



# STMPS2242, STMPS2252 STMPS2262, STMPS2272

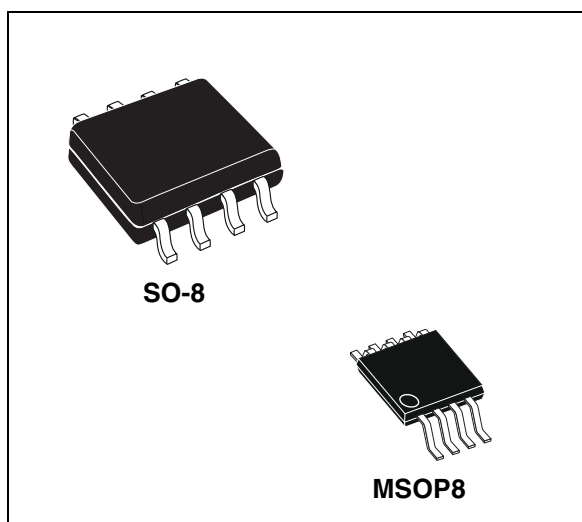
## Enhanced dual-channel power switches

### Features

- 100 mΩ high-side MOSFET switch
- 500 mA/1000 mA continuous current per channel
- Thermal protection
- Independent short-circuit protection with overcurrent logic output
- Operating range from 2.7 V to 5.5 V
- CMOS and TTL compatible inputs
- 2.5 ms typical rise time
- Undervoltage lockout
- 13 μA maximum standby supply current
- Ambient temperature range: -40 °C to 85 °C
- 8 kV ESD protection
- Reverse current protection
- Fault blanking

### Description

The STMPS2242/2252/2262/2272 power distribution switches are intended for applications where heavy capacitive loads and short-circuits are likely to be encountered. These devices incorporate 100 mΩ MOSFET high-side power switches for power distribution systems that require multiple power switches in a single package.



Each switch is controlled by an independent logic enable input. When the output load exceeds the current limit threshold or a short is present, these devices limit the output current to a safe level by switching into a constant current mode, pulling the overcurrent (OCx) logic output low. When continuous heavy overloads and short-circuits increase the power dissipation in the switch, causing the junction temperature to rise, a thermal protection circuit shuts off the switch to prevent damage. Recovery from a thermal shutdown is automatic once the device has cooled sufficiently. Internal circuitry ensures the switch remains off until valid input voltage is present.

Table 1. Device summary

| Order code   |                      | Current limit (mA) | Enable      | Packing       |
|--------------|----------------------|--------------------|-------------|---------------|
| SO-8         | MSOP8 <sup>(1)</sup> |                    |             |               |
| STMPS2242MTR | STMPS2242TTR         | 500                | Active low  | Tape and reel |
| STMPS2252MTR | STMPS2252TTR         | 500                | Active high | Tape and reel |
| STMPS2262MTR | STMPS2262TTR         | 1000               | Active low  | Tape and reel |
| STMPS2272MTR | STMPS2272TTR         | 1000               | Active high | Tape and reel |

1. MSOP8 is also known as TSSOP8.

# Contents

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>Block diagram</b> .....   | <b>6</b>  |
| <b>2</b> | <b>Pin descriptions</b> .....  | <b>7</b>  |
| <b>3</b> | <b>Functional description</b> .....  | <b>8</b>  |
| 3.1      | Fault blanking .....   | 8         |
| 3.2      | Overcurrent/overtemperature protection .....                                       | 8         |
| 3.3      | Reverse current blocking .....   | 8         |
| 3.4      | UVLO .....   | 8         |
| <b>4</b> | <b>Maximum rating</b> .....  | <b>9</b>  |
| 4.1      | Absolute maximum rating .....  | 9         |
| 4.2      | Recommended operating conditions .....   | 9         |
| <b>5</b> | <b>Electrical specifications</b> .....   | <b>10</b> |
| <b>6</b> | <b>Typical operating characteristics</b> .....                                     | <b>13</b> |
| 6.1      | STMPS2242, STMPS2252 characteristics .....   | 13        |
| 6.1.1    | Turn-on/off characteristics for $V_I = 3\text{ V}$ , $R_{LOAD} = 6\ \Omega$ .....  | 13        |
| 6.1.2    | Turn-on/off characteristics for $V_I = 5\text{ V}$ , $R_{LOAD} = 10\ \Omega$ ..... | 16        |
| 6.1.3    | UVLO characteristics .....   | 20        |
| 6.1.4    | Overcurrent protection characteristics .....                                       | 21        |
| 6.1.5    | Other electrical characteristics .....   | 22        |
| 6.2      | STMPS2262, STMPS2272 characteristics .....   | 24        |
| 6.2.1    | Turn-on/off characteristics for $V_I = 3\text{ V}$ , $R_{LOAD} = 3\ \Omega$ .....  | 24        |
| 6.2.2    | Turn-on/off characteristics for $V_I = 5\text{ V}$ , $R_{LOAD} = 5\ \Omega$ .....  | 27        |
| 6.2.3    | UVLO characteristics .....   | 30        |
| 6.2.4    | Overcurrent protection characteristics .....                                       | 32        |
| 6.2.5    | Other electrical characteristics .....   | 33        |
| <b>7</b> | <b>Application information</b> .....   | <b>35</b> |
| 7.1      | Input and output capacitors .....  | 35        |
| <b>8</b> | <b>Package mechanical data</b> .....   | <b>36</b> |

**9**      **Revision history** ..... **41**

## List of tables

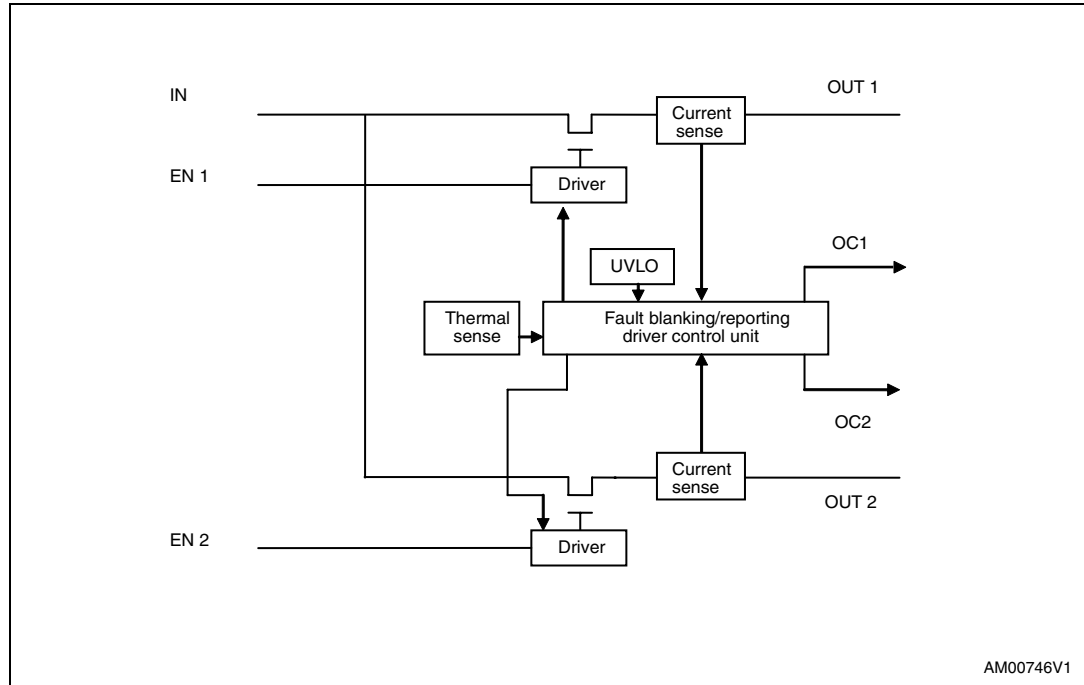
|           |  |    |
|-----------|--|----|
| Table 1.  | Device summary . . . . .   | 1  |
| Table 2.  | Pin descriptions . . . . .   | 7  |
| Table 3.  | Absolute maximum ratings . . . . .   | 9  |
| Table 4.  | Recommended operating conditions . . . . .   | 9  |
| Table 5.  | Electrical characteristics . . . . .   | 10 |
| Table 6.  | Current limit characteristics<br>( $V_I = 5.5\text{ V}$ , $I_O = \text{rated current}$ , $T_J = 25^\circ\text{C}$ , unless otherwise specified) . . . . .  | 10 |
| Table 7.  | Supply current characteristics<br>( $V_I = 5.5\text{ V}$ , $I_O = \text{rated current}$ , $T_J = 25^\circ\text{C}$ , unless otherwise specified) . . . . . | 11 |
| Table 8.  | Thermal characteristics<br>( $V_I = 5.5\text{ V}$ , $I_O = \text{rated current}$ , $T_J = 25^\circ\text{C}$ , unless otherwise specified) . . . . .        | 11 |
| Table 9.  | UVLO characteristics<br>( $V_I = 5.5\text{ V}$ , $I_O = \text{rated current}$ , $T_J = 25^\circ\text{C}$ , unless otherwise specified) . . . . .           | 12 |
| Table 10. | OCx pin characteristics<br>( $V_I = 5.5\text{ V}$ , $I_O = \text{rated current}$ , $T_J = 25^\circ\text{C}$ , unless otherwise specified) . . . . .        | 12 |
| Table 11. | ENx pin characteristics<br>( $V_I = 5.5\text{ V}$ , $I_O = \text{rated current}$ , $T_J = 25^\circ\text{C}$ , unless otherwise specified) . . . . .        | 12 |
| Table 12. | SO-8 mechanical data . . . . .   | 37 |
| Table 13. | MSOP8 mechanical data . . . . .  | 38 |
| Table 14. | Reel mechanical data . . . . .   | 40 |
| Table 15. | Document revision history . . . . .  | 41 |

## List of figures

|            |   |    |
|------------|---|----|
| Figure 1.  | Block diagram   | 6  |
| Figure 2.  | Pinout  | 7  |
| Figure 3.  | Turn-on for $C_{LOAD} = 1 \mu F$  | 13 |
| Figure 4.  | Turn-on for $C_{LOAD} = 100 \mu F$  | 14 |
| Figure 5.  | Turn-on for $C_{LOAD} = 470 \mu F$  | 14 |
| Figure 6.  | Turn-off for $C_{LOAD} = 1 \mu F$   | 15 |
| Figure 7.  | Turn-off for $C_{LOAD} = 100 \mu F$   | 15 |
| Figure 8.  | Turn-off for $C_{LOAD} = 470 \mu F$   | 16 |
| Figure 9.  | Turn-on for $C_{LOAD} = 1 \mu F$  | 16 |
| Figure 10. | Turn-on for $C_{LOAD} = 100 \mu F$  | 17 |
| Figure 11. | Turn-on for $C_{LOAD} = 470 \mu F$  | 17 |
| Figure 12. | Turn-off for $C_{LOAD} = 1 \mu F$   | 18 |
| Figure 13. | Turn-off for $C_{LOAD} = 100 \mu F$   | 18 |
| Figure 14. | Turn-off for $C_{LOAD} = 470 \mu F$   | 19 |
| Figure 15. | UVLO, $V_I$ rising  | 20 |
| Figure 16. | UVLO, $V_I$ falling   | 20 |
| Figure 17. | Overcurrent protection characteristics, $V_I = 3 V$ , $R_{LOAD} = 2.2 \Omega$ | 21 |
| Figure 18. | Overcurrent protection characteristics, $V_I = 5 V$ , $R_{LOAD} = 2.2 \Omega$ | 21 |
| Figure 19. | $I_{CC}$ versus $V_I$   | 22 |
| Figure 20. | $t_r$ versus $V_I$  | 22 |
| Figure 21. | $t_f$ versus $V_I$  | 23 |
| Figure 22. | $R_{ds(on)}$ versus $V_I$   | 23 |
| Figure 23. | Turn-on for $C_{LOAD} = 1 \mu F$  | 24 |
| Figure 24. | Turn-on for $C_{LOAD} = 100 \mu F$  | 25 |
| Figure 25. | Turn-on for $C_{LOAD} = 470 \mu F$  | 25 |
| Figure 26. | Turn-off for $C_{LOAD} = 1 \mu F$   | 26 |
| Figure 27. | Turn-off for $C_{LOAD} = 100 \mu F$   | 26 |
| Figure 28. | Turn-off for $C_{LOAD} = 470 \mu F$   | 27 |
| Figure 29. | Turn-on for $C_{LOAD} = 1 \mu F$  | 27 |
| Figure 30. | Turn-on for $C_{LOAD} = 100 \mu F$  | 28 |
| Figure 31. | Turn-on for $C_{LOAD} = 470 \mu F$  | 28 |
| Figure 32. | Turn-off for $C_{LOAD} = 1 \mu F$   | 29 |
| Figure 33. | Turn-off for $C_{LOAD} = 100 \mu F$   | 29 |
| Figure 34. | Turn-off for $C_{LOAD} = 470 \mu F$   | 30 |
| Figure 35. | UVLO, $V_I$ rising  | 30 |
| Figure 36. | UVLO, $V_I$ falling   | 31 |
| Figure 37. | Overcurrent protection characteristics, $V_I = 3 V$ , $R_{LOAD} = 1 \Omega$   | 32 |
| Figure 38. | Overcurrent protection characteristics, $V_I = 5 V$ , $R_{LOAD} = 1 \Omega$   | 32 |
| Figure 39. | $I_{CC}$ versus $V_I$   | 33 |
| Figure 40. | $t_r$ versus $V_I$  | 33 |
| Figure 41. | $t_f$ versus $V_I$  | 34 |
| Figure 42. | $R_{ds(on)}$ versus $V_I$   | 34 |
| Figure 43. | SO-8 package outline  | 36 |
| Figure 44. | MSOP8 package outline   | 38 |
| Figure 45. | SO-8 carrier tape   | 39 |
| Figure 46. | MSOP8 carrier tape  | 39 |
| Figure 47. | Reel information  | 40 |

# 1 Block diagram

Figure 1. Block diagram



## 2 Pin descriptions

Figure 2. Pinout

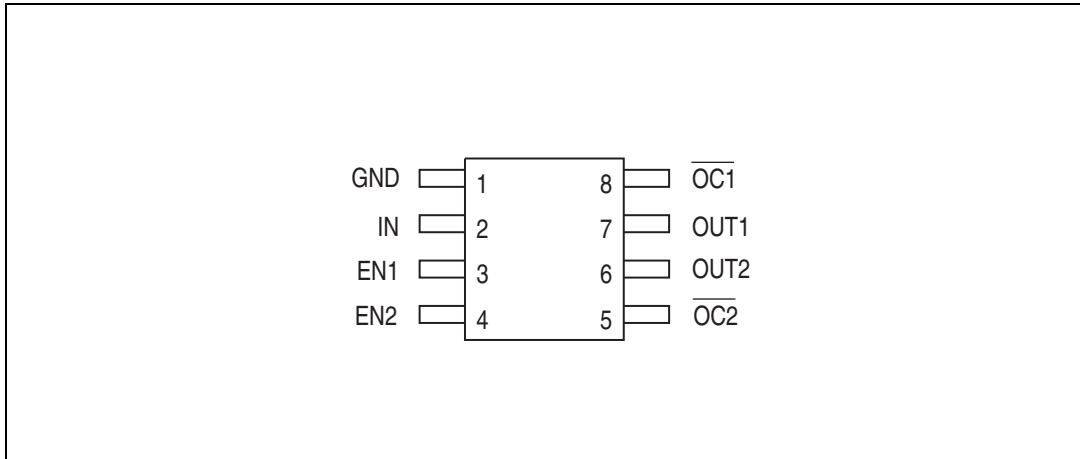


Table 2. Pin descriptions

| Pin number | Name                 | Type | Function   |
|------------|----------------------|------|--|
| 1          | GND                  | —    | Ground   |
| 2          | IN                   | —    | V <sub>CC</sub> input, 2.7 - 5.5 V   |
| 3          | $\overline{EN1}/EN1$ | I    | Channel 1 active low (STMPS2242 and STMPS2262) or active high (STMPS2252 and STMPS2272) enable |
| 4          | $\overline{EN2}/EN2$ | I    | Channel 2 active low (STMPS2242 and STMPS2262) or active high (STMPS2252 and STMPS2272) enable |
| 5          | $\overline{OC2}$     | O    | Open drain output for fault indication of channel 2  |
| 6          | OUT2                 | —    | Output of channel 2  |
| 7          | OUT1                 | —    | Output of channel 1  |
| 8          | $\overline{OC1}$     | O    | Open drain output for fault indication of channel 1  |

## 3 Functional description

### 3.1 Fault blanking

The STMPS devices feature a 10 ms fault blanking. Fault blanking allows current-limit faults, including momentary short-circuit faults that occur when hot-swapping a capacitive load, and also ensures that no fault is issued during power-up. When a load transient causes the device to enter current limit, an internal counter starts. If the load fault persists beyond the 10 ms fault-blanking timeout, the FAULT output asserts “low”. Load-transient faults less than 10 ms (typ.) do not cause a FAULT output assertion. Only current-limit faults have fault-blanking. Die overtemperature faults and input voltage drops below the UVLO threshold cause an immediate fault output.

