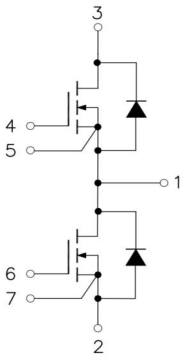
## 62mm Sic MOSFET Half-Bridge Power Module

Vds=1700V, Id=600A, Rds(on)= 5mΩ




**Features:**

- Zero Turn-off Tail Current from MOSFET
- High-frequency Operation
- High Temperature, Humidity, and Bias operation
- Normally-off, Fail-safe Device Operation




**Applications:**

- Enables Compact, lightweight,efficient systems
- Mitigates over-voltage protection
- Reduced thermal requirements
- Reduced system cost

### Maximum Ratings (Tc= 25 °C unless otherwise specified)

| Symbol | Parameter | Value | Unit | Test Conditions |
|---|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 1700 | V | VGS=0V,ID= 100μA |
| $V_{GSmax}$ | Gate-Source Voltage | -10/+25 | V | Absolute maximum values |
| $V_{GSop}$ | Gate-Source Voltage | -5/+20 | V | Recommended operational values |
| $I_D$ | Continuous Drain Current | 600 | A | VGS = 20V,TC = 25℃ |
| | Continuous Drain Current | 400 | | VGS = 20V,TC = 100℃ |
| $I_{D(pulse)}$ | Pulsed Drain Current | 1200 | A | Pulse width tp limited by Tjmax |
| $T_{J,TSTG}$ | Case and Storage Temperature Range | -40 to +175 | ˚C | |
| $T_{jmax}$ | Junction Temperature | 175 | ˚C | |

### MOSFET Electrical Characteristics (Tc = 25°C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| V(BR)DSS | Drain-Source Breakdown Voltage | VGS=0V,ID= 100μA | 1700 | | | V |
| | Gate threshold Voltage | VDS = VGS, ID = 144mA | 2 | 2.8 | 4 | V |
| VGS(th) | | VDS = VGS, ID = 144mA, Tj = 150℃ | | 1.9 | | V |
| IDSS | Zero Gate Voltage Drain Current | VDS = 1700 V, VGS = 0 V | | 2 | 100 | μA |
| IGSS | Gate Source Leakage Current | VGS = 20 V, VDS = 0 V | | | 250 | nA |
| RDSON | Drain-Source | VGS = 20V, ID = 300A, Tj = 25℃ | | 5 | 7.5 | mΩ |

| | | | | | | |
|---|---|---|---|---|---|---|
| | On-State Resistance | VGS = 20V, ID = 300A, Tj = 150℃ | | 8.75 | | |
| Ciss | Input Capacitance | VDS= 1000V,Tj=25°C,f=1MHz | | 32.6 | | nF |
| Coss | Output Capacitance | | | 1.3 | | |
| Crss | Reverse Capacitance | | | 0.31 | | |
| Eon | Turn on Switching Energy | VDS = 1200 V, VGS = -5/+20 V, ID = 300A, Rgon(ext)= 10Ω | | 92 | | mJ |
| Eoff | Turn off Switching Energy | | | 25 | | |
| tdon | Turn on delay time | VDS = 1200 V, VGS = -5/+20V, ID = 300A, Rgon(ext)= 10Ω | | 92 | | ns |
| tr | Rise time | | | 124 | | |
| ton | Sum(tdon+tr) | | | 216 | | |
| tdoff | Turn off delay time | | | 338 | | |
| tf | Fall time | | | 151 | | |
| toff | Sum(tdoff+tf) | | | 489 | | |
| Rgint | Internal Gate Resistance | VAC =25mV, f= 1MHz | | 0.525 | | Ω |
| Qgs | Gate to Source Charge | VGS= -5/+20V, VDS=1200V, ID = 300A，Rgon(ext)= 10Ω, Rgoff(ext)= 3Ω | | 352 | | nC |
| Qgd | Gate to Drain Charge | | | 672 | | |
| Qg | Total gate charge | | | 1984 | | |
| Id Peak | Peak Current | (Turn-on) VGS = -5/+20 V, VDS=1200V, ID = 300A, Rgon(ext)= 10Ω, Rgoff(ext)= 3Ω, Tj = 125℃ | | 364 | | A |
| Vds Peak | Drain-Source Peak Voltage | | | 1214 | | V |
| dId/dt | Sllope from 10%-90% | | | 1942 | | A/us |
| dIdX/dt | Slope from 50%-60%(~max dId/dt) | | | 2622 | | A/us |
| dVdsX/dt | Slope from 60% -40% (~max dVds/dt) | | | -3480 | | V/us |
| Id Max | Turn-off current | (Turn-off) VGS= -5/+20 V, VDS=1200V, ID = 300A，Rgon(ext)= 10Ω, Rgoff(ext)= 3Ω, Tj = 125℃ | | 299.7 | | A |
| Vds | Drain-Source Voltage | | | 1184 | | V |
| Vds Peak | Drain-Source Peak Voltage | | | 1435 | | V |
| dVds/dt | Slope from 90%-10% | | | 8930 | | V/us |
| dVdsX/dt | Slope from 40%-60%(~max dVds/dt) | | | 9736 | | V/us |
| dId/dt | Slope from 90%-10% | | | 1588 | | A/us |
| dIdX/dt | Slope from 60%-50%(~max dId/dt) | | | 3126 | | A/us |

