

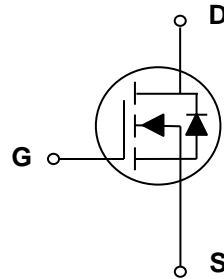
General Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS 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}	30V
I_D (at $V_{GS}=10V$)	245A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	0.85m Ω (Typ)

PDFN5x6



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

Parameter	Symbol	Maximum	Units	
Drain-Source Voltage	V_{DS}	30	V	
Gate-Source Voltage	V_{GS}	± 20	V	
Drain Current-Continuous	TC=25 $^\circ\text{C}$	I_D	245	A
	TC=100 $^\circ\text{C}$	I_D	155	A
Drain Current – Pulsed	I_{DM}	540	A	
Single Pulse Avalanche Energy	EAS	206	mJ	
Maximum Power Dissipation	P_D	96	W	
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	$R_{\theta Jc}$		0.9	$^\circ\text{C}/\text{W}$
Thermal Resistance junction-to-Ambient	$R_{\theta JA}$		62	$^\circ\text{C}/\text{W}$

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	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, 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		0.85	1.1	mΩ
		V _{GS} =4.5V, I _D =10A		1.3	1.7	mΩ
DYNAMIC PARAMETERS						
C _{ISS}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, F=1.0MHz		4185		pF
C _{OSS}	Output Capacitance			2861		pF
C _{RSS}	Reverse Transfer Capacitance			233		pF
SWITCHING PARAMETERS						
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V V _{DD} =15V I _D =15A R _{GEN} =3Ω		6.2		nS
t _r	Turn-on Rise Time			7.8		nS
t _{d(off)}	Turn-Off Delay Time			35		nS
t _f	Turn-Off Fall Time			20		nS
Q _g	Total Gate Charge	V _{DS} =15V, I _D =20A, V _{GS} =10V		47.6		nC
Q _{gs}	Gate-Source Charge			9.63		nC
Q _{gd}	Gate-Drain Charge			13.5		nC
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =1A		0.7	1.3	V
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.8		Ω

Note:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≅ 300us , duty cycle ≅ 2%.
3. Essentially independent of operating temperature.
4. V_{DD}=20V, I_{AR}=32A, L=0.5mH, R_G=25Ω, Starting T_J=25°C.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

