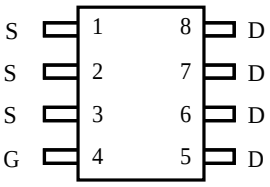
N-Channel High Density Trench MOSFET

Features:

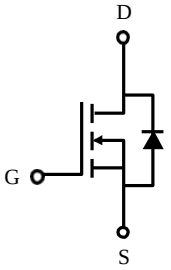
- Super high dense cell trench design for low RDS(on).
- Rugged and reliable.
- Surface Mount package.

SOP-8



PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(on)}$ (mΩ) Max	I_D
30V	13 @ V_{GS} =10V	16A
	16 @ V_{GS} = 4.5V	



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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuousa (Note 1) @ T_A = 25 ℃		I_D	16	A
-Pulse (Note 2)		I_{DM}	60	
Maximum Power Dissipation (Note 1)	T_A=25℃	P_D	3.2	W
	T_A=75℃		2.0	
Operating Junction and Storage Temperature Range		T_J,T_{STG}	- 55 to 150	℃

THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Ambient (Note 1)	R_{thJA}	42	℃/W

Note:

1. Surface Mounted on FR4 Board , t ≤ 10sec .
2. Pulse width limited by maximum junction temperature

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	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V , V_{GS} = 0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS} = ±20V , V_{DS} = 0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250uA	1	1.6	3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} = 10V , I_D = 15A		11	13	mΩ
		V_{GS} = 4.5V , I_D = 9A		13	16	mΩ
Forward Transconductance	gfs	V_{DS} = 15V , I_D = 12.5A		12		S
DYNAMIC CHARACTERISTICS (Note 4)						
Input Capacitance	C_{ISS}	V_{DS} = 10V , V_{GS} = 0V f = 1.0MHz		1094		pF
Output Capacitance	C_{OSS}			147		pF
Reverse Transfer Capacitance	C_{RSS}			127		pF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-On Delay Time	$td_{(ON)}$	V_{DD} = 15V , I_D = 1A V_{GEN} = 10V R_{GEN} = 6 Ω , R_L = 15 Ω		6		nS
Rise Time	tr			22.5		nS
Turn-Off Delay Time	$td_{(OFF)}$			48.6		nS
Fall Time	tf			19.8		nS
Total Gate Charge	Qg	V_{DS} = 10V , I_D = 1A V_{GS} = 10V		31		nC
Gate-Source Charge	Qgs			1.4		nC
Gate-Drain Charge	Qgd			9.3		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Drain-Source Diode Forward Current (Note 1)	I_S			8		A
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS} = 0V , I_S = 1.0A		0.7	1.1	V

Note：

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

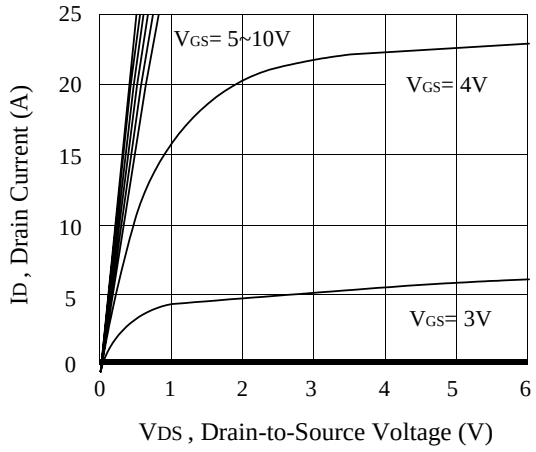


Figure 1. Output Characteristics

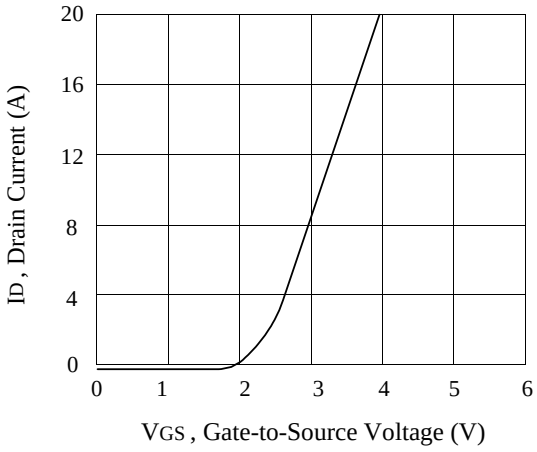


Figure 2. Transfer Characteristics

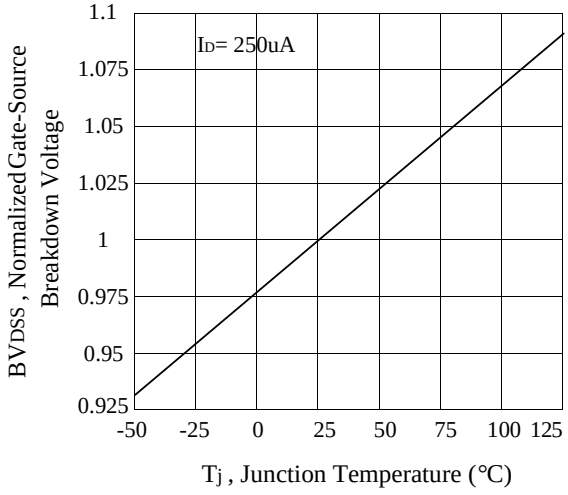


Figure 3. Breakdown Voltage Variation with Temperature

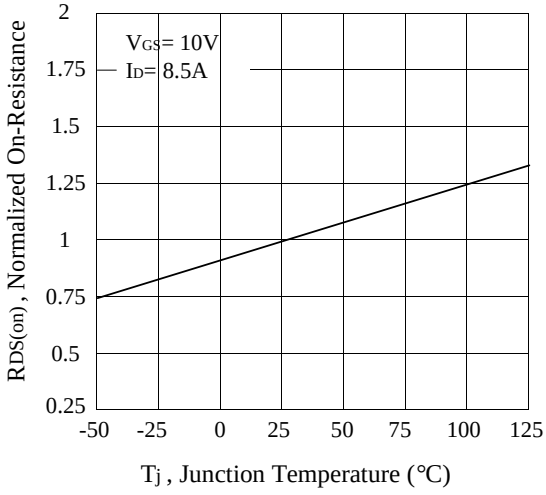


Figure 4. On-Resistance Variation with Temperature

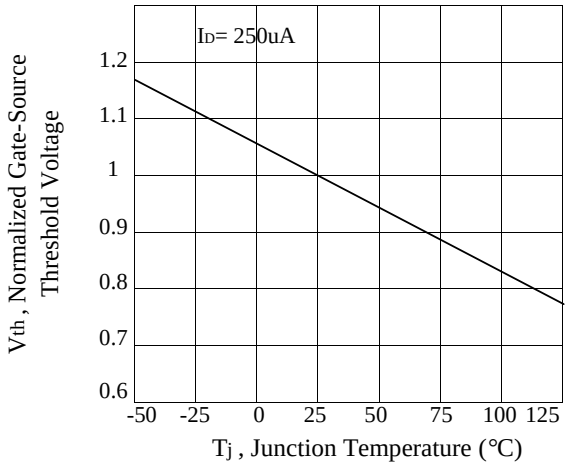


Figure 5. Gate Threshold Variation with Temperature

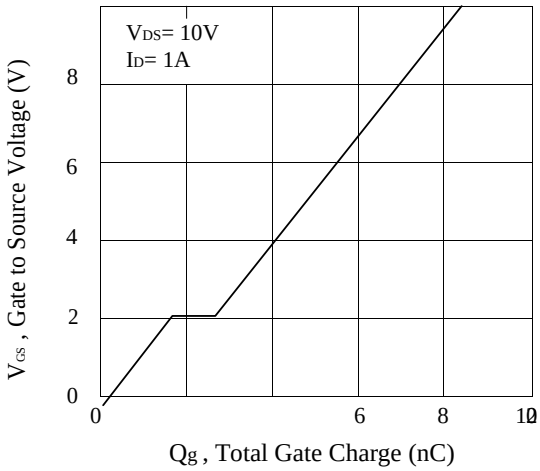
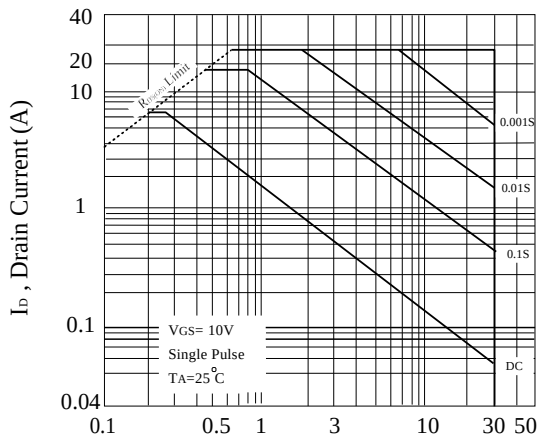
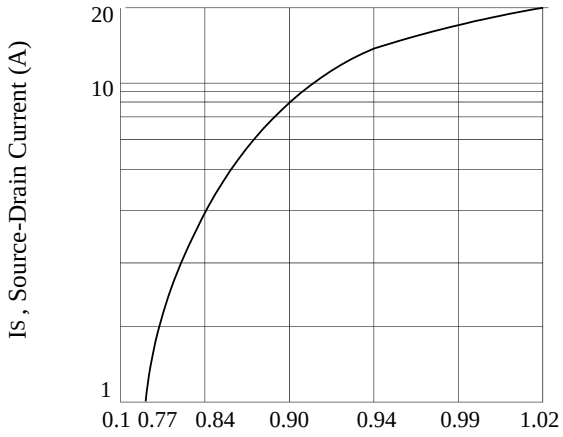


Figure 6. Gate Charge



VDS , Drain-Source Voltage (V)

Figure 7. Maximum Safe Operating Area



VSD , Body Diode Forward Voltage (V)

Figure 8. Body Diode Forward Voltage Variation with Source Current

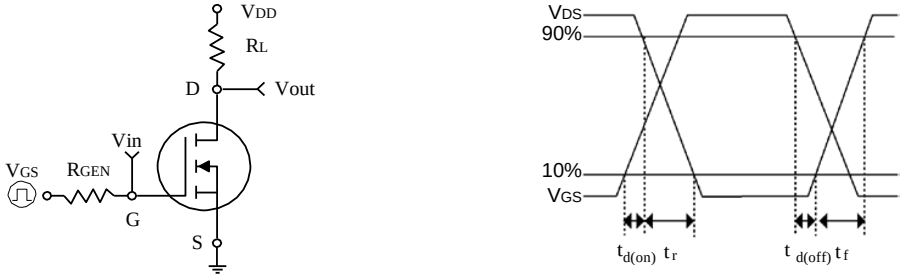
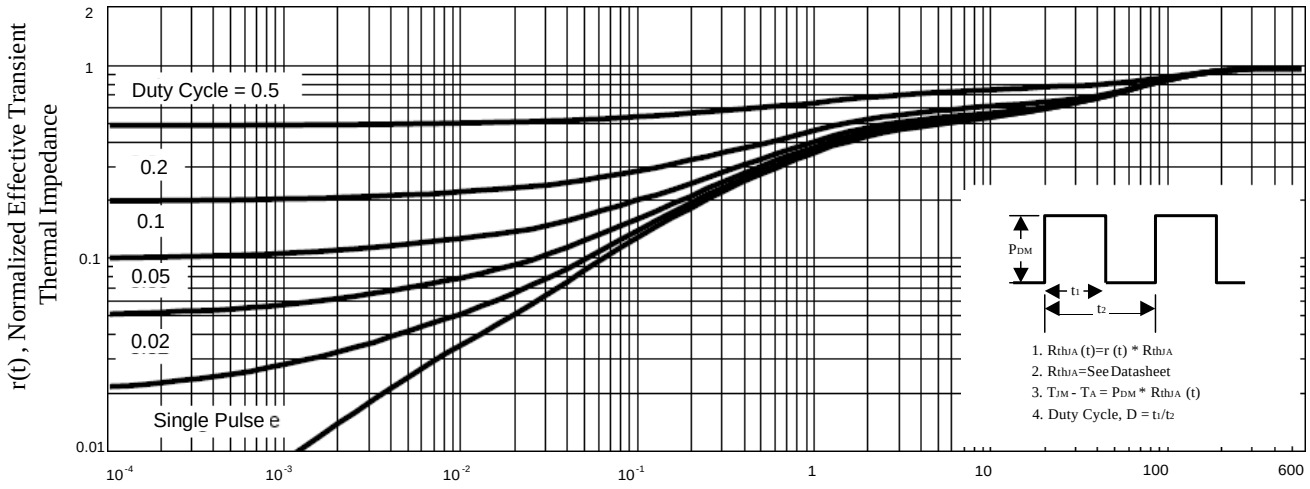


Figure 9. Switching Test Circuit and Switching Waveforms



Square Wave Pulse Duration (sec)

Figure 10. Normalized Thermal Transient Impedance Curve