## Diode Electrical Characteristics (Tc = 25 °C unless otherwise specified)

| Symbol | Parameter | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| VSD | Diode Forward Voltage | | 6.1 | | V | VGS = -5 V, ISD = 300A, Tj=25°C |
| Qrr | Diode Reverse Recovery Charge | | 8.878 | | μC | VR = 1200V, ID = 300A, di/dt = 1400A/μs, VGS = -5V, Tj = 125℃ |
| Irrm | Peak Reverse Recovery Current | | 132 | | A | |
| trr | Reverse Recovery Time | | 422 | | ns | |
| IS | Continuous Diode Forward Current | | | 600 | A | VGS = -5 V,Tj=25°C |

## CHARACTERISTICS DIAGRAMS

**Figure 1. MOSFET Output Characteristics Tj = 25 ºC**

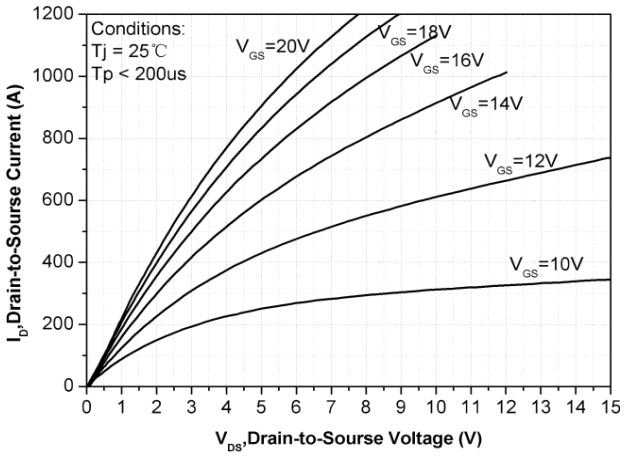



**Figure 2. Normalized On-Resistance vs Temperature**

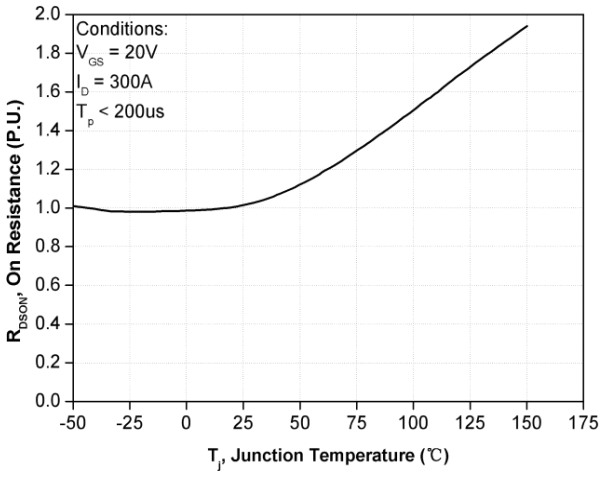



**Figure 3. Threshold Voltage vs. Temperature Id=144mA**

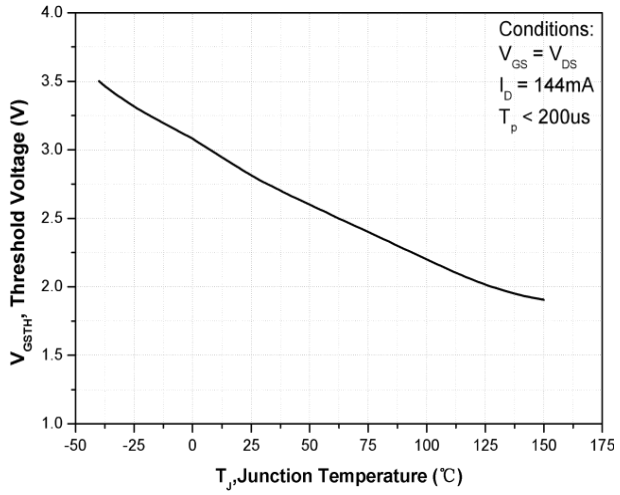



**Figure 4. Transfer Characteristic for Various Junction Temperatures**

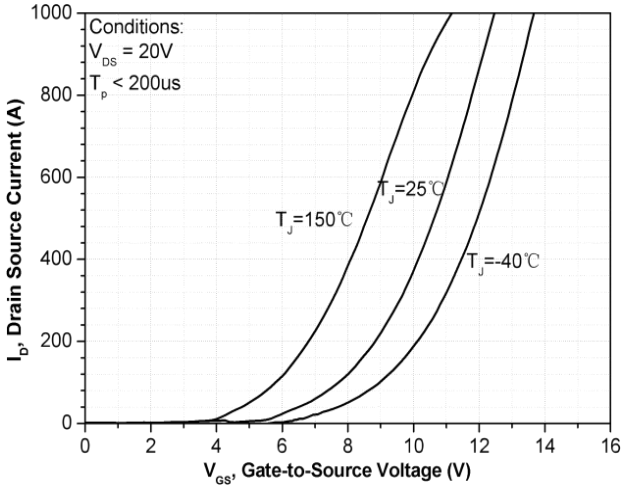



**Figure 5. Body Diode Characteristics at TJ = 25℃**

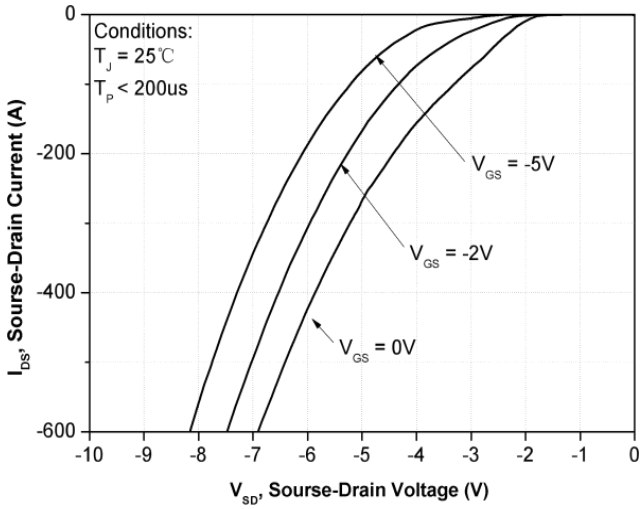