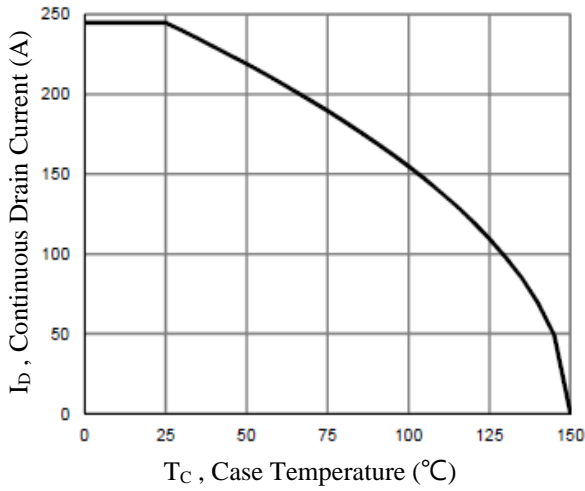


Fig.1 Continuous Drain Current vs. TC

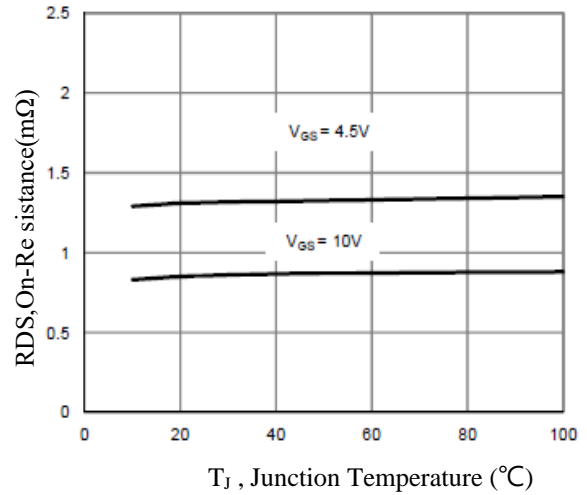


Fig.2 Normalized RDSON vs. TJ

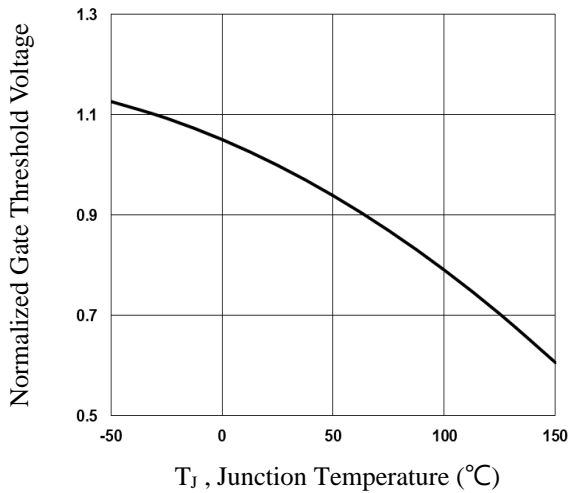


Fig.3 Normalized V_{th} vs. TJ

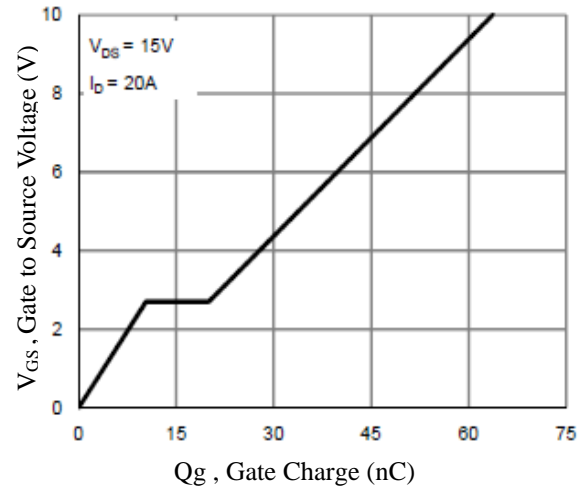


Fig.4 Gate Charge Characteristics

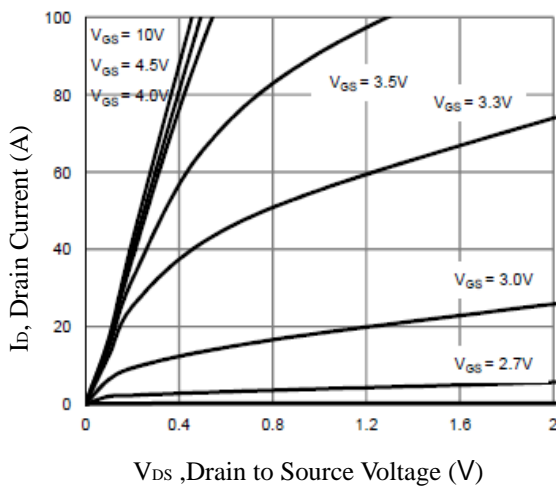


