

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ | I_D $T_A = +25^\circ C$ |
|---------------|----------------------------------|------------------------------|
| -100V | 350m Ω @ $V_{GS} = -10V$ | -3.9A |
| | 450m Ω @ $V_{GS} = -6.0V$ | -3.4A |

Description and Applications

This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

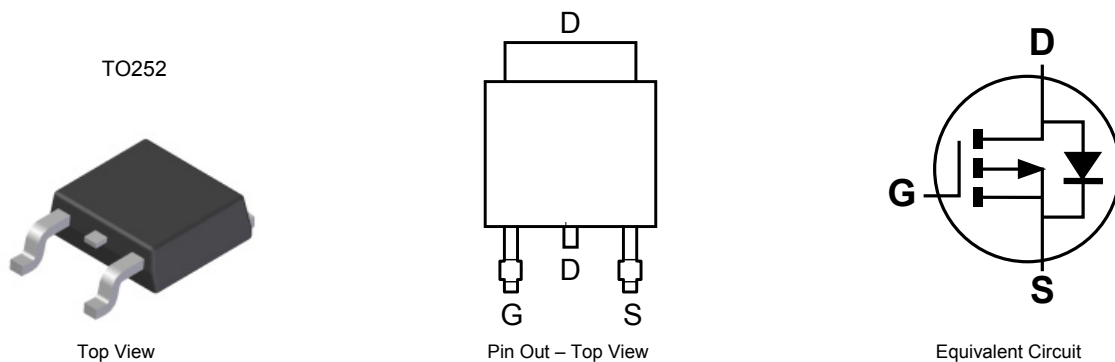
- Motor Control
- DC-DC Converters
- Power Management Functions
- Uninterrupted Power Supply

Features and Benefits

- Fast Switching Speed
- Low Gate Drive
- Low Input Capacitance
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: TO252
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.33 grams (approximate)

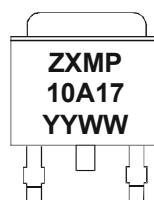


Ordering Information (Note 4)

| Product | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|--------------|-----------|--------------------|-----------------|-------------------|
| ZXMP10A17KTC | See below | 13 | 16 | 2,500 |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



ZXMP = Product Type Marking Code, Line 1
 10A17 = Product Type Marking Code, Line 2
 YYWW = Date Code Marking
 YY = Year (ex: 09 = 2009)
 WW = Week (01-52)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

