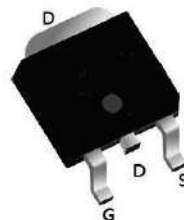
N-Channel High Density Trench MOSFET

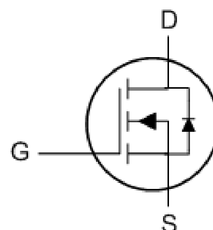
Features:

- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology



PRODUCT SUMMARY

V_{DSS}	$R_{DS(on)}$ (m-ohm) Max	I_D
100V	100 @ V_{GS} = 10V	14.6 A
	110 @ V_{GS} = 4.5V	



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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous[1]	Tc=25℃	I_D	14.6	A
	Tc=100℃		10	
Pulsed Drain Current[2]		I_{DM}	25	A
Single Pulse Avalanche Energy[3]		EAS	0.8	mJ
Avalanche Current		I_{AS}	4	A
Maximum Power Dissipation	Tc=25℃	P_D	30.0	W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	- 55 to 150	℃

THERMAL CHARACTERISTICS

Parameter	Symbol	Limit	Unit
Thermal Resistance,Junction-to-Ambient[1]	R_{thJA}	50	℃/W
Thermal Resistance,Junction-to-Case[1]	R_{thJC}	3	℃/W

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	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80V , V_{GS} = 0V , Tj = 25℃			10	uA
		V_{DS} = 80V , V_{GS} = 0V , Tj = 55℃			100	
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	1.2		2.9	V
Drain-Source On-State Resistance[2]	$R_{DS(on)}$	V_{GS} = 4.5V , I_D = 3A			110	mΩ
		V_{GS} = 10V , I_D = 5A			100	mΩ
Gate Resistance	Rg	V_{DS}=0V , V_{GS}=0V , f=1MHz		3		Ω
Forward Transconductance	gfs	V_{DS} = 5V , I_D = 5A		14.0		S
DRAIN-SOURCE DIODE CHARACTERISTICS						
Continuous Current[1,5]	I_S	V_G=V_D=0V , Force Current			14.6	A
Pulsed Source Current[2,5]	I_{SM}				25	A
Diode Forward Voltage[2]	V_{SD}	V_{GS} = 0V , I_S = 1A			1.2	V
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iSS}	V_{DS} =15V , V_{GS} = 0V f = 1.0MHz		450		pF
Output Capacitance	C_{OSS}			55		pF
Reverse Transfer Capacitance	C_{RSS}			16		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$td_{(ON)}$	V_{DD}=50V , V_{GS}=10V , R_G=3 I_D=5A		3.8		ns
Rise Time	tr			25.8		ns
Turn-Off Delay Time	$td_{(OFF)}$			16		ns
Fall Time	tf			8.8		ns
Total Gate Charge	Qg(V_{GS}=10V)	VDS=50V , VGS=10V , ID=5A		11.9		nC
Gate-Source Charge	Qgs			2.8		nC
Gate-Drain Charge	Qgd			1.7		nC

Note：
1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3. The EAS data shows Max. rating . The test condition is VDD=25V,VGS=10V,L=0.1mH,IAS=4A
4. The power dissipation is limited by 150℃ junction temperature
5. The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation

Typical Characteristics

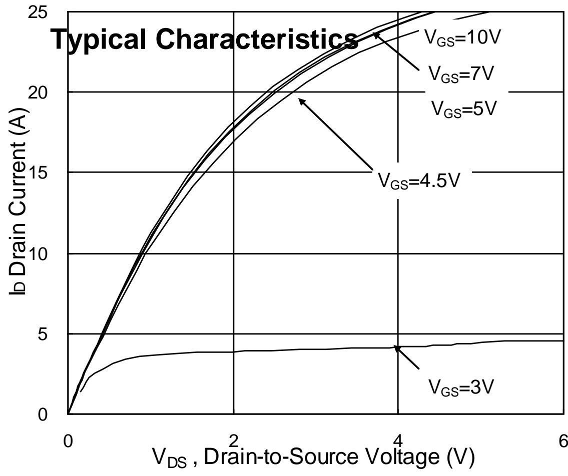


Fig.1 Typical Output Characteristics

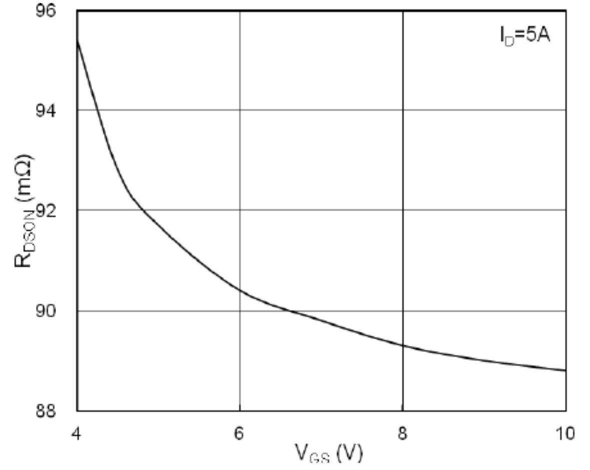


Fig.2 On-Resistance vs. Gate-Source

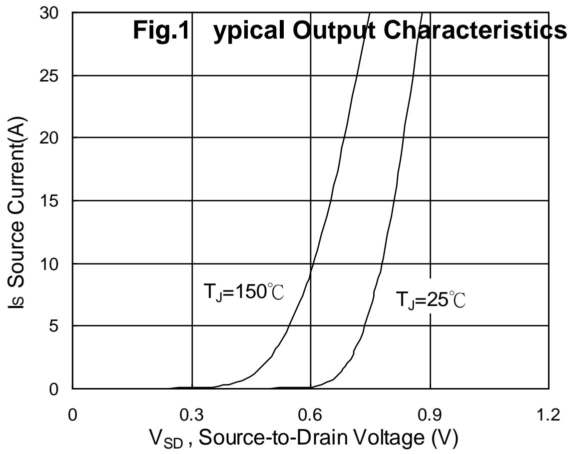


Fig.3 Forward Characteristics Of Reverse

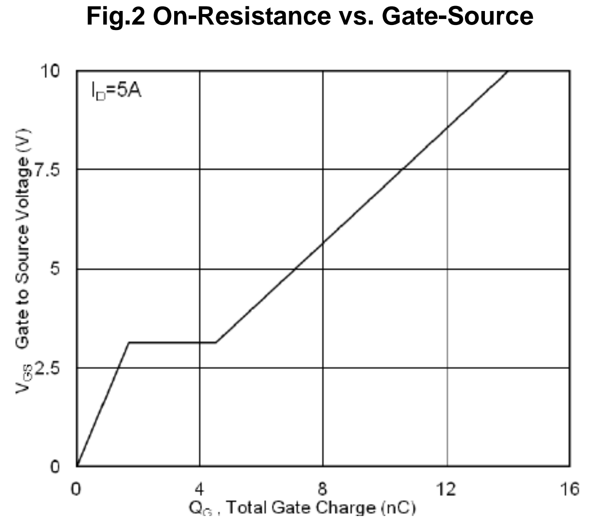


Fig.4 Gate-Charge Characteristics

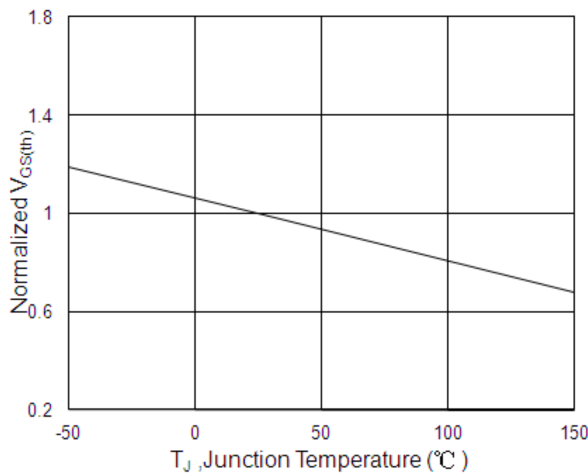


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

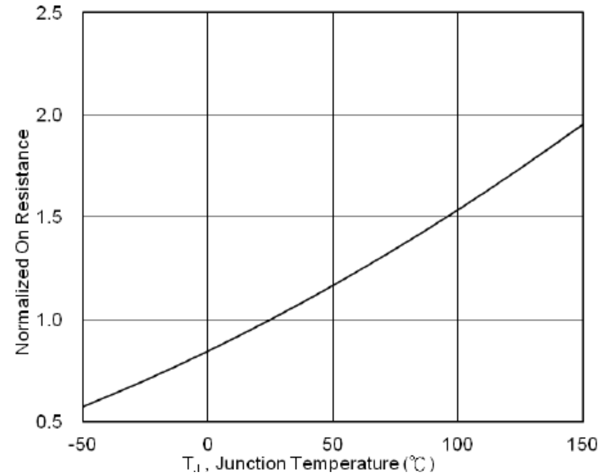


Fig.6 Normalized R_{DSON} vs. T_J

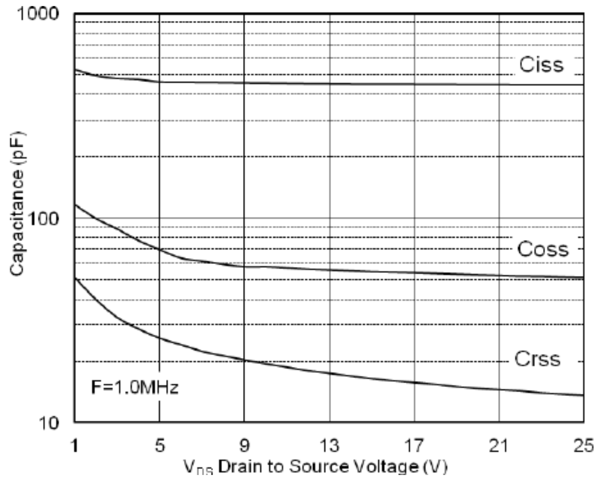


Fig.7 Capacitance

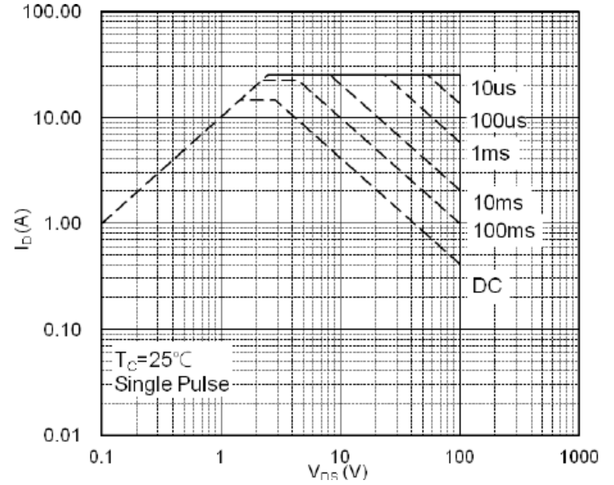
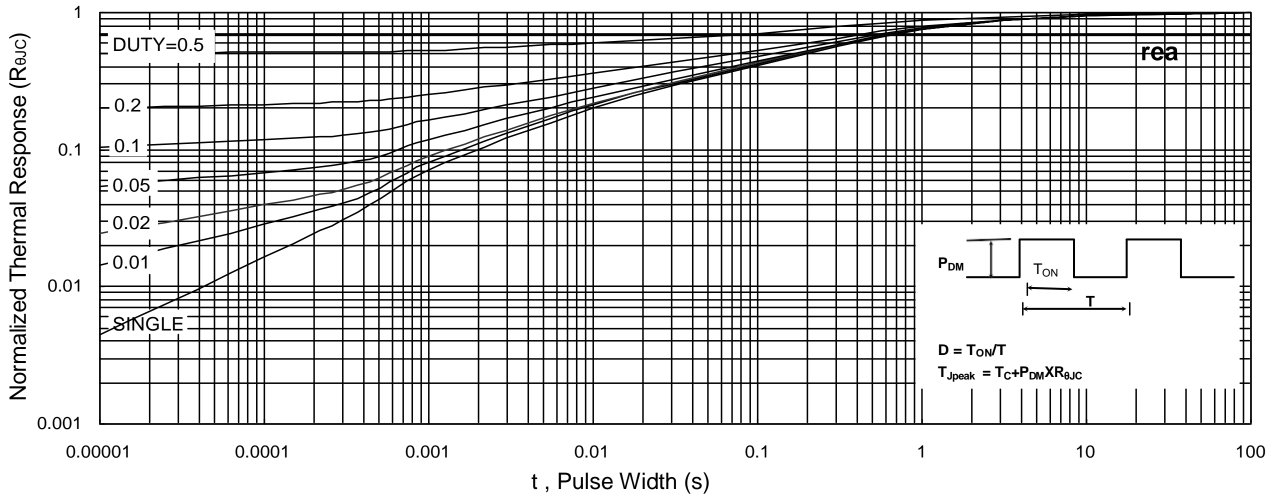


Fig.8 Safe Operating A



Normalized Maximum Transient Thermal Impedance

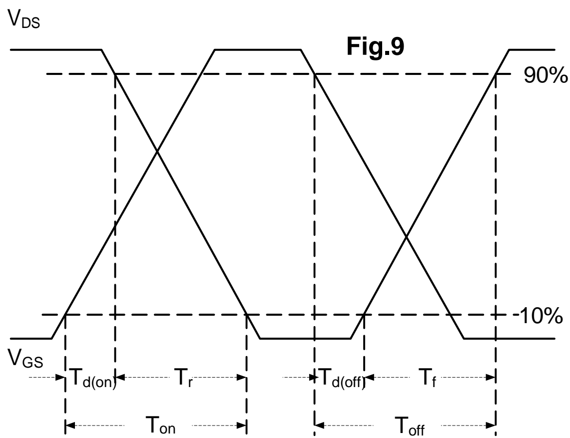


Fig.10 Switching Time Waveform

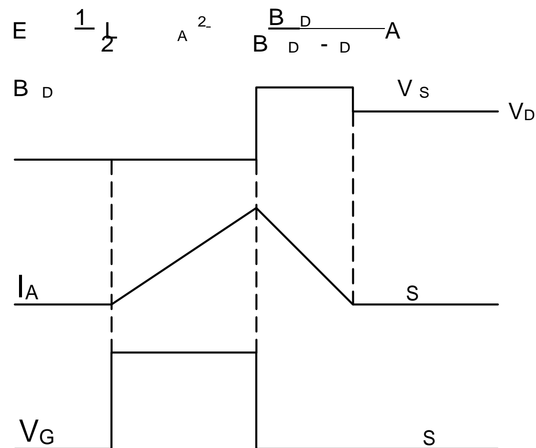


Fig.11 Unclamped Inductive Switching Waveform