

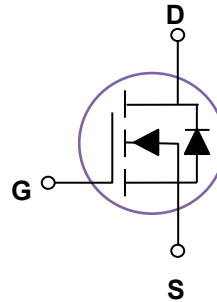
General Description

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 $V_{GS}=10V$)	275A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	0.9m Ω (Typ)
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	1.3m Ω (Typ)

PDFN5*6



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°C	I_D	275	A
	TC=100°C	I_D	174	A
Drain Current – Pulsed		I_{DM}	777	A
Maximum Power Dissipation		P_D	278	W
Single pulse avalanche energy ⁽¹⁾		E_{AS}	480	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	$R_{\theta Jc}$		0.78	°C /W
Thermal Resistance junction-to-Ambient	$R_{\theta JA}$		90	°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	1.5	2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A		0.9	1.2	mΩ
		V _{GS} =4.5V, I _D =15A		1.3	1.7	mΩ
gfs	Forward Transconductance	V _{DS} =5V , I _D =20A		120		S
DYNAMIC PARAMETERS						
C _{iSS}	Input Capacitance	V _{DS} =30V,V _{GS} =0V, F=1.0MHz		6338		pF
C _{oSS}	Output Capacitance			2157		pF
C _{rSS}	Reverse Transfer Capacitance			34		pF
SWITCHING PARAMETERS						
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V,I _D =1A, V _{GS} =10V, R _G =3.3Ω		17		nS
t _r	Turn-on Rise Time			77		nS
t _{d(off)}	Turn-Off Delay Time			159		nS
t _f	Turn-Off Fall Time			113		nS
Q _g	Total Gate Charge	V _{DS} =30V,I _D =50A, V _{GS} =10V		102		nC
Q _{gs}	Gate-Source Charge			17		nC
Q _{gd}	Gate-Drain Charge			16		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		3.0		Ω
Drain-Source Diode Characteristics						
T _{rr}	Reverse Recovery Time	V _{GS} =10V,I _S =20A , di/		77		nS
Q _{rr}	Reverse Recovery Charge	dt=100A/μs T _J =25°C		108		nC

Note:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=30V, V_{GS}=10V, L=0.6mH, 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

