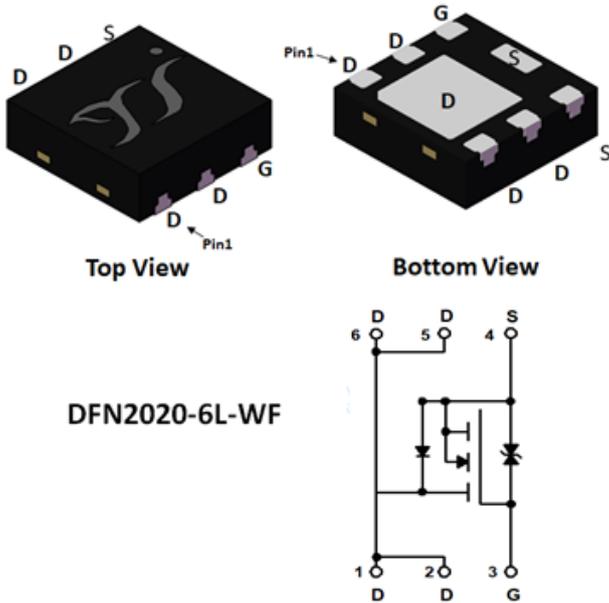


N-Channel Enhancement Mode Field Effect Transistor



Product Summary

- V_{DS} 60V
- I_D 8A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $<90m\Omega$
- $R_{DS(ON)}$ (at $V_{GS}=4.5V$) $<115m\Omega$
- ESD Protected Up to 1.2KV(HBM)

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Part no. with suffix "Q" means AEC-Q101 qualified
- Halogen Free

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor

Limiting Values

| Parameter | Conditions | | Symbol | Min | Max | Unit |
|--|------------------------------------|--|----------------|-----|------|------------|
| Drain-source Voltage | | | V_{DS} | - | 60 | 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 | - | 2.7 | A |
| | | $T_A=100^\circ C, V_{GS}=10V$ | | - | 1.7 | |
| Continuous Drain Current (Note 1,3) | Steady-State | $T_C=25^\circ C, V_{GS}=10V, \text{Chip limitation}$ | | - | 8 | |
| | | $T_C=100^\circ C, V_{GS}=10V$ | | - | 5 | |
| Pulsed Drain Current | $T_C=25^\circ C, t_p \leq 10\mu s$ | | I_{DM} | - | 18 | |
| Maximum Body-Diode Continuous Current | $T_C=25^\circ C$ | | I_S | | 8 | |
| Total Power Dissipation (Note 1,2) | Steady-State | $T_A=25^\circ C$ | P_D | - | 1.47 | W |
| | | $T_A=100^\circ C$ | | - | 0.58 | |
| Total Power Dissipation (Note 1,3) | Steady-State | $T_C=25^\circ C$ | | - | 12.5 | |
| | | $T_C=100^\circ C$ | | - | 5 | |
| Junction and Storage Temperature Range | | | T_J, T_{STG} | -55 | 150 | $^\circ C$ |

Thermal Resistance

| Parameter | | Symbol | Typ | Max | Units |
|---|--------------|-----------------|-----|-----|--------------|
| Thermal Resistance Junction-to-Ambient (Note 2) | Steady-State | $R_{\theta JA}$ | - | 85 | $^\circ C/W$ |
| Thermal Resistance Junction-to-Case | Steady-State | $R_{\theta JC}$ | - | 10 | |

Ordering Information (Example)

| PREFERRED P/N | PACKING CODE | Marking | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|----------------|--------------|---------|----------------------|-------------------------|----------------------------|---------------|
| YJQT090N06AJKQ | F1 | 090N06 | 3000 | 30000 | 120000 | 7" reel |



