MSG12051LAD5

120V_{DS}/±20V_{GS} N-Channel MOSFET

General Description

These N-Channel enhancement mode power field effect transistors are using SGT technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

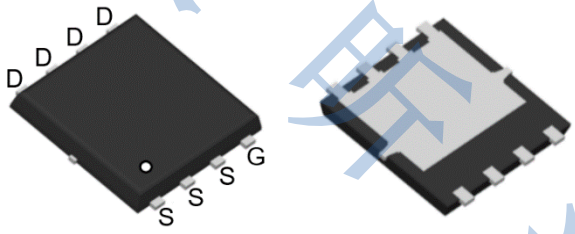
Features

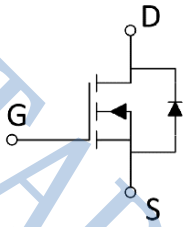
BVDSS	**120V**
$R_{DS(ON)}$(10V)	**5.3mΩ（TYP）**
$R_{DS(ON)}$(4.5V)	**6.5mΩ（TYP）**
I_D	**90A**

100% UIS TESTED!

100% ΔVds TESTED!

PDFN5060





Absolute maximum ratings（T_A=25℃）

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	120	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current (T_C=25℃)	90	A
	Continuous Drain Current (T_C=100℃)	56	A
I_{DM}	Pulesd Drain Current	360	A
I_{AS}	Avalanche Current (L=0.4mH)	35	A
E_{AS}	Single Pulsed Avalanche Energy	245	mJ
P_D	Maximum Power Dissipation (T_C =25℃)	119	W
	Maximum Power Dissipation (T_C =100℃)	48	W
T_J,T_{STG}	Operating,Storage Temperature Range	-55~150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance,Junction-to-Case	1.05	---	℃/ W
$R_{\theta JA}$	Thermal Resistance,Junction-to-Ambient	53	---	℃/ W

Electrical Characteristics(T_J=25℃,unless otherwise noted)

Static State Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
B_{VDSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250μA	120	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=120V, V_{GS}=0V	---	---	1	μA
I_{GSS}	Gate -Source Leakage Current	V_{GS}=±20V, V_{DS}=0V	---	---	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS},I_D=250μA	1.5	2.0	2.5	V
$R_{DS(ON)}$	Drain-Source On-stage Resistance	V_{GS}=10V,I_D=20A	---	5.3	7.0	mΩ
		V_{GS}=4.5V,I_D=20A	---	6.5	9.0	

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input capacitance	V_{DS}=60V	---	3525	---	pF
C_{oss}	Output capacitance	V_{GS}=0V	---	805	---	
C_{rss}	Reverse transfer capacitance	f=1MHz	---	22	---	
R_g	Gate Resistance	f=1MHz	---	2.6	---	Ω
Q_g	Total Gate Charge	V_{DS}=60V	---	53	---	nC
Q_{gs}	Gate Source Charge	V_{GS}=10V	---	10	---	
Q_{gd}	Gate Drain Charge	I_D=20A	---	9.7	---	
$t_{d(on)}$	Turn-on delay Time	V_{DS}=60V	---	16	---	ns
t_r	Rise time	V_{GS}=10V	---	57	---	
$t_{d(off)}$	Turn-off delay Time	R_G=3Ω	---	98	---	
t_f	Fall time	I_D=20A	---	95	---	
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_{SD}=20A	---	0.8	1.2	V
t_{rr}	Reverse Recovery Time	I_D=20A	---	50	---	ns
Q_{rr}	Reverse Recovery Charge	d_i/d_t=100A/μs	---	276	---	nC

Note:

1.Repetitive Rating : Pulsed width limited by maximum junction temperature.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.

3.Essentially independent of operating temperature.

