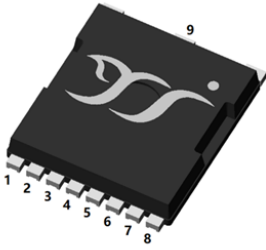
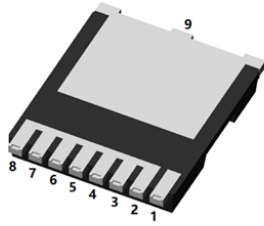


N-Channel Enhancement Mode Field Effect Transistor

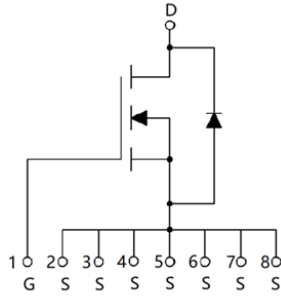


Top View



Bottom View

TOLL



Product Summary

- V_{DS} 200V
- I_D 102A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $< 10.7m\Omega$
- 100% EAS Tested
- 100% ∇V_{DS} Tested

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- UPS and Inverter applications
- Motor drivers
- DC-DC convertor

Limiting Values

| Parameter | Conditions | | Symbol | Min | Max | Unit |
|--|--|--|----------------|-----|-----|------------|
| Drain-source Voltage | | | V_{DS} | - | 200 | V |
| Gate-source Voltage | | | V_{GS} | -20 | 20 | |
| Continuous Drain Current (Note 1,2) | Steady-State | $T_A=25^\circ C, V_{GS}=10V$ | I_D | - | 11 | A |
| | | $T_A=100^\circ C, V_{GS}=10V$ | | - | 7.7 | |
| Continuous Drain Current (Note 1,3) | Steady-State | $T_C=25^\circ C, V_{GS}=10V, \text{Chip limitation}$ | | - | 102 | |
| | | $T_C=100^\circ C, V_{GS}=10V$ | | - | 72 | |
| Pulsed Drain Current | $T_C=25^\circ C, t_p \leq 10\mu s$ | | I_{DM} | - | 408 | |
| Maximum Body-Diode Continuous Current | $T_C=25^\circ C$ | | I_S | | 102 | |
| Avalanche energy (non-repetitive) | $T_J=25^\circ C, V_G=10V, R_G=25\Omega, L=0.5mH, I_{AS}=50A$ | | EAS | - | 625 | mJ |
| Total Power Dissipation (Note 1,2) | Steady-State | $T_A=25^\circ C$ | P_D | - | 3.4 | W |
| | | $T_A=100^\circ C$ | | - | 1.7 | |
| Total Power Dissipation (Note 1,3) | Steady-State | $T_C=25^\circ C$ | | - | 300 | |
| | | $T_C=100^\circ C$ | | - | 150 | |
| Junction and Storage Temperature Range | | | T_J, T_{STG} | -55 | 175 | $^\circ C$ |

Thermal Resistance

| Parameter | | Symbol | Typ | Max | Units |
|---|--------------|-----------------|-----|-----|--------------|
| Thermal Resistance Junction-to-Ambient (Note 2) | Steady-State | $R_{\theta JA}$ | - | 43 | $^\circ C/W$ |
| Thermal Resistance Junction-to-Case | Steady-State | $R_{\theta JC}$ | - | 0.5 | |

Ordering Information (Example)

| PREFERRED P/N | PACKING CODE | Marking | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|------------|----------------------|-------------------------|----------------------------|---------------|
| YJT011G20H | F1 | YJT011G20H | 2000 | 4000 | 20000 | 13" reel |