### 3.2 Overcurrent/overtemperature protection

In overcurrent or short-circuit condition, the switch limits the current at 500 mA for STMPS2242/STMPS2252 and 1000 mA for STMPS2262/STMPS2272. If the temperature of the die goes above the limit value, the switch turns OFF.

### 3.3 Reverse current blocking

When the switch is OFF, or when the STMPS device is not powered ( $V_{CC}=0$  V), the switch behaves as a Hi-Z at the output pin, ensuring that no reverse current will flow into the device when  $V_I < V_O$ .

*Note:* In the case where the switch is ON, and a voltage higher than  $V_I$  is applied to the OUT pin, a reverse current will occur.

### 3.4 UVLO

When the input voltage drops below the threshold value, the power switch turns OFF to prevent improper operation due to low voltage.



## 4 Maximum rating

Stressing the device above the rating listed in the absolute maximum ratings table may cause permanent damage to the device. These are stress ratings only and operation of the device at these or any other conditions above those indicated in the operating sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

### 4.1 Absolute maximum rating

**Table 3. Absolute maximum ratings**

| Symbol     | Parameter                      | Value                  | Unit |
|------------|--------------------------------|------------------------|------|
| $V_I$      | Input voltage range            | -0.3 – 6.0             | V    |
| $V_O$      | Output voltage range           | -0.3 – ( $V_I + 0.3$ ) | V    |
| $V_{IENx}$ | EN input voltage range         | -0.3 – 6.0             | V    |
| $I_O$      | Continuous output current      | Internally limited     |      |
| ESD        | ESD protection level           | 8                      | kV   |
| $T_J$      | Junction operating temperature | -40 to 125             | °C   |
| $T_{STG}$  | Storage temperature            | -55 to 150             | °C   |
| $T_R$      | Thermal resistance (MSOP8)     | 220                    | °C/W |
| $T_R$      | Thermal resistance (SO-8)      | 160                    | °C/W |

### 4.2 Recommended operating conditions

**Table 4. Recommended operating conditions**

| Symbol                            | Parameter                 | Value |     |      | Unit |
|-----------------------------------|---------------------------|-------|-----|------|------|
|                                   |                           | Min   | Typ | Max  |      |
| $V_I$                             | Input voltage             | 2.7   | 5.0 | 5.5  | V    |
| $V_O$                             | Output voltage            | 0     | 5.0 | 5.5  | V    |
| $I_O$<br>(STMPS2242<br>STMPS2252) | Continuous output current | 0     | -   | 500  | mA   |
| $I_O$<br>(STMPS2262<br>STMPS2272) | Continuous output current | 0     | -   | 1000 | mA   |

## 5 Electrical specifications

**Table 5. Electrical characteristics**

| Symbol              | Parameter                               | Test conditions  | Value |     |     | Unit |
|---------------------|---|--|-------|-----|-----|------|
|                     |   |  | Min   | Typ | Max |      |
| R <sub>ds(on)</sub> | Static drain source ON state resistance | V <sub>I</sub> = 2.7 V<br>T <sub>J</sub> = 25°C                                |       | 120 | 160 | mΩ   |
|                     |   | V <sub>I</sub> = 5.0 V<br>T <sub>J</sub> = 25°C;                               |       | 105 | 115 | mΩ   |
| R <sub>ds(on)</sub> | Static drain source ON state resistance | V <sub>I</sub> = 2.7 V<br>-40 < T <sub>J</sub> < 125°C                         |       |     | 200 | mΩ   |
|                     |   | V <sub>I</sub> = 5.0 V<br>-40 < T <sub>J</sub> < 125°C                         |       |     | 140 |      |
| t <sub>r</sub>      | Output rise time (STMPS2242,STMPS2252)  | V <sub>I</sub> = 5.0 V<br>R <sub>LOAD</sub> = 10 Ω<br>C <sub>LOAD</sub> = 1 μF | 0.05  |     | 2   | ms   |
|                     | Output rise time (STMPS2262,STMPS2272)  | V <sub>I</sub> = 5.0 V<br>R <sub>LOAD</sub> = 10 Ω<br>C <sub>LOAD</sub> = 1 μF | 0.05  |     | 2   | ms   |
| t <sub>f</sub>      | Output fall time (STMPS2242,STMPS2252)  | V <sub>I</sub> = 5.0 V<br>R <sub>LOAD</sub> = 10 Ω<br>C <sub>LOAD</sub> = 1 μF | 0.05  |     | 2   | ms   |
|                     | Output fall time (STMPS2262,STMPS2272)  | V <sub>I</sub> = 5.0 V<br>R <sub>LOAD</sub> = 10 Ω<br>C <sub>LOAD</sub> = 1 μF | 0.05  |     | 2   | ms   |

**Table 6. Current limit characteristics**  
(V<sub>I</sub> = 5.5 V, I<sub>O</sub> = rated current, T<sub>J</sub> = 25°C, unless otherwise specified)

| Symbol                                      | Parameter                    | Test condition   | Value |     |     | Unit |
|---|------------------------------|--|-------|-----|-----|------|
|   |                              |  | Min   | Typ | Max |      |
| I <sub>OS</sub><br>(STMPS2242<br>STMPS2252) | Short circuit output current | V <sub>I</sub> = 5 V<br>OUT connected to GND through 10 mΩ load, device enabled into short circuit | 0.6   | 0.8 | 1.0 | A    |
| I <sub>OS</sub><br>(STMPS2262<br>STMPS2272) |                              |  | 1.1   | 1.6 | 2.0 | A    |

**Table 7. Supply current characteristics**  
 ( $V_I = 5.5\text{ V}$ ,  $I_O = \text{rated current}$ ,  $T_J = 25^\circ\text{C}$ , unless otherwise specified)

| Symbol        | Parameter                             | Test condition  | Value |     |     | Unit          |
|---------------|---------------------------------------|---|-------|-----|-----|---------------|
|               |                                       |   | Min   | Typ | Max |               |
| $I_{off}$     | Switch turned off                     | No load<br>Switch is off  |       | 9   | 14  | $\mu\text{A}$ |
|               |                                       | No load<br>Switch is off<br>$-40 < T_J < 125^\circ\text{C}$                                     |       |     | 16  |               |
| $I_{on}$      | Switch turned on                      | No load<br>Switch is on   |       | 50  | 70  | $\mu\text{A}$ |
|               |                                       | No load<br>Switch is on<br>$-40 < T_J < 125^\circ\text{C}$                                      |       |     | 85  |               |
| $I_{leakage}$ | Output leakage current <sup>(1)</sup> | $I_{off}$ (grounded output) -<br>$I_{off}$ (floating output)                                    |       | 1   | 2   | $\mu\text{A}$ |
|               |                                       | $I_{off}$ (grounded output) -<br>$I_{off}$ (floating output)<br>$-40 < T_J < 125^\circ\text{C}$ |       | 1   | 6   |               |
| $I_{reverse}$ | Reversed leakage current              | Switch is off<br>$V_I < V_O$ ,<br>Output connected to<br>5.5 V, $25^\circ\text{C}$              |       | 1   | 2   | $\mu\text{A}$ |
|               |                                       | Switch is off<br>$V_I < V_O$<br>Output connected to<br>5.5 V, $125^\circ\text{C}$               |       | 1   | 10  |               |

1.  $I_{leakage} = I_{off-ground} - I_{off}$ , where  $I_{off-ground}$  = current into IN when switch is off and output is grounded

**Table 8. Thermal characteristics**  
 ( $V_I = 5.5\text{ V}$ ,  $I_O = \text{rated current}$ ,  $T_J = 25^\circ\text{C}$ , unless otherwise specified)

| Symbol     | Parameter                      | Test condition | Value |     |     | Unit             |
|------------|--------------------------------|----------------|-------|-----|-----|------------------|
|            |                                |                | Min   | Typ | Max |                  |
| T1         | Thermal shutdown threshold     |                | 135   |     |     | $^\circ\text{C}$ |
| T2         | Recovery from thermal shutdown |                | 125   |     |     | $^\circ\text{C}$ |
| Hysteresis |                                |                |       | 10  |     | $^\circ\text{C}$ |

**Table 9. UVLO characteristics**(V<sub>I</sub> = 5.5 V, I<sub>O</sub> = rated current, T<sub>J</sub> = 25°C, unless otherwise specified)

| Symbol            | Parameter                      | Test condition | Value |     |     | Unit |
|-------------------|--------------------------------|----------------|-------|-----|-----|------|
|                   |                                |                | Min   | Typ | Max |      |
| V <sub>UVLO</sub> | Undervoltage lockout threshold |                | 2.0   |     | 2.5 | V    |
| Hysteresis        |                                |                |       | 75  |     | mV   |

**Table 10. OCx pin characteristics**(V<sub>I</sub> = 5.5 V, I<sub>O</sub> = rated current, T<sub>J</sub> = 25°C, unless otherwise specified)

| Symbol           | Parameter                      | Test condition                                      | Value |     |     | Unit |
|------------------|--------------------------------|---|-------|-----|-----|------|
|                  |                                |   | Min   | Typ | Max |      |
| OC blanking      | OCx assertion and de-assertion |   | 4     | 8   | 15  | ms   |
| V <sub>O</sub>   | Output low voltage             | I <sub>O</sub> = 5 mA                               | –     | –   | 0.4 | V    |
| I <sub>off</sub> | Off current                    | V <sub>OC</sub> = 2.7 V, 5.5 V<br>(No OC condition) | –     | –   | 1.0 | μA   |

**Table 11. ENx pin characteristics**(V<sub>I</sub> = 5.5 V, I<sub>O</sub> = rated current, T<sub>J</sub> = 25°C, unless otherwise specified)

| Symbol           | Parameter                    | Test condition   | Value |     |     | Unit |
|------------------|------------------------------|--|-------|-----|-----|------|
|                  |                              |  | Min   | Typ | Max |      |
| V <sub>IH</sub>  | High level input voltage     | V <sub>I</sub> = 2.7 V to 5.5 V                        | 2.0   | –   | –   | V    |
| V <sub>IL</sub>  | Low level input voltage      | V <sub>I</sub> = 4.5 V to 5.5 V                        | –     | –   | 0.8 | V    |
|                  |                              | V <sub>I</sub> = 2.7 V to 4.5 V                        | –     | –   | 0.4 | V    |
| I <sub>I</sub>   | Input current                | V <sub>IENx</sub> = 0 V or V <sub>I</sub>              | -0.5  | –   | 0.5 | μA   |
| t <sub>on</sub>  | Turn ON time <sup>(1)</sup>  | R <sub>LOAD</sub> = 10 Ω<br>C <sub>LOAD</sub> = 100 μF | –     | –   | 5   | ms   |
| t <sub>off</sub> | Turn OFF time <sup>(1)</sup> | R <sub>LOAD</sub> = 10 Ω<br>C <sub>LOAD</sub> = 100 μF | –     | –   | 10  | ms   |

1. Not tested in production, specified by design.

## 6 Typical operating characteristics

### 6.1 STMP2242, STMP2252 characteristics

The waveforms and characteristics shown in this section pertain to the STMP2252 device. The STMP2242 is expected to have the same characteristics with inverted EN input function. All measurements are at ambient temperature 25 °C.

