

General Description

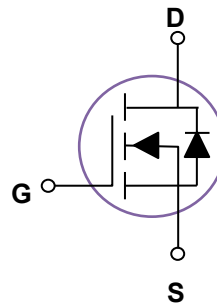
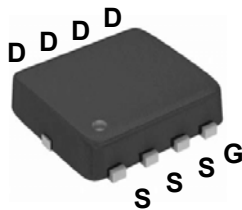
These N-Channel enhancement mode power field effect transistors are using SGT technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices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

Features

V_{DS}	60V
I_D (at $V_{GS}=10V$)	40A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	7.5m Ω (Typ)

100% UIS TESTED!
100% ΔV_{ds} TESTED!

PDFN3*3



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 $^\circ C$	I_D	40	A
	TC=100 $^\circ C$	I_D	26	A
Drain Current – Pulsed	I_{DM}	160	A	
Maximum Power Dissipation	P_D	28	W	
Single pulse avalanche energy ⁽¹⁾	E_{AS}	34	mJ	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$	

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance junction-case	$R_{\theta Jc}$		2.3	$^\circ C / W$
Thermal Resistance junction-to-Ambient	$R_{\theta JA}$		62	$^\circ C / W$

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	1.2	1.7	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A		7.5	9.5	mΩ
		V _{GS} =4.5V, I _D =15A		9.4	12	mΩ
gfs	Forward Transconductance	V _{DS} =5V, I _D =20A		85		S
DYNAMIC PARAMETERS						
C _{ISS}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, F=1.0MHz		1090		pF
C _{OSS}	Output Capacitance			309		pF
C _{RSS}	Reverse Transfer Capacitance			8.5		pF
SWITCHING PARAMETERS						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V, I _D =12A, V _{GS} =10V, R _G =3Ω		4.8		nS
t _r	Turn-on Rise Time			7.6		nS
t _{d(off)}	Turn-Off Delay Time			24		nS
t _f	Turn-Off Fall Time			8.9		nS
Q _g	Total Gate Charge	V _{DS} =30V, I _D =15A, V _{GS} =10V		16.5		nC
Q _{gs}	Gate-Source Charge			2.6		nC
Q _{gd}	Gate-Drain Charge			2.7		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		1.6		Ω

Note:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=30V, V_{GS}=10V, L=0.5mH, I_{AS}=37A., 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

