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.

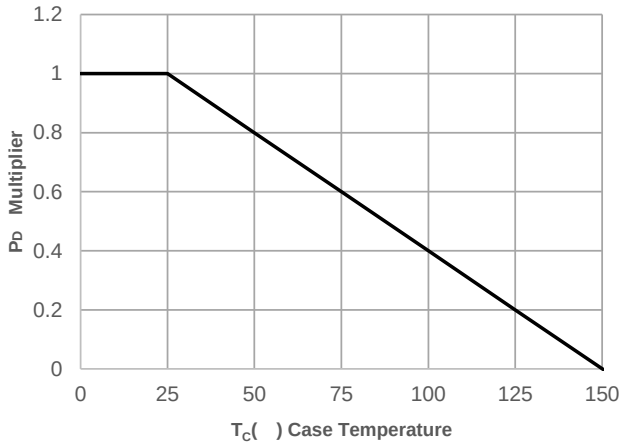
2. E_{AS} condition: Starting T_J=25C, V_{DD}=55V, V_{GS}=10V, R_G=25ohm, L=3mH, I_{AS}=31.5A, V_{DD}=0V during time in avalanche.

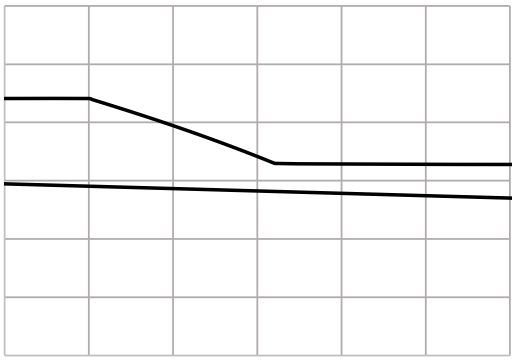
3. R is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.

4. Pulse Test: Pulse Width 0.5%.

Typical Performance Characteristics

Figure 1: Power De-rating





Typical Performance Characteristics

Figure 5: Output Characteristics

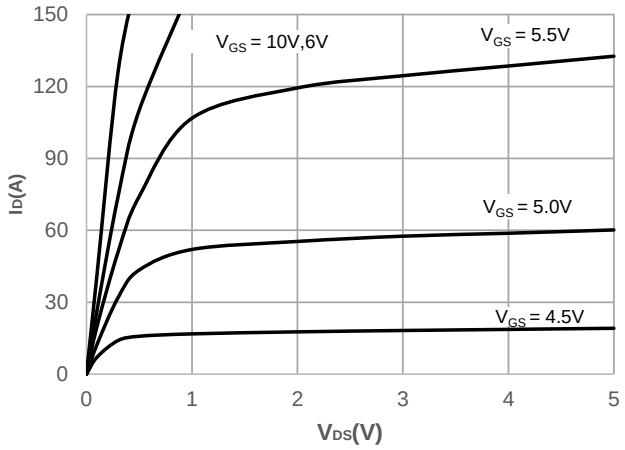


Figure 6: Typical Transfer Characteristics

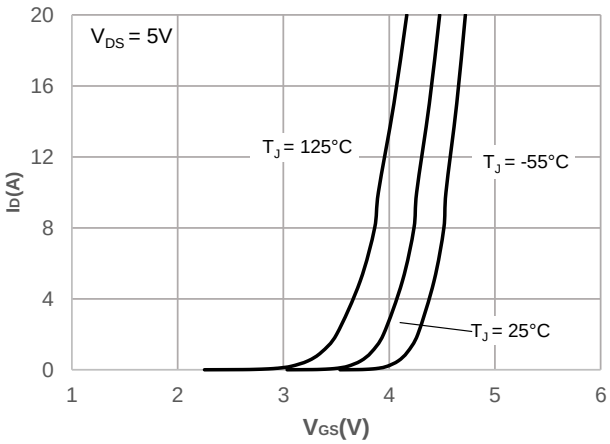


Figure 7: On-resistance vs. Drain Current

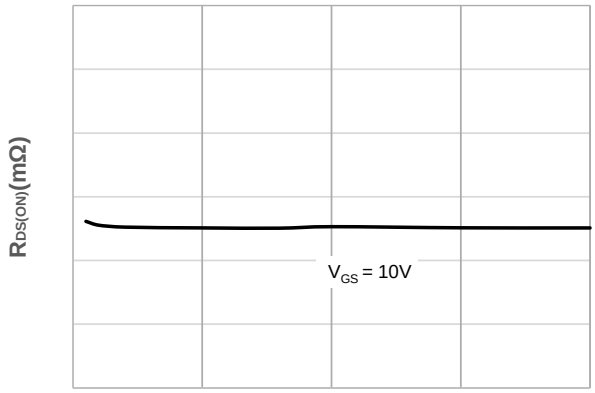


Figure 8: Body Diode Characteristics

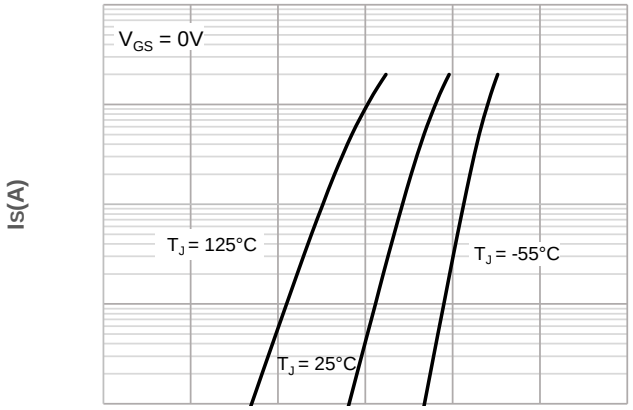


Figure 9: Gate Charge Characteristics

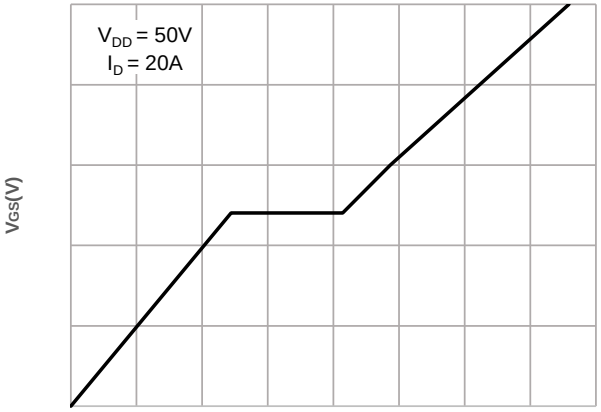
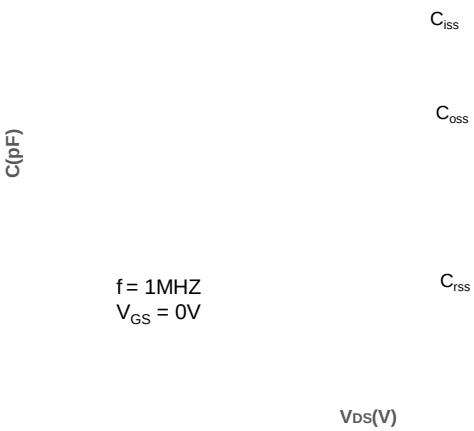


Figure 10: Capacitance Characteristics



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Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

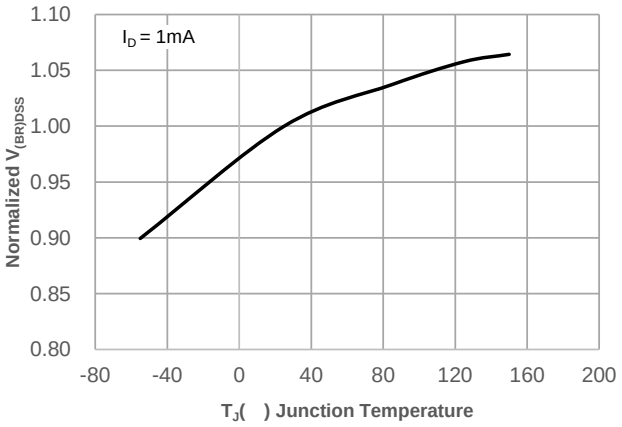
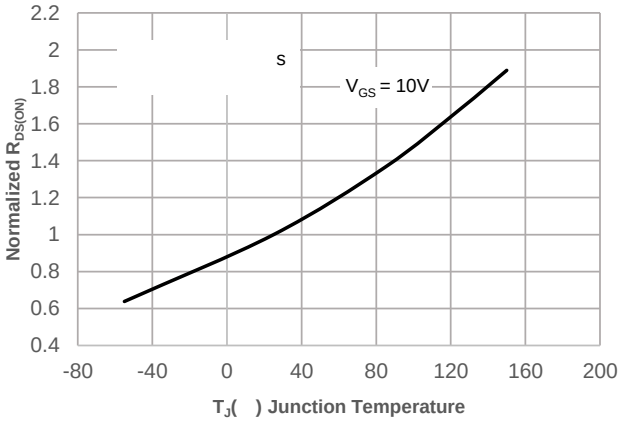


Figure 12: Normalized on Resistance vs. Junction Temperature



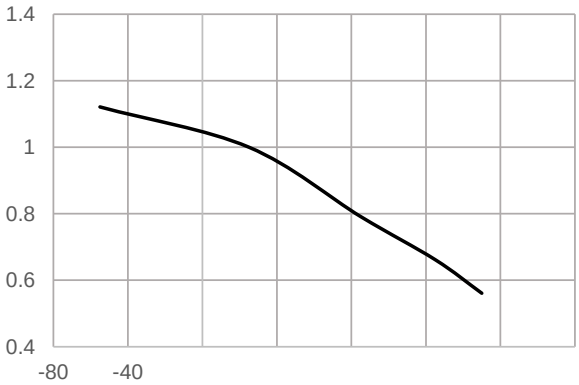


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

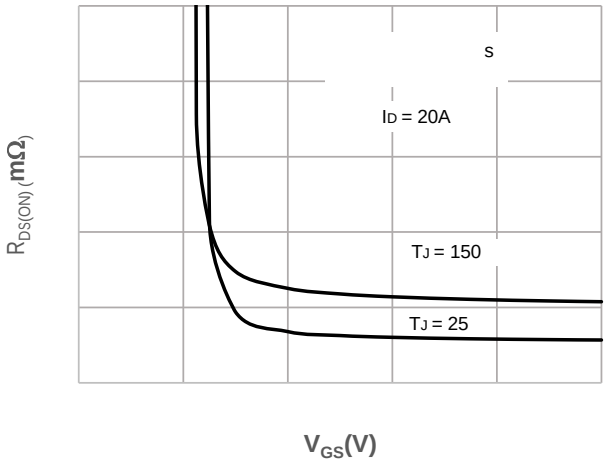
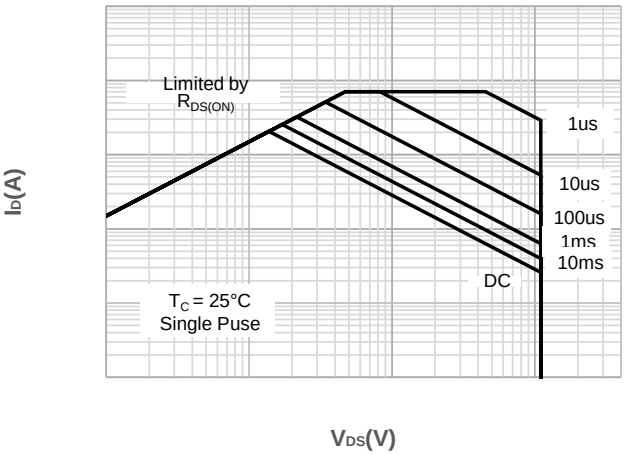


Figure 15: Maximum Safe Operating Area



Test Circuit

Package Mechanical Data(TO-220-3L)