

General Description

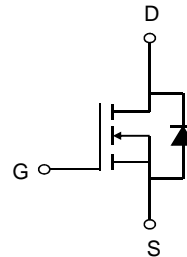
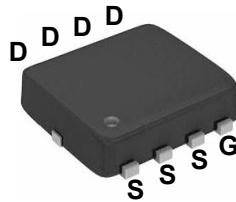
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

Features

V_{DS}	30V
I_D (at $V_{GS}=10V$)	30A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	6.0m Ω (Typ)
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	9.5m Ω (Typ)

100% UIS TESTED!
100% ΔV_{ds} TESTED!

PDFN3*3



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	50	A
	TC=100 $^\circ\text{C}$	I_D	30	A
Drain Current – Pulsed	I_{DM}	240	A	
Single pulse avalanche energy	E_{AS}	100	mJ	
Maximum Power Dissipation	P_D	35	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	$R_{\theta Jc}$		3.6	$^\circ\text{C}/\text{W}$
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	1.0	1.6	2.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =16A		6.0	8.5	mΩ
		V _{GS} =4.5V, I _D =8A		9.5	13.0	mΩ
DYNAMIC PARAMETERS						
C _{ISS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, F=1.0MHz		1270		pF
C _{OSS}	Output Capacitance			132		pF
C _{RSS}	Reverse Transfer Capacitance			110		pF
SWITCHING PARAMETERS						
t _{d(on)}	Turn-on Delay Time	V _{GS} =10V V _{DS} =15V R _L =0.75Ω R _{GEN} =3Ω		12		nS
t _r	Turn-on Rise Time			18		nS
t _{d(off)}	Turn-Off Delay Time			27.6		nS
t _f	Turn-Off Fall Time			21		nS
Q _g	Total Gate Charge	V _{DS} =15V, I _D =20A, V _{GS} =4.5V		22		nC
Q _{gs}	Gate-Source Charge			4.6		nC
Q _{gd}	Gate-Drain Charge			3.3		nC
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =1A			1.2	V
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		2.5		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.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