YJQT090N06AJKQ

■ Electrical Characteristics

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|-----------------------------------|--------------|---|-----|------|----------|-----------|
| Static Parameter | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A, T_j=25^\circ C$ | 60 | - | - | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=60V, V_{GS}=0V, T_j=25^\circ C$ | - | - | 1 | μA |
| | | $V_{DS}=60V, V_{GS}=0V, T_j=150^\circ C$ | - | - | 100 | |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V, T_j=25^\circ C$ | - | - | ± 10 | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A, T_j=25^\circ C$ | 1.1 | 1.6 | 2.1 | V |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=2A, T_j=25^\circ C$ | - | 75 | 90 | $m\Omega$ |
| | | $V_{GS}=4.5V, I_D=1A, T_j=25^\circ C$ | - | 85 | 115 | $m\Omega$ |
| Diode Forward Voltage | V_{SD} | $I_S=2A, V_{GS}=0V, T_j=25^\circ C$ | - | 0.81 | 1.2 | V |
| Gate Resistance | R_G | $f=1MHz, T_j=25^\circ C$ | - | 6.3 | - | Ω |
| Dynamic Parameters | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=30V, V_{GS}=0V, f=1MHz, T_j=25^\circ C$ | - | 315 | - | pF |
| Output Capacitance | C_{oss} | | - | 20 | - | |
| Reverse Transfer Capacitance | C_{rss} | | - | 16 | - | |
| Switching Parameters | | | | | | |
| Total Gate Charge | Q_g | $V_{GS}=10V, V_{DS}=30V, I_D=2A, T_j=25^\circ C$ | - | 6.4 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 0.97 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 1.3 | - | |
| Reverse Recovery Charge | Q_{rr} | $I_F=2A, di/dt=100A/\mu s, V_{GS}=0V, V_R=30V, T_j=25^\circ C$ | - | 8 | - | nC |
| Reverse Recovery Time | t_{rr} | | - | 13 | - | ns |
| Turn-on Delay Time | $t_{D(on)}$ | $V_{GS}=10V, V_{DS}=30V, I_D=2A, R_{GEN}=3\Omega, T_j=25^\circ C$ | - | 4.7 | - | ns |
| Turn-on Rise Time | t_r | | - | 2.6 | - | |
| Turn-off Delay Time | $t_{D(off)}$ | | - | 14.2 | - | |
| Turn-off Fall Time | t_f | | - | 2.7 | - | |

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 150 $^\circ C$. 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

