

100V_{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

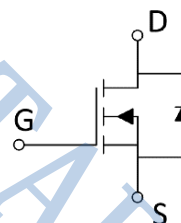
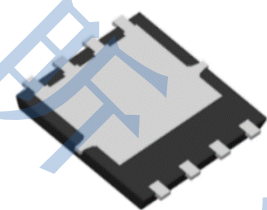
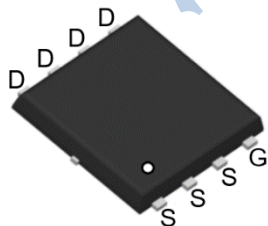
BVDSS	100V
R_{DS(ON)}(10V)	4.5mΩ (TYP)
R_{DS(ON)}(4.5V)	6.3mΩ (TYP)
I_D	95A

100% UIS TESTED!

100% ΔV_{ds} TESTED!



PDFN5060



Absolute maximum ratings (T_A=25°C)

Symbol	Parameter	Value	Unit
V _{DS}	Drain-Source Voltage	100	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Continuous Drain Current (T _C =25°C)	95	A
	Continuous Drain Current (T _C =100°C)	60	A
I _{DM}	Pulsed Drain Current	380	A
I _{AS}	Avalanche Current (L=0.4mH)	33	A
E _{AS}	Single Pulsed Avalanche Energy	218	mJ
P _D	Maximum Power Dissipation (T _C =25°C)	104	W
	Maximum Power Dissipation (T _C =100°C)	41.6	W
T _J , T _{STG}	Operating, Storage Temperature Range	-55~150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	1.2	---	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	58	---	°C/W

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Static State Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
B_{VDSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$	---	---	1	μA
I_{GSS}	Gate -Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.7	2.2	V
$R_{DS(ON)}$	Drain-Source On-stage Resistance	$V_{GS}=10V, I_D=20A$	---	4.5	5.8	m Ω
		$V_{GS}=4.5V, I_D=10A$	---	6.3	8.0	

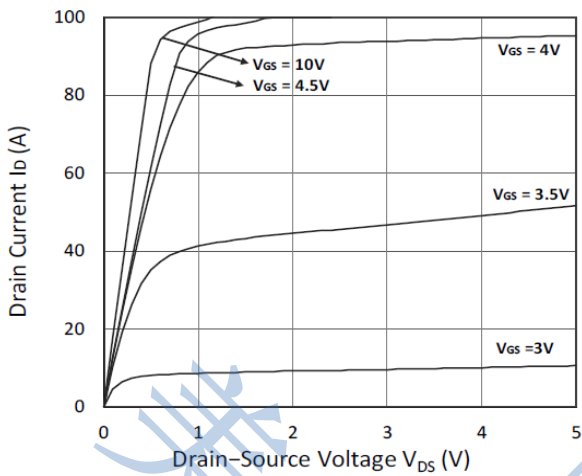
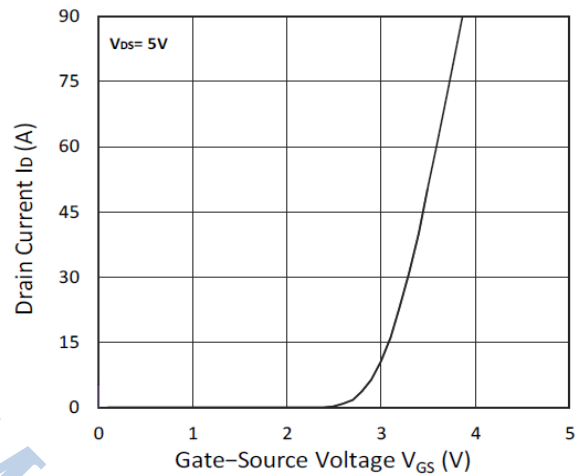
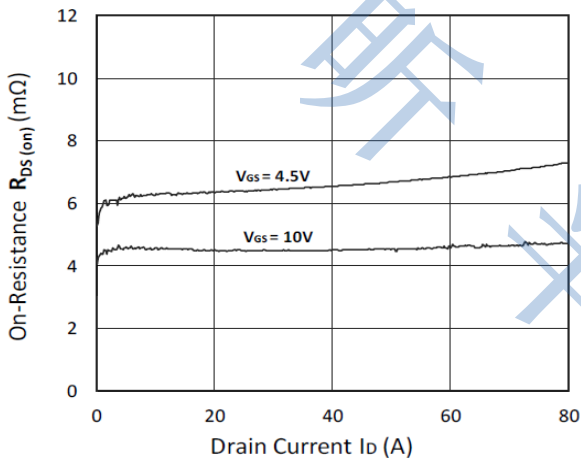
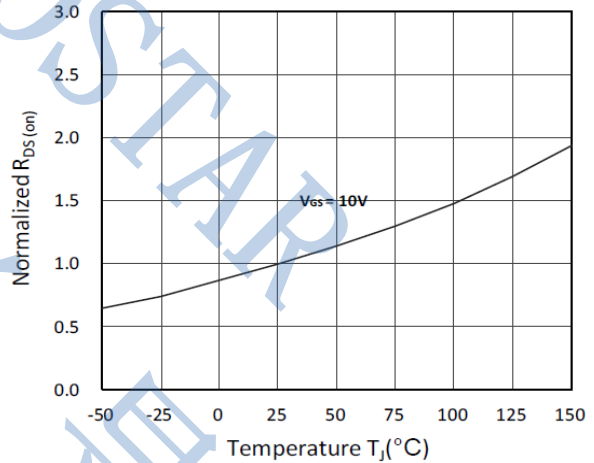
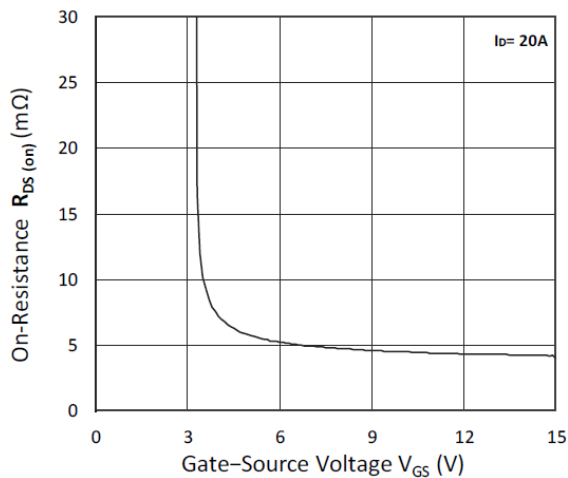
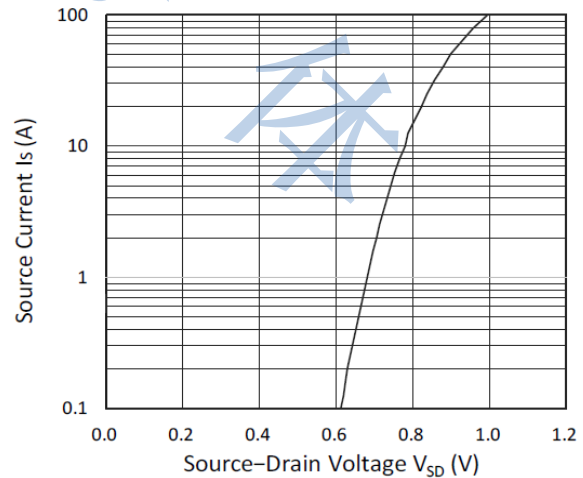
Dynamic Characteristics

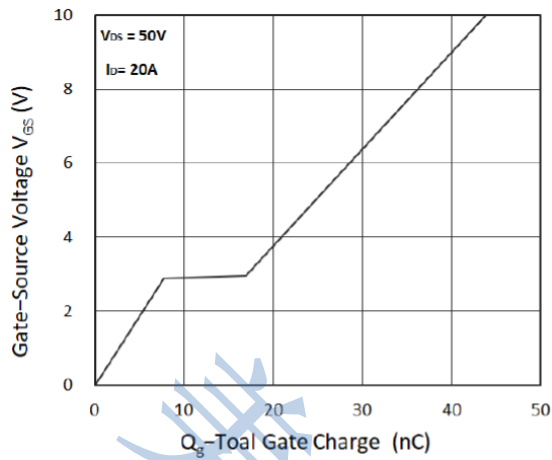
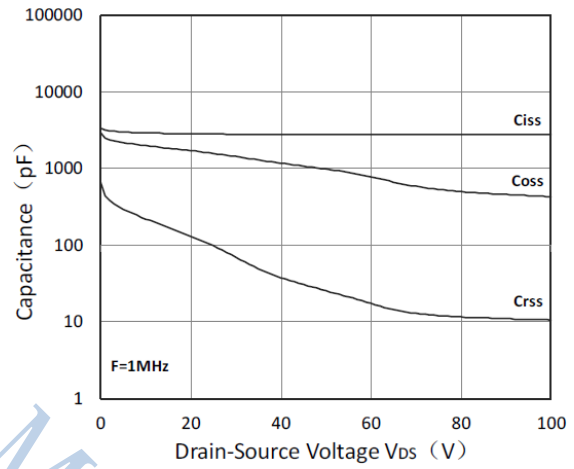
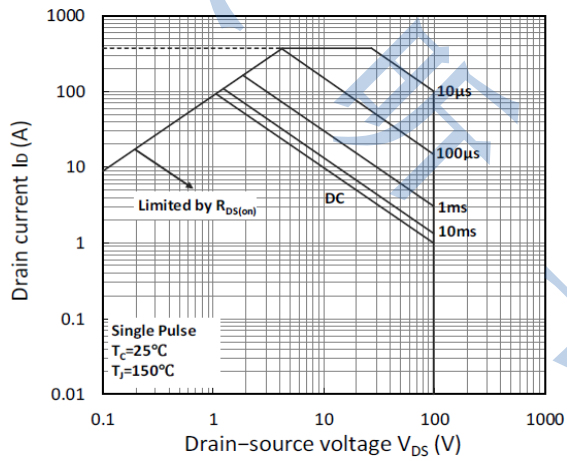
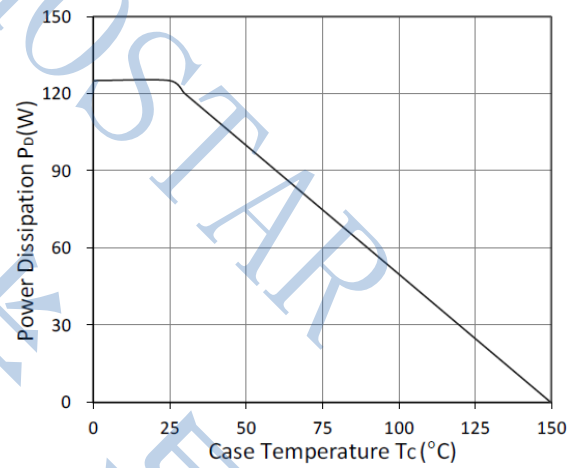
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input capacitance	$V_{DS}=50V$ $V_{GS}=0V$ $f=1\text{MHz}$	---	2760	---	pF
C_{oss}	Output capacitance		---	936	---	
C_{rss}	Reverse transfer capacitance		---	21	---	
R_g	Gate Resistance	$f=1\text{MHz}$	---	1.7	---	Ω
Q_g	Total Gate Charge	$V_{DS}=50V$	---	47	---	nC
Q_{gs}	Gate Source Charge	$V_{GS}=10V$	---	7.7	---	
Q_{gd}	Gate Drain Charge	$I_D=20A$	---	9.3	---	
$t_{d(on)}$	Turn-on delay Time	$V_{DS}=50V$ $V_{GS}=10V$ $R_G=3\Omega$ $I_D=20A$	---	11.5	---	ns
t_r	Rise time		---	8.8	---	
$t_{d(off)}$	Turn-off delay Time		---	36	---	
t_f	Fall time		---	612	---	
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=20A$	---	0.8	1.2	V
t_{rr}	Reverse Recovery Time	$I_D=20A$	---	59	---	ns
Q_{rr}	Reverse Recovery Charge	$d_i/d_t=100A/\mu s$	---	77	---	nC

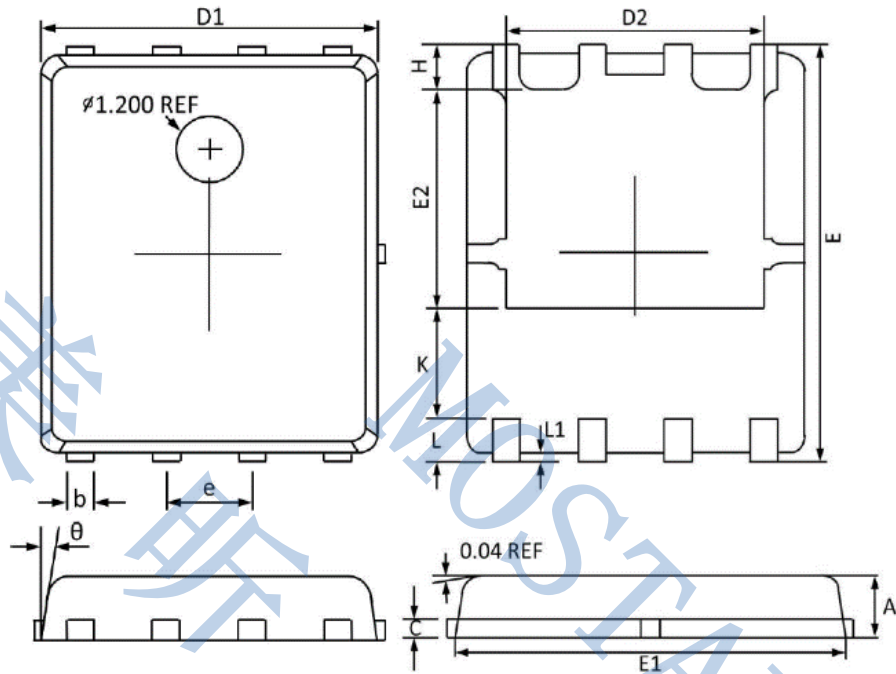
Note:

- 1.Repetitive Rating : Pulsed width limited by maximum junction temperature.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 3.Essentially independent of operating temperature.

Electrical Characteristics Diagrams


Figure 1. On-Region Characteristics

Figure 2. Transfer Characteristics

Figure 3. $R_{DS(on)}$ vs. I_D and Gate Voltage

Figure 4. $R_{DS(on)}$ vs. Junction Temperature

Figure 5. $R_{DS(on)}$ 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°