## Features

- CRM G4 SIC MOSFET Technology
- High Blocking Voltage with Low On-Resistance
- High Speed Switching with Low Capacitances
- Avalanche Ruggedness
- Fast Reverse Recovery
- AEC-Q101 Qualified

## Product Summary

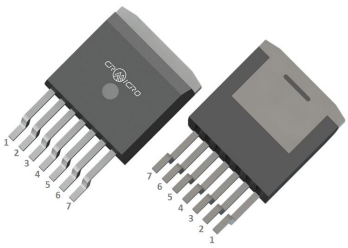
| | |
|---|---|
| VDS | 750V |
| $R_{DS(on)_typ}$ | 25m Ω |
| $I_D$ | 70A |

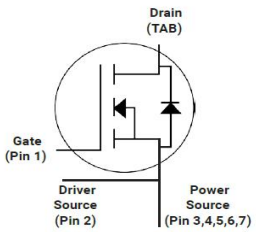
## Applications

- Switching Mode Power Supply(SMPS)
- High Voltage DC/DC Converters
- On Board Charger(OBC)
- EV Charger

***100% Avalanche Tested***

RoHS HF






## Package Marking and Ordering Information

| Part # | Marking | Package | Packing | Qty |
|---|---|---|---|---|
| CRXSP25M065G4Q | X25M065G4Q | TO-263-7 | Reel | 800pcs |

## Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-source voltage | $V_{DS}$ | 750 | V |
| Continuous drain current<br>$V_{GS}$=18V， $T_C$ = 25°C<br>$V_{GS}$=18V， $T_C$ = 100°C | $I_D$ | <br>70<br>50 | A |
| Pulsed drain current ($T_C$ = 25°C, $t_p$ limited by $T_{jmax}$) | $I_{D(pulse)}$ | 140 | A |
| Avalanche energy, single pulse (L=10mH, Rg=25Ω) | $E_{AS}$ | 920 | mJ |
| Gate-Source voltage (dynamic)[a1] | $V_{GSmax}$ | -10/+22 | V |
| Gate-Source voltage (static)[a2] | $V_{GSop}$ | -5/+18 | V |
| Power dissipation ($T_C$=25°C,$T_J$=175°C) | $P_D$ | 242 | W |
| Operating Junction and Storage Temperature | $T_j$,$T_{stg}$ | -55...175 | °C |

a1: When using MOSFET Body Diode $V_{GSmax}$ = -5V/+22V

a2: MOSFET can also safely operate at 0/+18V

## Thermal Resistance

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Thermal resistance, junction – case. Max | $R_{thJC}$ | 0.62 | °C/W |
| Thermal resistance, junction – ambient. Max | $R_{thJA}$ | 50 | |

## Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

| Parameter | Symbol | Value | | | Unit | Test Condition |
|---|---|---|---|---|---|---|
| | | min. | typ. | max. | | |
| **Static Characteristic** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | 750 | - | - | V | $V_{GS}$=0V, $I_D$=250uA |
| Gate threshold voltage | $V_{GS(th)}$ | 2 | - | 4 | V | $V_{DS}$=$V_{GS}$,$I_D$=10mA |
| Zero gate voltage drain current | $I_{DSS}$ | - | 0.1 | 100 | μA | VDS=650V,VGS=0V<br>$T_j$=25°C |
| | | - | 1 | - | | $T_j$=175°C |
| Gate-source leakage current | $I_{GSS}$ | - | - | ±100 | nA | $V_{GS}$=-10/+22V,$V_{DS}$=0V |
| Drain-source on-state resistance | $R_{DS(on)}$ | - | 32 | 45 | mΩ | VGS=15V, ID=23A,<br>$T_j$=25°C |
| | | - | 34 | - | | $T_j$=175°C |
| Drain-source on-state resistance | $R_{DS(on)}$ | - | 25 | 35 | mΩ | VGS=18V, ID=23A,<br>$T_j$=25°C |
| | | - | 30 | - | | $T_j$=175°C |
| Transconductance | $g_{fs}$ | - | 19 | - | S | VDS=20V,IDS=23A |
| **Dynamic Characteristic** | | | | | | |
| Internal Gate resistance | $R_{G(int)}$ | - | 1.1 | - | Ω | f=1MHz |
| Input Capacitance | $C_{iss}$ | - | 1777 | - | pF | $V_{GS}$=0V, $V_{DS}$=650V, f=1MHz |
| Output Capacitance | $C_{oss}$ | - | 135 | - | | |
| Reverse Transfer Capacitance | $C_{rss}$ | - | 6.1 | - | | |
| Coss Stored Energy | $E_{oss}$ | - | 35 | - | uJ | |
| Gate Total Charge | $Q_g$ | - | 78.4 | - | nC | VGS=-5/18V<br>VDS=400V<br>ID=23A |
| Gate-Source charge | $Q_{gs}$ | - | 26.6 | - | | |
| Gate-Drain charge | $Q_{gd}$ | - | 10.4 | - | | |
| Turn-on delay time | $t_{d(on)}$ | - | 6.4 | - | ns | VDD=400V,ID=23A<br>VGS=-5V/18V，<br>RG=2.5Ω， L=120uH |
| Rise time | $t_r$ | - | 9.6 | - | | |
| Turn-off delay time | $t_{d(off)}$ | - | 18 | - | | |
| Fall time | $t_f$ | - | 9 | - | | |
| Turn-On Switching Energy | $E_{(on)}$ | - | 85.2 | - | uJ | |
| Turn Off Switching Energy | $E_{(off)}$ | - | 4.7 | - | | |

