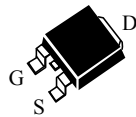


N-Channel High Density Trench MOSFET

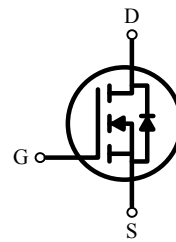
PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(on)} (m-ohm) Max
25V	80A ^c	6 @ V _{GS} = 10V
		9 @ V _{GS} = 4.5V

FEATURES

- Super high dense cell trench design for low R_{DS(on)}.
- Rugged and reliable.
- Improved Shoot-Through FOM.
- Fully Characterized Avalanche Voltage and Current.



To-252(D-PAK)



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	25	V
Gate-Source Voltage	V _{GS}	± 20	V
Drain Current-Continuous ^c	I _D	T _C =25°C	80
		T _C =100°C	50
Drain Current-Pulse	I _{DM}	150	A
Drain-Source Diode Forward Current	I _S	20	A
Maximum Power Dissipation	P _D	T _C =25°C	54.3
		T _C =100°C	21.7
		T _A =25°C ^{a,b}	8.9
		T _A =100°C ^{a,b}	3.6
Avalanche Energy with Single Pulse L=0.1mH	E _{AS}	45	mJ
Operating Junction and Storage Temperature Range	T _J , T _{STG}	- 55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	Steady-State	R _{thJC}	2.3	°C/W
Thermal Resistance, Junction-to-Ambient ^a	Steady-State	R _{thJA}	70	°C/W
	t ≤ 10S		14	

Note :

a. Surface Mounted on 1"x1" FR4 Board.

b. t = 10 sec

c. Calculation based on maximum allowable Junction Temperature . Package limitation current is 40A.

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	25			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 25V, V_{GS} = 0V$			1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.8	3	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 30A$		4	6	m-ohm
		$V_{GS} = 4.5V, I_D = 30A$		6	9	m-ohm
Forward Transconductance	g_{fs}	$V_{DS} = 15V, I_D = 15A$		22		S
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 20A$		0.85	1.3	V
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C_{ISS}	$V_{DS} = 15V, V_{GS} = 0V$ $f = 1.0MHz$		2054		pF
Output Capacitance	C_{OSS}			395		pF
Reverse Transfer Capacitance	C_{RSS}			235		pF
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = 12V, I_D = 20A$ $V_{GEN} = 10V$ $R_L = 0.6\text{ ohm}$ $R_{GEN} = 6\text{ ohm}$		13.2		ns
Rise Time	t_r			7.20		ns
Turn-Off Delay Time	$t_{D(OFF)}$			44.8		ns
Fall Time	t_f			16		ns
Total Gate Charge	Q_g	$V_{DS} = 12V, I_D = 20A$ $V_{GS} = 10V$		32.7		nC
		$V_{DS} = 12V$		15.4		nC
Gate-Source Charge	Q_{gs}	$I_D = 20A$		7.12		nC
Gate-Drain Charge	Q_{gd}	$V_{GS} = 4.5V$		5.20		nC

Note :

 b. Pulse Test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

c. Guaranteed by design, not subject to production testing.

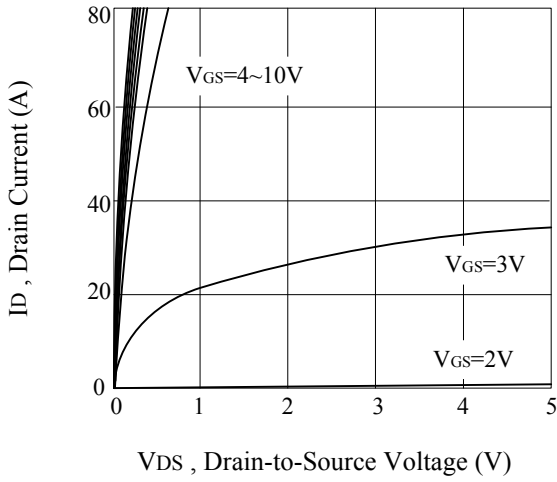


Figure 1. Output Characteristics

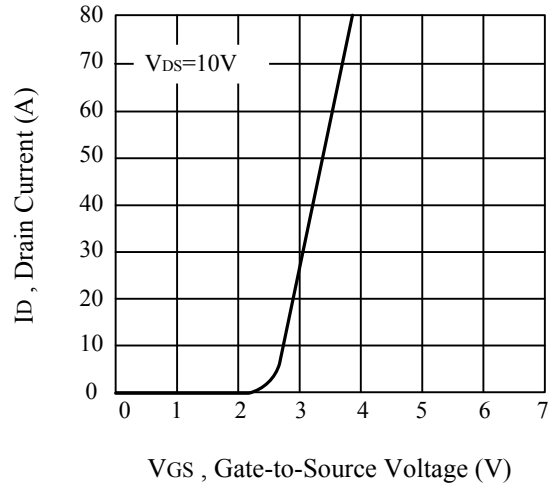


Figure 2. Transfer Characteristics

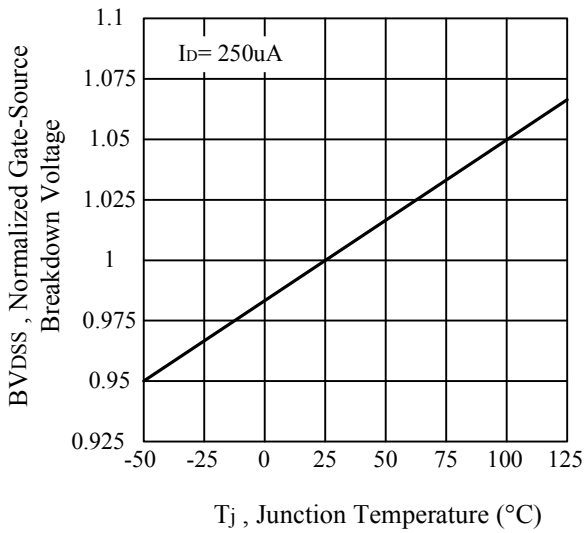


Figure 3. Breakdown Voltage Variation with Temperature

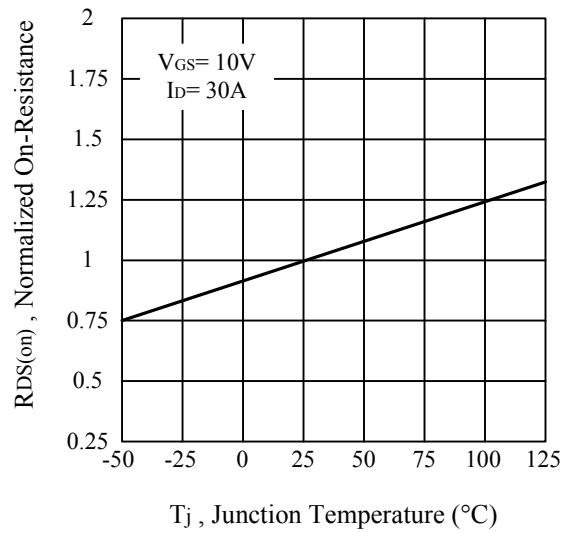


Figure 4. On-Resistance Variation with Temperature

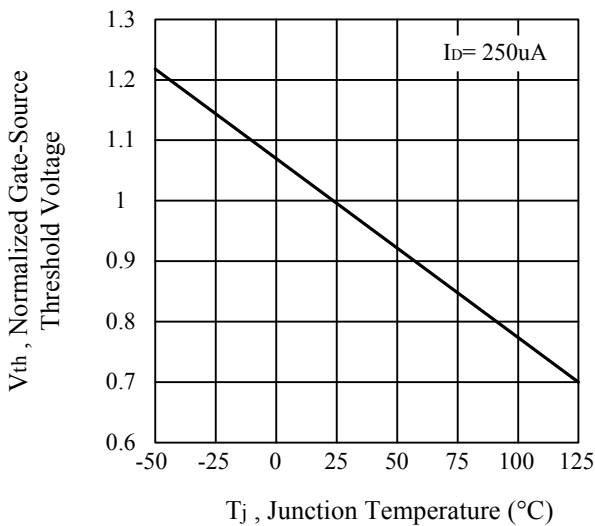


Figure 5. Gate Threshold Variation with Temperature

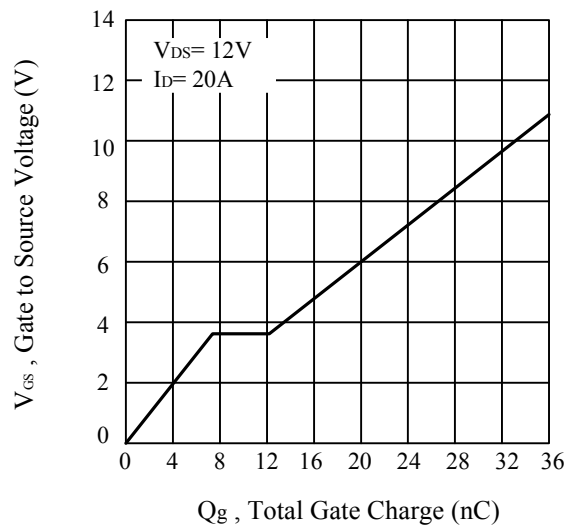


Figure 6. Gate Charge

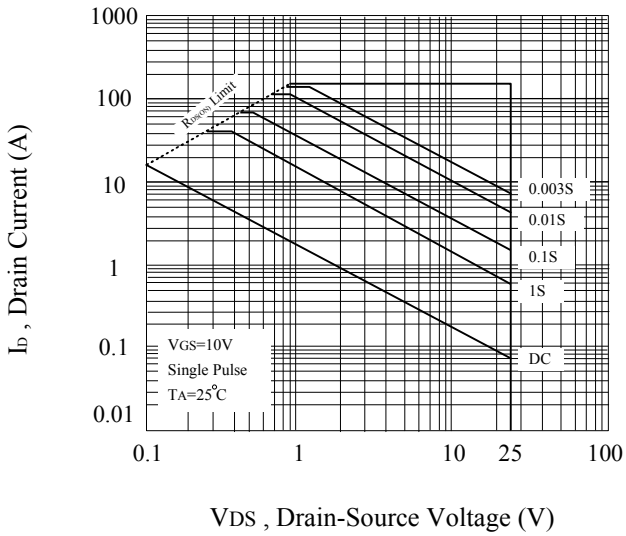


Figure 7. Maximum Safe Operating Area

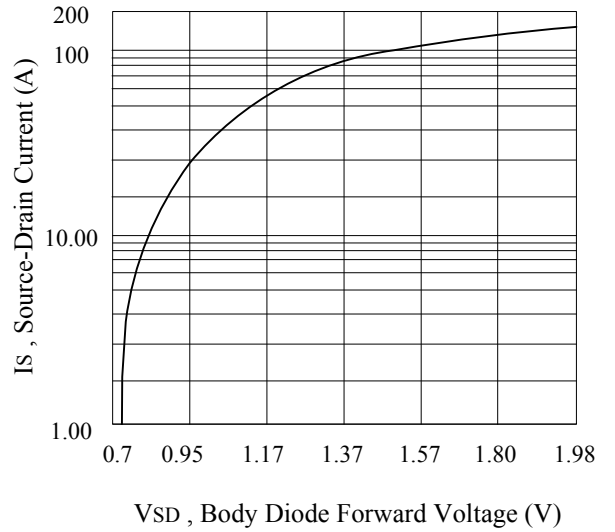


Figure 8. Body Diode Forward Voltage Variation with Source Current

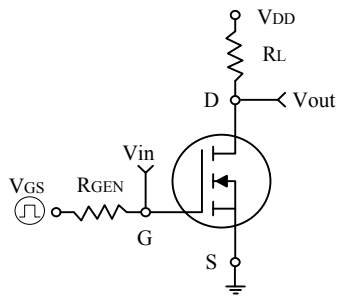


Figure 9. Switching Test Circuit and Switching Waveforms

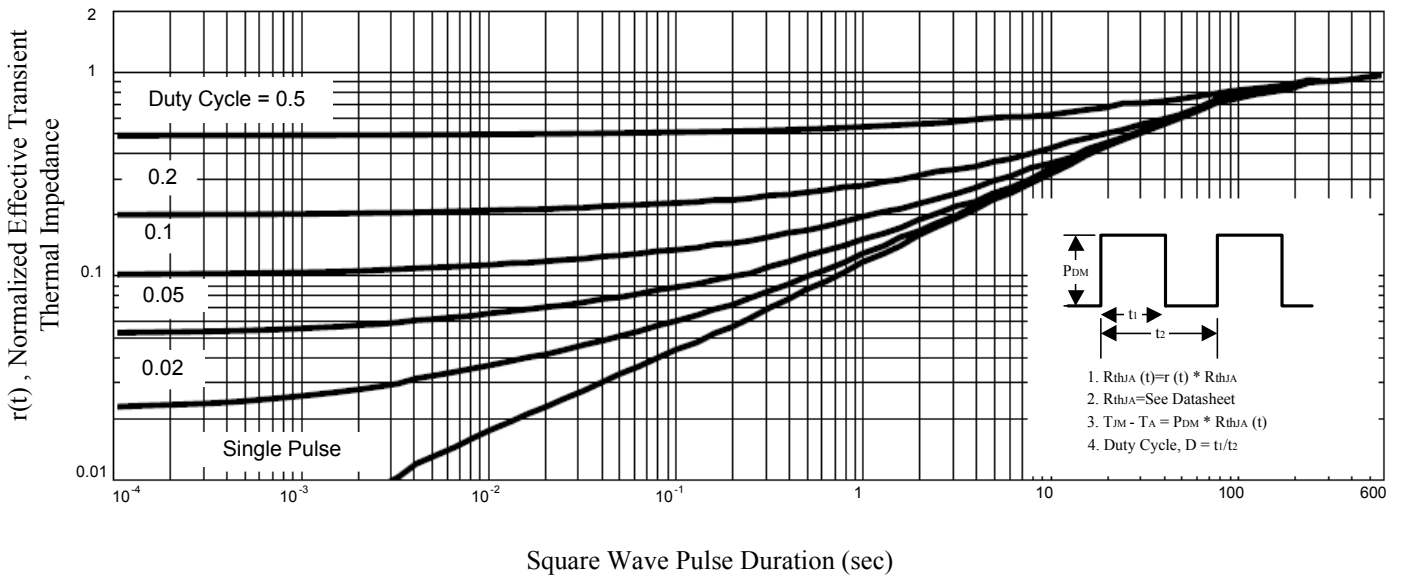


Figure 10. Normalized Thermal Transient Impedance, Junction-to-Ambient.