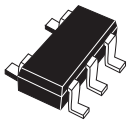
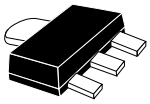
# LDK220

Datasheet

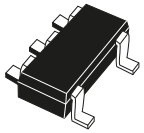
## 200 mA low quiescent current and low noise LDO



SOT23-5L



SOT89



SOT323-5L

DFN6-1.2x1.3

| Maturity status link |
| --- |
| LDK220 |

## Features

- Input voltage from 2.5 to 13.2 V
- Very low-dropout voltage (100 mV typ. @ 100 mA load)
- Low quiescent current (typ. 55 µA, 1 µA in off mode)
- Low noise
- Output voltage tolerance: ± 2.0% @ 25 °C
- 200 mA guaranteed output current
- Wide range of output voltages available on request: fixed from 1.2 V to 12 V with 100 mV step and adjustable
- Logic-controlled electronic shutdown
- Output discharge function
- Compatible with ceramic capacitor $C_{OUT}$ = 1 µF
- Internal current and thermal limit
- Available in SOT23-5L, SOT323-5L, SOT-89 and DFN6-1.2x1.3 packages
- Temperature range: -40 °C to 125 °C

## Applications

- Battery-powered equipment
- TV
- Set-top box
- PC and laptop
- Industrial

## Description

The LDK220 is a low drop voltage regulator, which provides a maximum output current of 200 mA from an input voltage in the range of 2.5 V to 13.2 V, with a typical dropout voltage of 100 mV.

A ceramic capacitor stabilizes it on the output.

The very low drop voltage, low quiescent current and low noise make it suitable for battery-powered applications.

The enable logic control function puts the LDK220 in shutdown mode allowing a total current consumption lower than 1 µA.

The device also includes a short-circuit constant current limiting and thermal protection.

# 1 Diagram

**Figure 1. Block diagram (fixed version)**

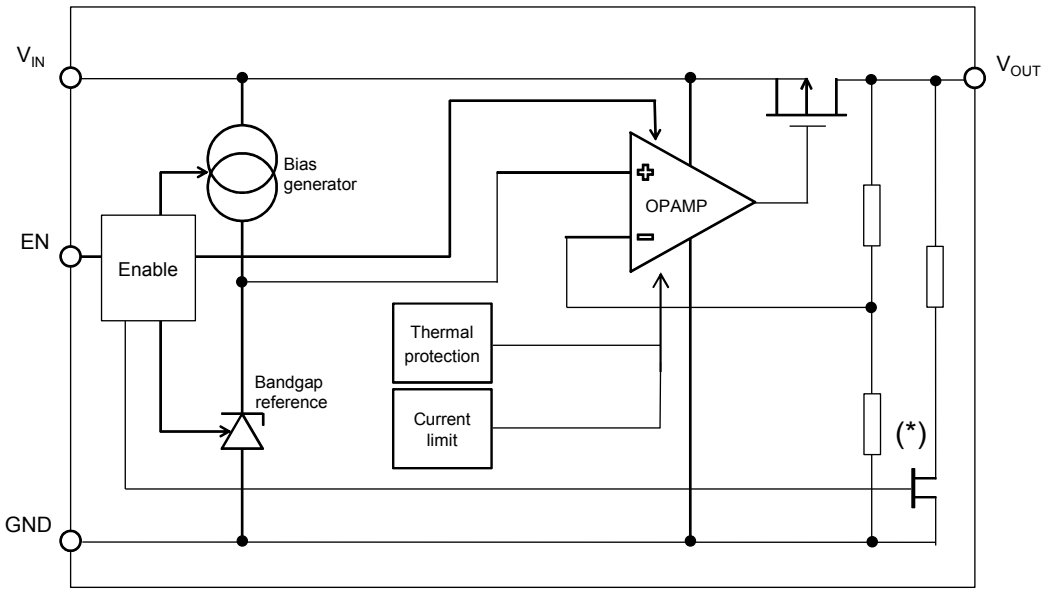
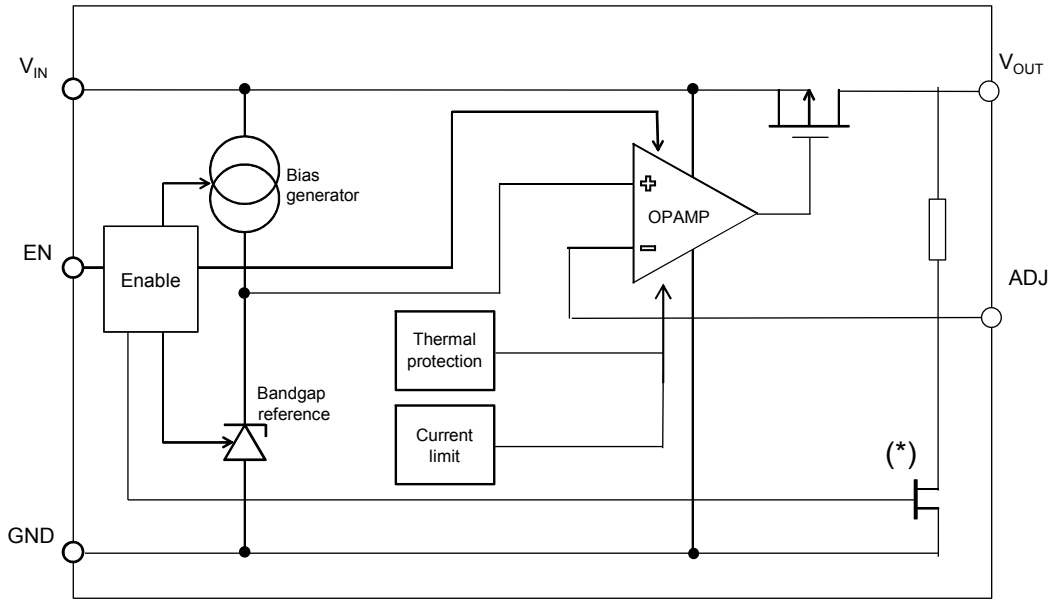



**Figure 2. Block diagram (adjustable version)**




(*) The device embeds autodischarge function (active when Enable in low). To avoid damages to the discharge function, we discourage to apply any external voltage to $V_{OUT}$ pin when Enable pin is low.

# 2 Pin configuration

**Figure 3. Pin connections (top view)**

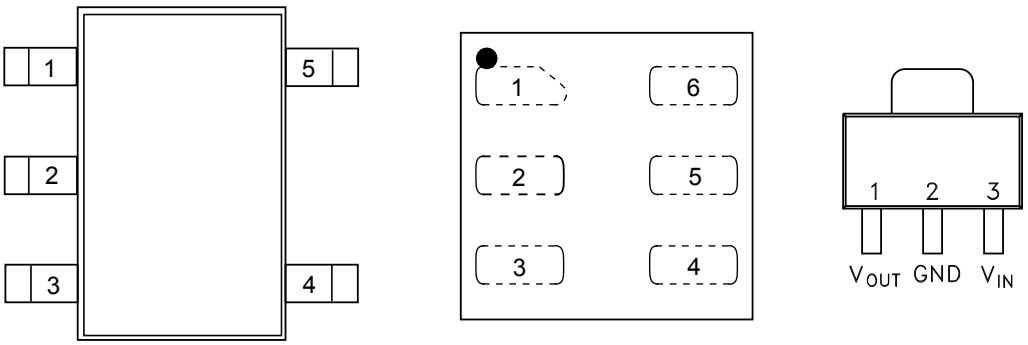



**Table 1. Pin description (SOT23-5L, SOT323-5L)**

| Pin n° | Symbol | Function |
|---|---|---|
| 1 | IN | Input voltage of the LDO |
| 2 | GND | Common ground |
| 3 | EN | Enable pin logic input: low = shutdown, high = active.<br>EN cannot be left floating. |
| 4 | ADJ/NC | Adjustable pin on ADJ version, not connected on fixed version |
| 5 | OUT | Output voltage of the LDO |

**Table 2. Pin description (DFN6)**

| Pin n° | Symbol | Function |
|---|---|---|
| 1 | OUT | Output voltage of the LDO |
| 2 | N/C | Not connected |
| 3 | ADJ/NC | Adjustable pin on ADJ version, not connected in fixed version |
| 4 | EN | Enable pin logic input: low = shutdown, high = active<br>EN cannot be left floating. |
| 5 | GND | Common ground |
| 6 | IN | Input voltage of the LDO |

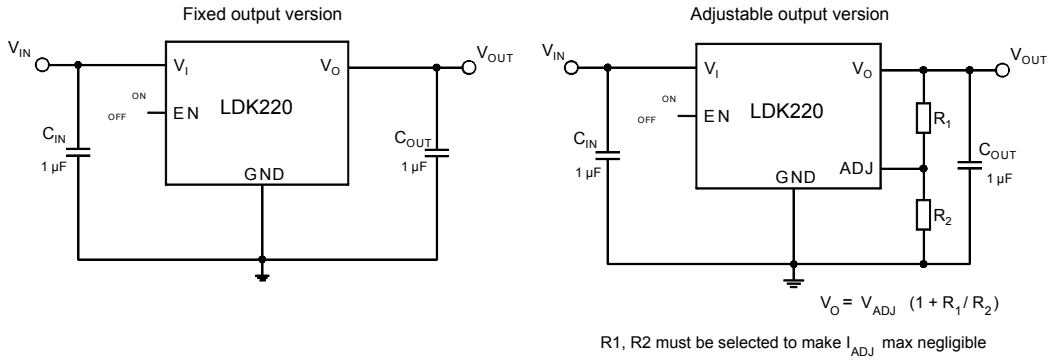
**Table 3. Pin description (SOT-89)**

| Pin n° (1) | Symbol | Function |
|---|---|---|
| 1 | OUT | Output voltage of the LDO |
| 2 | GND | Common ground |
| 3 | IN | Input voltage of the LDO |

1. *Adjustable version and enable pin are not available on the SOT-89 package.*

# 3 Typical application

**Figure 4. Typical application circuits**




*Note: Adjustable version and enable pin are not available on the SOT-89 package.*

# 4 Maximum ratings

**Table 4. Absolute maximum ratings**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{IN}$ | DC input voltage | - 0.3 to 14 | V |
| $V_{OUT}$ | DC output voltage | - 0.3 to VI + 0.3 | V |
| $V_{EN}$ | Enable input voltage | - 0.3 to VI + 0.3 | V |
| $V_{ADJ}$ | ADJ pin voltage | - 0.3 to 2 | V |
| $I_{OUT}$ | Output current | Internally limited | mA |
| $P_D$ (1) | Power dissipation | 500 | mW |
| $T_{STG}$ | Storage temperature range | - 65 to 150 | °C |
| $T_{OP}$ | Operating junction temperature range | - 40 to 125 | °C |