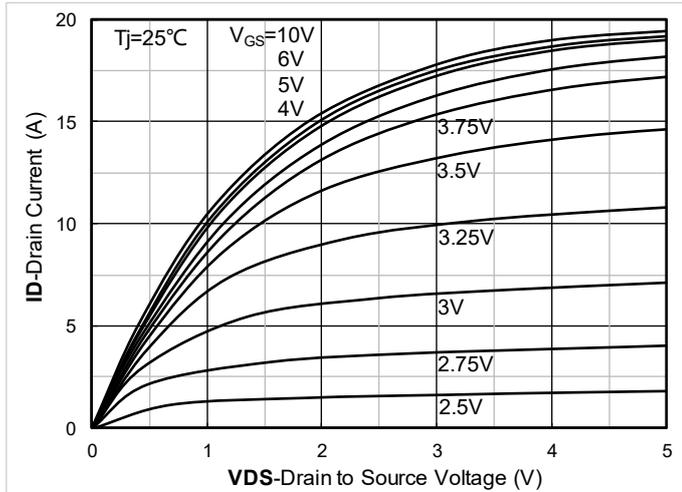


Figure 1. Output Characteristics; typical values

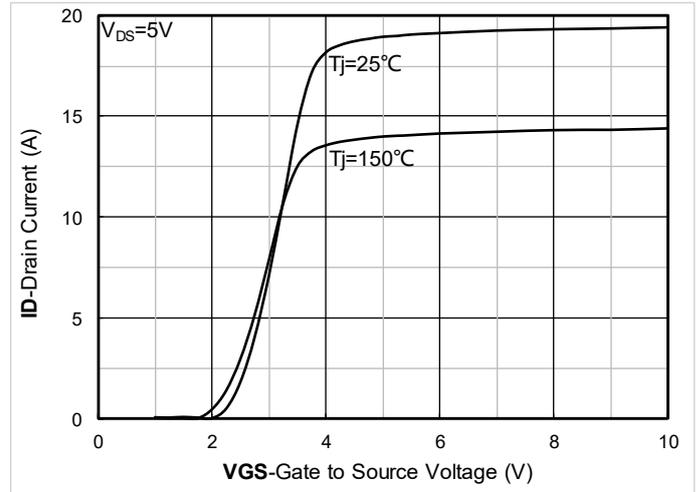


Figure 2. Transfer Characteristics; typical values

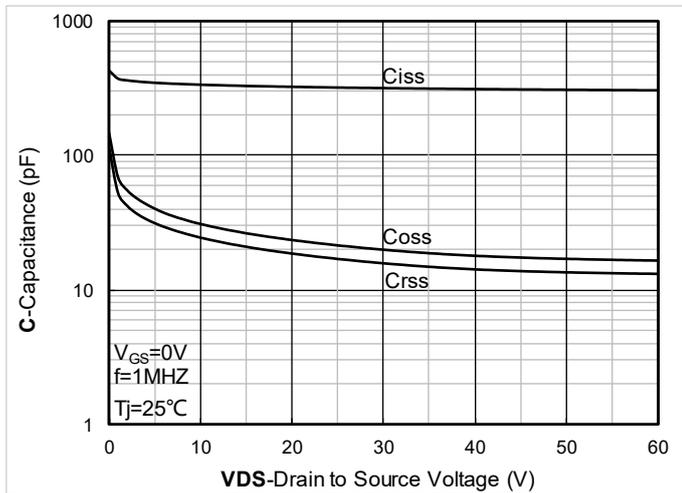


Figure 3. Capacitance Characteristics; typical values

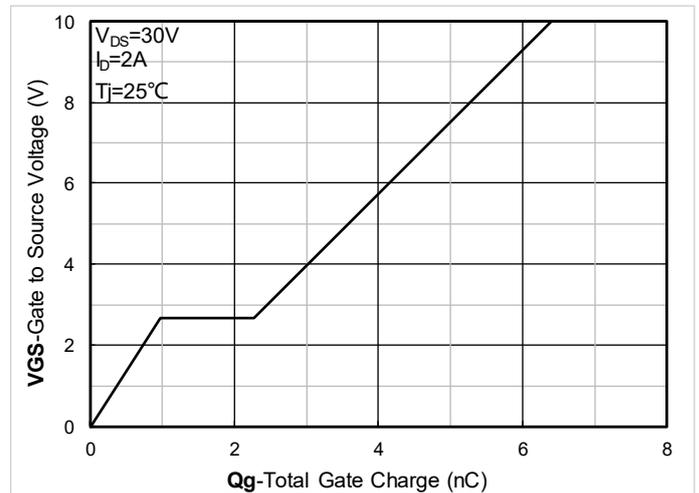


