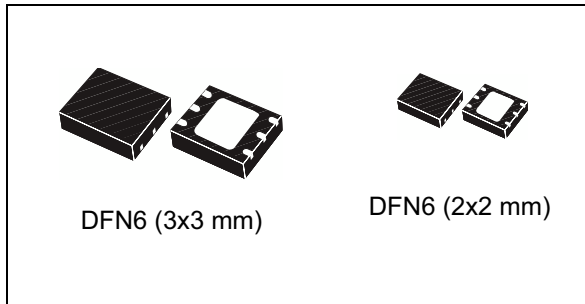


500 mA low quiescent current and low noise voltage regulator

Datasheet - production data

**Features**

- Input voltage from 1.5 to 5.5 V
- Ultra low-dropout voltage (200 mV typ. at 500 mA load)
- Very low quiescent current (20 μ A typ. at no load, 100 μ A typ. at 500 mA load, 1 μ A max. in OFF mode)
- Very low noise without bypass capacitor
- Output voltage tolerance: $\pm 2.0\%$ @ 25 $^{\circ}$ C
- 500 mA guaranteed output current
- Wide range of output voltages available on request: 0.8 V to 4.5 V with 100 mV step and adjustable from 0.8 V
- Logic-controlled electronic shutdown
- Compatible with ceramic capacitor $C_{OUT} = 1 \mu$ F
- Internal current and thermal limit
- Package DFN6 (3x3 mm) and DFN6 (2x2 mm)
- Temperature range: from -40 $^{\circ}$ C to 125 $^{\circ}$ C

Description

The LD39050 provides 500 mA maximum current with an input voltage range from 1.5 V to 5.5 V and a typical dropout voltage of 200 mV. Stability is given by ceramic capacitors. The ultra low drop voltage, low quiescent current and low noise features make it suitable for low power battery-powered applications. Power supply rejection is 65 dB at low frequencies and starts to roll off at 10 kHz. The enable logic control function puts the LD39050 in shutdown mode allowing a total current consumption lower than 1 μ A. The device also includes short-circuit constant current limiting and thermal protection. Typical applications are mobile phones, hard disks and battery-powered systems.

Contents

| | | |
|----------|--|-----------|
| 1 | Diagrams | 3 |
| 2 | Pin configuration | 4 |
| 3 | Maximum ratings | 6 |
| 4 | Electrical characteristics | 7 |
| 5 | Typical performance characteristics | 11 |
| 6 | Application information | 16 |
| | 6.1 Power dissipation | 17 |
| | 6.2 Enable function | 18 |
| | 6.3 Power Good function | 18 |
| 7 | Package information | 19 |
| | 7.1 DFN6 (3x3 mm) package information | 20 |
| | 7.2 DFN6 (3x3 mm) packing information | 22 |
| | 7.3 DFN6 (2x2 mm) package information | 24 |
| 8 | Ordering information | 26 |
| 9 | Revision history | 27 |

1 Diagrams

Figure 1. Schematic diagram for the LD39050 (adjustable)

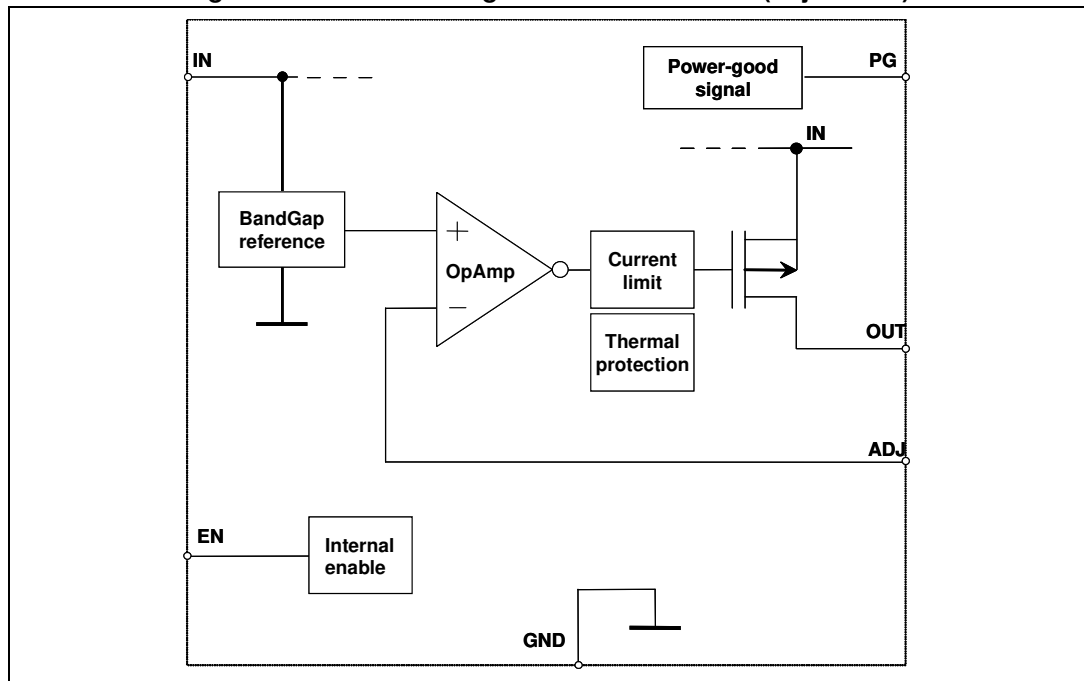
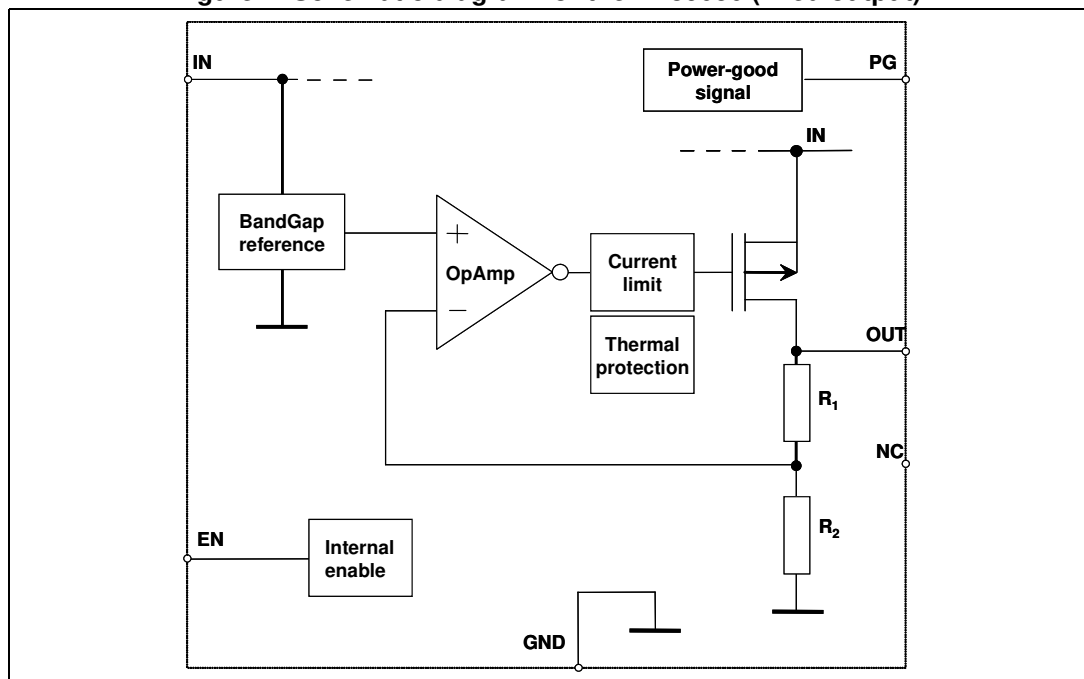


Figure 2. Schematic diagram for the LD39050 (fixed output)



2 Pin configuration

Figure 3. DFN6 (3x3 mm) pin connection (top view)

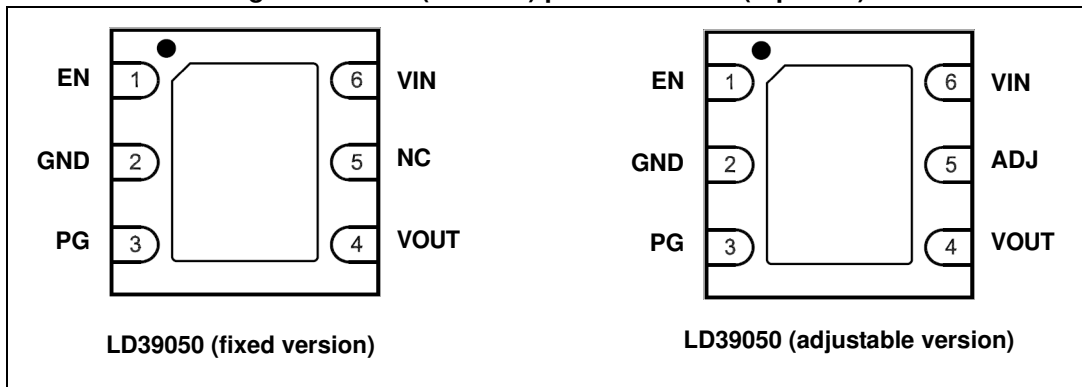


Figure 4. DFN6 (2x2 mm) pin connection (top view)

