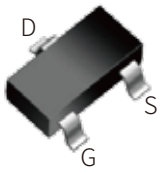
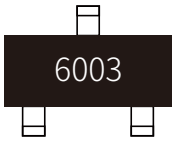
# FEATURES

- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology
- Meet AEC-Q101 Requirements



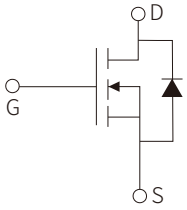

SOT-23




Marking

# APPROVALS

| | |
|---|---|
| **RoHS** | Compliance with 2011/65/EU |
| **HF** | Compliance with IEC61249-2-21:2003 |




Schematic Symbol

# ABSOLUTE MAXIMUM RATINGS($T_a$=25°C)

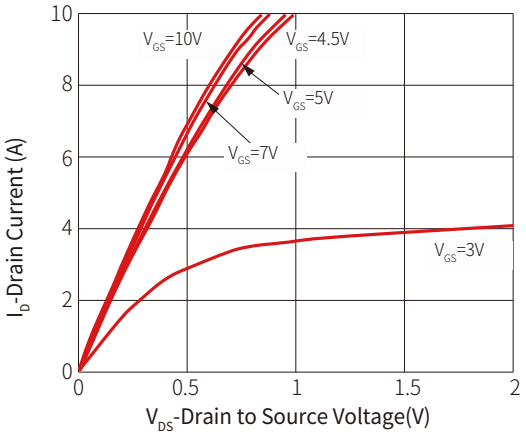
| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 60 | V |
| Continuous Drain Current @10V | $T_A$=25°C | $I_D$ | 5.0 | A |
| | $T_A$=70°C | | 1.8 | |
| Pulsed Drain Current | | $I_{DM}$ | 20 | A |
| Gate Source Voltage | | $V_{GS}$ | ±20 | V |
| Total Power Dissipation $T_A$=25°C | | $P_D$ | 1 | W |
| Thermal Resistance Junction-ambient | | $R_{\theta JA}$ | 125 | °C/W |
| Thermal Resistance Junction-Case | | $R_{\theta JC}$ | 80 | °C/W |
| Junction and Storage Temperature Range | | $T_J$,$T_{STG}$ | -55 to 150 | °C |

