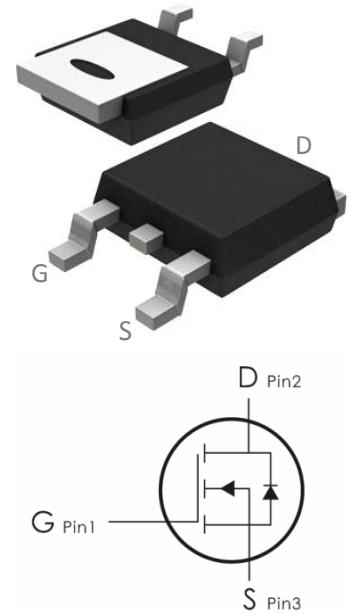


Description:

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) $V_{DS}=600V, I_D=4A, R_{DS(ON)} < 2.5 \Omega @ V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ 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- $T_C=25^\circ C$	4	A
	Continuous Drain Current- $T_C=100^\circ C$	2.5*	
	Pulsed Drain Current ¹	16*	
E_{AS}	Single Pulse Avalanche Energy ²	240	mJ
P_D	Power Dissipation, $T_C=25^\circ C$ ⁴	51	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.5	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	83	

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	$V_{GS}=10V, I_D=2A$	---	2	2.5	Ω
		$V_{GS}=4.5V, I_D=4A$	---	50	60	
G_{FS}	Forward Transconductance 4	$V_{DS}=40V, I_D=2A$	---	4.7	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	710	920	pF
C_{oss}	Output Capacitance		---	65	85	
C_{rss}	Reverse Transfer Capacitance		---	14	19	
Switching Characteristics^{4,5}						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=300V, I_D=4A,$ $V_{GS}=10V, R_{GEN}=25\Omega$	---	20	50	ns
t_r	Rise Time		---	55	120	ns
$t_{d(off)}$	Turn-Off Delay Time		---	70	150	ns
t_f	Fall Time		---	55	120	ns
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=480V,$ $I_D=4A$	---	27	30	nC
Q_{gs}	Gate-Source Charge		---	3.6	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	13.1	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=4A$	---	---	1.4	V

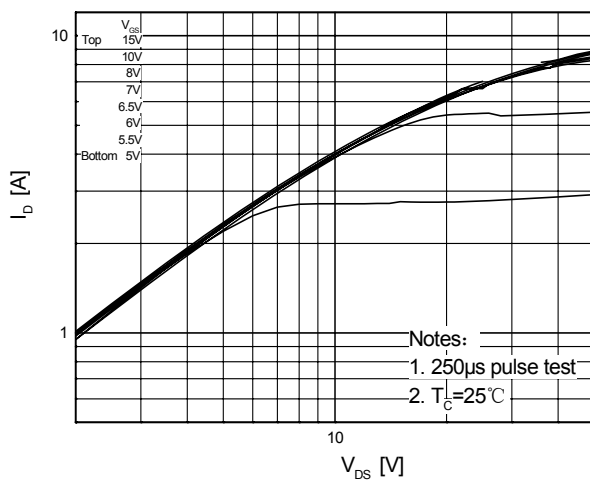
trr	Reverse Recovery Time ⁴	$V_{GS}=0V, I_S=4.0A$ $di_F/dt=100A/\mu s$	330	---	Ns
qrr	Reverse Recovery Charge ⁴		2.67	---	nc

Notes:

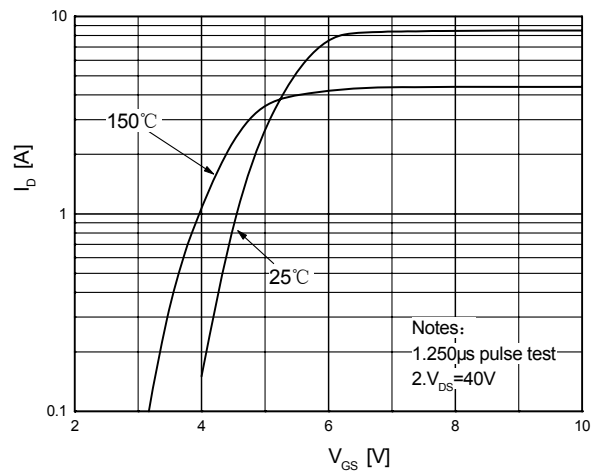
- 1: Pulse width limited by maximum junction temperature
- 2: $L=25mH, I_{AS}=4.0A, V_{DD}=50V, R_G=25 \Omega$, Starting $T_J=25^\circ C$
- 3: $I_{SD} \leq 4.0A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 5: Essentially independent of operating temperature

Typical Characteristics: ($T_C=25^\circ C$ unless otherwise noted)

