# 110V, 176A, 2.5mΩ N-channel Power SGT MOSFET

## JMSH1102QC

### Features

Excellent $R_{Df(ON)}$ and Low Gate Charge

100% UIS Tested

100%  Vds Tested

Halogen-free; RoHS-compliant

| Parameters | Value | Unit |
|---|---|---|
| DS | 110 | V |
| $V_{Gf(th)\_Typ}$ | 3.1 | V |
| $I_D$(@$V_{GS}$=10V) | 176 | A |
| D(ON)_Typ GS | 2.5 | mΩ |

### Applications

Load fwitch

PWM Application

| Device | Marking MSL | Form | Package | Tube(pcs) | Per Carton (pcs) |
|---|---|---|---|---|---|
| JMSH1102QC-U | | | TO-220-3L | | |

C

| | Parameter | | Value | |
|---|---|---|---|---|
| V | Drain-to-fource Voltge | | 110 | |
| $V_{GS}$ | Gate-to-fource Voltge | | ±20 | V |
| D | Continuous Drain Current | T = 25°C | 176 | A |
| | | $T_C$ = 100°C | 125 | |
| | Pulsed Drain Current (1) | | | A |
| E | (2) | | 1488 | |
| $P_D$ | | C | | |
| | | C | | |
| T , T | Junction & ftorage Temperature Range | | -55 to 150 | °C |

| | | | |
|---|---|---|---|
| | (3) | | |
| | | | |

## Electrical Characteristics ($T_J$ = 25°C unless otherwise specified)

| Symbol | | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| $V_{(BR)DSS}$ | | | 110 | - | - | V |
| $I_{DSS}$ | | | - | - | 1.0 | μA |
| $I_{GSS}$ | | | - | - | ±100 | nA |
| | | | | | | |
| $V_{GS(th)}$ | | | 2.1 | 3.1 | 4.3 | V |
| $R_{DS(ON)}$ | Static Drain-Source ON-Resistance(4) | | - | 2.5 | 3.5 | mΩ |
| | | | | | | |
| $R_g$ | Gate Resistance | f = 1MHz | - | 2.4 | - | Ω |
| $C_{iss}$ | | $V_{GS}$ = 0V, $V_{DS}$ = 55V, f = 1MHz | 7411 | 10375 | 14007 | pF |
| $C_{oss}$ | | | 1067 | 1494 | 2017 | pF |
| $C_{rss}$ | | | 23 | 32 | 43 | pF |
| $Q_g$ | | $V_{GS}$ = 0 to 10V, $V_{DS}$ = 55V, $I_D$ = 20A | 108 | 152 | 205 | nC |
| $Q_{gs}$ | | | 35 | 49 | 66 | nC |
| $Q_{gd}$ | | | 24 | 34 | 46 | nC |
| | | | | | | |
| $t_{d(on)}$ | | $V_{GS}$ = 10V, $V_{DD}$ = 55V, $I_D$= 20A, $R_{GEN}$ = 6.2Ω | - | 44 | - | ns |
| $t_r$ | | | - | 65 | - | ns |
| $t_{d(off)}$ | | | - | 128 | - | ns |
| $t_f$ | | | - | 77 | - | ns |
| | | | | | | |
| $I_S$ | | | - | - | 176 | A |
| $I_{SM}$ | | | - | - | 706 | A |
| $V_{SD}$ | | | - | | 1.2 | V |
| trr | | $I_F$ = 20A, di/dt = 100A/uc6 | 72 | 101 | 136 | ns |
| Qrr | Body Diode Reverse Recovery Charge | | - | 324 | - | nC |