## Body Diode Characteristic

| Parameter | Symbol | Value | | | Unit | Test Condition |
|---|---|---|---|---|---|---|
| | | min. | typ. | max. | | |
| Body Diode Forward Voltage | $V_{SD}$ | - | 3.7 | - | V | VGS=0V,IF=11A |
| | | - | 3.2 | - | V | VGS=0V,IF=11A, Tj=175℃ |
| Continuous Diode Forward Current | $I_S$ | - | - | 70 | A | $V_{GS}$=0V |
| Diode pulse Current | $I_{S,pulse}$ | - | - | 140 | A | pulse width $t_p$ limited by Tjmax |
| Body Diode Reverse Recovery Time | $t_{rr}$ | - | 24.3 | - | ns | di/dt=1000A/us IF=23A Vdd=400V Tj=25℃ |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | - | 270 | - | nC | |
| Body Diode Peak Reverse Recovery Current | $I_{rrm}$ | - | 18.7 | - | A | |
| Body Diode Reverse Recovery Time | $t_{rr}$ | - | 45 | - | ns | di/dt=1000A/us IF=23A Vdd=400V, Tj=175℃ |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | - | 420 | - | nC | |
| Body Diode Peak Reverse Recovery Current | $I_{rrm}$ | - | 20 | - | A | |