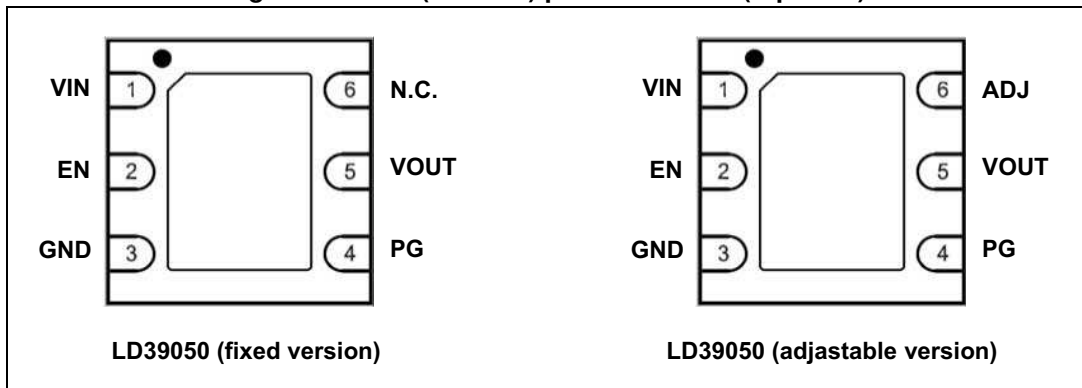


Table 1. Pin description

| Symbol | Pin n° for DFN6 (3x3 mm) | | Pin n° for DFN6 (2x2 mm) | | Function |
|--------|--------------------------|-----------------|--------------------------|-----------------|---|
| | LD39050 (adjustable) | LD39050 (fixed) | LD39050 (adjustable) | LD39050 (fixed) | |
| EN | 1 | 1 | 2 | 2 | Enable pin logic input: low = shutdown, high = active |
| GND | 2 | 2 | 3 | 3 | Common ground |
| PG | 3 | 3 | 4 | 4 | Power Good |
| VOUT | 4 | 4 | 5 | 5 | Output voltage |
| ADJ | 5 | - | 6 | - | Adjustable pin |
| VIN | 6 | 6 | 1 | 1 | Input voltage of the LDO |
| N.C. | - | 5 | - | 6 | Not connected |
| GND | Exposed pad | | Exposed pad | | Exposed pad must be connected to GND |

3 Maximum ratings

Table 2. Absolute maximum ratings

| Symbol | Parameter | Value | Unit |
|-----------|--------------------------------------|--------------------------------|------|
| V_{IN} | DC input voltage | -0.3 to 7 | V |
| V_{OUT} | DC output voltage | -0.3 to $V_I + 0.3$ (7 V max.) | V |
| EN | Enable pin | -0.3 to $V_I + 0.3$ (7 V max.) | V |
| PG | Power Good pin | -0.3 to 7 | V |
| ADJ | Adjustable pin | 4 | V |
| I_{OUT} | 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 |

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 3. Thermal data

| Symbol | Parameter | Value | | Unit |
|------------|-------------------------------------|---------------|---------------|------|
| | | DFN6 (2x2 mm) | DFN6 (3x3 mm) | |
| R_{thJA} | Thermal resistance junction-ambient | 65 | 55 | °C/W |
| R_{thJC} | Thermal resistance junction-case | 6.5 | 10 | °C/W |

Table 4. ESD performance

| Symbol | Parameter | Test conditions | Value | Unit |
|--------|------------------------|-----------------|-------|------|
| ESD | ESD protection voltage | HBM | 2 | kV |
| | | CDM | 500 | V |
| | | MM | 0.3 | kV |

4 Electrical characteristics

$T_J = 25\text{ °C}$, $V_{IN} = 1.8\text{ V}$, $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$, $I_{OUT} = 10\text{ mA}$, $V_{EN} = V_{IN}$, unless otherwise specified.

Table 5. Electrical characteristics for the LD39050 (adjustable)

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|------------------|--|---|------|-------|------|---------------------|
| V_{IN} | Operating input voltage | | 1.5 | | 5.5 | V |
| V_{ADJ} | V_{ADJ} accuracy | $I_{OUT} = 10\text{ mA}$, $T_J = 25\text{ °C}$ | 784 | 800 | 816 | mV |
| | | $I_{OUT} = 10\text{ mA}$, $-40\text{ °C} < T_J < 125\text{ °C}$ | 776 | 800 | 824 | |
| I_{ADJ} | Adjustable pin current | | | | 1 | μA |
| ΔV_{OUT} | Static line regulation | $V_{OUT} + 1\text{ V} \leq V_{IN} \leq 5.5\text{ V}$, $I_{OUT} = 1\text{ mA}$ | | 0.01 | | %/V |
| ΔV_{OUT} | Transient line regulation ⁽¹⁾ | $\Delta V_{IN} = 500\text{ mV}$, $I_{OUT} = 10\text{ mA}$, $t_R = 5\text{ }\mu\text{s}$ | | 10 | | mVpp |
| | | $\Delta V_{IN} = 500\text{ mV}$, $I_{OUT} = 10\text{ mA}$, $t_F = 5\text{ }\mu\text{s}$ | | 10 | | |
| ΔV_{OUT} | Static load regulation | $I_{OUT} = 10\text{ mA}$ to 500 mA | | 0.002 | | %/mA |
| ΔV_{OUT} | Transient load regulation ⁽¹⁾ | $I_{OUT} = 10\text{ mA}$ to 500 mA , $t_R = 5\text{ }\mu\text{s}$ | | 40 | | mVpp |
| | | $I_{OUT} = 10\text{ mA}$ to 500 mA , $t_F = 5\text{ }\mu\text{s}$ | | 40 | | |
| V_{DROP} | Dropout voltage ⁽²⁾ | $I_O = 500\text{ mA}$, V_{OUT} fixed to 1.5 V $40\text{ °C} < T_J < 125\text{ °C}$ | | 200 | 400 | mV |
| e_N | Output noise voltage | 10 Hz to 100 kHz, $I_{OUT} = 100\text{ mA}$, $V_{OUT} = 0.8\text{ V}$ | | 30 | | μV_{RMS} |
| SVR | Supply voltage rejection $V_{OUT} = 0.8\text{ V}$ | $V_{IN} = 1.8\text{ V} \pm V_{RIPPLE}$ $V_{RIPPLE} = 0.25\text{ V}$, frequency = 1 kHz $I_{OUT} = 10\text{ mA}$ | | 65 | | dB |
| | | $V_{IN} = 1.8\text{ V} \pm V_{RIPPLE}$ $V_{RIPPLE} = 0.25\text{ V}$, frequency = 10 kHz $I_{OUT} = 100\text{ mA}$ | | 62 | | |
| I_Q | Quiescent current | $I_{OUT} = 0\text{ mA}$ | | 20 | | μA |
| | | $I_{OUT} = 0\text{ mA}$, $-40\text{ °C} < T_J < 125\text{ °C}$ | | | 50 | |
| | | $I_{OUT} = 0$ to 500 mA | | 100 | | |
| | | $I_{OUT} = 0$ to 500 mA , $-40\text{ °C} < T_J < 125\text{ °C}$ | | | 200 | |
| | | V_{IN} input current in OFF mode: $V_{EN} = \text{GND}^{(3)}$ | | 0.001 | 1 | |

Table 5. Electrical characteristics for the LD39050 (adjustable) (continued)

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|------------|-------------------------------|--|------|--------------------|------|------------------|
| PG | Power Good output threshold | Rising edge | | 0.92* V_{OUT} | | V |
| | | Falling edge | | 0.8* V_{OUT} | | |
| | Power Good output voltage low | $I_{sink} = 6 \text{ mA}$ open drain output | | | 0.4 | V |
| I_{SC} | Short-circuit current | $R_L = 0$ | 600 | 800 | | mA |
| V_{EN} | Enable input logic low | $V_{IN} = 1.5 \text{ V to } 5.5 \text{ V}$, $40 \text{ }^\circ\text{C} < T_J < 125 \text{ }^\circ\text{C}$ | | | 0.4 | V |
| | Enable input logic high | $V_{IN} = 1.5 \text{ V to } 5.5 \text{ V}$, $40 \text{ }^\circ\text{C} < T_J < 125 \text{ }^\circ\text{C}$ | 0.9 | | | V |
| I_{EN} | Enable pin input current | $V_{EN} = V_{IN}$ | | 0.1 | 100 | nA |
| t_{ON} | Turn-on time ⁽⁴⁾ | | | 30 | | μs |
| T_{SHDN} | Thermal shutdown | | | 160 | | $^\circ\text{C}$ |
| | Hysteresis | | | 20 | | |
| C_{OUT} | Output capacitor | Capacitance (see typical performance characteristics for stability) | 1 | | 22 | μF |

1. All transient values are guaranteed by design, not production tested
2. 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 output voltages below 1.5 V
3. PG pin floating
4. Turn-on time is time measured between the enable input just exceeding V_{EN} high value and the output voltage just reaching 95% of its nominal value

$T_J = 25\text{ °C}$, $V_{IN} = V_{OUT(NOM)} + 1\text{ V}$, $C_{IN} = C_{OUT} = 1\text{ }\mu\text{F}$, $I_{OUT} = 10\text{ mA}$, $V_{EN} = V_{IN}$, unless otherwise specified.

Table 6. Electrical characteristics for the LD39050 (fixed output)

