

SGT MOSFET

JMSH04011G4L

Features

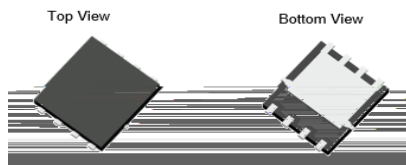
- Low Gate Charge
- 100% UIS Tested
- 100% ΔV_{ds} Tested
- Halogen-free; RoHS-compliant

Applications

- Load Switch
- PWM Application
- Power Management

Product Summary

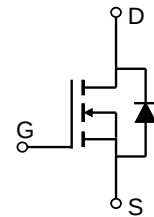
Parameters	Value	Unit
V_{DS}	40	V
$V_{GS(th_Typ)}$	2.8	V
$I_D(@V_{GS}=10V)$	325.8	A
$R_{DS(ON_Typ)}(@V_{GS}=10V)$	0.8	m Ω



PDFN5X6-8L



Pin Assignment



Schematic Diagram

Ordering Information

Device	Marking	MSL	Form	Package	Reel(pcs)	Per Carton (pcs)
JMSH04011G4L-13	SH040114L	1	Tape&Reel	PDFN5x6-8L	5000	50000

Absolute Maximum Ratings (@ $T_C = 25^\circ\text{C}$ 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	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	
I_{DM}	Pulsed Drain Current ⁽¹⁾	Refer to Fig.4	A
E_{AS}	Single Pulsed Avalanche Energy ⁽²⁾	662	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	W
		$T_C = 100^\circ\text{C}$	
T_J, T_{STG}	Junction & Storage Temperature Range	-55 to 175	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁽³⁾	42	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.79	

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

Symbol		Min.	Typ.	Max.	Unit
Off Characteristics					
V _{(BR)DSS}		40	-	-	V
I _{DSS}		-	-	1.0	μA
I _{GSS}		-	-	±100	nA
V _{GS(th)}		2.0	2.8	4.0	V
R _{DS(ON)}	Static Drain-Source ON-Resistance ⁽⁴⁾	-	0.8	1.0	mΩ
R _g		-	2.0	-	Ω
C _{iss}	V _{GS} = 0V, V _{DS} = 20V, f = 1MHz	-	5653	8479	pF
C _{oss}		-	1619	2429	pF
C _{rss}		-	63	126	pF
Q _g		-	78	-	nC
Q _{gs}	V _{GS} = 0 to 10V V _{DS} = 20V, I _D = 20A	-	26	-	nC
Q _{gd}		-	12	-	nC
t _{d(on)}		-	19	-	ns
t _r	V _{GS} = 10V, V _{DD} = 20V	-	35	-	ns
t _{d(off)}	I _D = 20A, R _{GEN} = 3Ω	-	54	-	ns
t _f		-	18	-	ns
I _S		-	-	326	A
I _{SM}		-	-	1303	A
V _{SD}	Body Diode Forward Voltage			1.2	V
trr	Body Diode Reverse Recovery Time	26	52	77	ns
Qrr	Body Diode Reverse Recovery Charge	-	61	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
 2. E_{AS} condition: Starting T_J=25°C, V_{DD}=20V, V_{GS}=10V, R_G=25ohm, L=3mH, I_{AS}=21A, V_{DD}=0V during time in avalanche.
 3. R_{θJA} is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB.
 4. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%.