#### 6.1.1 Turn-on/off characteristics for $V_I = 3\text{ V}$ , $R_{LOAD} = 6\ \Omega$

Figure 3. Turn-on for  $C_{LOAD} = 1\ \mu\text{F}$



Figure 4. Turn-on for  $C_{LOAD} = 100 \mu F$



Figure 5. Turn-on for  $C_{LOAD} = 470 \mu F$

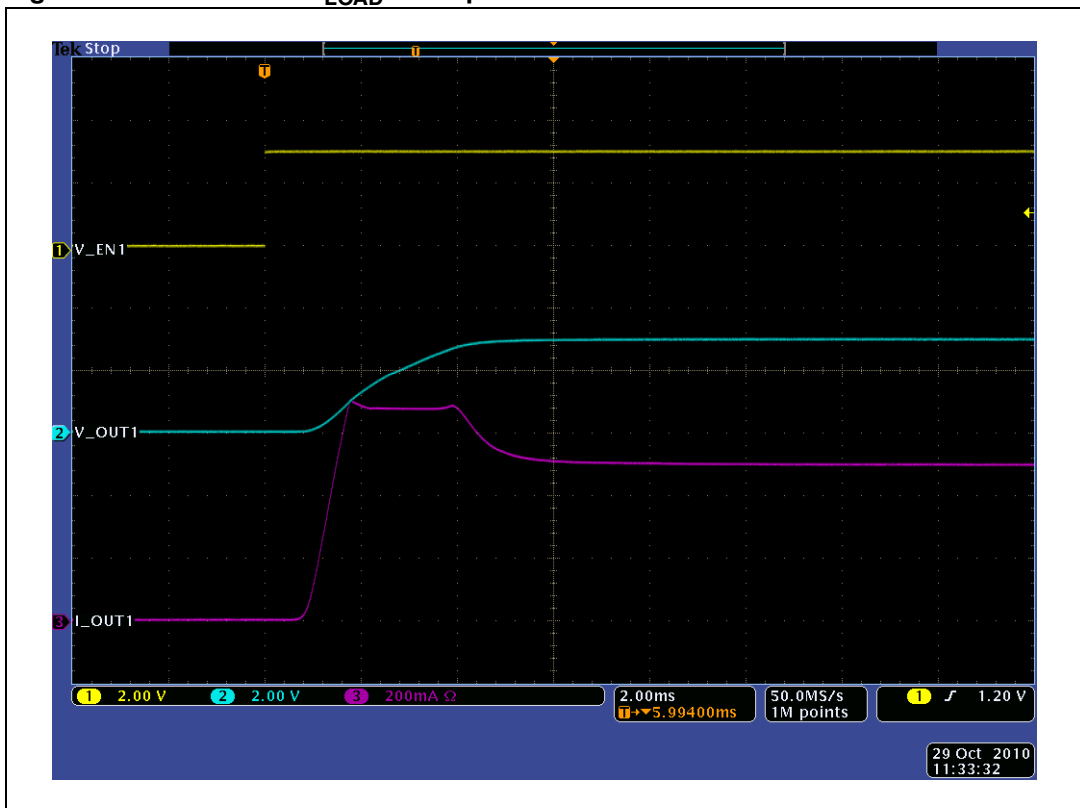


Figure 6. Turn-off for  $C_{LOAD} = 1 \mu F$

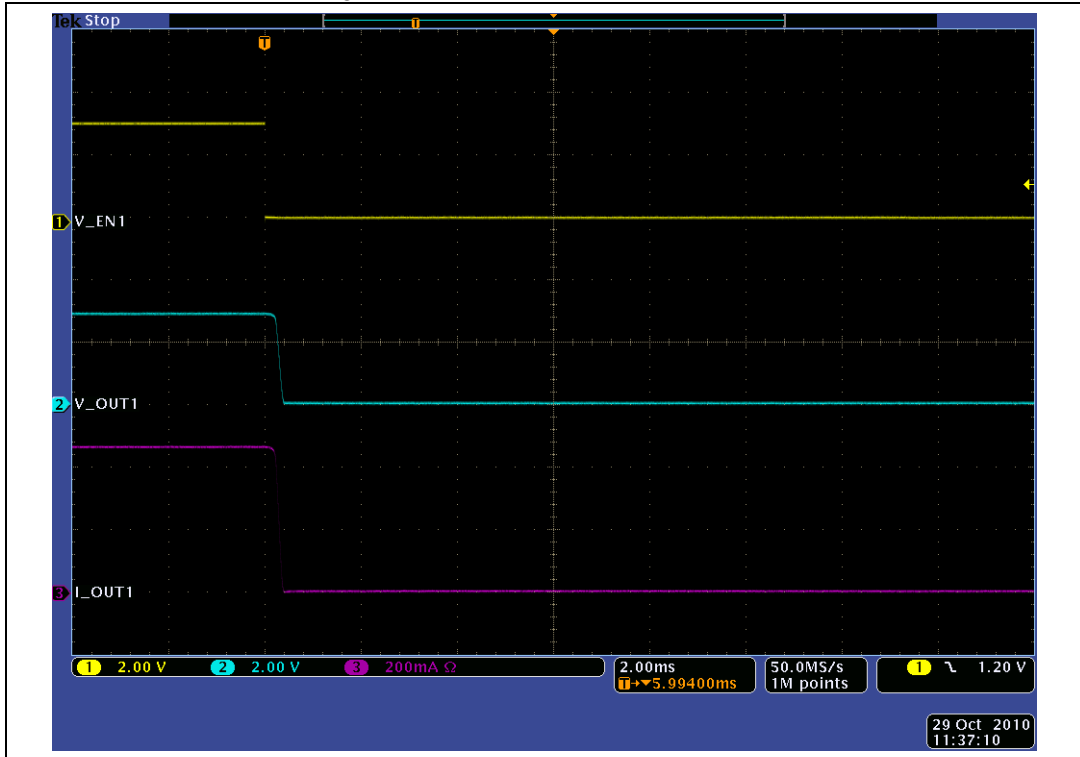


Figure 7. Turn-off for  $C_{LOAD} = 100 \mu F$

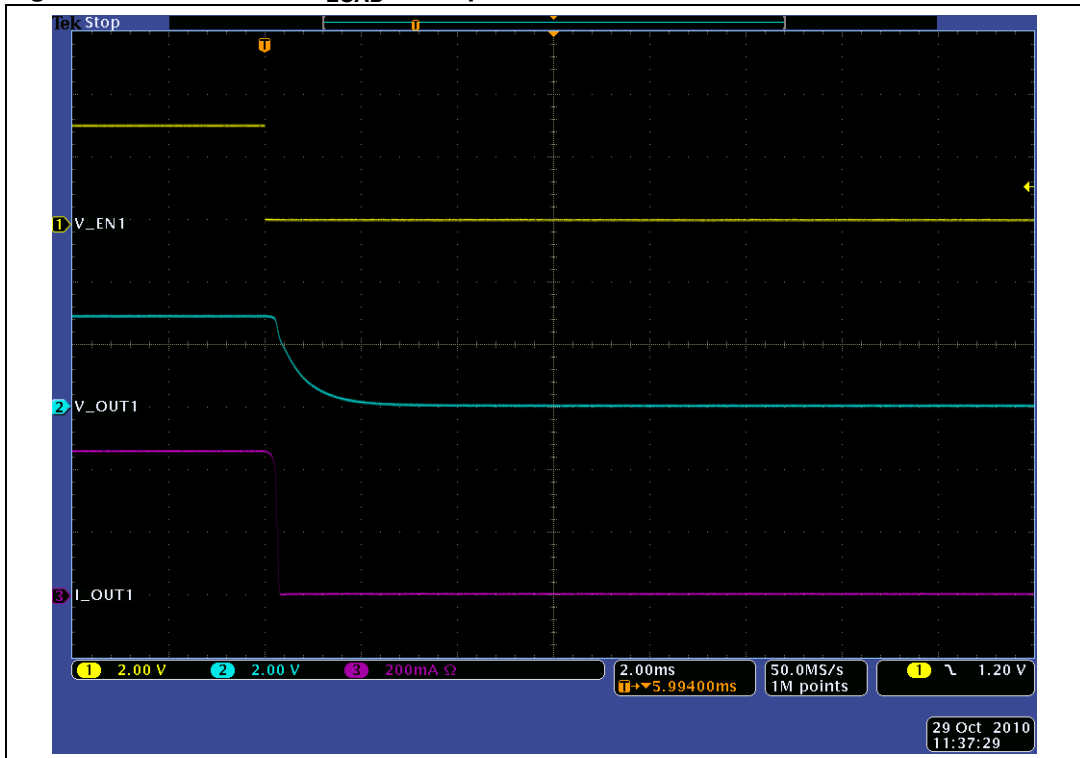
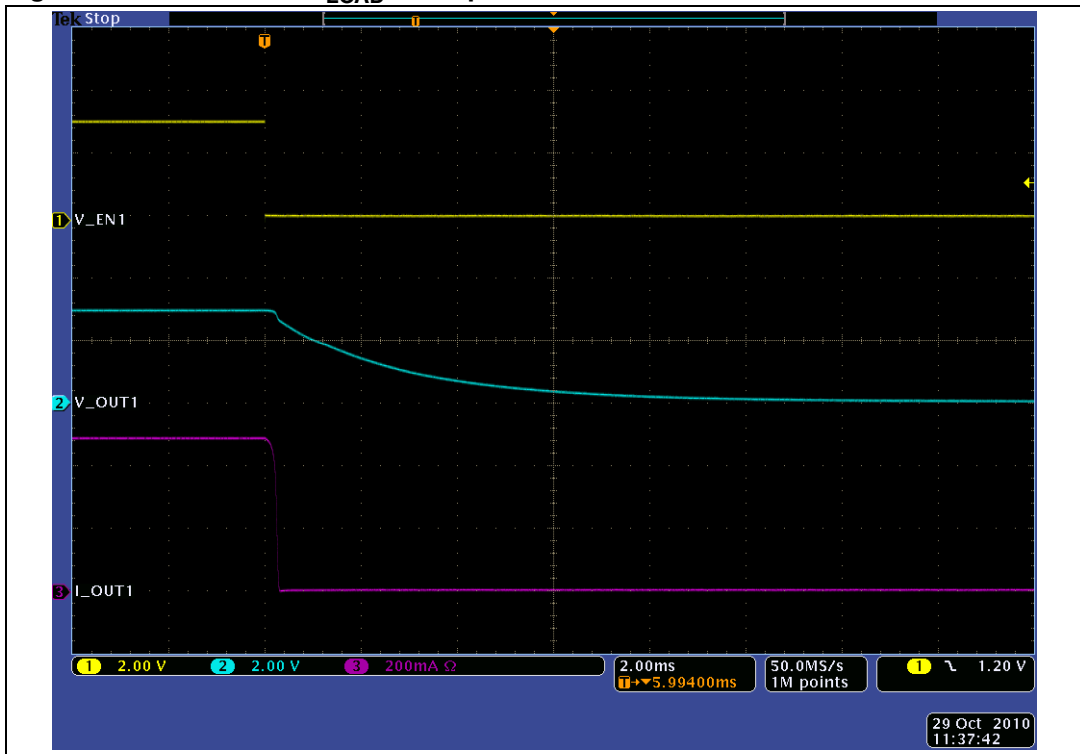