Figure 4. Gate Charge; typical values

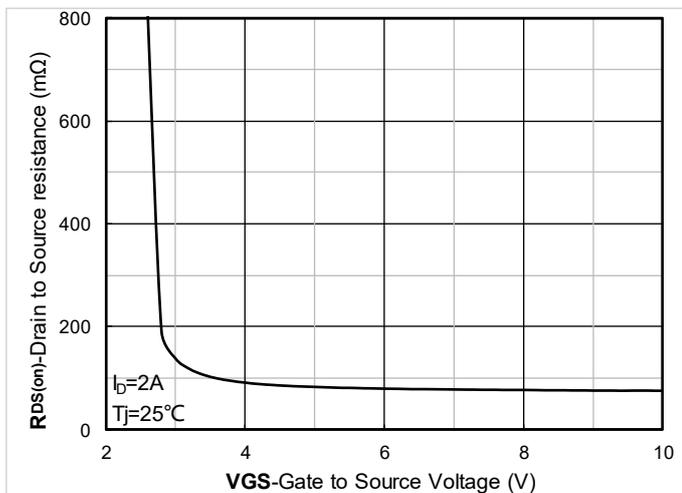


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

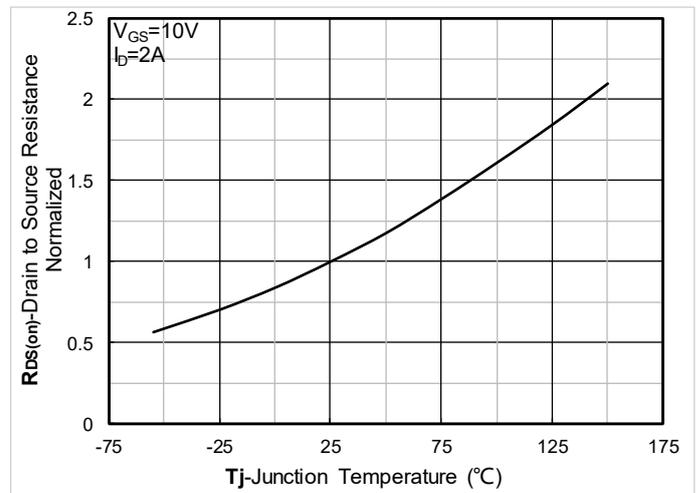


Figure 6. Normalized On-Resistance



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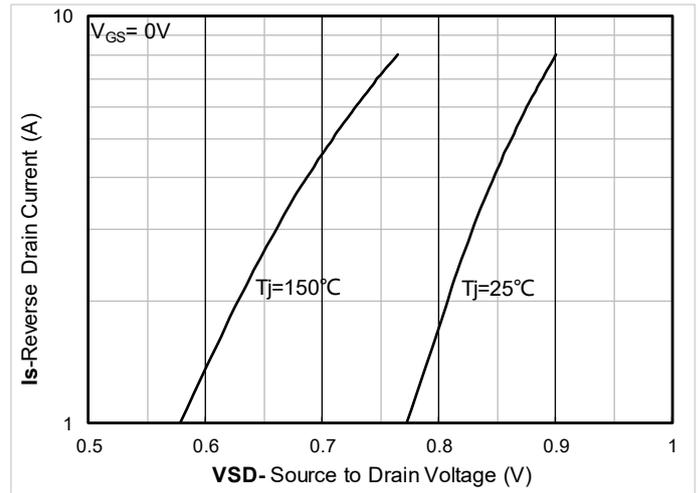
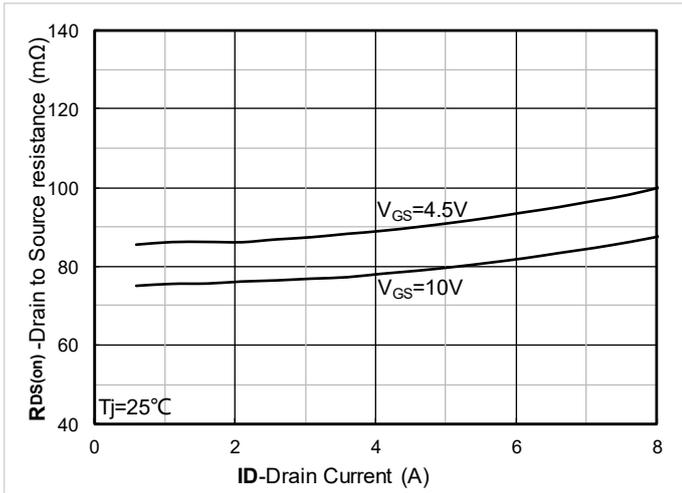


