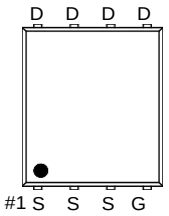
P -Channel High Density Trench MOSFET

Features:

- Super high dense cell trench design for low $R_{DS(on)}$.
- Rugged and reliable.
- Surface Mount package.

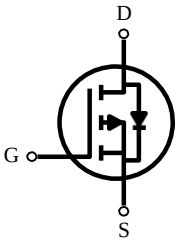
PDFN3333



G. GATE
D. DRAIN
S. SOURCE

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(on)}$ (mΩ) Max	I_D
-60V	33 @ V_{GS} = -10V	-20A
	40 @ V_{GS} = -4.5V	



ABSOLUTE MAXIMUM RATINGS (TA = 25 ℃ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous	TC=25℃	I_D	-20	A
	TC=100℃		-13	
Pulsed Drain Current (Note 1)		I_{DM}	-78	
Avalanche Current		I_{AS}	-19	
Single Pulse Avalanche Energy	L = 0.1mH	E_{AS}	26	mJ
Maximum Power Dissipation (Note 1)	TC=25℃	P_D	30	W
	TC=100℃		12	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	- 55 to 150	℃

TYPICAL THERMAL CHARACTERISTICS (Note 1)

Thermal Resistance,Junction-to-Case	R_{thJC}	4.3	℃/W
Thermal Resistance Junction-Ambient	R_{thJA}	48	℃/W

Note：

1. Pule width limited by maximum junction temperature.

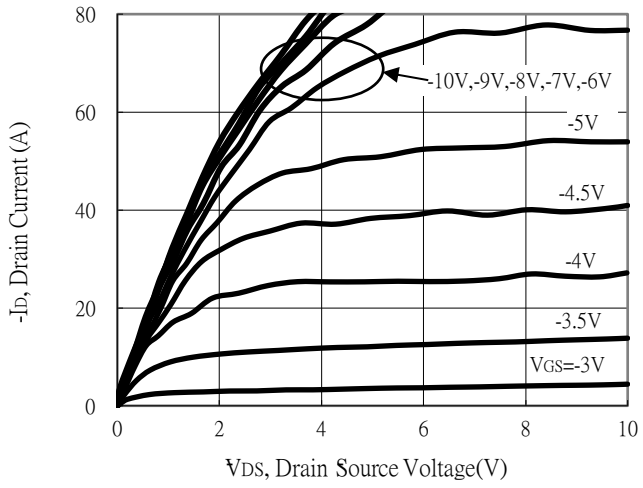
ELECTRICAL CHARACTERISTICS (TA = 25 ℃ unless otherwise noted)

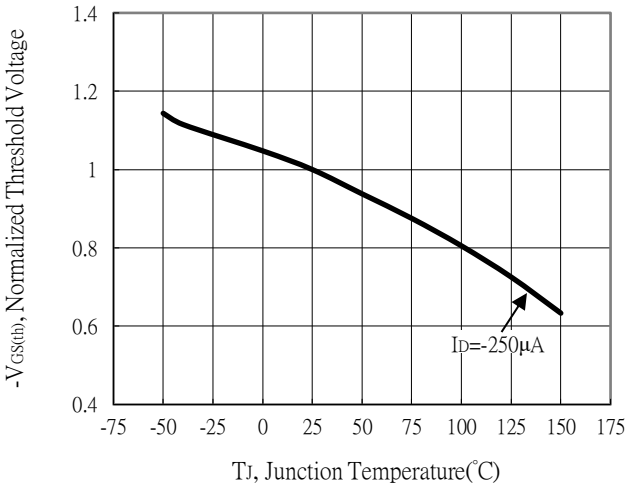
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V , I_D = -250uA	-60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -48V , V_{GS} = 0V, Tj = 25℃			-1	uA
		V_{DS} = -48V , V_{GS} = 0V , Tj = 125℃			-30	
Gate-Body Leakage	I_{GSS}	V_{GS} = ±20V , V_{DS} = 0V			±100	nA
ON CHARACTERISTICS (Note 2)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = VGS , I_D = 250uA	-1	-1.5	-2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} = -10V , I_D = -8A		33	42	mΩ
		V_{GS} = -4.5V , I_D = -6A		40	52	mΩ
Forward Transconductance	gfs	V_{DS} = -10V , I_D = -12A		18		S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS} = -30V , V_{GS} = 0V f = 1.0MHz		1348		pF
Output Capacitance	C_{OSS}			121		pF
Reverse Transfer Capacitance	C_{RSS}			88		pF
Gate Resisance	Rg	V_{DS} = 0V , V_{GS} = 0V , f = 1.0MHz		3.7		Ω
SWITCHING CHARACTERISTICS (Note 3)						
Turn-On Delay Time	$td_{(ON)}$	V_{DD} = -30V , I_D = -8A , V_{GS} = -10V R_{GS}= 1 Ω		12		nS
Rise Time	tr			11		nS
Turn-Off Delay Time	$td_{(OFF)}$			42		nS
Fall Time	tf			10		nS
Total Gate Charge (10V)	Qg	V_{DS} = -30BVDSS , I_D = -8A V_{GS} = -10V		26		nC
Total Gate Charge (4.5V)	Qg			18		nC
Gate-Source Charge	Qgs			5.1		nC
Gate-Drain Charge	Qgd			5.7		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Continuous Current	I_S			-19		A
Diode Forward Voltage (Note 2)	V_{SD}	V_{GS} = 0V , I_S = I_F		-0.8	-1.2	V