Electrical Characteristics Diagrams

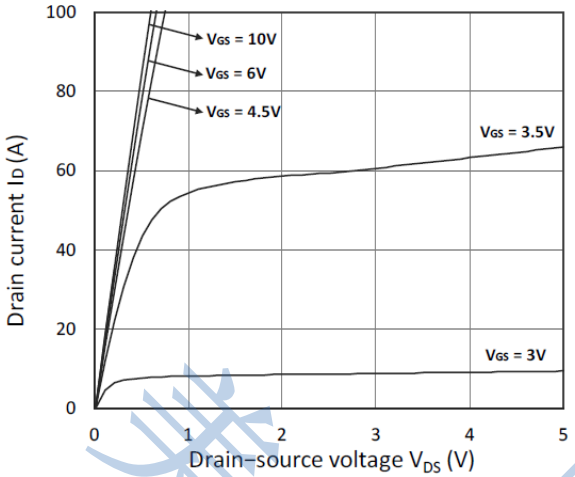


Figure 1. On-Region Characteristics

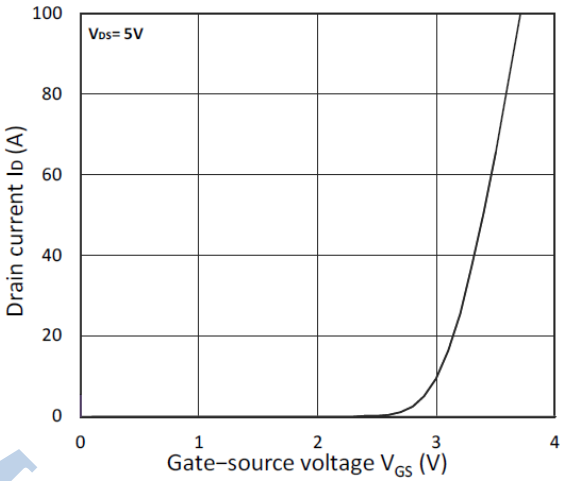


Figure 2. Transfer Characteristics

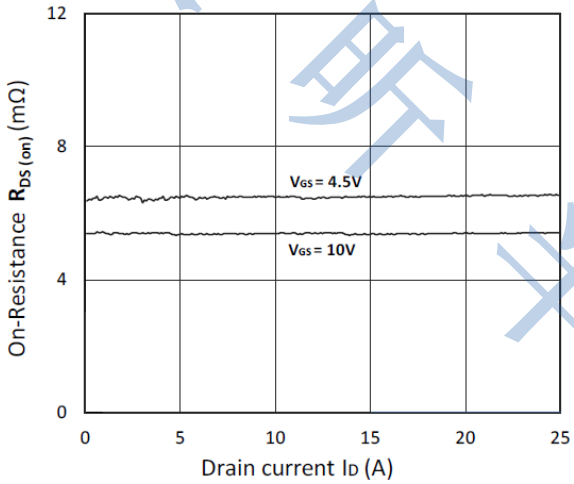


Figure 3. R_{DSON} vs. I_D and Gate Voltage

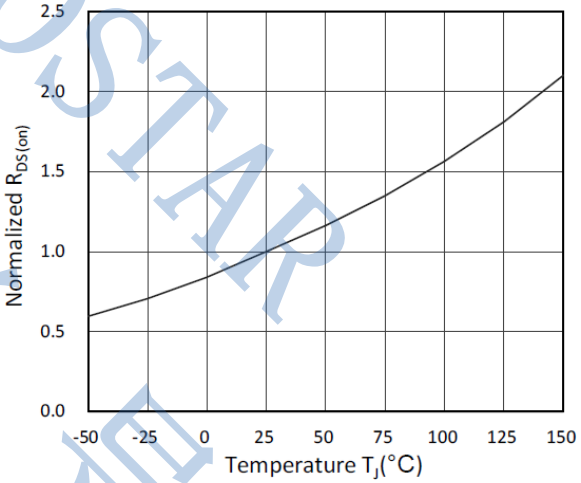


Figure 4. R_{DSON} vs. Junction Temperature

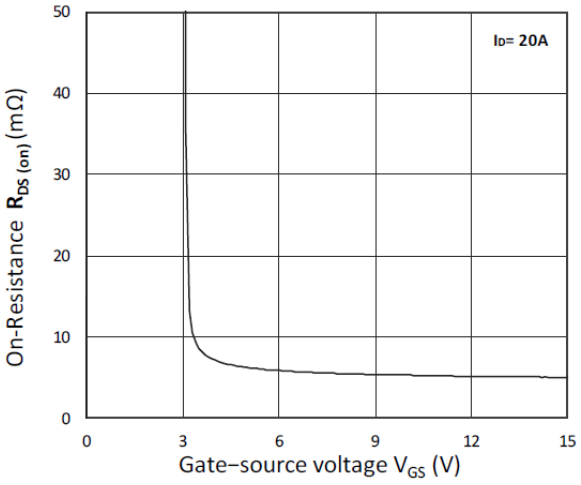


Figure 5. R_{DSON} vs. Gate Voltage

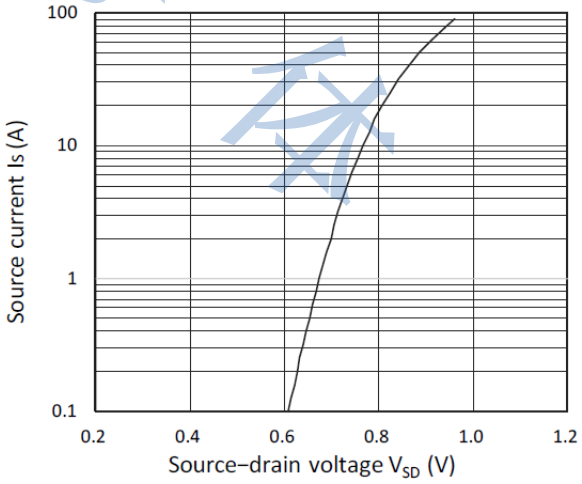


Figure 6. Body-Diode Characteristics

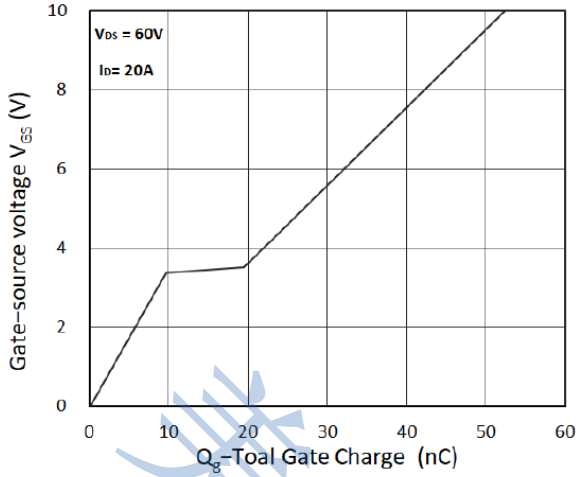


Figure 7. Gate-Charge Characteristics

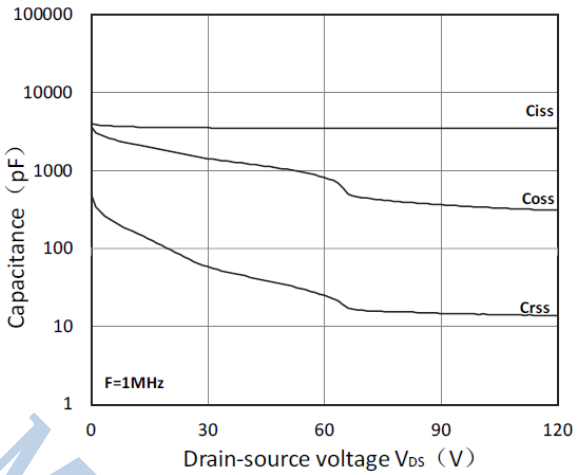


Figure 8. Capacitance Characteristics

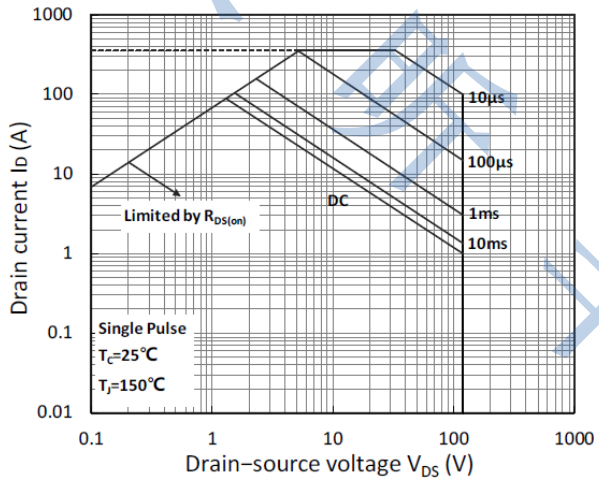


Figure 9. Safe Operating Area