**Figure 6. Gate Charge Characteristic**

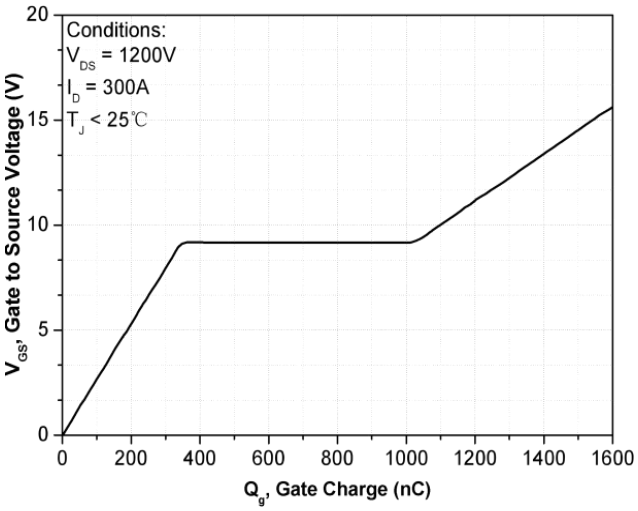


**Figure 7. Capacitances vs Drain-Source Voltage（0-1000V）**

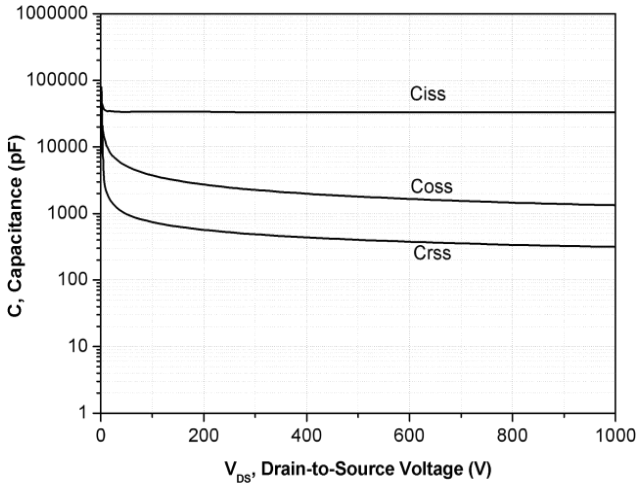



**Figure 8. Safe Operating Area**

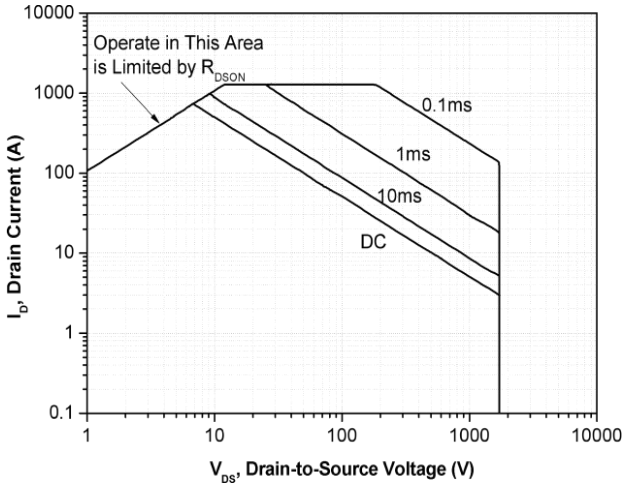
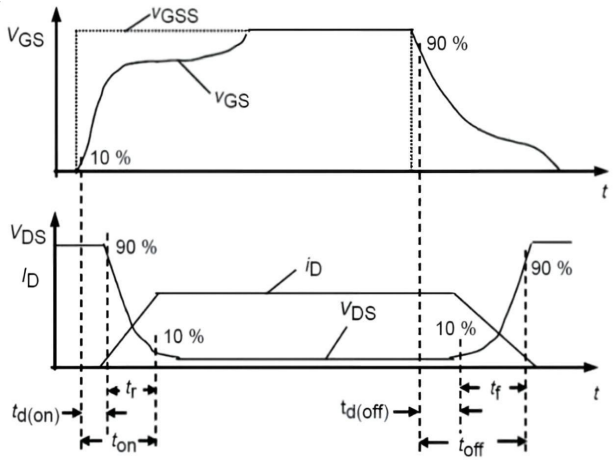
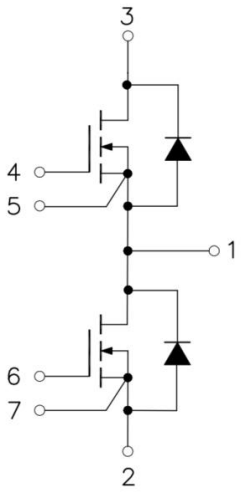


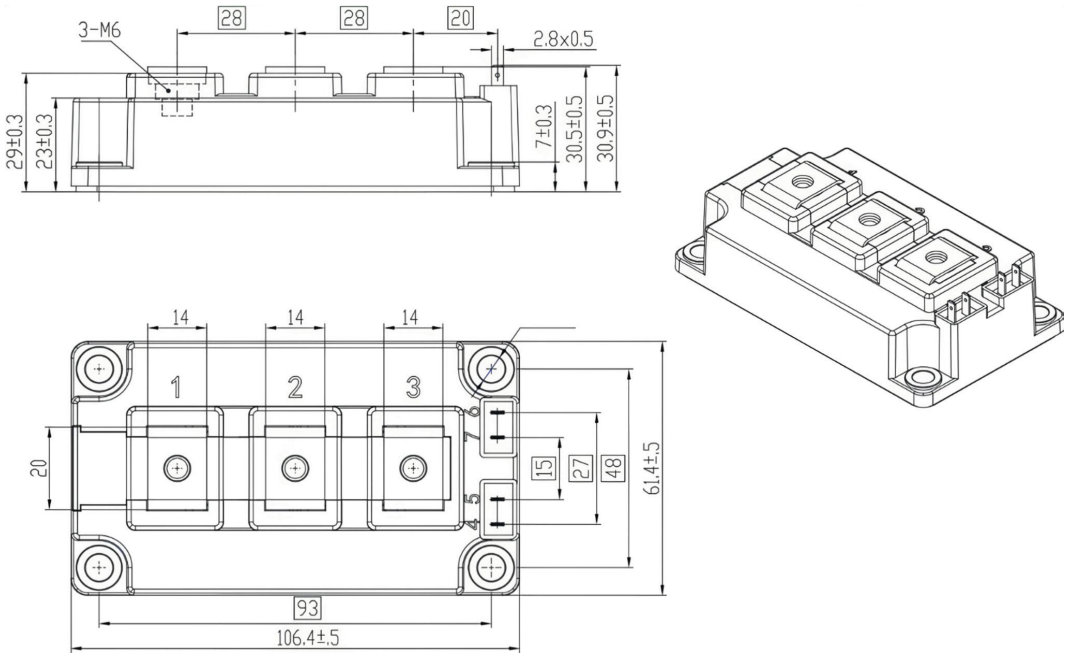

**Figure 9. Switching Times Definition**




## CIRCUIT DIAGRAM



**PACKAGE OUTLINES(62mm)**




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