Typical Performance Characteristics

Figure 1: Power De-rating

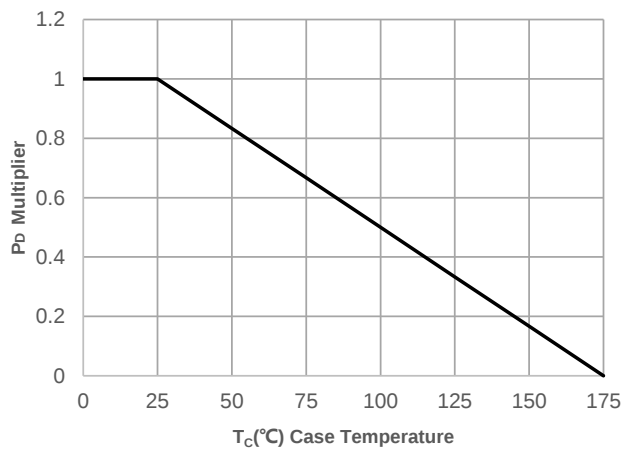
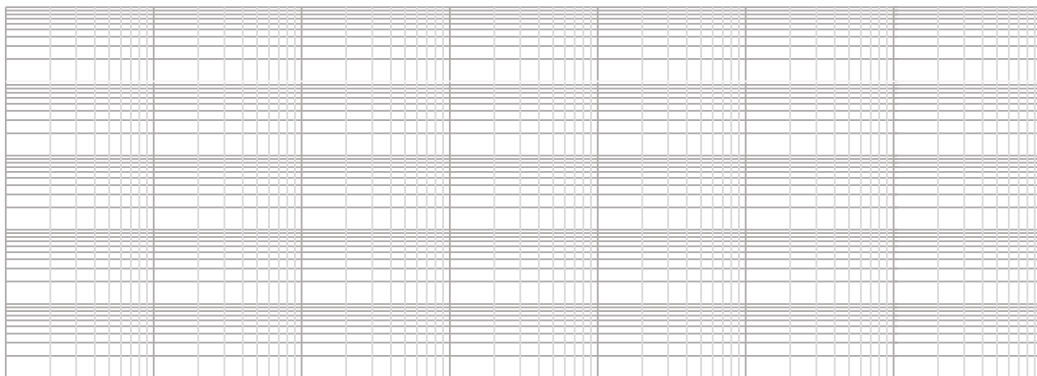
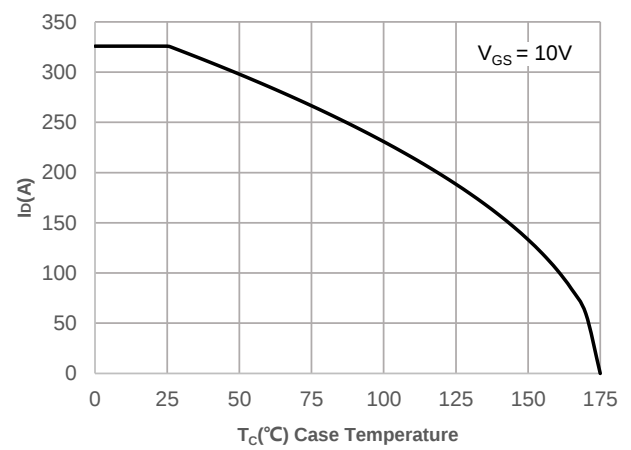