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

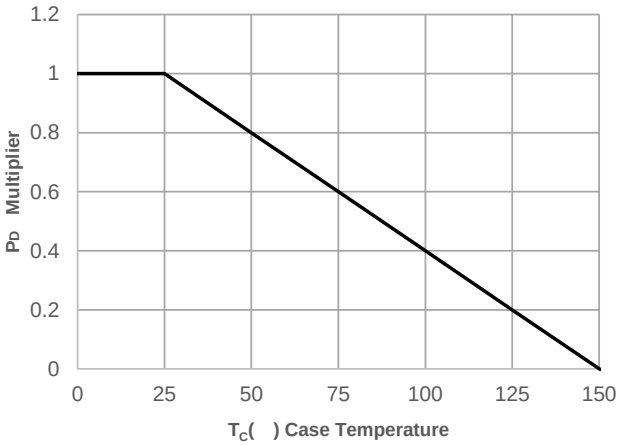
2. $E_{AS}$ condition: Starting $T_J$=25C, $V_{DD}$=55V, $V_{GS}$=10V, $R_G$=25ohm, L=3mH, $I_{AS}$=31.5A, $V_{DD}$=0V during time in avalanche.

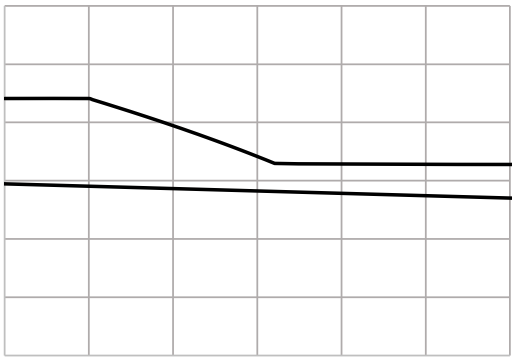
3. R is measured with the device mounted on a 1inch$^2$ pad of 2oz copper FR4 PCB.

