

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

## JMSH1102QC

### Features

- Excellent  $R_{D(ON)}$  and Low Gate Charge
- 100% UIS Tested
- 100% Vds Tested
- Halogen-free; RoHS-compliant

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

### Applications

- Load fwitch
- PWM Application

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

	Parameter	Value	
V	Drain-to-fource Voltge	110	
$V_{GS}$	Gate-to-fource Voltge	±20	V
$I_D$	Continuous Drain Current	$T = 25^{\circ}C$	176
		$T_C = 100^{\circ}C$	125
	Pulsed Drain Current <sup>(1)</sup>		A
E	<sup>(2)</sup>	1488	
$P_D$		c	
		c	
$T_j, T_C$	Junction & fstorage Temperature Range	-55 to 150	°C

	<sup>(3)</sup>		

## Electrical Characteristics (T<sub>J</sub> = 25°C unless otherwise specified)

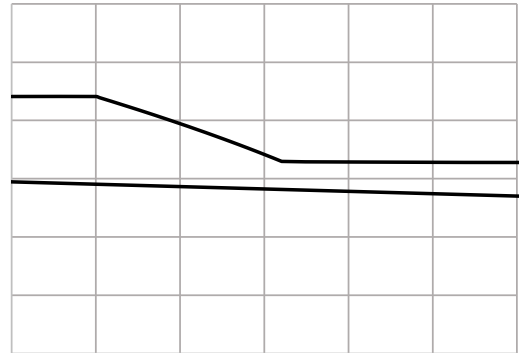
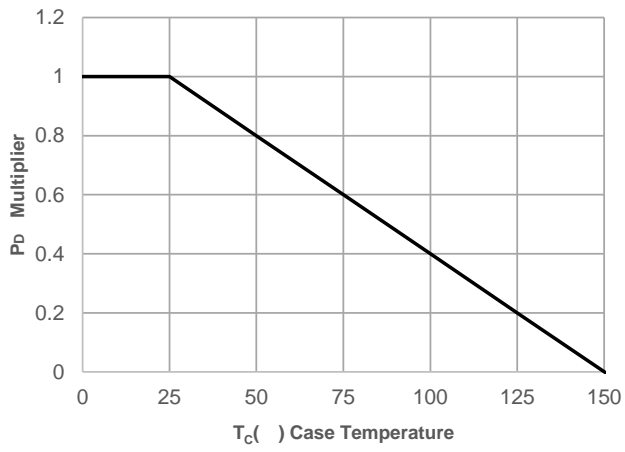
Symbol	Conditions	Min.	Typ.	Max.	Unit	
<b>Off Characteristics</b>						
V <sub>(BR)DSS</sub>		110	-	-	V	
I <sub>DSS</sub>		-	-	1.0	μA	
I <sub>GSS</sub>		-	-	±100	nA	
V <sub>GS(th)</sub>		2.1	3.1	4.3	V	
R <sub>DS(ON)</sub>	Static Drain-Source ON-Resistance <sup>(4)</sup>	-	2.5	3.5	mΩ	
R <sub>g</sub>	Gate Resistance	f = 1MHz	-	2.4	Ω	
C <sub>iss</sub>		7411	10375	14007	pF	
C <sub>oss</sub>		1067	1494	2017	pF	
C <sub>rss</sub>		23	32	43	pF	
Q <sub>g</sub>		108	152	205	nC	
Q <sub>gs</sub>		35	49	66	nC	
Q <sub>gd</sub>		24	34	46	nC	
t <sub>d(on)</sub>		-	44	-	ns	
t <sub>r</sub>	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 55V	-	65	-	ns	
t <sub>d(off)</sub>	I <sub>D</sub> = 20A, R <sub>GEN</sub> = 6.2Ω	-	128	-	ns	
t <sub>f</sub>		-	77	-	ns	
I <sub>S</sub>		-	-	176	A	
I <sub>SM</sub>		-	-	706	A	
V <sub>SD</sub>		-	-	1.2	V	
t <sub>rr</sub>		72	101	136	ns	
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge	I <sub>F</sub> = 20A, di/dt = 100A/uc6!	-	324	-	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E<sub>AS</sub> condition: Starting T<sub>J</sub>=25C, V<sub>DD</sub>=55V, V<sub>GS</sub>=10V, R<sub>G</sub>=25ohm, L=3mH, I<sub>AS</sub>=31.5A, V<sub>DD</sub>=0V during time in avalanche.
3. R<sub>th(j-c)</sub> is measured with the device mounted on a 1inch<sup>2</sup> 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

