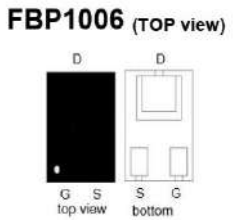
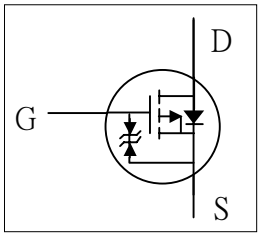
N-Channel High Density Trench MOSFET

FEATURES

- Super high dense cell trench design for low $R_{DS(on)}$.
- Rugged and reliable.
- Surface Mount package.
- ESD protected up to 2KV



PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(on)}$ (m-ohm) Max
30V	0.8	280@ V_{GS} = 4.5V
	0.5	550@ V_{GS} = 1.8V



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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±10	V
Drain Current-Continuous[a] @ T_A = 25 ℃		I_D	1	A
-Pulse[b]		I_{DM}	4	A
Drain-Source Diode Forward Current[a]		I_S	0.8	A
Maximum Power Dissipation[a]	T_A=25 ℃	P_D	0.2	W
	T_A=75 ℃		0.13	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	- 55 to 150	℃

THERMAL CHARACTERISTICS

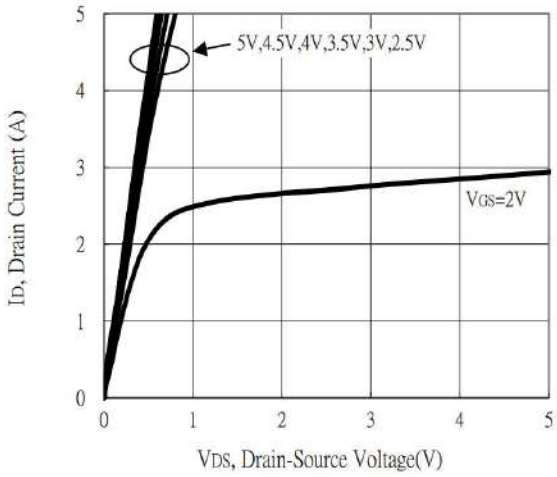
Thermal Resistance,Junction-to-Ambient[a]	R_{thJA}	625	℃/W

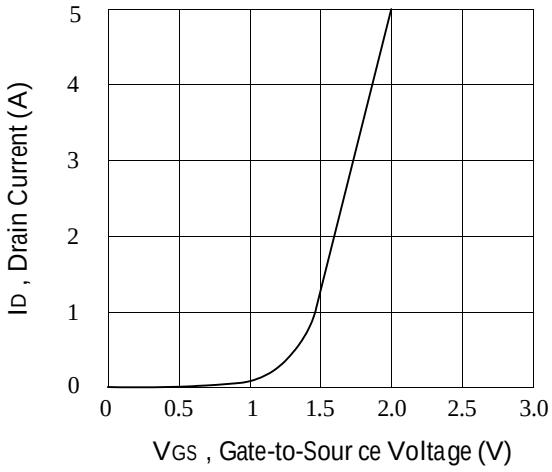
Note
a. Surface Mounted on FR4 Board , t ≤ 10sec .
b. Pulse width limited by maximum junction temperature.

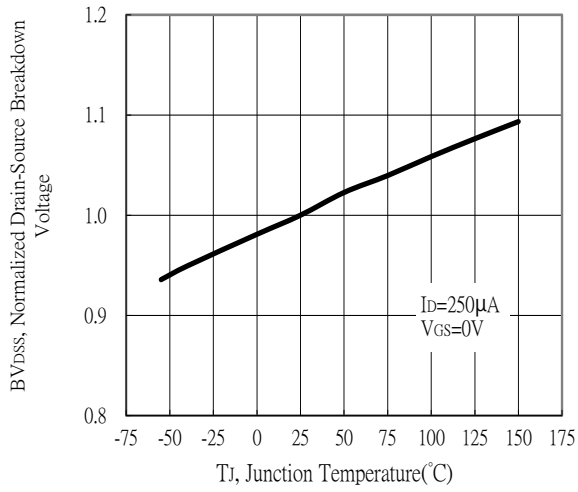
ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)