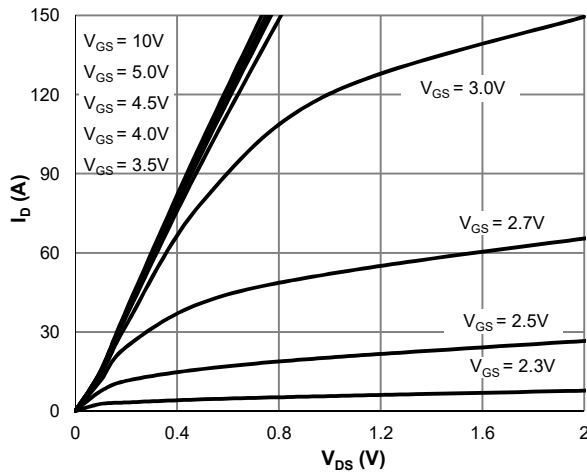


Figure 1: Saturation Characteristics

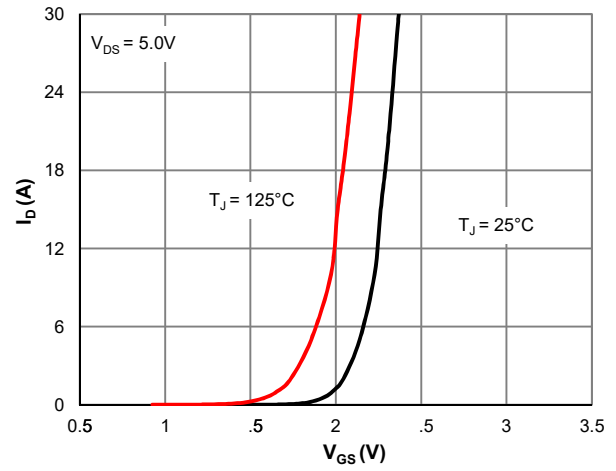


Figure 2: Transfer Characteristics

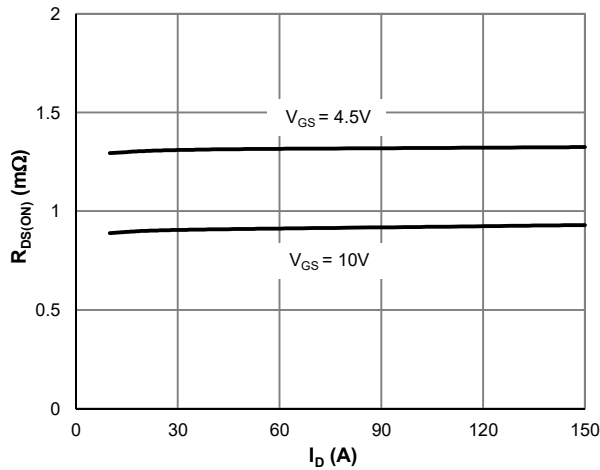


Figure 3: $R_{DS(ON)}$ vs. Drain Current

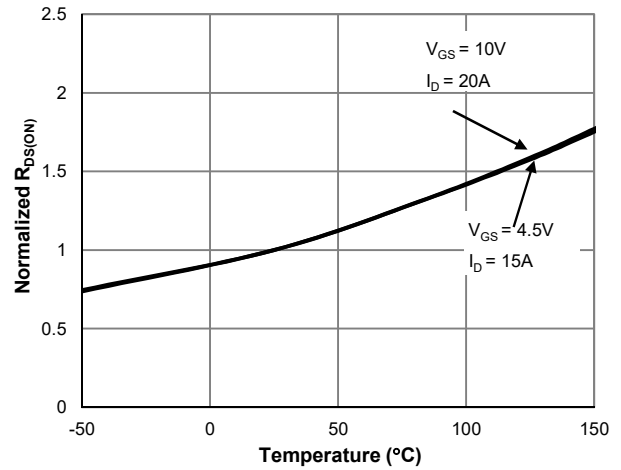


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

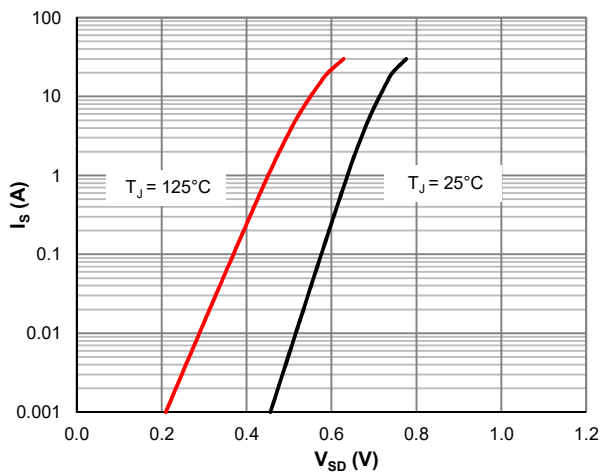


Figure 5: Body-Diode Characteristics

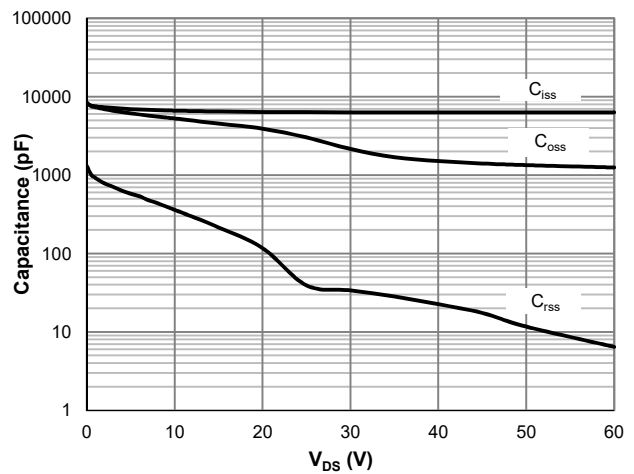


Figure 6: Capacitance Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

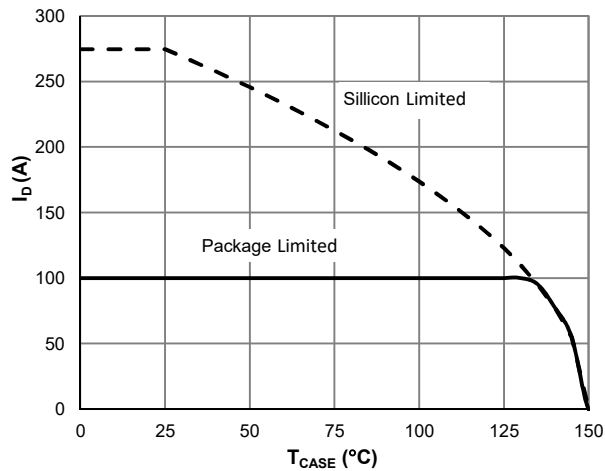


Figure 7: Current De-rating

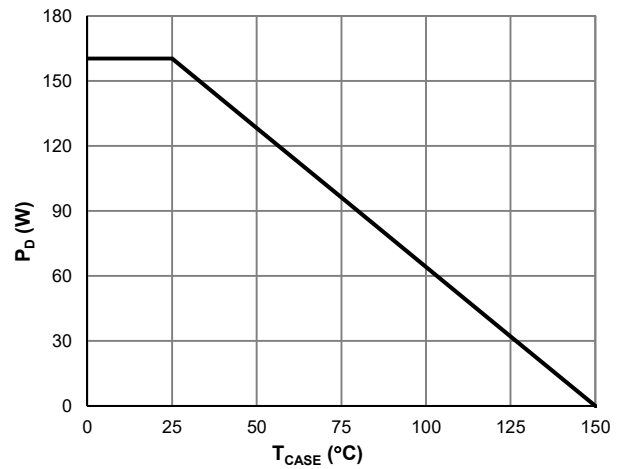


Figure 8: Power De-rating

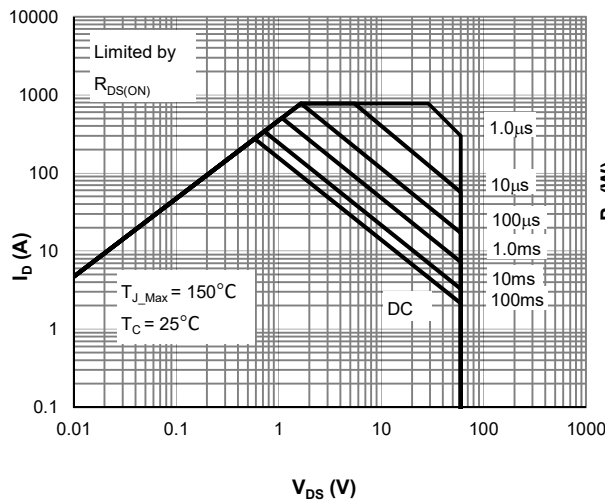


Figure 9: Maximum Safe Operating Area

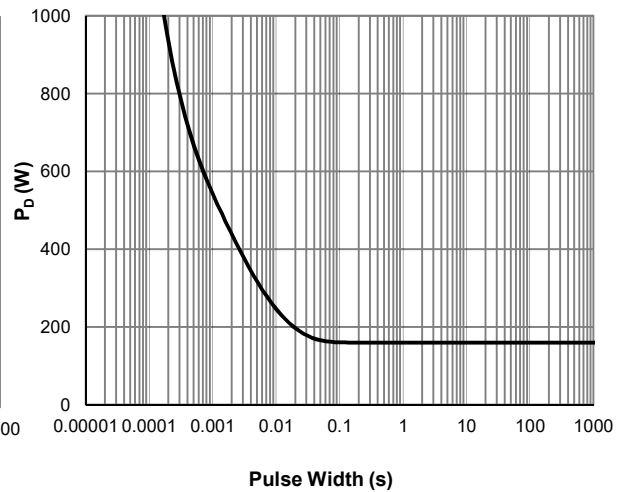


Figure 10: Single Pulse Power Rating, Junction-to-Case

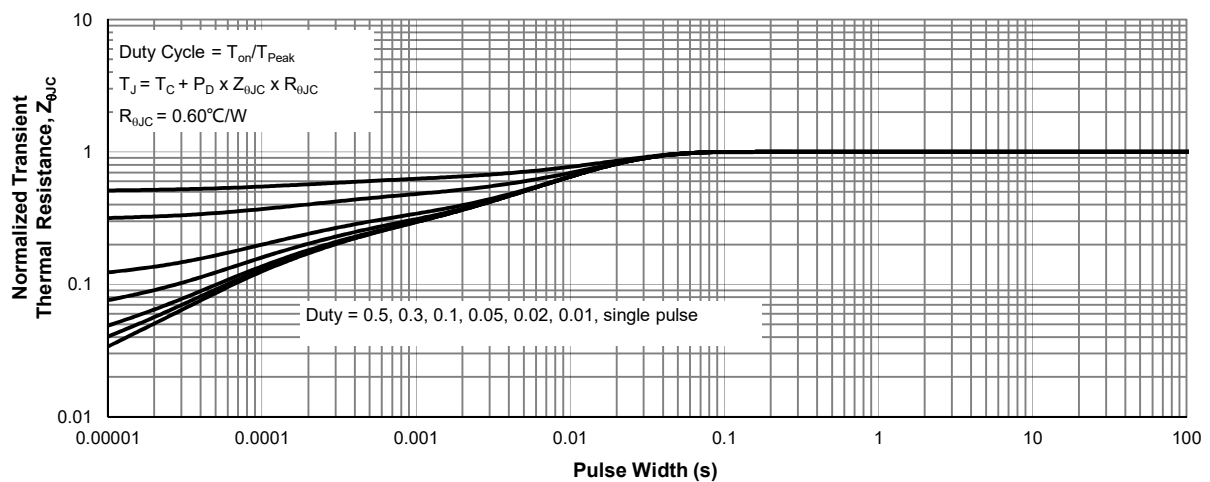
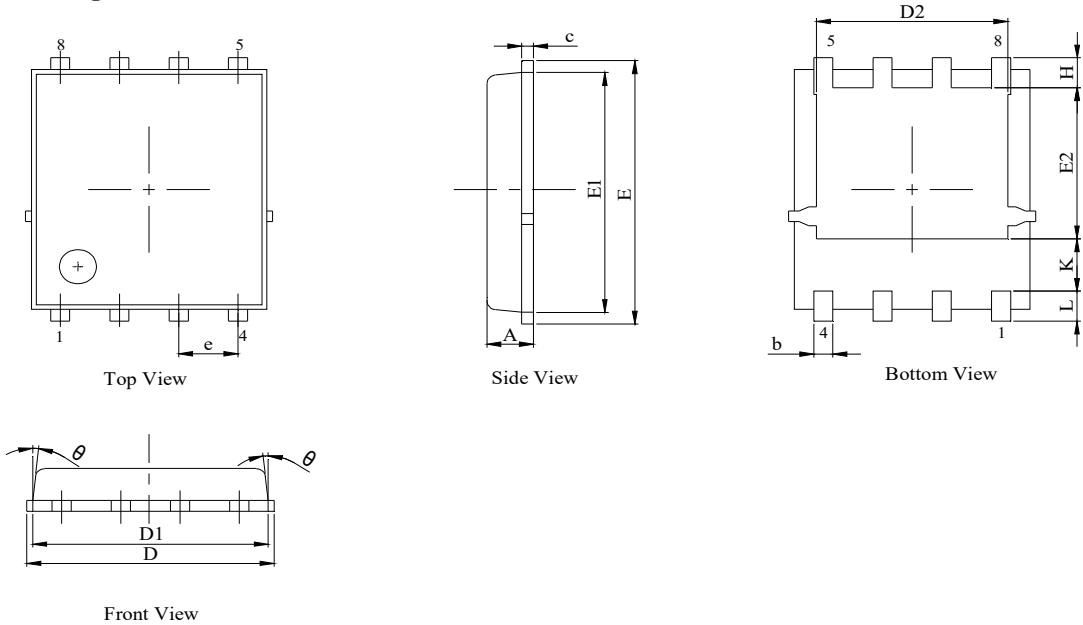


Figure 11: Normalized Maximum Transient Thermal Impedance

PDFN5*6 PACKAGE INFORMATION

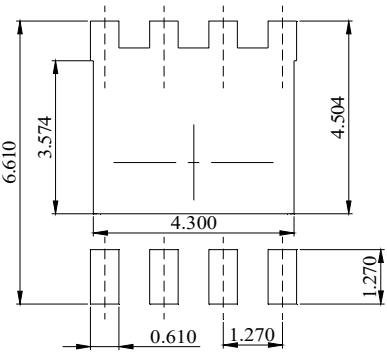
Package Outline



- NOTES:
- 1. Dimension and tolerance per ASME Y14.5M, 1994.
 - 2. All dimensions in millimeter (angle in degree).
 - 3. Dimensions D1 and E1 do not include mold flash protrusions or gate burrs.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.31	0.41	0.51
c	0.20	0.25	0.30
D	5.00	5.20	5.40
D1	4.95	5.05	5.15
D2	4.00	4.10	4.20
E	6.05	6.15	6.25
E1	5.50	5.60	5.70
E2	3.42	3.53	3.63
e	1.27BSC		
H	0.60	0.70	0.80
L	0.50	0.70	0.80
θ	-	-	10°

Recommended Soldering Footprint



DIMENSIONS:MILLIMETERS