1. *Maximum power dissipation has to be calculated taking into account the package thermal performance.*

*Note: Absolute maximum ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. All values are referred to GND.*

**Table 5. Thermal data**

| Symbol | Parameter | SOT23-5L | SOT323-5L | SOT-89 | DFN-6 | Unit |
|---|---|---|---|---|---|---|
| $R_{thJA}$ | Thermal resistance junction-ambient | 160 | 246 | 110 | 237 | °C/W |
| $R_{thJC}$ | Thermal resistance junction-case | 68 | 134 | 15 | 104 | °C/W |

*Note: JESD 51, 4 LAYERS 2S2P.*

# 5 Electrical characteristics

**Table 6. LDK220 electrical characteristics for fixed output version. $T_J$ = 25 °C, $V_{IN}$ = $V_{OUT(NOM)}$ + 1 V, $C_{IN}$ = $C_{OUT}$ = 1 µF, $I_{OUT}$ = 1 mA, $V_{EN}$ = $V_{IN}$, unless otherwise specified.**

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{IN}$ | Operating input voltage | | 2.5 | | 13.2 | V |
| $V_{OUT}$ | $V_{OUT}$ accuracy | $I_{OUT}$ = 1 mA, $T_J$ = 25 °C | -2 | | 2 | % |
| | | $I_{OUT}$ = 1 mA, -40 °C < $T_J$ < 125 °C | -3 | | 3 | % |
| $\Delta V_{OUT}$ | Static line regulation | $V_{OUT}$ + 1 V ≤ $V_{IN}$ ≤ 13.2 V, $I_{OUT}$ = 1 mA | | 0.001 | 0.05 | %/V |
| $\Delta V_{OUT}$ | Static load regulation | $I_{OUT}$ = 1 mA to 200 mA | | 0.001 | 0.003 | %/mA |
| $V_{DROP}$ | Dropout voltage (1) | $I_{OUT}$ = 100 mA, $V_{OUT}$ = 3.3 V | | 100 | | mV |
| | | $I_{OUT}$ = 200 mA, $V_{OUT}$ = 3.3 V<br>40 °C < $T_J$ < 125 °C | | 200 | 350 | |
| $e_N$ | Output noise voltage | 10 Hz to 100 kHz, $I_{OUT}$ = 10 mA | | 20 | | $\mu V_{RMS}/V$ |
| SVR | Supply voltage rejection | $V_{IN}$ = $V_{OUTNOM}$+ 0.5 V+/-$V_{RIPPLE}$<br>$V_{RIPPLE}$ = 0.1 V<br>frequency = 120 Hz to 1 kHz<br>$I_{OUT}$ = 10 mA | | 55 | | dB |
| | | $V_{IN}$ = $V_{OUTNOM}$ + 0.5 V+/-$V_{RIPPLE}$ $I_{OUT}$ = 10 mA<br>$V_{RIPPLE}$ = 0.1 V<br>frequency = 10 kHz | | 50 | | |
| $I_Q$ | Quiescent current | $V_{IN}$ = $V_{OUT}$ +1 V<br>$I_{OUT}$ = 0 mA,-40 °C < $T_J$ < 125 °C | | 55 | 90 | µA |
| | | $V_{OUT}$ +1 V ≤ $V_{IN}$ ≤ 13.2 V (2)<br>$I_{OUT}$ = 200 mA,-40 °C < $T_J$ < 125 °C | | 60 | 100 | |
| | | $V_{IN}$ input current in off mode: $V_{EN}$ = GND, $T_J$ = 25 °C | | 0.1 | 1 | |
| $I_{SC}$ | Short-circuit current (2) | $R_L$ = 0 | | 400 | | mA |
| $V_{EN}$ | Enable input logic low | $V_{IN}$ = 2.5 V to 13.2 V, -40 °C < $T_J$ < 125 °C | | | 0.4 | V |
| | Enable input logic high | $V_{IN}$ = 2.5 V to 13.2 V, -40 °C < $T_J$ < 125 °C | 1.2 | | | |
| $I_{EN}$ | Enable pin input current | $V_{EN}$ = $V_{IN}$ | | 0.1 | 100 | nA |
| Rdis | Discharger resistor | $V_{EN}$ = 0 | | 18 | | Ω |
| $T_{SHDN}$ | Thermal shutdown | | | 160 | | °C |
| | Hysteresis | | | 20 | | |
| $C_{OUT}$ | Output capacitor | Capacitance (see Section 6 Typical characteristics) | 1 | | 22 | µF |

1. *Dropout voltage is the input-to-output voltage difference at which the output voltage is 100 mV below its nominal value.*
2. *The maximum current has to be limited according to the maximum power dissipation.*

**Table 7. LDK220 electrical characteristics for adjustable version. $T_J$ = 25 °C, $V_{IN}$ = $V_{OUT(NOM)}$ + 1 V, $C_{IN}$ = $C_{OUT}$ = 1 µF, $I_{OUT}$ = 1 mA, $V_{EN}$ = $V_{IN}$, unless otherwise specified.**

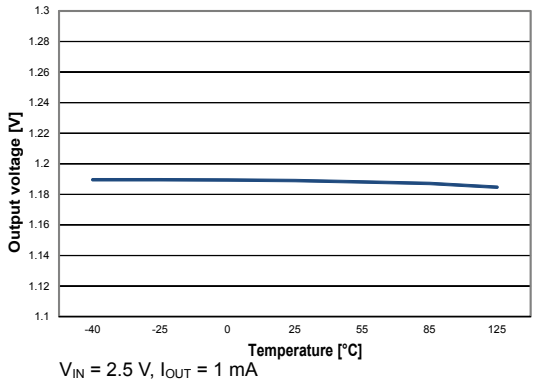
| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{IN}$ | Operating input voltage | | 2.5 | | 13.2 | V |
| $V_{ADJ}$ | Adjustable voltage | $T_J$ = 25 °C | | 1.185 | | V |
| | Adjustable voltage accuracy | $T_J$ = 25 °C | -2 | | +2 | % |
| | | 40 °C < $T_J$ < 125 °C | -3 | | +3 | |
| $\Delta V_{OUT}$ | Static line regulation | $V_{OUT}$ +1 V ≤ $V_{IN}$ ≤ 13.2 V $I_{OUT}$=1 mA | | 0.001 | 0.05 | %/V |
| $\Delta V_{OUT}$ | Static load regulation | $I_{OUT}$ = 1 mA to 200 mA | | 0.0002 | 0.003 | %/mA |
| $V_{DROP}$ | Dropout voltage (1) | $I_{OUT}$ = 100 mA, $V_{OUT}$ = 3.3 V | | 100 | | |
| | | $I_{OUT}$ = 200 mA, $V_{OUT}$ = 3.3 V<br>40 °C < $T_J$ < 125 °C | | 200 | 350 | mV |
| $e_N$ | Output noise voltage | 10 Hz to 100 kHz, $I_{OUT}$ = 10 mA | | 100 | | $\mu V_{RMS}/V$ |
| $I_{ADJ}$ | Adjust pin current | | | | 1 | µA |
| SVR | Supply voltage rejection | $V_{IN}$ = $V_{OUTNOM}$ + 0.5 V+/-$V_{RIPPLE}$<br>$V_{RIPPLE}$ = 0.1 V<br>frequency = 120 Hz to1 kHz, $I_{OUT}$ = 10 mA | | 60 | | dB |
| | | $V_{RIPPLE}$ = 0.1 V $V_{IN}$ = $V_{OUTNOM}$+0.5 V+/-$V_{RIPPLE}$ frequency = 10 kHz, $I_{OUT}$ = 10 mA | | 45 | | |
| $I_Q$ | Quiescent current | $V_{OUT}$ +1 V ≤ $V_{IN}$ ≤ 13.2 V $I_{OUT}$ = 0 mA, -40 °C < $T_J$ < 125 °C | | 55 | 90 | µA |
| | | $V_{OUT}$ +1 V ≤ $V_{IN}$ ≤ 13.2 V $I_{OUT}$ = 200 mA,-40 °C < $T_J$ < 125 °C (2) | | 60 | 100 | |
| | | $V_{IN}$ input current in off mode: $V_{EN}$ = GND,$T_J$ = 25 °C | | 0.1 | 1 | |
| $I_{SC}$ | Short-circuit current (2) | $R_L$ = 0 | | 400 | | mA |
| $V_{EN}$ | Enable input logic low | $V_{IN}$ = 2.5 V to 13.2 V -40 °C < $T_J$ < 125 °C | | | 0.4 | V |
| | Enable input logic high | $V_{IN}$ = 2.5 V to 13.2 V -40 °C < $T_J$ < 125 °C | 1.2 | | | |
| $I_{EN}$ | Enable pin input current | $V_{EN}$ = $V_{IN}$ | | 0.1 | 100 | nA |
| $T_{SHDN}$ | Thermal shutdown | | | 160 | | °C |
| | Hysteresis | | | 20 | | |
| $C_{OUT}$ | Output capacitor | Capacitance (see Section 6 Typical characteristics) | 1 | | 22 | µF |

1. *Dropout voltage is the input-to-output voltage difference at which the output voltage is 100 mV below its nominal value.*
2. *The maximum current has to be limited according to the maximum power dissipation.*

# 6 Typical performance characteristics

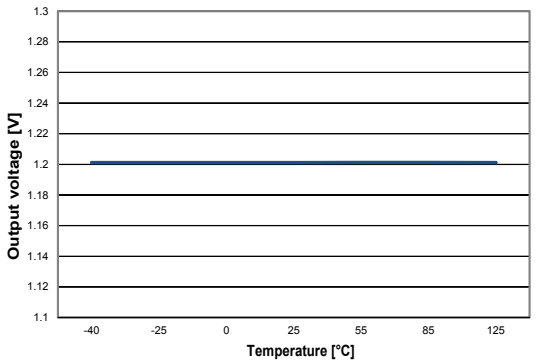
($C_{IN}$ = $C_{OUT}$ = 1 µF, $V_{EN}$ to $V_{IN}$)