# ELECTRICAL CHARACTERISTICS ($T_A$=25°C)

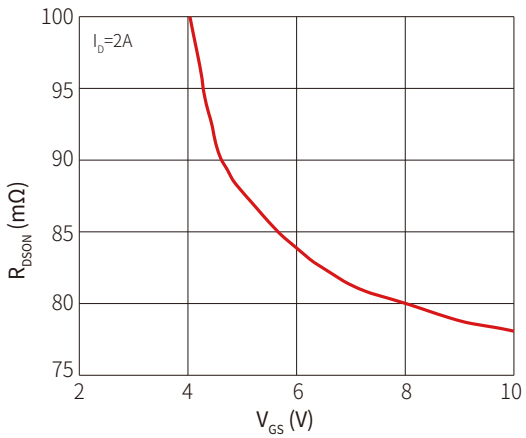
| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain-source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V,$I_D$=250μA | 60 | | | V |
| BVDSS Temperature Coefficient | $\triangle BV_{DSS}/\triangle T_J$ | Reference to 25°C ,$I_D$=1mA | | 0.054 | | V/°C |
| Drain Leakage Curren | $I_{DSS}$ | $V_{DS}$=48V,$V_{GS}$=0V,$T_J$=25°C | | | 1 | μA |
| | | $V_{DS}$=48V,$V_{GS}$=0V,$T_J$=55°C | | | 5 | μA |
| Gate Leakage Current | $I_{GSS}$ | $V_{GS}$=±20V,$V_{DS}$=0V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_{DS}$=250μA | 0.8 | | 1.5 | V |
| $V_{GS(th)}$ Temperature Coefficient | $\triangle V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_{DS}$=250μA | | -4.96 | | mV/°C |
| On-State Resistance | $R_{DS(on)}$ | $V_{GS}$=10V,$I_D$=2A | | 65 | 85 | mΩ |
| | | $V_{GS}$=4.5V,$I_D$=1A | | 76 | 106 | |
| Forward Transconductance | gfs | $V_{DS}$=5V,$I_D$=2A | | 13 | | S |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=15V,$V_{GS}$=0V,f=1MHz | | 280 | | pF |
| Output Capacitance | $C_{oss}$ | | | 38 | 53 | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 25 | 35 | |
| Turn–On Delay Time | $t_{d(on)}$ | $V_{DD}$=30V,$V_{GS}$=10V<br>$R_G$=3.3Ω,$I_D$=2A | | 1.6 | 3.2 | ns |
| Turn–On Rise Time | $t_r$ | | | 7.2 | 13 | |
| Turn–Off Delay Time | $t_{d(off)}$ | | | 25 | 50 | |
| Turn–Off Fall Time | $t_f$ | | | 14.4 | 28.8 | |
| Total Gate Charge | $Q_g$ | $V_{GS}$=4.5V,$V_{DS}$=48V,$I_D$=2A | | 5 | 7.0 | nC |
| Gate Source Charge | $Q_{gs}$ | | | 1.68 | 2.4 | |
| Gate Drain Charge | $Q_{gd}$ | | | 1.9 | 2.7 | |
| **Diode Characteristics** | | | | | | |
| Continuous Source Current | $I_S$ | $V_G$=$V_D$=0V, Force Current | | | 5 | A |
| Pulsed Source Current | $I_{SM}$ | | | | 9.2 | A |
| Diode Forward Voltage | $V_{SD}$ | $V_{GS}$=0V,$I_S$=1A,$T_J$=25°C | | | 1.2 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_F$=2A, dI/dt=100A/μs , $T_J$=25°C | | 9.7 | | nS |
| Reverse Recovery Charge | $Q_{rr}$ | | | 5.8 | | nC |

# PARAMETER CHARACTERISTIC CURVE

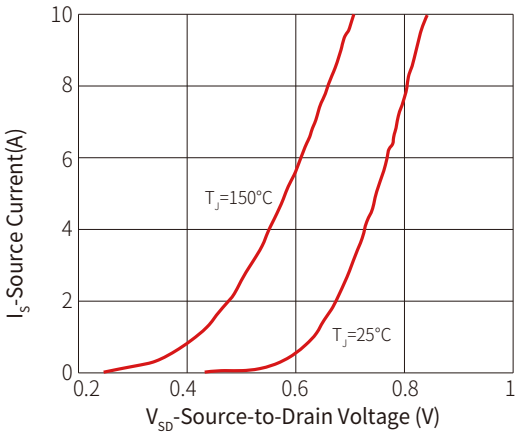
### Figure 1: Typical Output Characteristics



