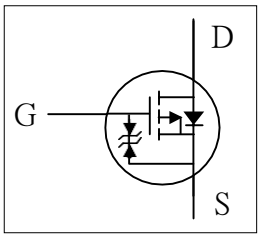
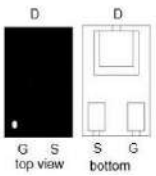
P-C hannel High Density Trench MOSFET



ESD PROTECTION DIODE

FBP1006 (TOP view)



1. GATE
2. DRAIN
3. SOURCE

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-20V	640mΩ	800mA

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TESTCONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_C = 25 °C	I_D	-800	mA
	T_C = 100 °C		-640	
Pulsed Drain Current [1]		I_{DM}	-2	A
Power Dissipation	T_C = 25 °C	P_D	0.69	W
	T_C = 100 °C		0.44	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-40 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		180	°C / W

[1]Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS(T_J = 25 °C, Unless Otherwise Noted)

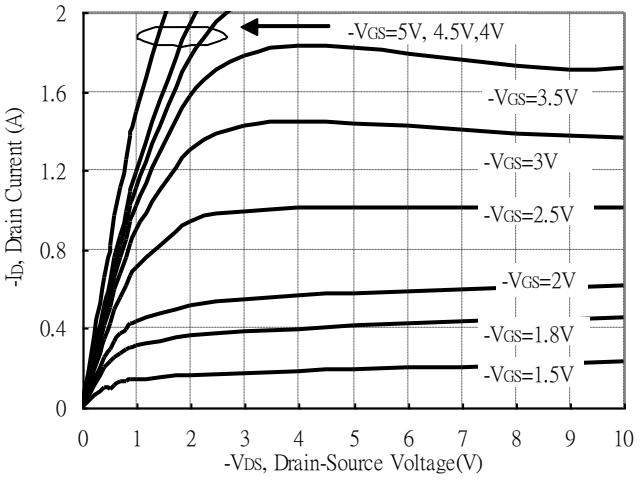
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 100μA	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 100μA	-0.5	-0.75	-1	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±16V			±30	μA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -16V, V_{GS} = 0V			1	μA
		V_{DS} = -16V, V_{GS} = 0V, T_J = 125 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS}= -10V, V_{GS} = -10V	-5			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -1.8V, I_D = -350mA		1300	1950	mΩ
		V_{GS} = -2.5V, I_D = -450mA		730	950	
		V_{GS} = -4.5V, I_D = -550mA		530	640	
Forward Transconductance[1]	g_{fs}	V_{GS} = -12V, I_D = -200mA		1		S

DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -25V, f = 1MHz		58		pF
Output Capacitance	C_{oss}			5.7		
Reverse Transfer Capacitance	C_{rss}			4.4		
Total Gate Charge[2]	Q_g	V_{DS} = -10$V_{(BR)DSS}$, V_{GS} = -4.5V, I_D = -600mA		0.8		nC
Gate-Source Charge[2]	Q_{gs}			0.2		
Gate-Drain Charge[2]	Q_{gd}			0.2		
SOURCE-DRAINDIODE RATINGS AND CHARACTERISTICS(T_J = 25 °C)						
Continuous Current	I_S	I_F =-200mA, V_{GS}= 0V		-500		mA
Forward Voltage[1]	V_{SD}			-0.85	-1.2	V

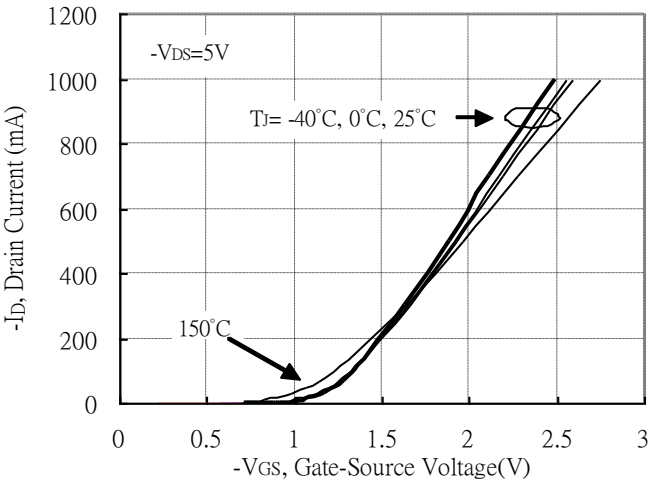
[1]Pulse test : Pulse W idth ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Pulse width limited by maximum junction temperature.