## Typical Performance Characteristics

**Fig 1. Output Characteristics (Tj=-55℃)**

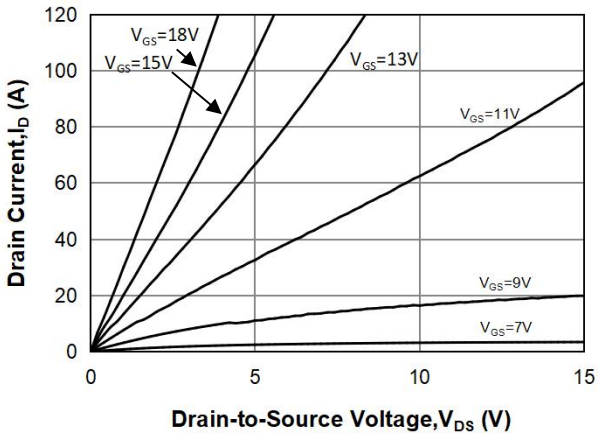



**Fig 2. Output Characteristics (Tj=25℃)**

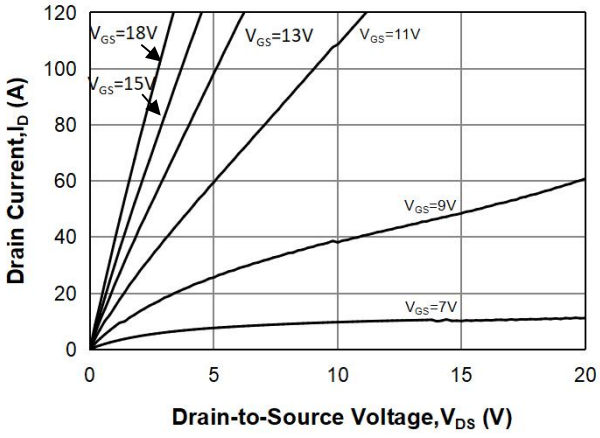



**Fig 3. Output Characteristics (Tj=175℃)**

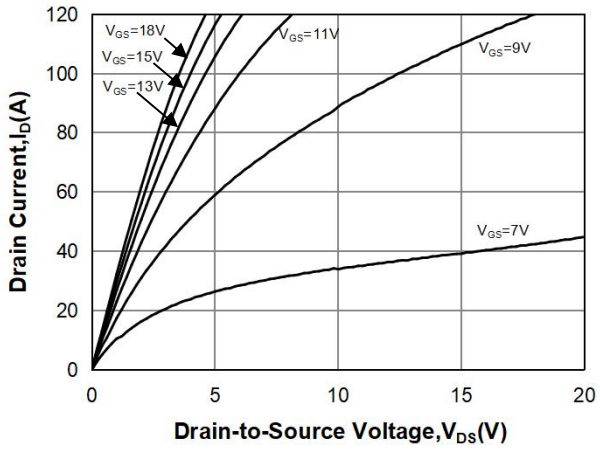



**Fig 4: Rds(on) vs. Temperature**

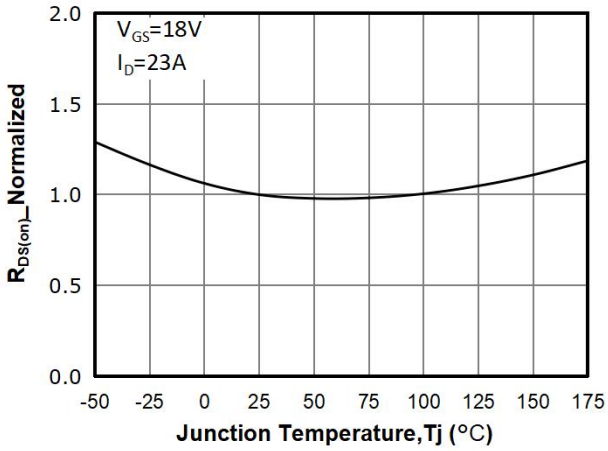



