## Package Marking and Ordering Information $T_C$ = 25°C unless otherwise noted

| Device Marking | Device | Package | Reel Size | Tape Width | Quantity |
|---|---|---|---|---|---|
| FQT1N60C | FQT1N60C | SOT-223 | 330mm | 12mm | 4000 |

## Electrical Characteristics

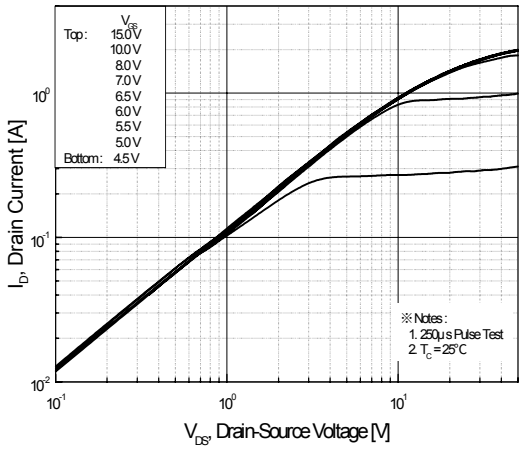
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain to Source Breakdown Voltage | $I_D$ = 250μA, $V_{GS}$ = 0V, $T_J$ = 25°C | 600 | - | - | V |
| $\Delta BV_{DSS}$ / $\Delta T_J$ | Breakdown Voltage Temperature Coefficient | $I_D$ = 250μA, Referenced to 25°C | - | 0.6 | - | V/°C |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$ = 600V, $V_{GS}$ = 0V | - | - | 25 | μA |
| | | $V_{DS}$ = 480V, $T_C$ = 125°C | - | - | 250 | |
| $I_{GSS}$ | Gate to Body Leakage Current | $V_{GS}$ = ±30V, $V_{DS}$ = 0V | - | - | ±100 | nA |
| **On Characteristics** | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$ = $V_{DS}$, $I_D$ = 250μA | 2.0 | - | 4.0 | V |
| $R_{DS(on)}$ | Static Drain to Source On Resistance | $V_{GS}$ = 10V, $I_D$ = 0.1A | - | 9.3 | 11.5 | Ω |
| $g_{FS}$ | Forward Transconductance | $V_{DS}$ = 40V, $I_D$ = 0.1A (Note 4) | - | 0.75 | - | S |
| **Dynamic Characteristics** | | | | | | |
| $C_{iss}$ | Input Capacitance | $V_{DS}$ = 25V, $V_{GS}$ = 0V, f = 1MHz | - | 130 | 170 | pF |
| $C_{oss}$ | Output Capacitance | | - | 19 | 25 | pF |
| $C_{rss}$ | Reverse Transfer Capacitance | | - | 3.5 | 6 | pF |
| $Q_g$ | Total Gate Charge at 10V | $V_{DS}$ = 480V, $I_D$ = 1A, $V_{GS}$ = 10V (Note 4, 5) | - | 4.8 | 6.2 | nC |
| $Q_{gs}$ | Gate to Source Gate Charge | | - | 0.7 | - | nC |
| $Q_{gd}$ | Gate to Drain “Miller” Charge | | - | 2.7 | - | nC |
| **Switching Characteristics** | | | | | | |
| $t_{d(on)}$ | Turn-On Delay Time | $V_{DD}$ = 300V, $I_D$ = 1A, $R_G$ = 25Ω (Note 4, 5) | - | 7 | 24 | ns |
| $t_r$ | Turn-On Rise Time | | - | 21 | 52 | ns |
| $t_{d(off)}$ | Turn-Off Delay Time | | - | 13 | 36 | ns |
| $t_f$ | Turn-Off Fall Time | | - | 27 | 64 | ns |
| **Drain-Source Diode Characteristics** | | | | | | |
| $I_S$ | Maximum Continuous Drain to Source Diode Forward Current | | - | - | 0.2 | A |
| $I_{SM}$ | Maximum Pulsed Drain to Source Diode Forward Current | | - | - | 0.8 | A |
| $V_{SD}$ | Drain to Source Diode Forward Voltage | $V_{GS}$ = 0V, $I_{SD}$ = 0.2A | - | - | 1.4 | V |
| $t_{rr}$ | Reverse Recovery Time | $V_{GS}$ = 0V, $I_{SD}$ = 1A, $dI_F/dt$ = 100A/μs (Note 4) | - | 190 | - | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | - | 0.53 | - | μC |