Figure 2: Current De-rating



Typical Performance Characteristics

Figure 5: Output Characteristics

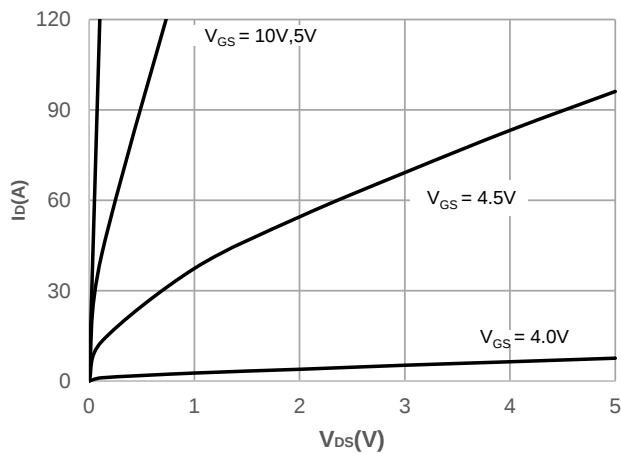


Figure 6: Typical Transfer Characteristics

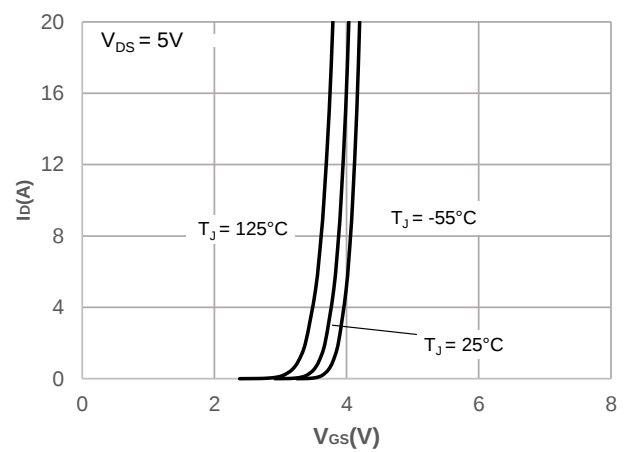


Figure 7: On-resistance vs. Drain Current

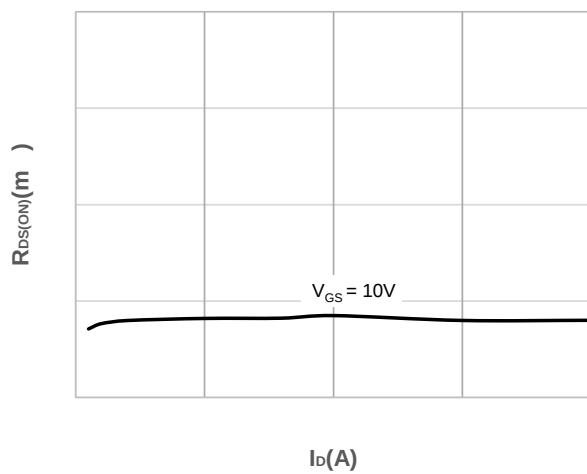


Figure 8: Body Diode Characteristics

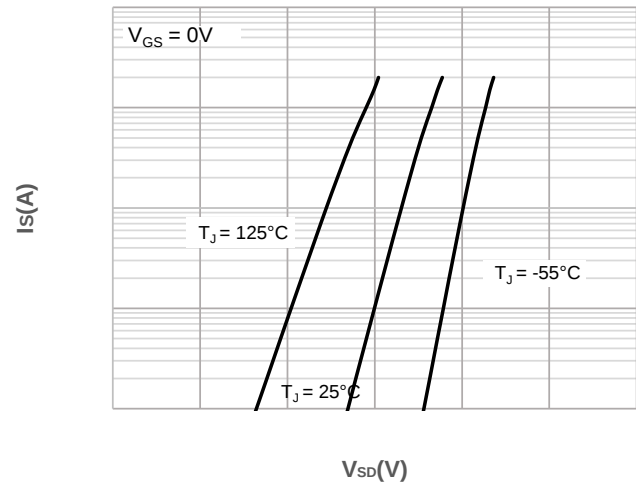


Figure 9: Gate Charge Characteristics

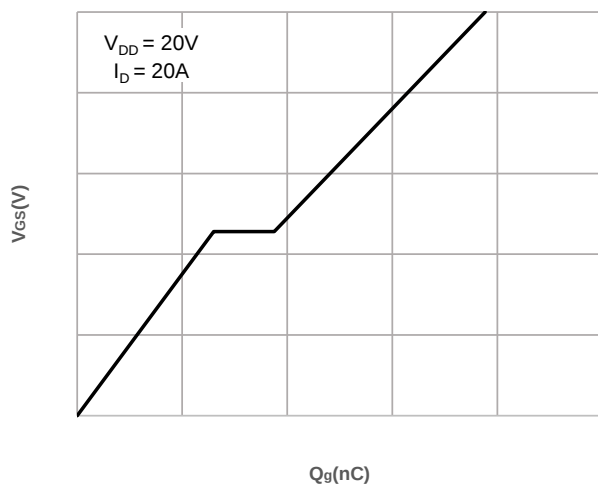
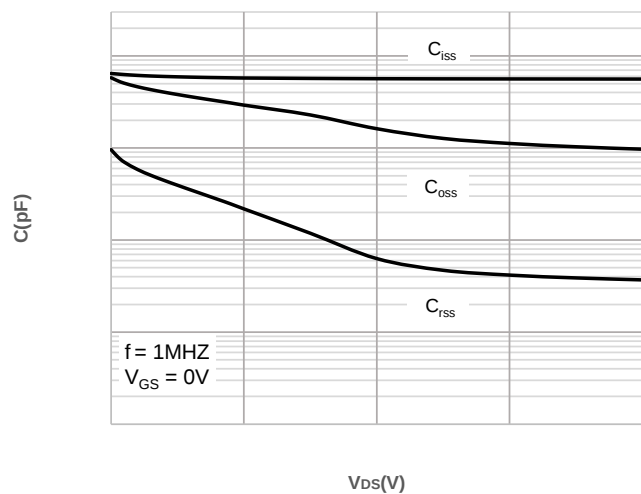


