |
| D    | 20.2 |      |      |
| N    | 60   |      |      |
| T    |      |      | 14.4 |
| Ao   | 3.13 | 3.23 | 3.33 |
| Bo   | 3.07 | 3.17 | 3.27 |
| Ko   | 1.27 | 1.37 | 1.47 |
| Po   | 3.9  | 4.0  | 4.1  |
| P    | 3.9  | 4.0  | 4.1  |

### 6.3 DFN6 (3 x 3 mm) package information

Figure 21: DFN6 (3 x 3 mm) package outline

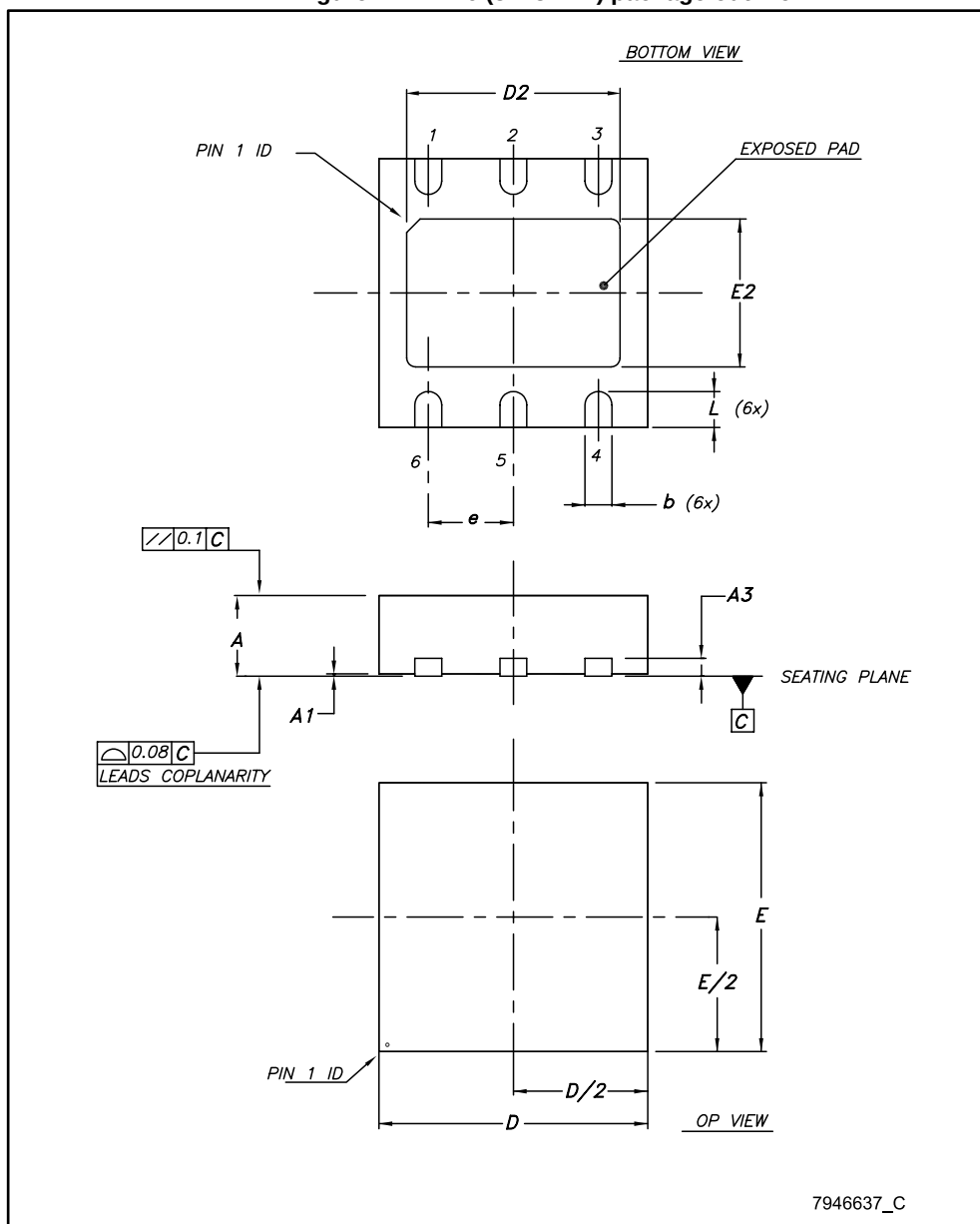
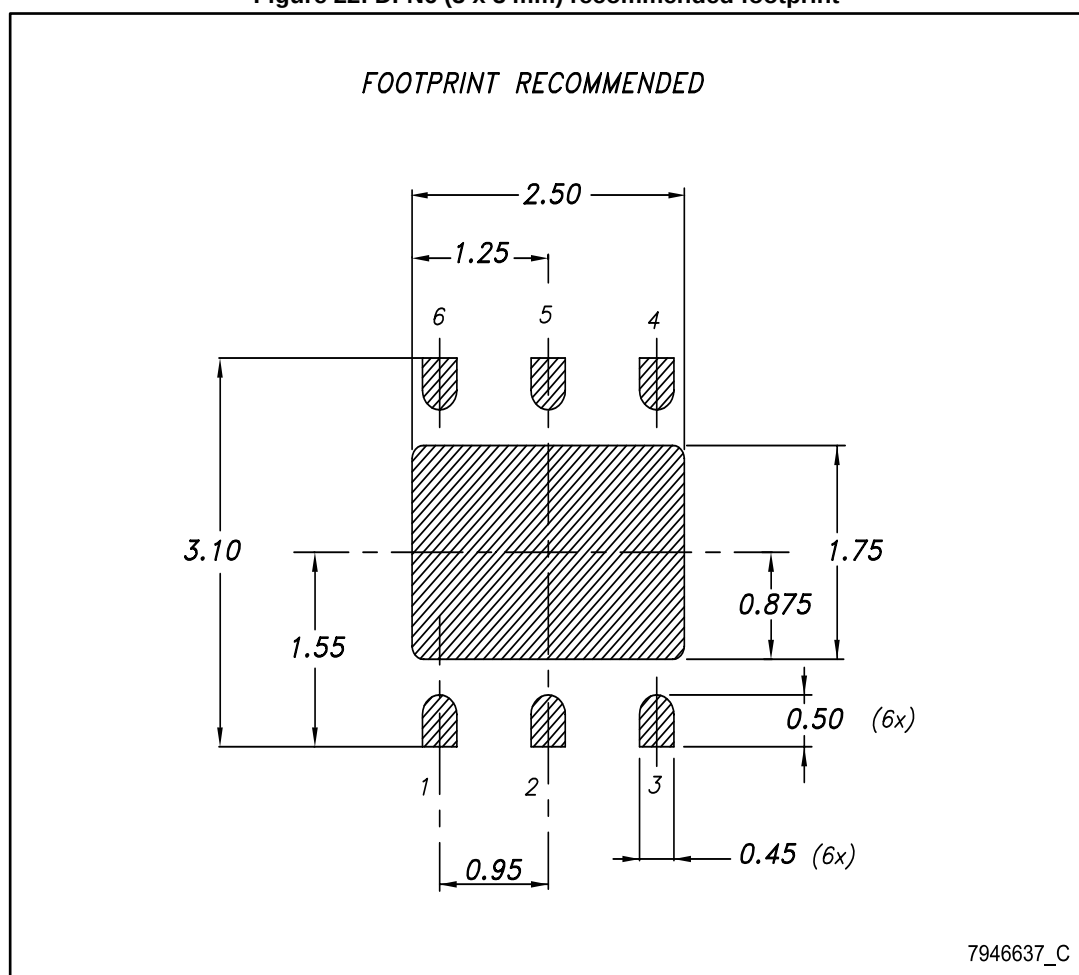