Notes:

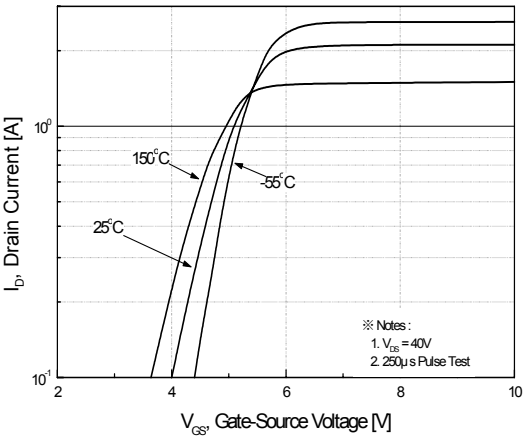
1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L = 59mH, $I_{AS}$ = 1.1A, $V_{DD}$ = 50V, $R_G$ = 25Ω, Starting $T_J$ = 25°C
3. $I_{SD}$ ≤ 0.2A, di/dt ≤ 200A/μs, $V_{DD}$ ≤ $BV_{DSS}$, Starting $T_J$ = 25°C
4. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%
5. Essentially Independent of Operating Temperature Typical Characteristics

## Typical Performance Characteristics

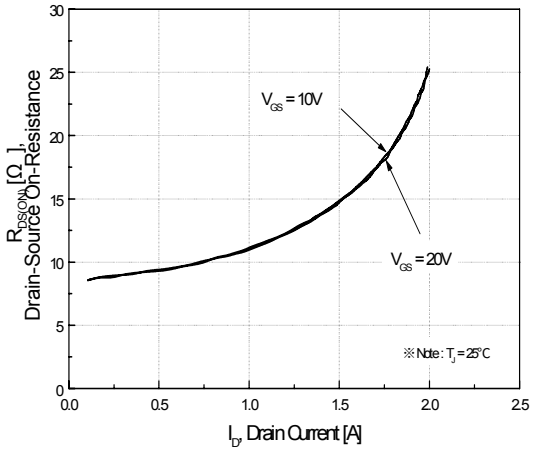
