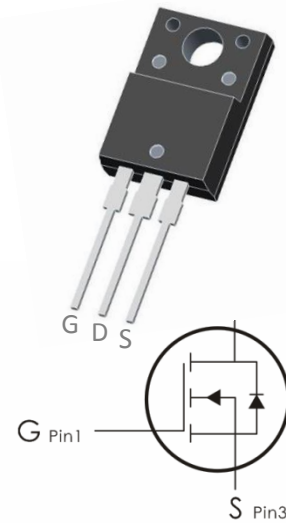


Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=600V, I_D=20A, R_{DS(ON)}<0.4\ \Omega @V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	600	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Continuous Drain Current- $T_J=25^\circ\text{C}$	20	A
	Continuous Drain Current- $T_J=100^\circ\text{C}$	12.5	
E_{AS}	Single Pulse Avalanche Energy ^(note1)	1020	mJ
I_{AR}	Avalanche Current (note2)	20	A
P_D	Power Dissipation	60	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.08	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62.5	

Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	600	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=600V$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	2	---	4	V
$R_{DS(ON)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=10A$	---	---	0.4	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	3200	---	pF
C_{oss}	Output Capacitance		---	1150	---	
C_{rss}	Reverse Transfer Capacitance		---	80	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=300V, I_D=20A$ $R_{GEN}=25\ \Omega$. (Note3,4)	---	62	135	ns
t_r	Rise Time		---	140	290	ns
$t_{d(off)}$	Turn-Off Delay Time		---	230	470	ns
t_f	Fall Time		---	65	140	ns
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=480V$ $I_D=20A$. (Note3,4)	---	75	98	nC
Q_{gs}	Gate-Source Charge		---	13.5	18	nC
Q_{gd}	Gate-Drain Charge		---	36	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	$I_D=20A$	---	---	1.4	V
I_S	Max. Diode Forward Current	---	---	---	20	A
I_{SM}	Max. Pulsed Forward Current	---	---	---	80	A

Trr	Reverse Recovery Time	$I_S=20A, V_{GS}=0V$ $diF/dt=100A/\mu s$ (Note3)	---	530	---	Ns
qrr	Reverse Recovery Charge		---	10.5	---	μc

Notes:

- 1, L=3.45mH, IAS=20A, VDD=50V, RG=25 Ω , Starting T_J =25°C
- 2, Repetitive Rating : Pulse width limited by maximum junction temperature
- 3, Pulse Test : Pulse Width \leq 300 μs , Duty Cycle \leq 2%
- 4, Essentially Independent of Operating Temperature

Typical Characteristics: (T_c=25°C unless otherwise noted)