4. Pulse Test: Pulse Width 0.5%.

## Typical Performance Characteristics

**Figure 1: Power De-rating**



# Typical Performance Characteristics

Figure 5: Output Characteristics

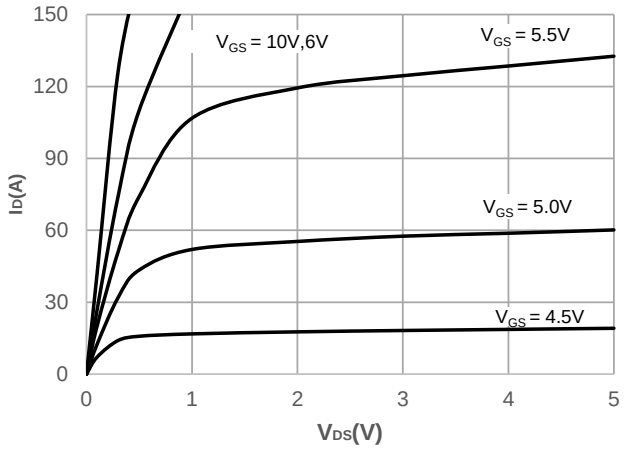



Figure 6: Typical Transfer Characteristics

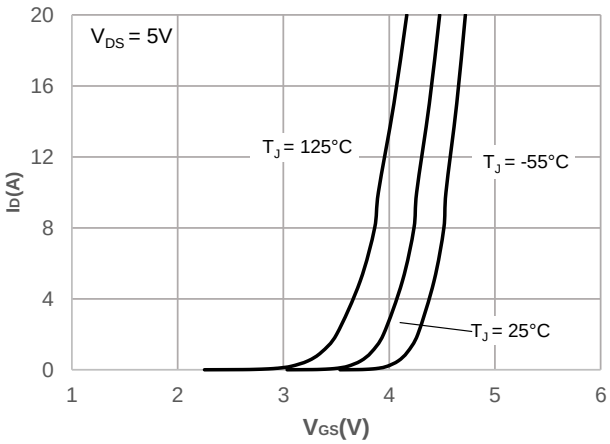



Figure 7: On-resistance vs. Drain Current

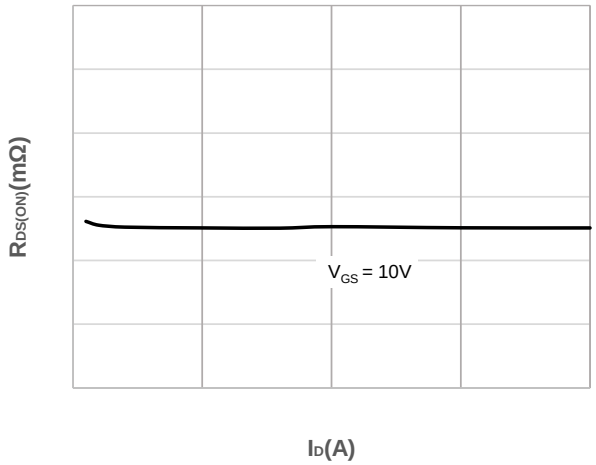



Figure 8: Body Diode Characteristics

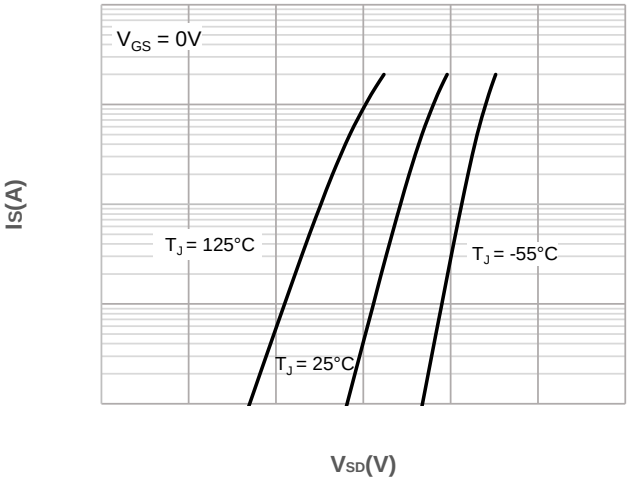



Figure 9: Gate Charge Characteristics

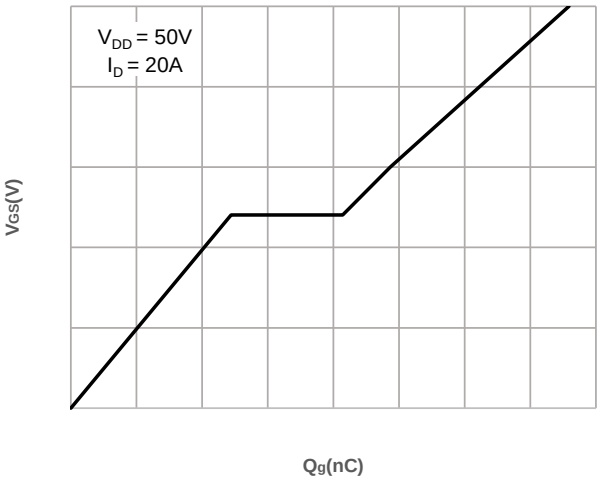
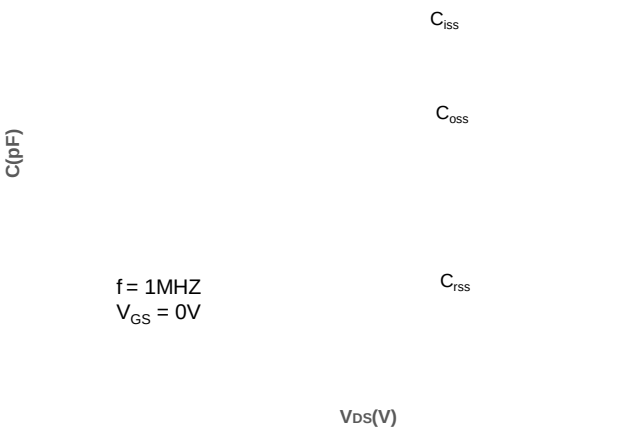



Figure 10: Capacitance Characteristics



# Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

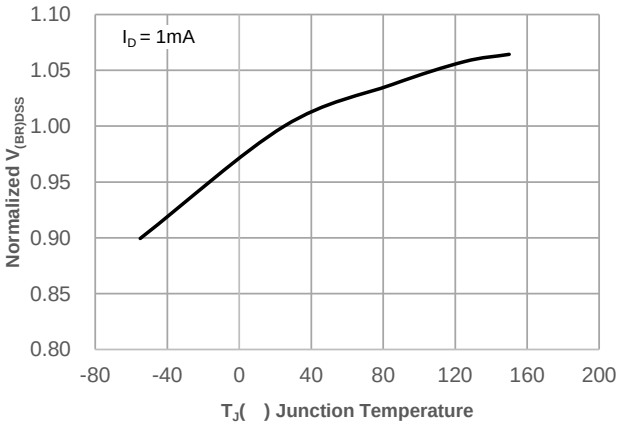
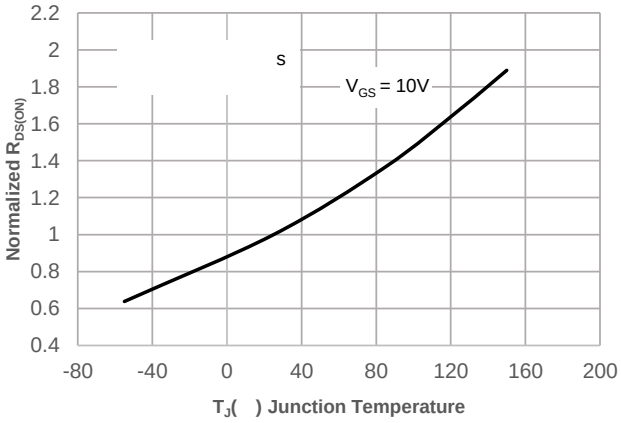



Figure 12: Normalized on Resistance vs. Junction Temperature



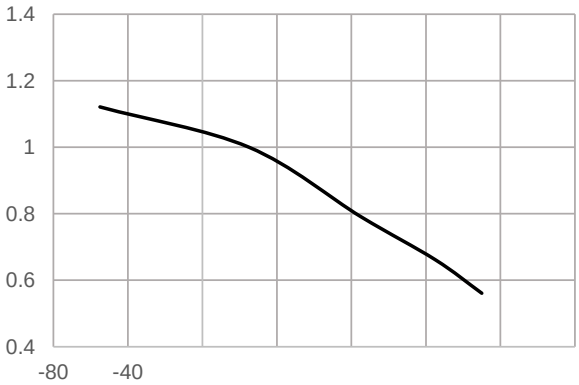




Figure 14: $R_{DS(ON)}$ vs. $V_{GS}$

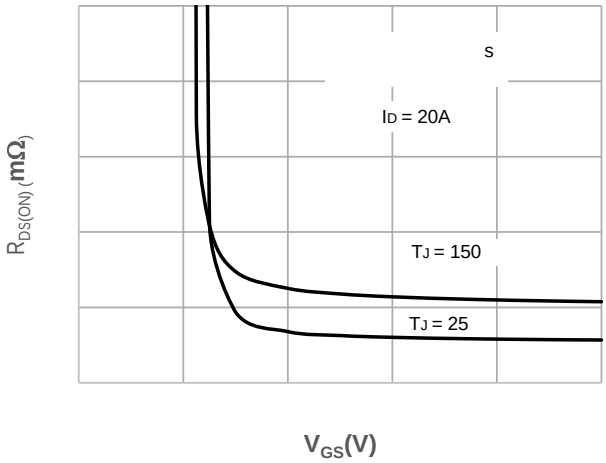
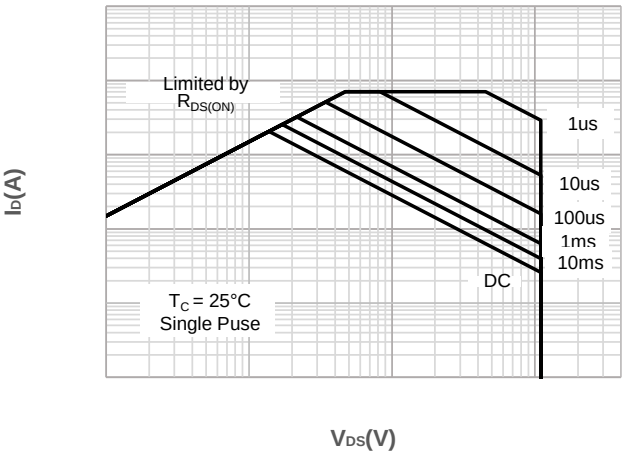



Figure 15: Maximum Safe Operating Area



## Test Circuit

## Package Mechanical Data(TO-220-3L)