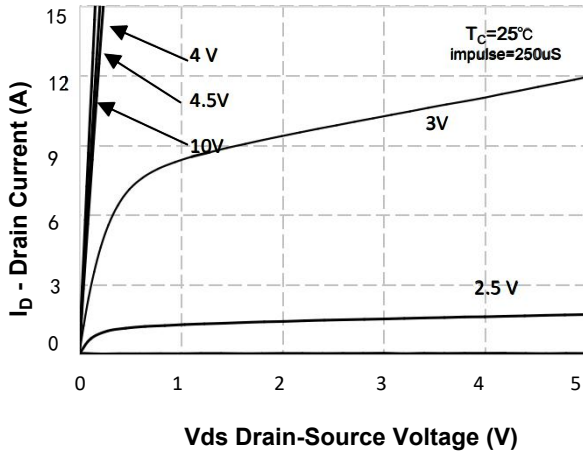


Figure 1. On-Region Characteristics

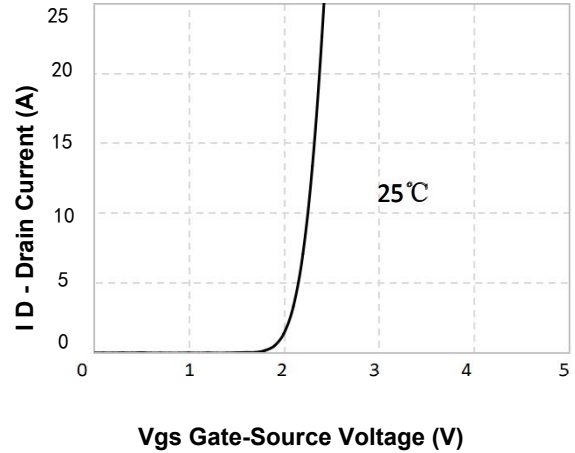


Figure 2. Transfer Characteristics

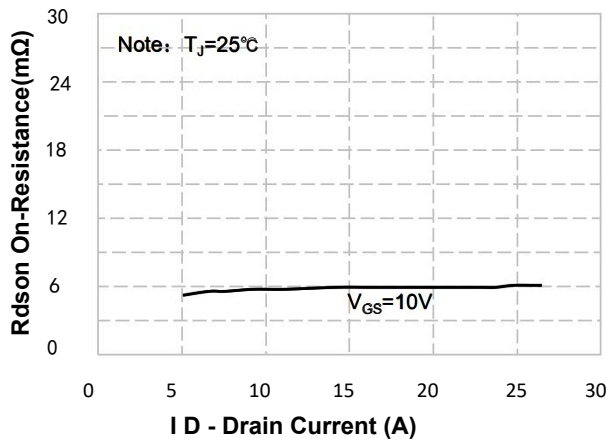


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

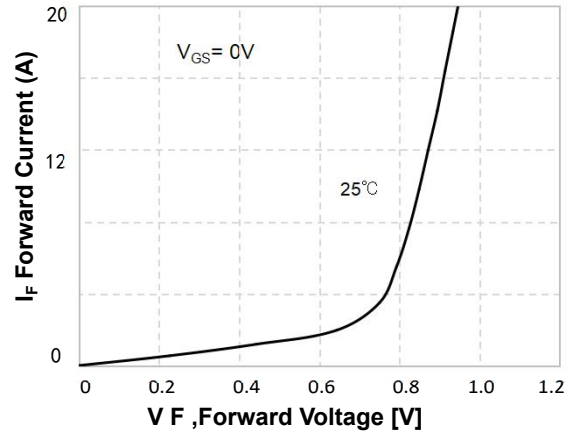


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

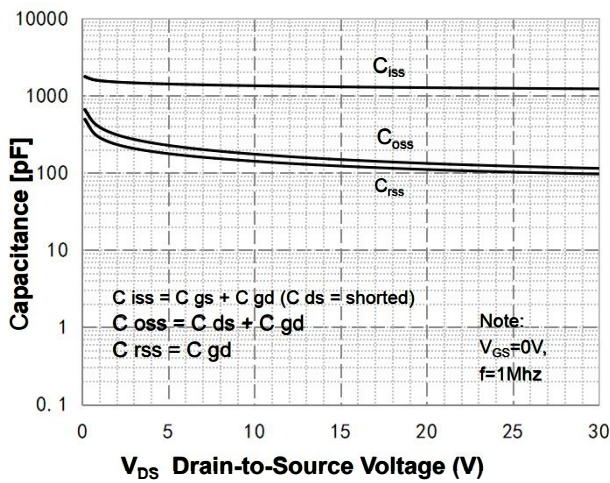


Figure 5. Capacitance Characteristics

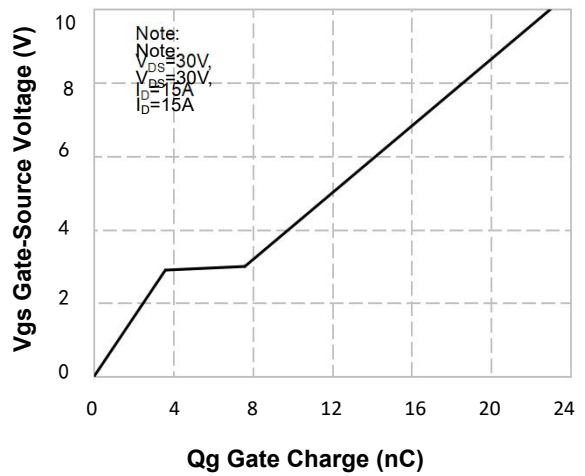


Figure 6. Gate Charge Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