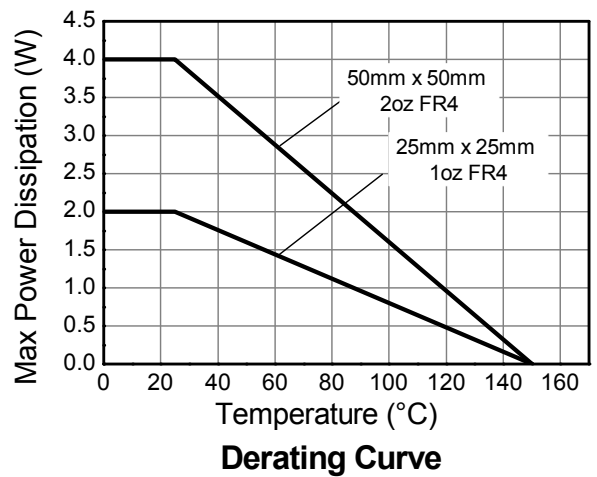
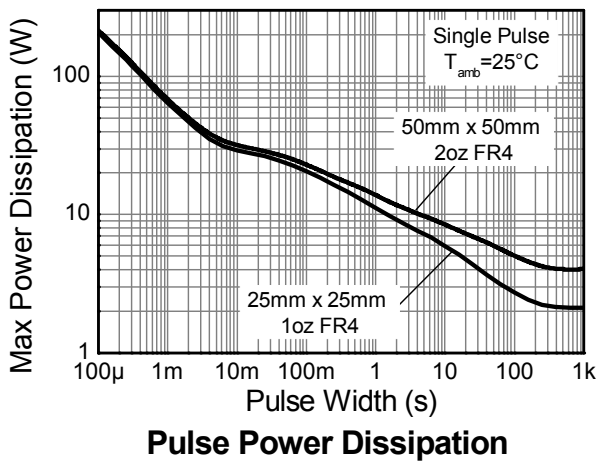
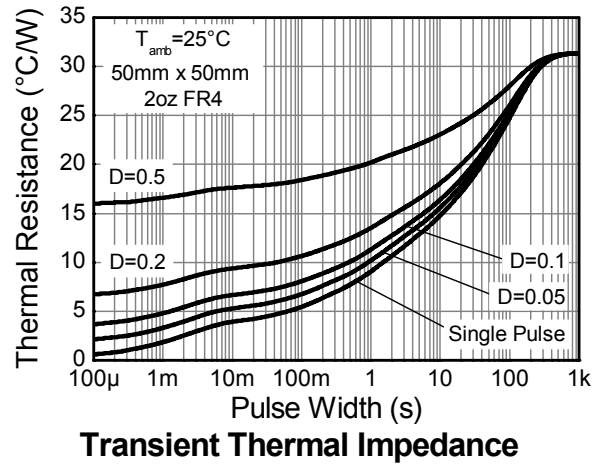
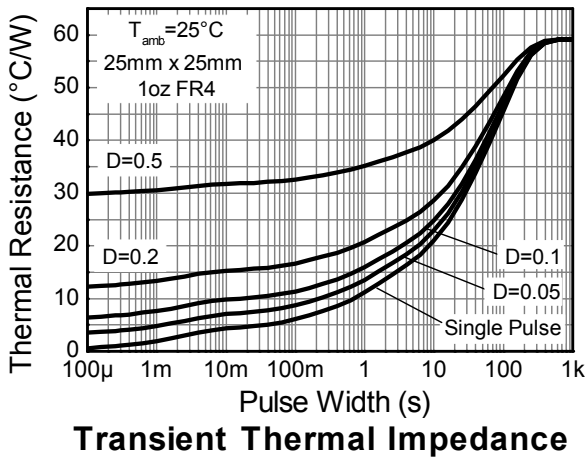
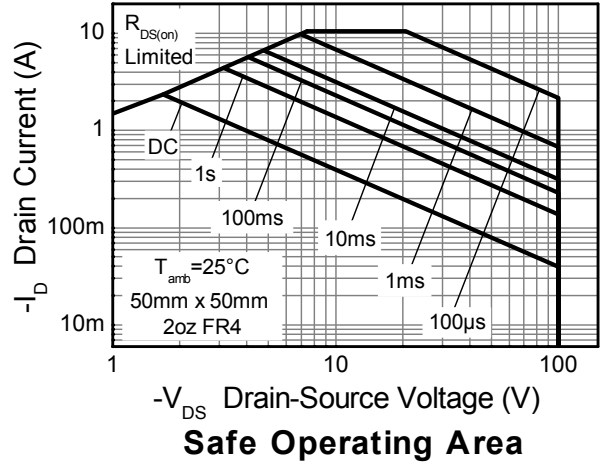
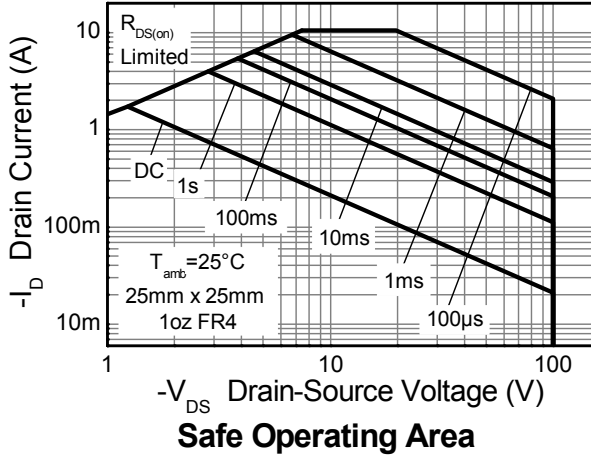
| Characteristic | | Symbol | Value | Unit |
|--|-----------------------|---------------------------------|-------|------|
| Drain-Source Voltage | | V _{DSS} | -100 | V |
| Gate-Source Voltage | | V _{GS} | ±20 | V |
| Continuous Drain current | V _{GS} = 10V | (Note 6) | -3.9 | A |
| | | T _A = +70°C (Note 6) | -3.1 | |
| | | (Note 5) | -2.4 | |
| Pulsed Drain current | V _{GS} = 10V | I _{DM} | -11.3 | A |
| Continuous Source Current (Body diode) | | I _S | -8.7 | A |
| Pulsed Source Current (Body diode) | | I _{SM} | -11.3 | A |

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | Symbol | Value | Unit |
|---|----------|-----------------------------------|------------|------------|
| Power dissipation Linear derating factor | (Note 5) | P _D | 4.0 | W mW/°C |
| | | | 32.0 | |
| | (Note 6) | | 10.2 | |
| | (Note 9) | | 80.8 | |
| Thermal Resistance, Junction to Ambient | (Note 5) | R _{θJA} | 2.0 | °C/W |
| | (Note 6) | | 31 | |
| | (Note 9) | | 12.3 | |
| Thermal Resistance, Junction to Case | (Note 8) | R _{θJL} | 62 | °C/W |
| Operating and Storage Temperature Range | | T _J , T _{STG} | -55 to 150 | °C |

- Notes:
5. For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 6. Same as note (1), except the device is measured at t ≤ 10 sec.
 7. Same as note (1), except the device is pulsed with D= 0.02 and pulse width 300µs. The pulse current is limited by the maximum junction temperature.
 8. Thermal resistance from junction to solder-point (at the end of the drain lead).
 9. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.

Thermal Characteristics

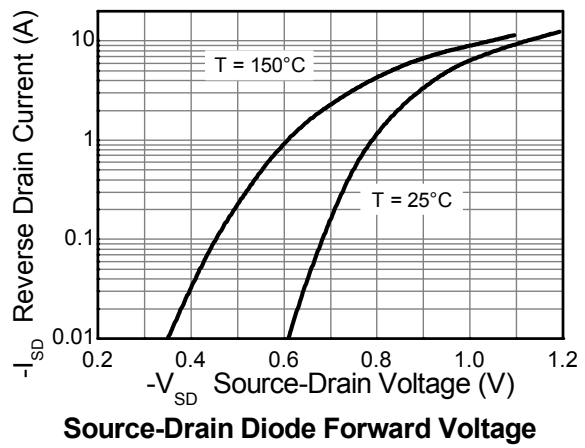
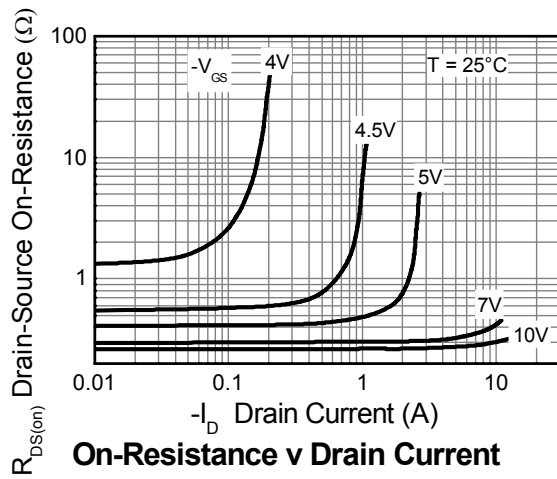
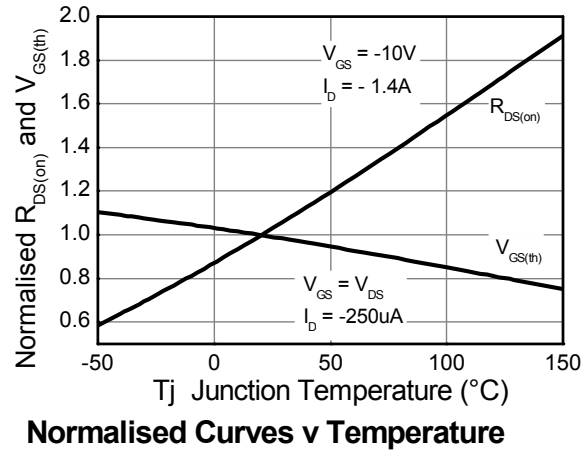
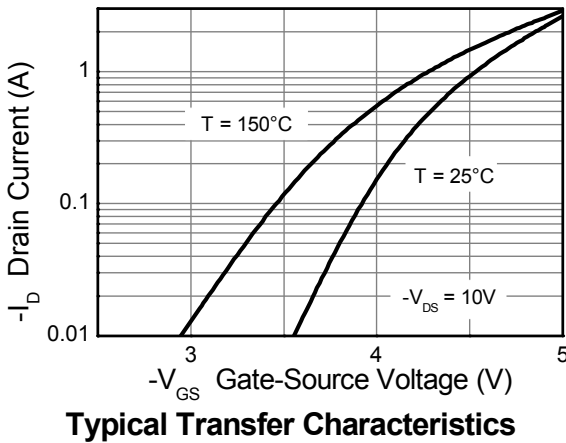
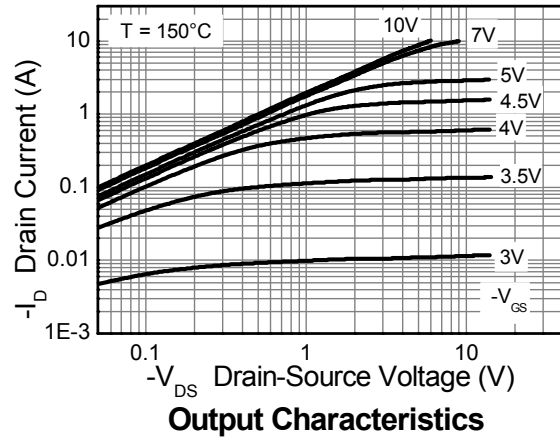
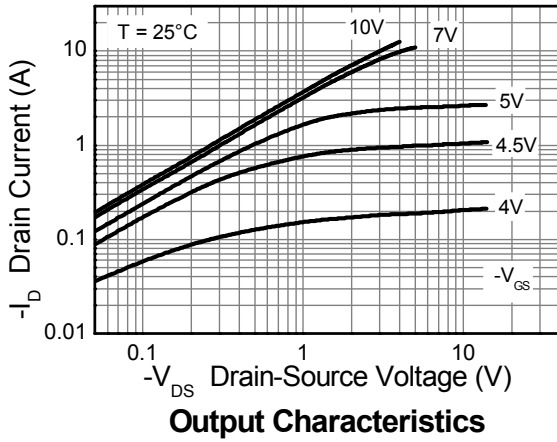


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

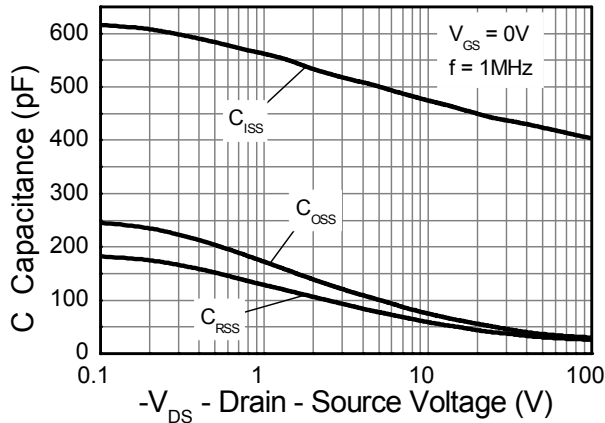
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---------------------|------|-------|-------|------|---|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -100 | — | — | V | I _D = -250μA, V _{GS} = 0V |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | -0.5 | μA | V _{DS} = -100V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | V _{GS(th)} | -2.0 | — | -4.0 | V | I _D = -250μA, V _{DS} = V _{GS} |
| Static Drain-Source On-Resistance (Note 10) | R _{DS(on)} | — | — | 0.350 | Ω | V _{GS} = -10V, I _D = -1.4A |
| | | | | 0.450 | | V _{GS} = -6V, I _D = -1.2A |
| Forward Transconductance (Notes 10 & 11) | g _{fs} | — | 2.8 | — | S | V _{DS} = -15V, I _D = -1.4A |
| Diode Forward Voltage (Note 10) | V _{SD} | — | -0.85 | -0.95 | V | I _S = -1.7A, V _{GS} = 0V |
| Reverse recovery time (Note 11) | t _{rr} | — | 33 | — | ns | I _S = -1.5A, di/dt = 100A/μs |
| Reverse recovery charge (Note 11) | Q _{rr} | — | 48 | — | nC | |
| DYNAMIC CHARACTERISTICS (Note 11) | | | | | | |
| Input Capacitance | C _{iSS} | — | 424 | — | pF | V _{DS} = -50V, V _{GS} = 0V F = 1MHz |
| Output Capacitance | C _{oss} | — | 36.6 | — | pF | |
| Reverse Transfer Capacitance | C _{rSS} | — | 29.8 | — | pF | |
| Total Gate Charge (Note 12) | Q _g | — | 7.1 | — | nC | V _{GS} = -6.0V |
| Total Gate Charge (Note 12) | Q _g | — | 10.7 | — | nC | V _{GS} = -10V |
| Gate-Source Charge (Note 12) | Q _{gs} | — | 1.7 | — | nC | |
| Gate-Drain Charge (Note 12) | Q _{gd} | — | 3.8 | — | nC | |
| Turn-On Delay Time (Note 12) | t _{D(on)} | — | 3.0 | — | ns | V _{DD} = -50V, V _{GS} = -10V I _D = -1A, R _G ≅ 6.0Ω |
| Turn-On Rise Time (Note 12) | t _r | — | 3.5 | — | ns | |
| Turn-Off Delay Time (Note 12) | t _{D(off)} | — | 13.4 | — | ns | |
| Turn-Off Fall Time (Note 12) | t _f | — | 7.2 | — | ns | |