**Fig 5: On-Resistance vs. Drain Current For Various Temperatures**

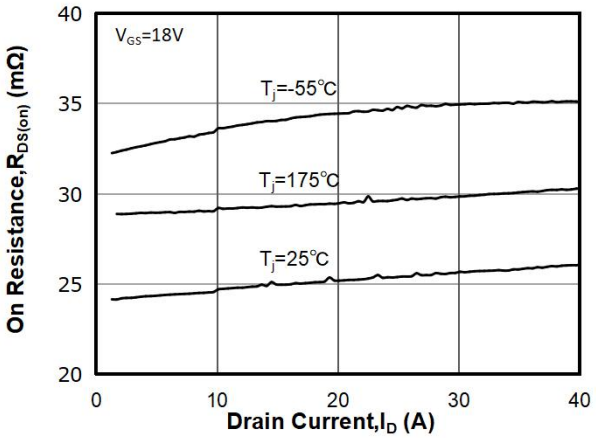



**Fig 6: Rds(on) vs. Temperature For Various Gate Voltage**

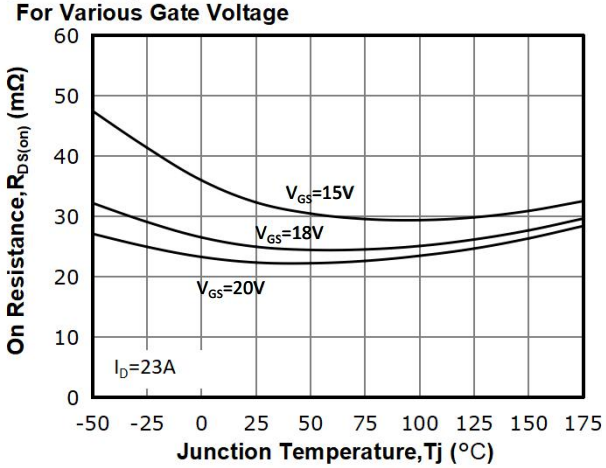


Fig 7: Transfer Characteristics

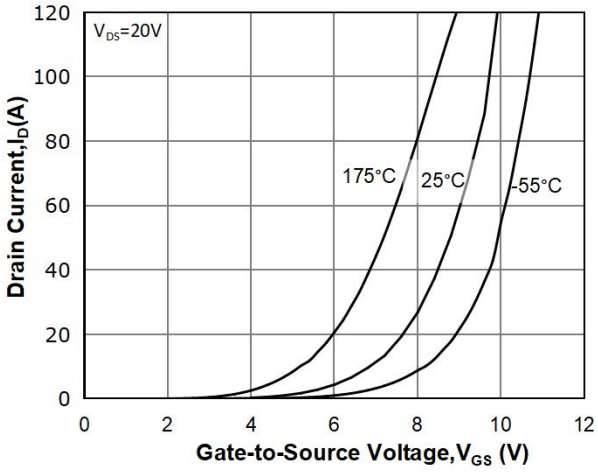



Fig 8: Body-diode Forward Characteristics For Various Temperatures

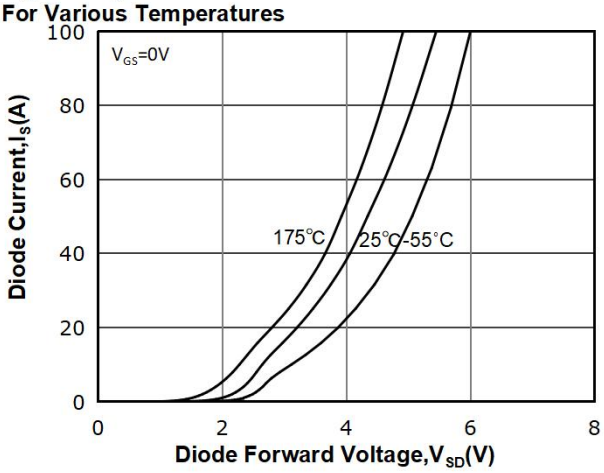