Figure 8. Turn-off for  $C_{LOAD} = 470 \mu F$



6.1.2 Turn-on/off characteristics for  $V_I = 5 V$ ,  $R_{LOAD} = 10 \Omega$

Figure 9. Turn-on for  $C_{LOAD} = 1 \mu F$

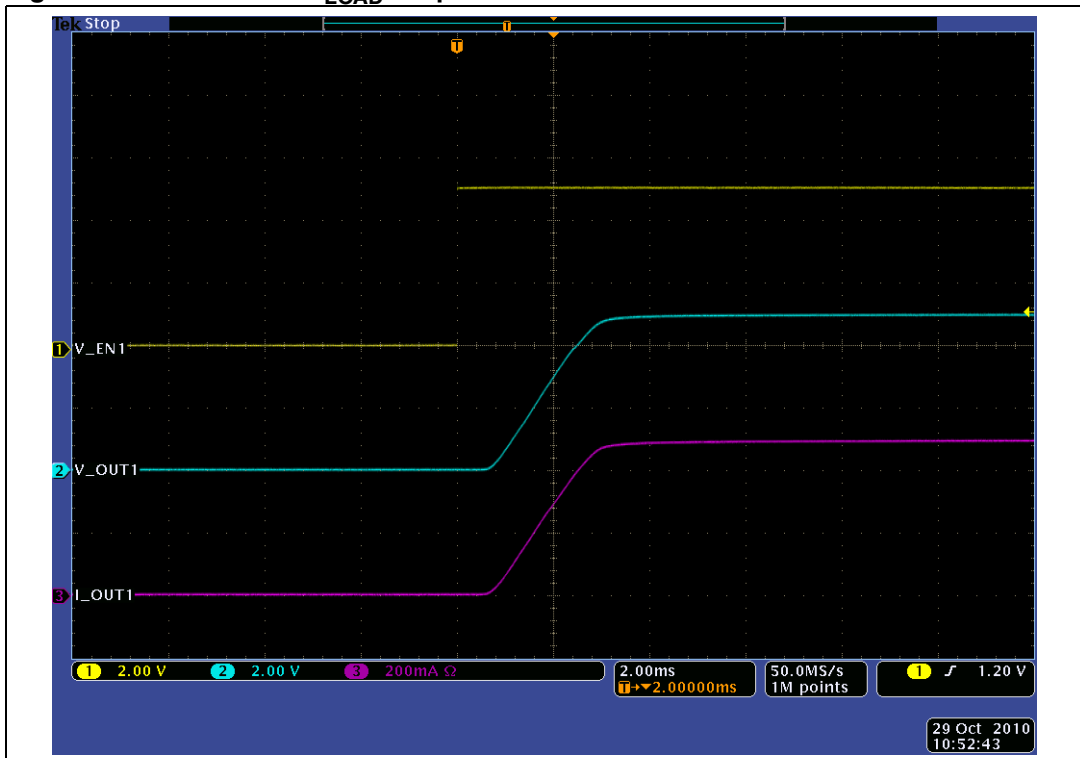




Figure 10. Turn-on for  $C_{LOAD} = 100 \mu F$



Figure 11. Turn-on for  $C_{LOAD} = 470 \mu F$

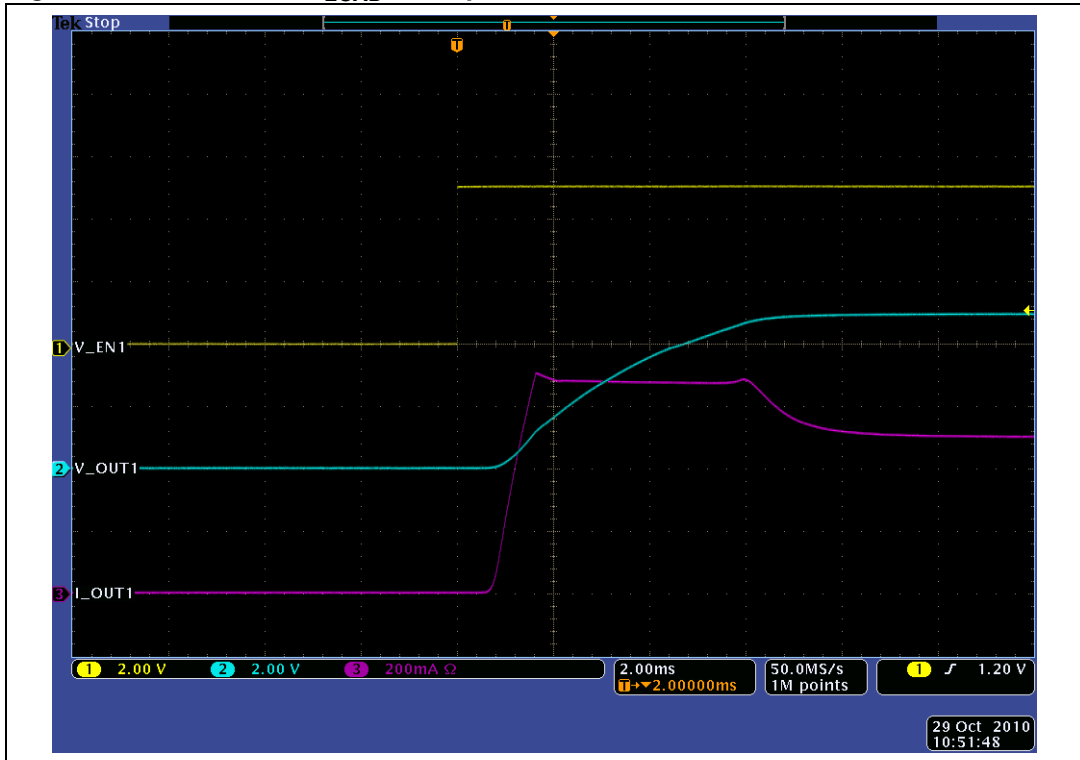


Figure 12. Turn-off for  $C_{LOAD} = 1 \mu F$

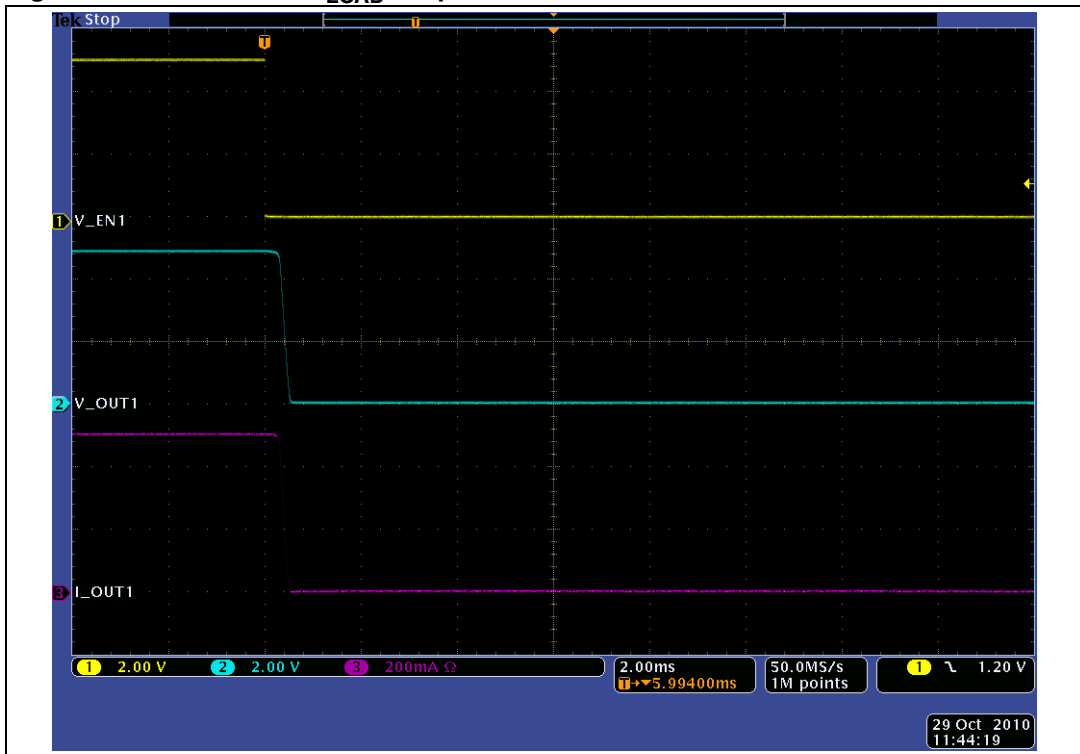


Figure 13. Turn-off for  $C_{LOAD} = 100 \mu F$

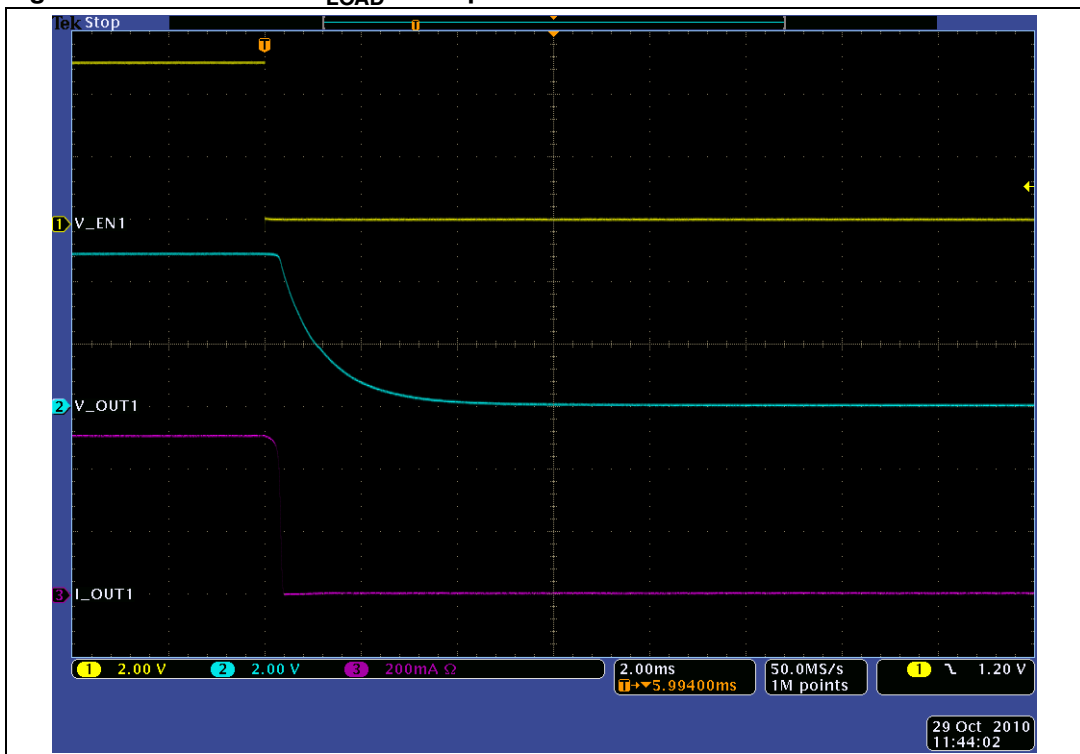
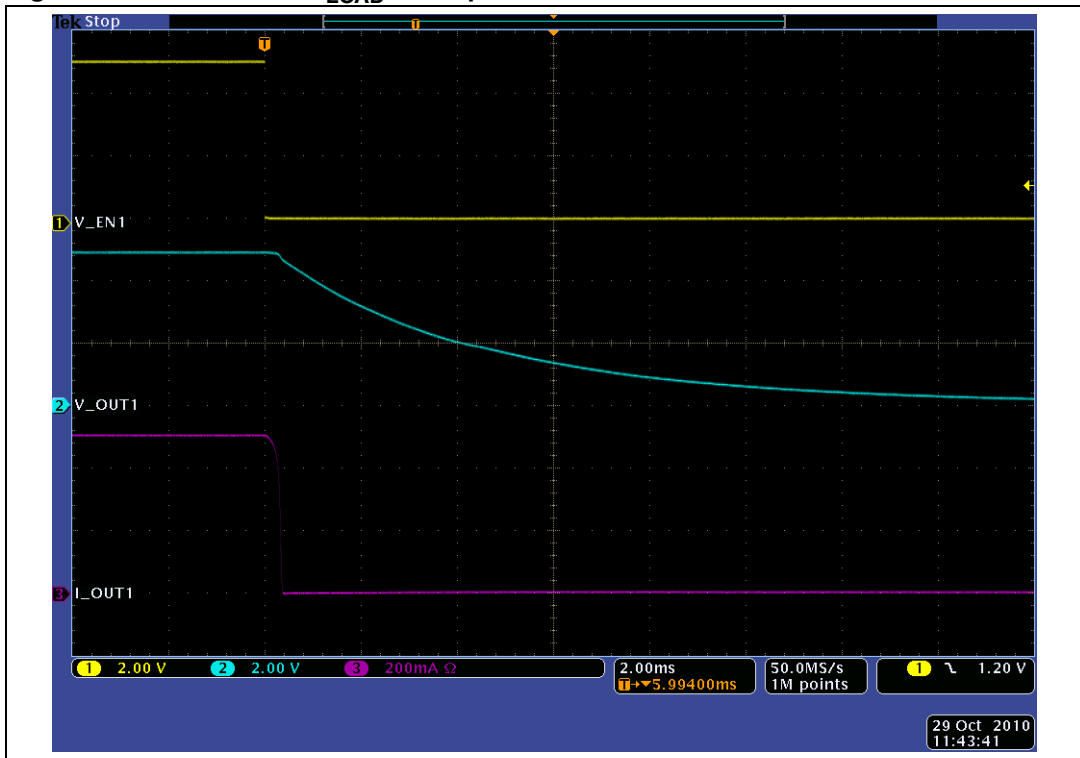


Figure 14. Turn-off for  $C_{LOAD} = 470 \mu F$



### 6.1.3 UVLO characteristics

Figure 15. UVLO,  $V_I$  rising

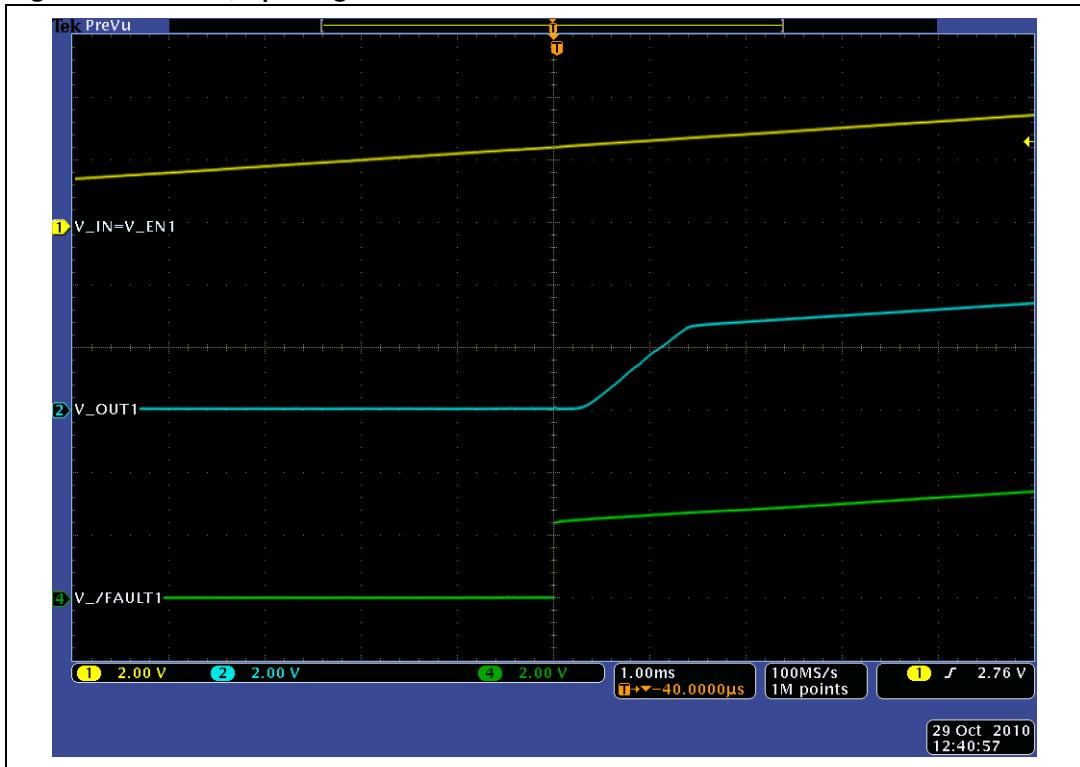


Figure 16. UVLO,  $V_I$  falling



6.1.4 Overcurrent protection characteristics

Figure 17. Overcurrent protection characteristics,  $V_I = 3\text{ V}$ ,  $R_{LOAD} = 2.2\ \Omega$

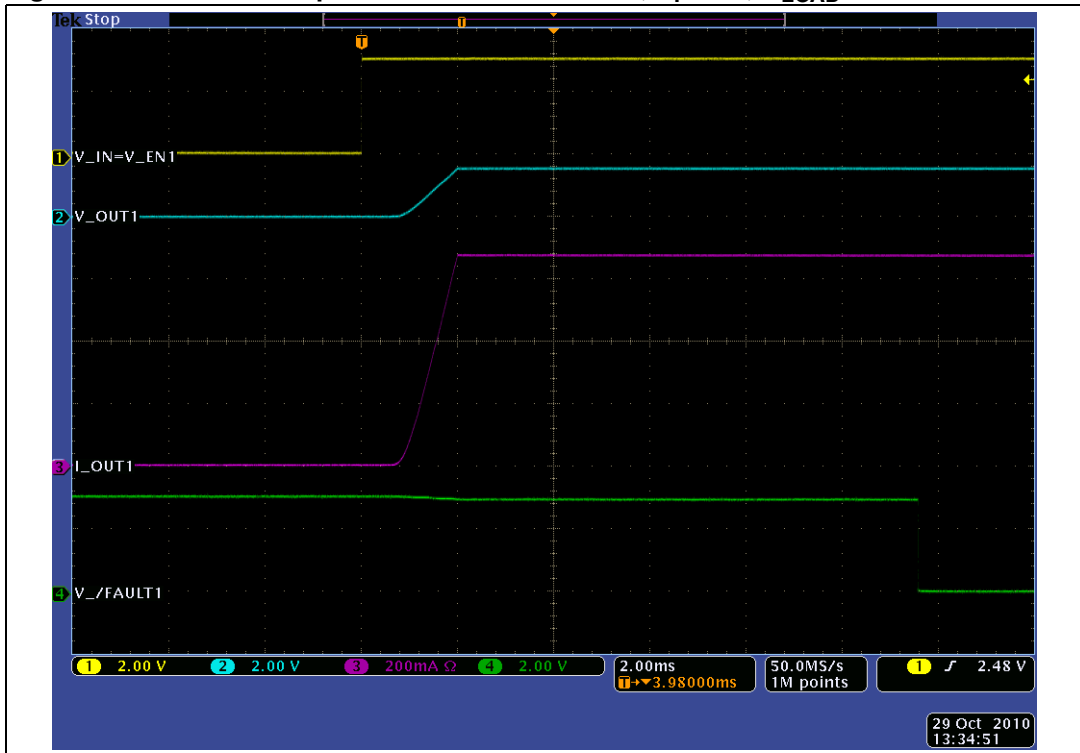
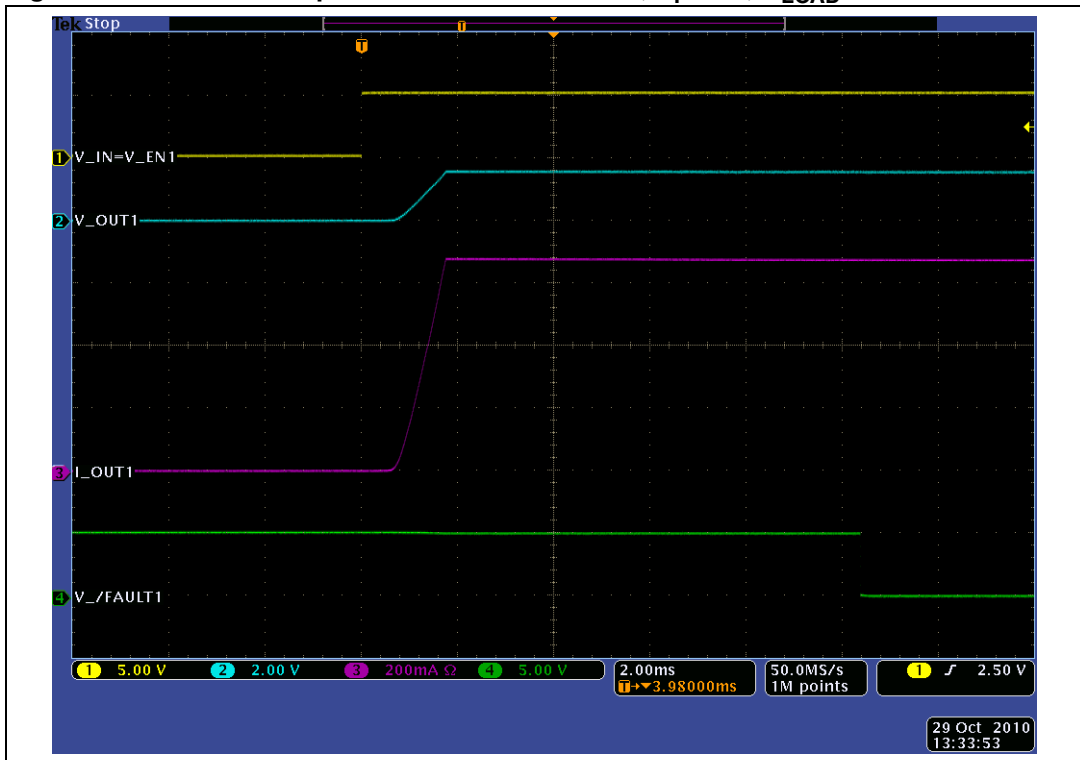


Figure 18. Overcurrent protection characteristics,  $V_I = 5\text{ V}$ ,  $R_{LOAD} = 2.2\ \Omega$