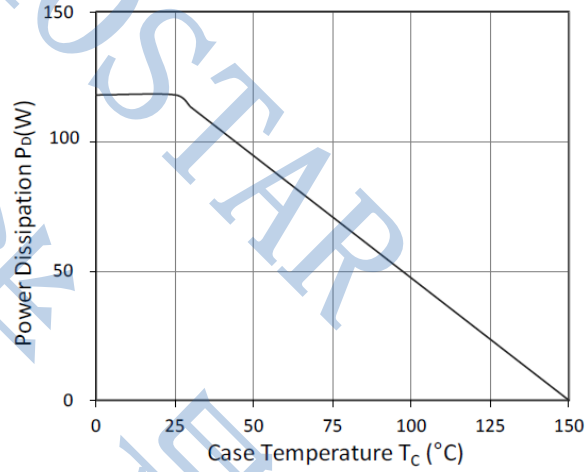
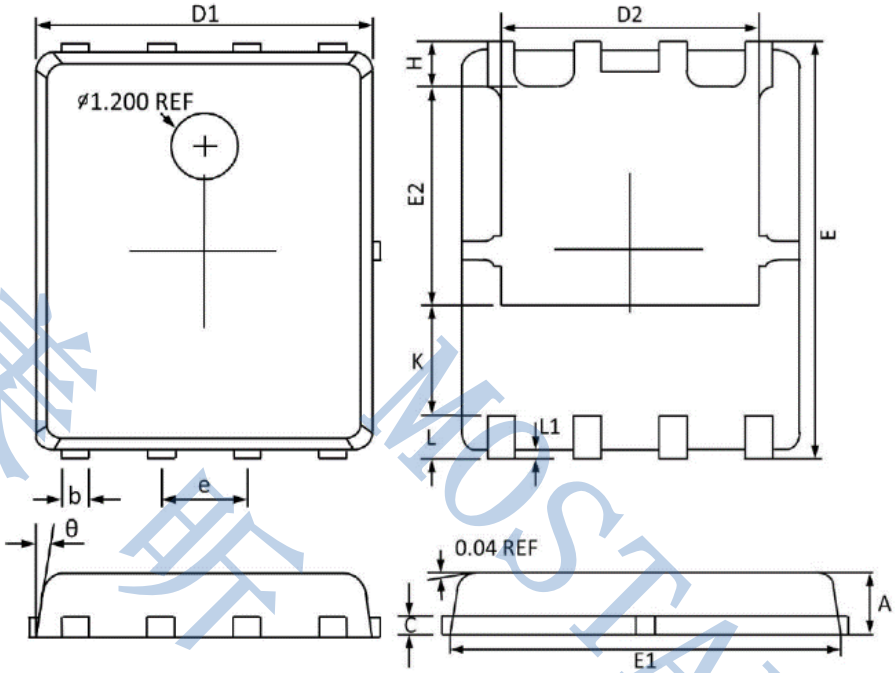


Figure 10. Power Dissipation

PDFN5060 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters(mm)	
	MIN	MAX
A	0.800	1.100
b	0.330	0.510
C	0.200	0.300
D1	4.800	5.100
D2	3.610	4.100
E	5.900	6.200
E1	5.700	5.900
E2	3.350	3.780
e	1.27BSC	
H	0.410	0.700
K	1.100	1.500
L	0.510	0.710
L1	0.060	0.200
θ	0°	12°