Fig 9: VGS(th) Vs Tj Characteristics

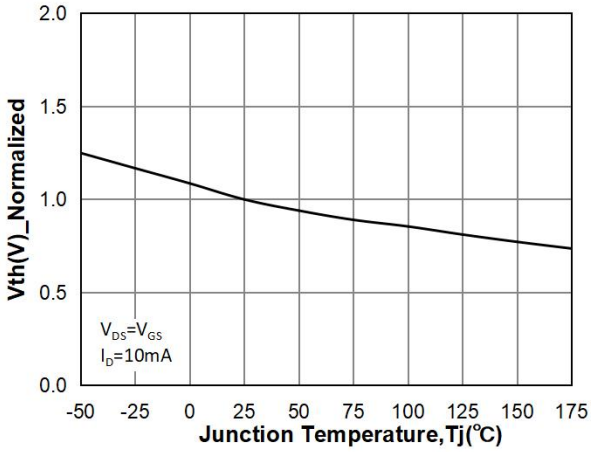



Fig 10: 3rd Quadrant Characteristic at 25℃

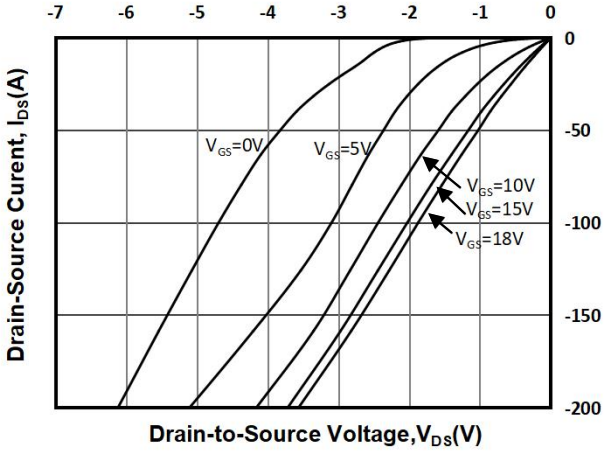



Fig 11：Gtate Charge Characteristics

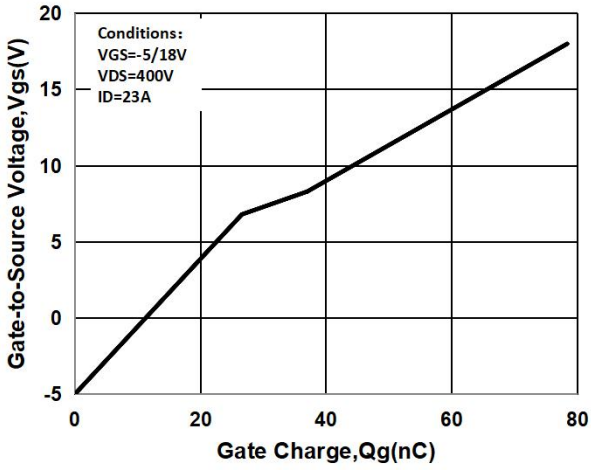



Fig 12: Capacitance Characteristics

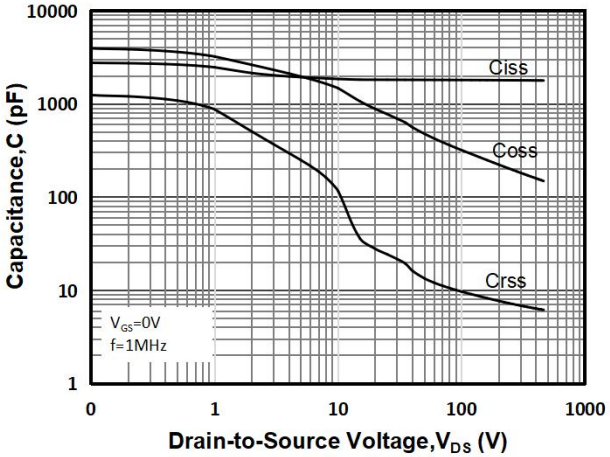