Figure 7. RDS(on) vs. Drain Current; typical values

Figure 8. Forward characteristics of reverse diode; typical values

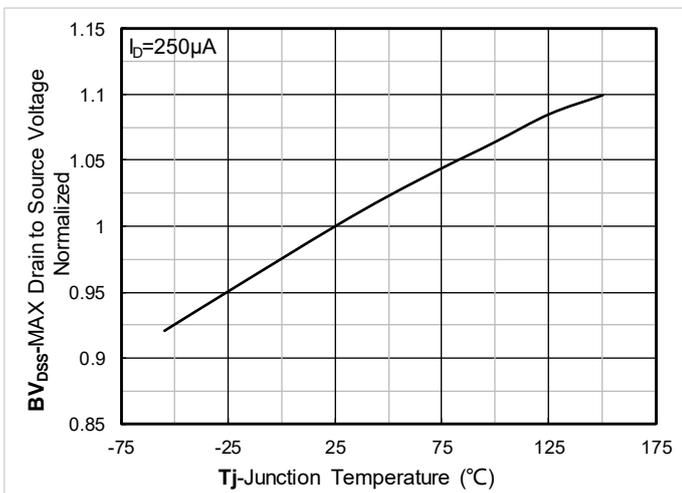


Figure 9. Normalized breakdown voltage

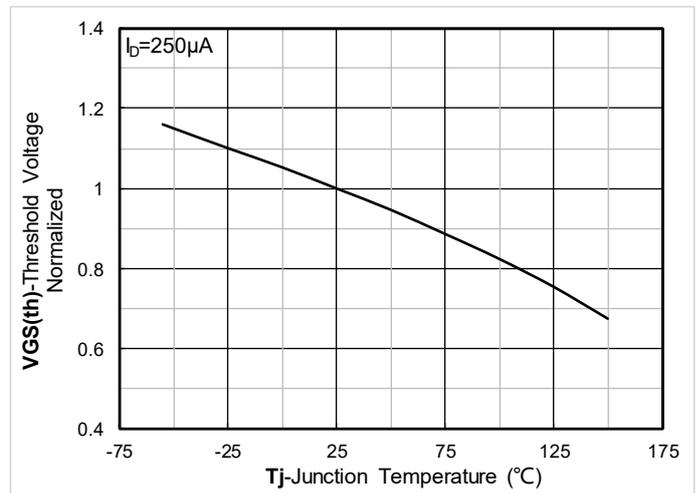


Figure 10. Normalized Threshold voltage

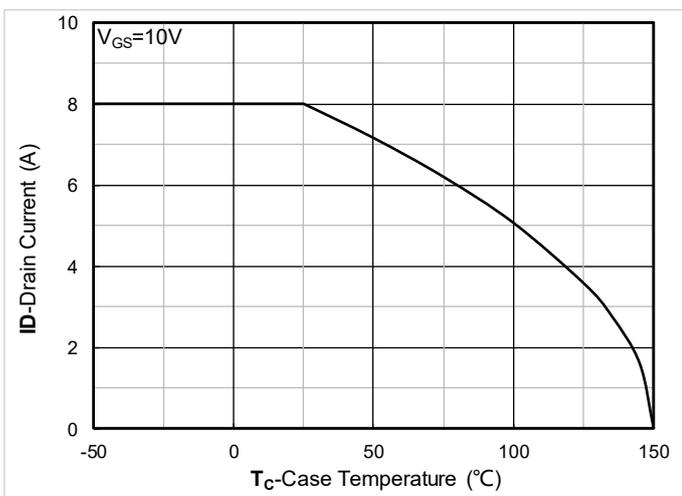


Figure 11. Current dissipation

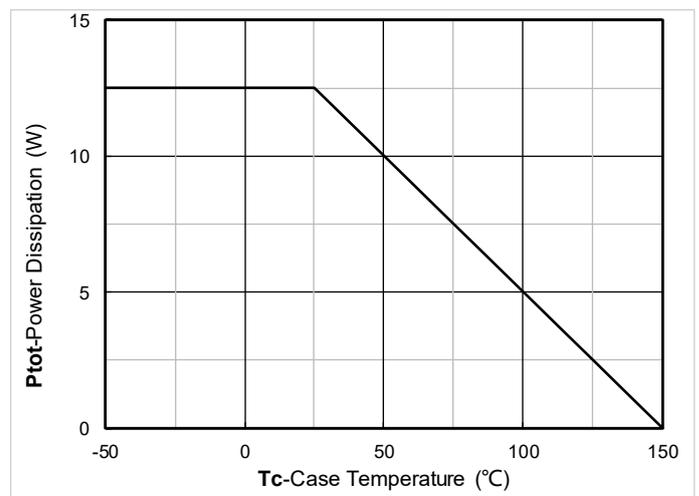


Figure 12. Power dissipation



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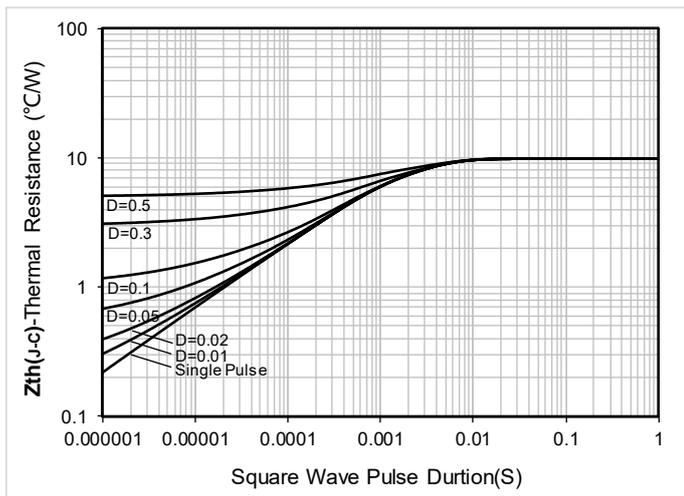