Figure 1. On-Region Characteristics

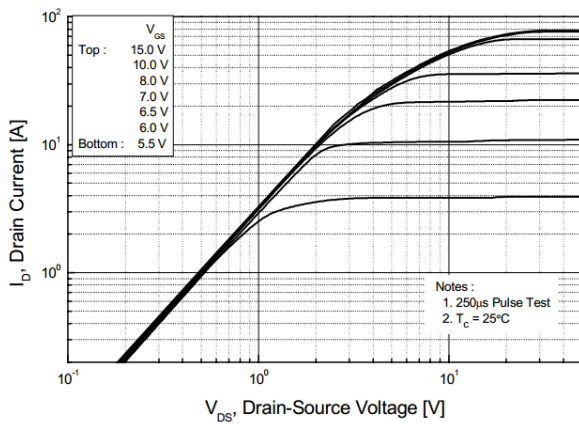


Figure 2. Transfer Characteristics

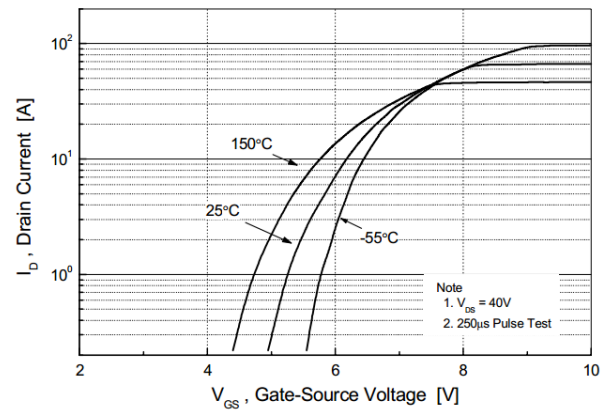


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

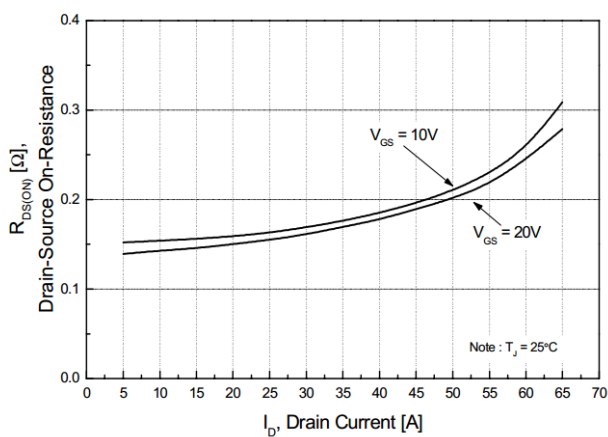


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

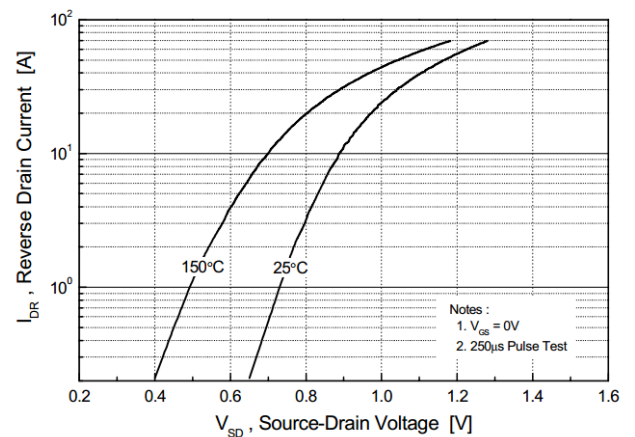


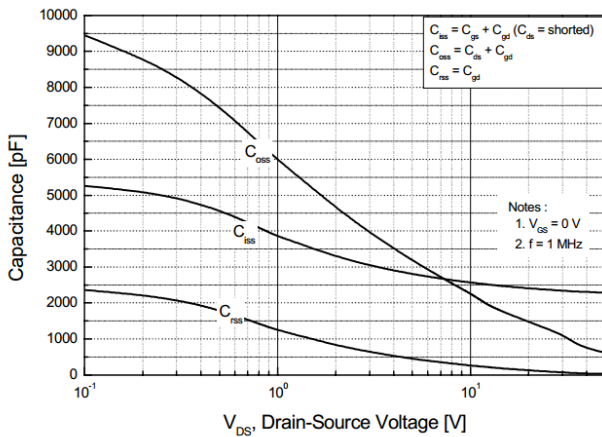
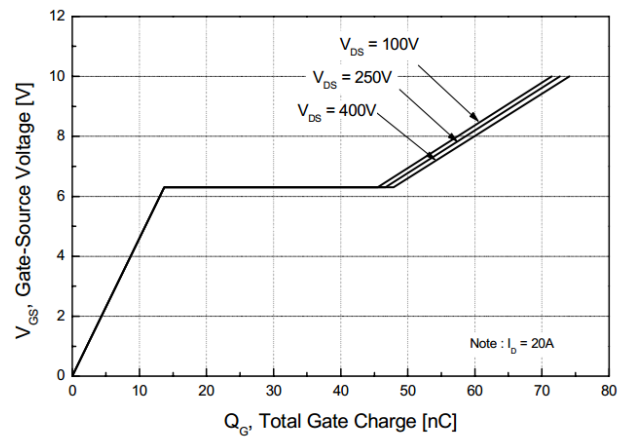
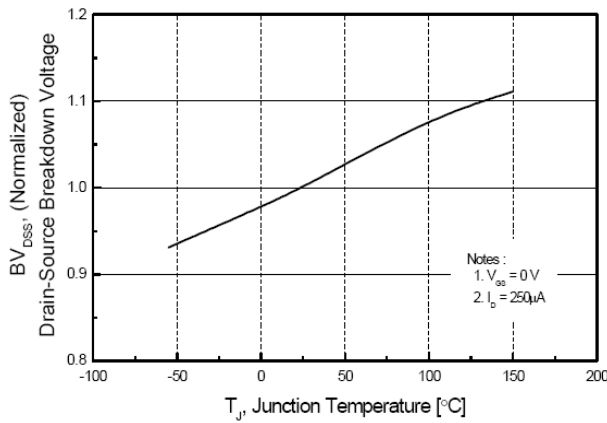
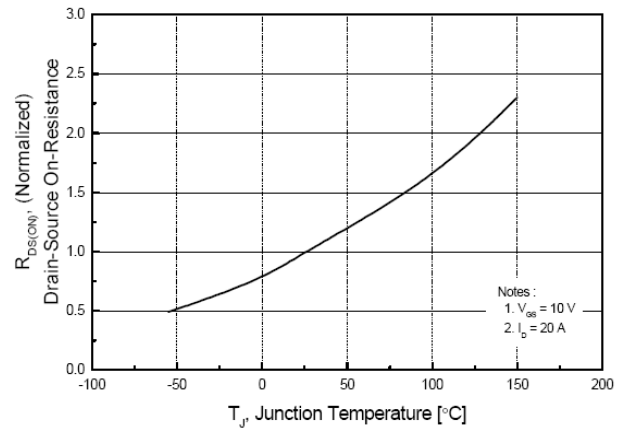
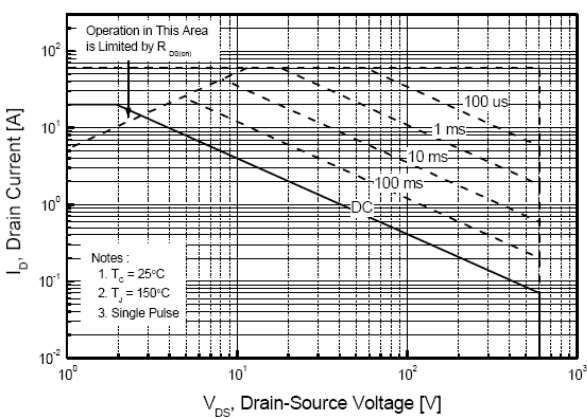
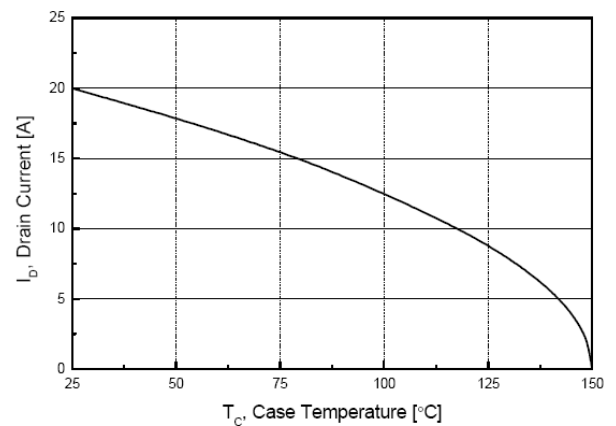
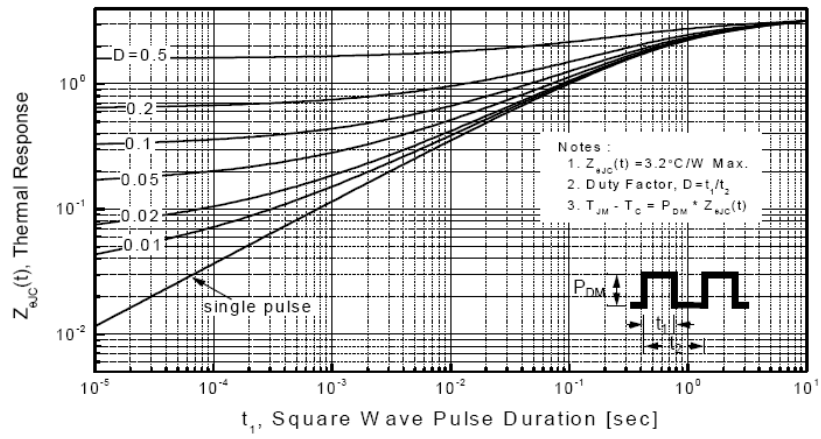
Figure 5. Capacitance Characteristics

Figure 6. Gate Charge Characteristics

Figure 7. Breakdown Voltage Variation vs. Temperature

Figure 8. On-Resistance Variation vs. Temperature

Figure 9. Maximum Safe Operating Area

Figure 10. Maximum Drain Current vs. Case Temperature


Figure 11. Transient Thermal Response Curve



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