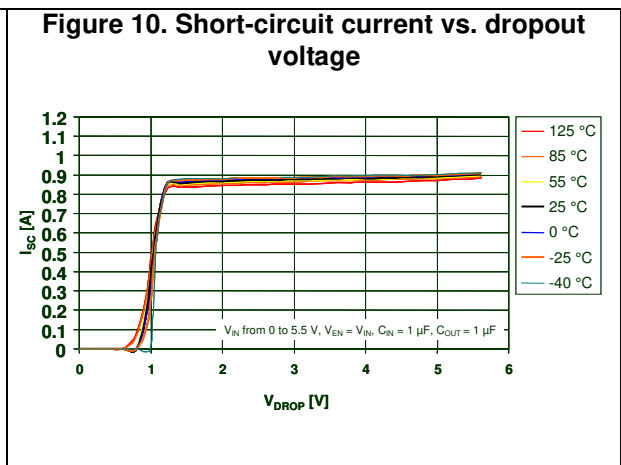
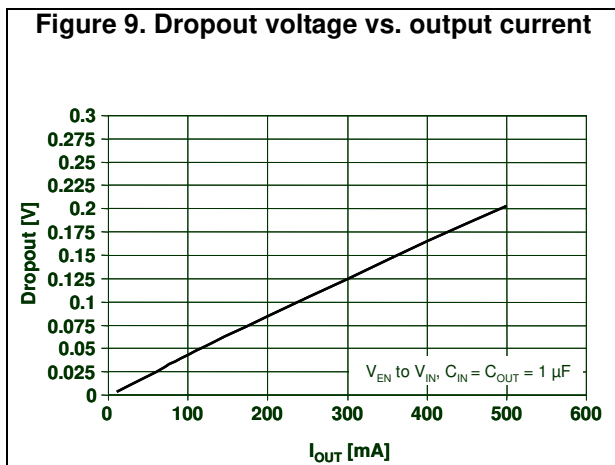
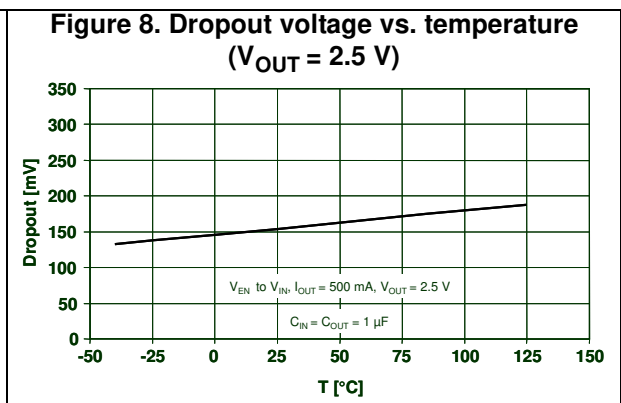
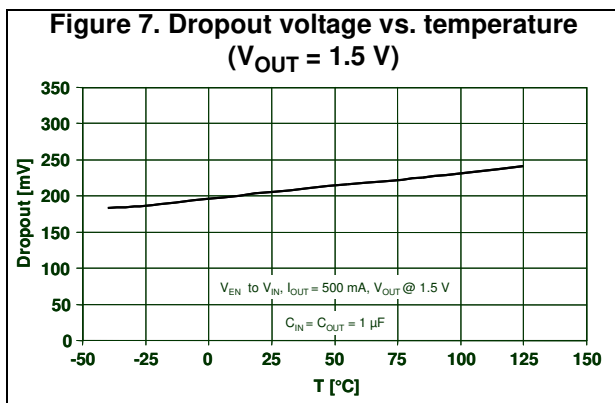
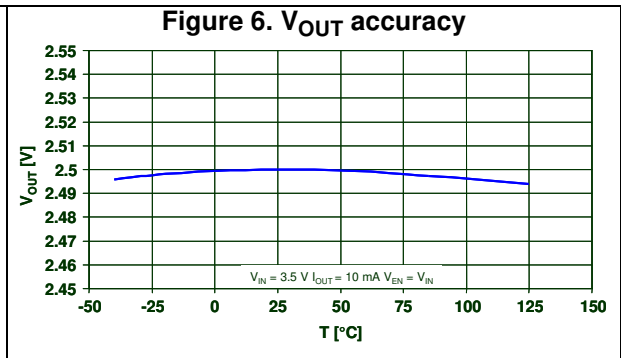
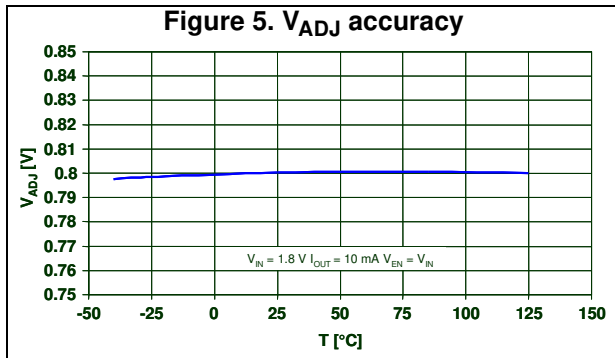
| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|------------------|--|---|------|----------|------|---------------------|
| V_{IN} | Operating input voltage | | 1.5 | | 5.5 | V |
| V_{OUT} | V_{OUT} accuracy | $V_{OUT} > 1.5\text{ V}$, $I_{OUT} = 10\text{ mA}$, $T_J = 25\text{ °C}$ | -2.0 | | 2.0 | % |
| | | $V_{OUT} > 1.5\text{ V}$, $I_{OUT} = 10\text{ mA}$, $-40\text{ °C} < T_J < 125\text{ °C}$ | -3.0 | | 3.0 | |
| | | $V_{OUT} \leq 1.5\text{ V}$, $I_{OUT} = 10\text{ mA}$ | | ± 20 | | mV |
| | | $V_{OUT} \leq 1.5\text{ V}$, $I_{OUT} = 10\text{ mA}$, $-40\text{ °C} < T_J < 125\text{ °C}$ | | ± 30 | | |
| ΔV_{OUT} | Static line regulation | $V_{OUT} + 1\text{ V} \leq V_{IN} \leq 5.5\text{ V}$, $I_{OUT} = 1\text{ mA}$ | | 0.01 | | %/V |
| ΔV_{OUT} | Transient line regulation ⁽¹⁾ | $\Delta V_{IN} = 500\text{ mV}$, $I_{OUT} = 10\text{ mA}$, $t_R = 5\text{ }\mu\text{s}$ | | 10 | | mVpp |
| | | $\Delta V_{IN} = 500\text{ mV}$, $I_{OUT} = 10\text{ mA}$, $t_F = 5\text{ }\mu\text{s}$ | | 10 | | |
| ΔV_{OUT} | Static load regulation | $I_{OUT} = 10\text{ mA to } 500\text{ mA}$ | | 0.002 | | %/mA |
| ΔV_{OUT} | Transient load regulation ⁽¹⁾ | $I_{OUT} = 10\text{ mA to } 500\text{ mA}$, $t_R = 5\text{ }\mu\text{s}$ | | 40 | | mVpp |
| | | $I_{OUT} = 10\text{ mA to } 500\text{ mA}$, $t_F = 5\text{ }\mu\text{s}$ | | 40 | | |
| V_{DROP} | Dropout voltage ⁽²⁾ | $I_{OUT} = 500\text{ mA}$, $V_{OUT} > 1.5\text{ V}$ $-40\text{ °C} < T_J < 125\text{ °C}$ | | 200 | 400 | mV |
| e_N | Output noise voltage | 10 Hz to 100 kHz, $I_O = 100\text{ mA}$, | | 30 | | μV_{RMS} |
| SVR | Supply voltage rejection $V_{OUT} = 1.5\text{ V}$ | $V_{IN} = V_{OUT(NOM)} + 0.5\text{ V} \pm V_{RIPPLE}$ $V_{RIPPLE} = 0.1\text{ V}$, freq. = 1 kHz $I_{OUT} = 10\text{ mA}$ | | 65 | | dB |
| | | $V_{IN} = V_{OUT(NOM)} + 0.5\text{ V} \pm V_{RIPPLE}$ $V_{RIPPLE} = 0.1\text{ V}$, frequency = 10 kHz $I_{OUT} = 100\text{ mA}$ | | 62 | | |
| I_Q | Quiescent current | $I_{OUT} = 0\text{ mA}$ | | 20 | | μA |
| | | $I_{OUT} = 0\text{ mA}$, $-40\text{ °C} < T_J < 125\text{ °C}$ | | | 50 | |
| | | $I_{OUT} = 0\text{ to } 500\text{ mA}$ | | 100 | | |
| | | $I_{OUT} = 0\text{ to } 500\text{ mA}$ $-40\text{ °C} < T_J < 125\text{ °C}$ | | | 200 | |
| | | V_{IN} input current in OFF mode: $V_{EN} = \text{GND}^{(3)}$ | | 0.001 | 1 | |

Table 6. Electrical characteristics for the LD39050 (fixed output) (continued)

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|------------|-------------------------------|---|------|--------------------|------|------------------|
| PG | Power Good output threshold | Rising edge | | 0.92* V_{OUT} | | V |
| | | Falling edge | | 0.8* V_{OUT} | | |
| | Power Good output voltage low | $I_{sink} = 6 \text{ mA}$ open drain output | | | 0.4 | V |
| I_{SC} | Short-circuit current | $R_L = 0$ | 600 | 800 | | mA |
| V_{EN} | Enable input logic low | $V_{IN} = 1.5 \text{ V to } 5.5 \text{ V}$, $-40 \text{ }^\circ\text{C} < T_J < 125 \text{ }^\circ\text{C}$ | | | 0.4 | V |
| | Enable input logic high | $V_{IN} = 1.5 \text{ V to } 5.5 \text{ V}$, $-40 \text{ }^\circ\text{C} < T_J < 125 \text{ }^\circ\text{C}$ | 0.9 | | | V |
| I_{EN} | Enable pin input current | $V_{EN} = V_{IN}$ | | 0.1 | 100 | nA |
| t_{ON} | Turn-on time ⁽⁴⁾ | | | 30 | | μs |
| T_{SHDN} | Thermal shutdown | | | 160 | | $^\circ\text{C}$ |
| | Hysteresis | | | 20 | | |
| C_{OUT} | Output capacitor | Capacitance (see typical performance characteristics for stability) | 1 | | 22 | μF |

1. All transient values are guaranteed by design, not production tested
2. 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 output voltages below 1.5 V
3. PG pin floating
4. Turn-on time is time measured between the enable input just exceeding V_{EN} high value and the output voltage just reaching 95% of its nominal value