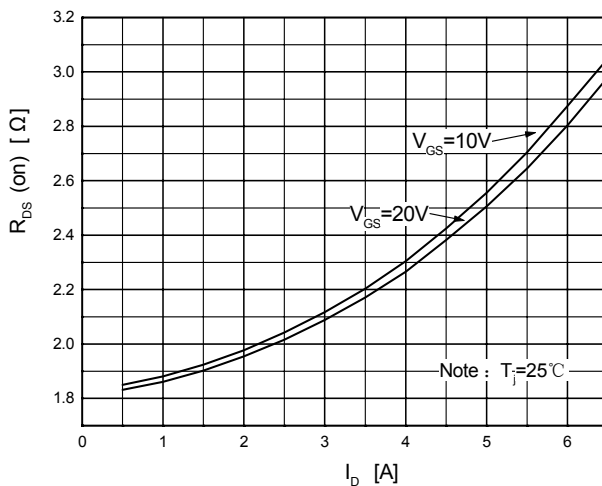
On-Region Characteristics



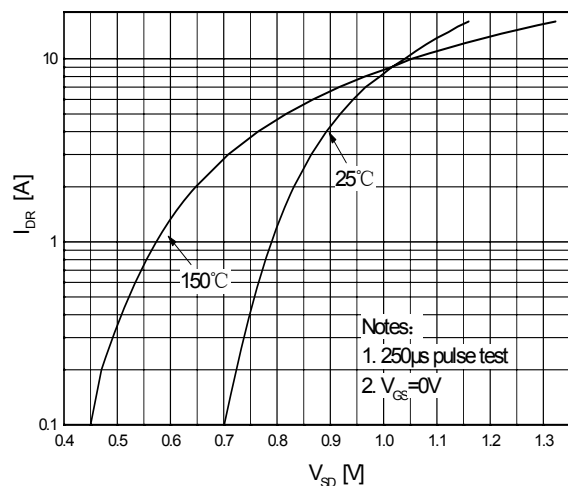
Transfer Characteristics



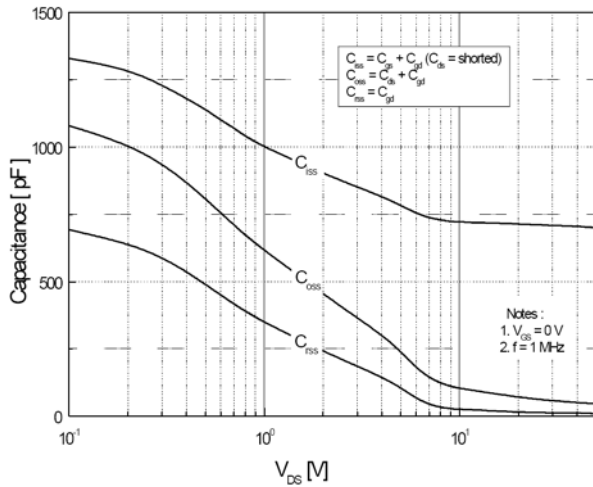
On-Resistance Variation vs. Drain Current and Gate Voltage



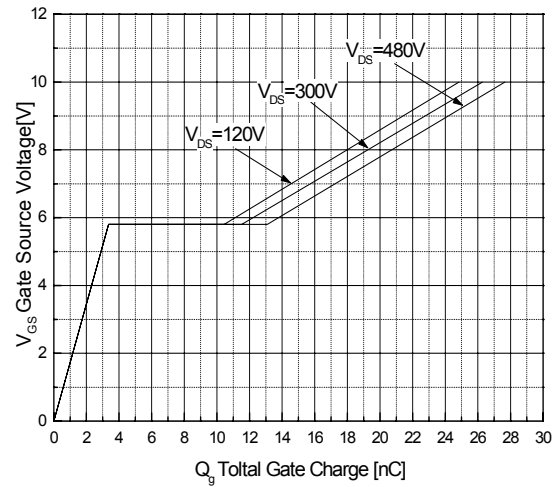
Body Diode Forward Voltage Variation vs. Source Current and Temperature