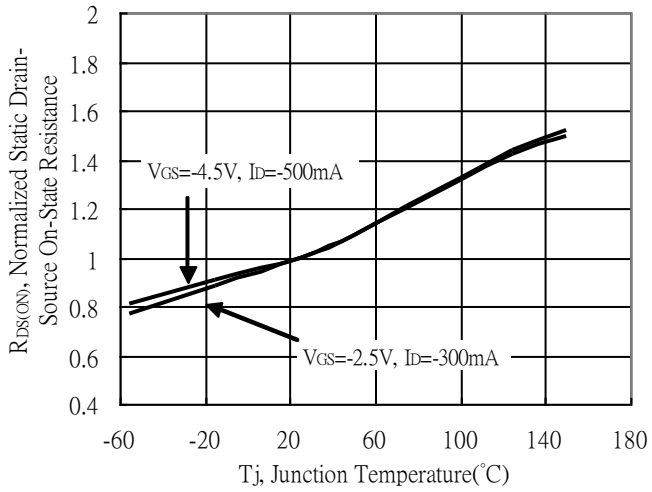
REMARK: ESD Protected Gate, 2KV HBM

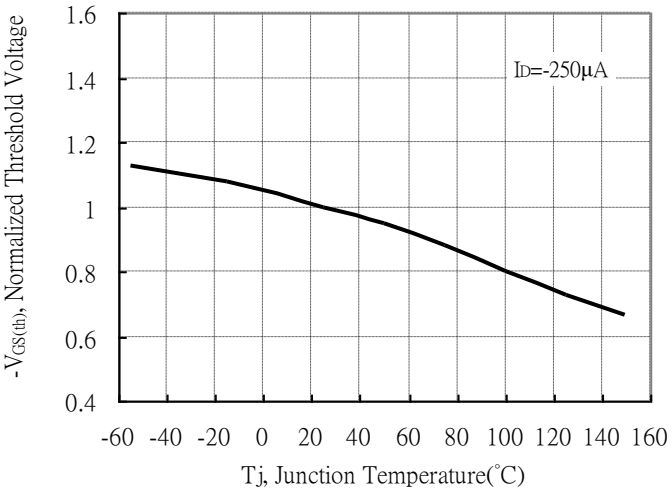
Typical Output Characteristics

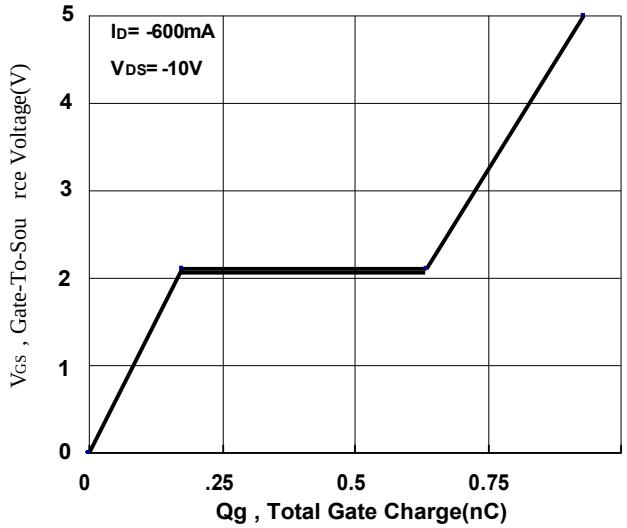


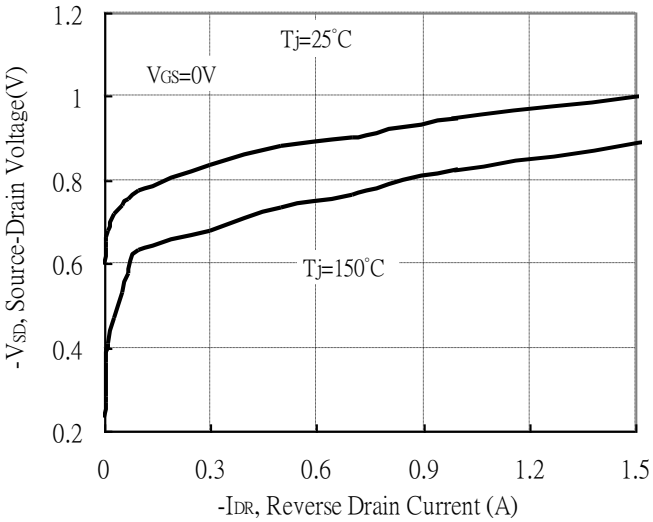
Typical Transfer Characteristics



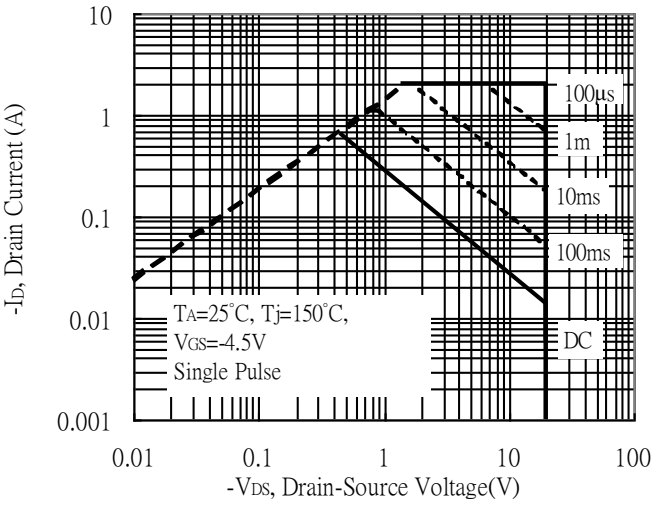




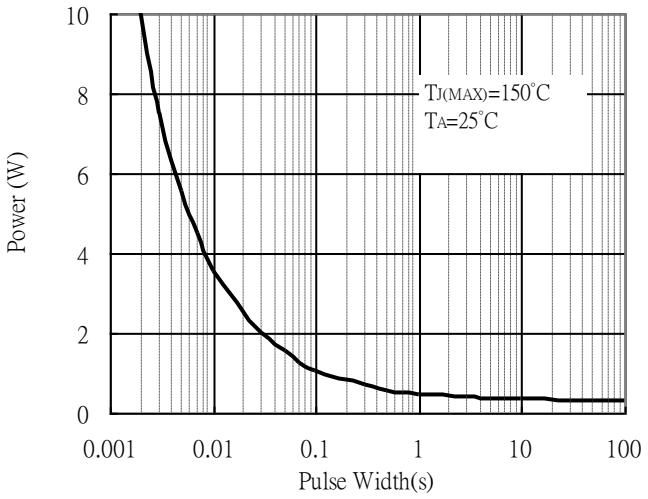




Maximum Safe Operating Area



Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curve