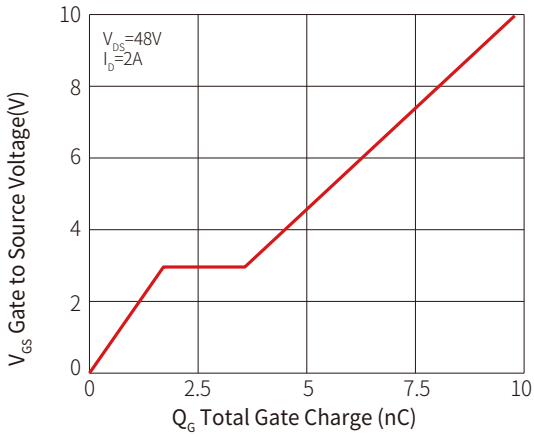

### Figure 2: On-Resistance v.s Gate-Source



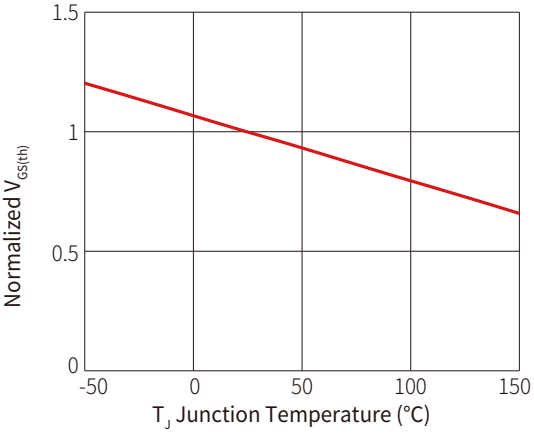

### Figure 3: Forward Characteristics of Reverse



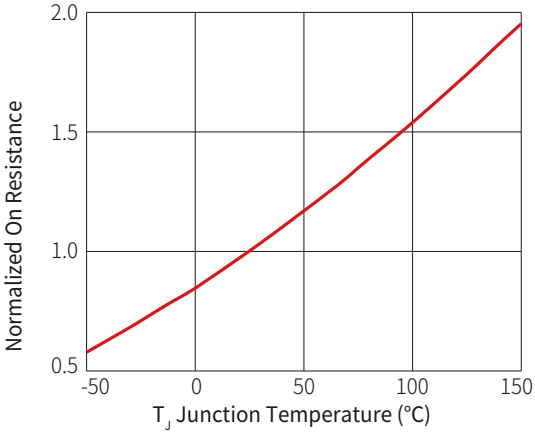

### Figure 4: Gate-charge Characteristics



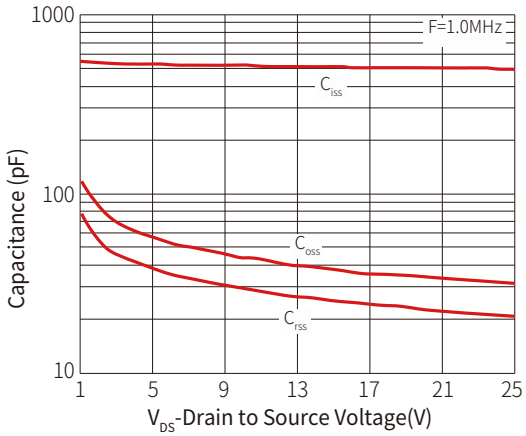

### Figure 5:Normalized $V_{GS(th)}$ vs. $T_J$



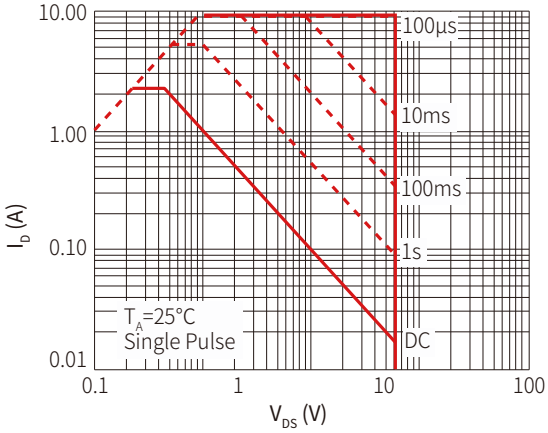

### Figure 6:Normalized $R_{DSON}$ vs. $T_J$



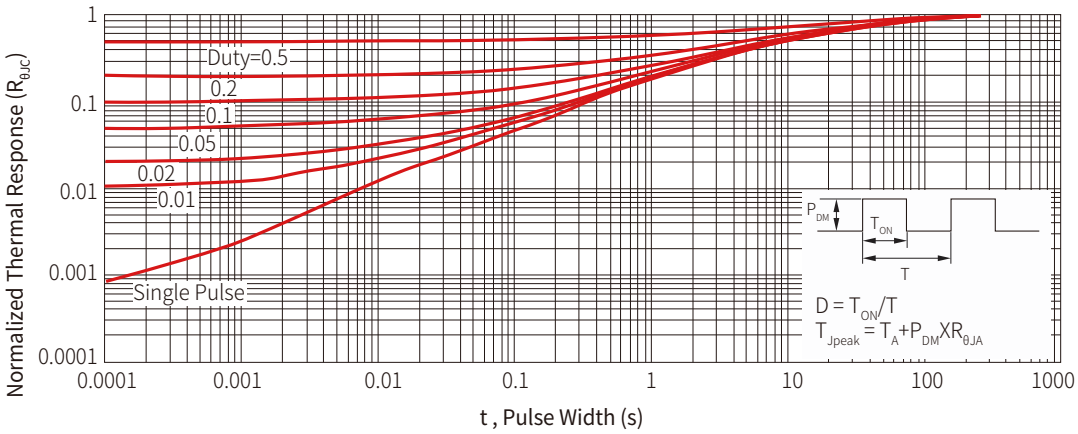
## Figure 7: Capacitance



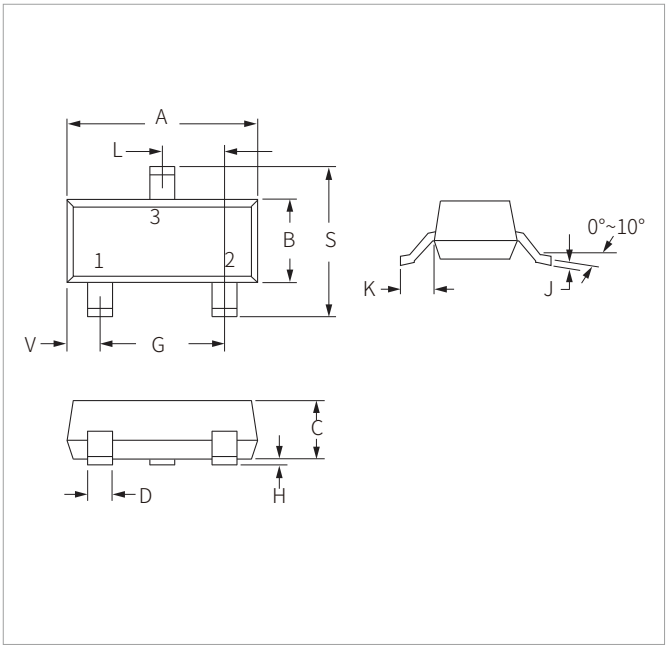

## Figure 8: Safe Operating Area




## Figure 9: Normalized Maximum Transient Thermal Impedance

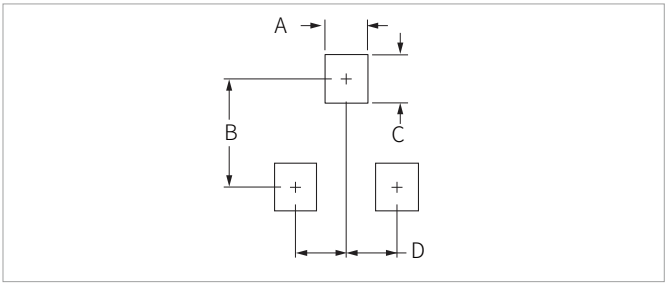


# SOT-23 PACKAGE INFORMATION




| Ref. | Millimeters | | Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 2.80 | 3.05 | 0.110 | 0.120 |
| B | 1.20 | 1.60 | 0.047 | 0.063 |
| C | 0.90 | 1.15 | 0.035 | 0.045 |
| D | 0.37 | 0.50 | 0.015 | 0.020 |
| G | 1.75 | 2.05 | 0.069 | 0.081 |
| H | 0.01 | 0.100 | 0.001 | 0.004 |
| J | 0.085 | 0.180 | 0.003 | 0.007 |
| K | 0.35 | 0.69 | 0.014 | 0.029 |
| L | 0.89 | 1.02 | 0.035 | 0.040 |
| S | 2.10 | 2.65 | 0.083 | 0.104 |
| V | 0.45 | 0.60 | 0.018 | 0.024 |

# RECOMMENDED PAD LAYOUT DIMENSIONS




| Ref. | Millimeters | | Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.71 | 0.97 | 0.028 | 0.038 |
| B | 1.88 | 2.13 | 0.074 | 0.084 |
| C | 0.71 | 0.97 | 0.028 | 0.038 |
| D | 0.81 | 1.07 | 0.032 | 0.042 |

# ORDERING INFORMATION

| Part Number | Component Package | QTY/Reel | Reel Size |
|---|---|---|---|
| SNM6003SQ | SOT-23 | 3000PCS | 7” |

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