YJT011G20H

■ Electrical Characteristics

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|-----------------------------------|--------------|---|-----|------|-----------|------------|
| Static Parameter | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A, T_j=25^\circ C$ | 200 | - | - | V |
| | | $V_{GS}=0V, I_D=10mA, T_j=25^\circ C$ | 200 | - | - | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=200V, V_{GS}=0V, T_j=25^\circ C$ | - | - | 1 | μA |
| | | $V_{DS}=200V, V_{GS}=0V, T_j=125^\circ C$ | - | - | 100 | |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V, T_j=25^\circ C$ | - | - | ± 100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A, T_j=25^\circ C$ | 2.2 | 3 | 3.8 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=50A, T_j=25^\circ C$ | - | 8.6 | 10.7 | m Ω |
| Diode Forward Voltage | V_{SD} | $I_S=50A, V_{GS}=0V, T_j=25^\circ C$ | - | 0.82 | 1.2 | V |
| Gate Resistance | R_G | $f=1MHz, T_j=25^\circ C$ | - | 0.8 | - | Ω |
| Dynamic Parameters | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=100V, V_{GS}=0V, f=1MHz, T_j=25^\circ C$ | - | 3920 | - | pF |
| Output Capacitance | C_{oss} | | - | 445 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 11.3 | - | |
| Switching Parameters | | | | | | |
| Total Gate Charge | Q_g | $V_{GS}=10V, V_{DS}=100V, I_D=50A, T_j=25^\circ C$ | - | 50.5 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 18.4 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 8.2 | - | |
| Reverse Recovery Charge | Q_{rr} | $I_F=50A, di/dt=100A/\mu s, V_{GS}=0V, V_R=100V, T_j=25^\circ C$ | - | 513 | - | nC |
| Reverse Recovery Time | t_{rr} | | - | 135 | - | ns |
| Turn-on Delay Time | $t_{D(on)}$ | $V_{GS}=10V, V_{DS}=100V, I_D=50A, R_{GEN}=3\Omega, T_j=25^\circ C$ | - | 20 | - | ns |
| Turn-on Rise Time | t_r | | - | 42 | - | |
| Turn-off Delay Time | $t_{D(off)}$ | | - | 32 | - | |
| Turn-off Fall Time | t_f | | - | 9 | - | |

Note:

- The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in² pad of 2oz. Copper, in the still air environment with $T_A=25^\circ C$. The maximum allowed junction temperature of 175 $^\circ C$. The value in any given application depends on the user's specific board design.
- Thermal resistance from junction to soldering point (on the exposed drain pad).



