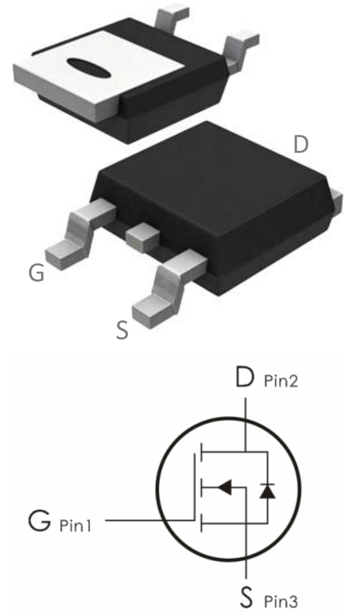
Description:

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}=500V,I_D=4A,$R_{DS(ON)}$<1.4Ω @V_{GS}=10V
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.

Absolute Maximum Ratings: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Continuous Drain Current-T_C=25℃	4	A
	Continuous Drain Current-T_C=100℃	2.4	
	Pulsed Drain Current[1]	16	
E_{AS}	Single Pulse Avalanche Energy[1]	300	mJ
P_D	Power Dissipation,T_C=25℃	2.5	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	2.6	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	50*	

* When mounted on the minimum pad size recommended (PCB Mount)

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Electrical Characteristics： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	500	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=500V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	2	---	4	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=2A	---	1.14	1.4	mΩ
		V_{GS}=4.5V,I_D=0A	---	---	---	
G_{FS}	Forward Transconductance[4]	V_{DS}=40V, I_D=2A	---	5.2	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	480	625	pF
C_{oss}	Output Capacitance		---	80	105	
C_{rss}	Reverse Transfer Capacitance		---	15	20	
Switching Characteristics[4.5]						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=250V, I_D=5A, V_{GS}=10V,R_{GEN}=25Ω	---	12	35	ns
t_r	Rise Time		---	46	100	ns
$t_{d(off)}$	Turn-Off Delay Time		---	50	110	ns
t_f	Fall Time		---	48	105	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=400V, I_D=5A	---	18	24	nC
Q_{gs}	Gate-Source Charge		---	2.2	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	9.7	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=1A	---	---	1.4	V

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Ls	Continuous Source Current		---	4	A
Ism	Pulsed Source Current		---	6	A
trr	Reverse Recovery Time[4]	V_{GS} = 0 V, I_S = 5 A, dI_F / dt = 100 A/µs	263	---	Ns
qrr	Reverse Recovery Charge[4]		1.9	---	nc

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L = 21.5 mH, I_{AS} = 5A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C
3. I_{SD} ≤ 5A, di/dt ≤ 200A/µs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C
4. Pulse Test : Pulse width ≤ 300µs, Duty cycle ≤ 2%
5. Essentially independent of operating temperature

Typical Characteristics： (T_C=25℃ unless otherwise noted)

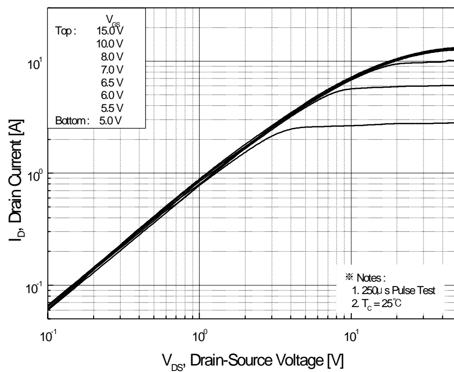

Figure 1. On-Region Characteristics

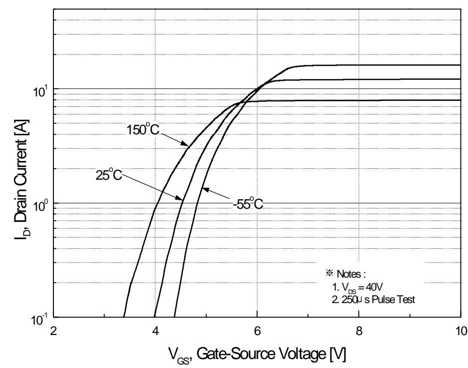

Figure 2. Transfer Characteristics

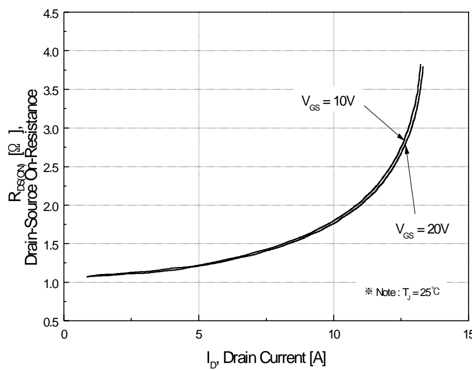

Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

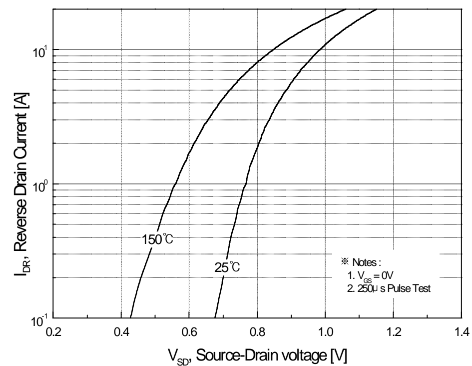

Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

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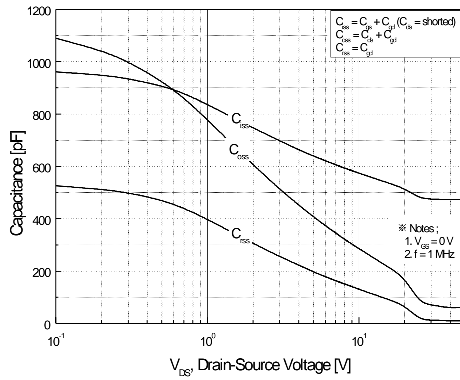

Figure 5. Capacitance Characteristics

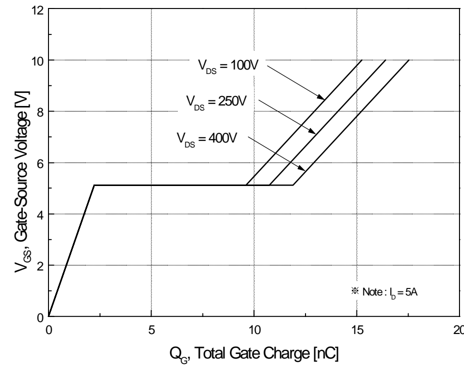

Figure 6. Gate Charge Characteristics

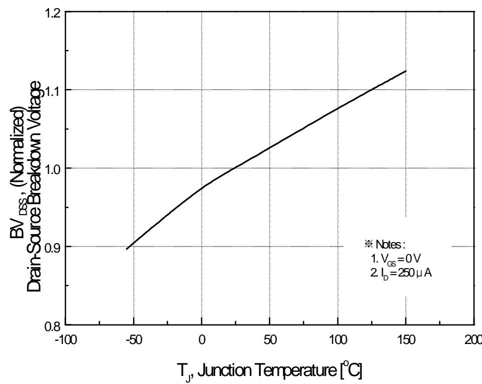

Figure 7. Breakdown Voltage Variation vs Temperature

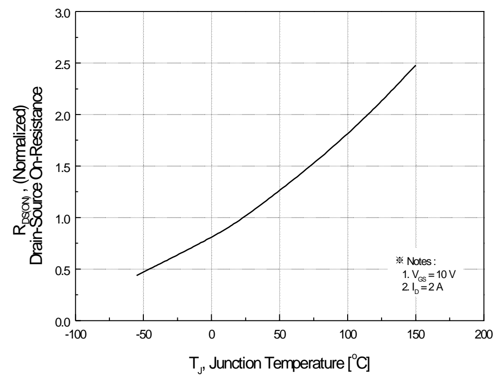

Figure 8. On-Resistance Variation vs Temperature

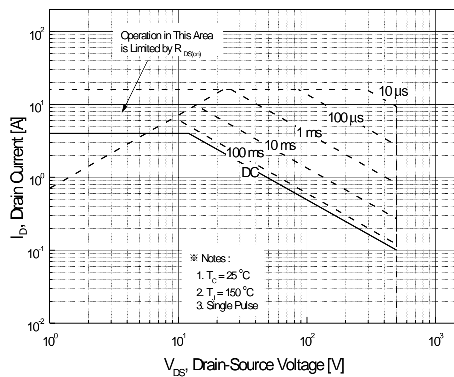

Figure 9. Maximum Safe Operating Area

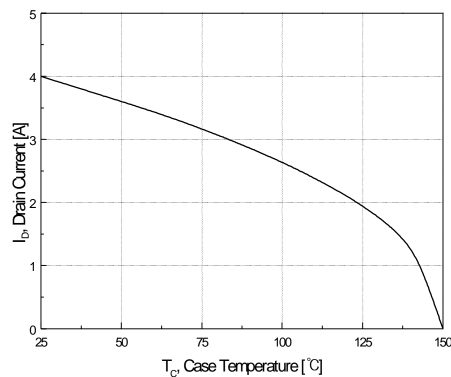

Figure 10. Maximum Drain Current vs Case Temperature

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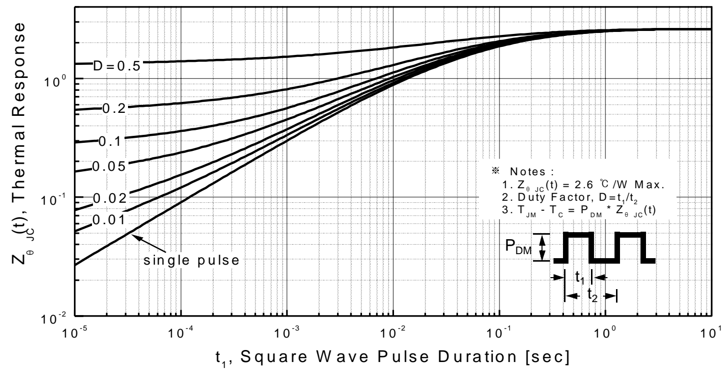

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