Figure 13. Maximum Transient Thermal Impedance

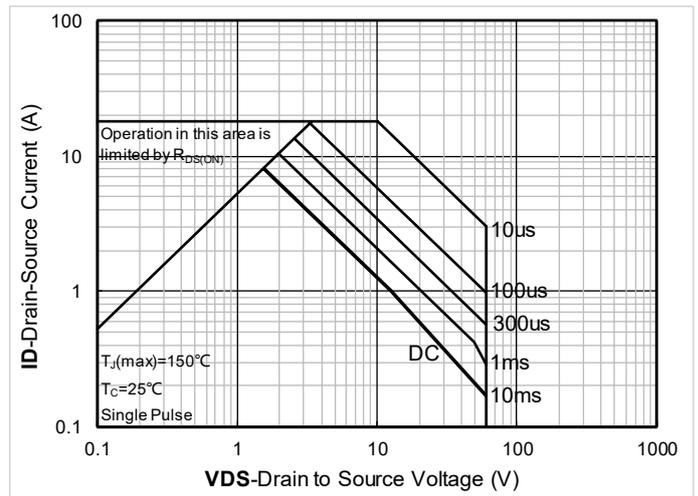


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms

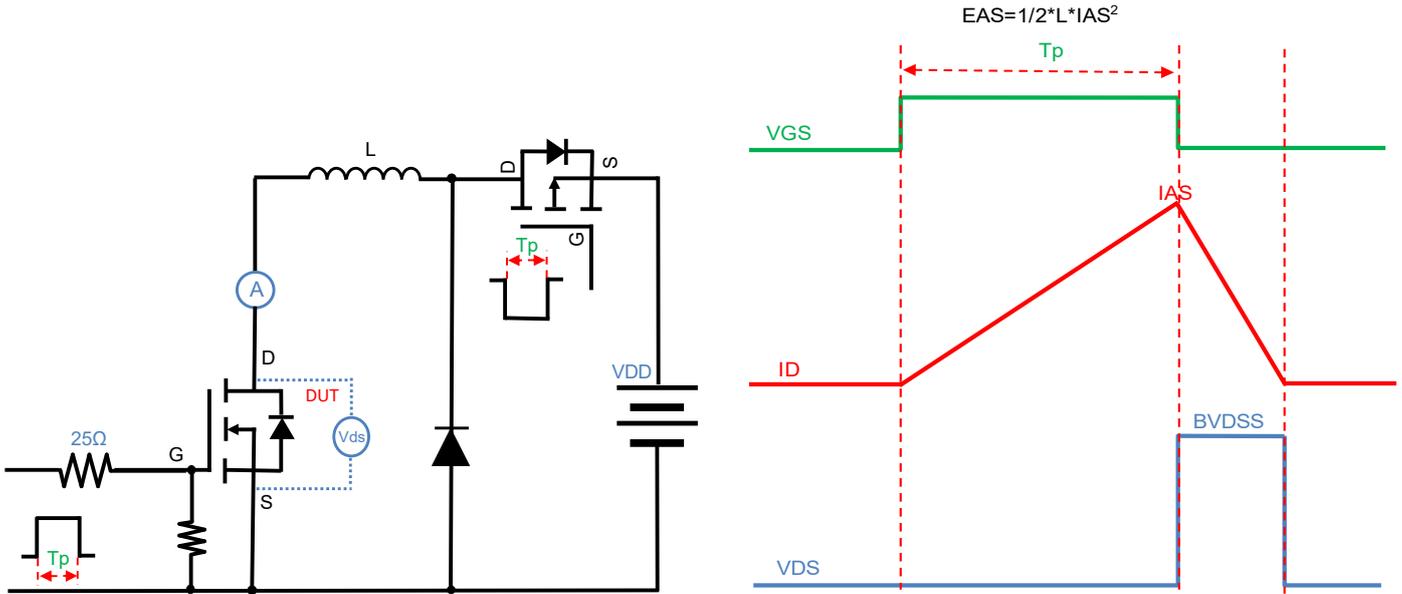


Figure A. Unclamped Inductive Switching (UIS) Test Circuit & Waveform

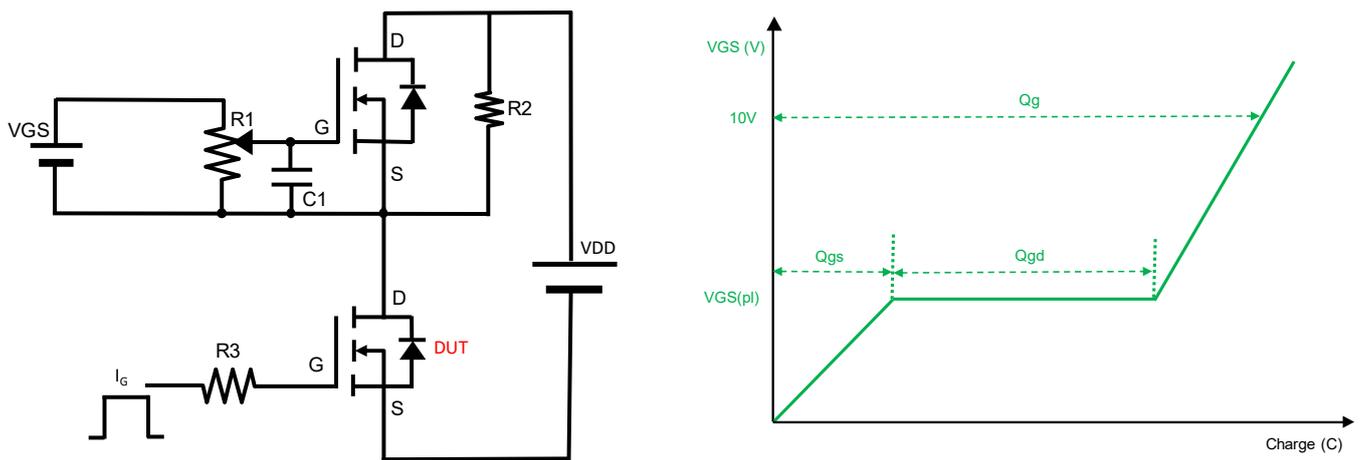


Figure B. Gate Charge Test Circuit & Waveform

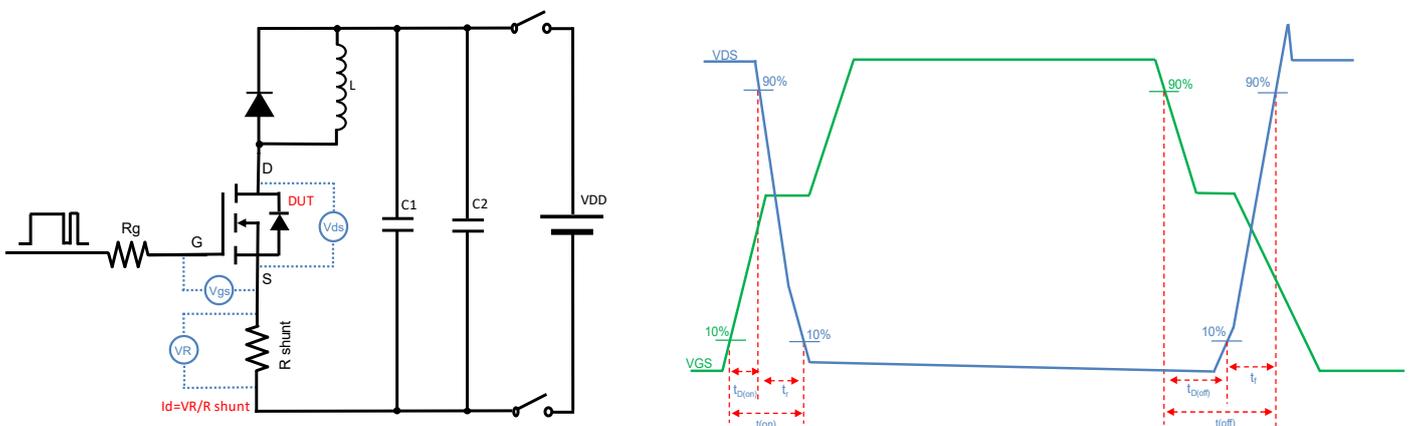


Figure C. Resistive Switching Test Circuit & Waveform

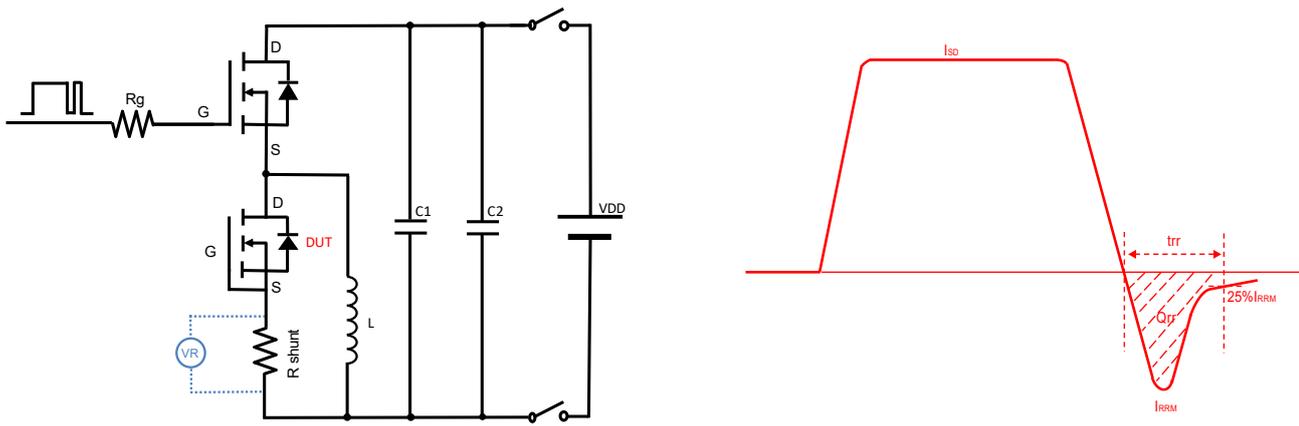
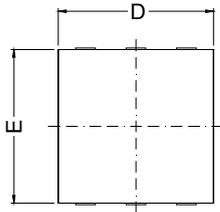


Figure D. Diode Recovery Test Circuit & Waveform

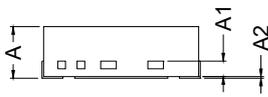


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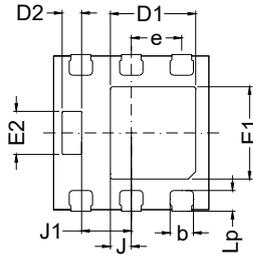
DFN2020-6L-H-0.65MM Package Information



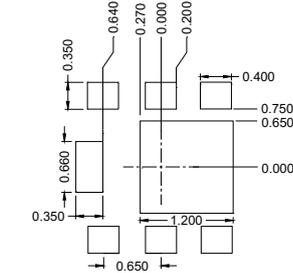
Top View
正面视图



Side View
侧面视图



Bottom View
背面视图



Suggested Solder Pad Layout
Top View

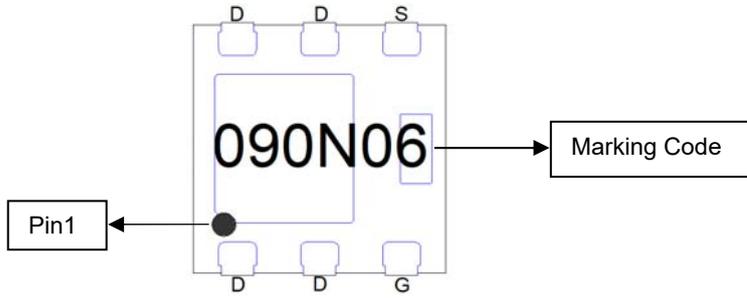
| SYMBOL | MILLIMETER | | |
|--------|------------|------|------|
| | MIN | NOM | MAX |
| D | 1.90 | 2.00 | 2.10 |
| E | 1.90 | 2.00 | 2.10 |
| A | 0.55 | 0.65 | 0.75 |
| A1 | 0.20 BSC | | |
| A2 | 0 | - | 0.10 |
| D1 | 1.00 | 1.10 | 1.20 |
| D2 | 0.20 | 0.25 | 0.35 |
| E1 | 1.10 | 1.20 | 1.30 |
| E2 | 0.51 | 0.56 | 0.66 |
| Lp | 0.20 | 0.25 | 0.35 |
| J | 0.27 BSC | | |
| J1 | 0.64 BSC | | |
| b | 0.20 | 0.30 | 0.40 |
| e | 0.65 BSC | | |

Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.10 mm.
3. The pad layout is for reference purposes only.



■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. 090N06 is marking code
4. Body color: Black



YJQT090N06AJKQ

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