Typical Electrical and Thermal Characteristics Diagrams

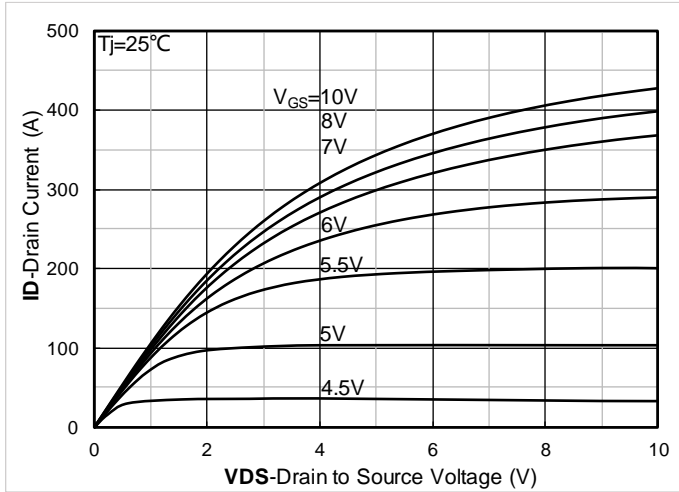


Figure 1. Output Characteristics; typical values

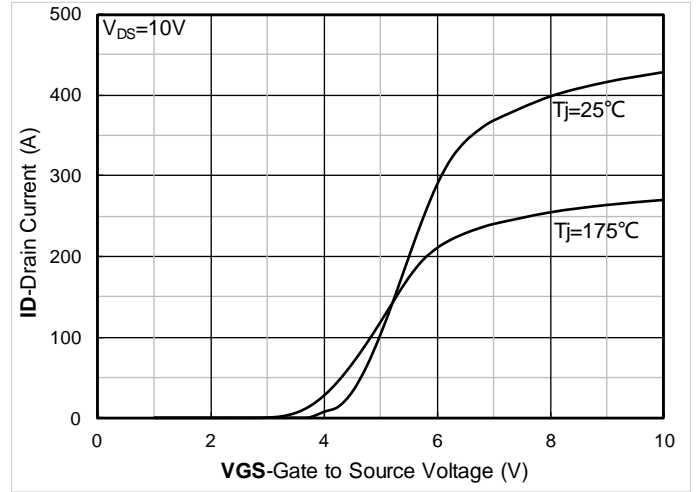


Figure 2. Transfer Characteristics; typical values

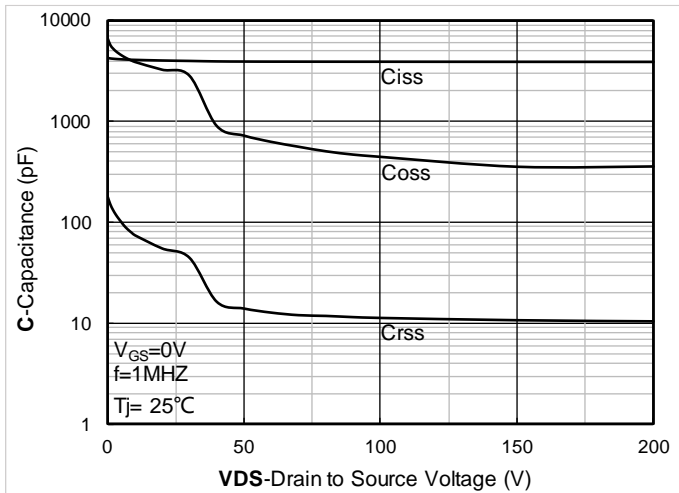


Figure 3. Capacitance Characteristics; typical values