**Figure 5. Output voltage vs. temperature ($V_{OUT}$ = $V_{ADJ}$, $I_{OUT}$ = 1 mA)**



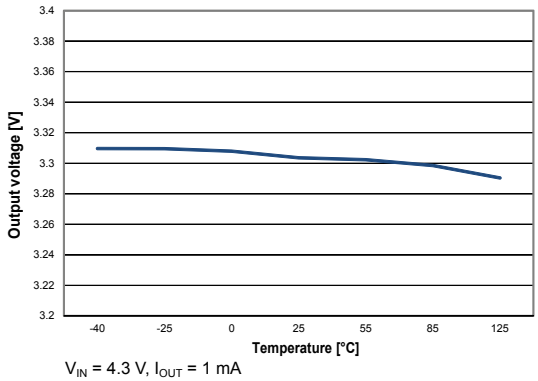

$V_{IN}$ = 2.5 V, $I_{OUT}$ = 1 mA

**Figure 6. Output voltage vs. temperature ($V_{OUT}$ = $V_{ADJ}$, $I_{OUT}$ = 200 mA)**



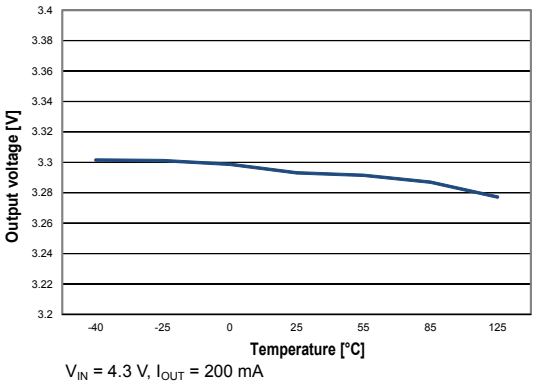

$V_{IN}$ = 2.5 V, $I_{OUT}$ = 200 mA

**Figure 7. Output voltage vs. temperature ($V_{OUT}$ = 3.3 V, $I_{OUT}$ = 1 mA)**



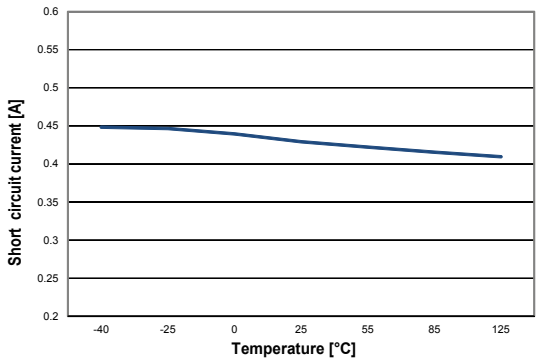

$V_{IN}$ = 4.3 V, $I_{OUT}$ = 1 mA

**Figure 8. Output voltage vs. temperature ($V_{OUT}$ = 3.3 V, $I_{OUT}$ = 200 mA)**



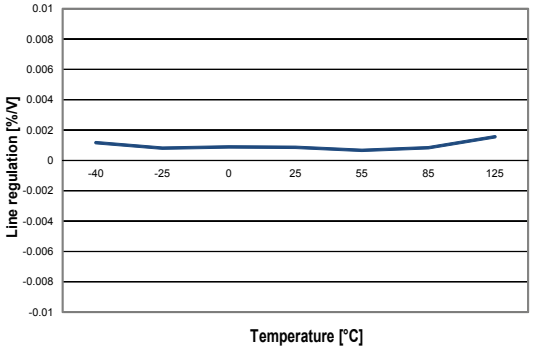

$V_{IN}$ = 4.3 V, $I_{OUT}$ = 200 mA

**Figure 9. Short-circuit current vs. temperature**



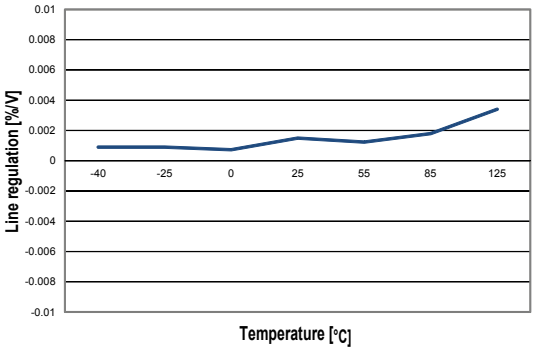

$V_{IN}$ = 4 V

**Figure 10. Line regulation vs. temperature ($V_{OUT}$ = 3.3 V)**



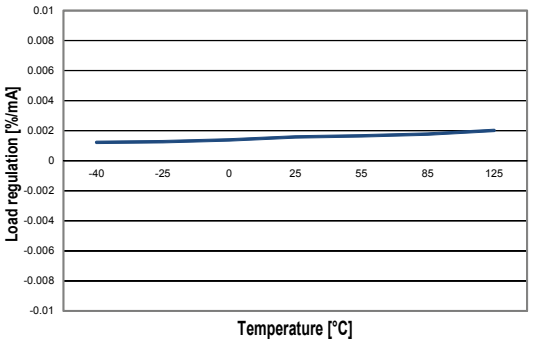

$V_{OUT}$ = 3.3 V, $I_{OUT}$ = 1 mA

**Figure 11. Line regulation vs. temperature ($V_{OUT}$ = $V_{ADJ}$)**



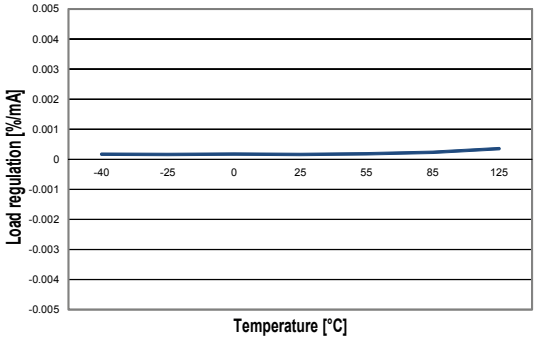

$V_{OUT}$ = $V_{ADJ}$, $I_{OUT}$ = 1 mA

**Figure 12. Load regulation vs. temperature ($V_{OUT}$ = 3.3 V)**



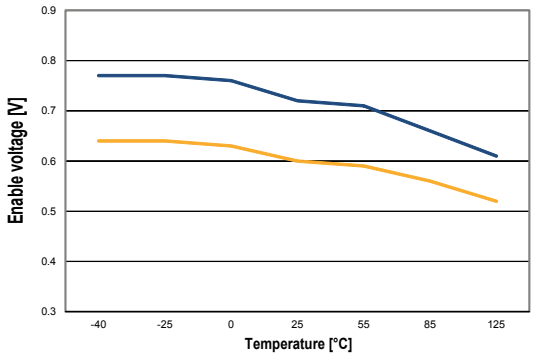

$V_{OUT}$ = 3.3 V, $I_{OUT}$ = 1 mA to 200 mA

**Figure 13. Load regulation vs. temperature ($V_{OUT}$ = $V_{ADJ}$)**



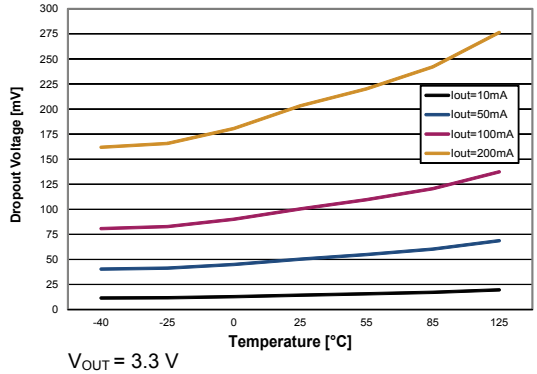

$I_{OUT}$ = 1 mA to 200 mA

**Figure 14. Enable thresholds vs. temperature**




$I_{OUT}$ = 1 mA

**Figure 15. Dropout voltage vs. temperature**




$V_{OUT}$ = 3.3 V

**Figure 16. Quiescent current vs. temperature ($I_{OUT}$ = 0 mA)**

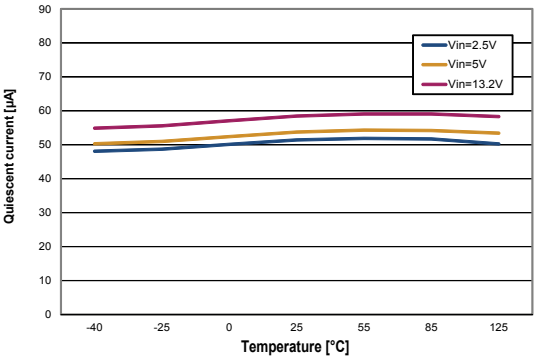


**Figure 17. Quiescent current vs. temperature ($I_{OUT}$ = 200 mA)**

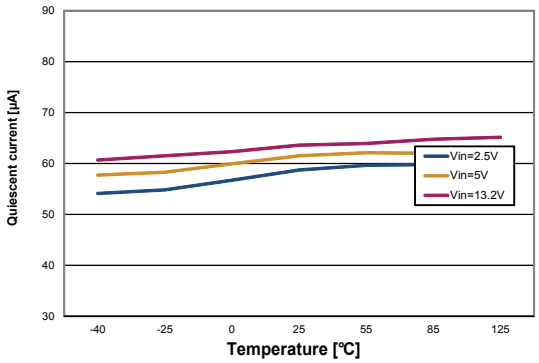



**Figure 18. Off-state current vs. temperature**

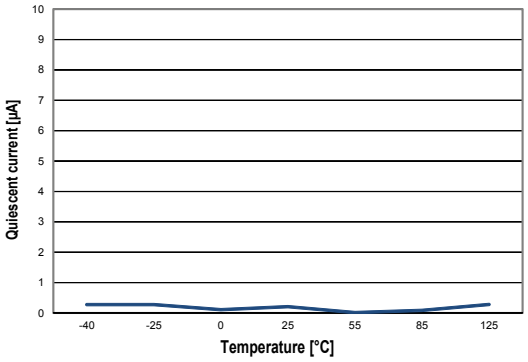
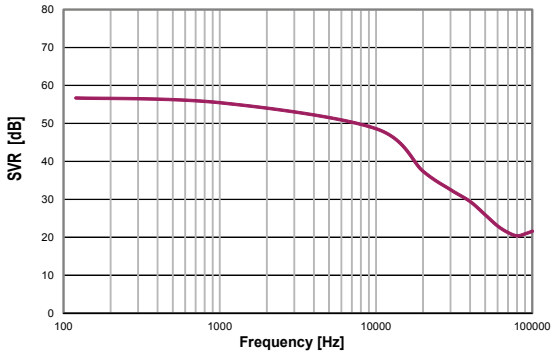
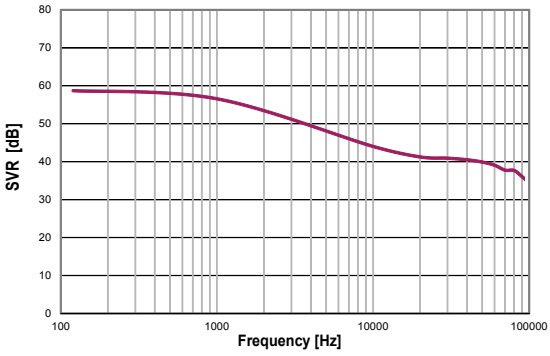