5 Typical performance characteristics



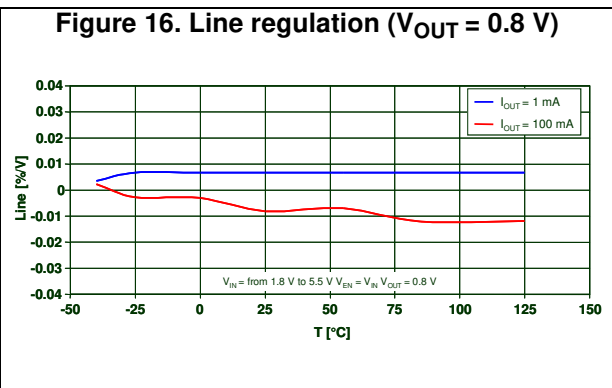
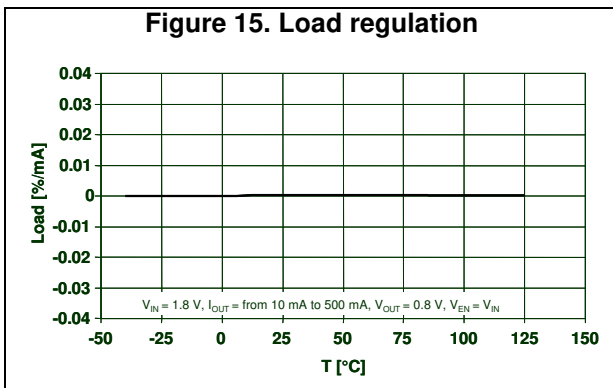
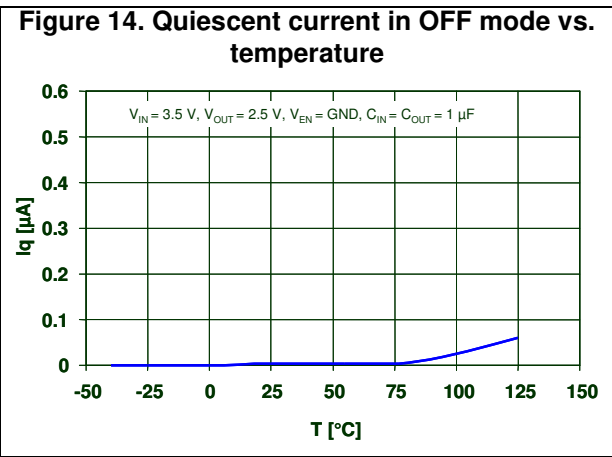
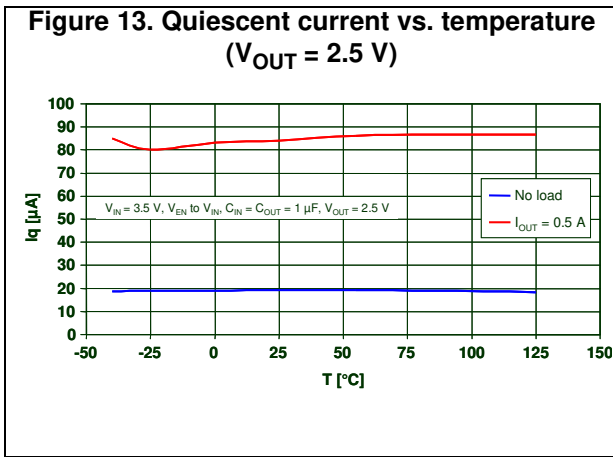
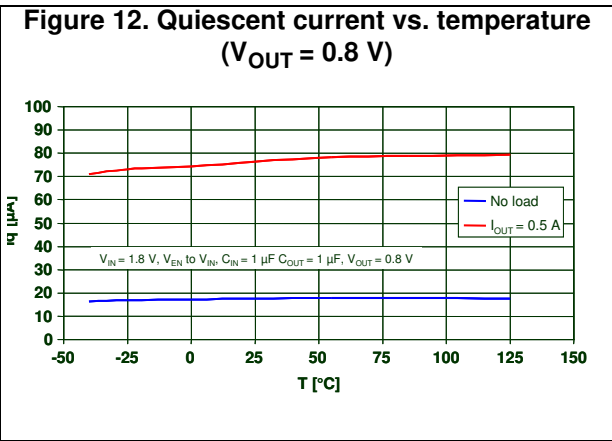
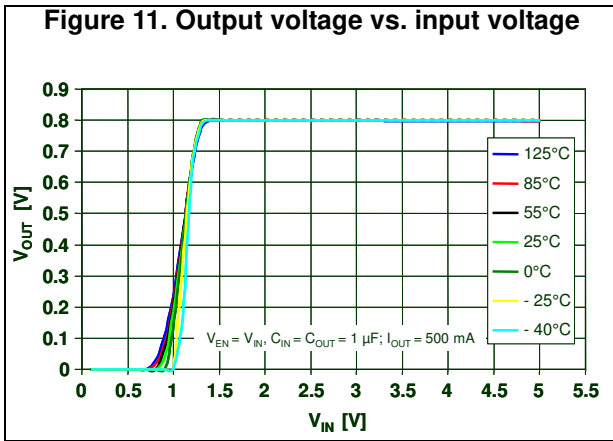


Figure 17. Line regulation ($V_{OUT} = 2.5\text{ V}$)

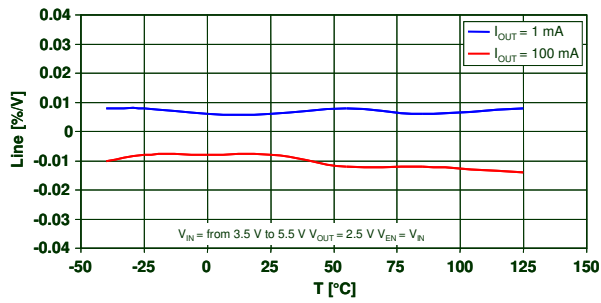


Figure 18. Supply voltage rejection vs. temperature ($V_{OUT} = 0.8\text{ V}$, $f = 1\text{ kHz}$)

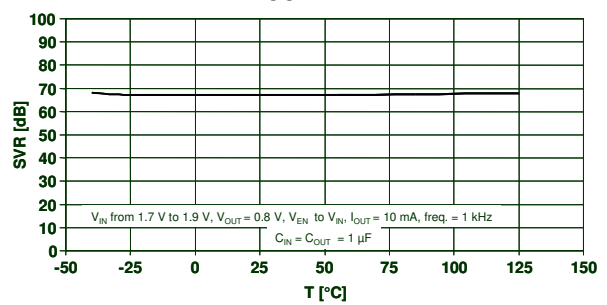


Figure 19. Supply voltage rejection vs. temperature ($V_{OUT} = 0.8\text{ V}$, $f = 10\text{ kHz}$)

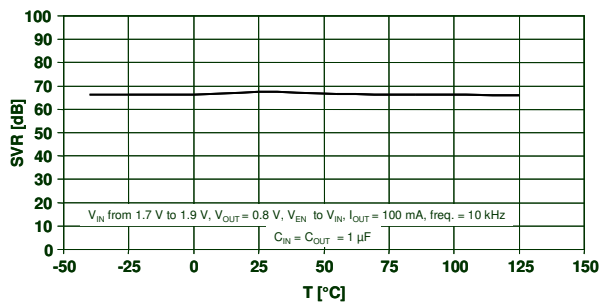


Figure 20. Supply voltage rejection vs. temperature ($V_{OUT} = 2.5\text{ V}$, $f = 1\text{ kHz}$)

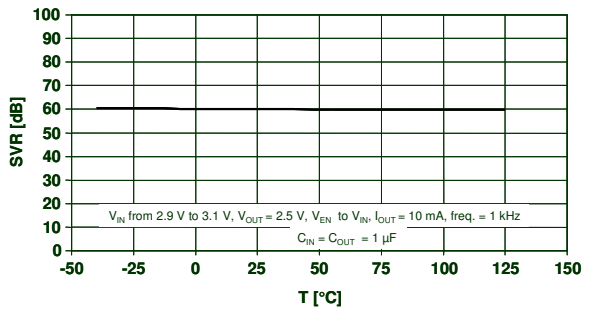


Figure 21. Supply voltage rejection vs. temperature ($V_{OUT} = 2.5\text{ V}$, $f = 10\text{ kHz}$)

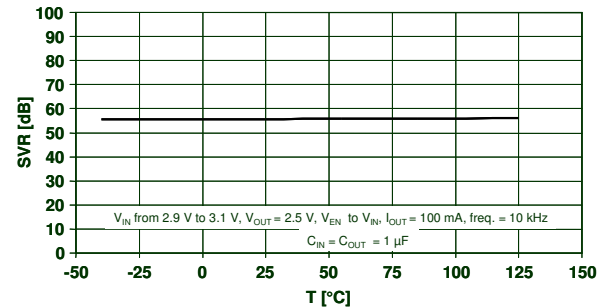
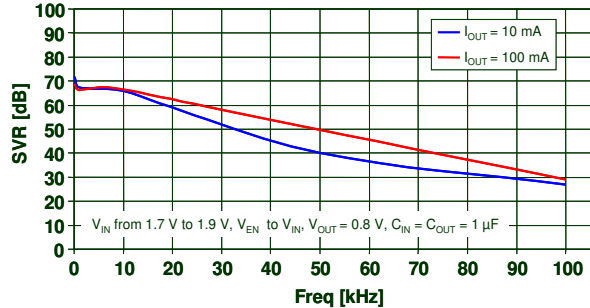


Figure 22. Supply voltage rejection vs. frequency ($V_{OUT} = 0.8\text{ V}$)



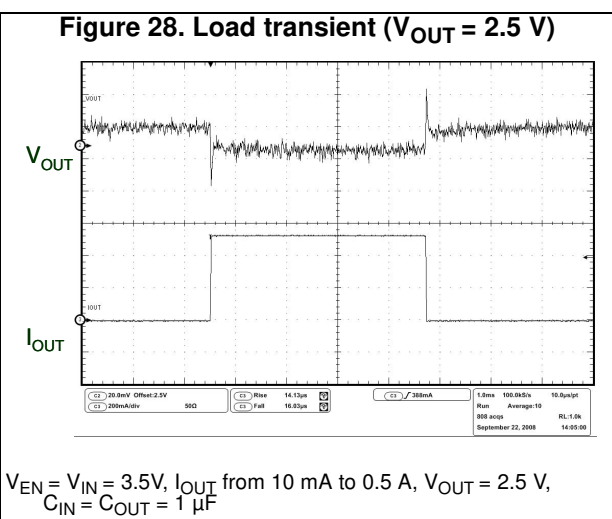
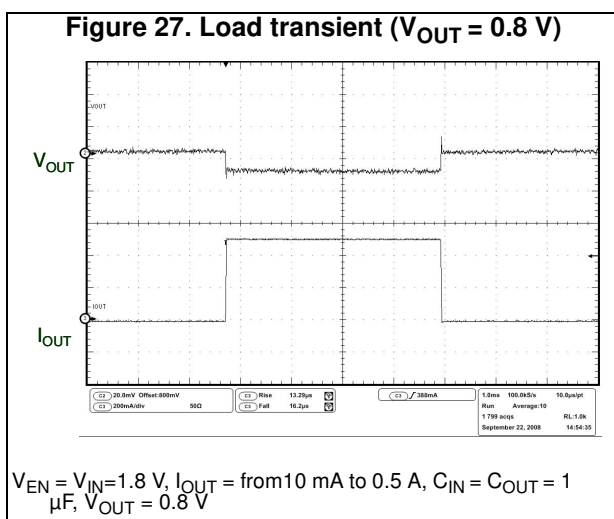
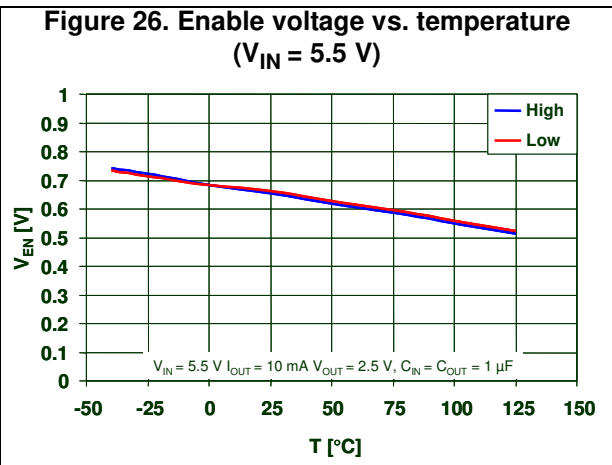
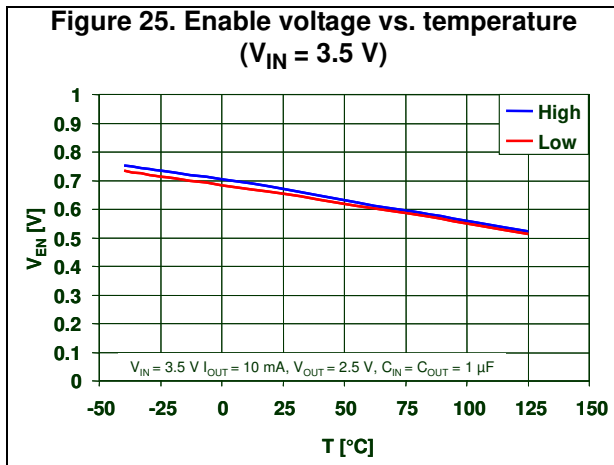
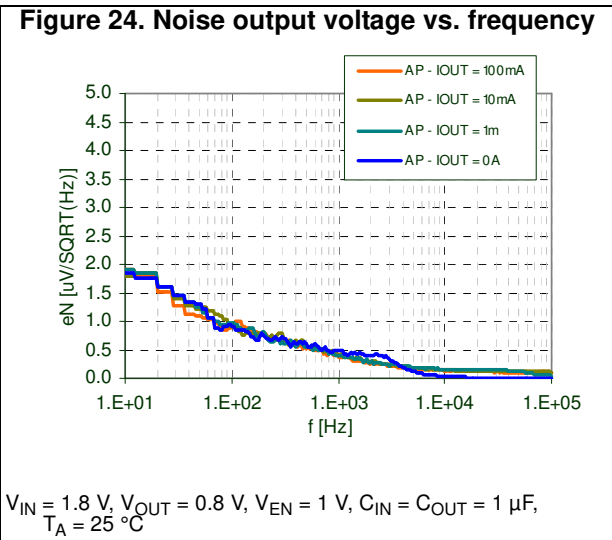
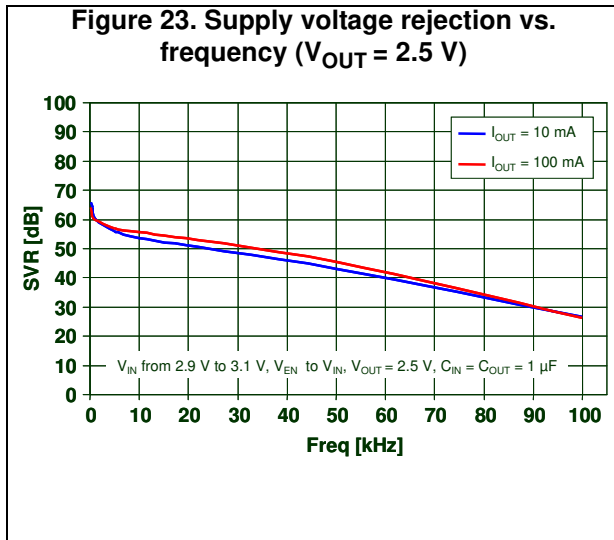
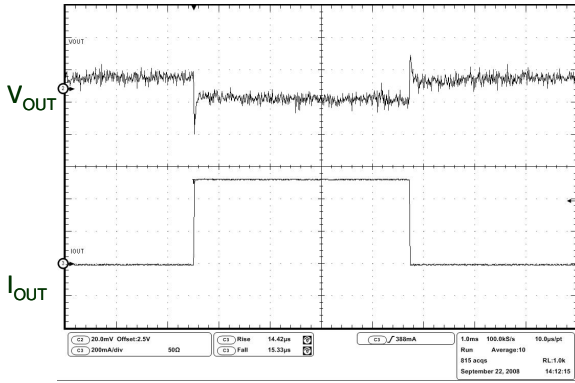
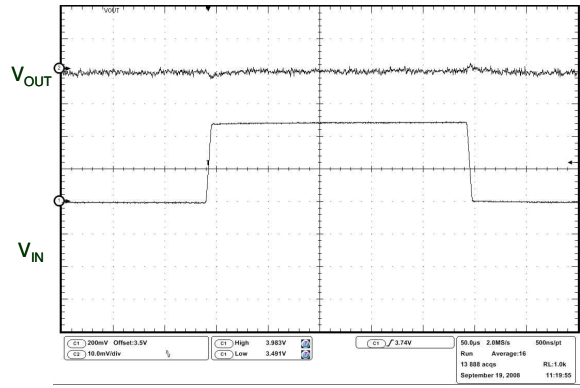


Figure 29. Load transient ($V_{OUT}=2.5\text{ V}$, I_{OUT} from 0.1 A to 0.5 A)



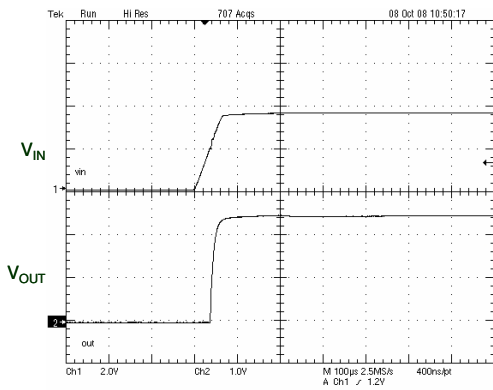
$V_{EN} = V_{IN} = 3.5\text{ V}$, I_{OUT} from 100 mA to 0.5 A, $V_{OUT} = 2.5\text{ V}$,
 $C_{IN} = C_{OUT} = 1\ \mu\text{F}$

Figure 30. Line transient



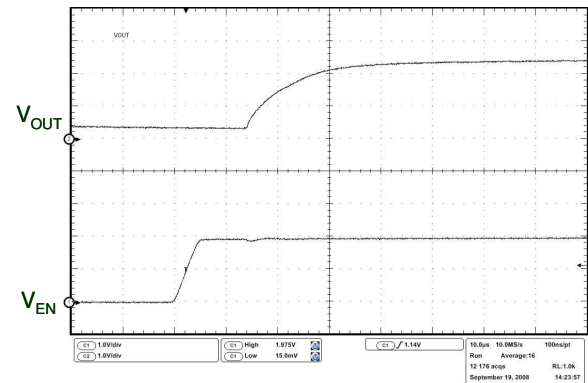
$V_{EN} = V_{IN}$ from 4.3 V to 4.8 V, $I_{OUT} = 10\text{ mA}$, $C_{OUT} = 1\ \mu\text{F}$,
 $C_{IN} = \text{NO}$

Figure 31. Start-up transient



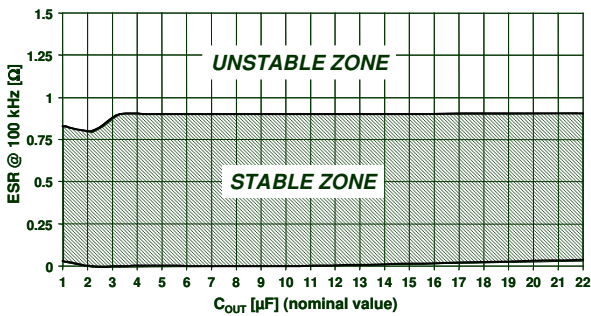
$V_{EN} = V_{IN}$ = from 0 V to 5.5 V, $I_{OUT}=10\text{ mA}$, $C_{IN} = C_{OUT} = 1\ \mu\text{F}$, $V_{OUT} = 2.5\text{ V}$

Figure 32. Enable transient



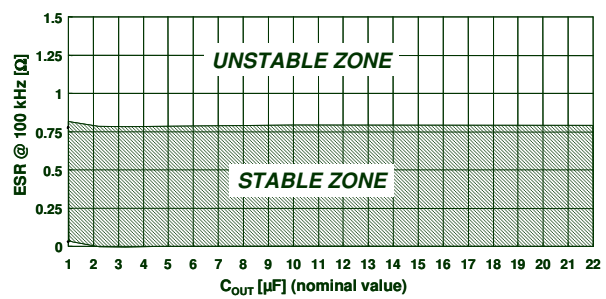
V_{EN} from 0 V to 2 V, $V_{IN} = 3.5\text{ V}$, $V_{OUT} = 2.5\text{ V}$, $I_{OUT} = 10\text{ mA}$,
 $C_{IN} = C_{OUT} = 1\ \mu\text{F}$

Figure 33. ESR required for stability with ceramic capacitors ($V_{OUT} = 0.8\text{ V}$)



$V_{IN} = V_{EN}$ = from 1.8 V to 5.5 V, I_{OUT} = from 1 mA to 500 mA, $V_{OUT} = 0.8\text{ V}$, $C_{IN} = 1\ \mu\text{F}$

Figure 34. ESR required for stability with ceramic capacitors ($V_{OUT} = 2.5\text{ V}$)



$V_{IN} = V_{EN}$ = from 3.5 V to 5.5 V, I_{OUT} = from 1 mA to 500 mA, $V_{OUT} = 2.5\text{ V}$, $C_{IN} = 1\ \mu\text{F}$

6 Application information

The LD39050 is an ultra low-dropout linear regulator. It provides up to 500 mA with a 200 mV dropout. The input voltage range is from 1.5 V to 5.5 V. The device is available in fixed and adjustable output versions.

The regulator is equipped with internal protection circuitry, such as short-circuit current limiting and thermal protection.

The regulator is designed to be stable with ceramic capacitors on the input and the output. The recommended values of the input and output ceramic capacitors are from 1 μF to 22 μF with 1 μF typical. The input capacitor must be connected within 0.5 inches of the V_{IN} terminal. The output capacitor must also be connected within 0.5 inches of output pin. There is no upper limit to the value of the input capacitor.

Figure 35 and *Figure 36* illustrate the typical application schematics:

Figure 35. Application schematic for fixed version

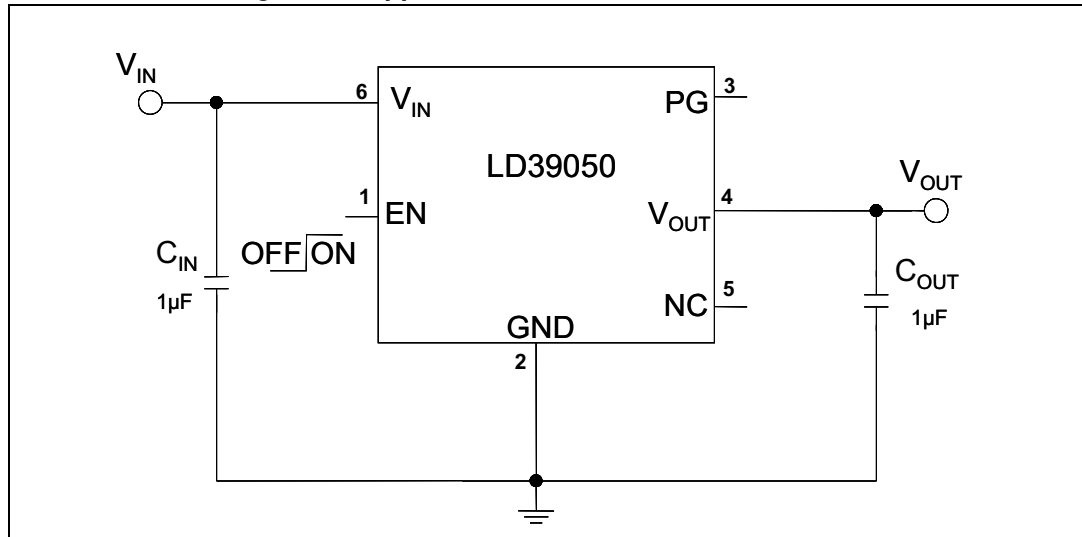
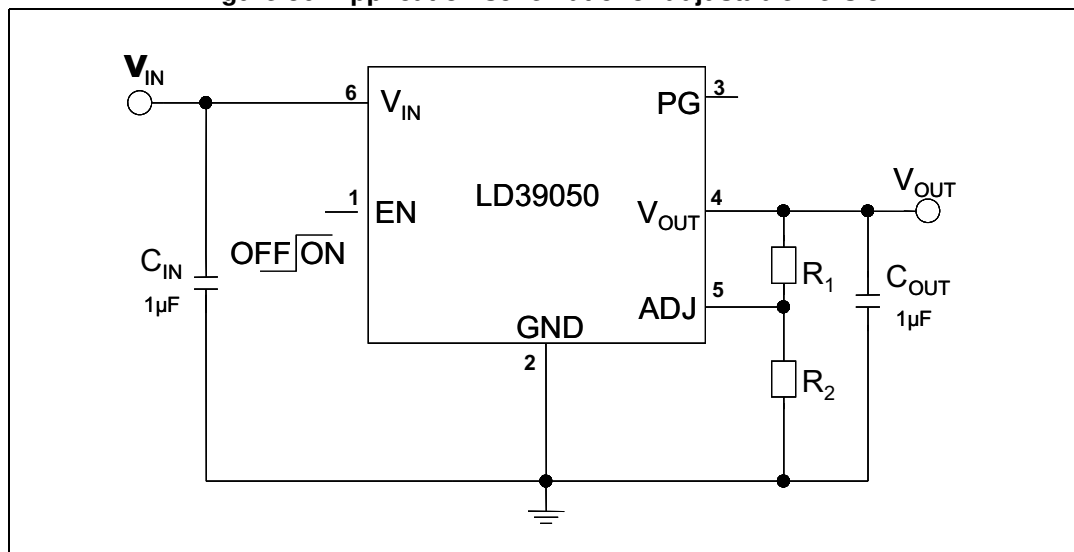


Figure 36. Application schematic for adjustable version



Regarding to the adjustable version, the output voltage can be adjusted from 0.8 V up to the input voltage minus the voltage drop across the PMOS (dropout voltage), by connecting a resistor divider between the ADJ pin and the output, thus allowing the remote voltage sensing.

The resistor divider should be selected using the following equation:

$$V_{OUT} = V_{ADJ} (1 + R_1 / R_2) \text{ with } V_{ADJ} = 0.8 \text{ V (typ.)}$$

Resistors should be used with values in the range from 10 kΩ to 50 kΩ. Lower values can also be suitable, but they increase current consumption.

6.1 Power dissipation

An internal thermal feedback loop disables the output voltage if the die temperature reaches approximately 160 °C. This feature protects the device from excessive temperature and allows the user to push the limits of the power handling capability of a given board without damaging the device.

A good PC board layout should be used to maximize the power dissipation. The thermal path for the heat generated by the device goes from the die to the copper lead frame through the package leads and exposed pad to the PC board copper. The PC board copper acts as a heat sink. The footprint copper pads should be as wider as possible to spread and dissipate the heat to the surrounding ambient. Feed-through vias to inner or backside copper layers improve the overall thermal performance of the device.

The power dissipation of the device depends on the input voltage, output voltage and output current, and is given by:

$$P_D = (V_{IN} - V_{OUT}) I_{OUT}$$

The junction temperature of the device is:

$$T_{J_MAX} = T_A + R_{thJA} \times P_D$$

where:

T_{J_MAX} is the maximum junction of the die, 125 °C;

T_A is the ambient temperature;

R_{thJA} is the thermal resistance junction-to-ambient.

6.2 Enable function

The LD39050 features an enable function. When the EN voltage is higher than 0.9 V the device is ON, and if it is lower than 0.4 V the device is OFF. In shutdown mode, consumption is lower than 1 μ A.

The EN pin does not have an internal pull-up, therefore it cannot be left floating if it is not used.

6.3 Power Good function

Most applications require a flag showing that the output voltage is in the correct range.

The Power Good threshold depends on the adjustable voltage. When the adjustable voltage is higher than $0.92 \cdot V_{ADJ}$, the Power Good (PG) pin goes to high impedance. If it is below $0.80 \cdot V_{ADJ}$ the PG pin goes to low impedance. If the device is working well, the PG pin is at high impedance. If the output voltage is fixed using an external or internal resistor divider, the Power Good threshold is $0.92 \cdot V_{OUT}$.

The use of the Power Good function requires an external pull-up resistor, which must be connected between the PG pin and V_{IN} or V_{OUT} . The typical current capability of the PG pin is up to 6 mA. The use of a pull-up resistor for PG in the range from 100 k Ω to 1 M Ω is recommended. If the Power Good function is not used, the PG pin must remain floating.

When EN pin is in low state the power good is asserted to the high state.

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 DFN6 (3x3 mm) package information

