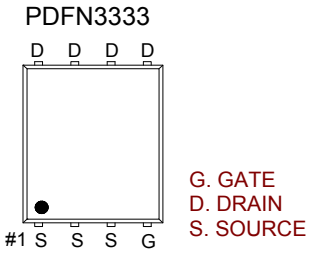
P -Channel High Density Trench MOSFET

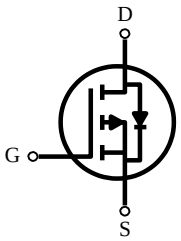
Features:

- Super high dense cell trench design for low RDS(on).
- Rugged and reliable.
- Surface Mount package.



PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(on)}$ (mΩ) Max	I_D
-30V	18 @ V_{GS}= -10V	-33A
	25 @ V_{GS}= -4.5V	



ABSOLUTE MAXIMUM RATINGS (TA = 25 °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 (Note 1)	T_C=25℃	I_D	-33	A
	T_C=70℃		-22	
Pulsed Drain Current (Note 2)		I_{DM}	-108	
Avalanche Current (Note 2)	L = 0.1mH	I_{AS}	-20	
Single Pulse Avalanche Energy (Note 2)		E_{AS}	33	mJ
Maximum Power Dissipation (Note 1)	T_C=25℃	P_D	23	W
	T_C=70℃		9.2	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	- 55 to 150	℃

TYPICAL THERMAL CHARACTERISTICS

Thermal Resistance	Symbol	Typical	Maximum	Units
Thermal Resistance Junction-to-Case (Note 1)	$R_{\theta JC}$		5.6	°C/W
Thermal Resistance,Junction-to-Ambient (Note 1)	$R_{\theta JA}$		62.5	°C/W

Note：

1. The value of R θJA is measured with the device mounted on 1 in FR-4 board with 2oz. Copper, in a still air environment with T A = 25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating

2. Repetitive rating, pulse width limited by junction temperature

3. The R θJA is the sum of the thermal impedence from junction to lead R θJL and lead to ambient

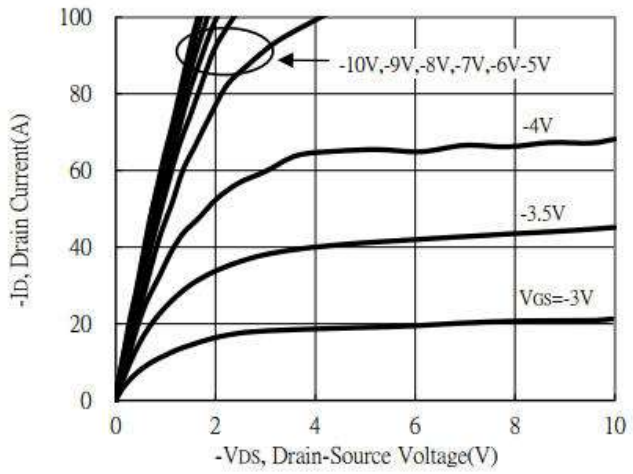
ELECTRICAL CHARACTERISTICS (TA = 25 °C unless otherwise noted)