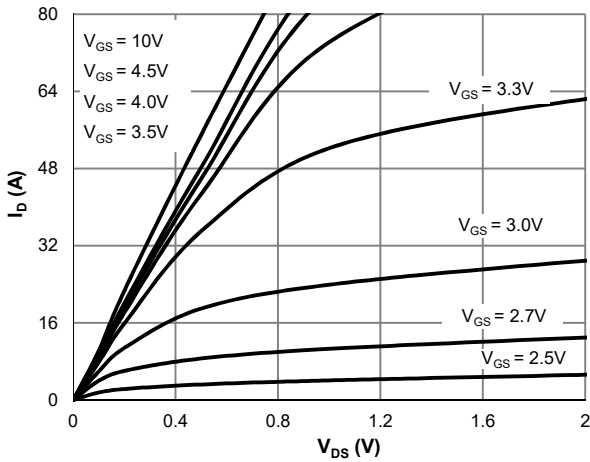


Figure 1: Saturation Characteristics

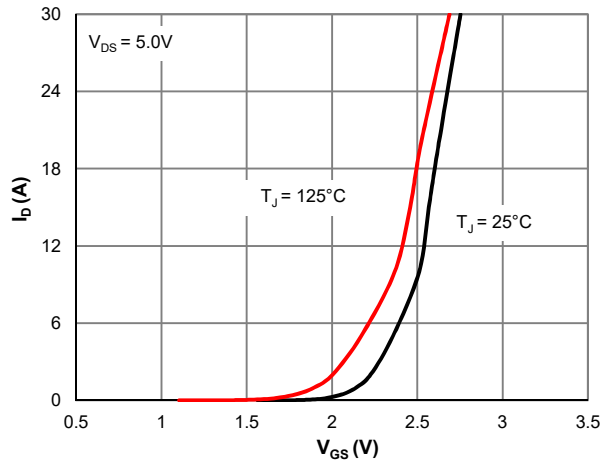


Figure 2: Transfer Characteristics

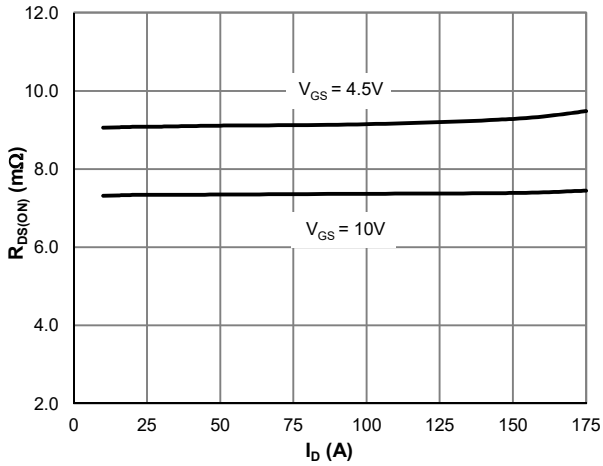


Figure 3: $R_{DS(ON)}$ vs. Drain Current

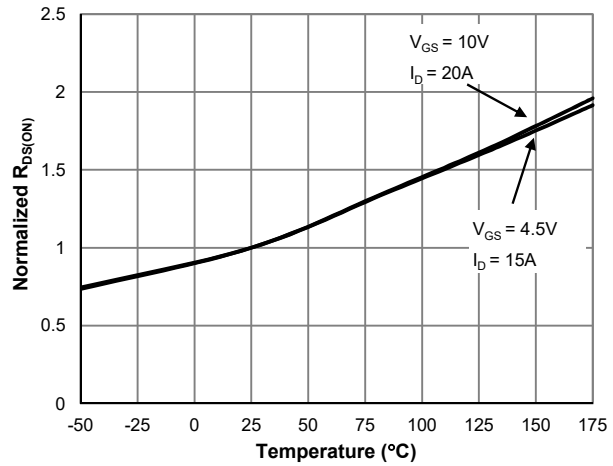


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

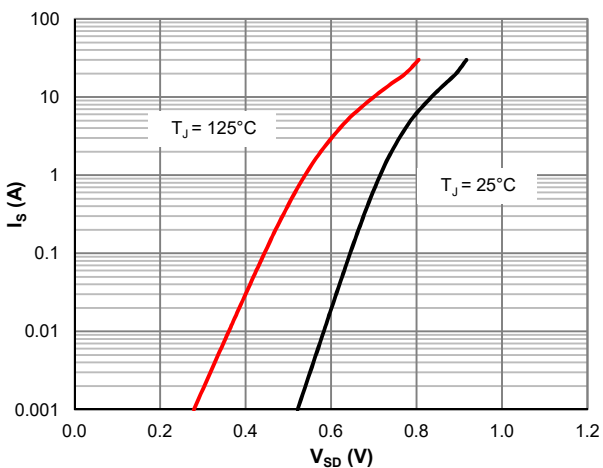


Figure 5: Body-Diode Characteristics