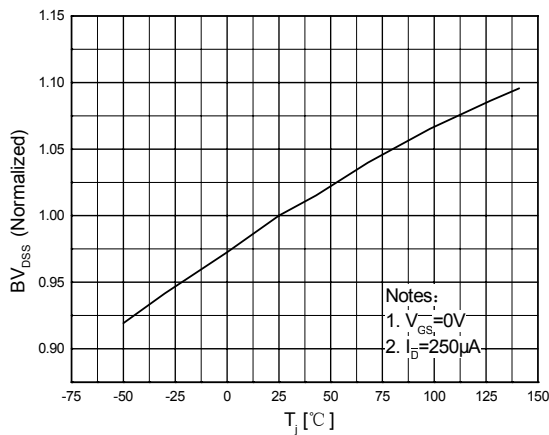
Capacitance Characteristics



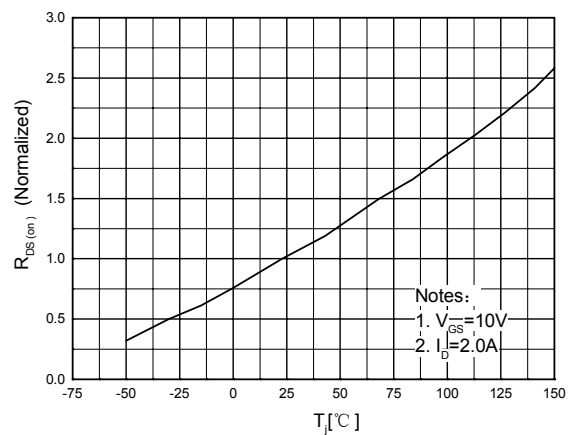
Gate Charge Characteristics



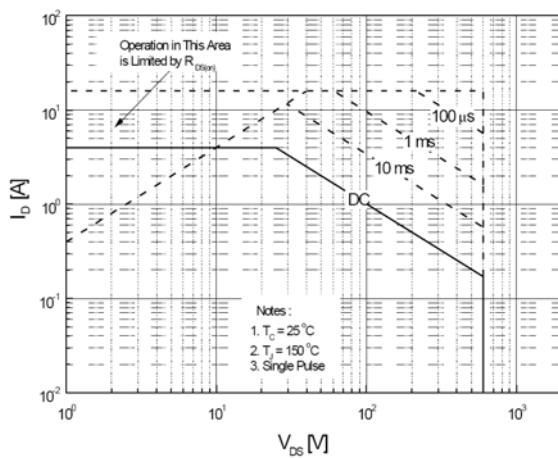
Breakdown Voltage Variation vs. Temperature



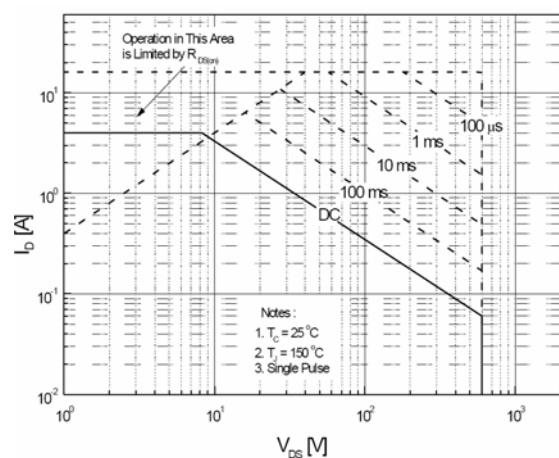
On-Resistance Variation vs. Temperature



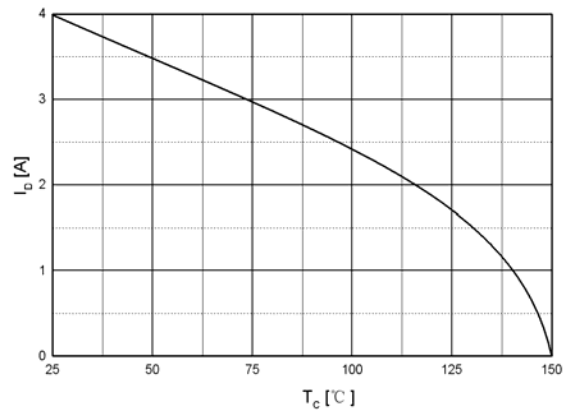
Maximum Safe Operating Area



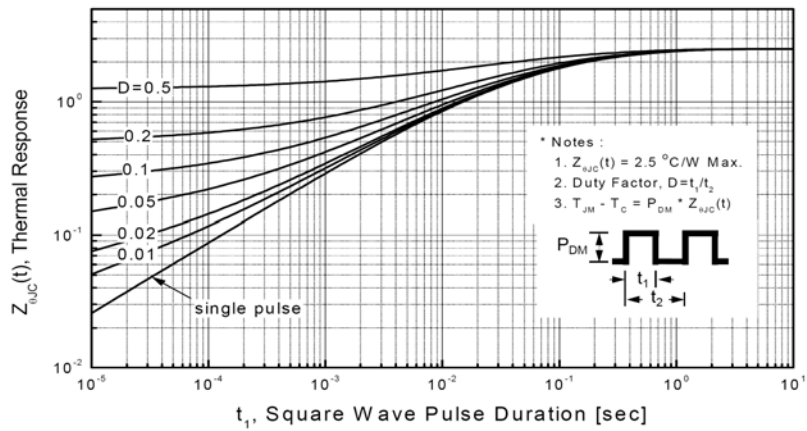
Maximum Safe Operating Area



Maximum Drain Current vs. Case Temperature



Transient Thermal Response Curve



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