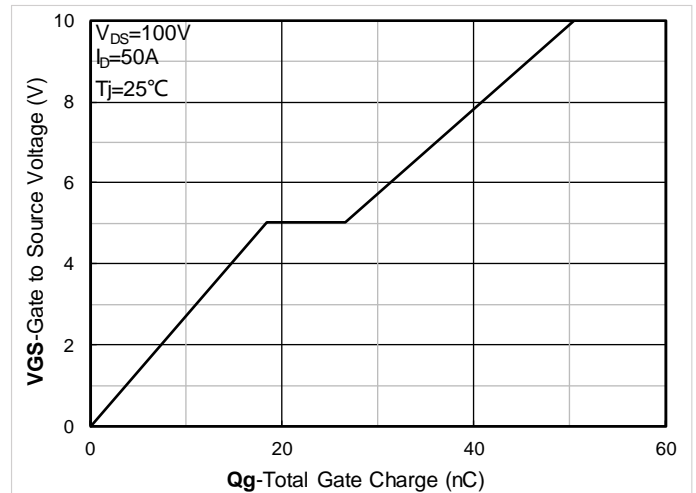


Figure 4. Gate Charge; typical values

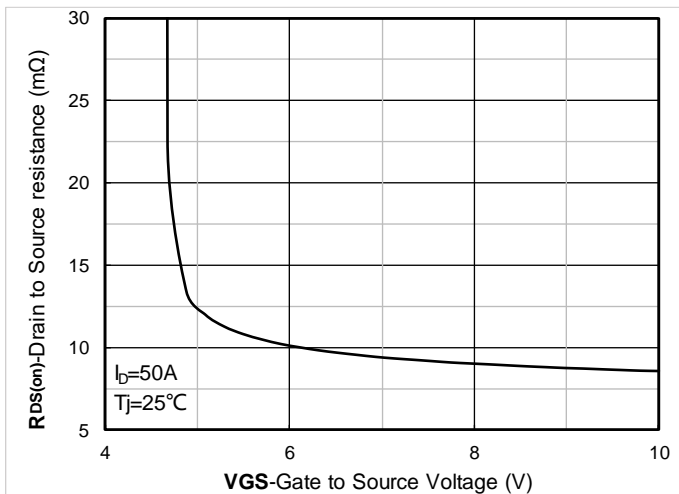


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

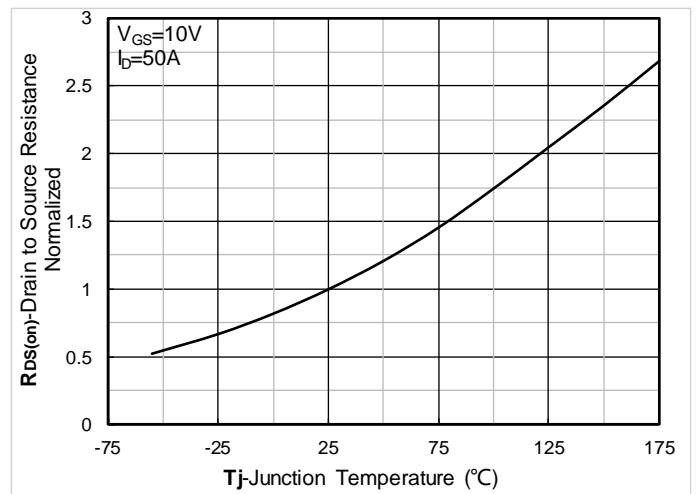


Figure 6. Normalized On-Resistance



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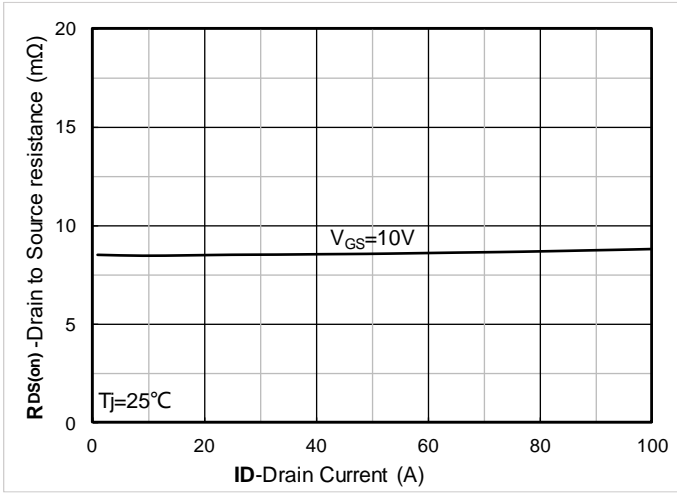


Figure 7. RDS(on) vs. Drain Current; typical values

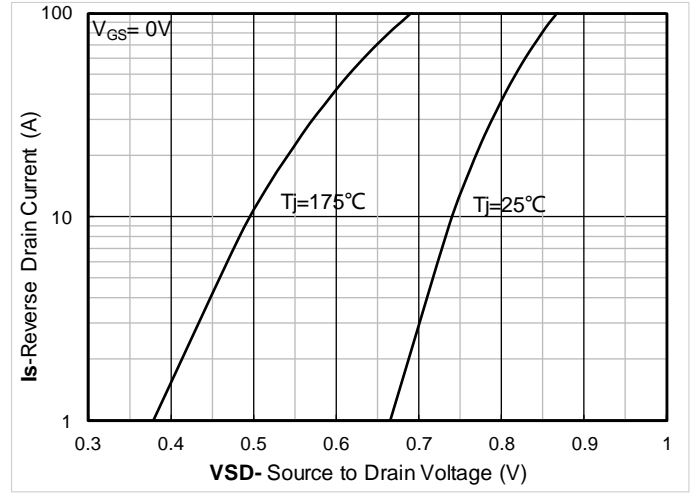


Figure 8. Forward characteristics of reverse diode; typical values

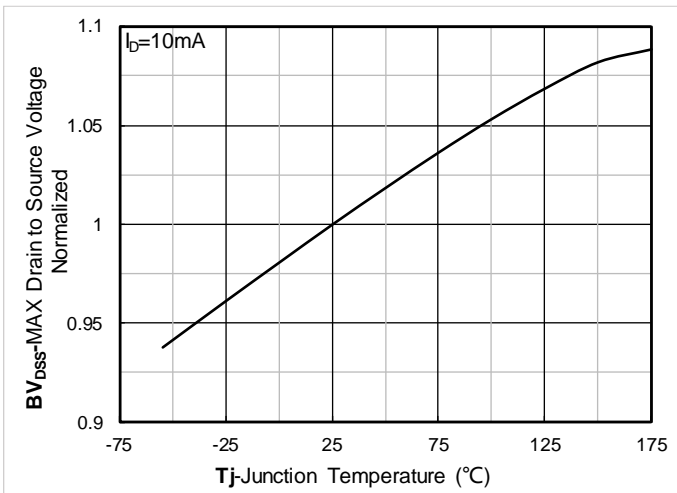


Figure 9. Normalized breakdown voltage

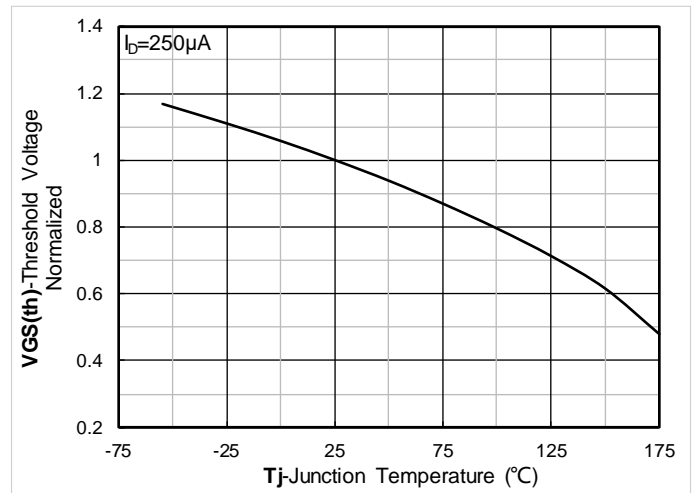


Figure 10. Normalized Threshold voltage

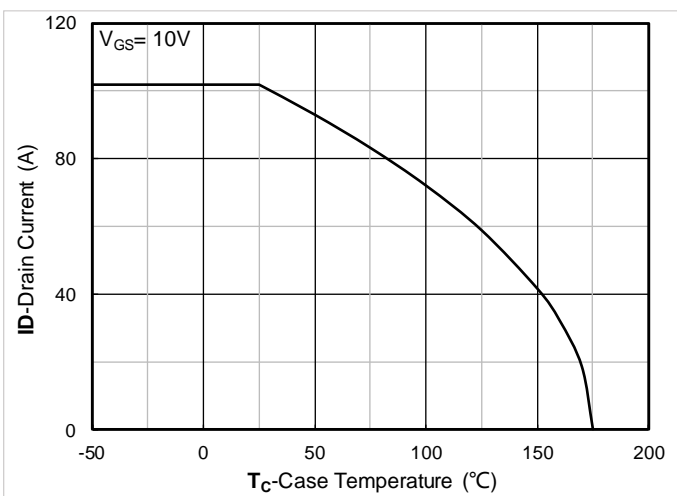


Figure 11. Current dissipation

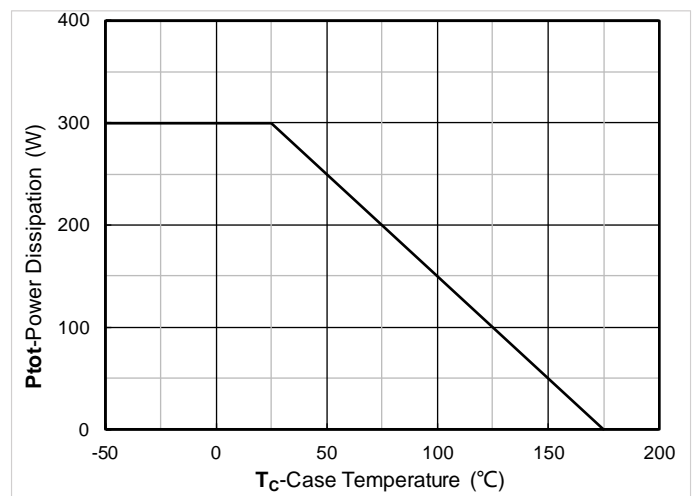


Figure 12. Power dissipation



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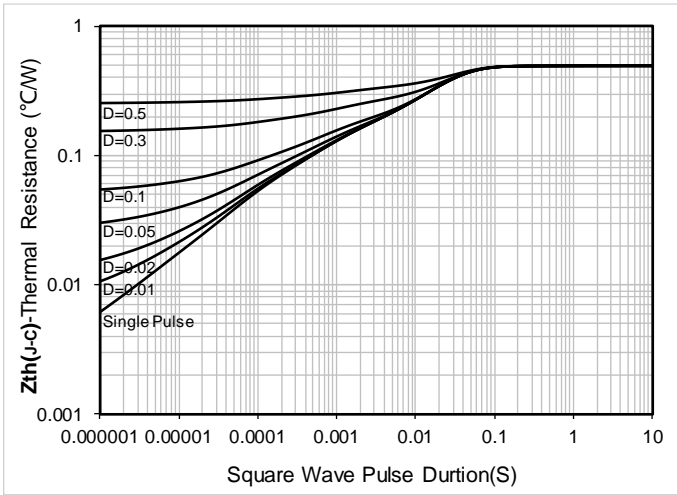


Figure 13. Maximum Transient Thermal Impedance

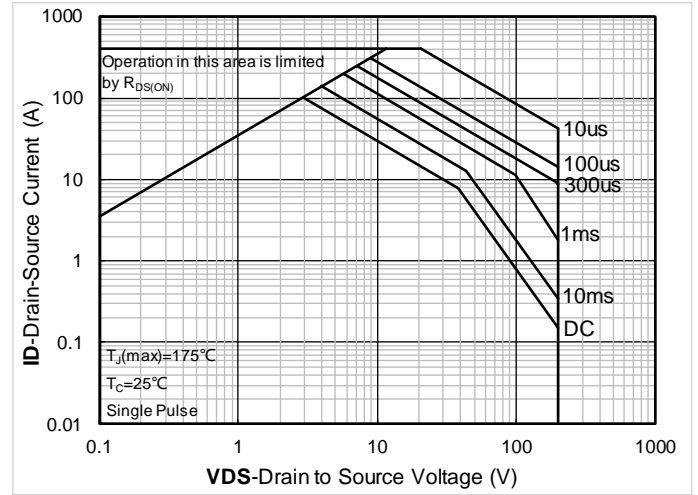


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

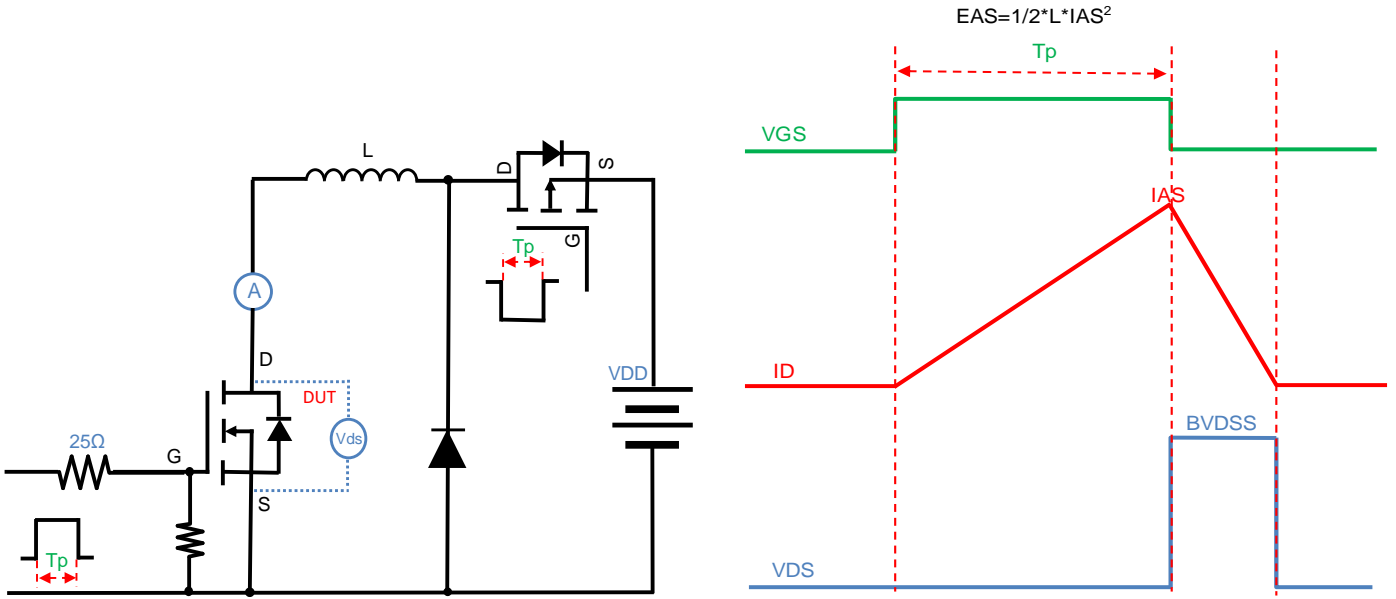


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

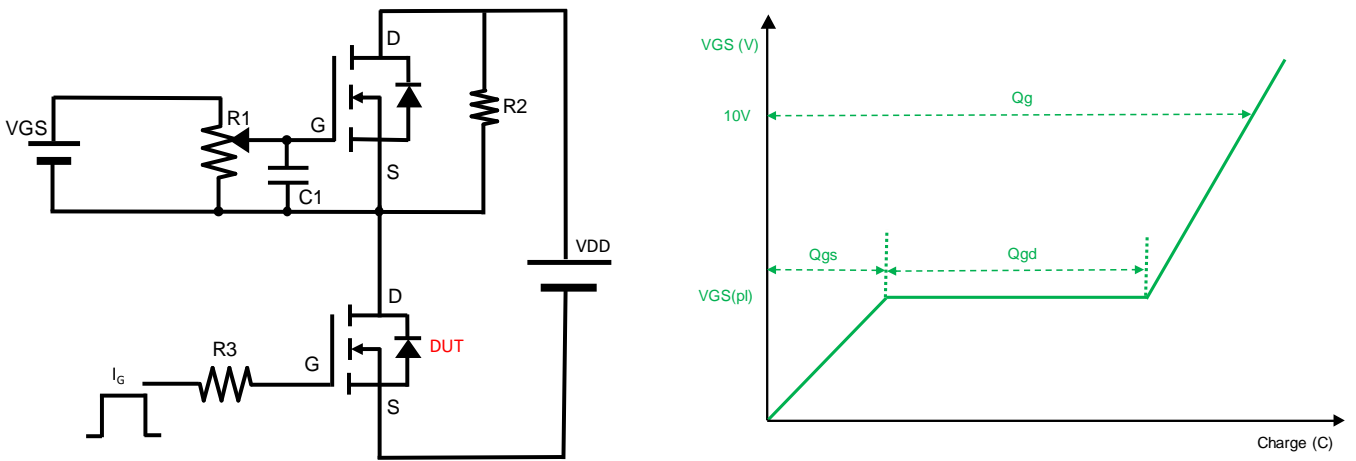


Figure B. Gate Charge Test Circuit & Waveform

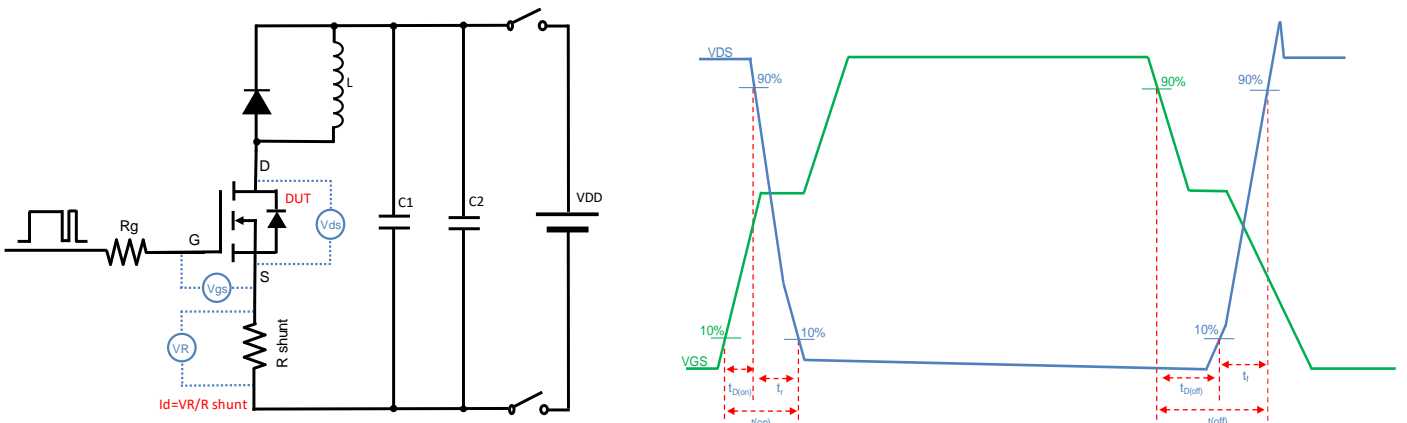


Figure C. Resistive Switching Test Circuit & Waveform

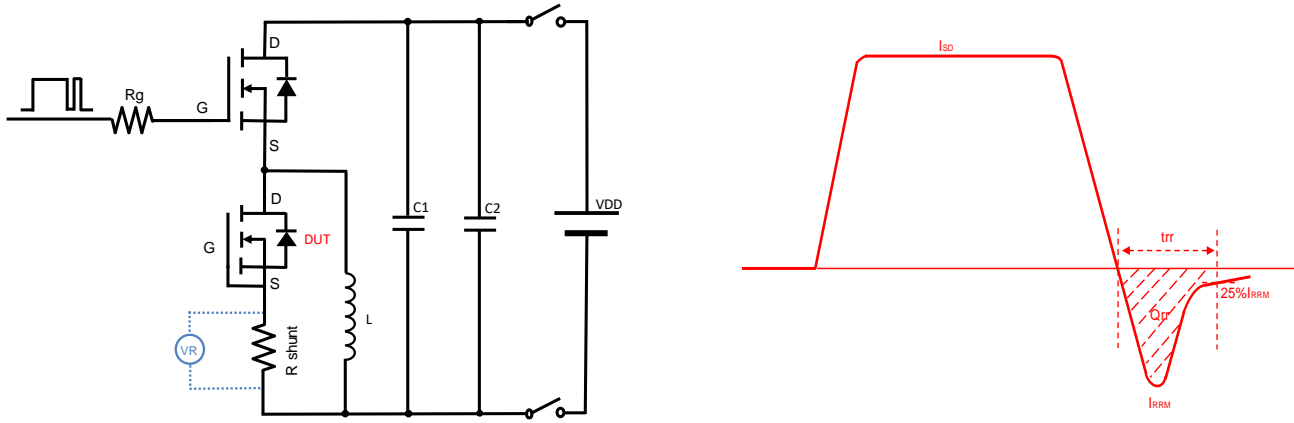
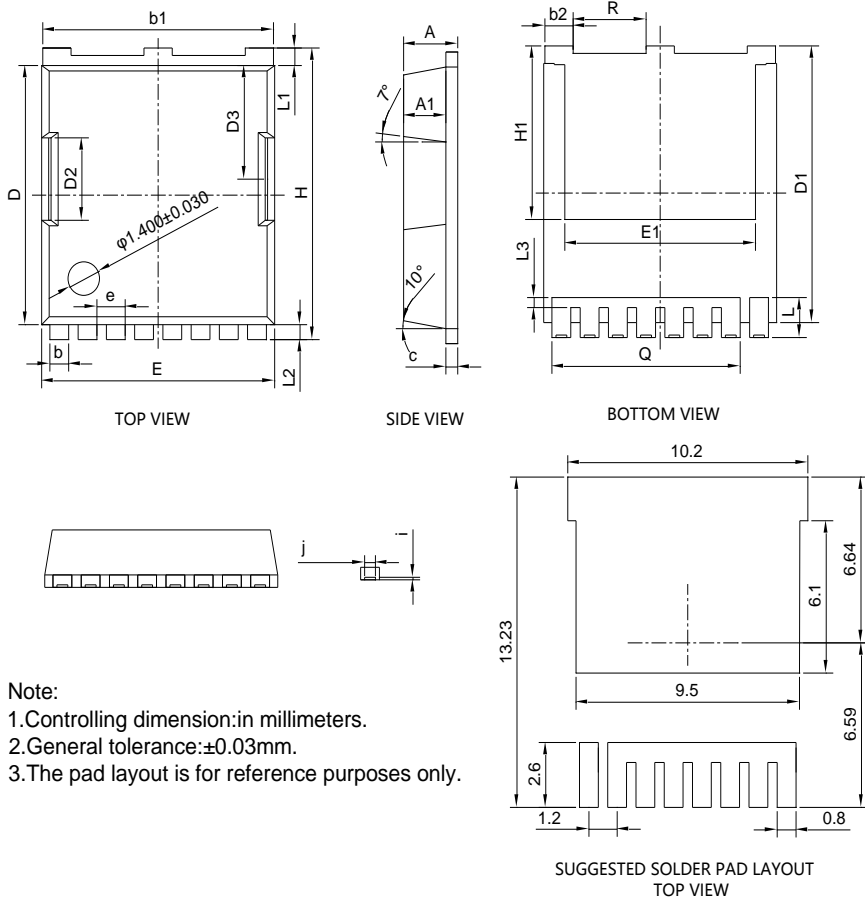


Figure D. Diode Recovery Test Circuit & Waveform



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■TOLL Package information



| SYMBOL | MILLIMETER | | |
|--------|------------|-------|-------|
| | MIN | NOM | MAX |
| A | 2.2 | 2.3 | 2.4 |
| A1 | 1.7 | 1.8 | 1.9 |
| b | 0.7 | 0.8 | 0.9 |
| b1 | 9.7 | 9.8 | 9.9 |
| b2 | 1.1 | 1.2 | 1.3 |
| c | 0.4 | 0.5 | 0.6 |
| D | 10.28 | 10.38 | 10.48 |
| D1 | 10.98 | 11.08 | 11.18 |
| D2 | 3.2 | 3.3 | 3.4 |
| D3 | 4.45 | 4.55 | 4.65 |
| E | 9.8 | 9.9 | 10 |
| E1 | 8 | 8.1 | 8.2 |
| e | 1.2 BSC | | |
| H | 11.58 | 11.68 | 11.78 |
| H1 | 6.95 BSC | | |
| i | 0.1 REF | | |
| j | 0.46 REF | | |
| L | 1.5 | 1.6 | 1.7 |
| L1 | 0.6 | 0.7 | 0.8 |
| L2 | 0.5 | 0.6 | 0.7 |
| L3 | 0.3 | 0.4 | 0.5 |
| Q | 8 REF | | |
| R | 3.0 | 3.1 | 3.2 |

- Note:
1. Controlling dimension: in millimeters.
 2. General tolerance: ± 0.03 mm.
 3. The pad layout is for reference purposes only.

UNIT: mm



YJT011G20H

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