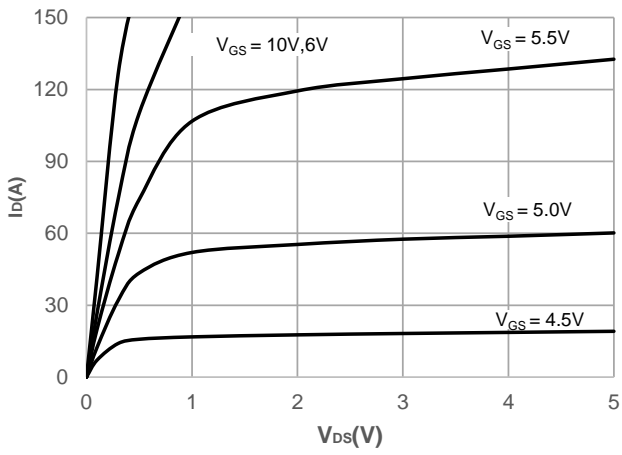


Figure 6: Typical Transfer Characteristics

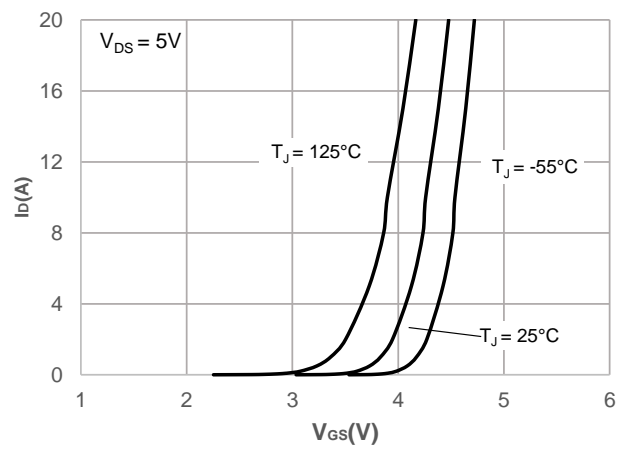


Figure 7: On-resistance vs. Drain Current

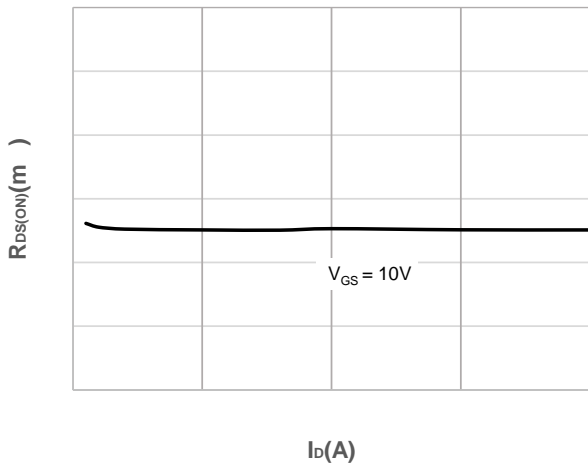


Figure 8: Body Diode Characteristics

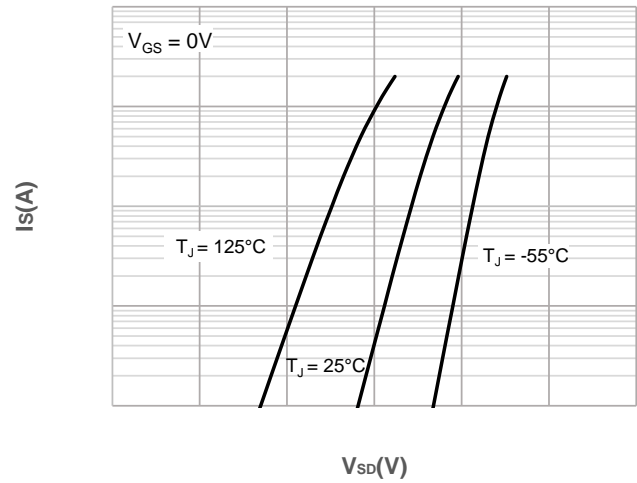


Figure 9: Gate Charge Characteristics

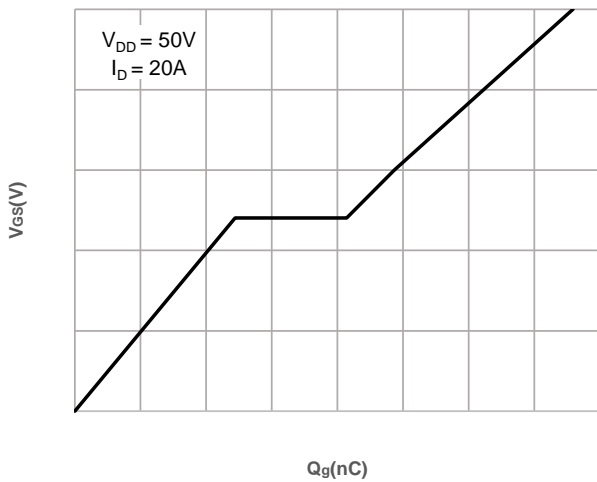
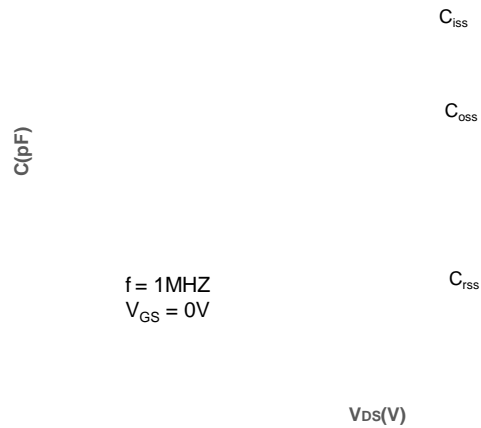
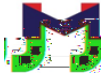


