

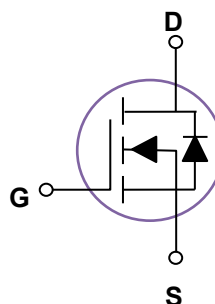
General Description

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. These devices are well suited for high efficiency fast switching applications.

Features

V_{DS}	60V
I_D (at $V_{GS}=10V$)	140A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	2.1m Ω (Typ)
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	2.7m Ω (Typ)

PDFN5*6



Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous	TC=25°C	I_D	140	A
	TC=100°C	I_D	88	A
Drain Current – Pulsed		I_{DM}	560	A
Maximum Power Dissipation		P_D	110	W
Single pulse avalanche energy ⁽¹⁾		E_{AS}	650	mJ
Junction and Storage Temperature Range		T_J, T_{STG}	-55 To 150	°C

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance junction-case	$R_{\theta Jc}$		1.12	°C /W
Thermal Resistance junction-to-Ambient	$R_{\theta JA}$		62	°C /W

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

Symbol	Parameter	Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	60			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V			1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =20V, V _{DS} =0V			100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.8	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A		2.1	2.5	mΩ
		V _{GS} =4.5V, I _D =15A		2.7	3.4	mΩ
gfs	Forward Transconductance	V _{DS} =10V , I _D =3A		15		S
DYNAMIC PARAMETERS						
C _{iSS}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, F=1.0MHz		4947		pF
C _{oSS}	Output Capacitance			2850		pF
C _{rSS}	Reverse Transfer Capacitance			26		pF
SWITCHING PARAMETERS						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V, I _D =1A, V _{GS} =10V, R _G =3.3Ω		19		nS
t _r	Turn-on Rise Time			12		nS
t _{d(off)}	Turn-Off Delay Time			62		nS
t _f	Turn-Off Fall Time			130		nS
Q _g	Total Gate Charge	V _{DS} =30V, I _D =50A, V _{GS} =10V		24		nC
Q _{gs}	Gate-Source Charge			27		nC
Q _{gd}	Gate-Drain Charge			19		nC
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =10A		0.72	1.4	V
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.1		Ω
Drain-Source Diode Characteristics						
T _{rr}	Reverse Recovery Time	V _{GS} =10V, I _S =10A , di/		88		nS
Q _{rr}	Reverse Recovery Charge	dt=100A/μs T _J =25°C		175		nC

Note:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=30V, V_{GS}=10V, L=0.1mH, I_{AS}=92A., Starting T_J=25°C
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

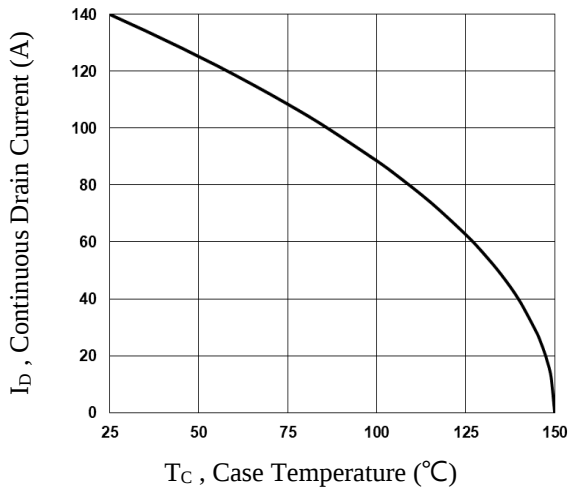


Fig.1 Continuous Drain Current vs. T_C

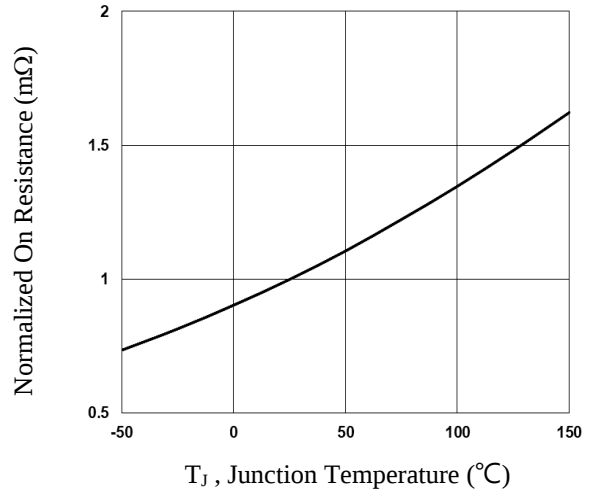


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

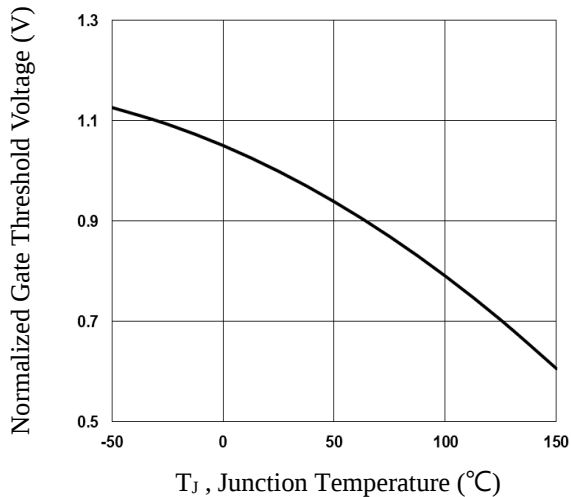


Fig.3 Normalized V_{th} vs. T_J

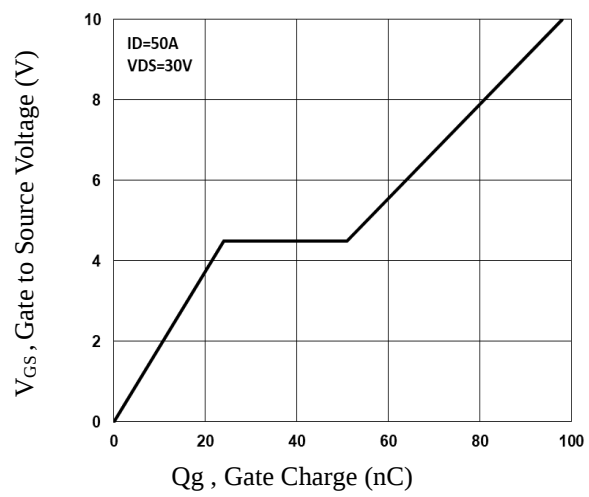


Fig.4 Gate Charge Characteristics

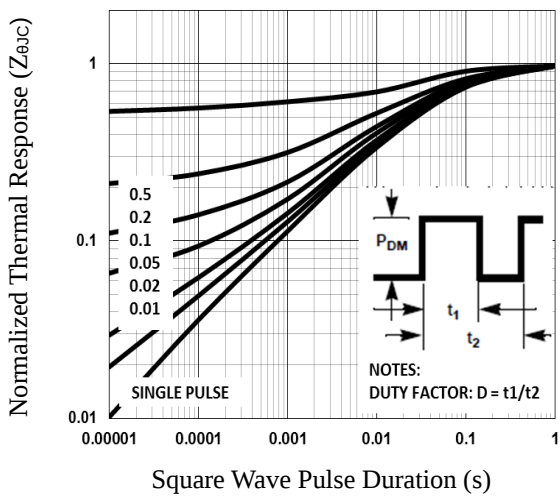


Fig.5 Normalized Transient Impedance

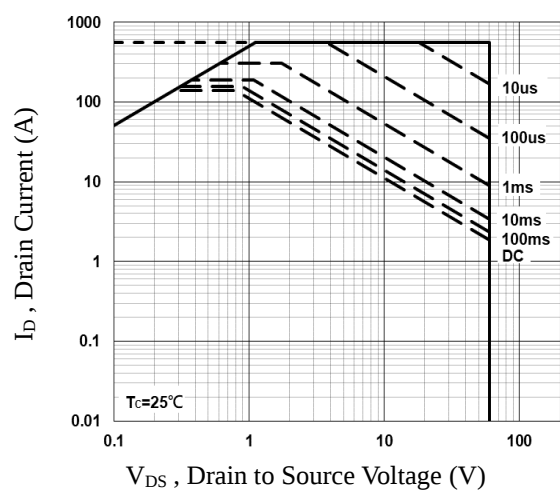


Fig.6 Maximum Safe Operation Area

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

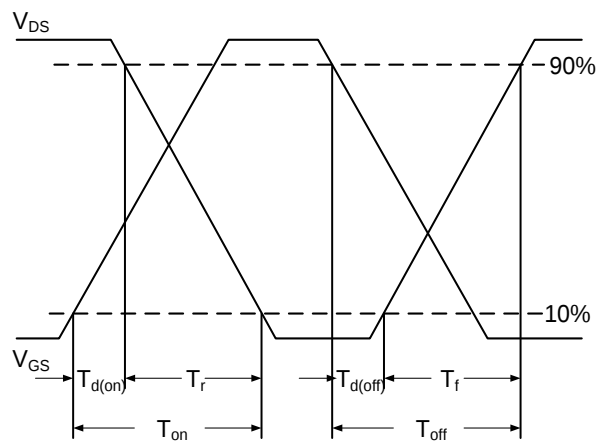


Fig.7 Switching Time Waveform

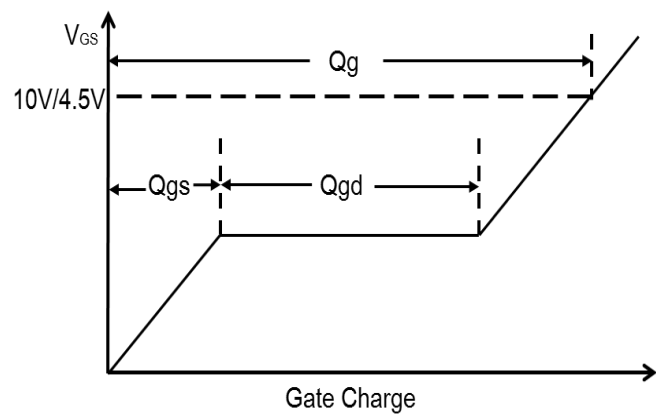
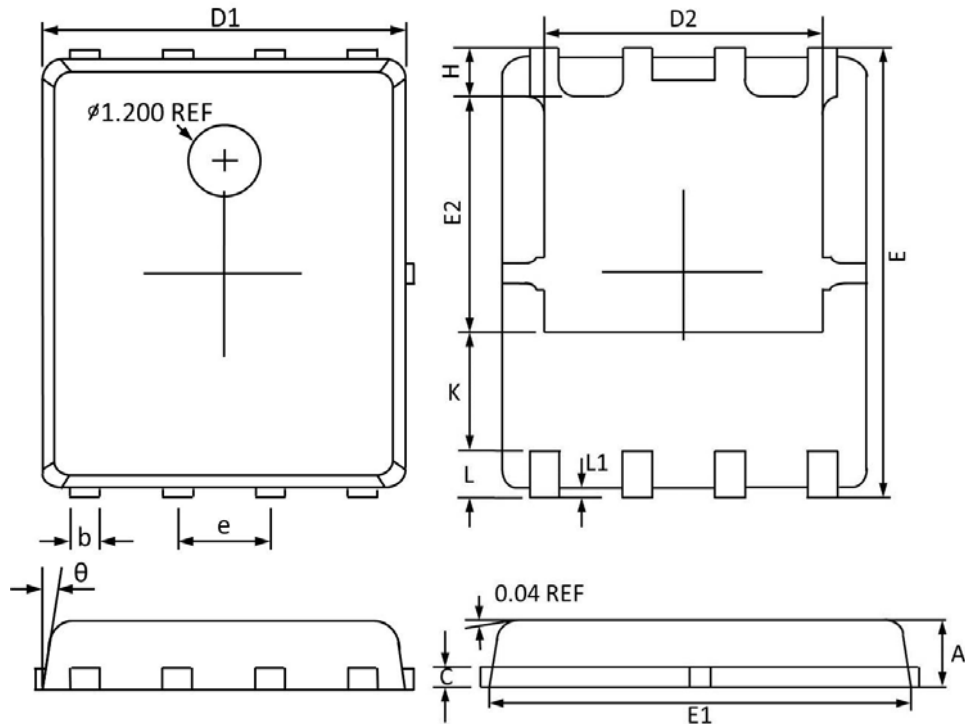


Fig.8 Gate Charge Waveform

PDFN5*6 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
b	0.510	0.330	0.020	0.013
C	0.300	0.200	0.012	0.008
D1	5.100	4.800	0.201	0.189
D2	4.100	3.610	0.161	0.142
E	6.200	5.900	0.244	0.232
E1	5.900	5.700	0.232	0.224
E2	3.780	3.350	0.149	0.132
e	1.27BSC		0.05BSC	
H	0.700	0.410	0.028	0.016
K	1.500	1.100	0.059	0.043
L	0.710	0.510	0.028	0.020
L1	0.200	0.060	0.008	0.002
θ	12°	0°	12°	0°