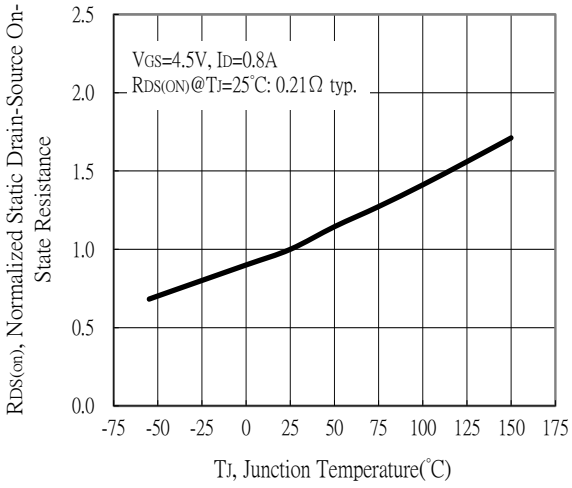
Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V , I_D = 250uA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30V , V_{GS} = 0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS} = ±10V , V_{DS}= 0V			±10	uA
ON CHARACTERISTICS[b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250uA	0.5	0.7	1	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} = 4.5V , I_D =0.8A		210	280	m-ohm
		V_{GS} = 1.8V , I_D = 0.5A		360	550	
Forward Transconductance	g_{fs}	V_{DS} = 5V , I_D = 0.8A		3.7		S
DRAIN-SOURCE DIODE CHARACTERISTICS[b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V , I_S = 0.8A			1.2	V
DYNAMIC CHARACTERISTICS[c]						
Input Capacitance	C_{ISS}	V_{DS} = 10V, V_{GS} = 0V f = 1.0MHz		60		pF
Output Capacitance	C_{OSS}			22		pF
Reverse Transfer Capacitance	C_{RSS}			12		pF
SWITCHING CHARACTERISTICS[c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DS} = 10V, I_D = 0.8A V_{GEN} = 4.5V R_L = 6 ohm R_{GEN} = 6 ohm		2		ns
Rise Time	t_r			19		ns
Turn-Off Delay Time	$t_{D(OFF)}$			10		ns
Fall Time	t_f			23		ns
Total Gate Charge	Q_g	V_{DS} = 10V I_D = 0.8A V_{GS} = 4.5V		1		nC
Gate-Source Charge	Q_{gs}			0.28		nC
Gate-Drain Charge	Q_{gd}			0.21		nC

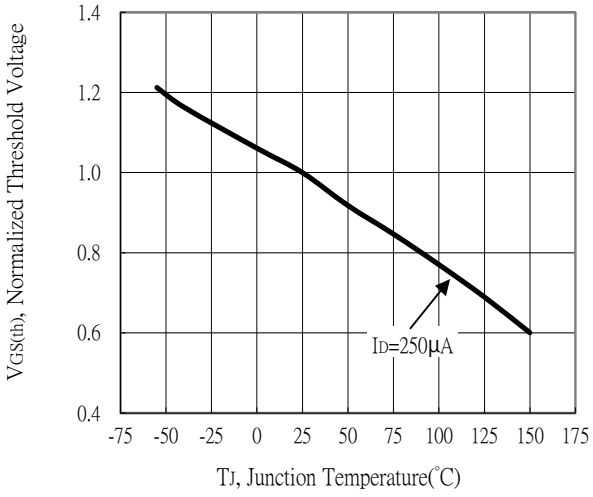
Note
b. Pulse Test Pulse width ≤ 300us , Duty Cycle ≤ 2% .
c. Guaranteed by design , not subject to production testing .



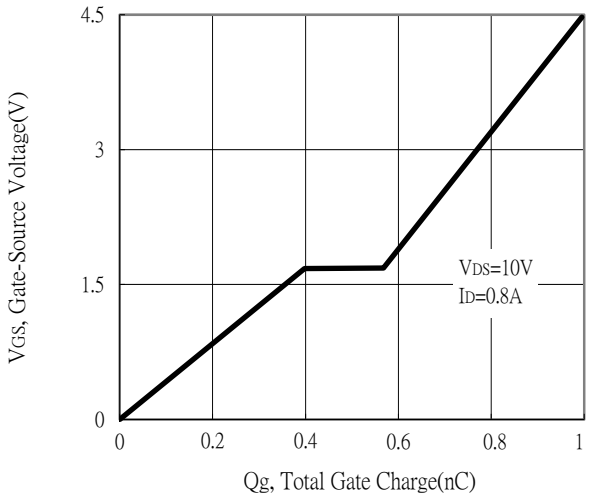


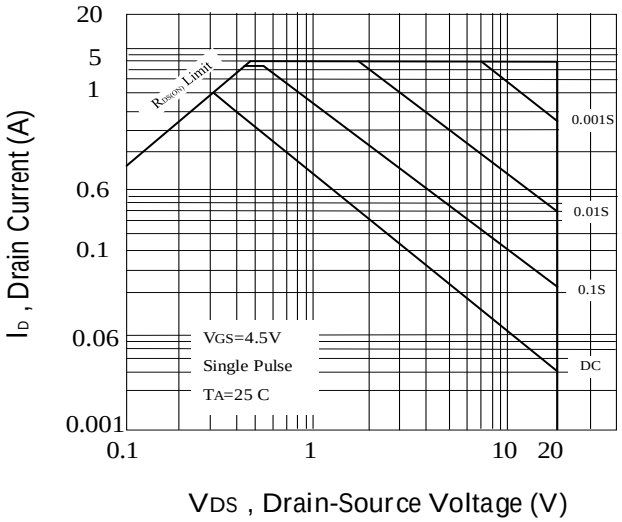




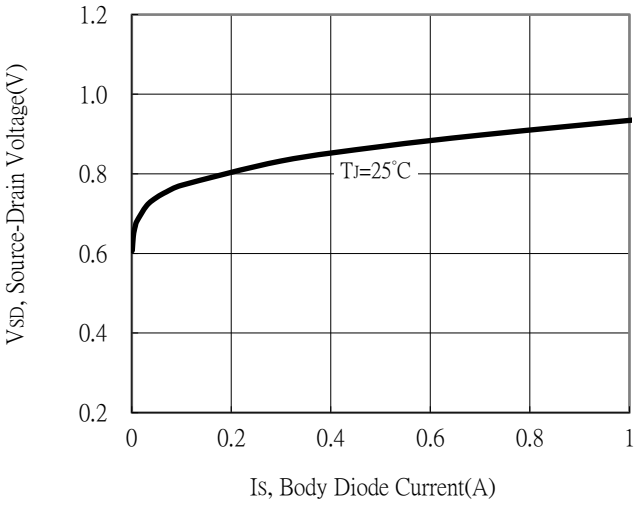


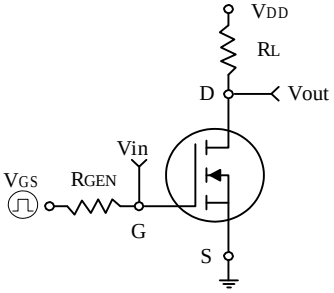
Gate Charge Characteristics

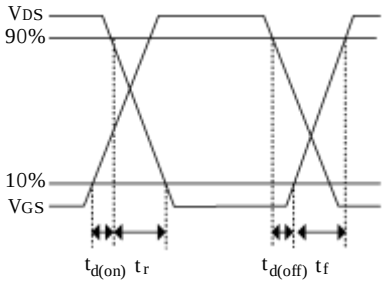




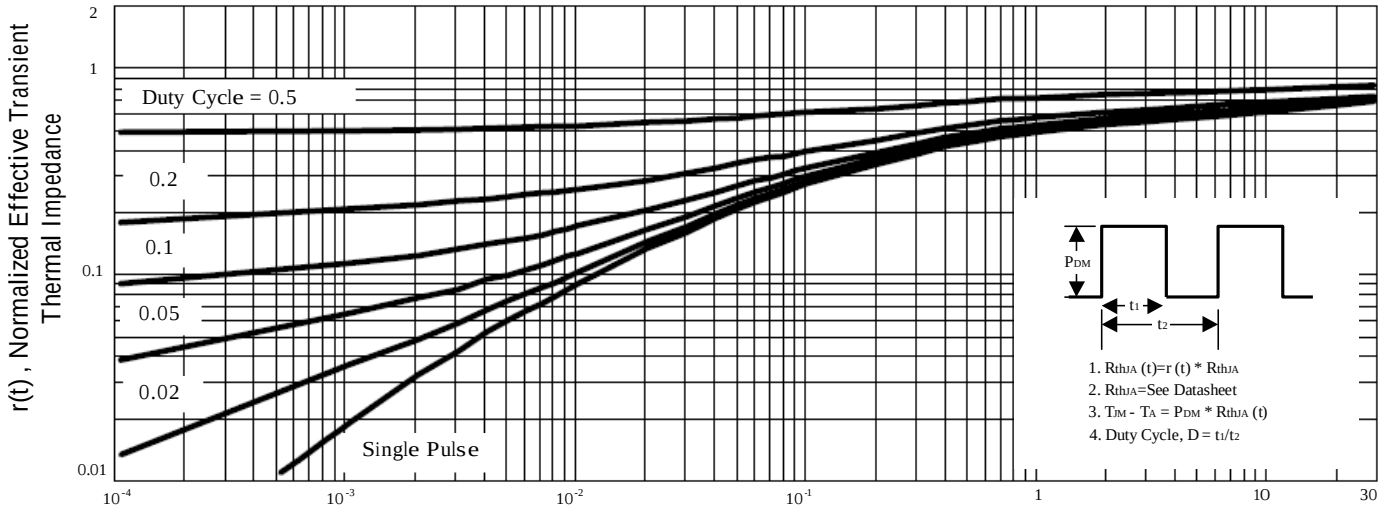
Maximum Safe Operating Area







Switching Test Circuit and Switching Waveforms



Square Wave Pulse Duration (sec)

Normalized Thermal Transient Impedance Curve