Figure 10: Capacitance Characteristics



Typical Performance Characteristics

Figure 11: Normalized Breakdown Voltage vs. Junction Temperature

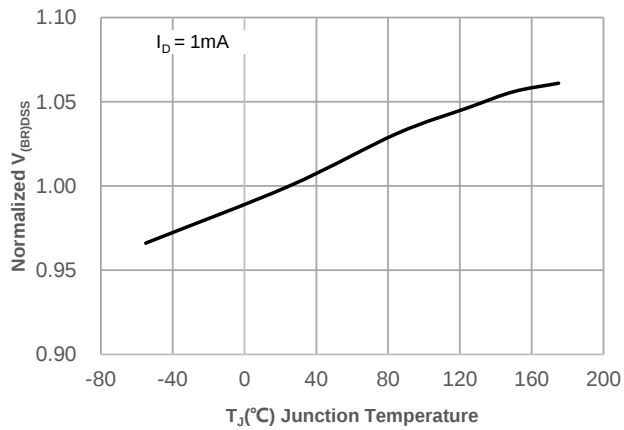


Figure 12: Normalized on Resistance vs. Junction Temperature

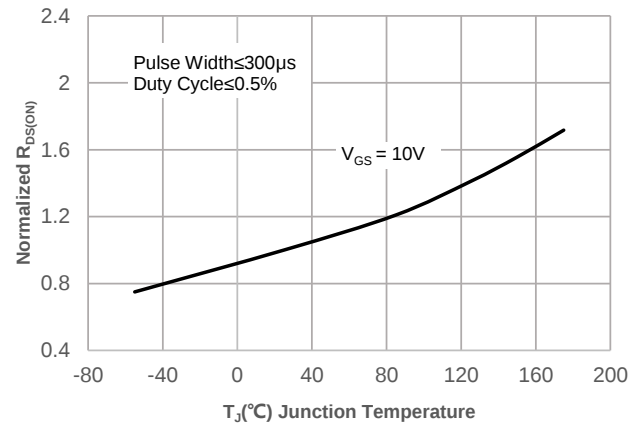


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

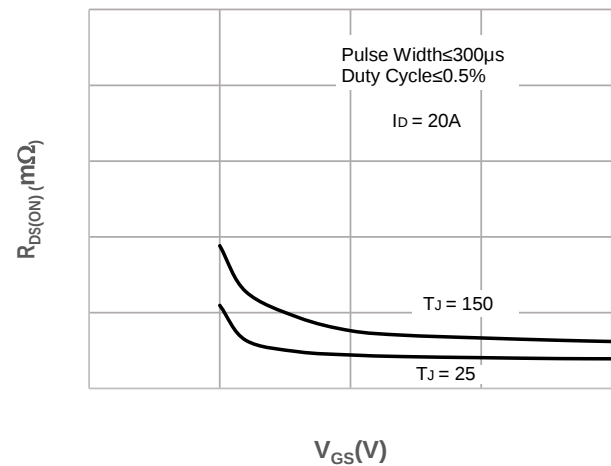
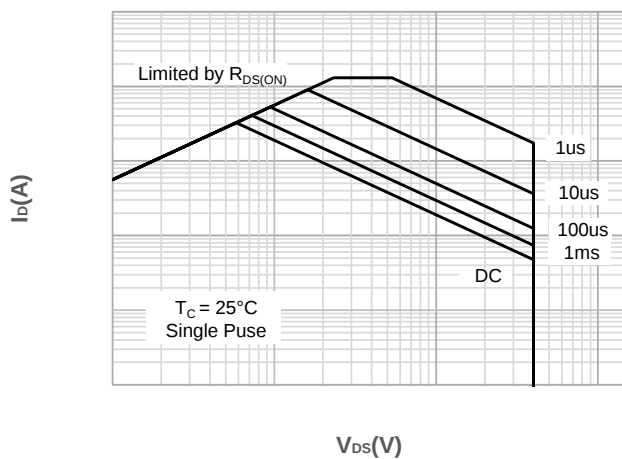