**Figure 19. SVR vs. frequency ($V_{OUT}$ = 3.3 V)**



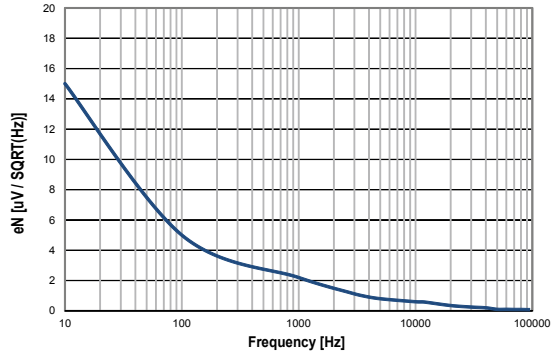

$V_{IN}$ = 3.7 V +/-100 mV, $V_{OUT}$ = 3.3 V, $C_{OUT}$ = 1 µF

**Figure 20. SVR vs. frequency ($V_{OUT}$ = $V_{ADJ}$)**



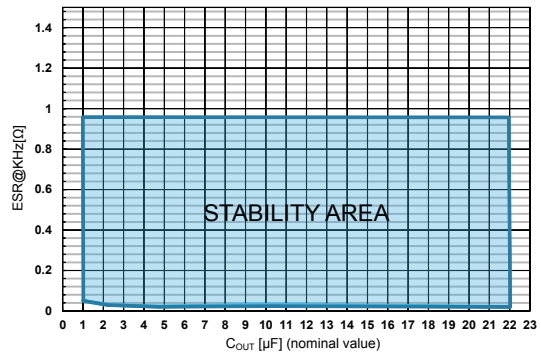

$V_{IN}$ = 2.5 V +/- 100 mV, $V_{OUT}$ = $V_{ADJ}$, $C_{OUT}$ = 1 µF

**Figure 21. Output noise spectral density**



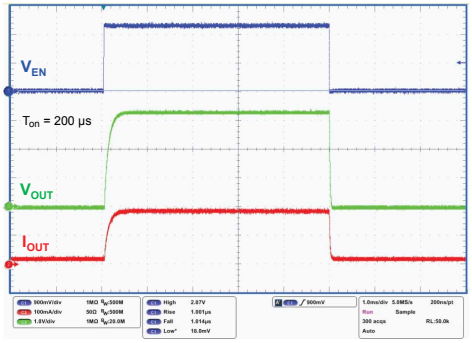

$V_{OUT}$ = 3.3 V, $C_{IN}$ = $C_{OUT}$ = 1 µF

**Figure 22. Stability vs. ($C_{OUT}$, ESR)**




$V_{IN}$ from 2.5 to 13.2 V, $I_{OUT}$ from 0 to 200 mA, $C_{IN}$ = 1 µF

**Figure 23. Startup with enable ($V_{OUT}$ = 3.3 V)**




$V_{IN}$ = 4.3 V, $V_{EN}$ = 0 V to 2 V, $I_{OUT}$ = 0.2 A, $V_{OUT}$ = 3.3 V, $T_r$ = $T_f$ = 1 µs

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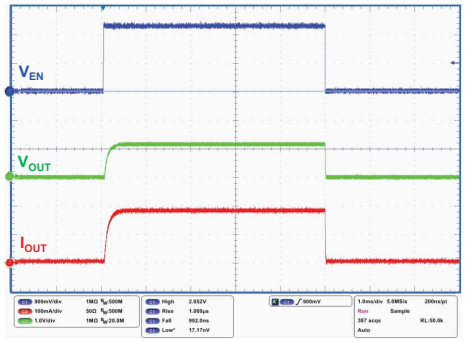
**Figure 24. Startup with enable ($V_{OUT}$ = $V_{ADJ}$)**




$V_{IN}$ = 2.5 V, $V_{EN}$ = 0 V to $V_{IN}$, $I_{OUT}$ = 0.2 A, $V_{OUT}$ = $V_{ADJ}$, $T_r$ = $T_f$ = 1 µs

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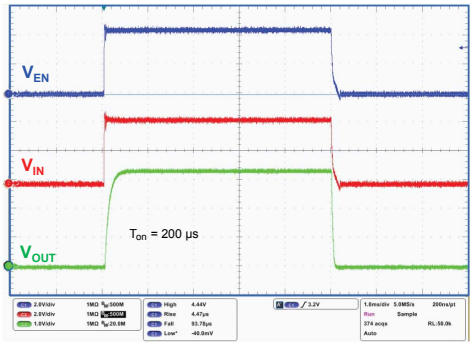
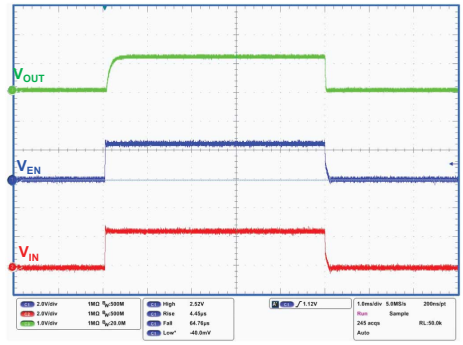
**Figure 25. Turn-on time ($V_{OUT}$ = 3.3 V)**




$V_{IN}$ = $V_{EN}$ = 0 V to 4.3 V, $I_{OUT}$ = 0.2 A, $V_{OUT}$ = 3.3 V, $T_r$ = 5 µs

GIPD250120161428MT

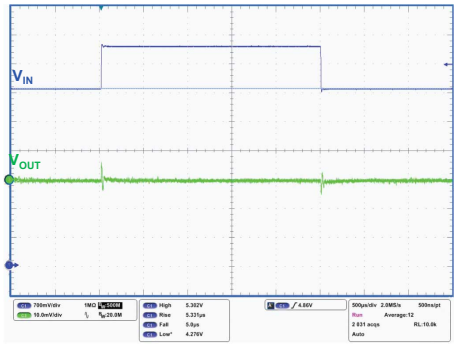
**Figure 26. Turn-on time ($V_{OUT}$ = $V_{ADJ}$)**




$V_{IN}$ = $V_{EN}$ = 0 V to 2.5 V, $I_{OUT}$ = 0.2 A, $V_{OUT}$ = $V_{ADJ}$, Tr = 5 µs

GIPD250120161429MT

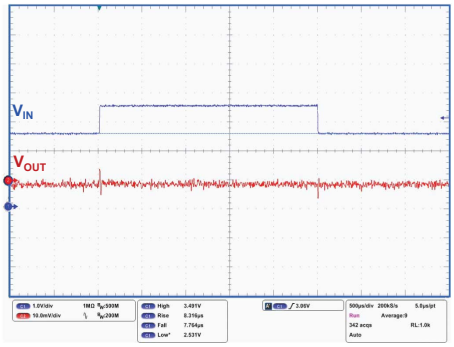
**Figure 27. Line transient ($V_{OUT}$ = 3.3 V)**




$V_{IN}$ = $V_{EN}$ = 4.3 V to 5.3 V, $I_{OUT}$ = 1 mA, $V_{OUT}$ = 3.3 V, $T_r$ = $T_f$ = 5 µs

GIPD250120161430MT

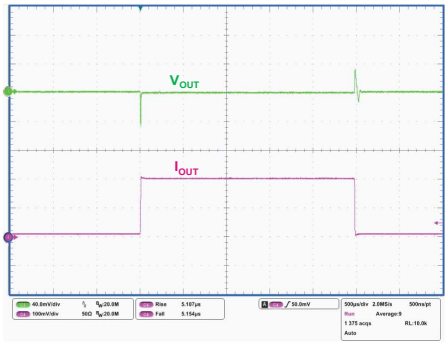
**Figure 28. Line transient ($V_{OUT}$ = $V_{ADJ}$)**




$V_{IN}$ = $V_{EN}$ = 2.5 V to 3.5 V, $I_{OUT}$ = 1 mA, $V_{OUT}$ = $V_{ADJ}$, $T_r$ = $T_f$ = 5 µs

GIPD250120161431MT

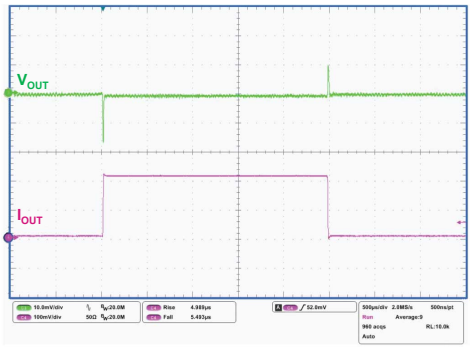
**Figure 29. Load transient ($V_{OUT}$ = 3.3 V)**




$V_{IN}$ = $V_{EN}$ = 4.3 V, $I_{OUT}$ = 1 mA to 0.2 A, $V_{OUT}$ = 3.3 V, $T_r$ = $T_f$ = 5 µs

GIPD250120161432MT

**Figure 30. Load transient ($V_{OUT}$ = $V_{ADJ}$)**




$V_{IN}$ = $V_{EN}$ = 2.5 V, $I_{OUT}$ = 1 mA to 0.2 A, $V_{OUT}$ = $V_{ADJ}$, $T_r$ = $T_f$ = 5 µs

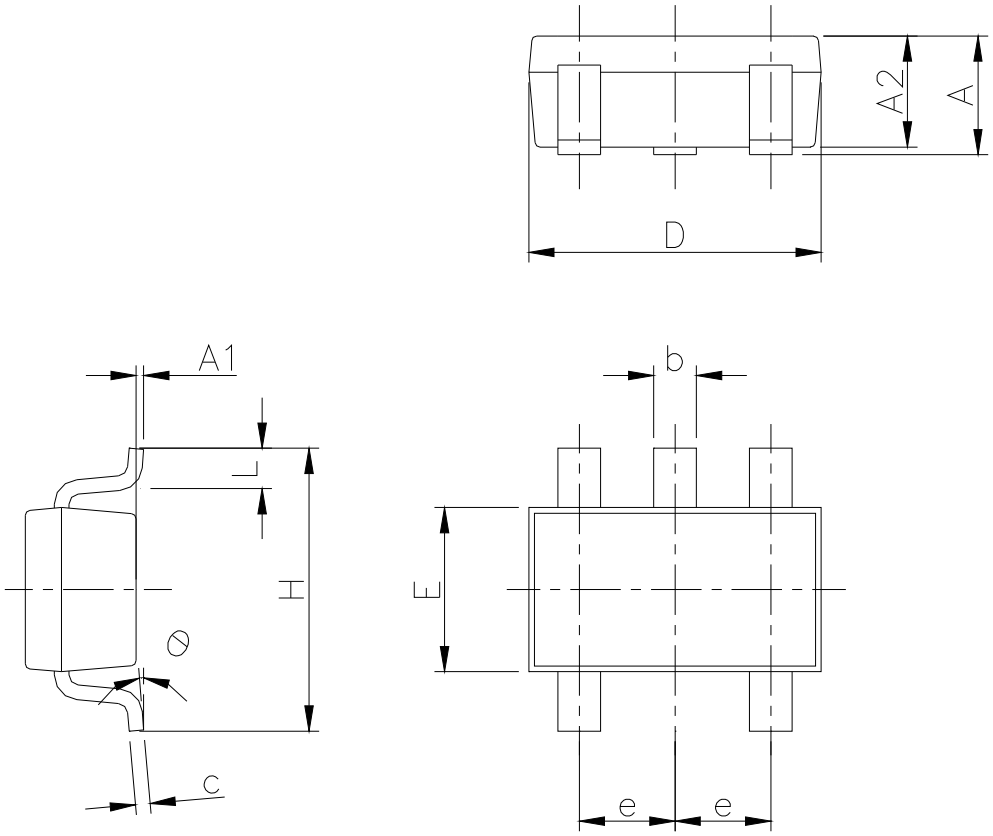
GIPD250120161433MT

# 7 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. ECOPACK is an ST trademark.

## 7.1 SOT23-5L package information

Figure 31. **SOT23-5L package outline**

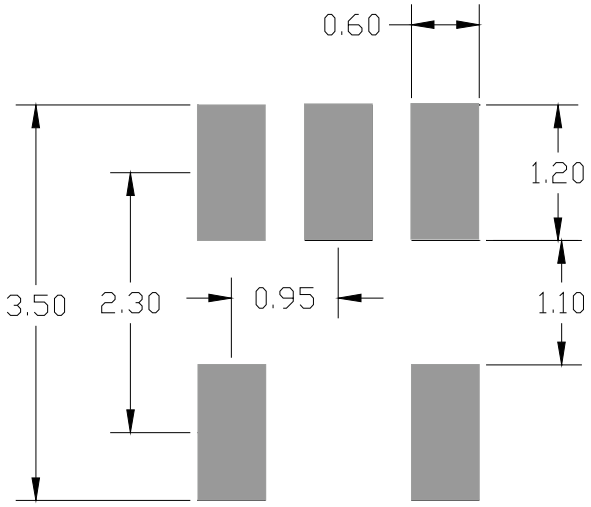



7049676_k

Table 8. **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 |
| θ | 0° | | 8° |

Figure 32. **SOT23-5L recommended footprint**




*Note: Dimensions are in mm*

## 7.2 SOT23-5L packing information

Figure 33. **SOT23-5L tape and reel outline**

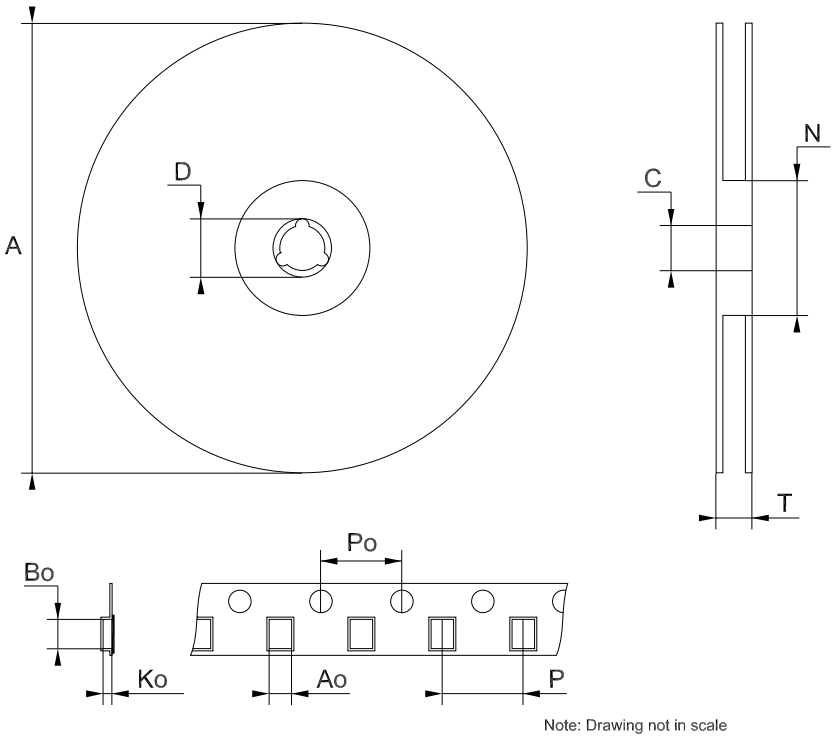


Table 9. **SOT23-5L tape and reel mechanical data**

| 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 |

## 7.3 SOT-89 package information

Figure 34. **SOT-89 package outline**

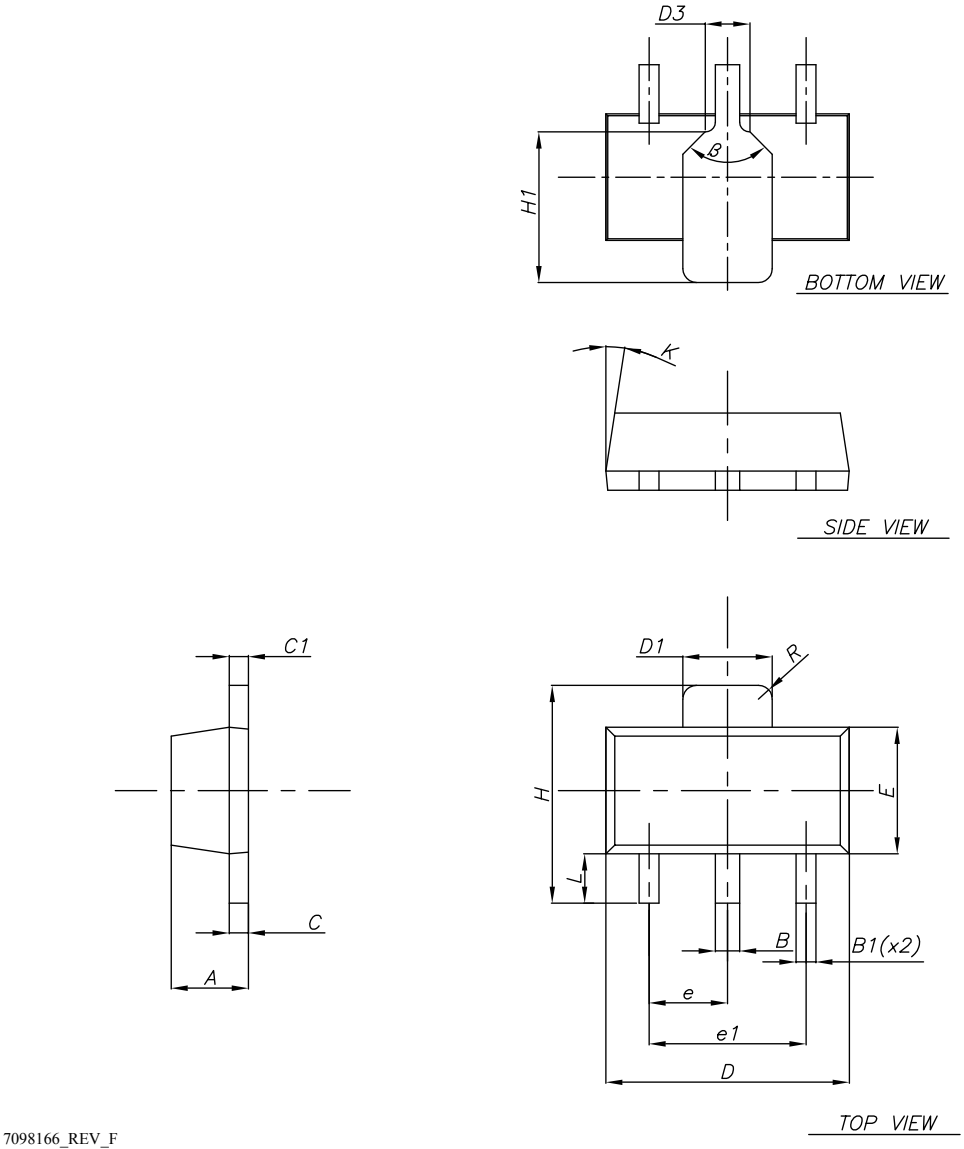
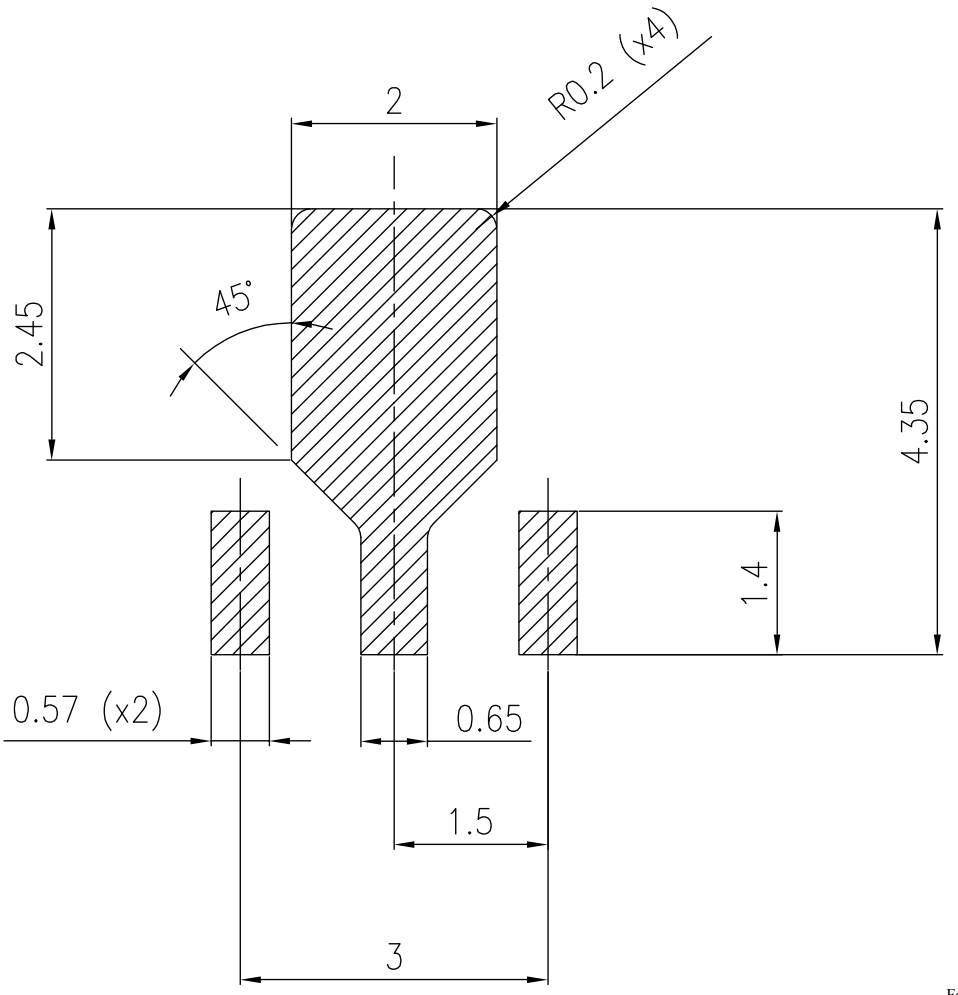


Table 10. **SOT-89 mechanical data**

| Dim. | mm | | |
|---|---|---|---|
| | Min. | Typ. | Max. |
| A | 1.40 | | 1.60 |
| B | 0.44 | | 0.56 |
| B1 | 0.36 | | 0.48 |
| C | 0.35 | | 0.44 |
| C1 | 0.35 | | 0.44 |
| D | 4.40 | | 4.60 |
| D1 | 1.62 | | 1.83 |
| D3 | | 0.90 | |
| E | 2.29 | | 2.60 |
| e | 1.42 | | 1.57 |
| e1 | 2.92 | | 3.07 |
| H | 3.94 | | 4.25 |
| H1 | 2.70 | | 3.10 |
| K | 1° | | 8° |
| L | 0.89 | | 1.20 |
| R | | 0.25 | |
| β | | 90° | |

Figure 35. **SOT-89 recommended footprint**




Footprint

## 7.4 SOT-89 packing information

Figure 36. **SOT-89 carrier tape outline**

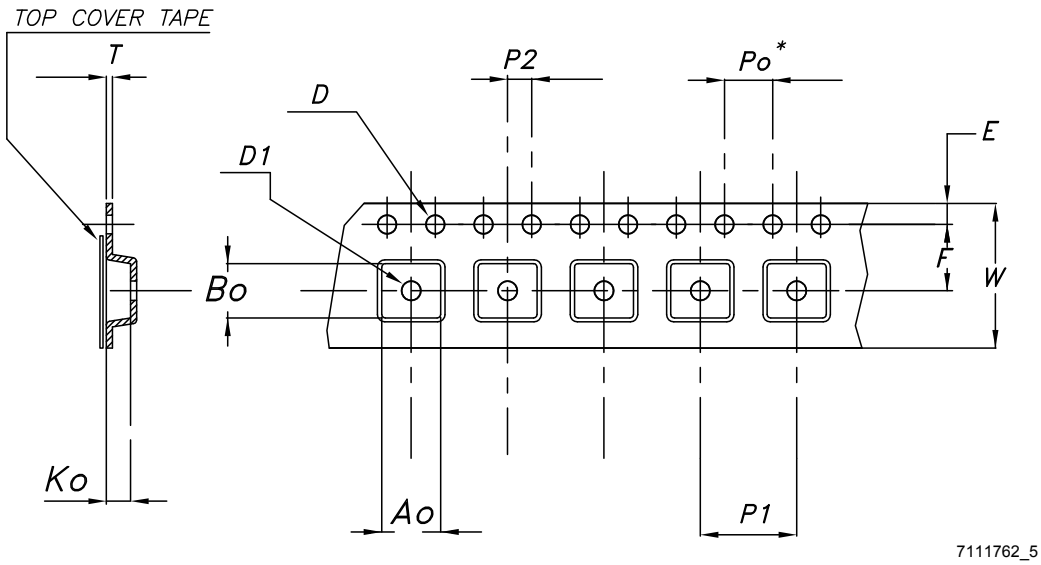



Figure 37. **SOT-89 device orientation**

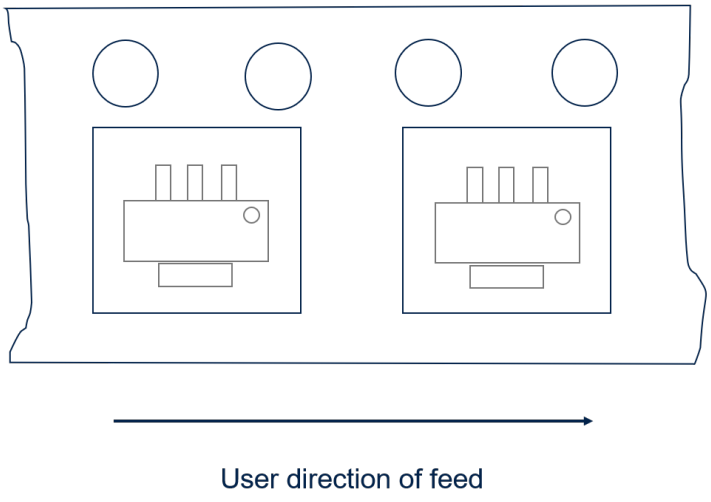
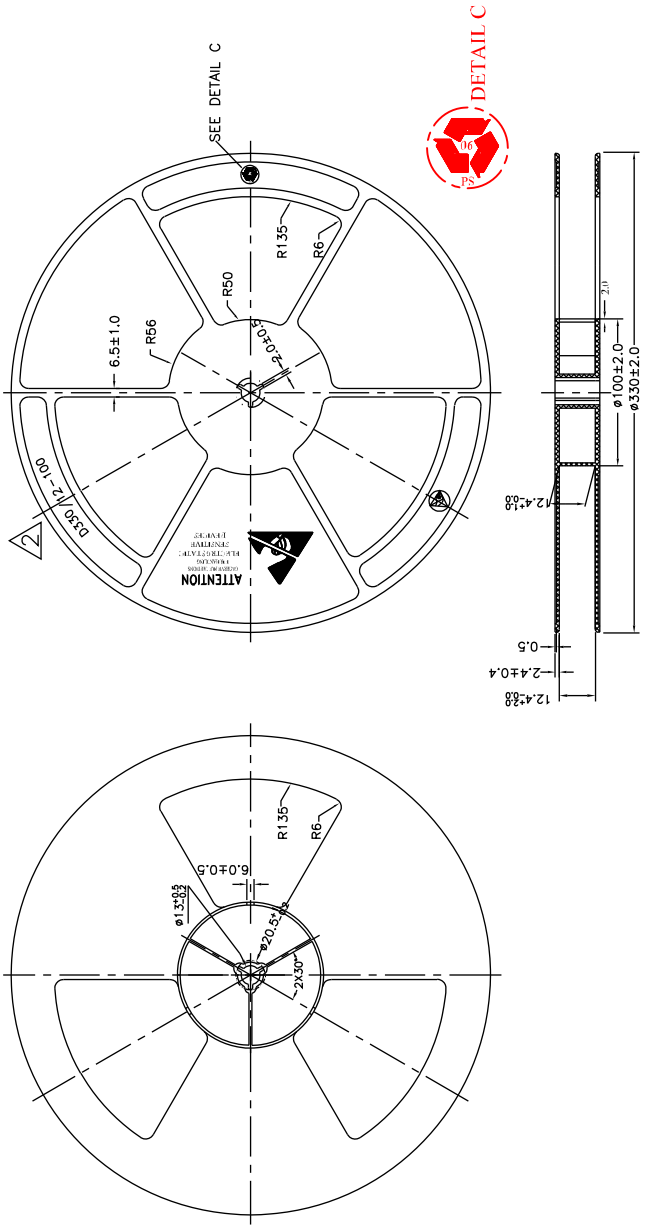


Table 11. **SOT-89 carrier tape mechanical data**

| Dim. | mm | |
|---|---|---|
| | Value | Tolerance |
| Ao | 4.91 | ± 0.10 |
| Bo | 4.52 | ± 0.10 |
| Ko | 1.90 | ± 0.10 |
| F | 5.50 | ± 0.10 |
| E | 1.75 | ± 0.10 |
| W | 12 | ± 0.30 |
| P2 | 2 | ± 0.10 |
| Po | 4 | ± 0.10 |
| P1 | 8 | ± 0.10 |
| T | 0.30 | ± 0.10 |
| D | Ø 1.55 | ± 0.05 |
| D1 | Ø 1.60 | ± 0.10 |

Figure 38. **SOT-89 reel drawing**



## 7.5 SOT323-5L package information

Figure 39. **SOT323-5L package outline**

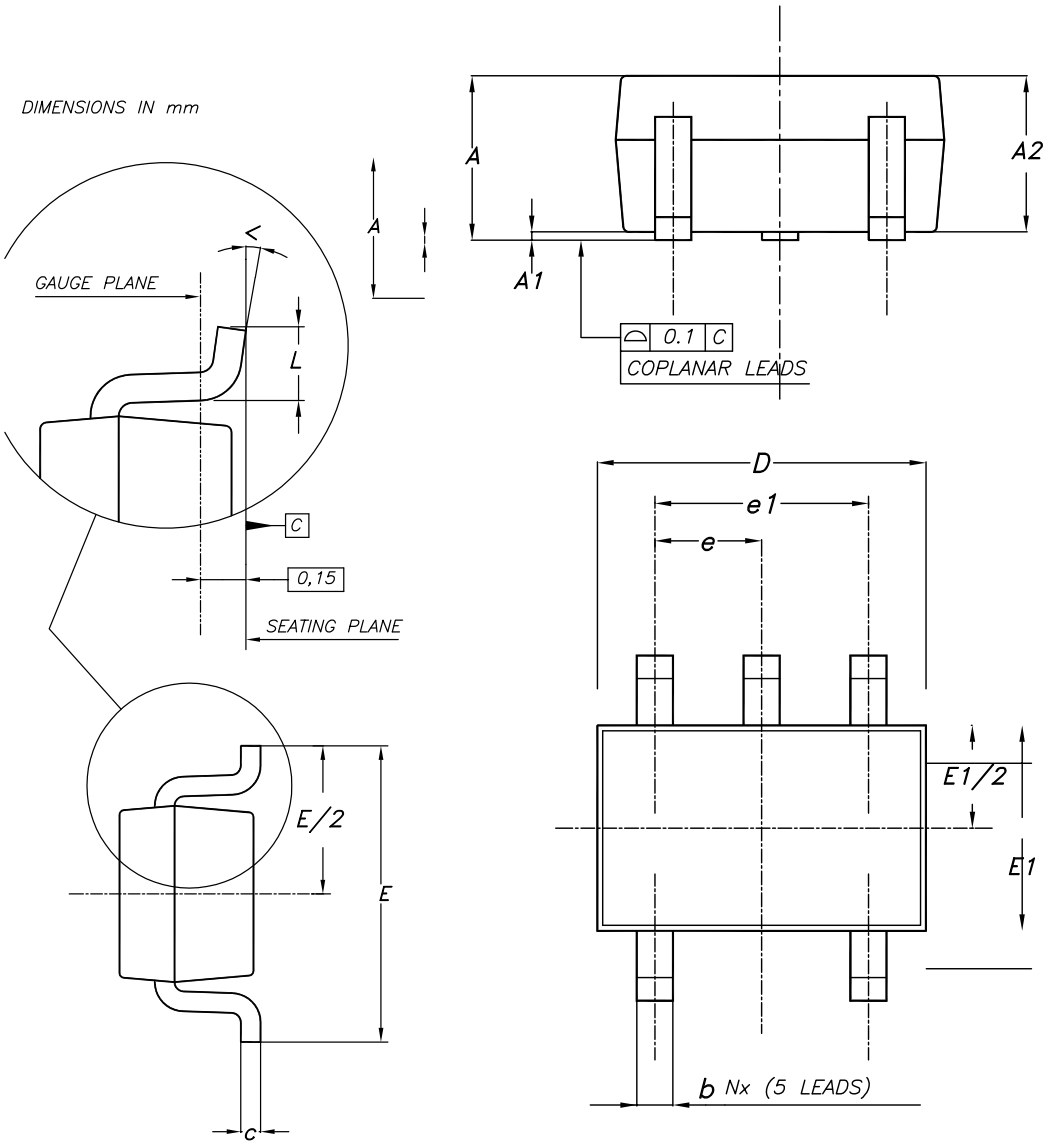
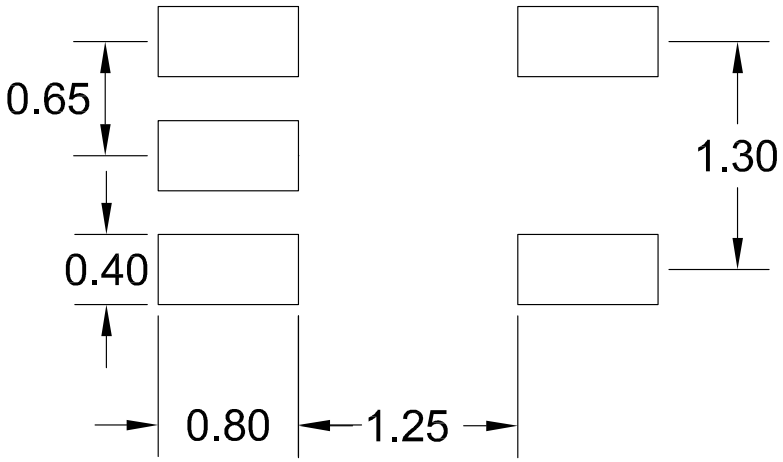


Table 12. **SOT323-5L package mechanical data**

| Dim. | mm | | |
|---|---|---|---|
| | Min. | Typ. | Max. |
| A | 0.80 | | 1.10 |
| A1 | 0 | | 0.10 |
| A2 | 0.80 | 0.90 | 1 |
| b | 0.15 | | 0.30 |
| c | 0.10 | | 0.22 |
| D | 1.80 | 2 | 2.20 |
| E | 1.80 | 2.10 | 2.40 |
| E1 | 1.15 | 1.25 | 1.35 |
| e | | 0.65 | |
| e1 | | 1.30 | |
| L | 0.26 | 0.36 | 0.46 |
| < | 0° | | 8° |

Figure 40. **SOT323-5L recommended footprint**



## 7.6 DFN6 1.2x1.3 package information

Figure 41. **DFN6 package outline**

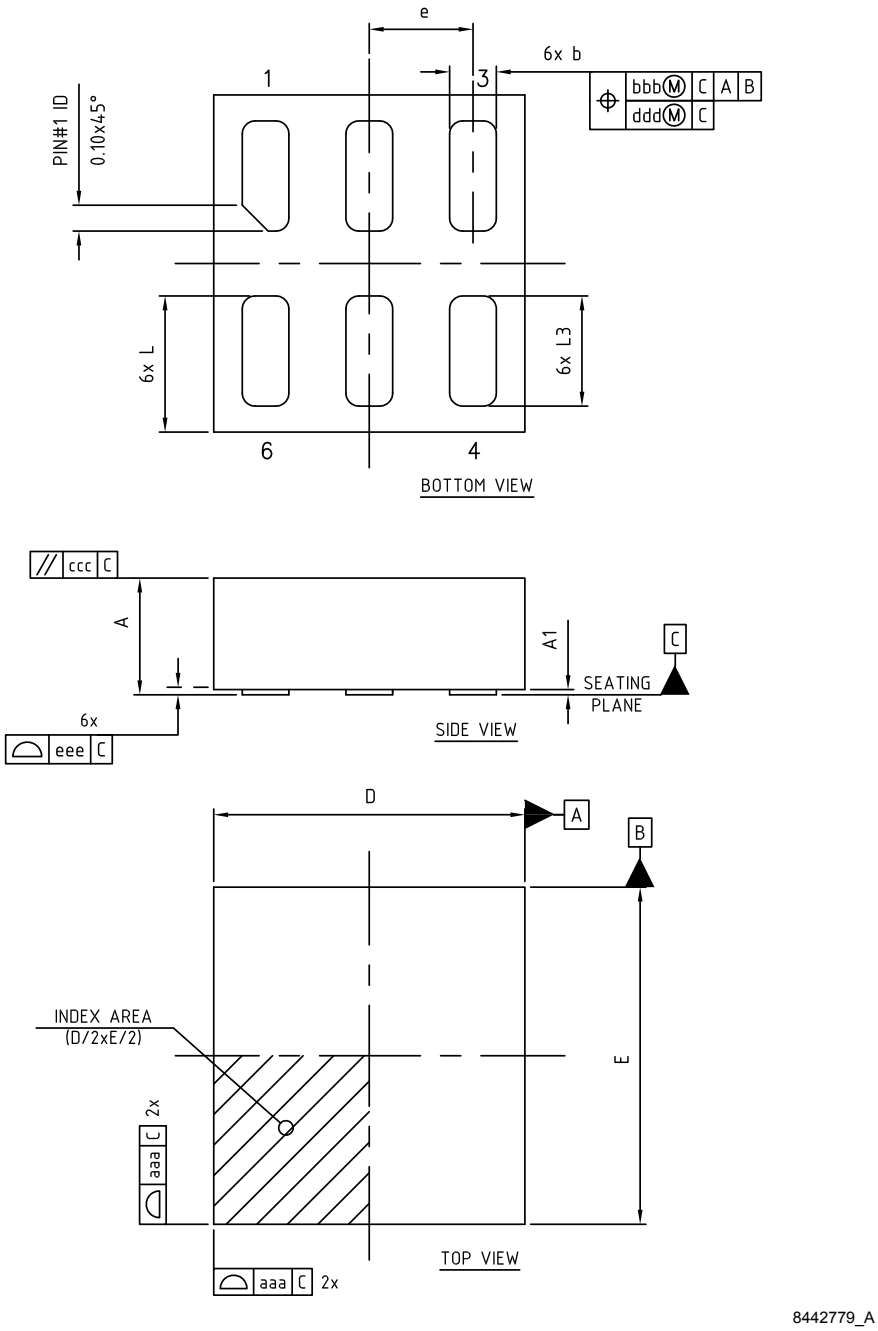
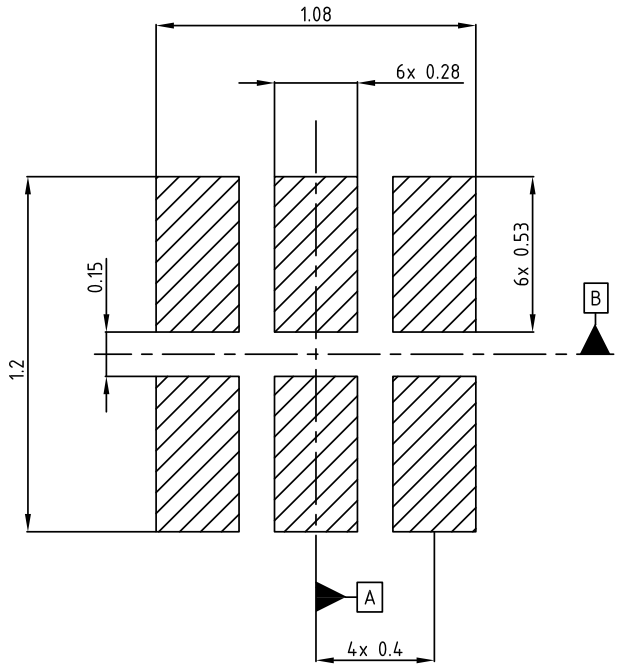


**Table 13. DFN6 package mechanical data**

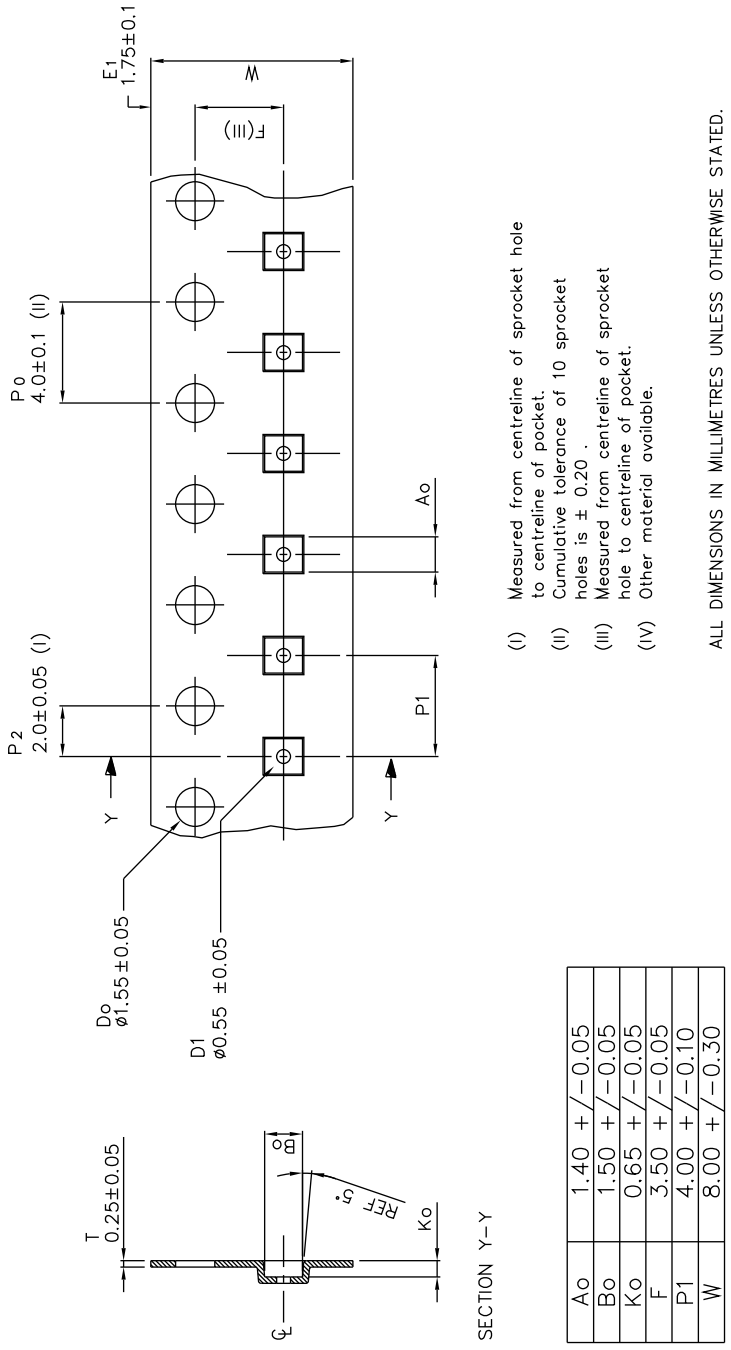
| Dim. | mm | | |
|---|---|---|---|
| | Min. | Typ. | Max. |
| A | 0.41 | 0.45 | 0.50 |
| A1 | 0.00 | 0.02 | 0.05 |
| D | - | 1.20 | - |
| E | - | 1.30 | - |
| e | - | 0.40 | - |
| b | 0.15 | 0.18 | 0.25 |
| L | 0.475 | 0.525 | 0.575 |
| L3 | 0.375 | 0.425 | 0.475 |
| aaa | - | 0.05 | - |
| bbb | - | 0.10 | - |
| ccc | - | 0.05 | - |
| ddd | - | 0.05 | - |
| eee | - | 0.05 | - |

**Figure 42. DFN6 recommended footprint**



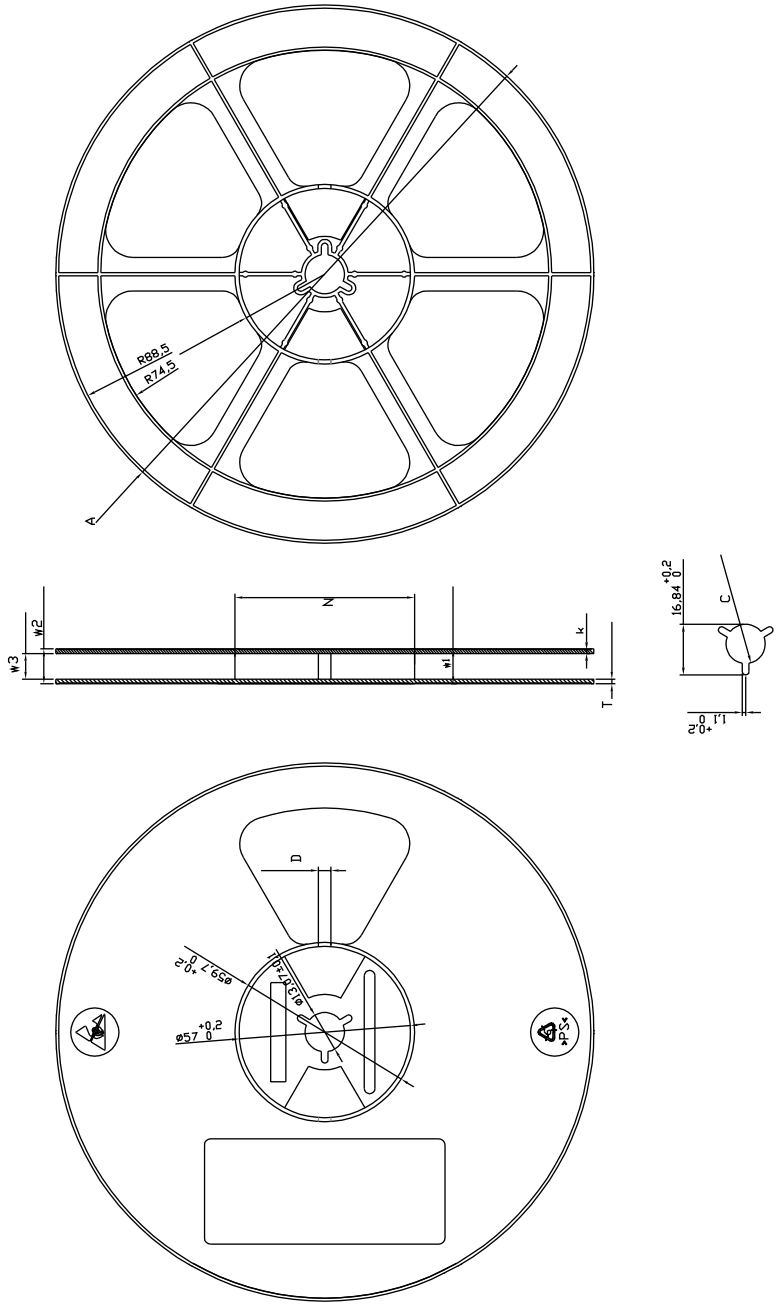
## 7.7 DFN6 packing information

Figure 43. **DFN6 reel drawing outline**



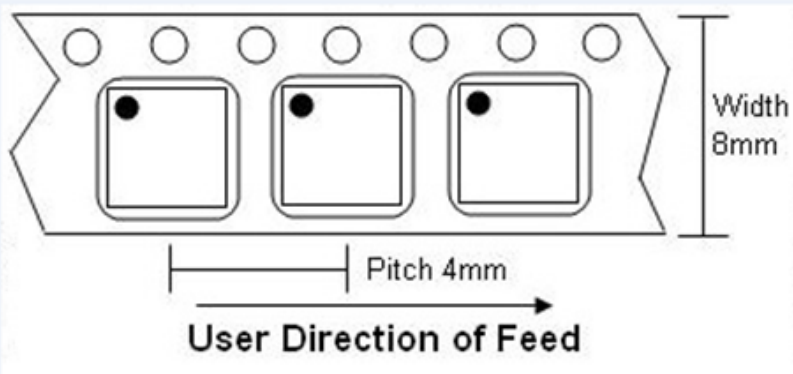

| | |
|---|---|
| Ao | 1.40 +/−0.05 |
| Bo | 1.50 +/−0.05 |
| Ko | 0.65 +/−0.05 |
| F | 3.50 +/−0.05 |
| P1 | 4.00 +/−0.10 |
| W | 8.00 +/−0.30 |

Figure 44. **DFN6 carrier tape**




| TYPE | A | N | C | D | W1 | W2 | W3 | T | K |
|---|---|---|---|---|---|---|---|---|---|
| 8MM | ø180 +2 -2 | ø60 +1 -1 | ø13.1 +0.2 -0.2 | 4.2±0.5 | 8.4 +1 -0 | 11.6 +1 -1 | 8.75 +1 -1 | 1.5±0.15 | 1.25 +0.1 -0.05 |
| 12MM | ø180 +2 -2 | ø60 +1 -1 | ø13.1 +0.2 -0.2 | 4.2±0.5 | 12.5 +1 -0 | 15.7 +1 -1 | 12.7 +1 -1 | 1.5±0.15 | 1.2±0.1 |

Figure 45. **DFN6 device orientation in tape**



# 8 Ordering information

Table 14. **Order codes**

| SOT323-5L | SOT23-5L | SOT-89 | DFN6 | Output voltage (V) |
|---|---|---|---|---|
| LDK220C25R | LDK220M25R | | LDK220PU25R | 2.5 |
| LDK220C27R | LDK220M27R | | LDK220PU27R | 2.7 |
| LDK220C30R | LDK220M30R | LDK220U30R | LDK220PU30R | 3 |
| LDK220C32R | LDK220M32R | | LDK220PU32R | 3.2 |
| LDK220C33R | LDK220M33R | LDK220U33R | LDK220PU33R | 3.3 |
| | LDK220M35R | | | 3.5 |
| LDK220C36R | LDK220M36R | LDK220U36R | LDK220PU36R | 3.6 |
| LDK220C40R | LDK220M40R | | LDK220PU40R | 4 |
| LDK220C50R | LDK220M50R | LDK220U50R | LDK220PU50R | 5 |
| LDK220C-R | LDK220M-R | | LDK220PU-R | ADJ |

## Revision history

Table 15. **Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 19-Mar-2014 | 1 | Initial release. |
| 24-Nov-2014 | 2 | Updated the features in cover page, Table 6: LDK220 electrical characteristics for fixed output version, Table 7: LDK220 electrical characteristics for adjustable version, Table 8: SOT23-5L mechanical data, and Section 6: Typical characteristics.<br>Minor text changes. |
| 19-May-2015 | 3 | Added SOT-89 package. Updated features in cover page. Updated Section 2: Pin configuration, Section 3: Typical application, Table 5: Thermal data, Section 7: Package information and Section 8: Ordering information.<br>Minor text changes. |
| 24-Oct-2016 | 4 | Updated Table 7: "LDK220 electrical characteristics for adjustable version" and Section 7: "Package information".<br>Minor text changes. |
| 20-Dec-2019 | 5 | Updated Section 1 Diagram. |
| 12-Feb-2020 | 6 | Added new part number LDK220M35R in Table 14. Order codes. |
| 05-Nov-2021 | 7 | Updated figure on the cover page, Figure 3, Figure 4, Figure 23 and Figure 25.<br>Added note in Table 5, Rdis parameter in Table 6 and Section 7.7 DFN6 packing information. |