Figure 10: Capacitance Characteristics





### Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

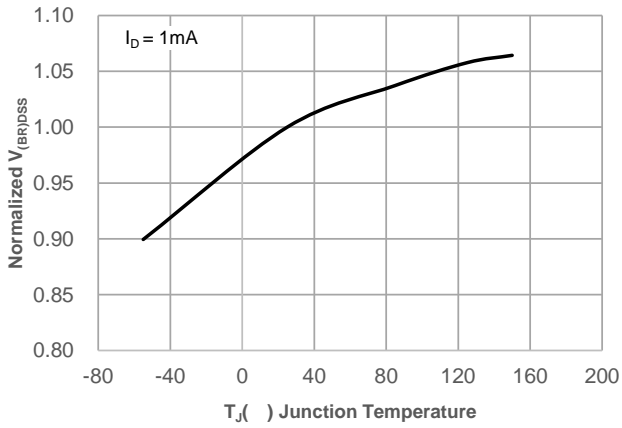


Figure 12: Normalized on Resistance vs. Junction Temperature

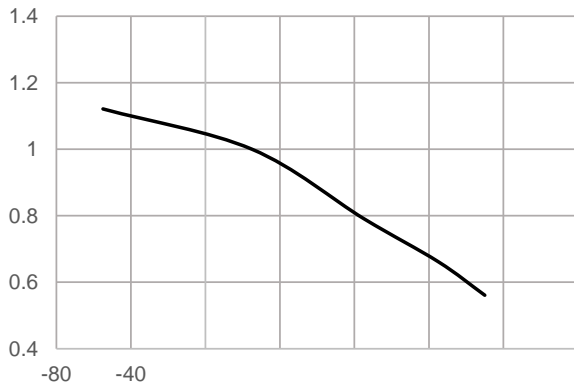
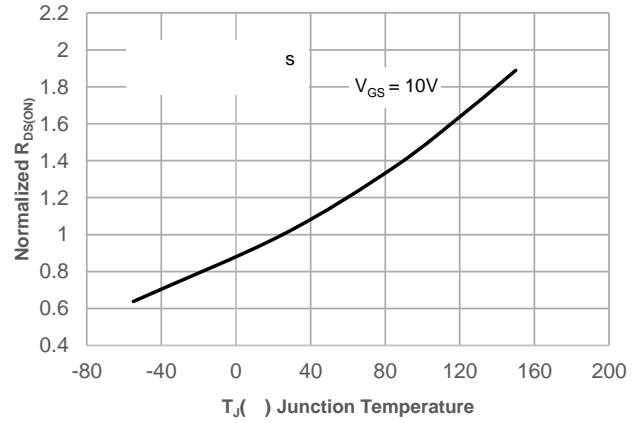


Figure 14:  $R_{DS(ON)}$  vs.  $V_{GS}$

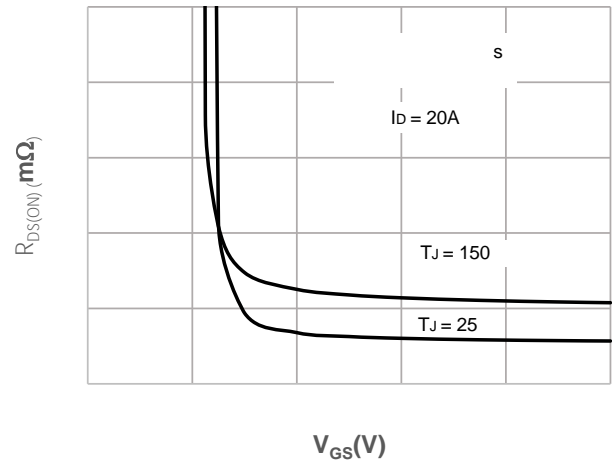
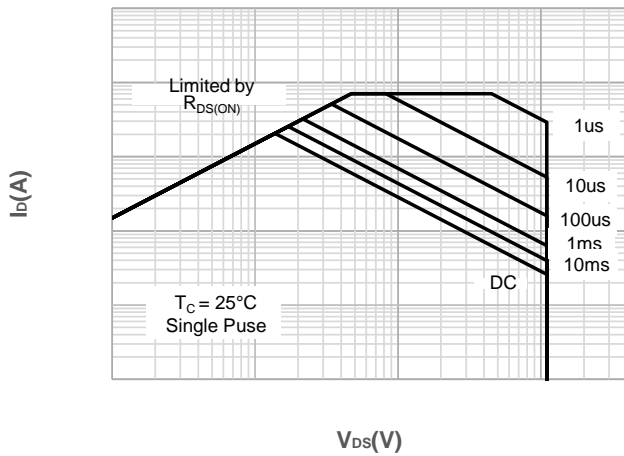


Figure 15: Maximum Safe Operating Area



## Test Circuit

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