

GENERAL FEATURES

- $V_{DS} = -30V, I_D = -50A$
- $R_{DS(ON)} = 8.0m\Omega @ V_{GS} = -10V \text{ typ}$
- $R_{DS(ON)} = 18m\Omega @ V_{GS} = -4.5V \text{ typ}$

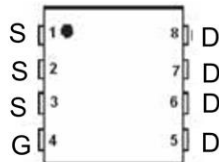
Application

- Load/Power Switching
- Interfacing Switching
- Logic Level Shift

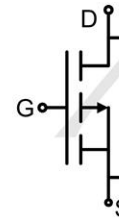
Package and Pin Configuration



PDFN3333 top view



Circuit diagram



Marking



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	20	V
Drain Current-Continuous	I_D	-50	A
Drain Current-Continuous($T_C = 100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	-32	A
Pulsed Drain Current	I_{DM}	-200	A
Maximum Power Dissipation	P_D	38	W
Single pulse avalanche energy ^(Note 5)	E_{AS}	125	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ\text{C}$

Electrical Characteristics (T_j=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250 μA	-30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-24V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = 20V, V _{DS} =0V	-	-	100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250 μA	-1.2	1.5	-2.5	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-30A	-	8.0	15	mΩ
		V _{GS} =-4.5V, I _D =-15A	-	18	24	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-18A	-	25	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, F=1.0MHz	-	3448	-	PF
Output Capacitance	C _{oss}		-	508	-	PF
Reverse Transfer Capacitance	C _{rss}		-	421	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-15V, I _D =-15A, R _L =1Ω	-	9.4	-	nS
Turn-on Rise Time	t _r		-	10.2	-	nS
Turn-Off Delay Time	t _{d(off)}	V _{GS} =-10V, R _G =3.3Ω	-	117	-	nS
Turn-Off Fall Time	t _f		-	24	-	nS
Total Gate Charge	Q _g	V _{DS} =-15V, I _D =-15A, V _{GS} =-4.5V	-	30	-	nC
Gate-Source Charge	Q _{gs}		-	10	-	nC
Gate-Drain Charge	Q _{gd}		-	10.4	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =-1A	-	-	-1	V
Diode Forward Current (Note 2)	I _S		-	-	-50	A

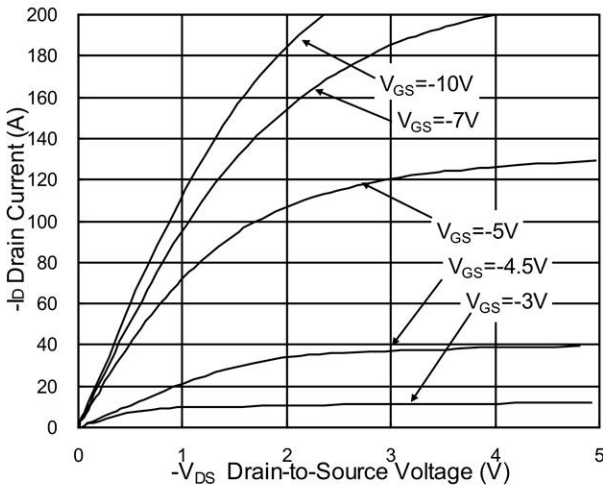


Fig.1 Typical Output Characteristics

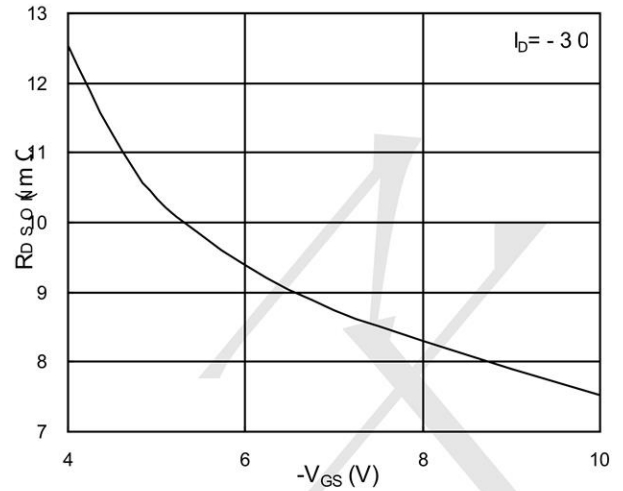


Fig.2 On-Resistance v.s Gate-Source

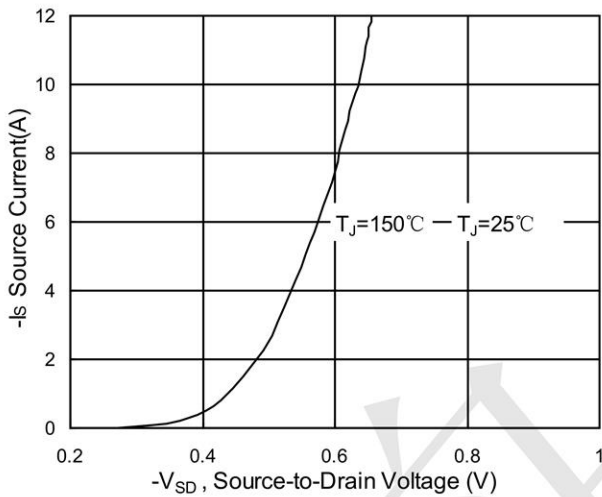


Fig.3 Forward Characteristics Of Reverse

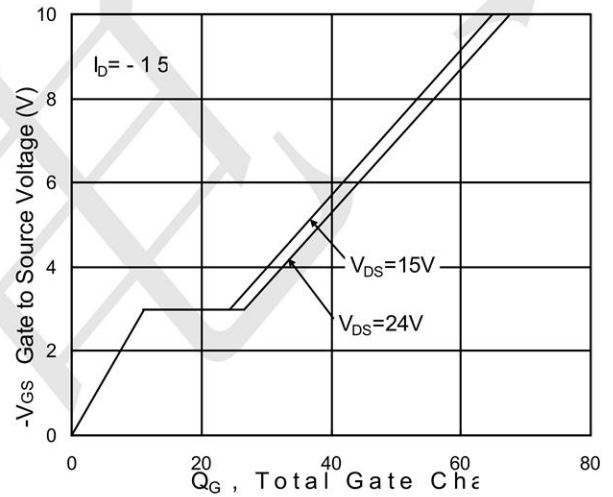


Fig.4 Gate-Charge Characteristics

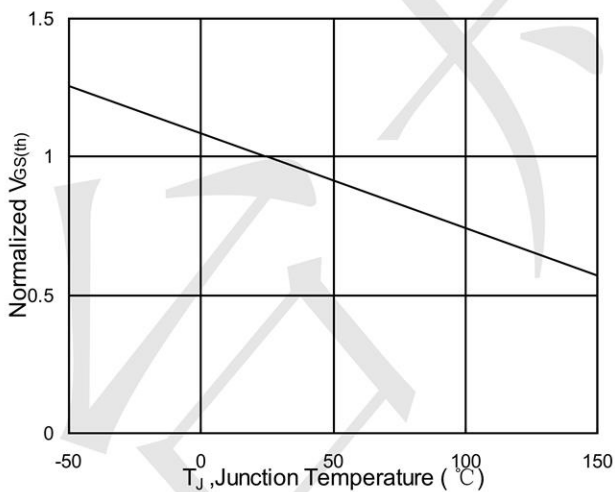


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

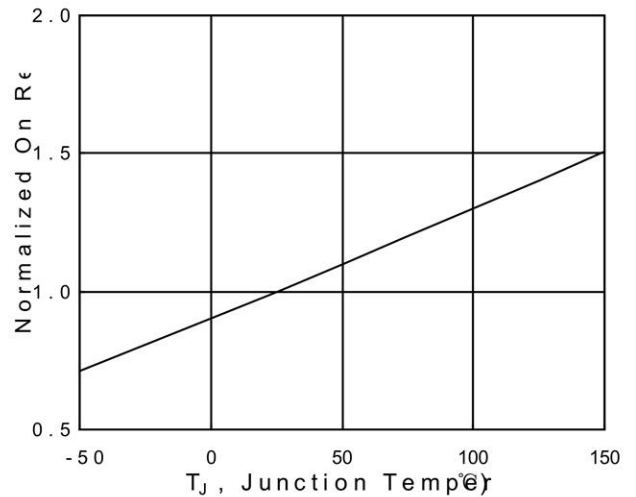


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

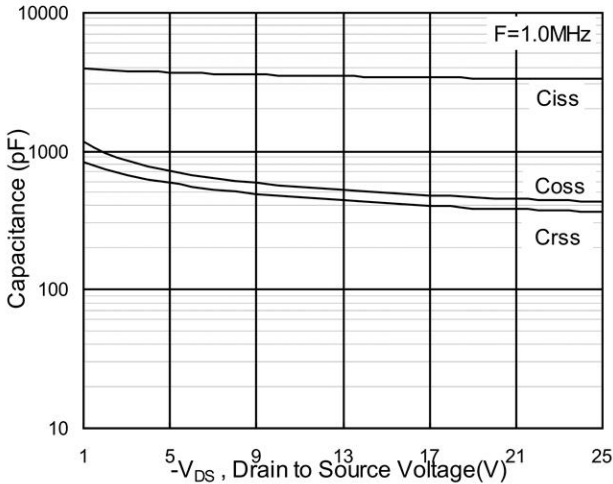


Fig.7 Capacitance

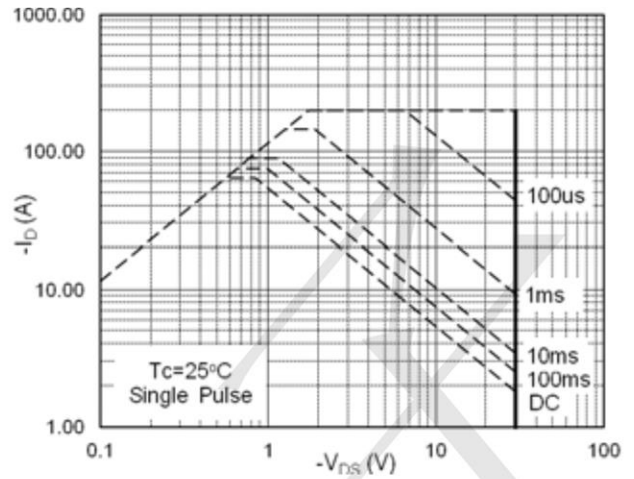


Fig.8 Safe Operating Area

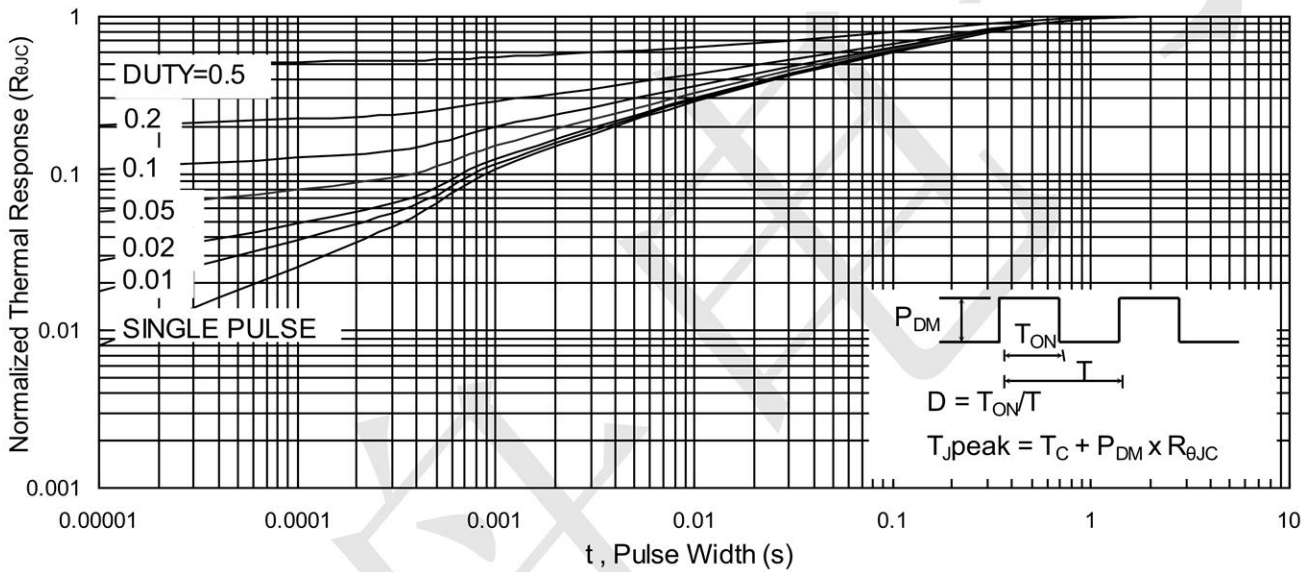


Fig.9 Normalized Maximum Transient Thermal Impedance

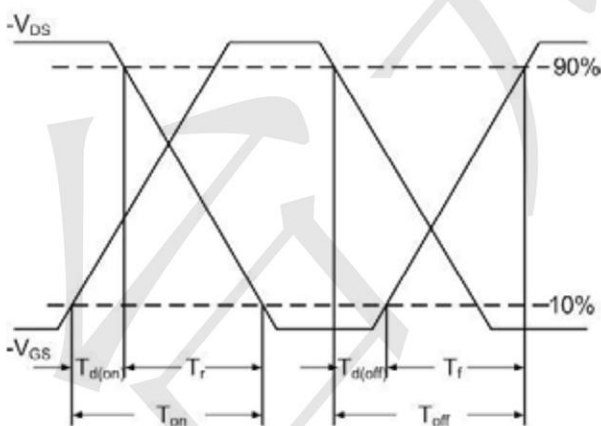


Fig.10 Switching Time Waveform

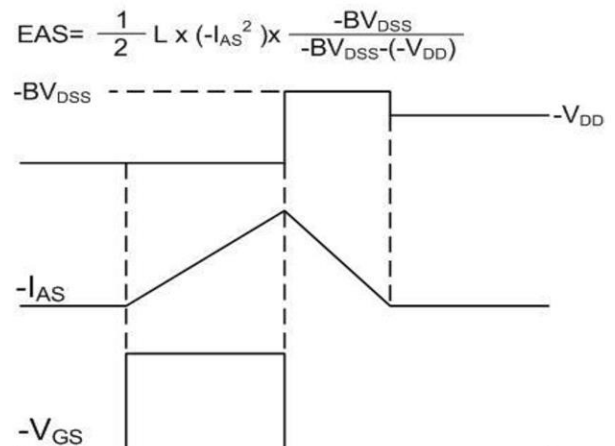
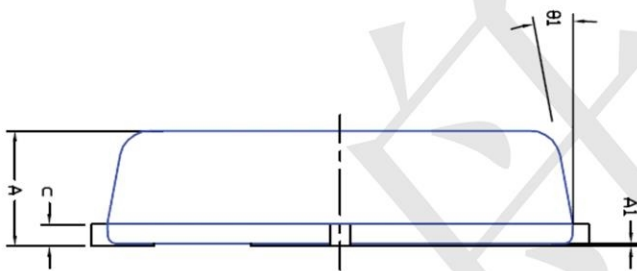
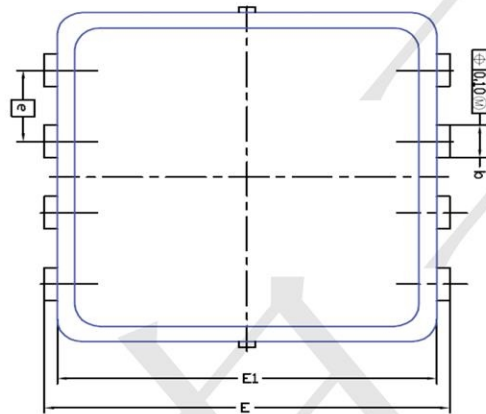
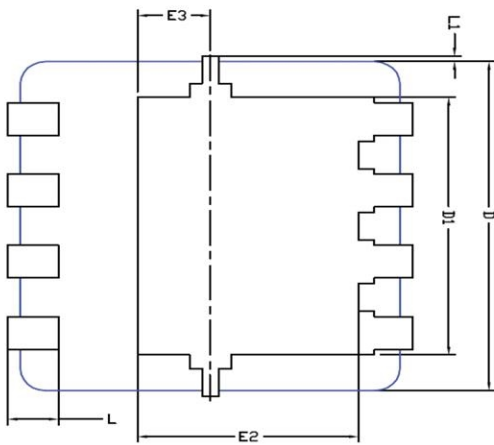


Fig.11 Unclamped Inductive Switching Waveform

PDFN3333 Package Information



DIM.	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.700	0.80	0.900	0.0276	0.0315	0.0354
A1	0.00	---	0.05	0.000	---	0.002
b	0.24	0.30	0.35	0.009	0.012	0.014
c	0.10	0.152	0.25	0.004	0.006	0.010
D	3.00 BSC			0.118 BSC		
D1	2.35 BSC			0.093 BSC		
E	3.20 BSC			0.126 BSC		
E1	3.00 BSC			0.118 BSC		
E2	1.75 BSC			0.069 BSC		
E3	0.575 BSC			0.023 BSC		
e	0.65 BSC			0.026 BSC		
L	0.30	0.40	0.50	0.0118	0.0157	0.0197
L1	0	---	0.100	0	---	0.004
θ_1	0°	10°	12°	0°	10°	12°