N Power SGT MOSFET

JMSL10380PD

Features

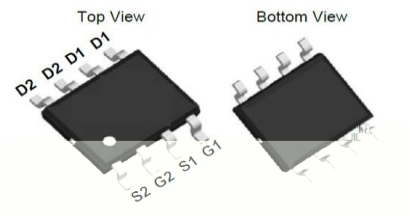
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS Tested
- Halogen-free; RoHS-compliant
- Pb-free plating

Applications

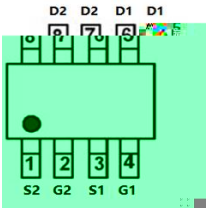
- Load Switch
- PWM Application
- Power Management

Product Summary

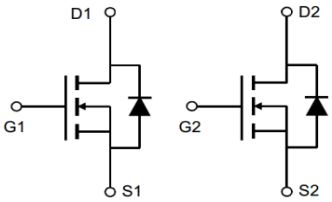
Parameters	Value	Unit
V_{DSS}	100	V
$V_{GS(th)_Typ}$	1.7	V
I_D(@V_{GS}=10V)	4.5	A
$R_{DS(ON)_Typ}$(@V_{GS}=10V)	28	mΩ
$R_{DS(ON)_Typ}$(@V_{GS}=4.5V)	36	mΩ



SOP-8L-Dual



Pin Assignment



Schematic Diagram

Ordering Information

Device	Marking	MSL	Form	Package	Reel(pcs)	Per Carton (pcs)
JMSL10380PD-13	L10380PD	3	Tape&Reel	SOP-8	4000	48000

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

Symbol	Parameter		Value	Unit
V_{DS}	Drain-to-Source Voltage		100	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_A = 25°C	4.5	A
		T_A = 100°C	2.8	
I_{DM}	Pulsed Drain Current (1)		Refer to Fig.4	A
E_{AS}	Single Pulsed Avalanche Energy (2)		26	mJ
P_D	Power Dissipation	T_A = 25°C	1.4	W
		T_A = 100°C	0.6	
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Max	Unit
R 3	Thermal Resistance, Junction to Ambient(3)	88.9	°C/W

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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 = 250μA, V_{GS} = 0V	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 80V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(4)	V_{GS} = 10V, I_D = 20A	-	28	36	mΩ
		V_{GS} = 4.5V, I_D = 15A	-	36	47	mΩ
Dynamic Characteristics						
R_g	Gate Resistance	f = 1MHz	-	1.2	-	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 50V, f = 1MHz	-	536	724	pF
C_{oss}	Output Capacitance		-	176	237	pF
C_{rss}	Reverse Transfer Capacitance		-	10	50	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 50V, I_D = 20A	·	10	-	nC
Q_{gs}	Gate Source Charge		-	2.3	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	2.2	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 10V, V_{DD} = 50V I_D= 20A, R_{GEN} =3	-	5.0	-	ns
t_r	Turn-On Rise Time		-	15	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	12	-	ns
t_f	Turn-Off Fall Time		-	3	-	ns
Body Diode Characteristics						
I_S	Maximum Continuous Body Diode Forward Current		-	-	4.5	A
I_{SM}	Maximum Pulsed Body Diode Forward Current		-	-	18	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	15	29	44	ns
Qrr	Body Diode Reverse Recovery Charge		-	27	-	nC

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

2. E_{AS} condition: Starting T_J=25°C, V_{DD}=50V, V_{GS}=10V, R_G=25ohm, L=3mH, I_{AS}=4.2A, V_{DD}=0V during time in avalanche.

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

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Typical Performance Characteristics

Figure 1: Power De-rating

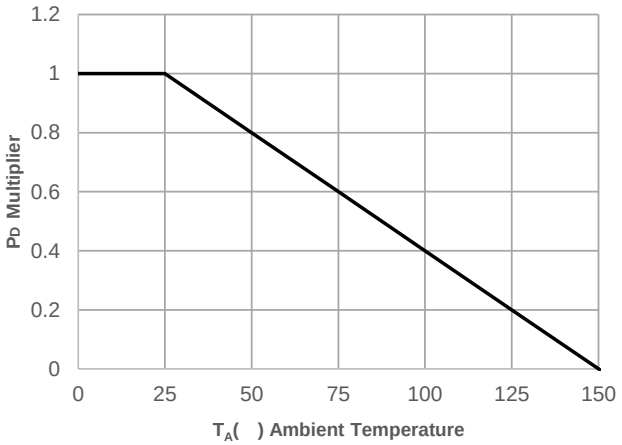
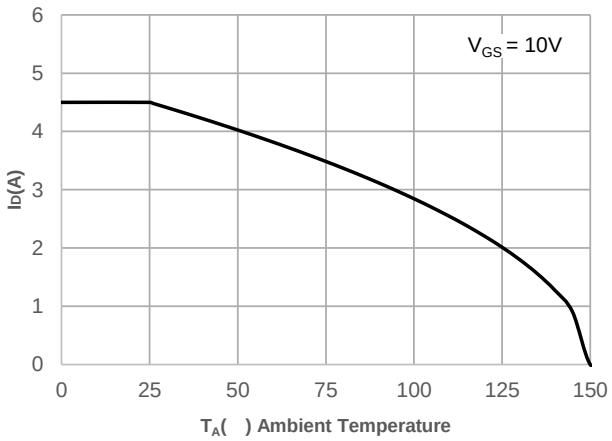
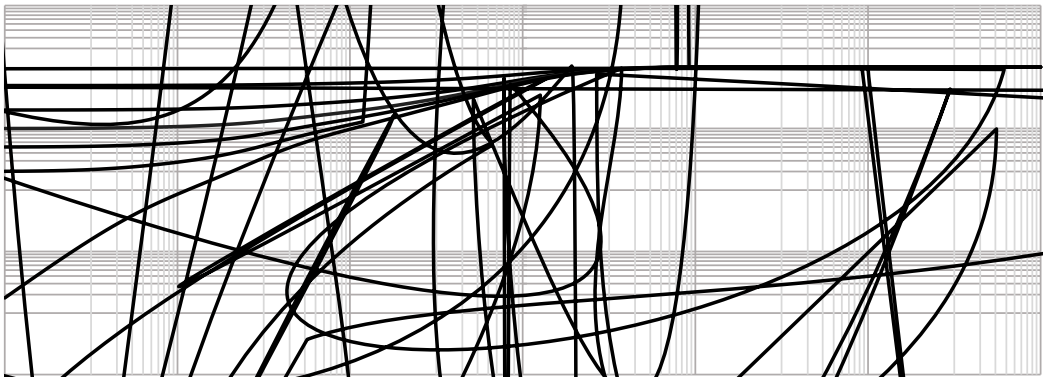


Figure 2: Current De-rating





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Typical Performance Characteristics

Figure 5: Output Characteristics

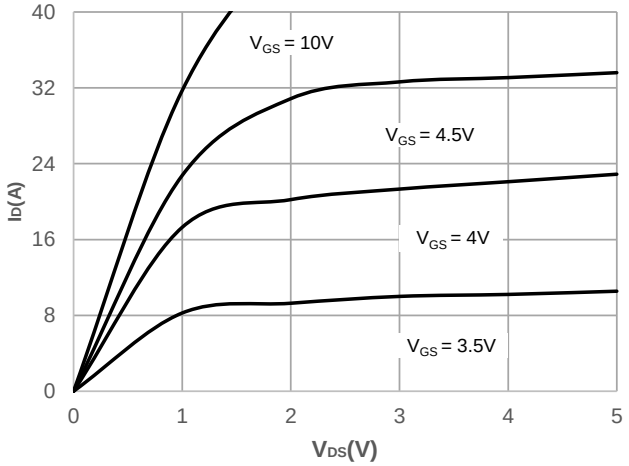


Figure 6: Typical Transfer Characteristics

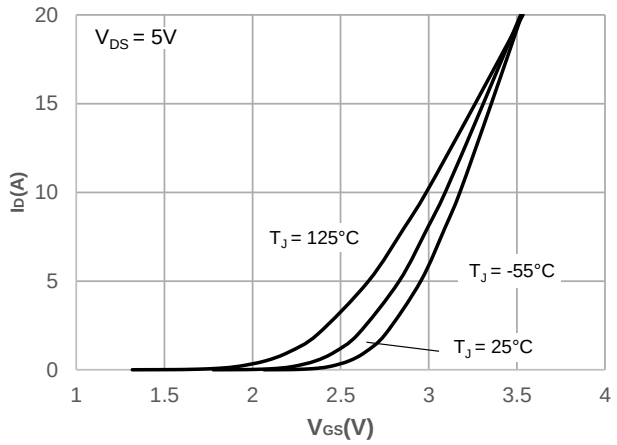


Figure 7: On-resistance vs. Drain Current

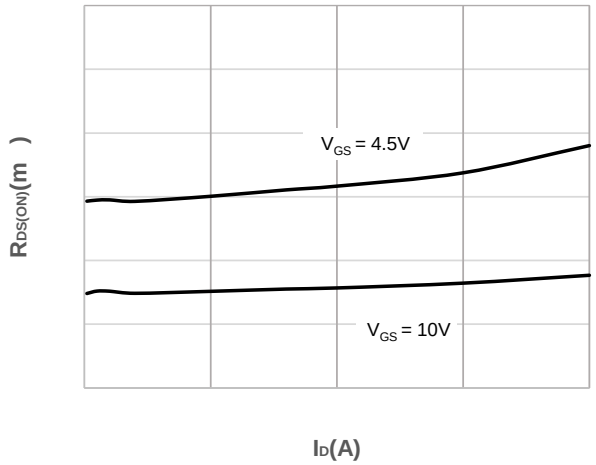


Figure 8: Body Diode Characteristics

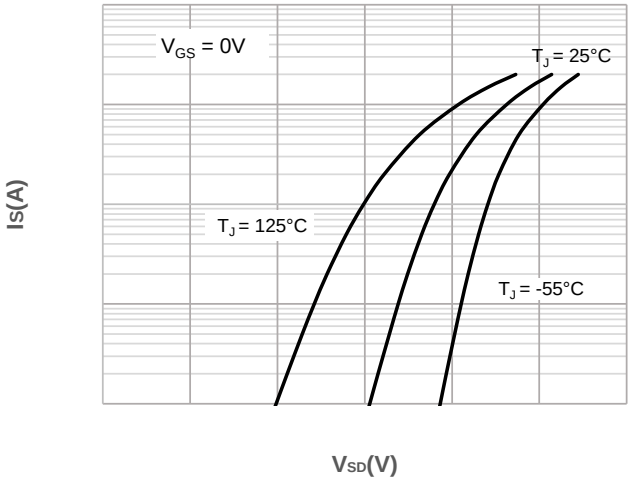


Figure 9: Gate Charge Characteristics

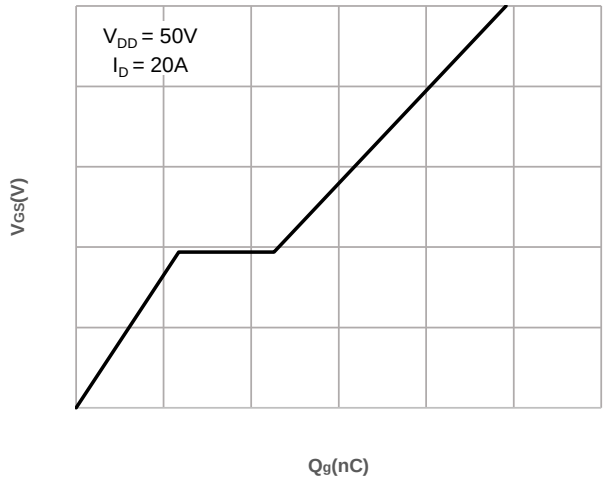
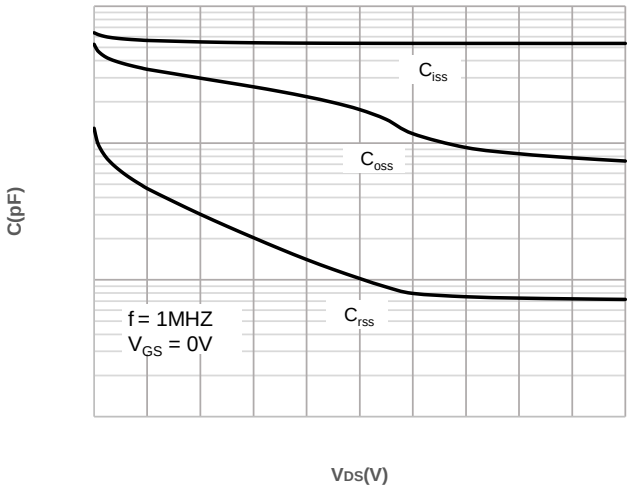


Figure 10: Capacitance Characteristics



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Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

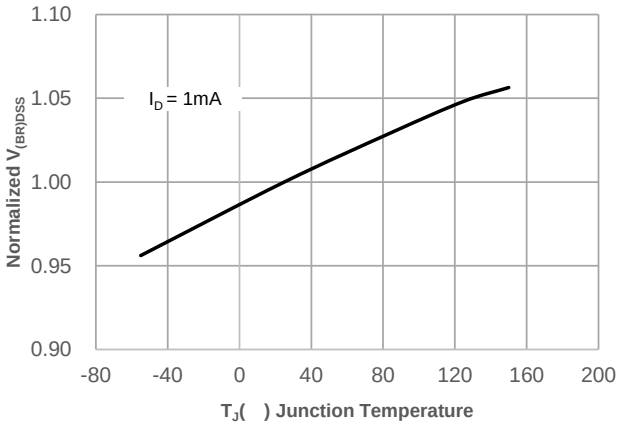
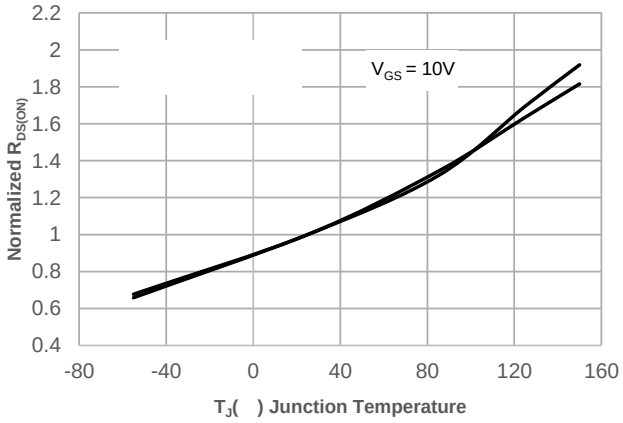


Figure 12: Normalized on Resistance vs. Junction Temperature



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Test Circuit

Figure 1: Gate Charge Test Circuit & Waveform

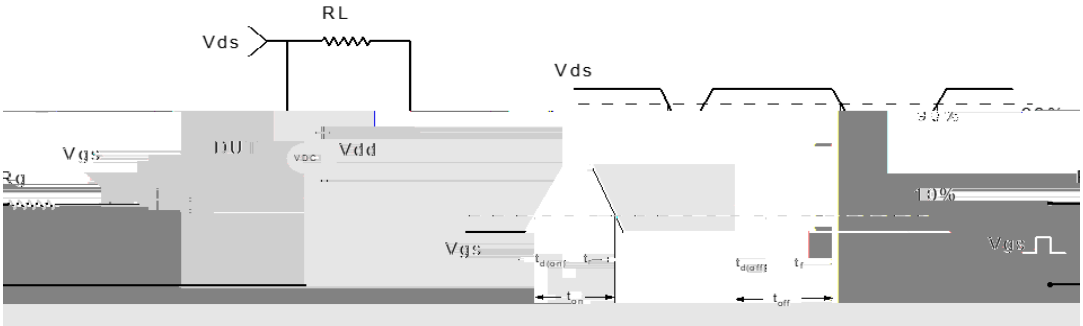

Figure 2: Resistive Switching Test Circuit & Waveform

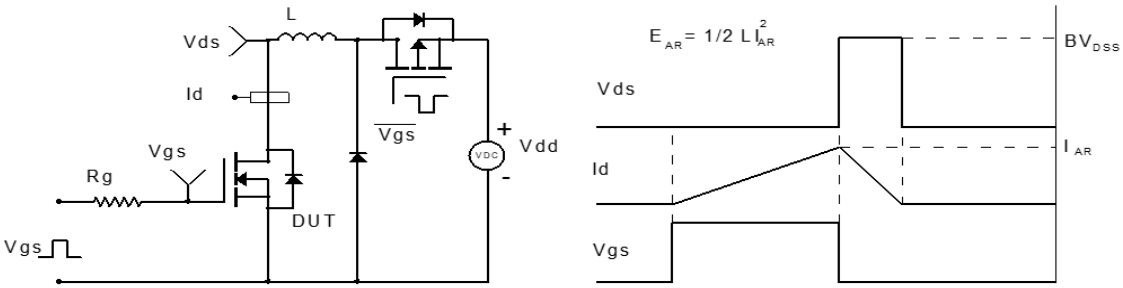

Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

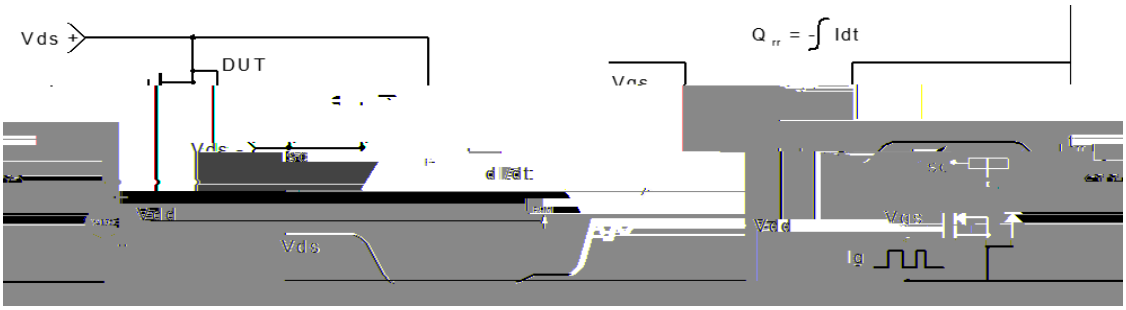

Figure 4: Diode Recovery Test Circuit & Waveform

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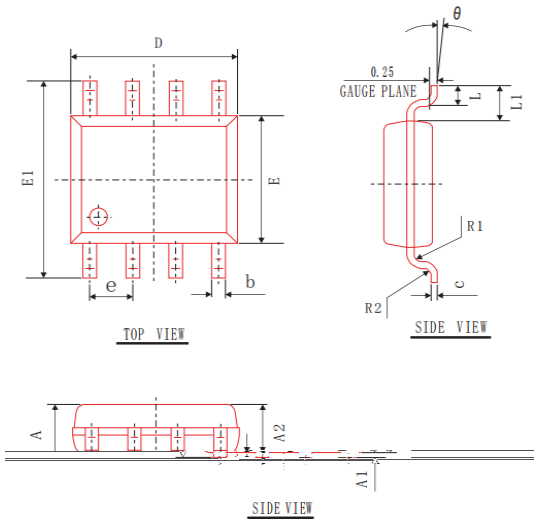
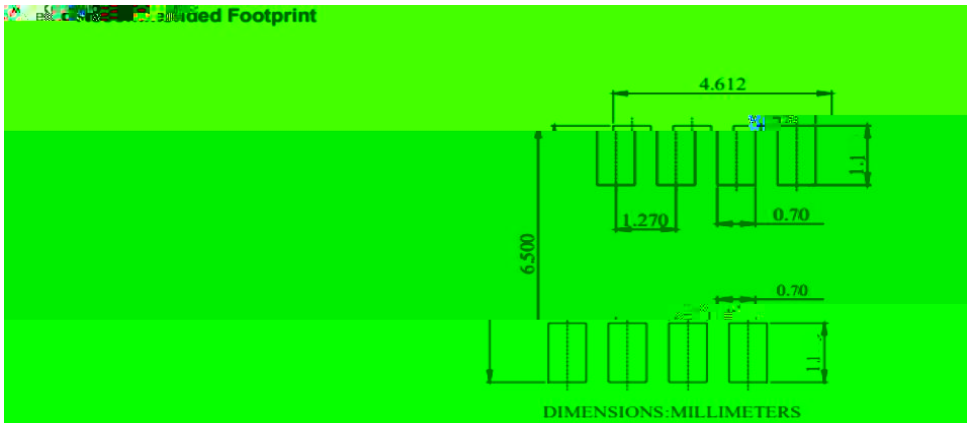
Package Mechanical Data(SOP-8)

Package Outline



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	1.40	1.60	1.80
A1	0.05	0.15	0.25
A2	1.35	1.45	1.55
b	0.30	0.40	0.50
c	0.153	0.203	0.253
D	4.80	4.90	5.00
E	3.80	3.90	4.00
E1	5.80	6.00	6.20
[illegible]	[illegible]	[illegible]	[illegible]
θ	[illegible]	2°	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]



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