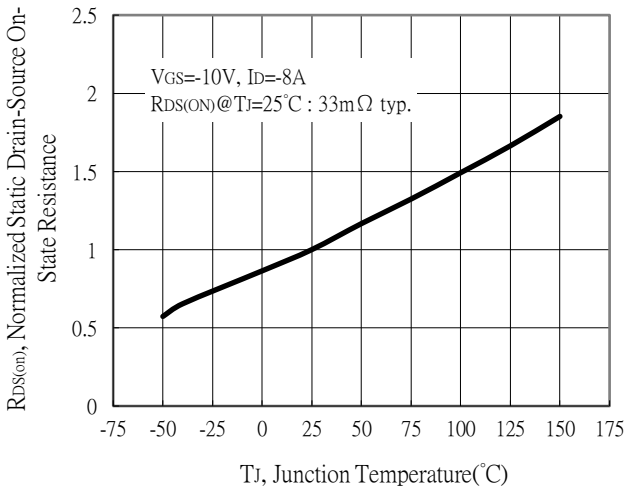
Note：

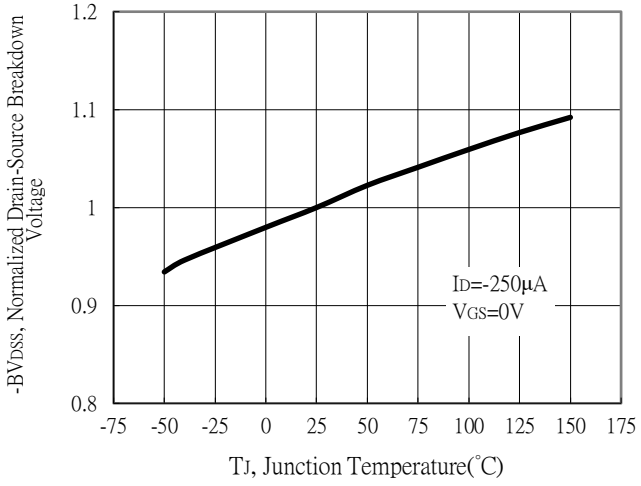
2. Pulse Test Pulse width ≤ 300usec , Duty Cycle ≤ 2%
3. Independent of operating production testing .

