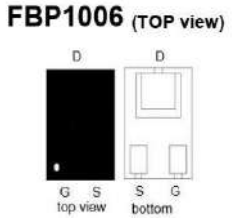
N-Channel High Density Trench MOSFET

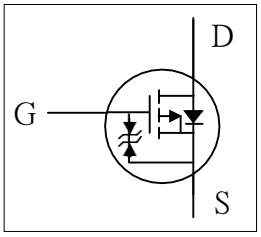
Features:

- 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
20V	1	240@ V_{GS} = 4.5V
	0.8	310@ V_{GS} = 2.5V



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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 8	V
Drain Current-Continuous[a] @ T_A = 25 ℃		I_D	1.4	A
-Pulse[b]		I_{DM}	5	A
Drain-Source Diode Forward Current[a]		I_S	0.8	A
Maximum Power Dissipation[a]	T_A=25℃	P_D	0.7	W
	T_A=75℃		0.4	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	- 55 to 150	℃

THERMAL CHARACTERISTICS

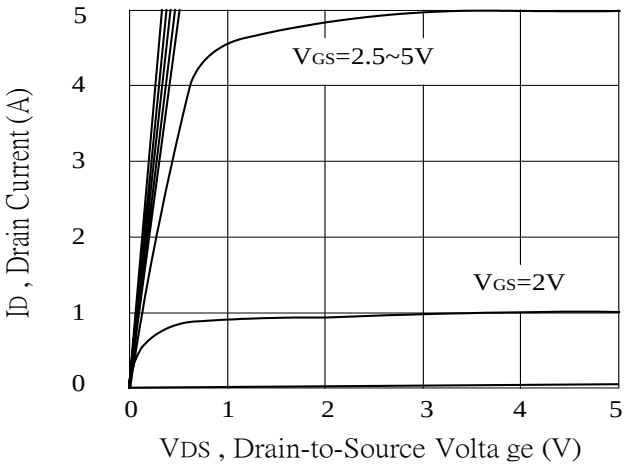
Thermal Resistance,Junction-to-Ambient[a]	R_{thJA}	180	℃/W

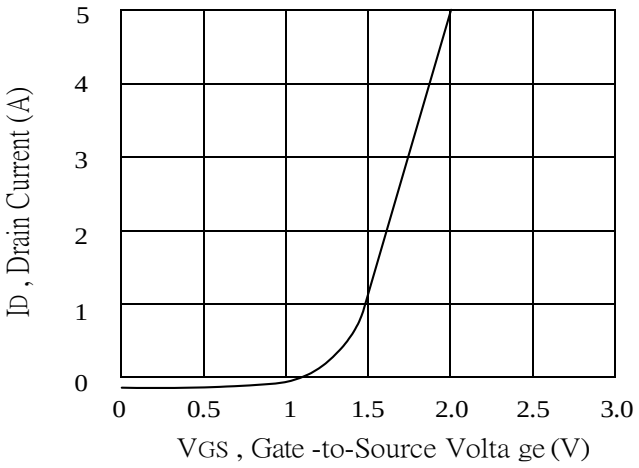
No te
a. Surface Mounted on FR4 Board , t ≤ 10sec .
b. Pulse width limited by maximum junction temperature.

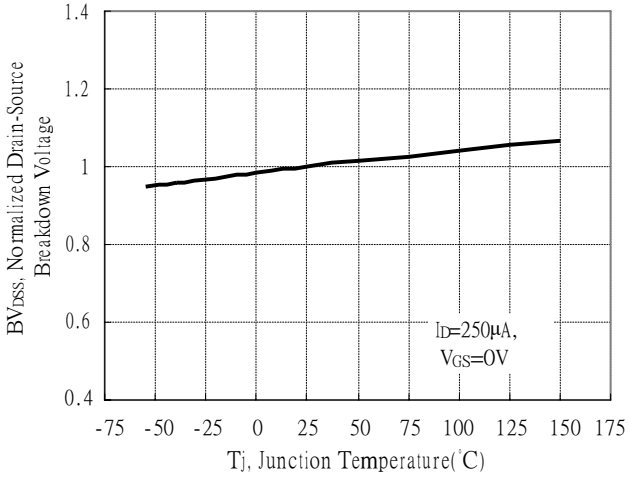
ELECTRICAL CHARACTERISTICS (T_A = 25 ℃ unless otherwise noted)

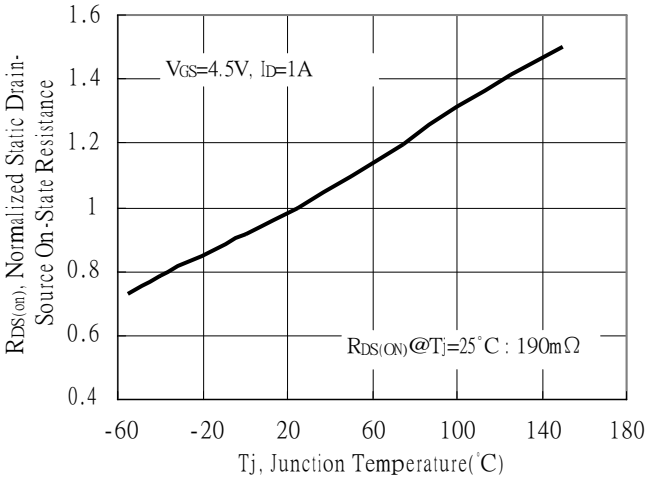
Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V , I_D = 250uA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20V , V_{GS} = 0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS} = ± 8V , V_{DS} = 0V			± 10	uA
ON CHARACTERISTICS[b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250uA	0.5	0.7	1	V
Drain-Source On-State Resistance	$R_{DS(on)}$	VGS= 4.5V , ID =1A		190	240	m-ohm
		VGS= 2.5V , ID = 0.8A		235	310	
		VGS= -1.8V, ID = 0.4A		320	450	
Forward Transconductance	g_{fs}	V_{DS} = 5V , I_D = 0.6A		1.7		S
DRAIN-SOURCE DIODE CHARACTERISTICS[b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V , Is = 1.7A		0.75	1.1	V
DYNAMIC CHARACTERISTICS[c]						
Input Capacitance	C_{ISS}	V_{DS} = 6V , V_{GS} = 0V f = 1.0MHz		43		pF
Output Capacitance	C_{OSS}			9		pF
Reverse Transfer Capacitance	C_{RSS}			6		pF
SWITCHING CHARACTERISTICS[c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD} = 10V, I_D = 1A V_{GEN} = 4.5V R_L = 6 ohm R_{GEN} = 6 ohm		1.2		ns
Rise Time	t_r			25		ns
Turn-Off Delay Time	$t_{D(OFF)}$			14		ns
Fall Time	t_f			15		ns
Total Gate Charge	Q_g	V_{DS} = 10V I_D = 1A V_{GS} = 4.5V		2		nC
Gate-Source Charge	Q_{gs}			0.3		nC
Gate-Drain Charge	Q_{gd}			0.3		nC

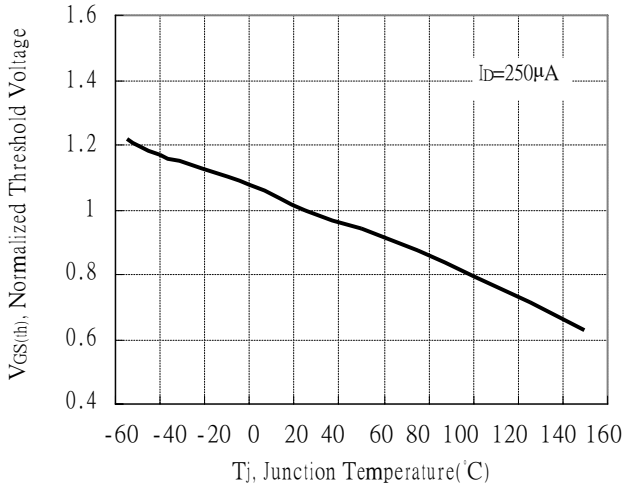
No te
b. Pulse Test Pulse width ≤ 300us , Duty Cycle ≤ 2% .
c. Guaranteed by design , not subject to production testing .

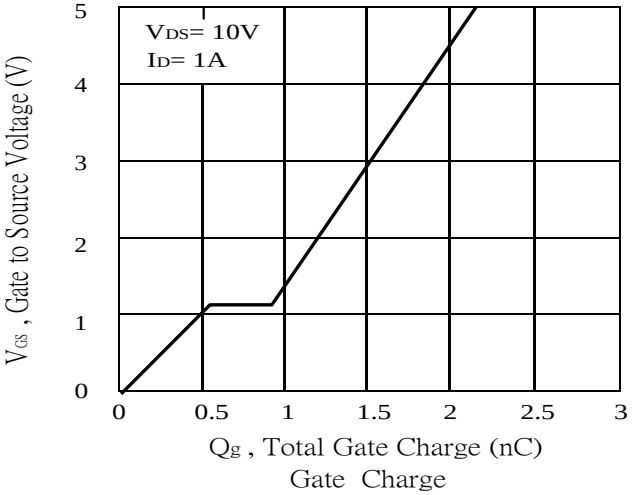

VGS=2.5~5V
VGS=2V
ID , Drain Current (A)
VDS , Drain-to-Source Volta ge (V)

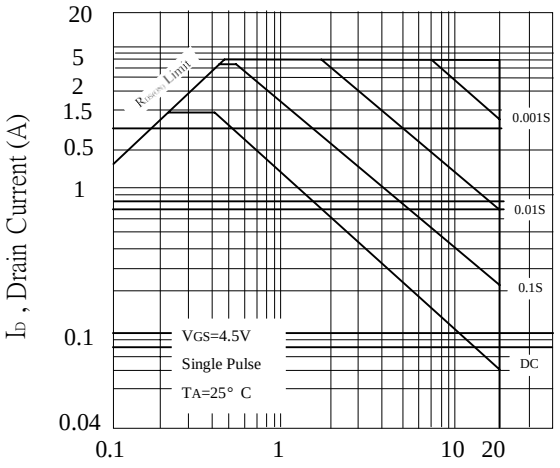

ID , Drain Current (A)
VGS , Gate -to-Source Volta ge (V)


BVDSS, Normalized Drain-Source Breakdown Voltage
ID=250μA,
VGS=0V
Tj, Junction Temperature(°C)

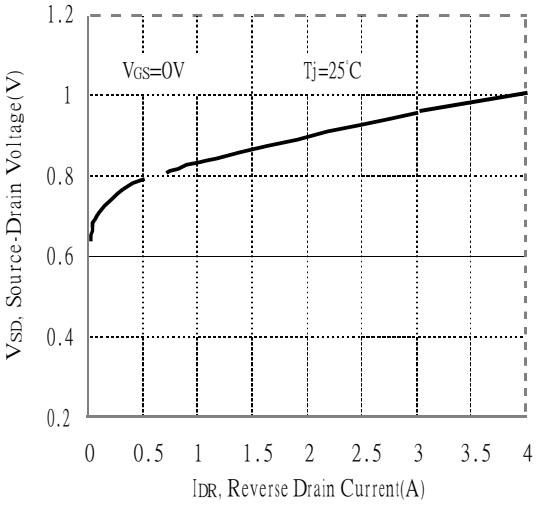

VGS=4.5V, ID=1A
RDS(ON)@Tj=25°C : 190mΩ
RDS(ON), Normalized Static Drain-Source On-State Resistance
Tj, Junction Temperature(°C)

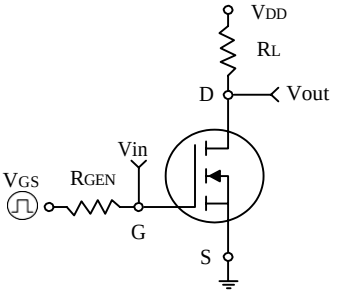

ID=250μA
VGS(th), Normalized Threshold Voltage
Tj, Junction Temperature(°C)

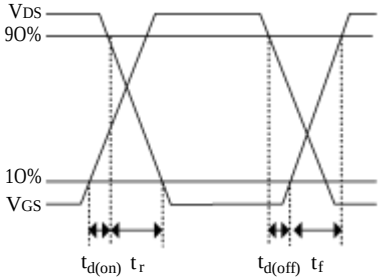

VDS= 10V
ID= 1A
VGS , Gate to Source Voltage (V)
Qg , Total Gate Charge (nC)
Gate Charge



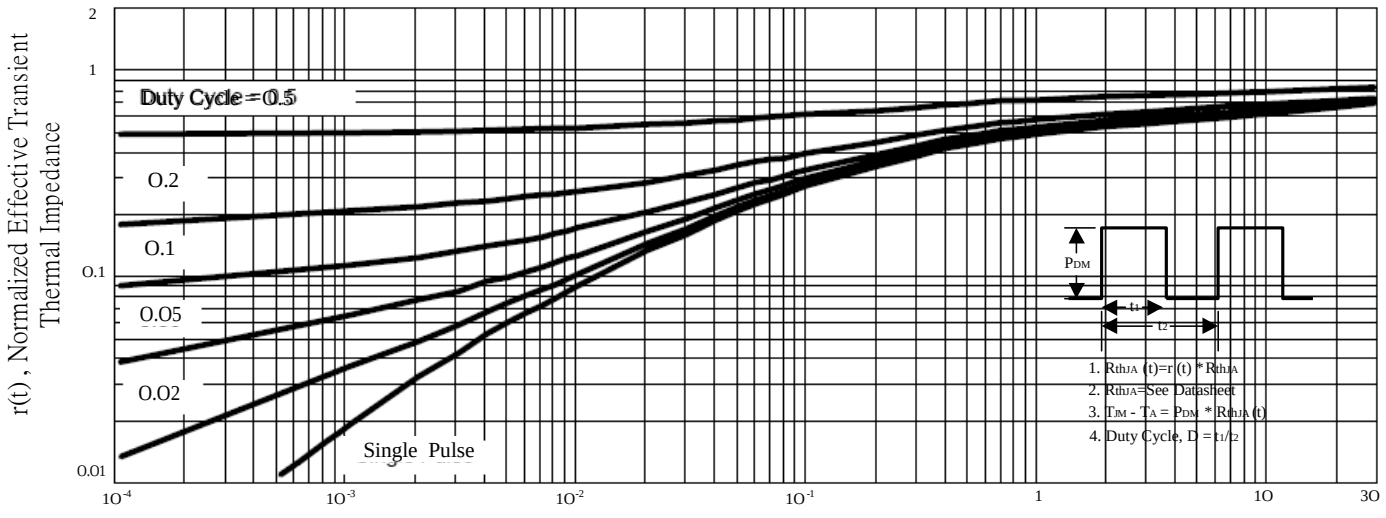
VDS , Drain-Source Voltage (V)
Maximum Safe Operating Area







Switc hing Test Circuit and Swi tching W aveform s



Square Wave Pulse Duration (sec)
Normalized Thermal Transient Imp edance Curve