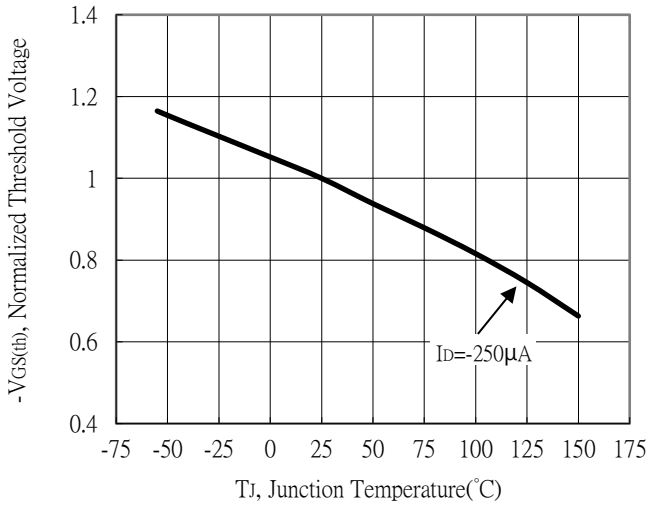
Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V , I_D = -250uA	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -24V , V_{GS} = 0V, Tj = 25℃			-1	uA
		V_{DS} = -24V , V_{GS} = 0V , Tj = 55℃			-30	
Gate-Body Leakage	I_{GSS}	V_{GS} = ±20V , V_{DS} = 0V			±100	nA
ON CHARACTERISTICS						
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 = -12A		13	18	mΩ
		V_{GS} = -4.5V , I_D = -9A		17	25	mΩ
Forward Transconductance (Note 3)	gfs	V_{DS} = -10V , I_D = -12A		21		S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{DS} = -15V , V_{GS} = 0V f = 1.0MHz		1420		pF
Output Capacitance	C_{OSS}			202		pF
Reverse Transfer Capacitance	C_{RSS}			187		pF
Gate Resistance	R_g	V_{DS} = -15V , V_{GS} = 0V , f = 1.0MHz		6		Ω
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$td_{(ON)}$	V_{DD} = -15V , V_{GS} = -10V R_{GS} = 6Ω , I_D = -12A		13		nS
Rise Time	tr			21		nS
Turn-Off Delay Time	$td_{(OFF)}$			62		nS
Fall Time	tf			19		nS
Total Gate Charge (4.5V)	Qg	V_{DS} = -15V , V_{GS}=-10V , I_D = -12A		12		nC
Total Gate Charge (10V)	Qg			28		nC
Gate-Source Charge	Qgs			5.4		nC
Gate-Drain Charge	Qgd			8.1		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Continuous Current	I_S				-21	A
Diode Forward Voltage	V_{SD}	V_{GS} = 0V , I_S = I_F		-0.8	-1.25	V

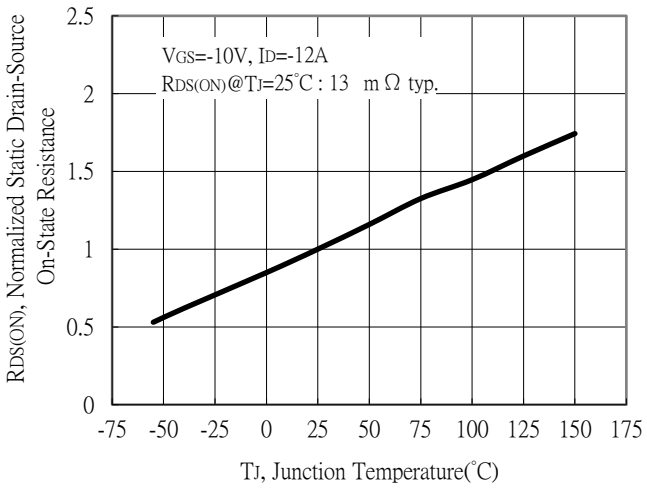
Note：

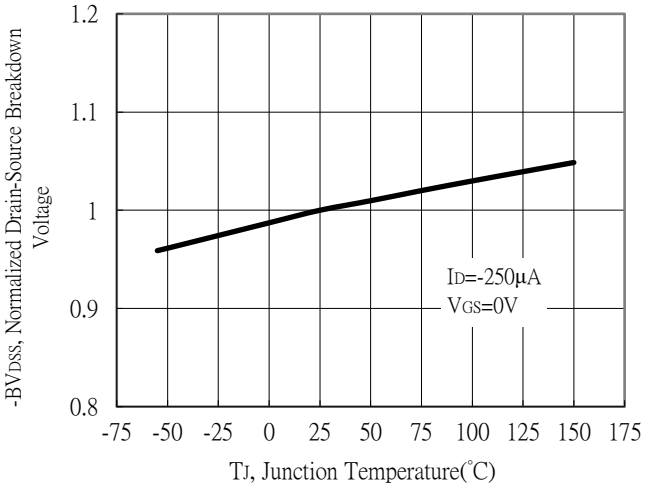
4. The static characteristics in Figures 1 to 6 are obtained using <300 μs pulses, duty cycle 0.5% max.
5. These tests are performed with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T curve provides a single pulse rating
6. The current rating is based on the t ≤ 10s thermal resistance rating.
7. EAR and IAR ratings are based on low frequency and duty cycles to keep T j=25C