6.1.5 Other electrical characteristics

Figure 19.  $I_{CC}$  versus  $V_I$

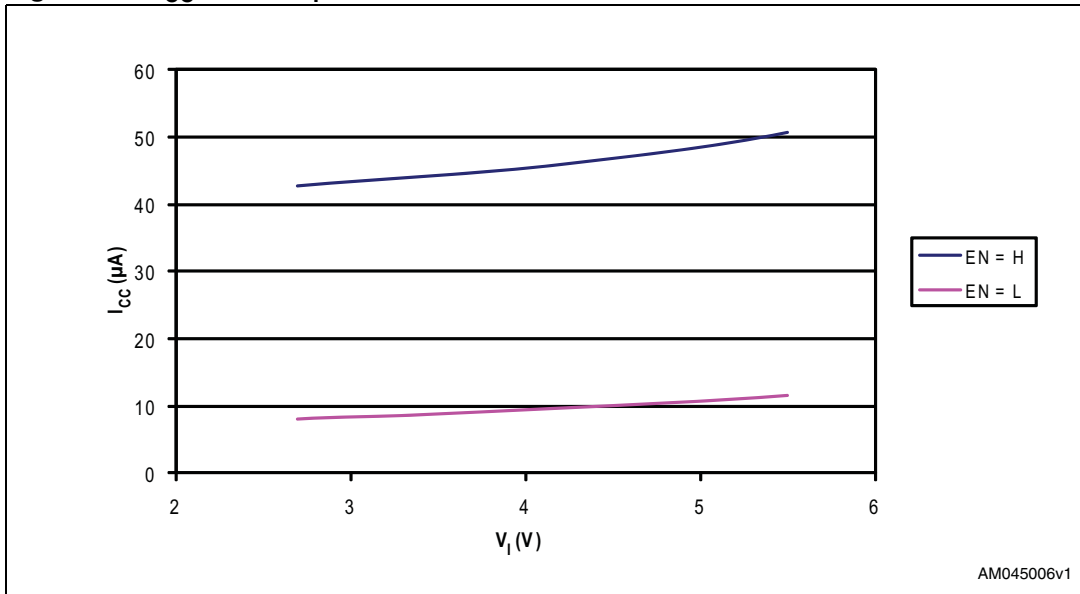


Figure 20.  $t_r$  versus  $V_I$

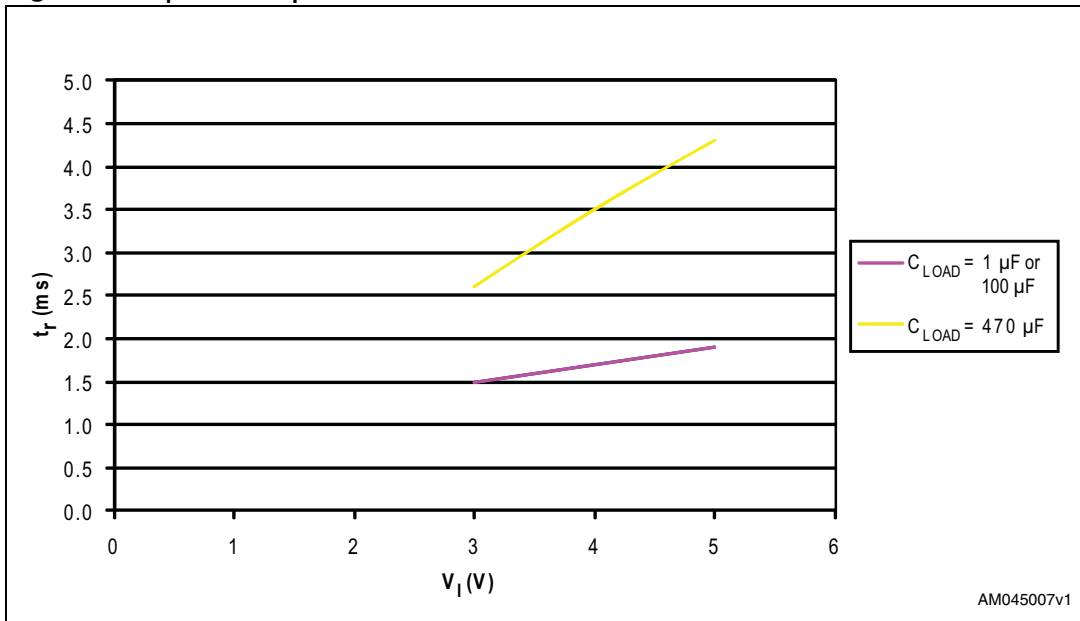


Figure 21.  $t_f$  versus  $V_I$

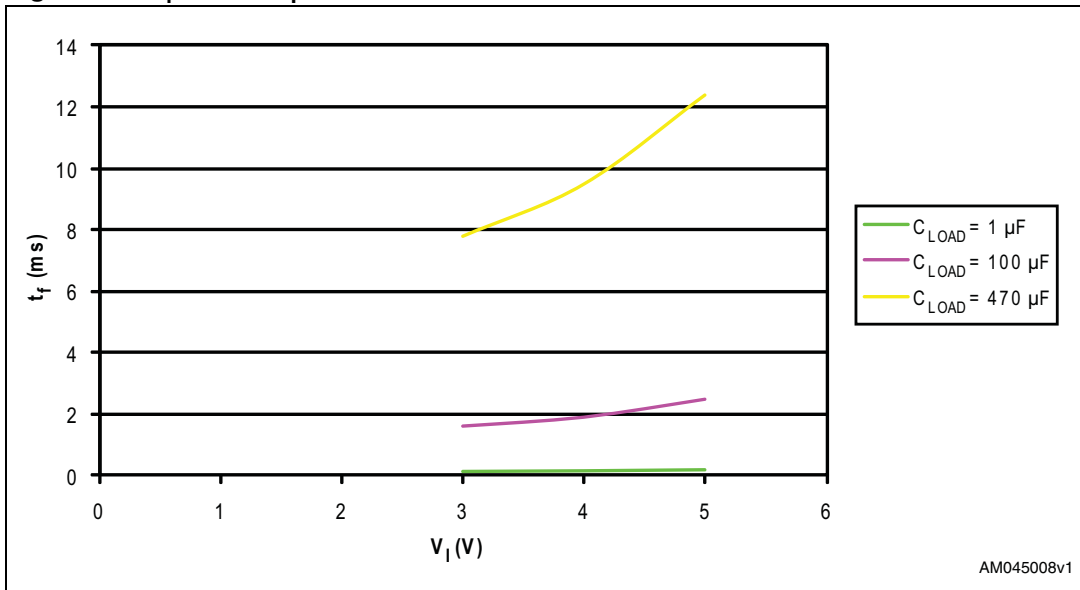
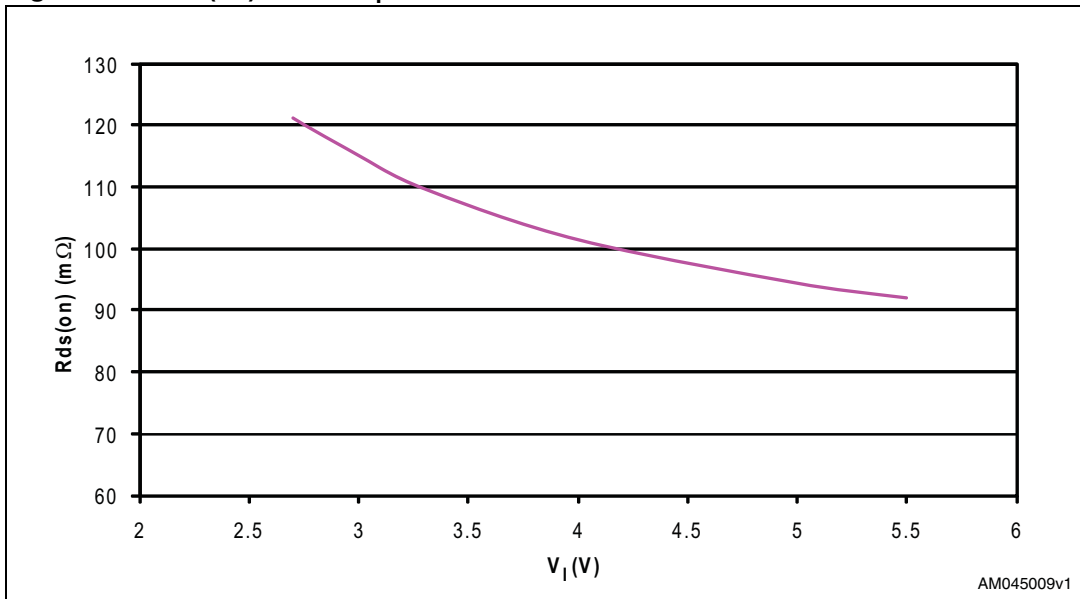


Figure 22.  $R_{ds(on)}$  versus  $V_I$



## 6.2 STMPS2262, STMPS2272 characteristics

The waveforms and characteristics shown in this section pertain to the STMPS2272 device. The STMPS2262 is expected to have the same characteristics with inverted EN input function. All measurements are at ambient temperature 25 °C.

### 6.2.1 Turn-on/off characteristics for $V_I = 3\text{ V}$ , $R_{LOAD} = 3\ \Omega$

Figure 23. Turn-on for  $C_{LOAD} = 1\ \mu\text{F}$





Figure 24. Turn-on for  $C_{LOAD} = 100 \mu F$



Figure 25. Turn-on for  $C_{LOAD} = 470 \mu F$

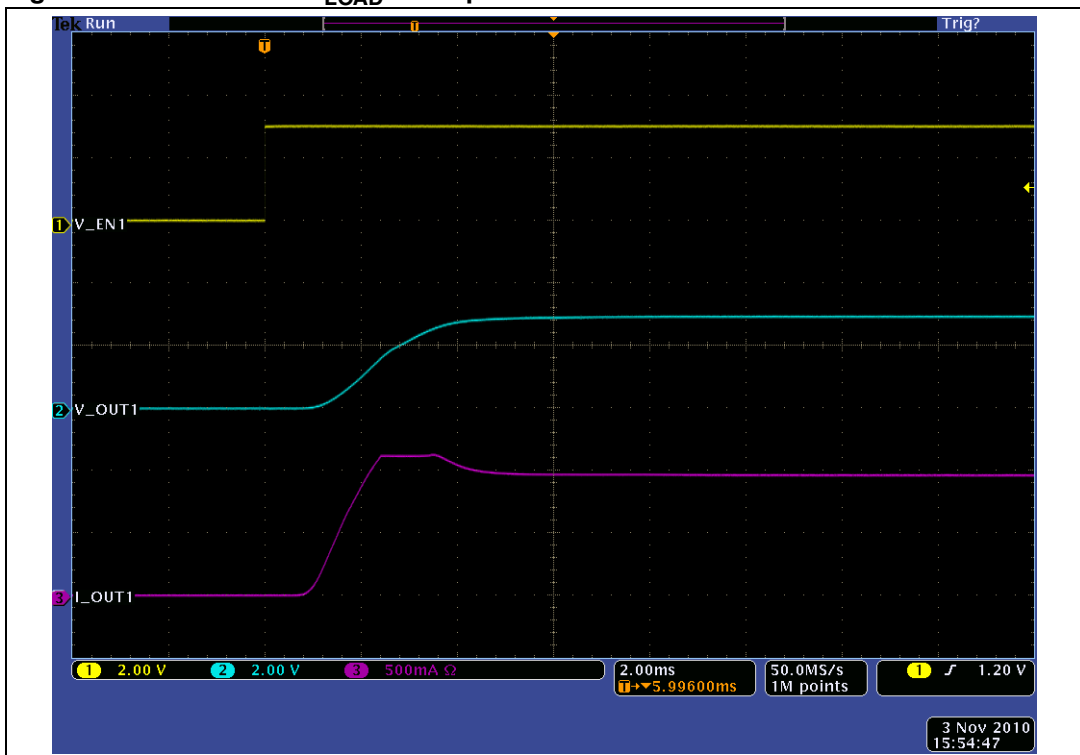


Figure 26. Turn-off for  $C_{LOAD} = 1 \mu F$

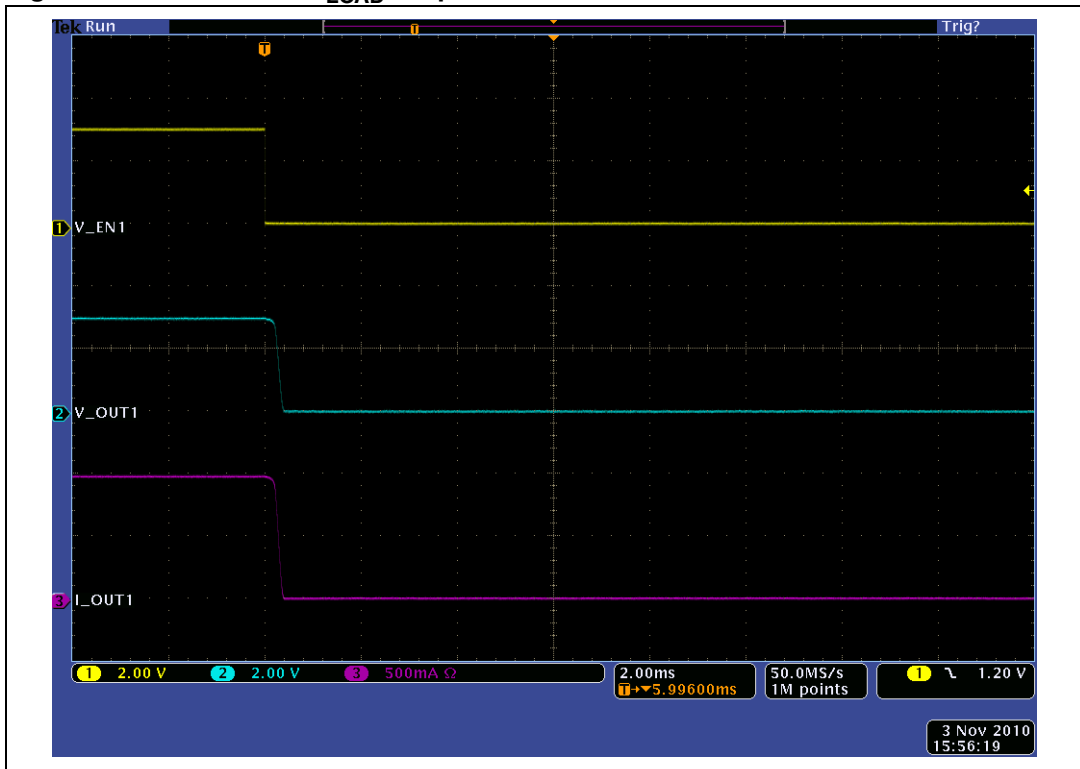


Figure 27. Turn-off for  $C_{LOAD} = 100 \mu F$

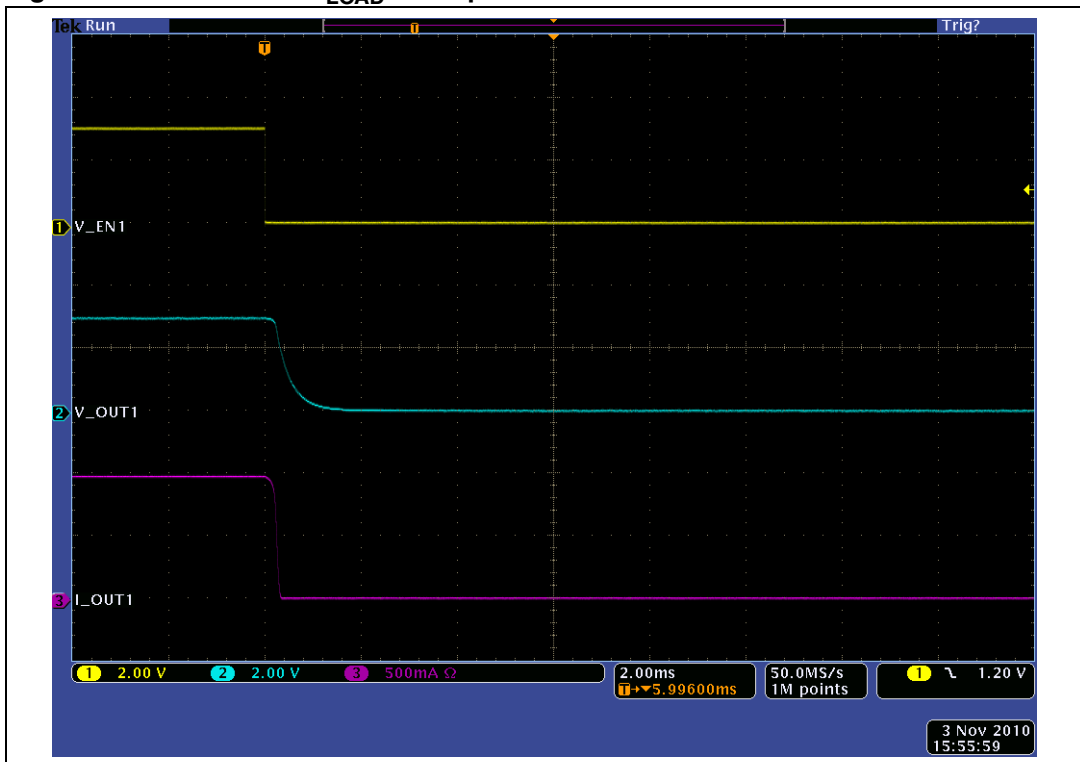
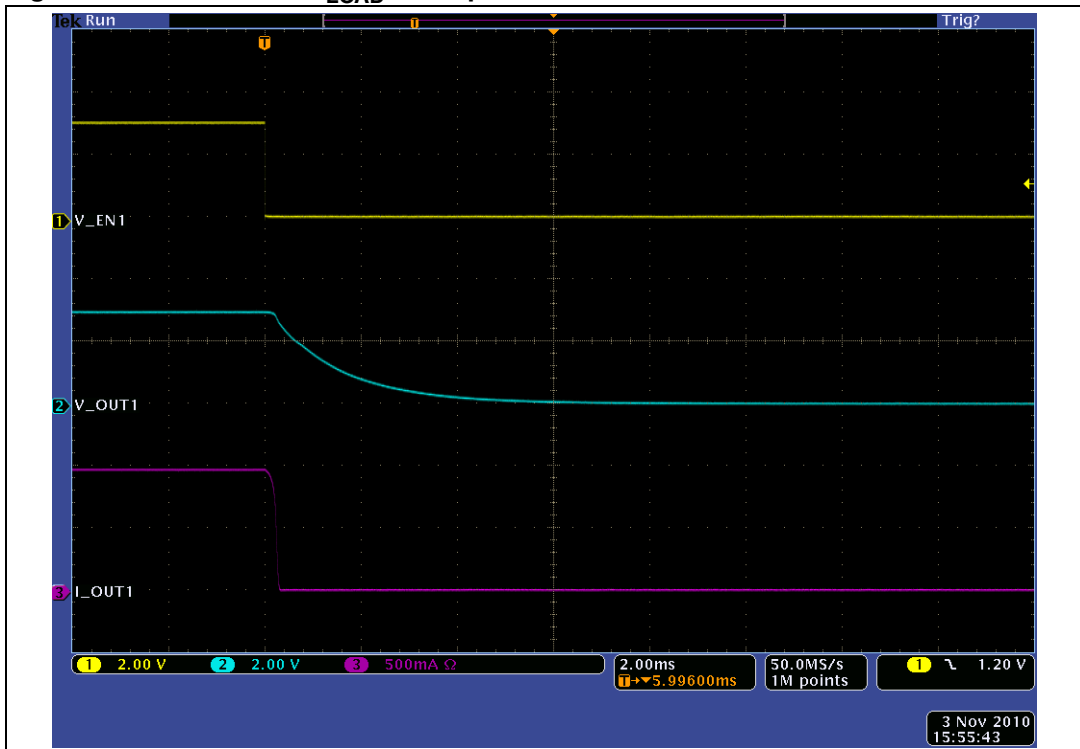


Figure 28. Turn-off for  $C_{LOAD} = 470 \mu F$



### 6.2.2 Turn-on/off characteristics for $V_I = 5 V$ , $R_{LOAD} = 5 \Omega$

Figure 29. Turn-on for  $C_{LOAD} = 1 \mu F$



Figure 30. Turn-on for  $C_{LOAD} = 100 \mu F$

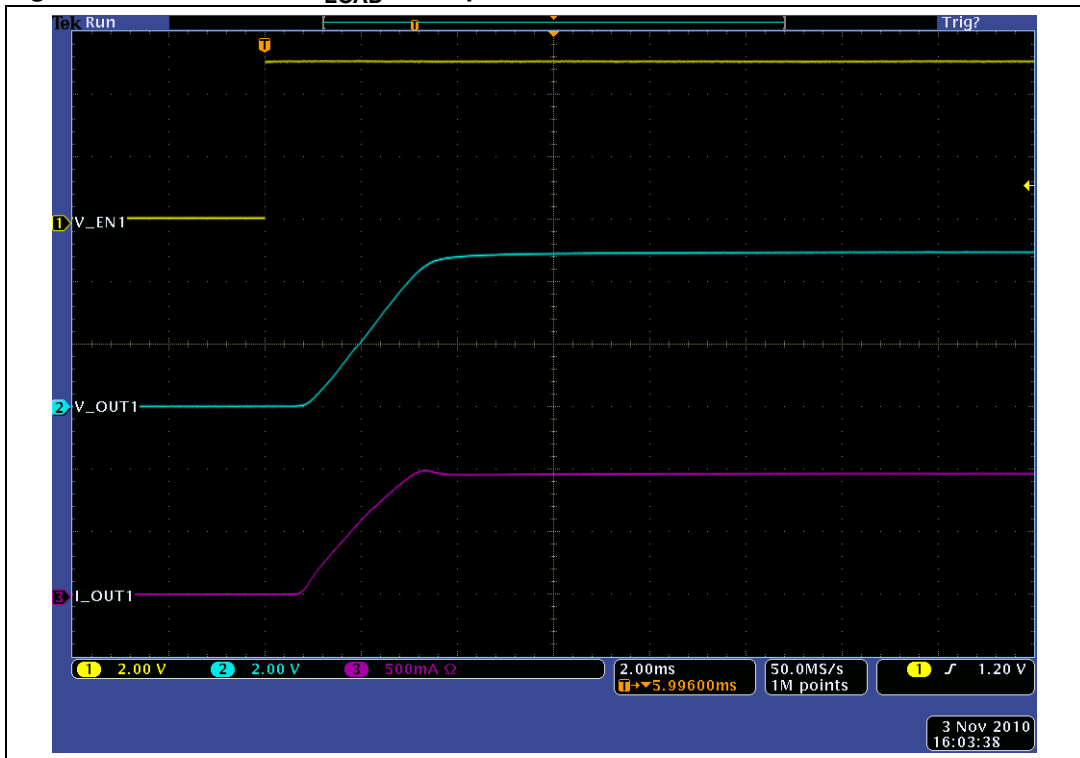


Figure 31. Turn-on for  $C_{LOAD} = 470 \mu F$

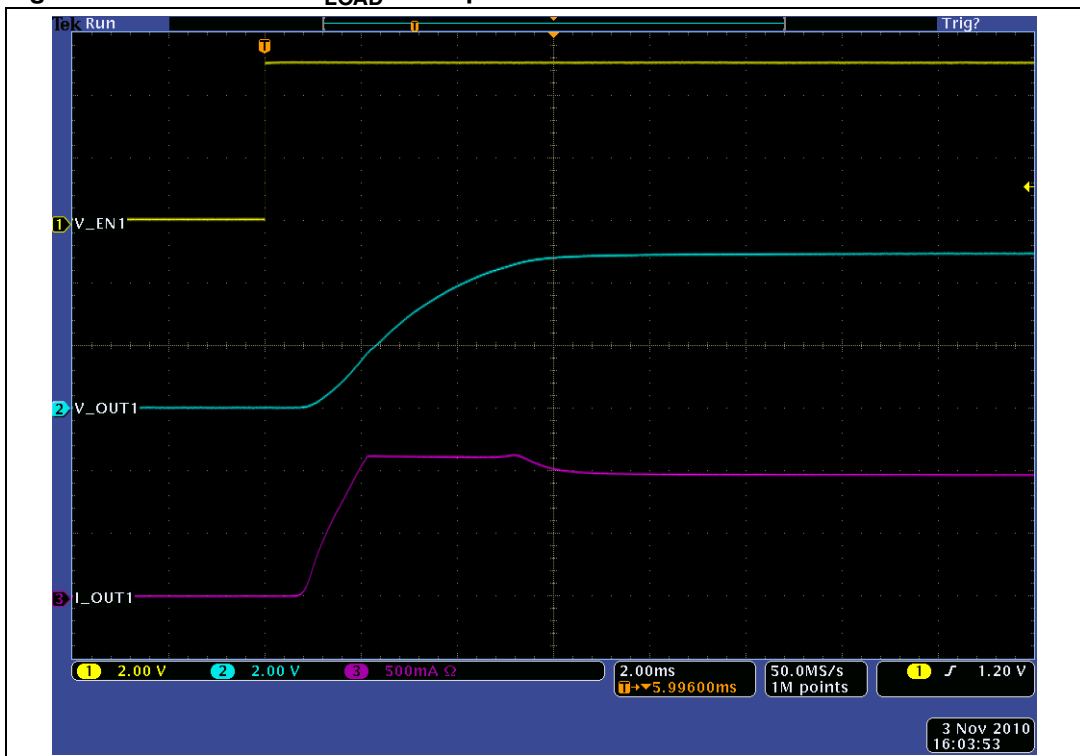


Figure 32. Turn-off for  $C_{LOAD} = 1 \mu F$

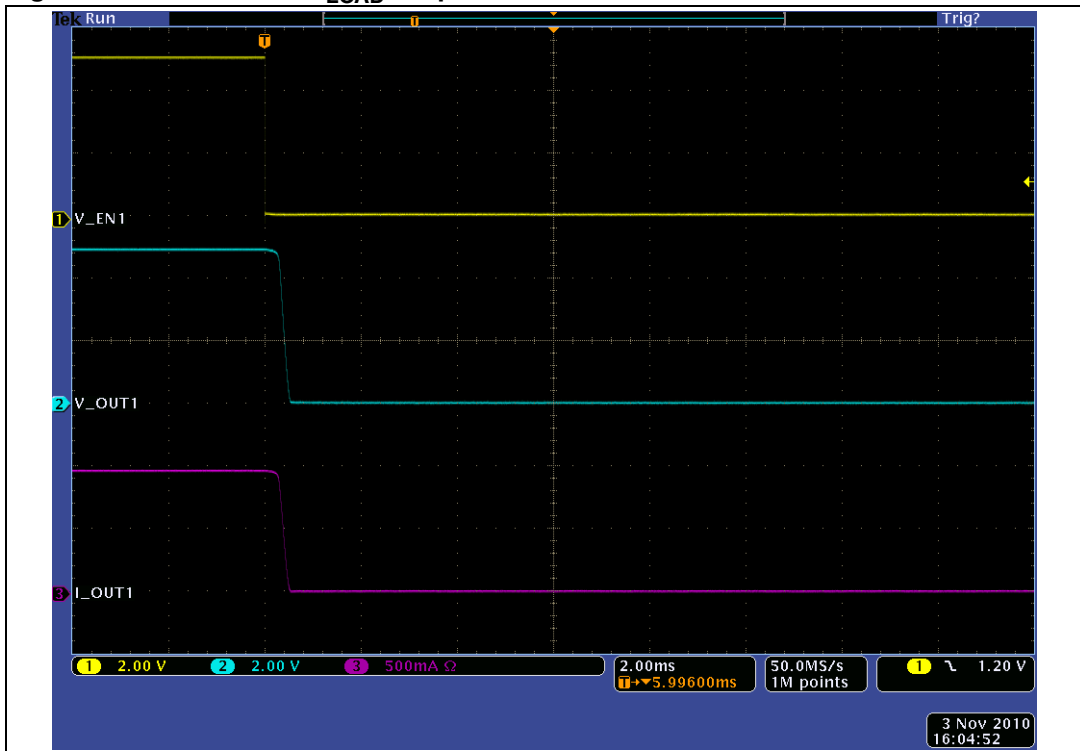
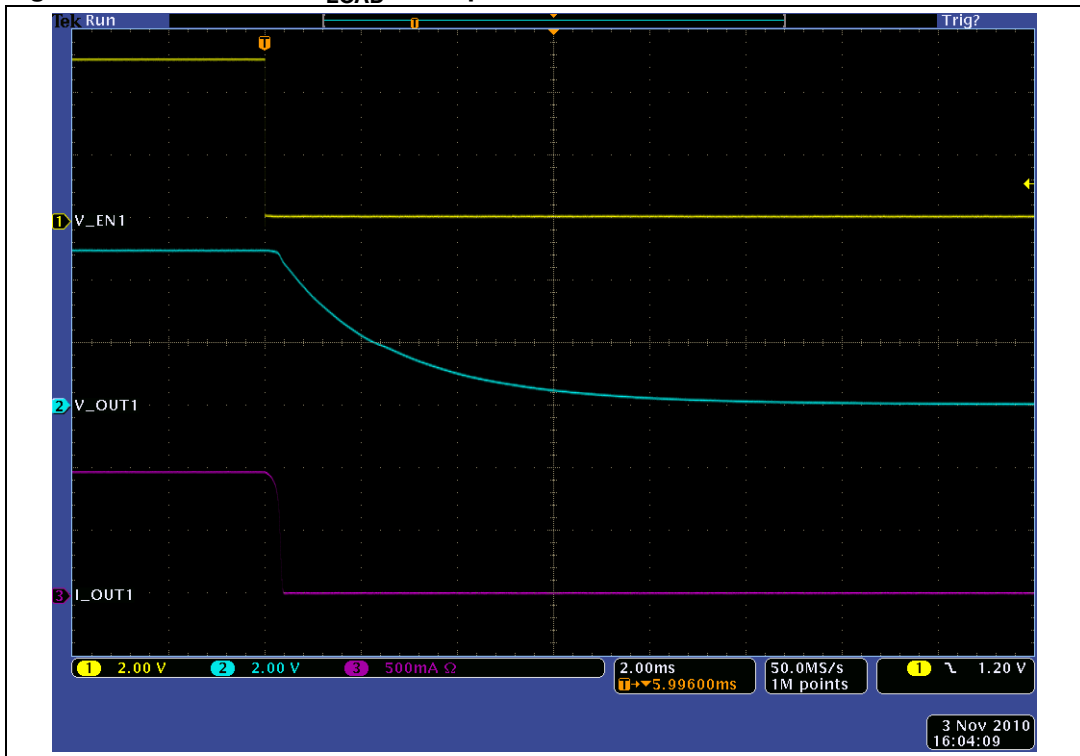


Figure 33. Turn-off for  $C_{LOAD} = 100 \mu F$



Figure 34. Turn-off for  $C_{LOAD} = 470 \mu F$



### 6.2.3 UVLO characteristics

Figure 35. UVLO,  $V_I$  rising

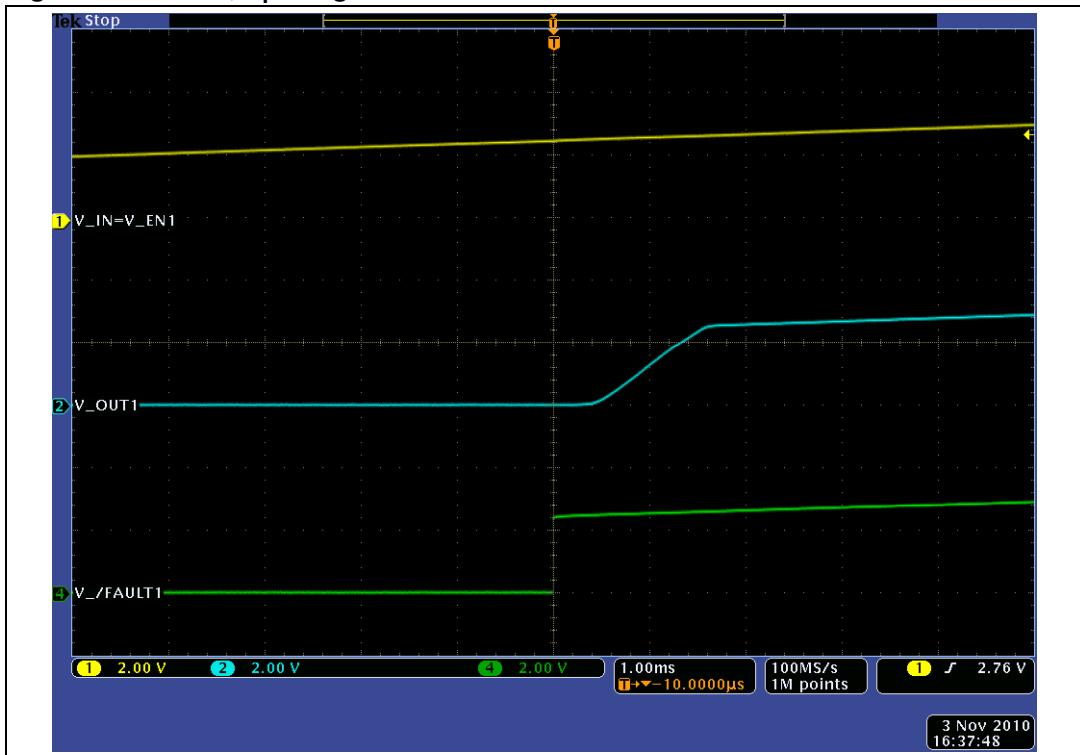
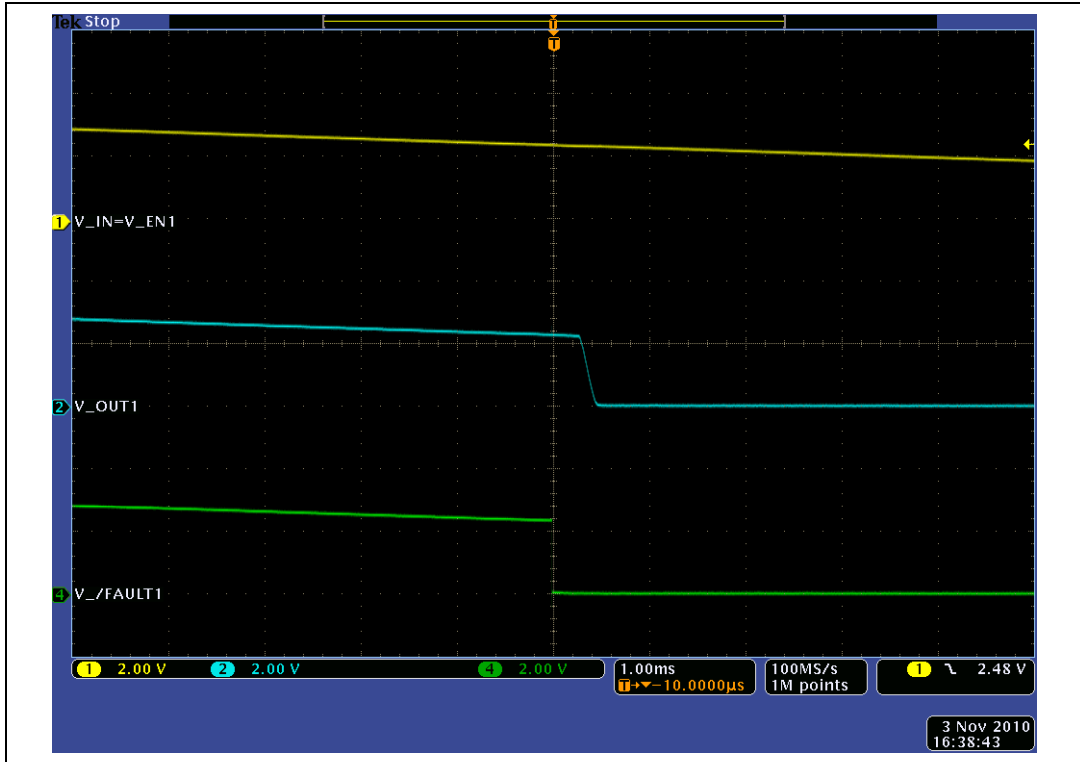


Figure 36. UVLO,  $V_I$  falling

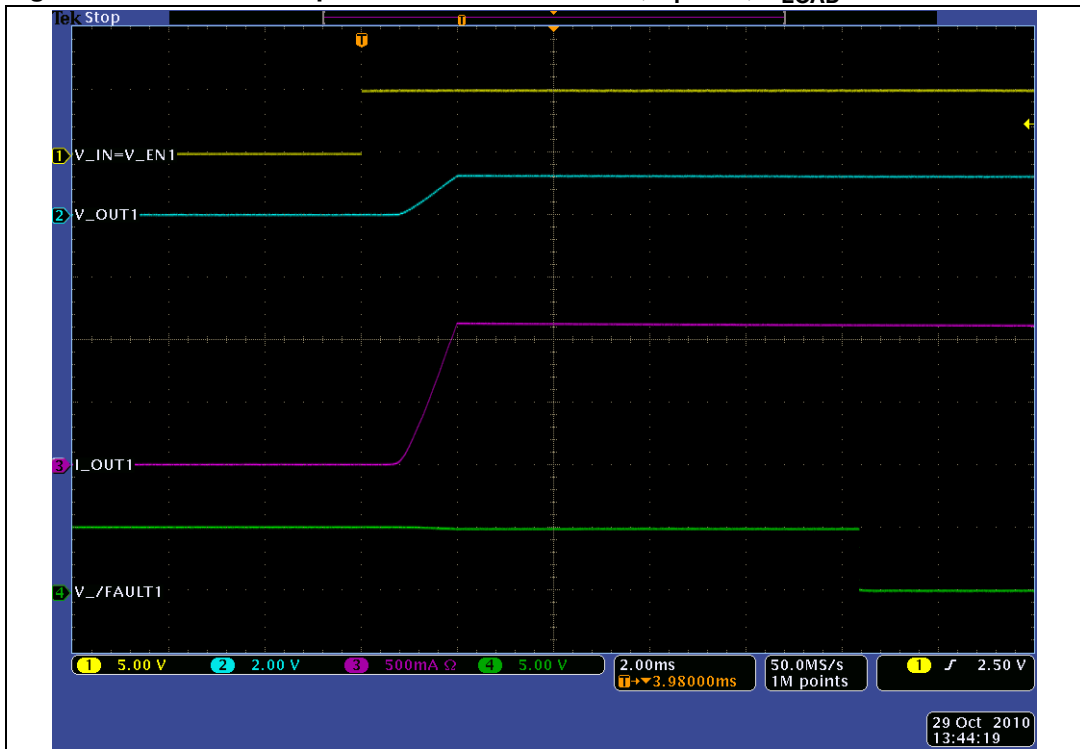


### 6.2.4 Overcurrent protection characteristics

Figure 37. Overcurrent protection characteristics,  $V_I = 3\text{ V}$ ,  $R_{LOAD} = 1\ \Omega$



Figure 38. Overcurrent protection characteristics,  $V_I = 5\text{ V}$ ,  $R_{LOAD} = 1\ \Omega$





6.2.5 Other electrical characteristics

Figure 39.  $I_{CC}$  versus  $V_I$

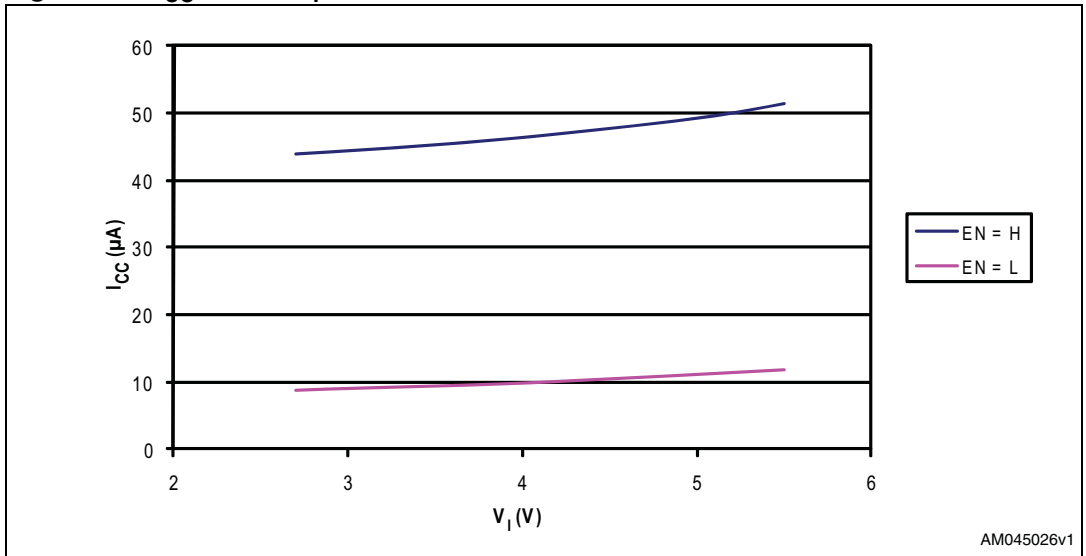


Figure 40.  $t_r$  versus  $V_I$

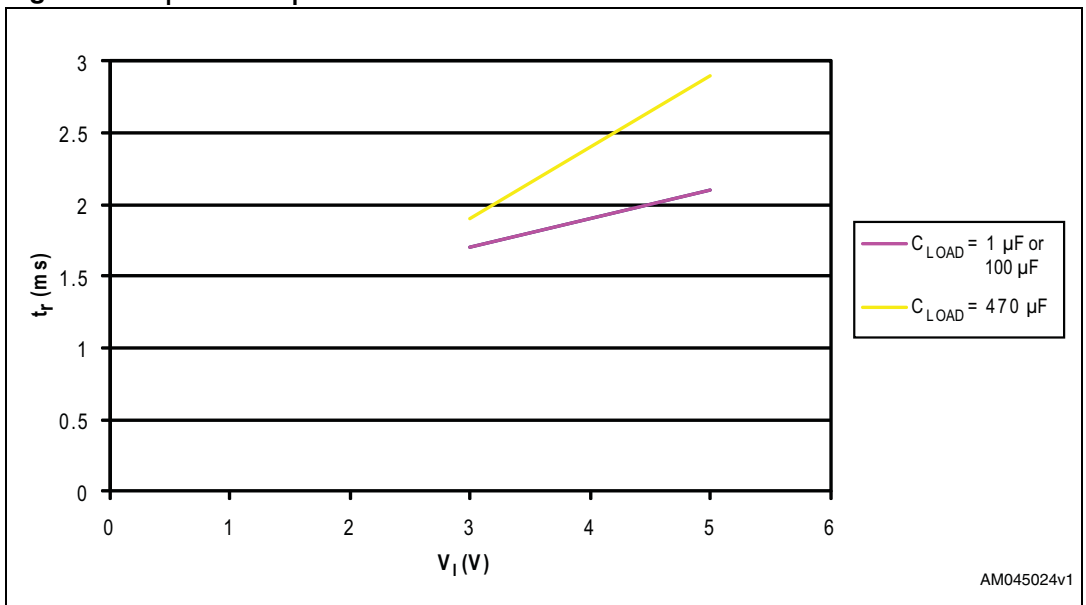


Figure 41.  $t_f$  versus  $V_I$

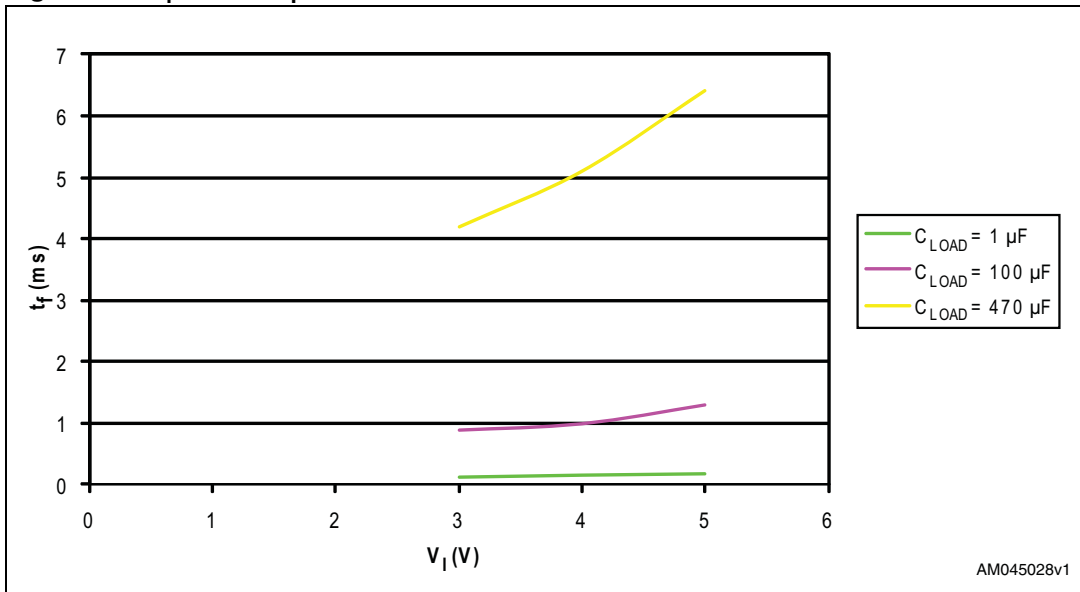
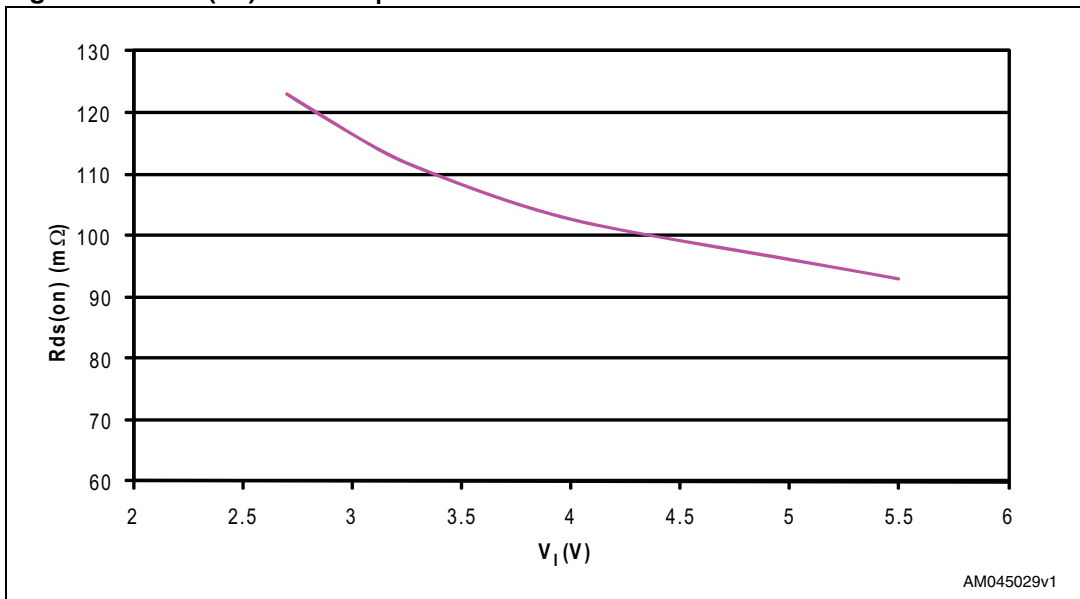


Figure 42.  $R_{ds(on)}$  versus  $V_I$



## 7 Application information

### 7.1 Input and output capacitors

Input and output capacitors improve the performance of the device; the actual capacitance should be optimized for the particular application. For all applications, a 0.1  $\mu\text{F}$  or greater ceramic bypass capacitor between IN and GND as close to the device as possible is recommended for local noise decoupling. This precaution also reduces ringing on the input due to power supply transients.

An additional capacitor may be needed on the input to reduce input voltage overshoots from exceeding the absolute maximum voltage of the device during heavy transient conditions. This is especially important during bench testing when long, inductive cables are used to connect the evaluation board to the bench power supply. The value of 100  $\mu\text{F}$  may be adequate in most situations.

An output capacitor is not required for device functionality, but placing a high-value (in the order of 10 - 100  $\mu\text{F}$ ) electrolytic capacitor on the output pins is recommended when large transient currents are expected on the output.

## 8 Package mechanical data

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.

Figure 43. SO-8 package outline

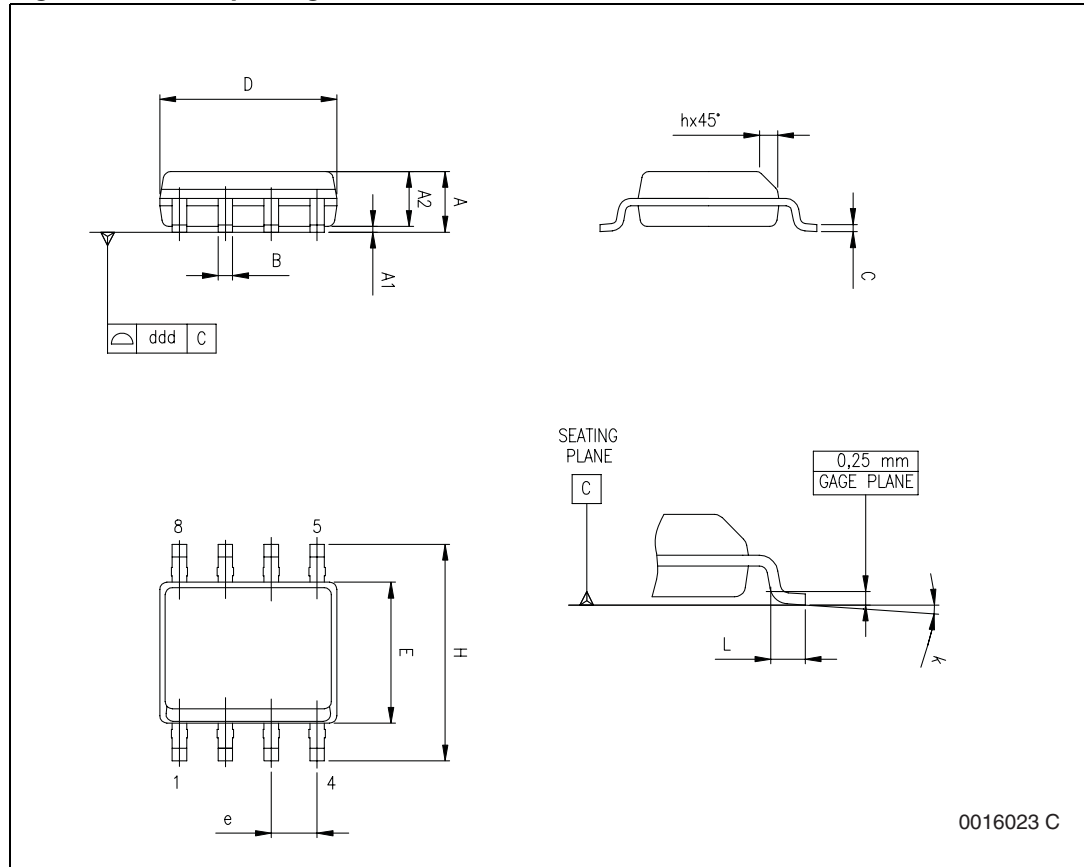


Table 12. SO-8 mechanical data

| Symbol           | Millimeters          |      |      |
|------------------|----------------------|------|------|
|                  | Min                  | Typ  | Max  |
| A                | 1.35                 | –    | 1.75 |
| A1               | 0.10                 | –    | 0.25 |
| A2               | 1.10                 | –    | 1.65 |
| B                | 0.33                 | –    | 0.51 |
| C                | 0.19                 | –    | 0.25 |
| D <sup>(1)</sup> | 4.80                 | –    | 5.00 |
| E                | 3.80                 | –    | 4.00 |
| e                | –                    | 1.27 | –    |
| H                | 5.80                 | –    | 6.20 |
| h                | 0.25                 | –    | 0.50 |
| L                | 0.40                 | –    | 1.27 |
| k                | 0° (min.), 8° (max.) |      |      |
| ddd              | –                    | –    | 0.10 |

1. Dimension D does not include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.15 mm (0.006 inch) in total (both sides).



Figure 45. SO-8 carrier tape

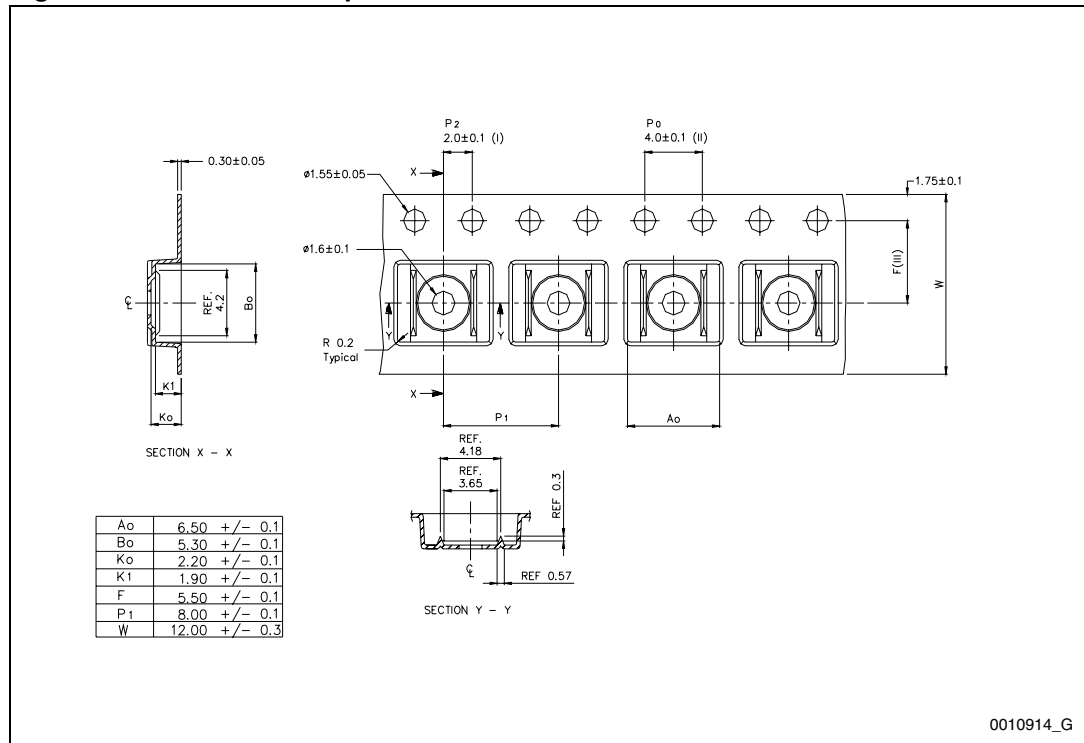


Figure 46. MSOP8 carrier tape

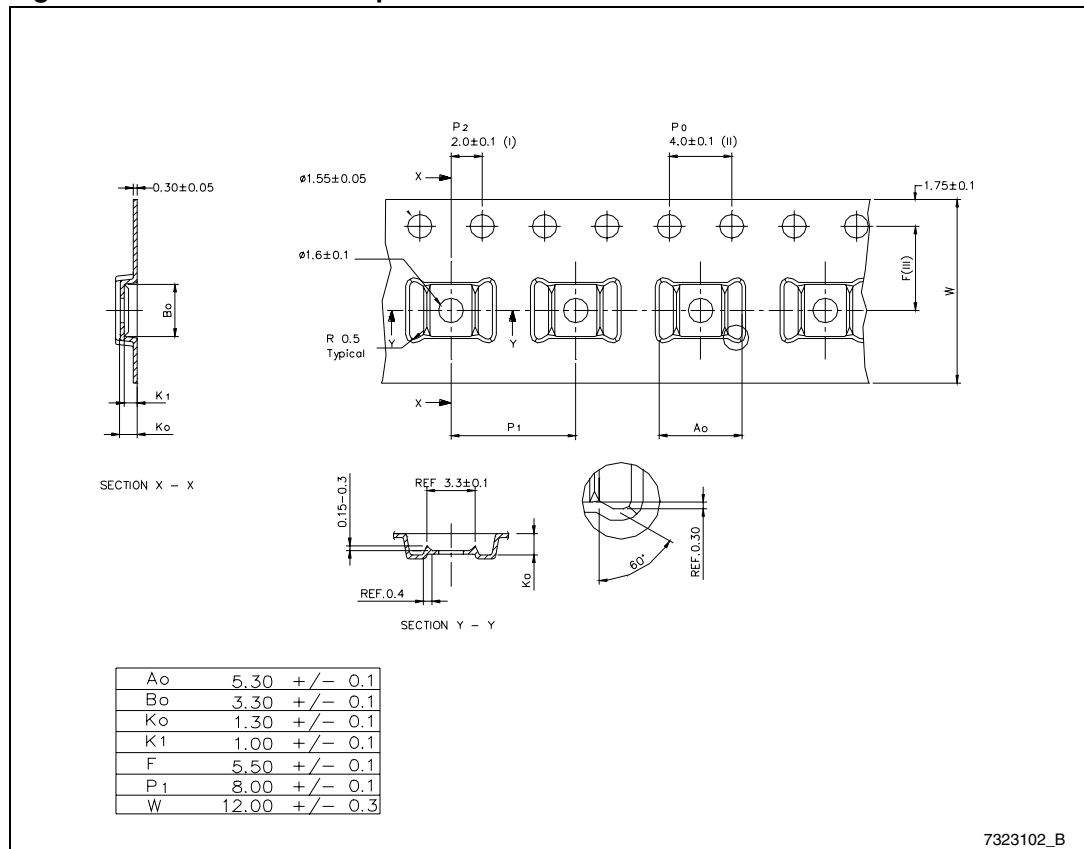


Figure 47. Reel information

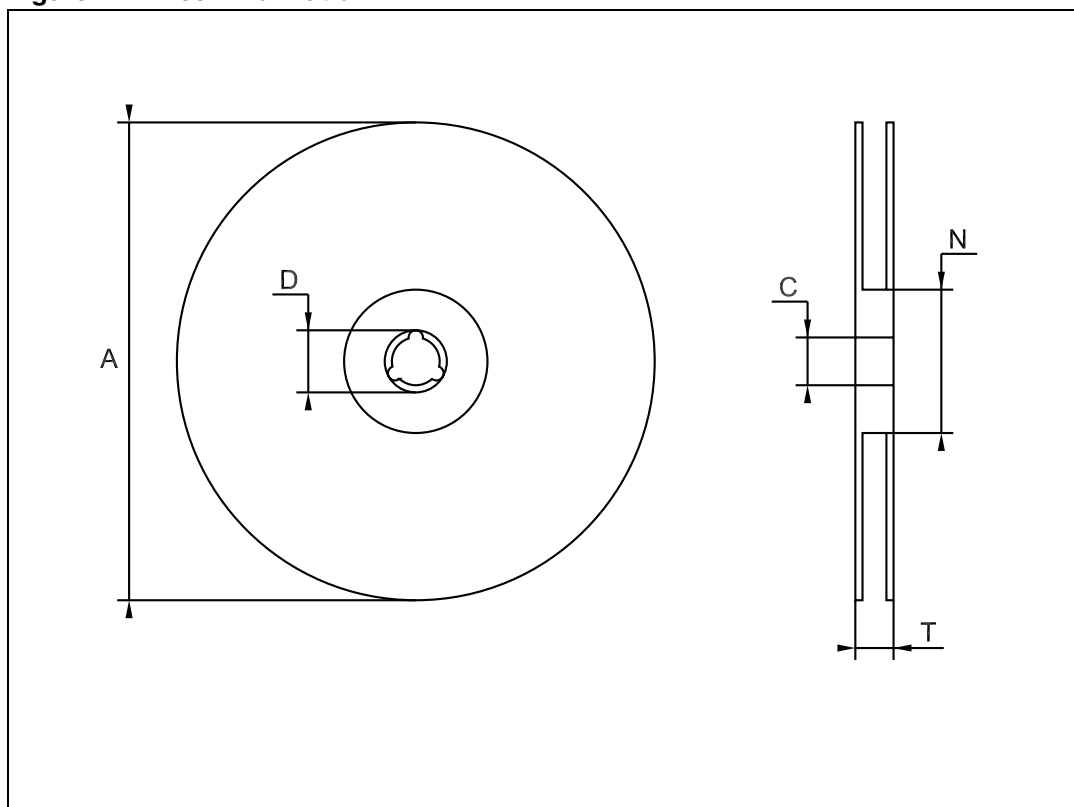


Table 14. Reel mechanical data

| Symbol | Millimeters |     |      |
|--------|-------------|-----|------|
|        | Min         | Typ | Max  |
| A      |             |     | 330  |
| C      | 12.8        |     | 13.2 |
| D      | 20.2        |     |      |
| N      | 60          |     |      |
| T      |             |     | 22.4 |



## 9 Revision history

**Table 15. Document revision history**

| Date        | Revision | Changes  |
|-------------|----------|--|
| 03-Dec-2008 | 1        | Initial release.   |
| 18-Dec-2009 | 2        | Modified: <a href="#">Table 6</a> , <a href="#">Table 7</a> and <a href="#">Table 9</a> .  |
| 19-Jan-2011 | 3        | Added <a href="#">Section 6: Typical operating characteristics</a> and <a href="#">Section 7: Application information</a> ; minor textual changes. |

**Please Read Carefully:**

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

**UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.**

**UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.**

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2011 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

[www.st.com](http://www.st.com)

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## STMicroelectronics:

[STMPS2262MTR](#) [STMPS2262TTR](#) [STMPS2242MTR](#) [STMPS2242TTR](#) [STMPS2272MTR](#) [STMPS2272TTR](#)  
[STMPS2252MTR](#) [STMPS2252TTR](#)