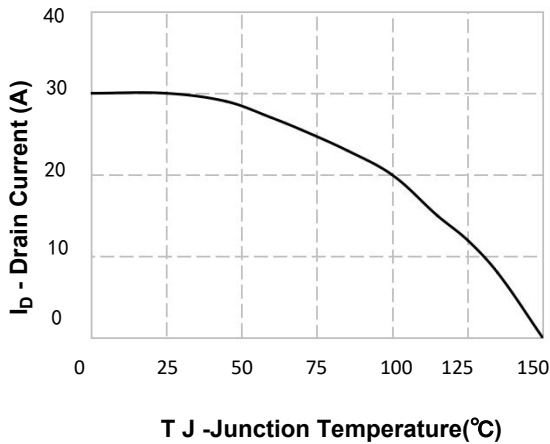


Figure 7. Maximum PContinuous Drain Current vs Case Temperature

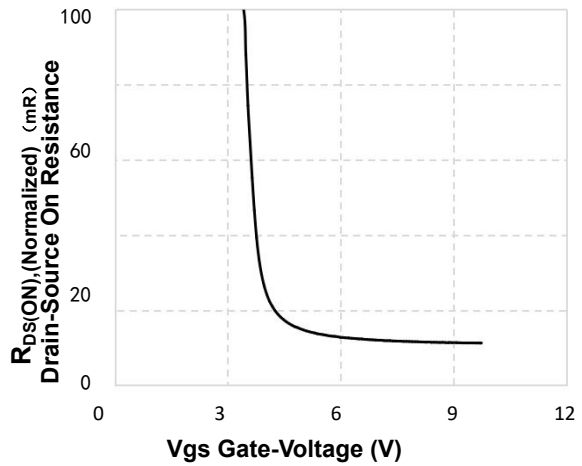


Figure 8. On-Resistance Variation vs Gate Voltage

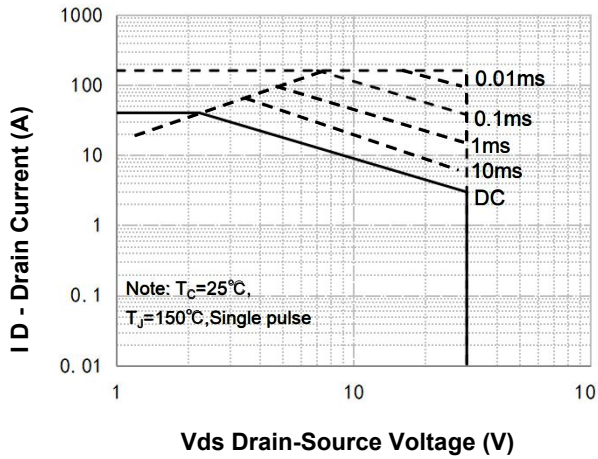


Figure 9. Maximum Safe Operating Area

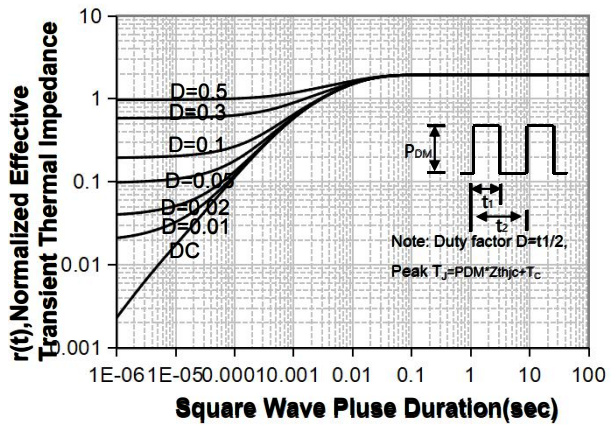


Figure 10. Transient Thermal Response Curve

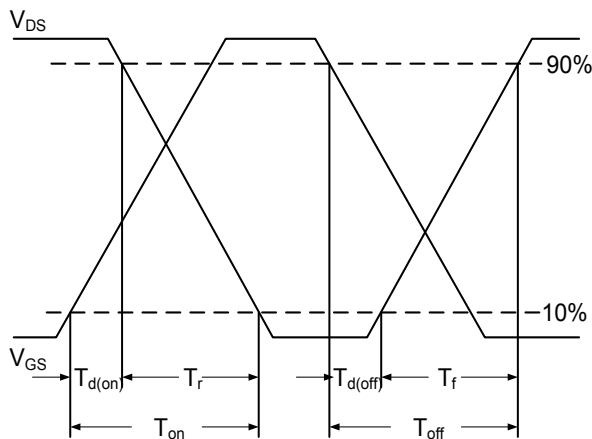


Fig.10 Switching Time Waveform

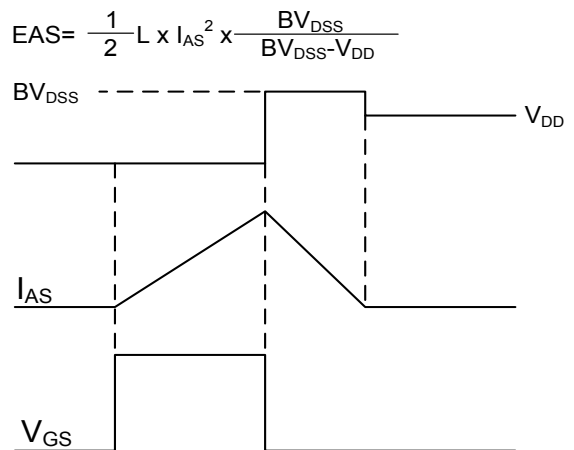
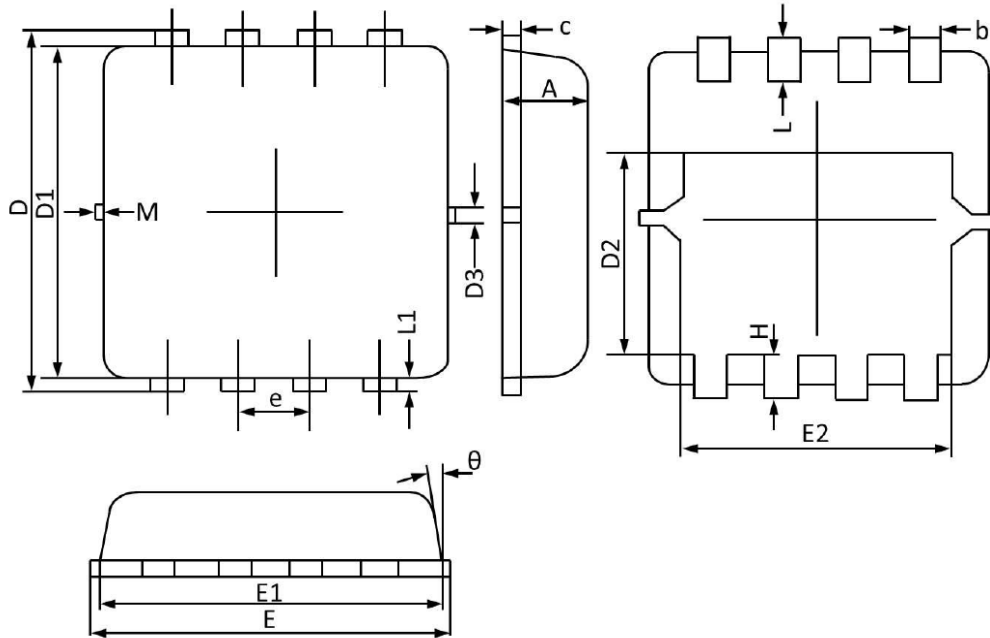


Fig.12 EAS Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

PDFN3x3 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.800	0.700	0.031	0.028
b	0.350	0.250	0.013	0.010
c	0.250	0.100	0.009	0.004
D	3.450	3.250	0.135	0.128
D1	3.200	3.000	0.125	0.119
D2	1.980	1.780	0.077	0.070
D3	0.130(REF)		0.005(REF)	
E	3.400	3.200	0.133	0.126
E1	3.200	3.000	0.125	0.119
E2	2.590	2.390	0.102	0.094
e	0.650(BSC)		0.026(BSC)	
H	0.500	0.300	0.019	0.011
L	0.500	0.300	0.019	0.011
L1	0.130(REF)		0.005(REF)	
θ	12°	0°	12°	0°
M	0.150(REF)		0.006(REF)	