Table 9: DFN6 (3 x 3 mm) mechanical data

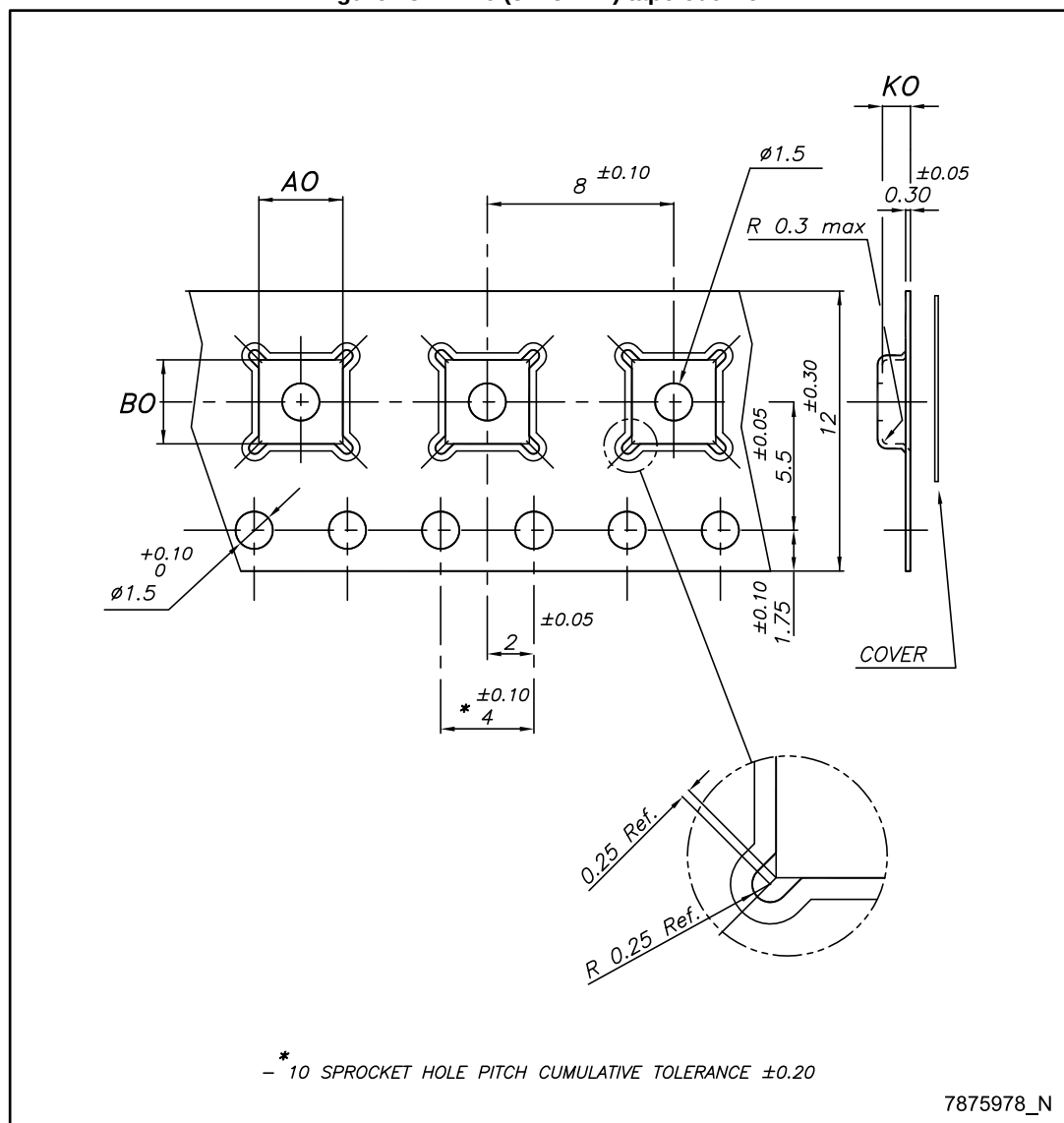
| Dim. | mm   |      |      |
|------|------|------|------|
|      | Min. | Typ. | Max. |
| A    | 0.80 |      | 1    |
| A1   | 0    | 0.02 | 0.05 |
| A3   |      | 0.20 |      |
| b    | 0.23 |      | 0.45 |
| D    | 2.90 | 3    | 3.10 |
| D2   | 2.23 |      | 2.50 |
| E    | 2.90 | 3    | 3.10 |
| E2   | 1.50 |      | 1.75 |
| e    |      | 0.95 |      |
| L    | 0.30 | 0.40 | 0.50 |

Figure 22: DFN6 (3 x 3 mm) recommended footprint



## 6.4 DFN6 (3 x 3 mm) packing information

Figure 23: DFN6 (3 x 3 mm) tape outline



Technical drawing of a circular mechanical part, likely a hub or flange, showing a top view and a cross-sectional view.

**Top View Dimensions:**

- Outer Diameter:  $\phi 330$  (13")
- Inner Diameter:  $\phi 20.2$  Min.
- Central Hole Diameter:  $\phi 13$  (+0.5 / -0.2)
- Radial Spokes: Four spokes are shown, each with a width of 2.2.

**Cross-sectional View Dimensions:**

- Thickness: 2.2
- Central Hole Diameter: 18.4 Mc (Measured at  $h_v$ )
- Dimensional Tolerance:  $\pm 0.5$  (indicated by a vertical arrow)

| Dim. | mm   |      |      |
|------|------|------|------|
|      | Min. | Typ. | Max. |
| A0   | 3.20 | 3.30 | 3.40 |
| B0   | 3.20 | 3.30 | 3.40 |
| K0   | 1    | 1.10 | 1.20 |

## 7 Revision history

**Table 11: Document revision history**

| Date        | Revision | Changes                                                                                                                                                                                                                                                                                                 |
|-------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 02-Dec-2004 | 1        | First release.                                                                                                                                                                                                                                                                                          |
| 10-Apr-2007 | 2        | Added: new package TSOT23-5L.                                                                                                                                                                                                                                                                           |
| 16-May-2007 | 3        | Added: new mechanical data DFN6D and order codes updated.                                                                                                                                                                                                                                               |
| 06-Sep-2007 | 4        | Added: Table 1 in cover page.                                                                                                                                                                                                                                                                           |
| 11-Jun-2008 | 5        | Modified: not found.                                                                                                                                                                                                                                                                                    |
| 11-Jul-2009 | 6        | Modified: not found.                                                                                                                                                                                                                                                                                    |
| 29-Jul-2010 | 7        | Modified: not found and not found.                                                                                                                                                                                                                                                                      |
| 24-Oct-2013 | 8        | Modified the Title and the Features in cover page.<br>Deleted Table1: Device summary.<br>Updated not found and not found.<br>Added and not found.<br>Minor text changes.                                                                                                                                |
| 28-Feb-2014 | 9        | Modified the Title and the Features in cover page.<br>Deleted Table1: Device summary.<br>Updated Table 10: Order codes and Section 6: Package mechanical data.<br>Added Table 6: LDS3985 (automotive grade) electrical characteristics and Section 7: Packaging mechanical data.<br>Minor text changes. |
| 03-May-2017 | 10       | Updated <a href="#">Table 1: "Device summary"</a> .<br>Minor text changes.                                                                                                                                                                                                                              |

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