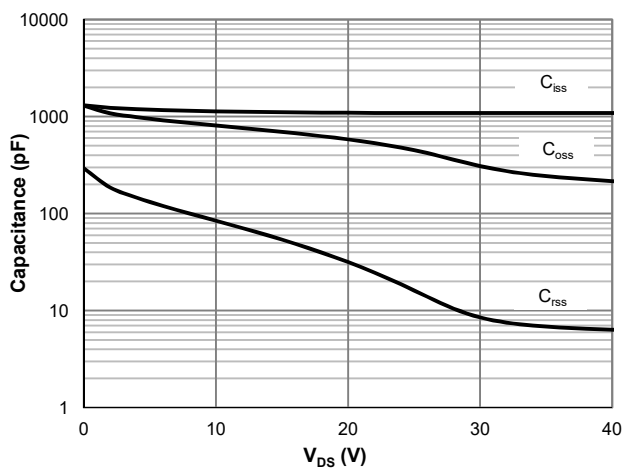


Figure 6: Capacitance Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

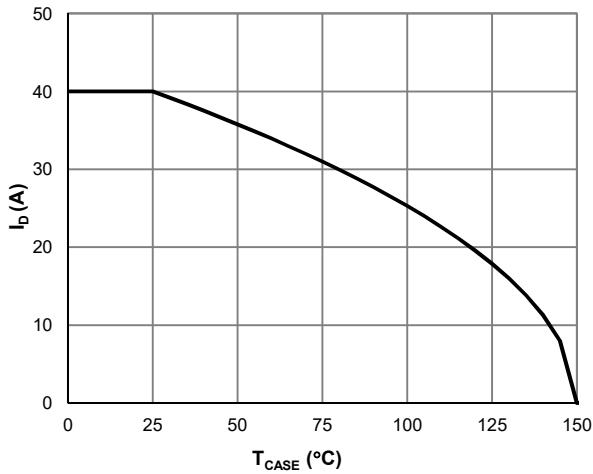


Figure 7: Current De-rating

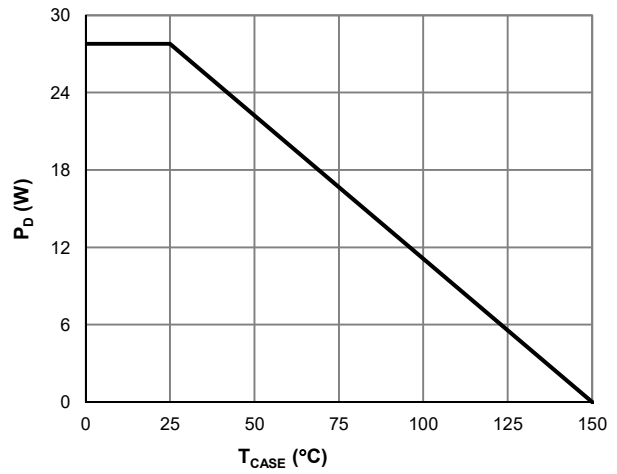


Figure 8: Power De-rating

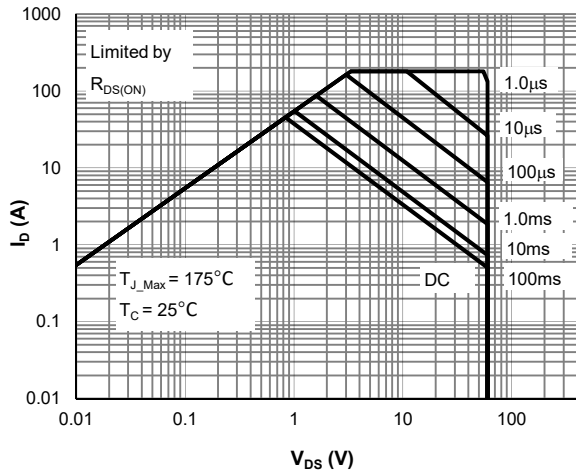


Figure 9: Maximum Safe Operating Area

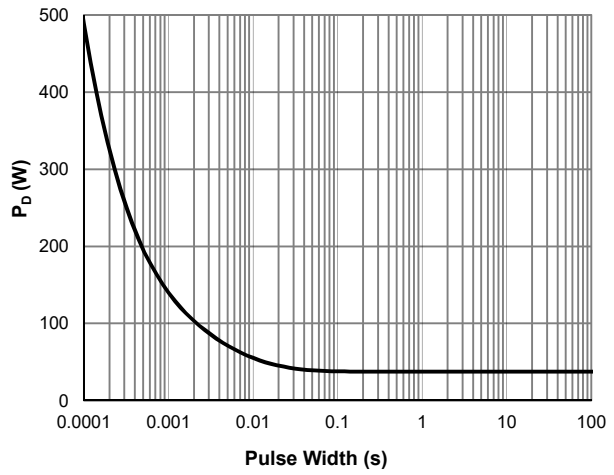


Figure 10: Single Pulse Power Rating, Junction-to-Case

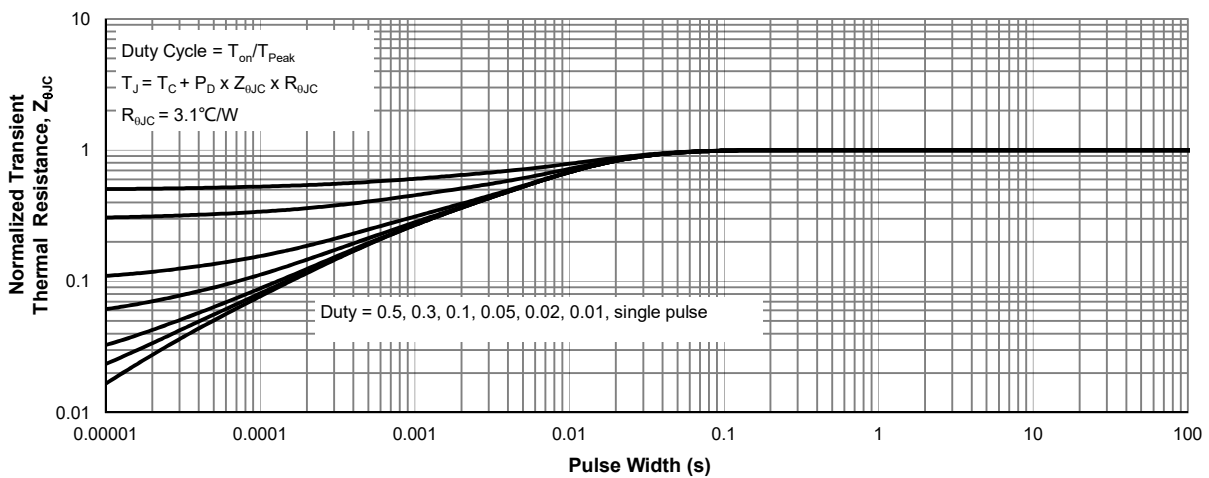
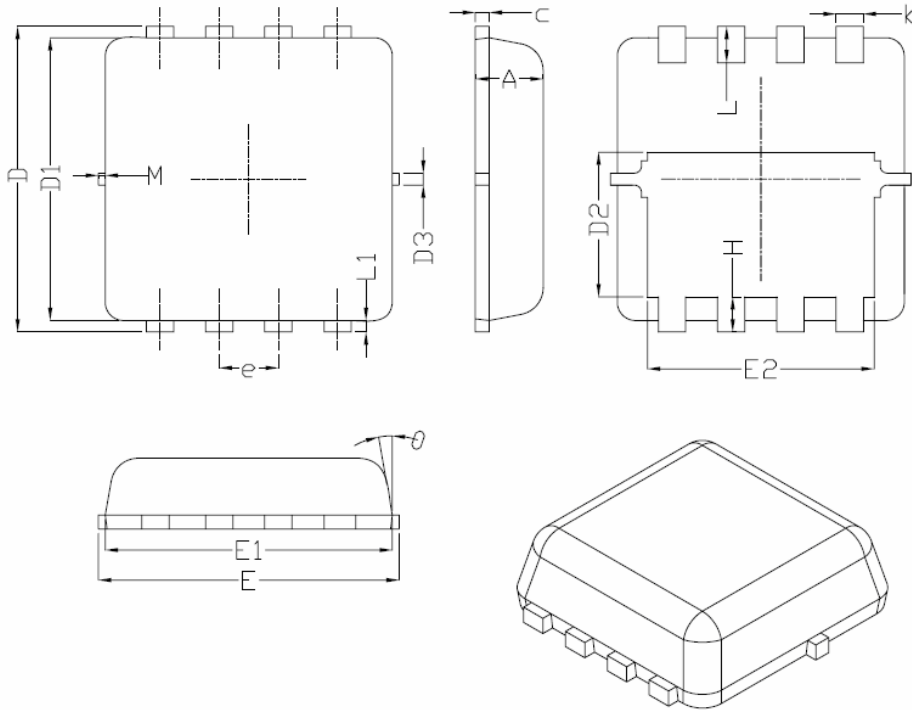


Figure 11: Normalized Maximum Transient Thermal Impedance

PDFN3x3 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.48	1.58	1.68
D3	-	0.13	-
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BS		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	-	0.13	-
M	*	*	0.15
θ		10°	12°