**Fig 13: Continuous Drain Current vs. Case Temperature**

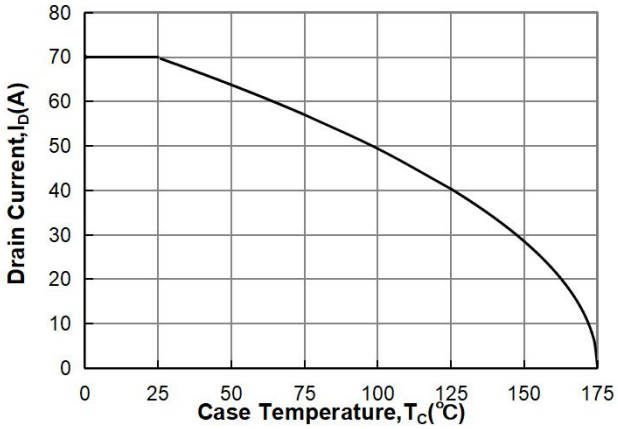



**Fig 14: Maximum Power Dissipation vs. Case Temperature**

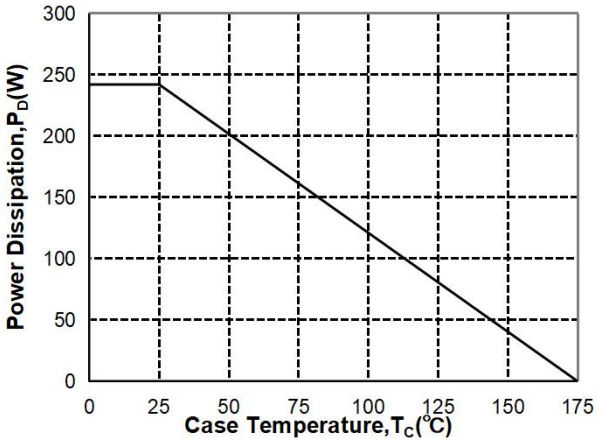



**Fig 15: Safe Operating Area**

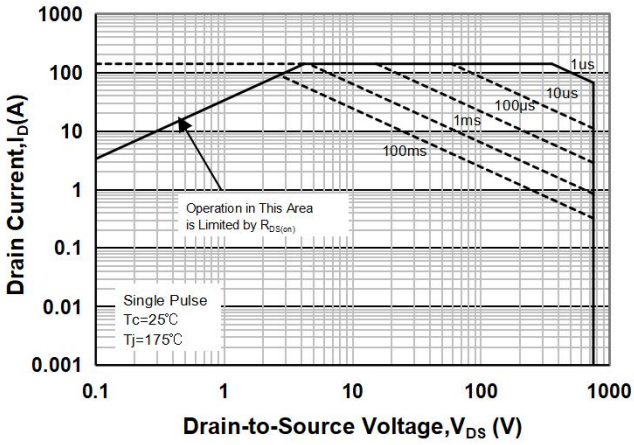



**Fig 16:Output Capacitor Stored Energy**

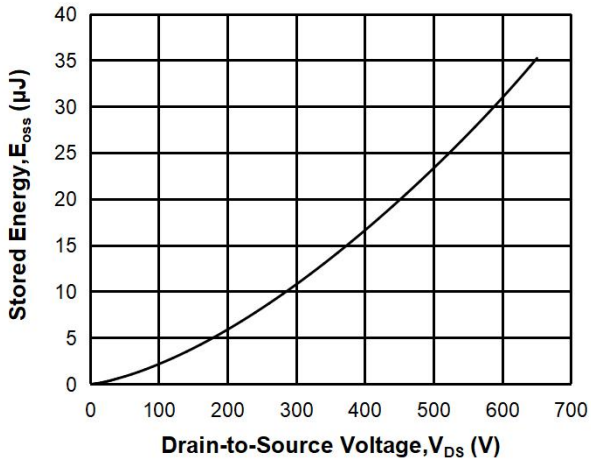



**Fig 17: Max. Transient Thermal Impedance**

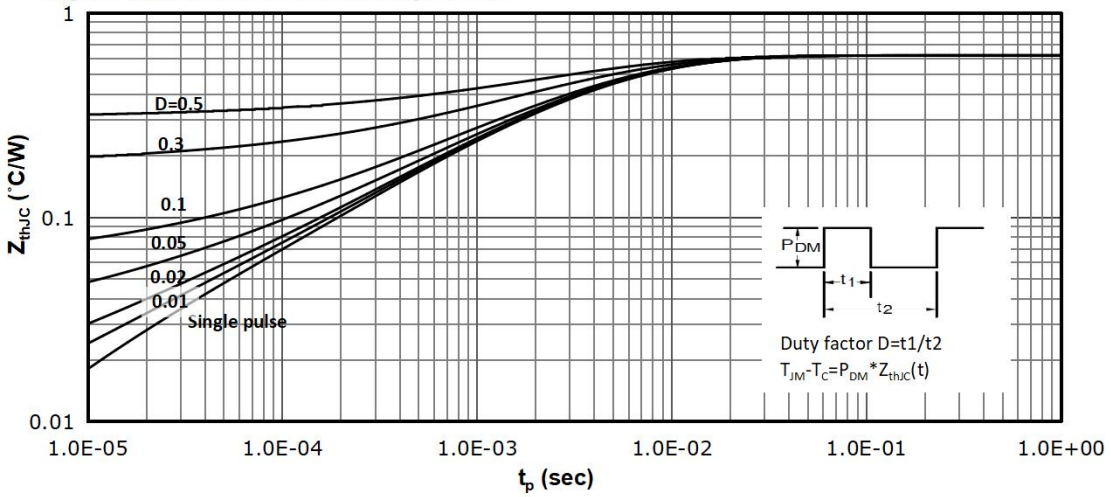