### Figure 1. On-Region Characteristics



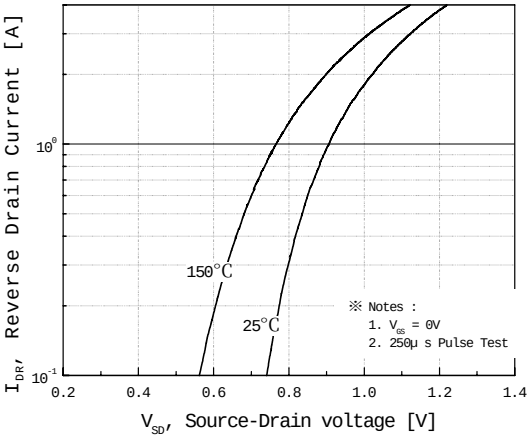

### Figure 2. Transfer Characteristics



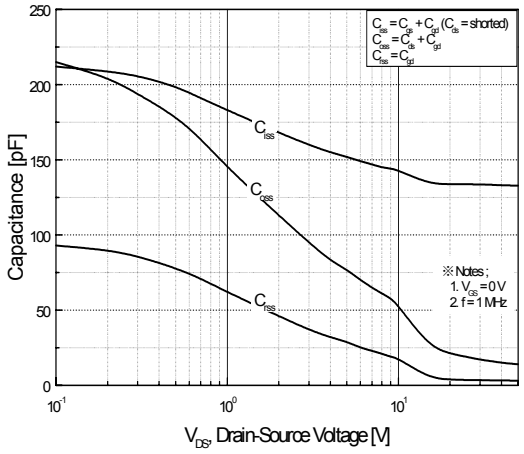

### Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage



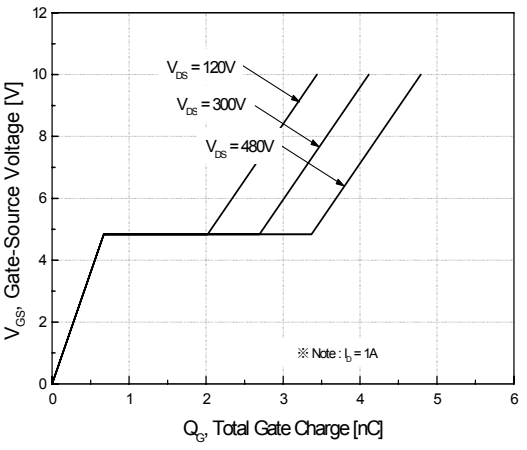

### Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature




### Figure 5. Capacitance Characteristics




### Figure 6. Gate Charge Characteristics



## Typical Performance Characteristics (Continued)