Figure 15: Maximum Safe Operating Area



Test Circuit



Figure 1: Gate Charge Test Circuit & Waveform

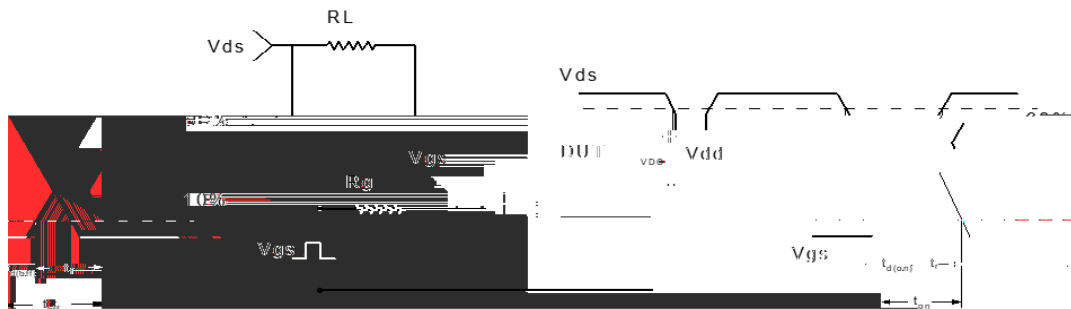


Figure 2: Resistive Switching Test Circuit & Waveform

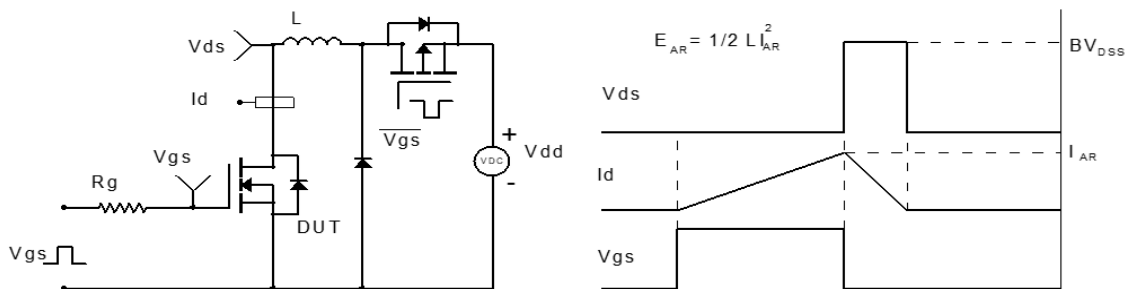


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

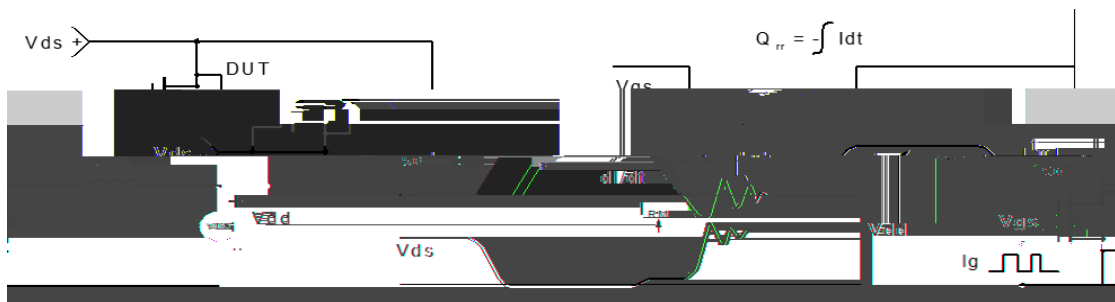
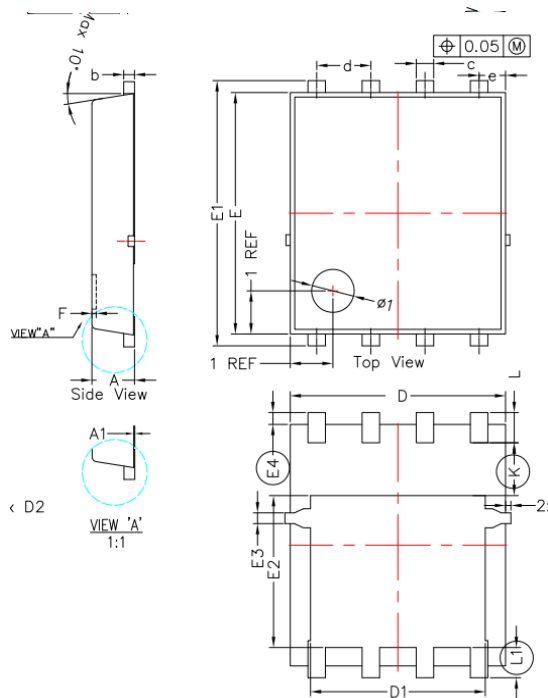


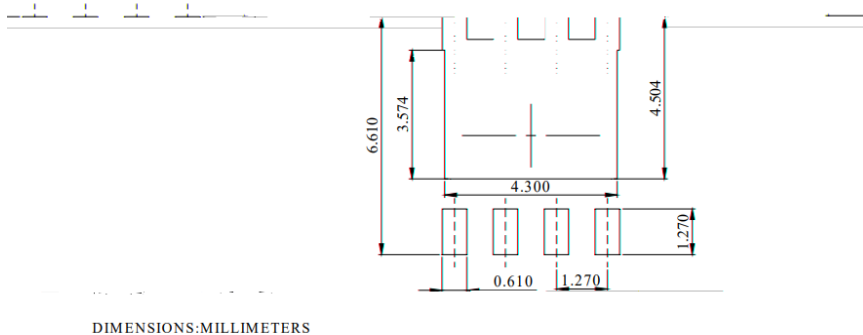
Figure 4: Diode Recovery Test Circuit & Waveform

Package Mechanical Data(PDFN5X6-8L)



SYMBOLS	UNIT	MIN	MAX	MIN	MAX
*A	mm	0.900	0.980	1.150	0.035
A1	mm	0.000	0.080	0.000	0.082
b	mm	0.246	0.254	0.350	0.010
d	mm	0.250	0.250	0.250	0.250
d1	mm	0.203	0.203	0.203	0.203
*D	mm	4.950	5.050	5.000	0.199
D3	mm	4.080	4.080	4.200	0.157
*D2	mm	0.025REF	0.025REF	0.025REF	0.025REF
E	mm	5.500	5.500	5.700	0.02
*E4	mm	0.275REF	0.275REF	0.275REF	0.02
F	mm	0.004	0.004	0.004	0.02
*L	mm	0.500	0.600	0.700	0.02
L1	mm	0.600	0.700	0.800	0.02
K	mm	1.225REF	1.225REF	1.225REF	0.02

Recommended Soldering Footprint



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