- Notes:
10. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
 11. For design aid only, not subject to production testing.
 12. Switching characteristics are independent of operating junction temperatures.

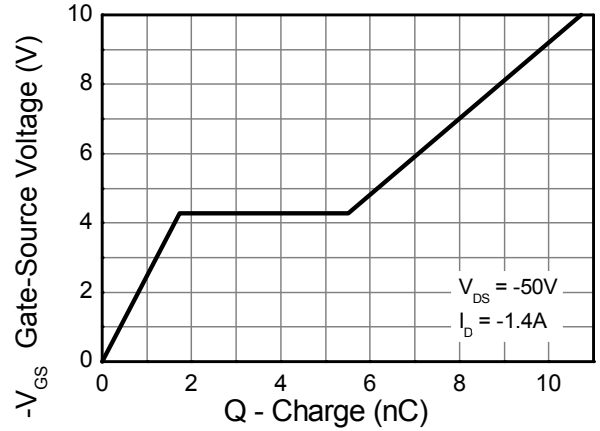
Typical Characteristics



Typical Characteristics (cont.)

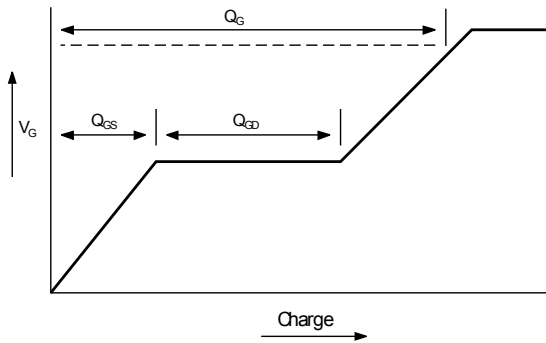


Capacitance v Drain-Source Voltage

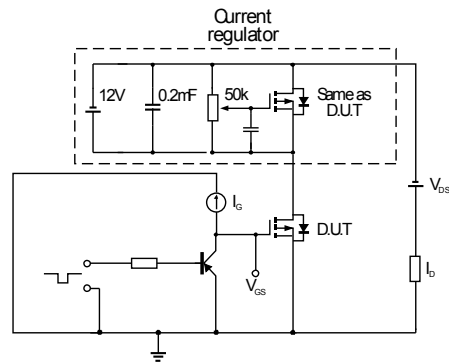


Gate-Source Voltage v Gate Charge

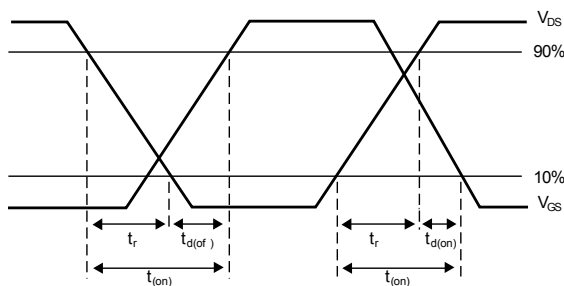
Test Circuits



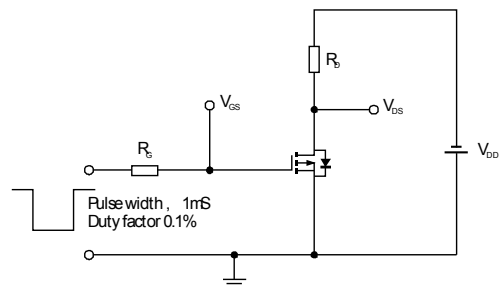
Basic gate charge waveform



Gate charge test circuit

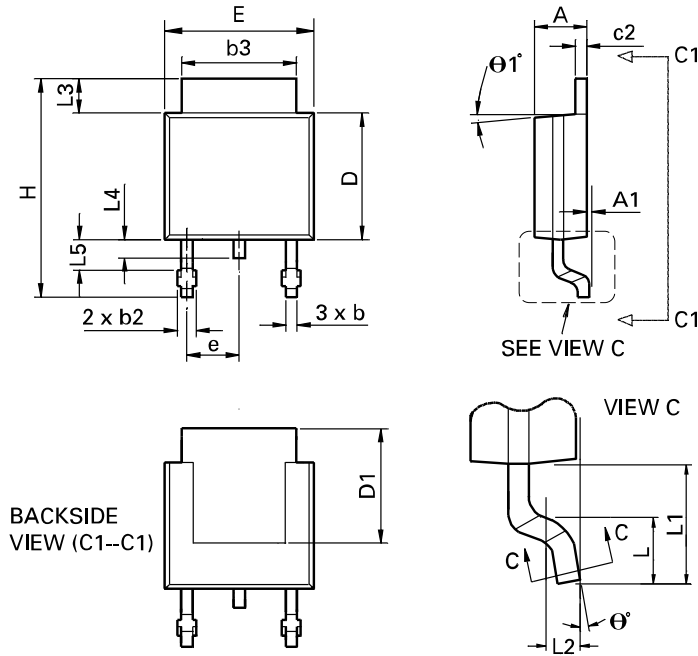


Switching time waveforms



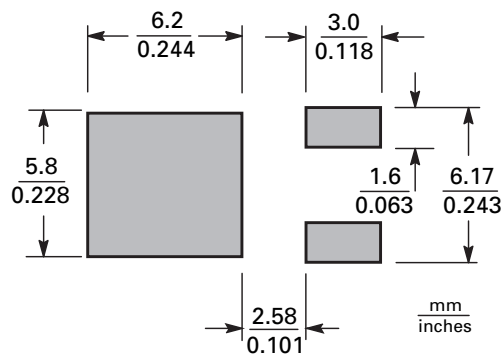
Switching time test circuit

Package Outline Dimensions



| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|-----|--------|-------|-------------|-------|----------|-----------|-------|-------------|-------|