**Figure 7. Breakdown Voltage Variation vs. Temperature**

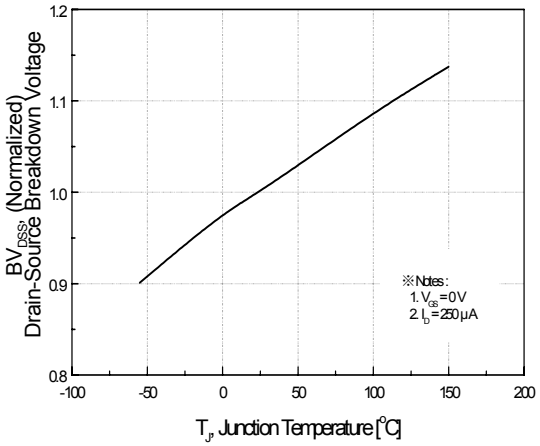



**Figure 8. On-Resistance Variation vs. Temperature**

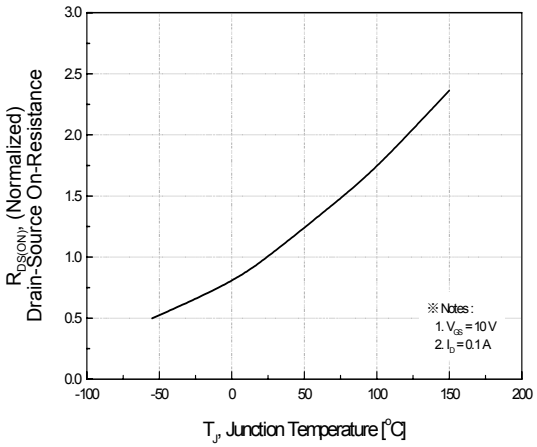



**Figure 9. Maximum Safe Operating Area**

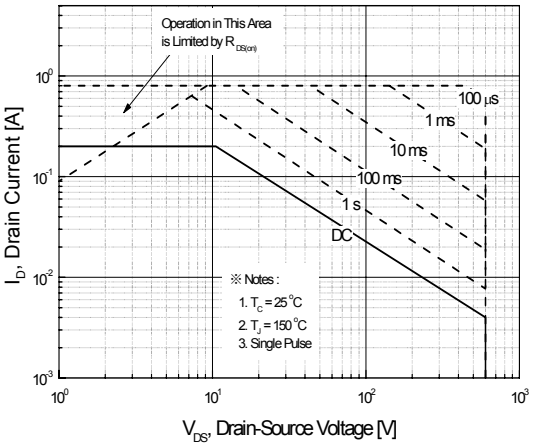



**Figure 10. Maximum Drain Current vs. Case Temperature**

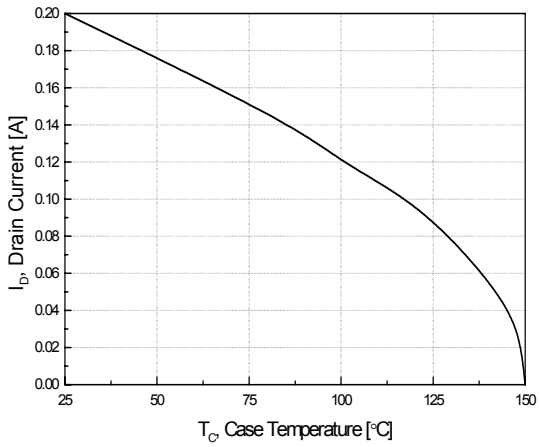
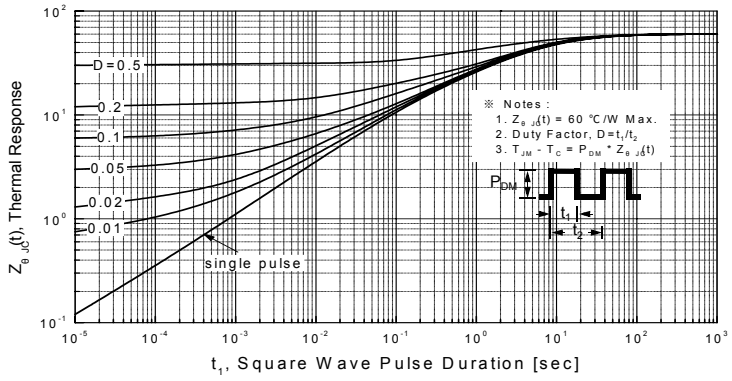
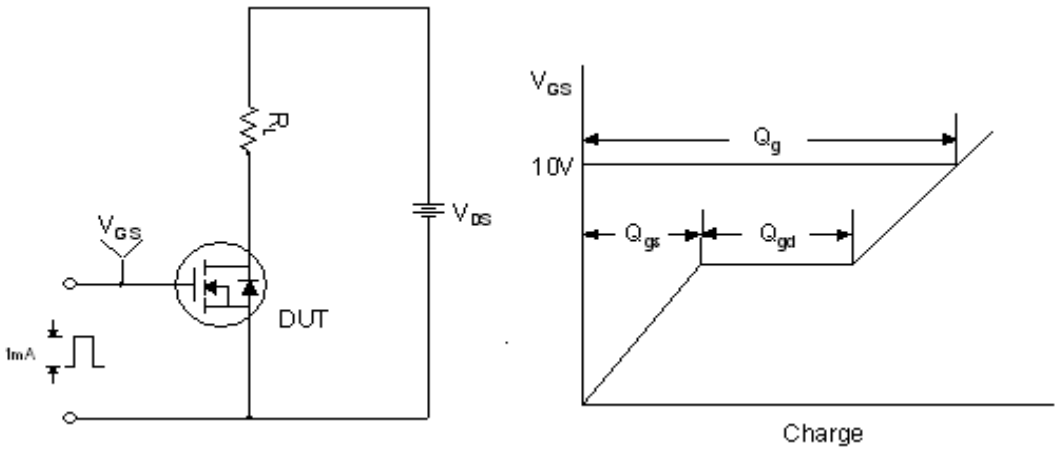


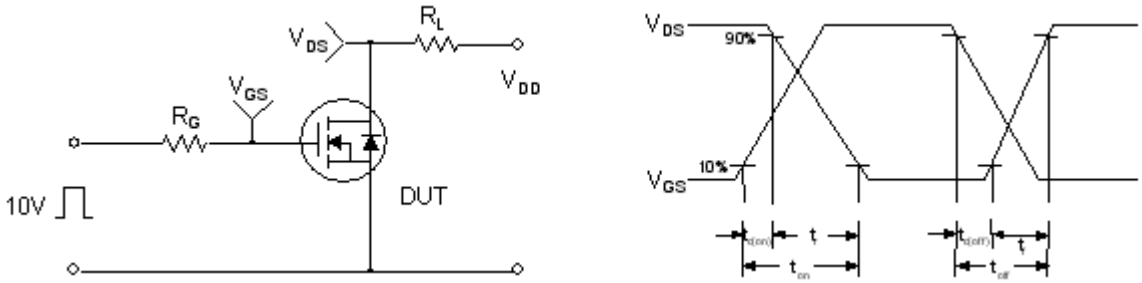

**Figure 11. Transient Thermal Response Curve**



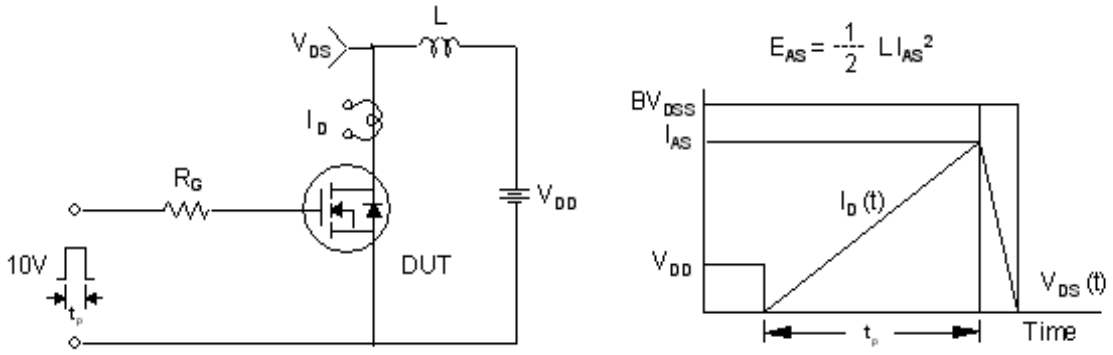
**Gate Charge Test Circuit & Waveform**



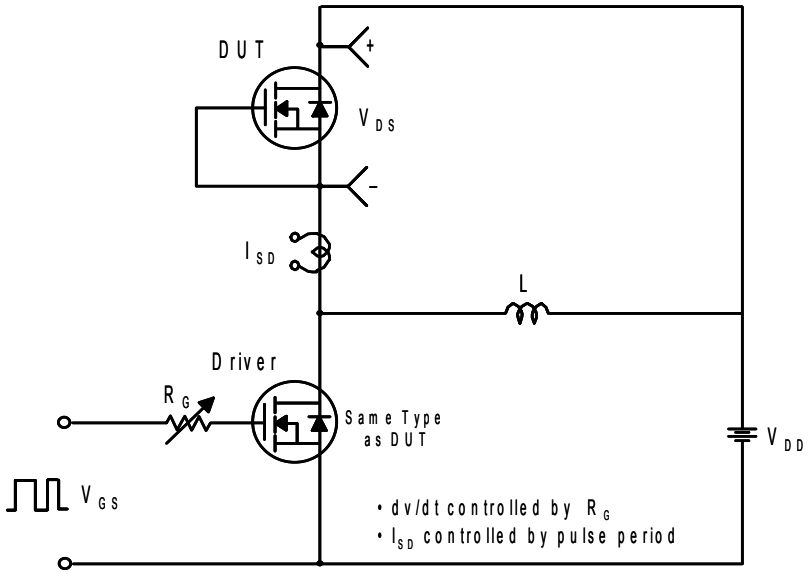

**Resistive Switching Test Circuit & Waveforms**

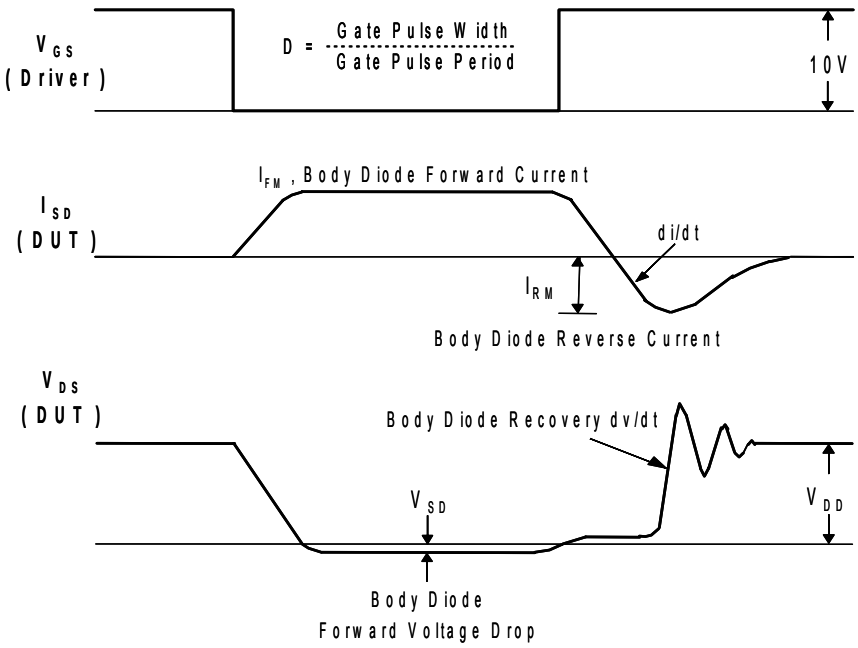



**Unclamped Inductive Switching Test Circuit & Waveforms**



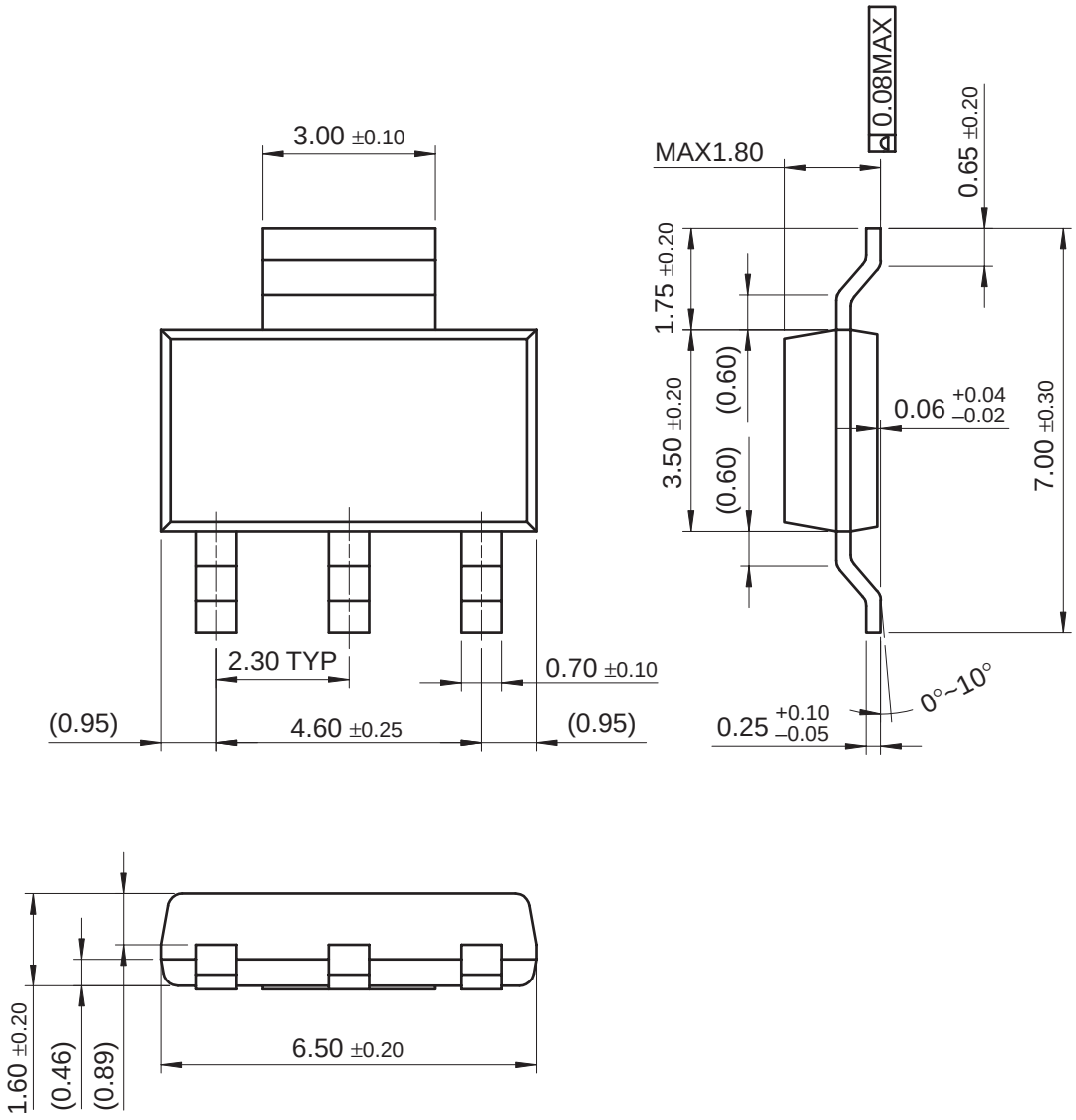
**Peak Diode Recovery dv/dt Test Circuit & Waveforms**



## Mechanical Dimensions

# SOT-223



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