**Fig 18: Rg(Ω) vs. Switching Times(us)**

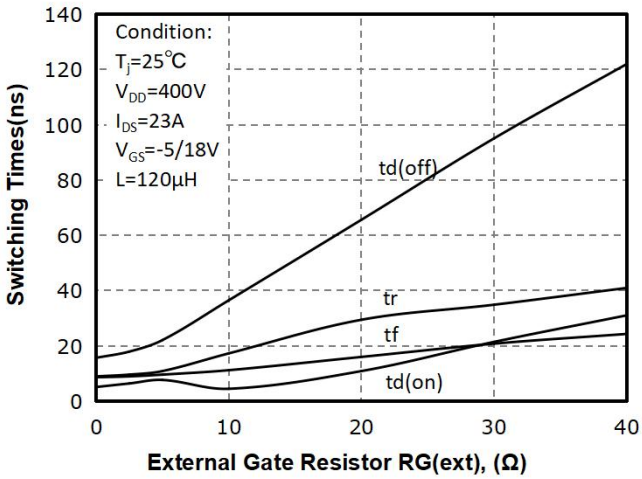



**Fig 19: Rg(Ω) vs. Switching Loss(uJ)**

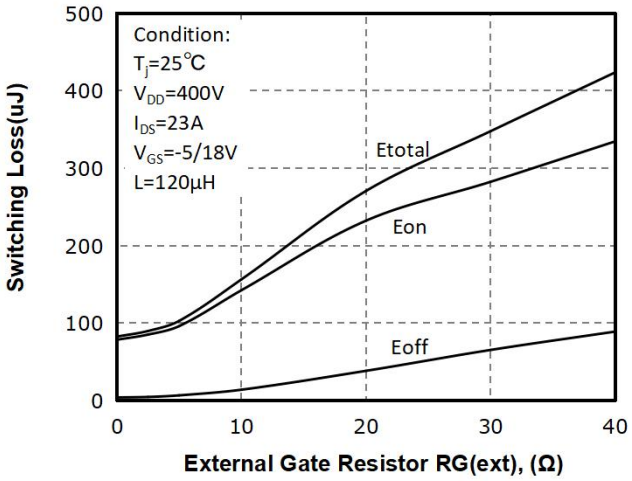



**Fig 20: Temperature(°C) vs. Switching Loss(uJ)**

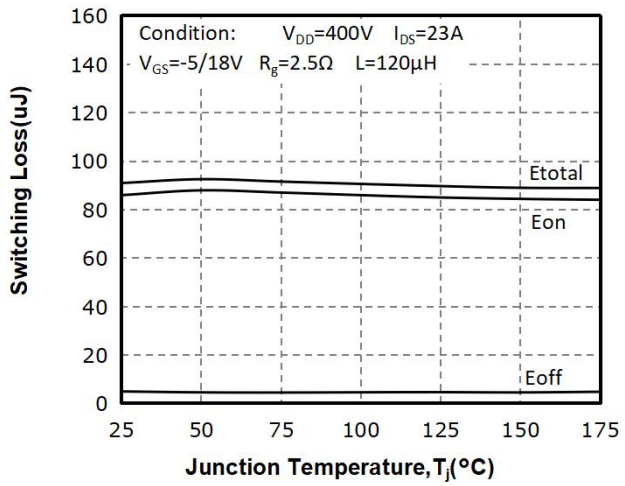
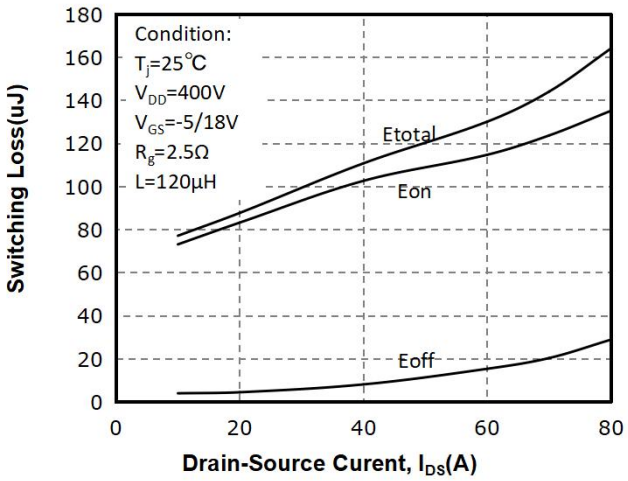
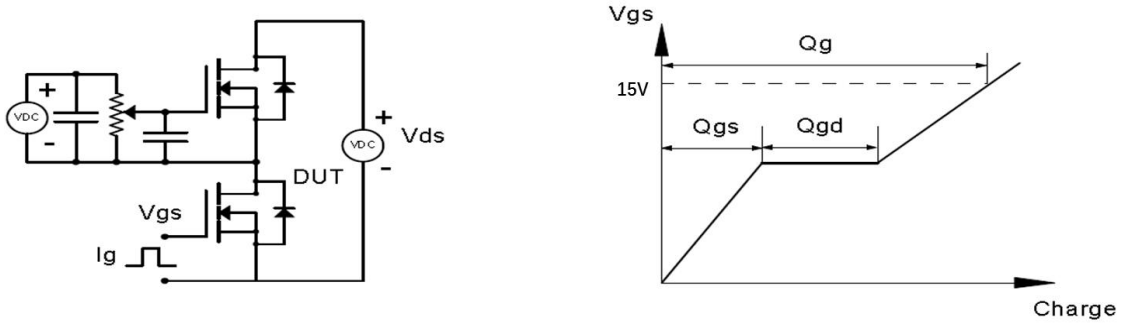



**Fig 21: $I_{DS}$(A) vs. Switching Loss(uJ)**

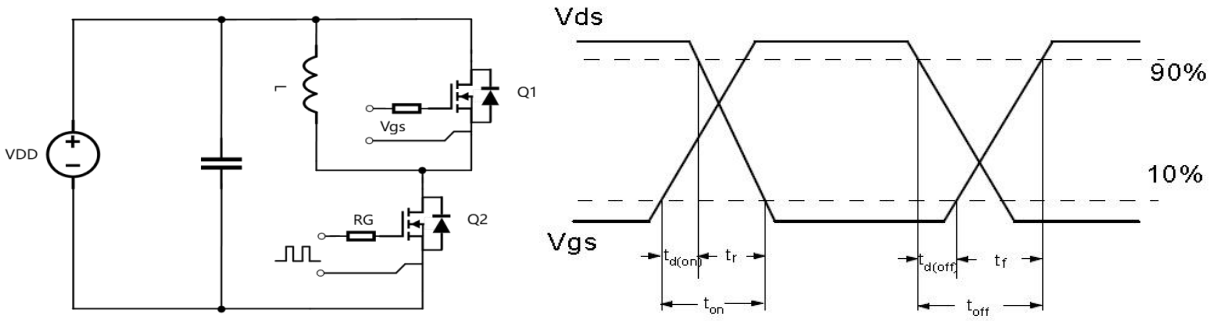


## Test Circuit & Waveform

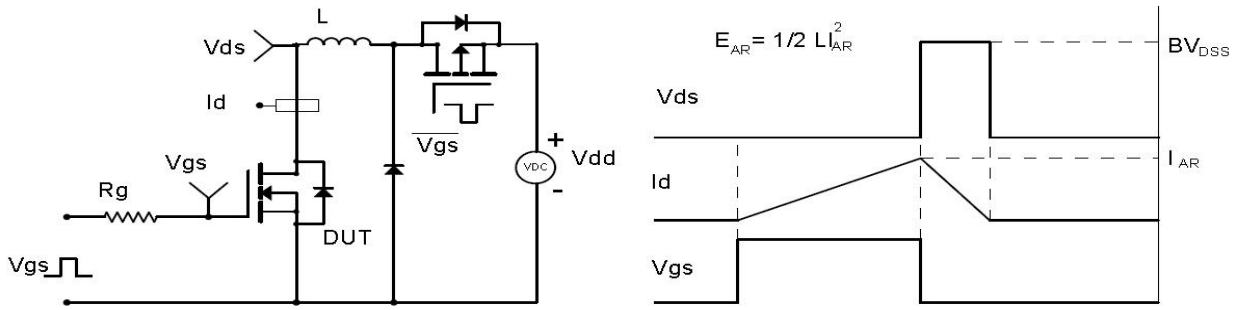
Gate Charge Test Circuit & Waveform



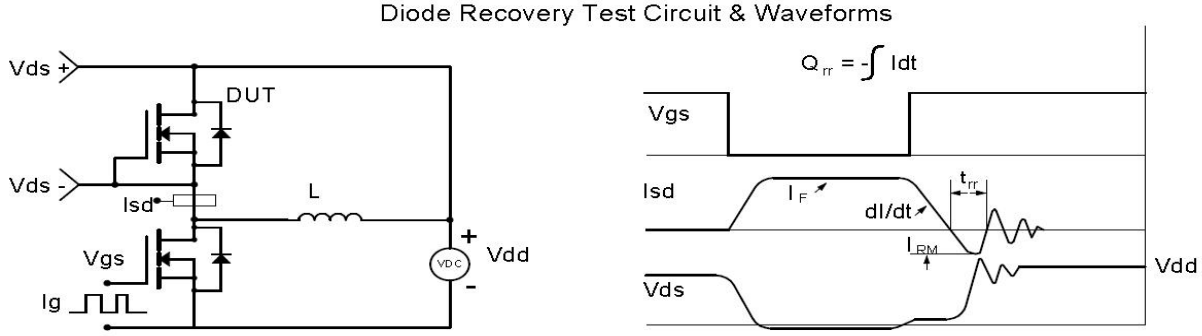

Resistive Switching Test Circuit & Waveforms



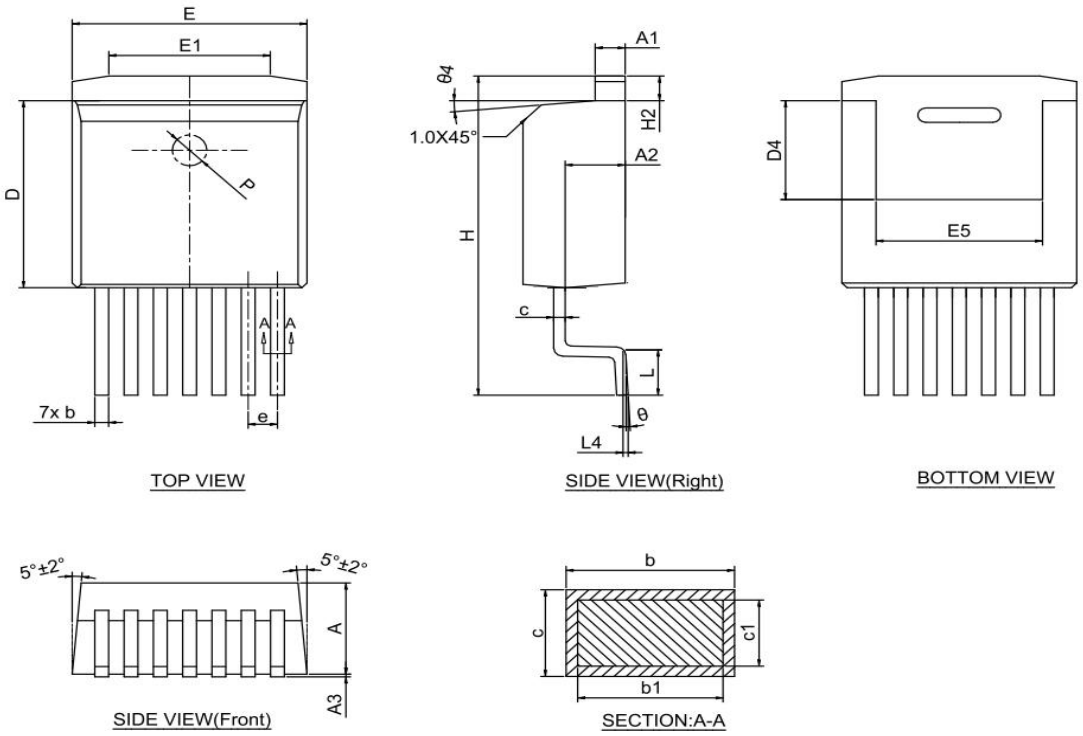

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms




Diode Recovery Test Circuit & Waveforms



## Package Outline: TO-263-7




| Items | Values(mm) | |
|---|---|---|
| | MIN | MAX |
| A | 4.2 | 4.66 |
| A1 | 1.15 | 1.45 |
| A2 | 2.35 | 2.85 |
| A3 | 0 | 0.3 |
| b | 0.5 | 0.78 |
| b1 | 0.45 | 0.75 |
| c | 0.49 | 0.64 |
| c1 | 0.4 | 0.6 |
| D | 8.83 | 9.33 |
| D4 | 4.6 | 5 |
| e | 1.27 BSC. | |
| E | 9.08 | 10.38 |
| E1 | 6.4 | 7.6 |
| E5 | 6.72 | 7.72 |
| H | 14.9 | 16.1 |
| H2 | 0.9 | 1.45 |
| L | 1.8 | 2.6 |
| L4 | 0.25 BCS. | |
| P | 1.4 | 1.6 |
| θ | 0° | 7° |

## Revision History

| Revison | Date | Major changes |
|---|---|---|
| 1.0 | 2026/3/31 | Release of formal version |
| | | |
| | | |

## Disclaimer

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