| | Min | Max | Min | Max | | Min | Max | Min | Max |
| A | 0.086 | 0.094 | 2.18 | 2.39 | e | 0.090 BSC | | 2.29 BSC | |
| A1 | - | 0.005 | - | 0.127 | H | 0.370 | 0.410 | 9.40 | 10.41 |
| b | 0.020 | 0.035 | 0.508 | 0.89 | L | 0.055 | 0.070 | 1.40 | 1.78 |
| b2 | 0.030 | 0.045 | 0.762 | 1.14 | L1 | 0.108 REF | | 2.74 REF | |
| b3 | 0.205 | 0.215 | 5.21 | 5.46 | L2 | 0.020 BSC | | 0.508 BSC | |
| c | 0.018 | 0.024 | 0.457 | 0.61 | L3 | 0.035 | 0.065 | 0.89 | 1.65 |
| c2 | 0.018 | 0.023 | 0.457 | 0.584 | L4 | 0.025 | 0.040 | 0.635 | 1.016 |
| D | 0.213 | 0.245 | 5.41 | 6.22 | L5 | 0.045 | 0.060 | 1.14 | 1.52 |
| D1 | 0.205 | - | 5.21 | - | theta 1° | 0° | 10° | 0° | 10° |
| E | 0.250 | 0.265 | 6.35 | 6.73 | theta° | 0° | 15° | 0° | 15° |
| E1 | 0.170 | - | 4.32 | - | - | - | - | - | - |

Suggested Pad Layout



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