Fig.5 Typical Output Characteristics

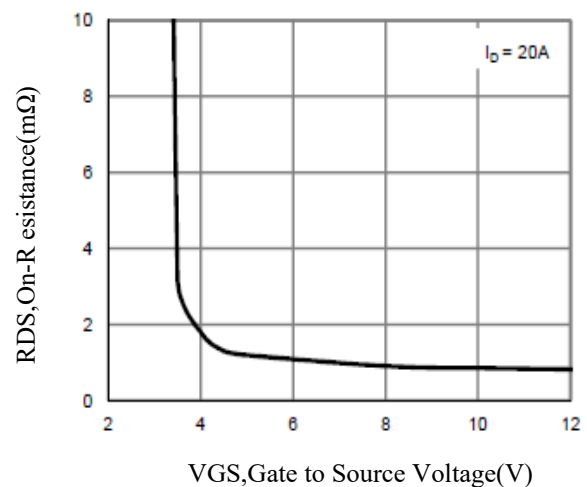


Fig.6 Turn-On Resistance vs. V_{GS}

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

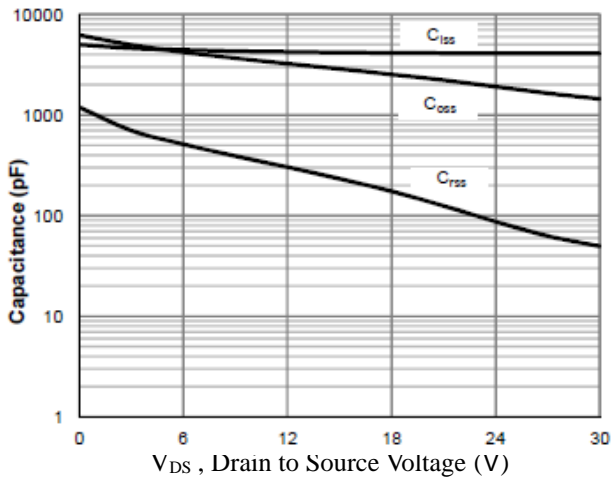


Fig.7 Capacitance Characteristics

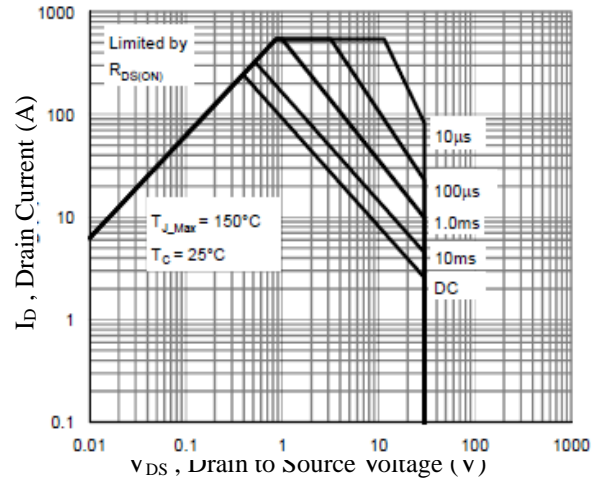


Fig.8 Maximum Safe Operation Area

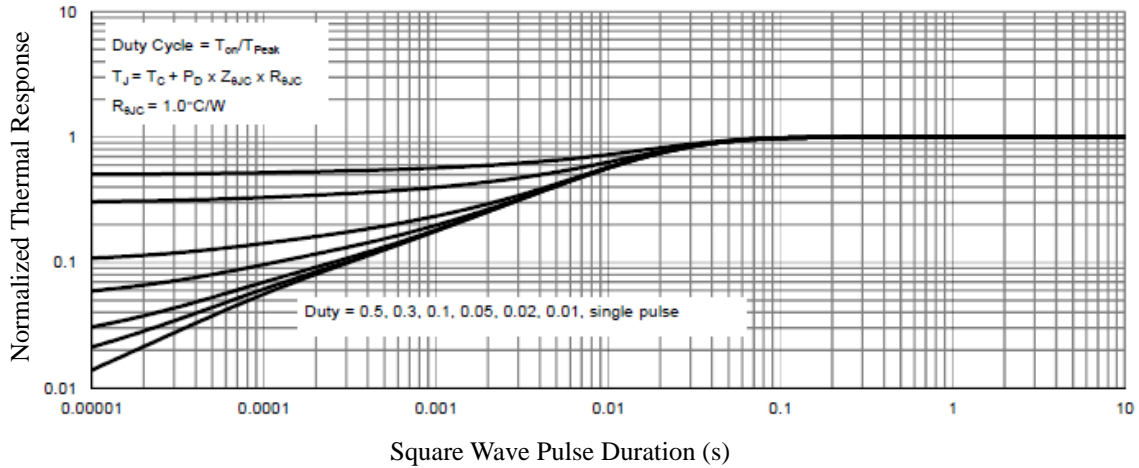


Fig.9 Normalized Transient Impedance

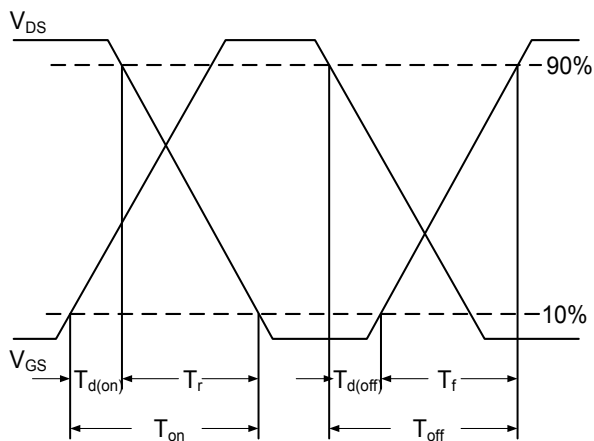


Fig.10 Switching Time Waveform

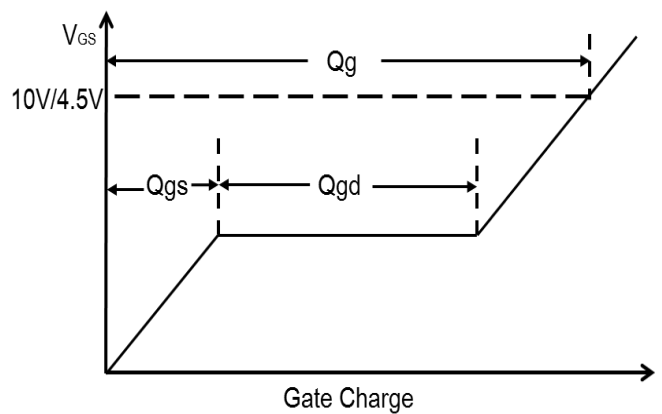
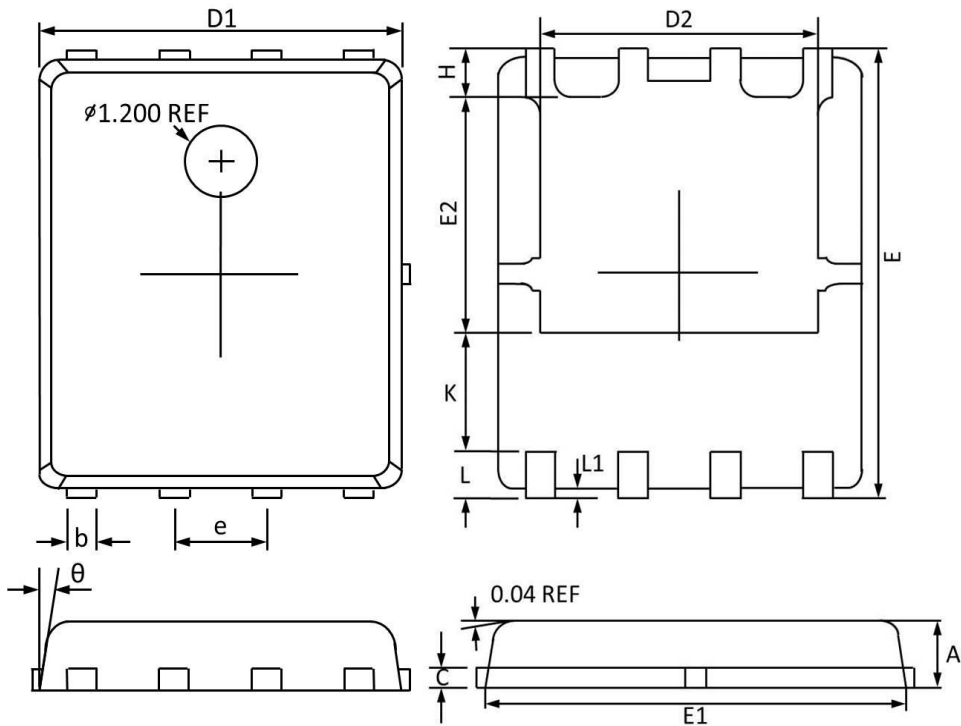


Fig.11 Gate Charge Waveform

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°