Typical Output Characteristics

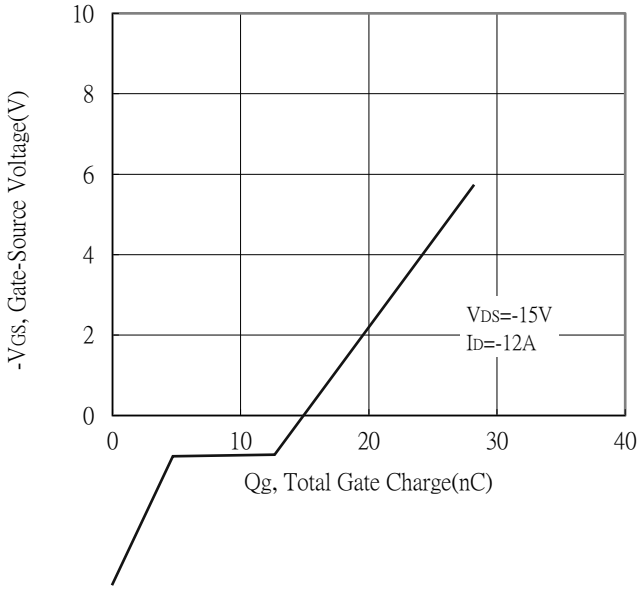


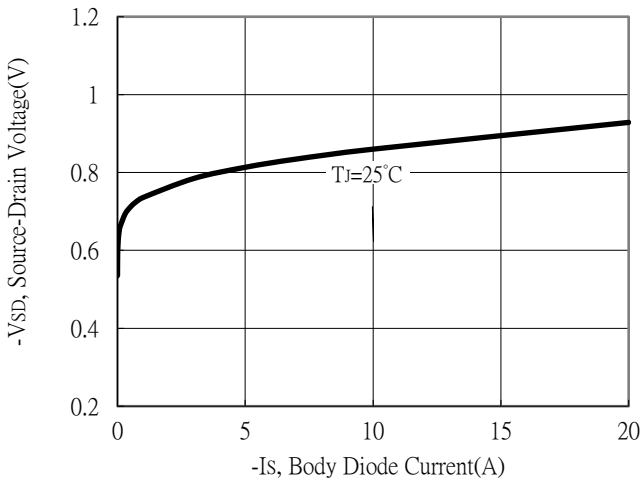






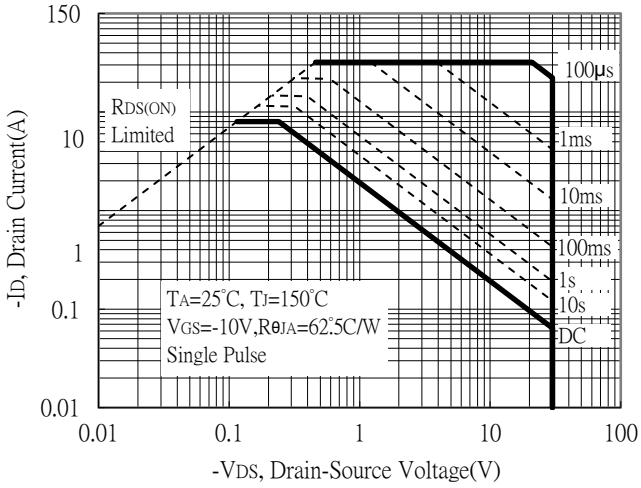
Gate Charge Characteristics



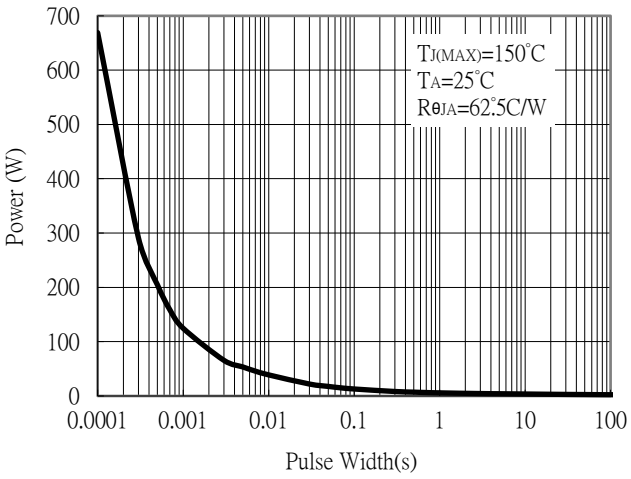


-ID, Drain Current(A)

Maximum Safe Operating Area



Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves