JMSH0401MGQ

Product Summary

Parameters	Value	Unit
V_{DSS}	40	V
$V_{GS(th)\_Typ}$	2.7	V
I_D(@V_{GS}=10V)	223	A
$R_{DS(ON)\_Typ}$(@V_{GS}=10V)	1.4	m

Ordering Information

Device	Marking	MSL	Form	Package	Reel(pcs)	Per Carton (pcs)
JMSH0401MGQ-13	SH0401MQ	1	Tape&Reel	PDFN5x6-8L	5000	50000

Absolute Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-to-Source Voltage		40	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	223	A
		T_C = 100°C	158	
I_{DM}	Pulsed Drain Current [1]		Refer to Fig.4	A
E_{AS}	Single Pulsed Avalanche Energy [2]		459	mJ
P_D	Power Dissipation	T_C = 25°C	157	W
		T_C = 100°C	78	
T_J $_{STG}$				°C

Symbol	Parameter	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient[3]	42	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.0	

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

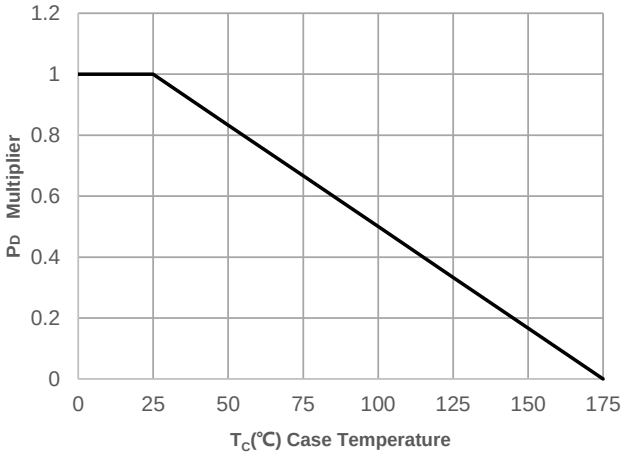
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250 A, V_{GS} = 0V	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 32V, V_{GS} = 0V	-	-	1.0	
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 A	1.9	2.7	3.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 20A	-	1.4	1.7	m
Dynamic Characteristics						
R_g	Gate Resistance	f = 1MHz	-	0.9	-	
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 20V, f = 1MHz	2589	3625	4893	pF
C_{oss}	Output Capacitance		1413	1979	2671	pF
C_{rss}	Reverse Transfer Capacitance		113	158	213	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 20V, I_D = 20A	42	59	80	nC
Q_{gs}	Gate Source Charge		11	15	21	nC
Q_{gd}	Gate Drain("Miller") Charge		12	16	22	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 20V I_D= 20A, R_{GEN} = 3	-	16	-	ns
t_r	Turn-On Rise Time		-	29	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	35	-	ns
t_f	Turn-Off Fall Time		-	13	-	ns
Body Diode Characteristics						
I_S	Maximum Continuous Body Diode Forward Current		-	-	223	A
I_{SM}	Maximum Pulsed Body Diode Forward Current		-	-	891	A
V_{SD}	Body Diode Forward Voltage	V_{GS} = 0V, I_S = 20A	-		1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 20A, di/dt = 100A/us	37	52	70	ns
Qrr	Body Diode Reverse Recovery Charge		-	66	-	nC

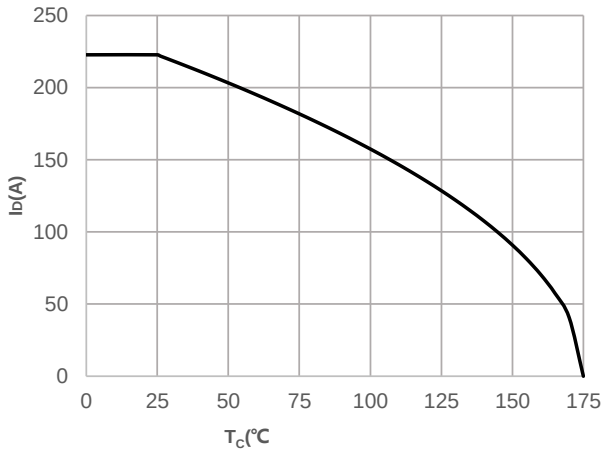
Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25C, V_{DD}=20V, V_{GS}=10V, R_G=25ohm, L=3mH, I_{AS}=17.5A, V_{DD}=0V during time in avalanche.
3. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.
4. Pulse Test: Pulse Width 300μs, Duty Cycle 0.5%.

Typical Performance Characteristics

Figure 1: Power De-rating





Typical Performance Characteristics

Figure 5: Output Characteristics

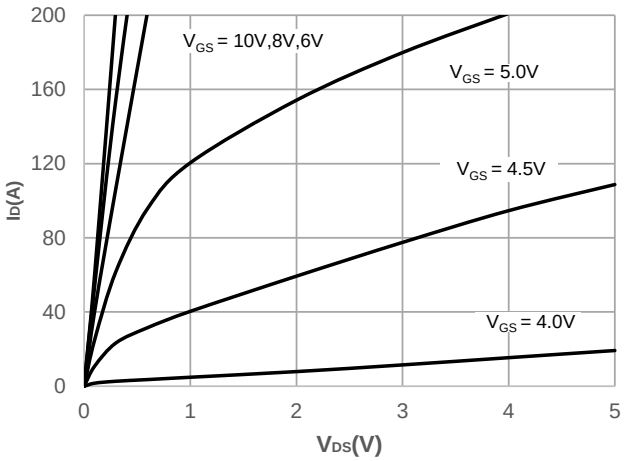


Figure 6: Typical Transfer Characteristics

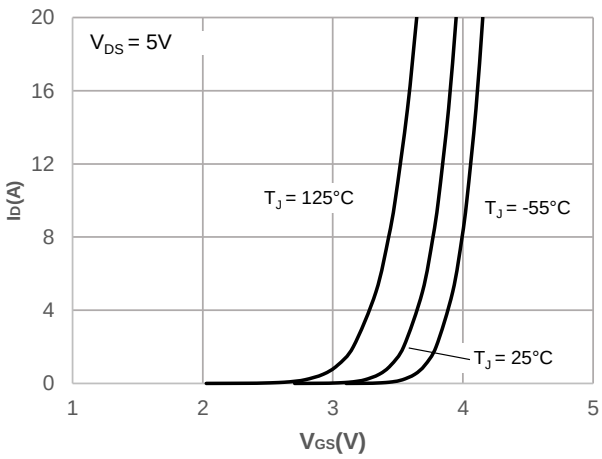


Figure 7: On-resistance vs. Drain Current

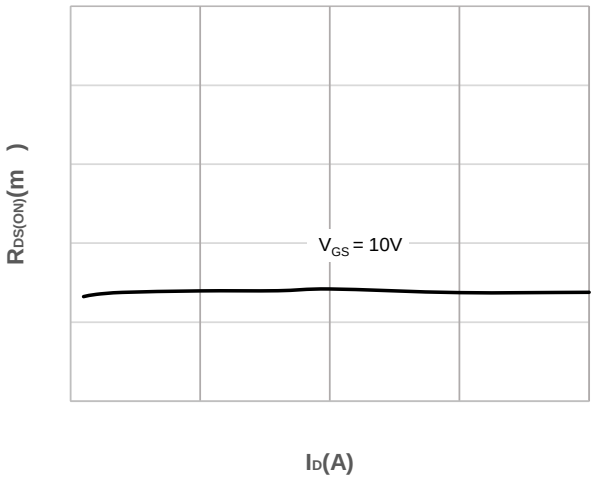


Figure 8: Body Diode Characteristics

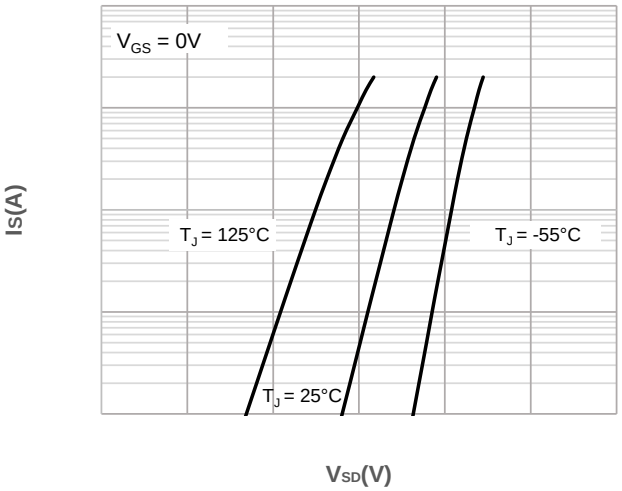


Figure 9: Gate Charge Characteristics

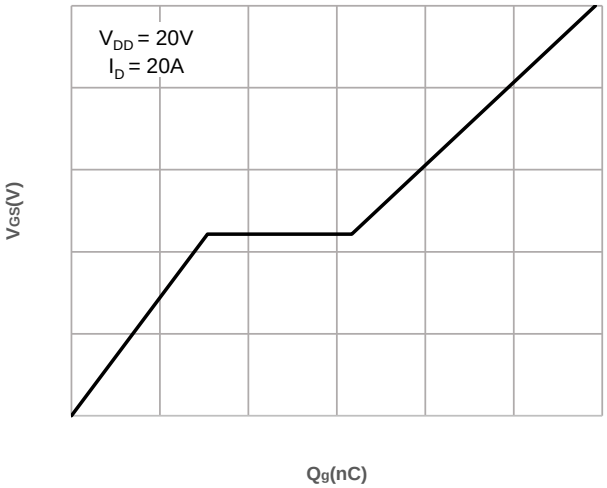
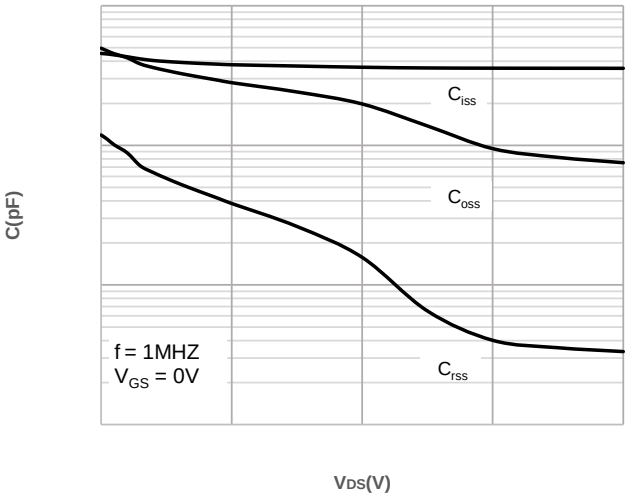


Figure 10: Capacitance Characteristics



Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

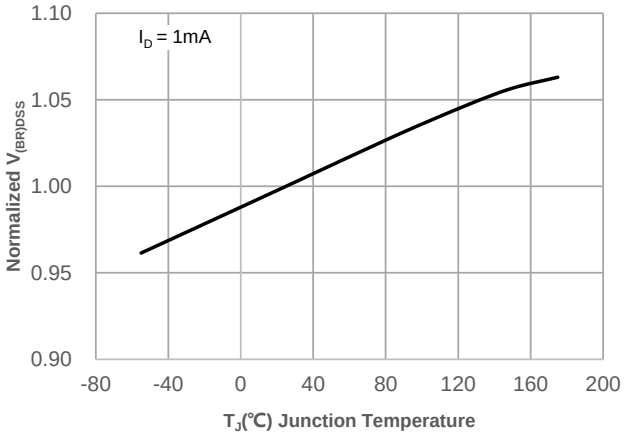


Figure 12: Normalized on Resistance vs. Junction Temperature

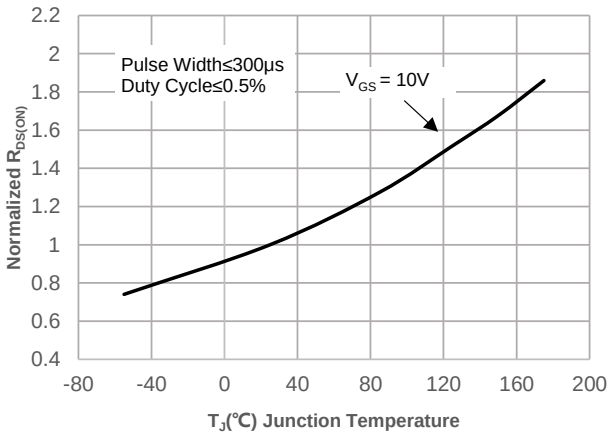
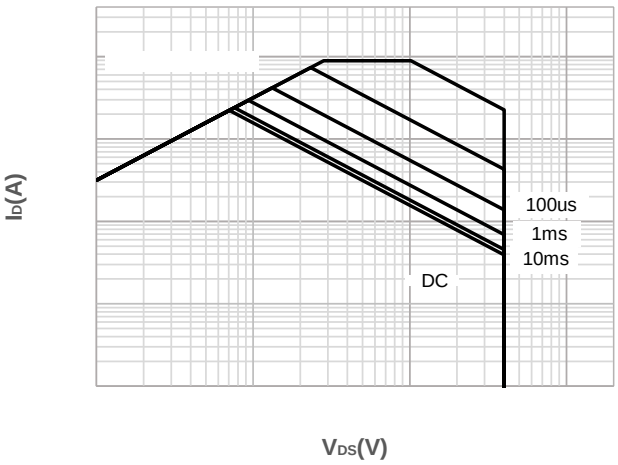


Figure 15: Maximum Safe Operating Area

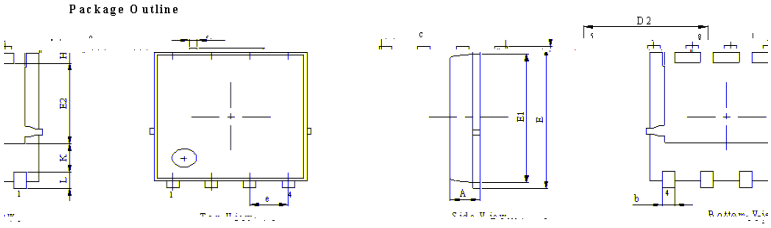


Test Circuit

Figure 1: Gate

Package Mechanical Data(PDFN5X6-8L)

Package Outline

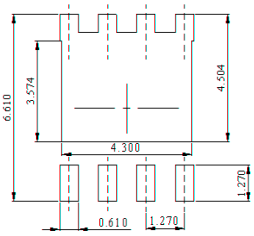


NOTES:
1. Dimension and tolerance per ASME Y14.5M, 1994.
2. All dimensions in millimeter (angle in degree).

MILLIMETER

DIM	MIN.	NOM.	MAX.
D1	4.95	5.05	5.15
D2	4	4.1	4.2
E	6.05	6.15	6.25
E1	5.5	5.6	5.7
H	0.6	0.7	0.8

Recommended Soldering Footprint



DIMENSIONS:MILLIMETERS

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