Figure 37. DFN6 (3x3 mm) package outline

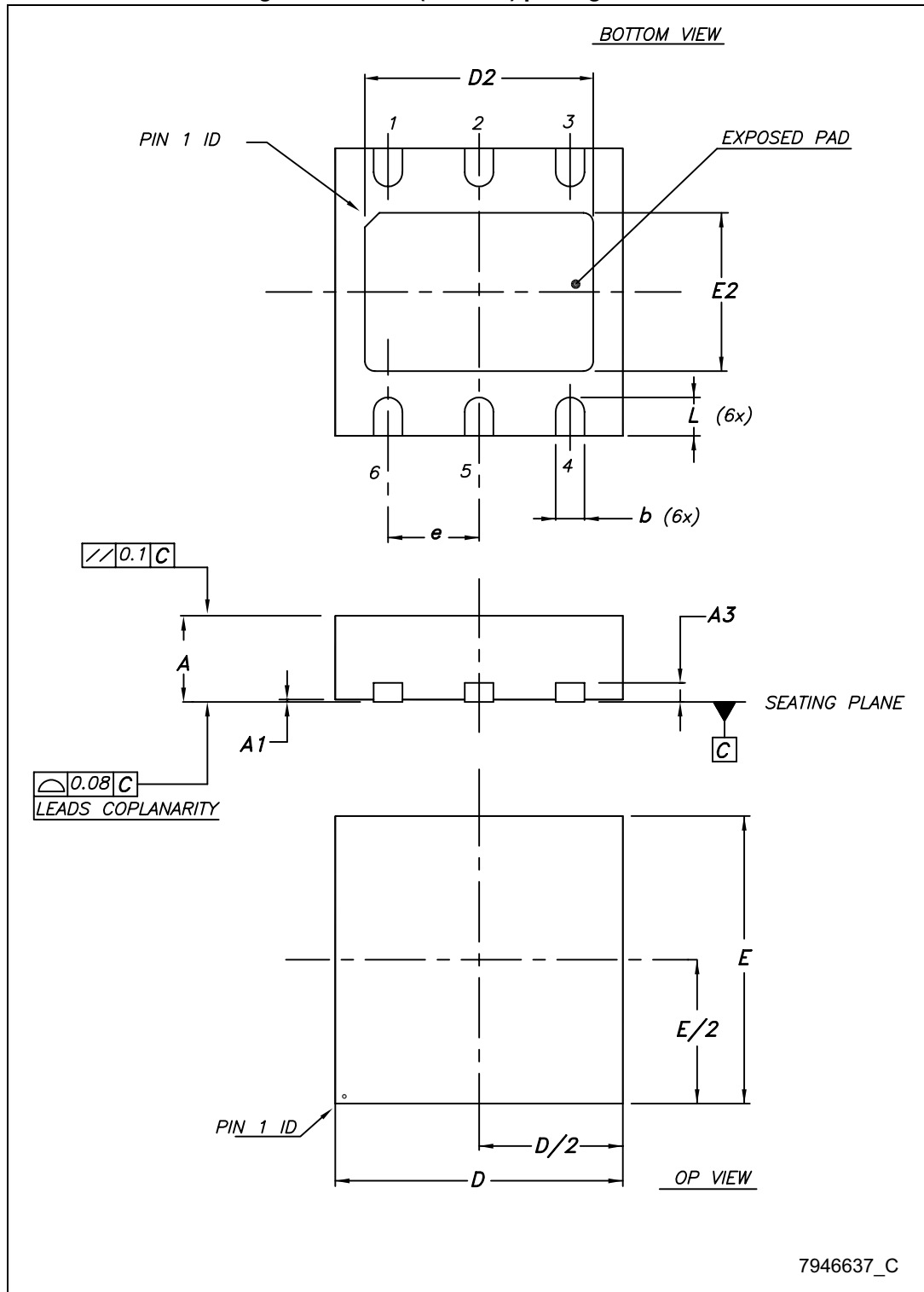
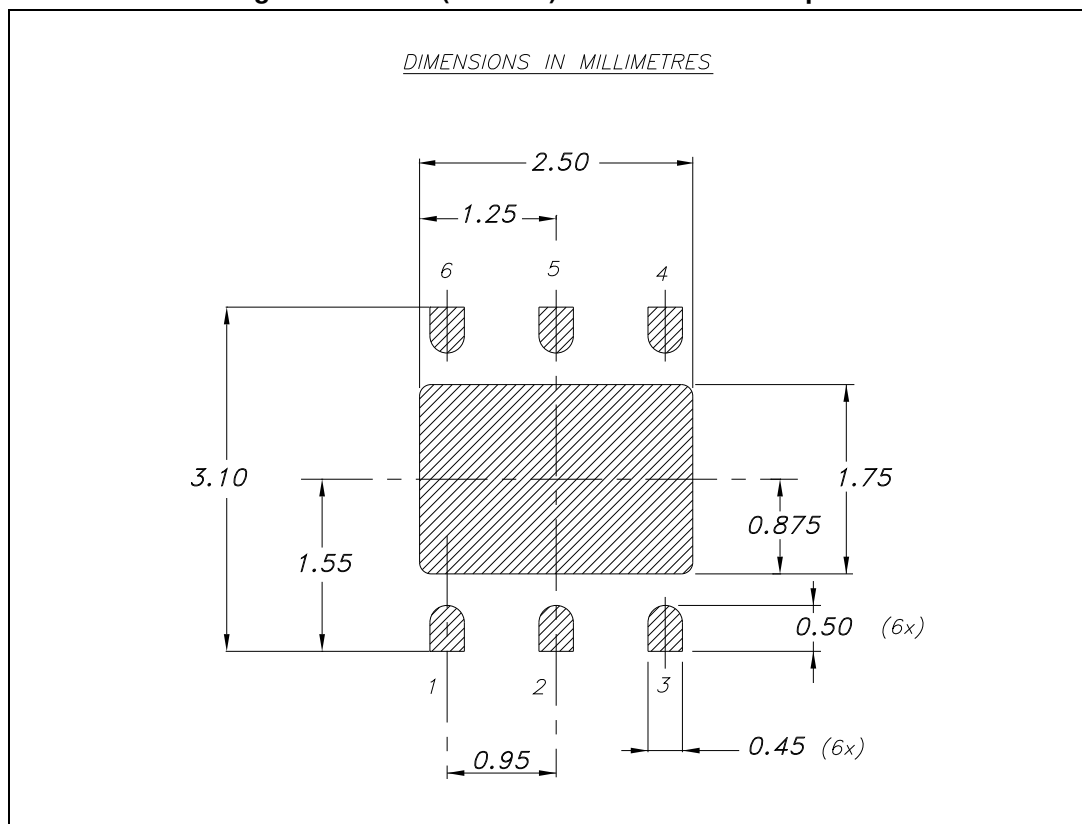


Table 7. DFN6 (3x3 mm) mechanical data

| 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 38. DFN6 (3x3 mm) recommended footprint



7.2 DFN6 (3x3 mm) packing information

Figure 39. DFN6 (3x3 mm) tape outline

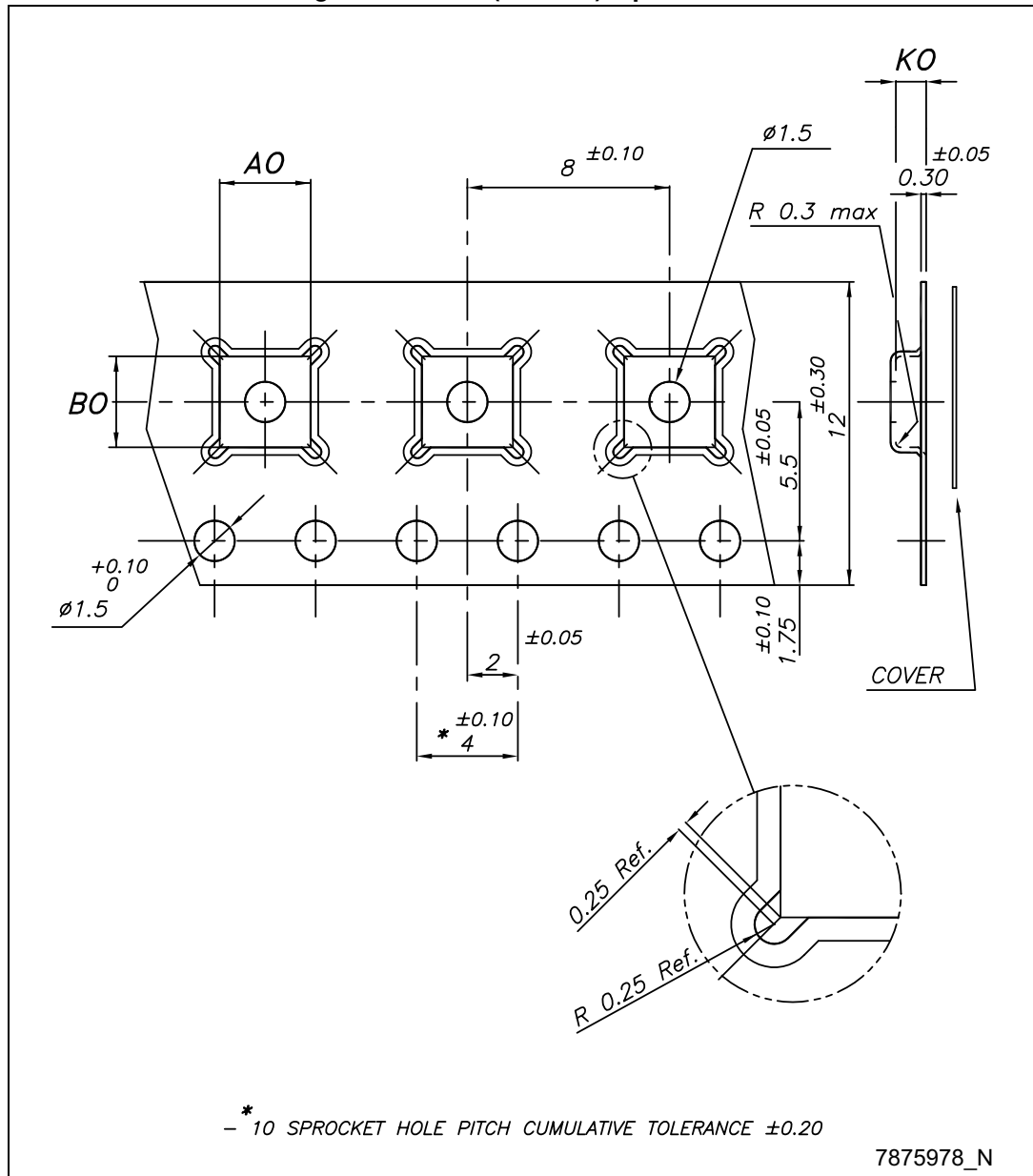


Figure 40. DFN6 (3x3 mm) reel outline

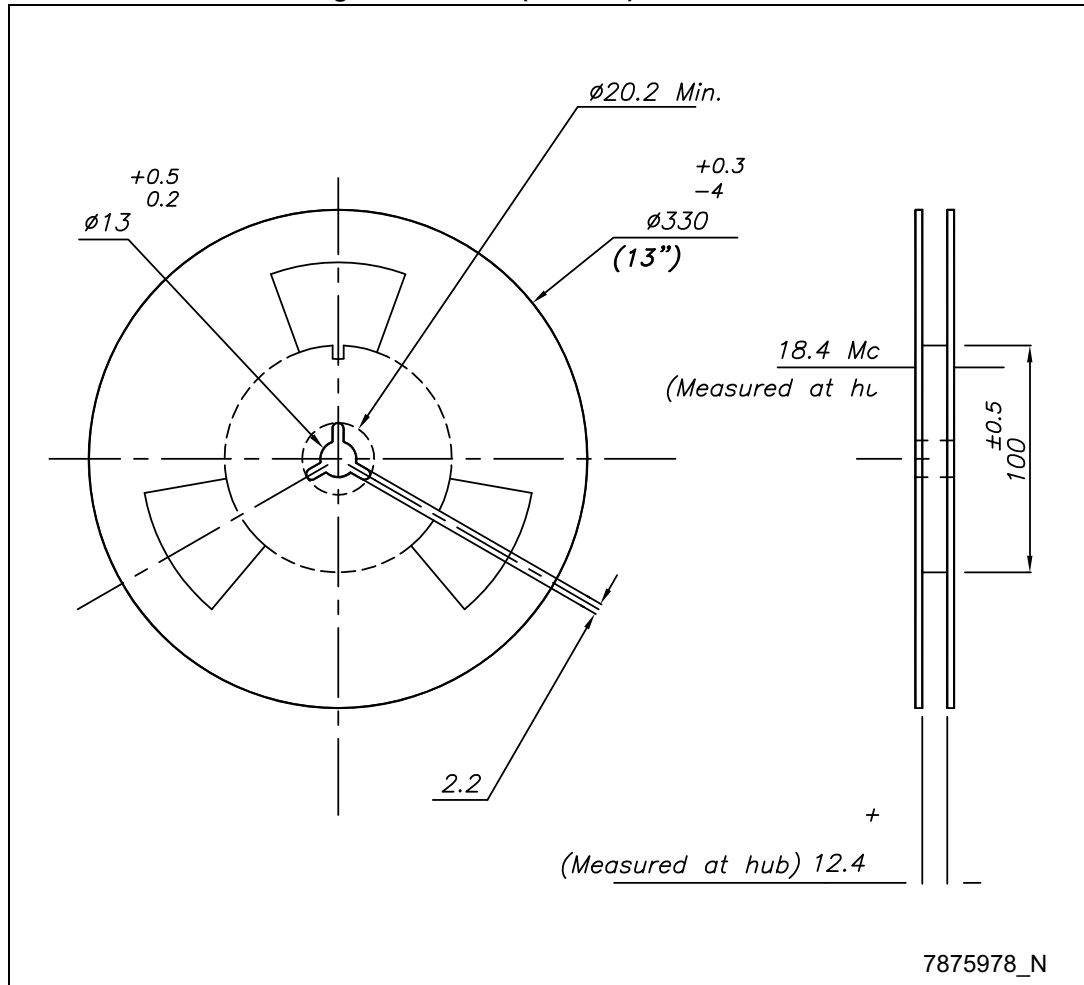


Table 8. DFN6 (3x3 mm) tape and reel mechanical data

| 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 |

7.3 DFN6 (2x2 mm) package information

Figure 41. DFN6 (2x2 mm) package outline

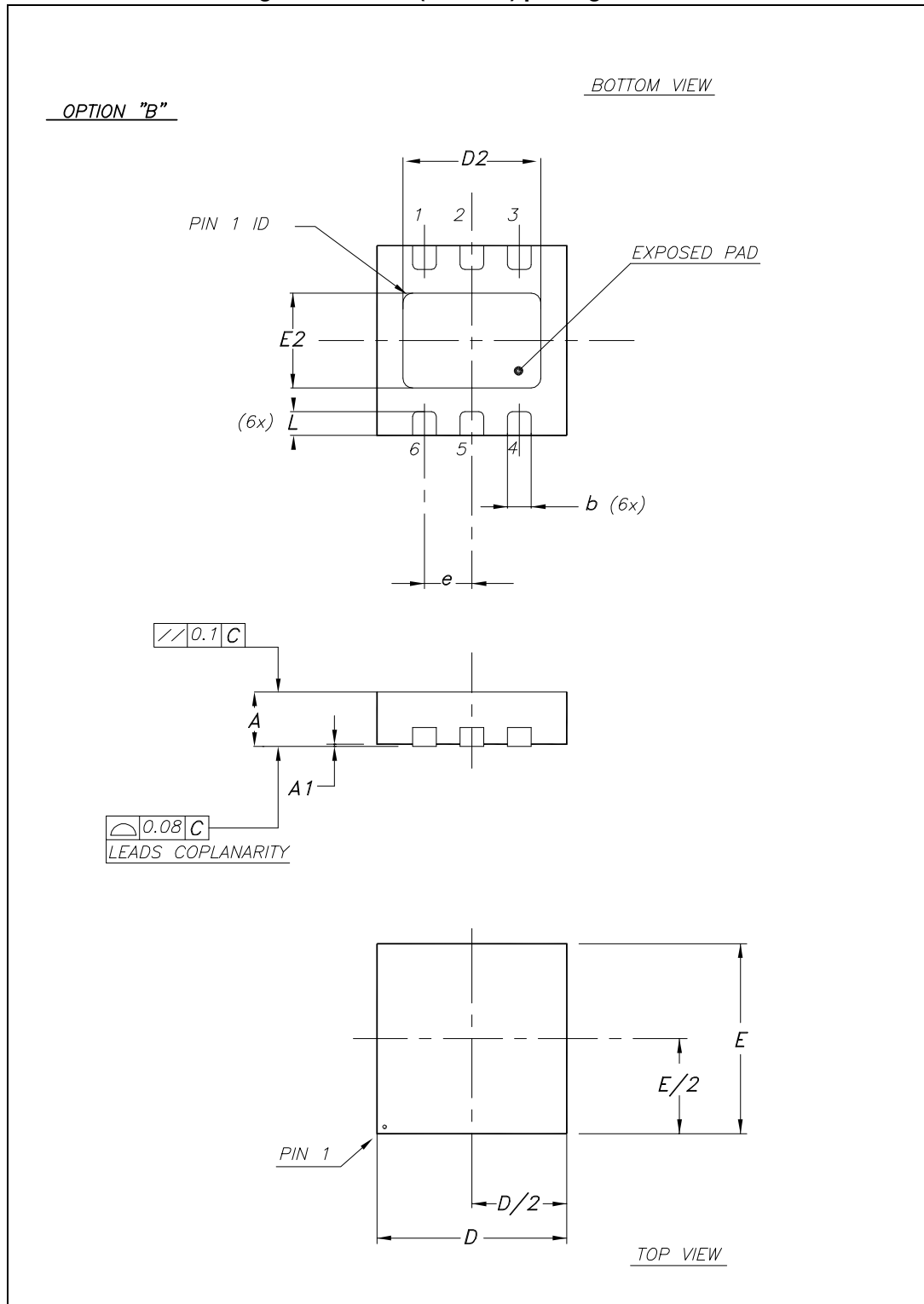
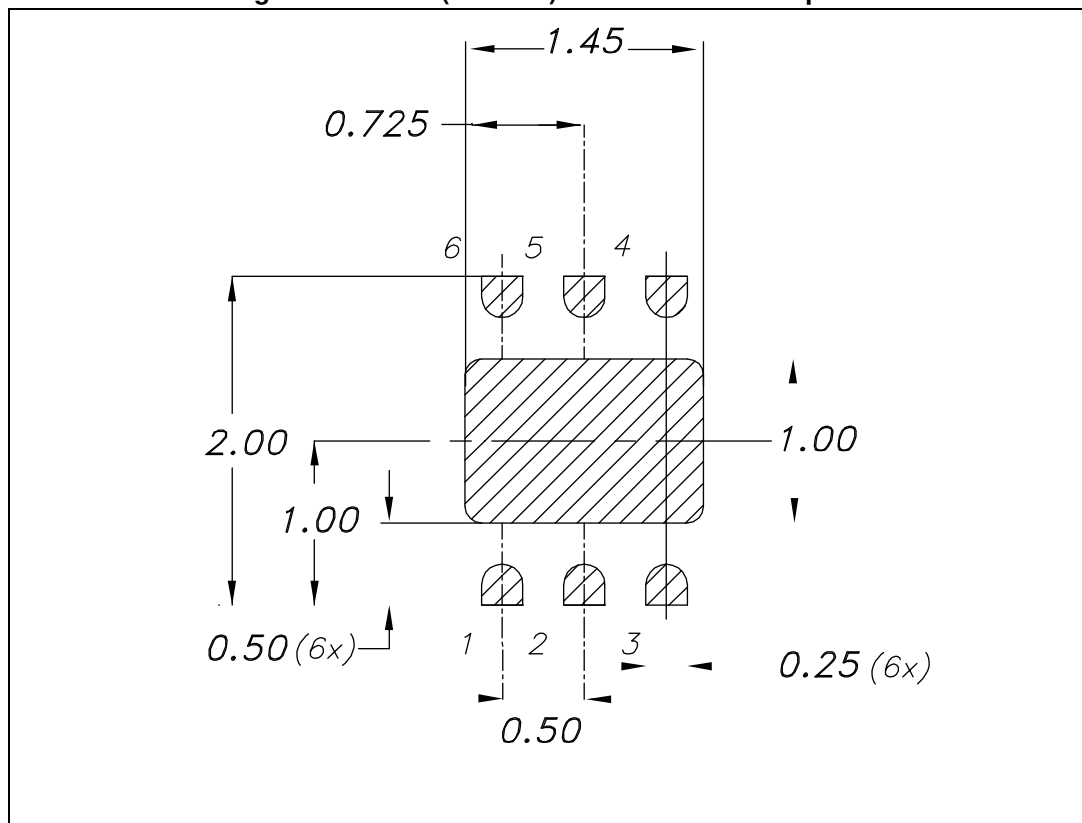


Table 9. DFN6 (2x2 mm) mechanical data

| Dim. | mm | | |
|------|------|------|------|
| | Min. | Typ. | Max. |
| A | 0.51 | 0.55 | 0.60 |
| A1 | 0 | 0.02 | 0.05 |
| b | 0.18 | 0.25 | 0.30 |
| D | | 2.00 | |
| D2 | 1.30 | 1.45 | 1.55 |
| E | | 2.00 | |
| E2 | 0.85 | 1.00 | 1.10 |
| e | | 0.50 | |
| L | 0.15 | 0.25 | 0.35 |

Figure 42. DFN6 (2x2 mm) recommended footprint



8 Ordering information

Table 10. Order code

| Order code | Package | Packing | Output voltages |
|--------------|-----------------------|---------------|-----------------------|
| LD39050PUR | DFN6 (3x3 mm) | Tape and reel | Adjustable from 0.8 V |
| LD39050PU25R | | | 2.5 V |
| LD39050PU33R | | | 3.3 V |
| LD39050PV10R | 1.0 V | | |
| LD39050PVR | Adjustable from 0.8 V | | |

9 Revision history

Table 11. Document revision history

| Date | Revision | Changes |
|-------------|----------|---|
| 11-Mar-2009 | 1 | Initial release. |
| 28-Feb-2014 | 2 | <p>The part number LD39050xx changed to LD39050.</p> <p>Updated the title in cover page, Table 10: Order code, Section 1: Diagrams, Section 2: Pin configuration, Section 4: Electrical characteristics, Section 5: Typical performance characteristics, Section 6: Application information and Section 7: Package information.</p> <p>Deleted order code table.</p> <p>Added Section 9: Revision history.</p> <p>Minor text changes.</p> |
| 26-Oct-2015 | 3 | <p>Added DFN6 (2x2 mm) package.</p> <p>Removed device summary table.</p> <p>Updated features and description in cover page.</p> <p>Updated <i>Section 2: Pin configuration</i>, <i>Table 3: Thermal data</i> and <i>Table 4: ESD performance</i>.</p> <p>Added <i>Section 8: Ordering information</i></p> <p>Minor text changes.</p> |
| 29-Nov-2017 | 4 | Updated Section 6.2: Enable function. |
| 12-Dec-2019 | 5 | Updated Table 10: Order code . |

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, please refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2019 STMicroelectronics – All rights reserved



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.