Typical Output Characteristics

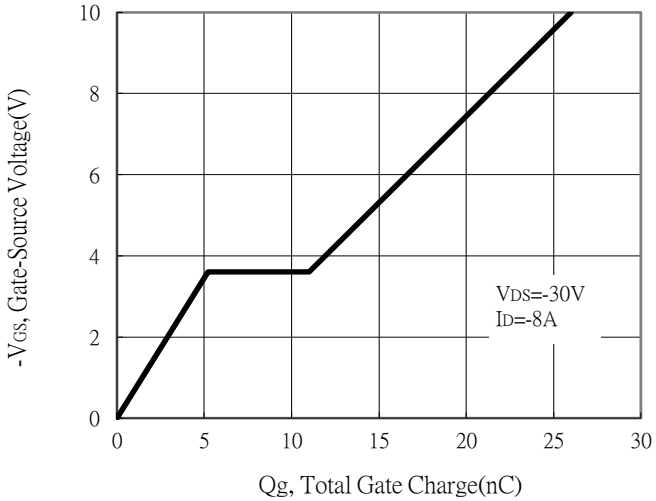


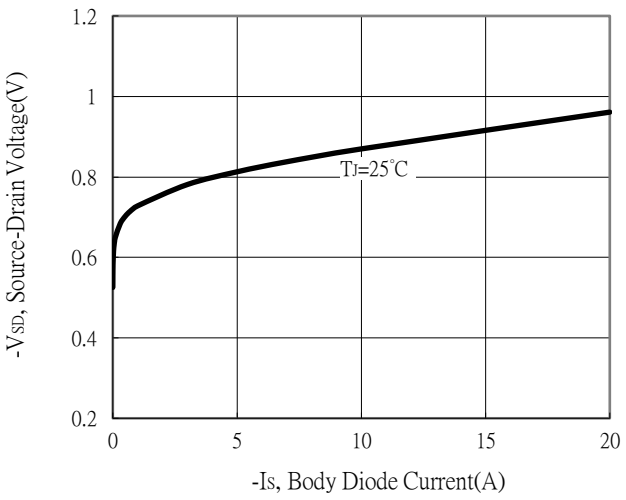




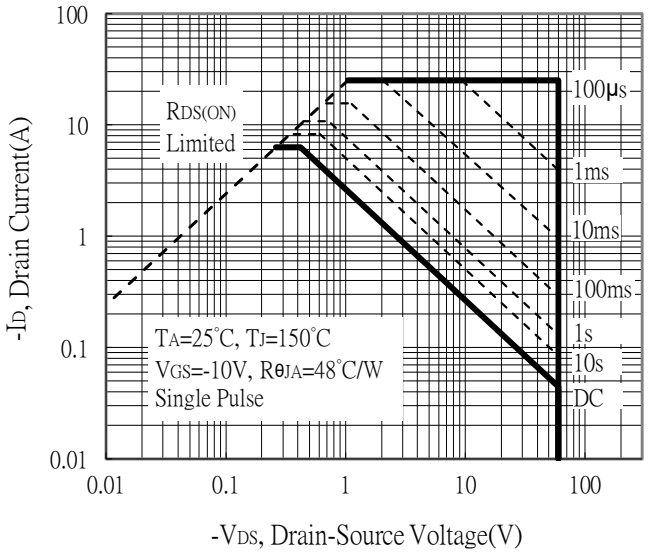


Gate Charge Characteristics

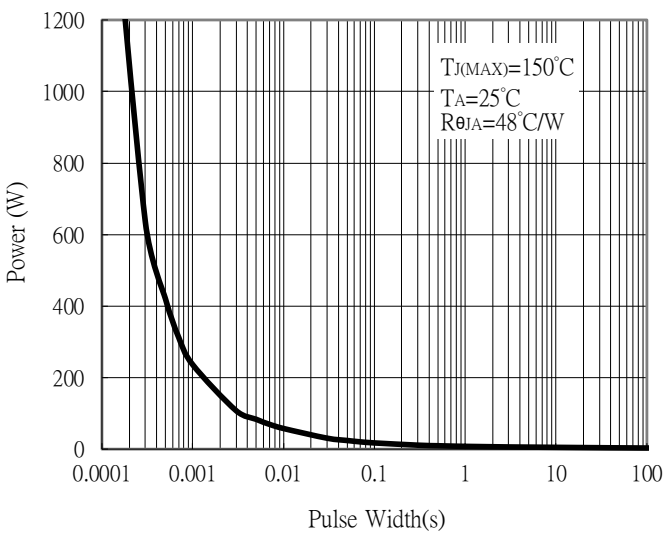




Maximum Safe Operating Area



Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves