

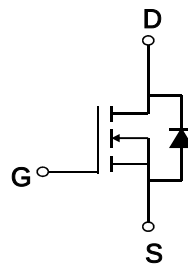
General Description

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 $V_{GS}=10V$)	35A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	9.5m Ω (Typ)

PDFN5x6



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

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous	$TC=25^\circ\text{C}$	I_D	35	A
	$TC=100^\circ\text{C}$	I_D	22	A
Maximum Power Dissipation		P_D	25	W
Drain Current - Pulsed		I_{DM}	140	A
Single pulse avalanche energy		E_{AS}	150	mJ
Junction and Storage Temperature Range		T_J, T_{STG}	-55 To 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance junction-case	$R_{\theta JC}$		1.1	$^\circ\text{C/W}$
Thermal Resistance junction-to-Ambient	$R_{\theta JA}$		62	$^\circ\text{C/W}$

Electrical Characteristics (TJ=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	1.6	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A		9.5	12	mΩ
		V _{GS} =4.5V, I _D =15A		12	16	mΩ
DYNAMIC PARAMETERS						
C _{iSS}	Input Capacitance	V _{DS} =30V,V _{GS} =0V, F=1.0MHz		730		pF
C _{oSS}	Output Capacitance			220		pF
C _{rSS}	Reverse Transfer Capacitance			7.5		pF
SWITCHING PARAMETERS						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V,I _D =1A, V _{GS} =10V, R _G =6Ω		3.7		nS
t _r	Turn-on Rise Time			4.3		nS
t _{d(off)}	Turn-Off Delay Time			16		nS
t _f	Turn-Off Fall Time			6.5		nS
Q _g	Total Gate Charge	V _{DS} =30V,I _D =20A, V _{GS} =10V		14		nC
Q _{gs}	Gate-Source Charge			1.5		nC
Q _{gd}	Gate-Drain Charge			3.1		nC
V _{SD}	Diode Forward Voltage	V _{GS} =0V,I _{SD} =1A		0.72	1.3	V

Note:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V, L=0.5mH$, Starting TJ=25°C
3. The data tested by pulsed , pulse width $\leq 30\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

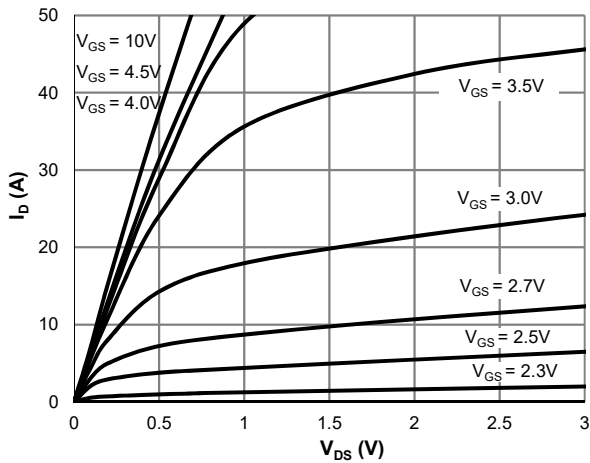


Figure 1: Saturation Characteristics

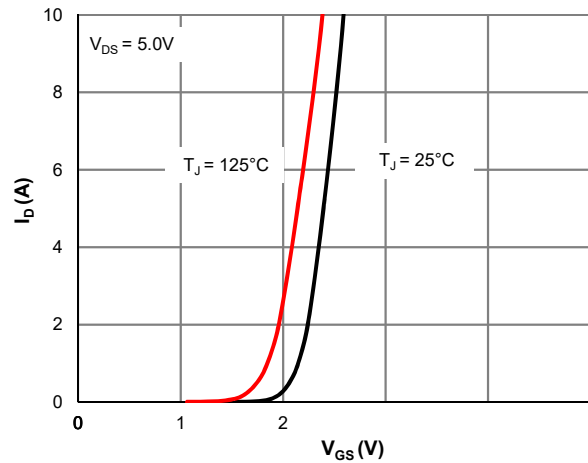


Figure 2: Transfer Characteristics

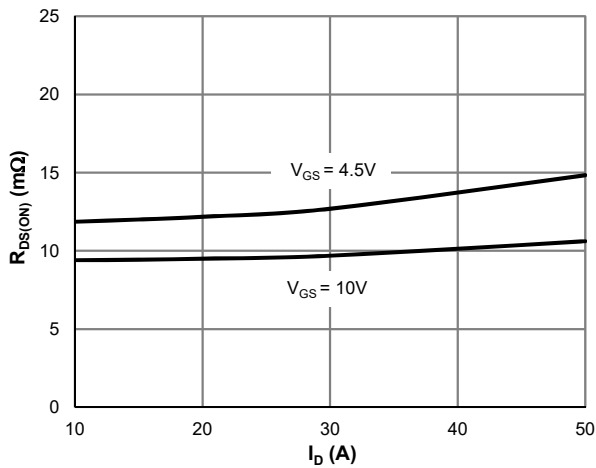


Figure 3: $R_{DS(ON)}$ vs. Drain Current

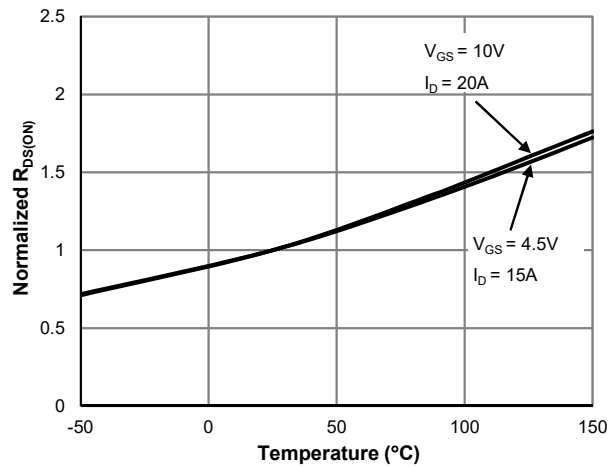


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

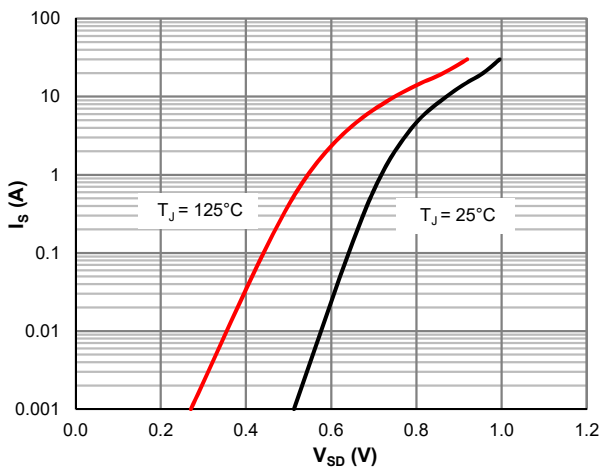


Figure 5: Body-Diode Characteristics

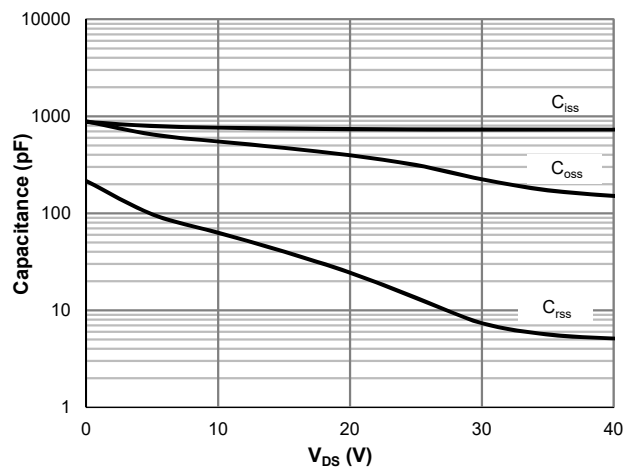


Figure 6: Capacitance Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

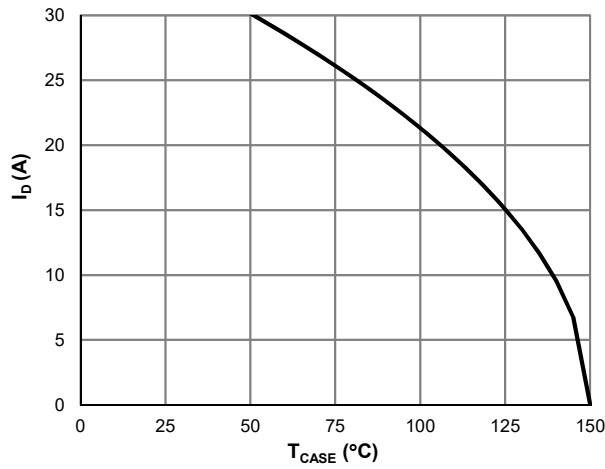


Figure 7: Current De-rating

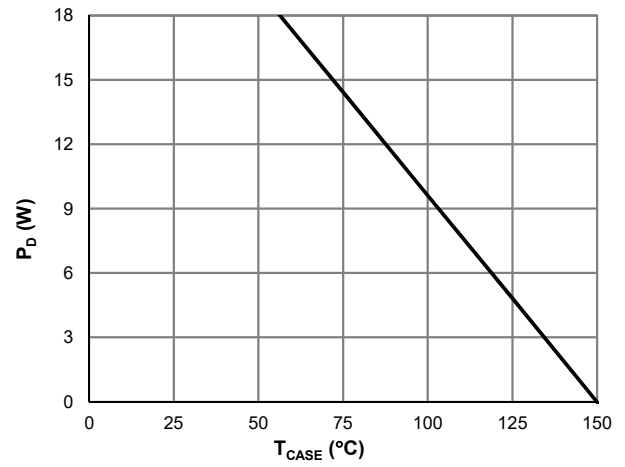


Figure 8: Power De-rating

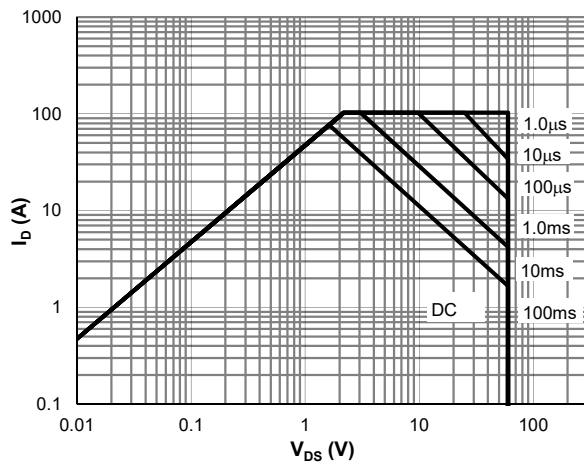


Figure 9: Maximum Safe Operating Area

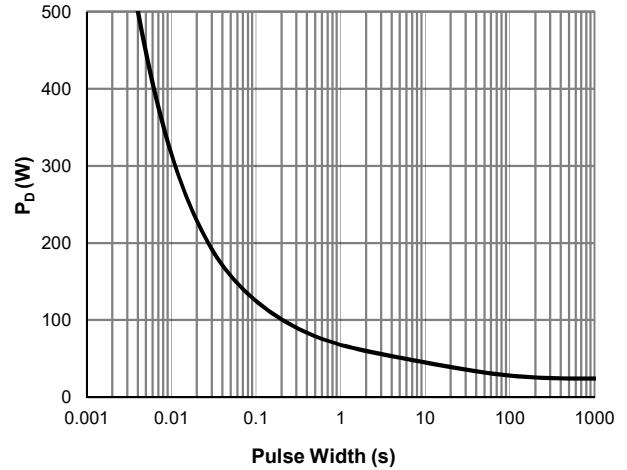


Figure 10: Single Pulse Power Rating, Junction-to-Case

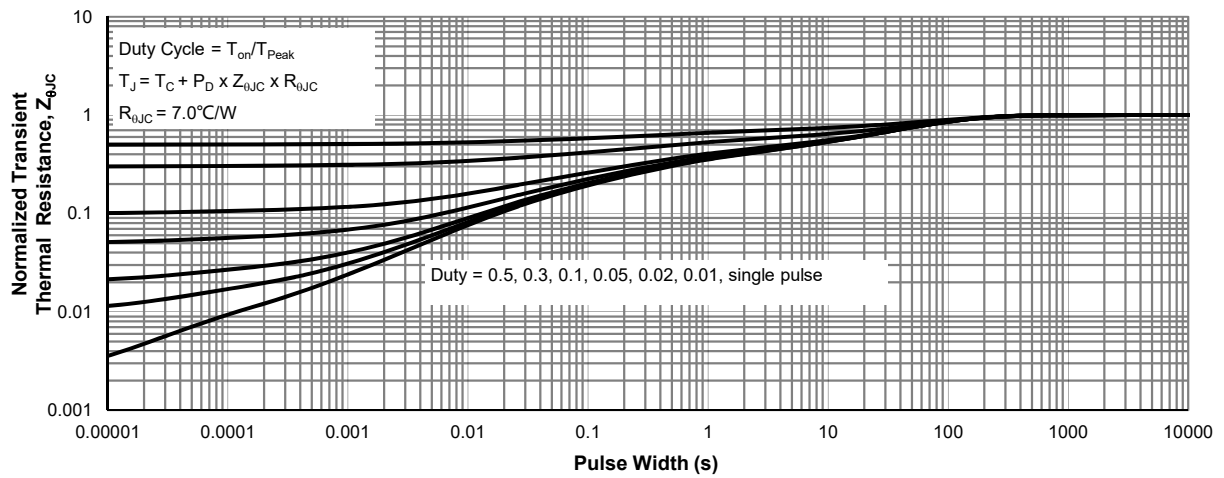
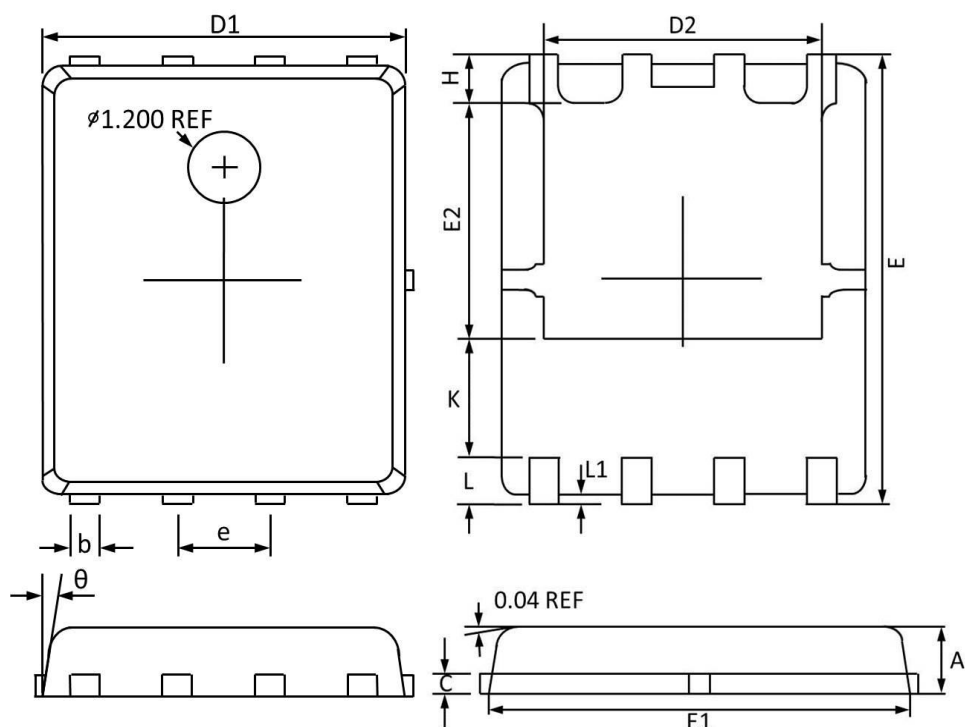


Figure 11: Normalized Maximum Transient Thermal Impedance

PDFN5x6 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°