

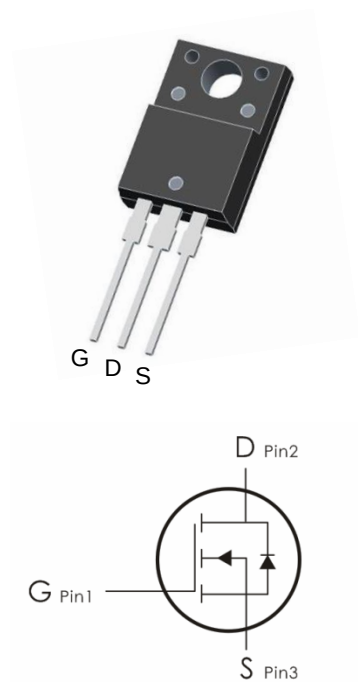
Description:

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) $V_{DS}=650V, I_D=5A, R_{DS(on)} < 2.7 \Omega @ V_{GS}=10V$
- 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: ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Continuous Drain Current- $T_C=25^\circ\text{C}$	5	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	2.5	
	Pulsed Drain Current ¹	16	
E_{AS}	Single Pulse Avalanche Energy ²	80	mJ
P_D	Power Dissipation	24.5	W
I_{AR}	Avalanche Current ¹	5	A
E_{AR}	Repetitive Avalanche Energy ¹	4.5	MJ
Dv/dt	Peak Diode Recovery dv/dt ³	5	
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	5.1	$^{\circ}\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	45.3	

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourtce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	650	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =650V	---	---	1	μ A
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 =250 μ A	2	---	4	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V, I _D =2.5A	---	2.3	2.7	Ω
G _{FS}	Forward Transconductance	V _{DS} =40V, I _D =2.5A	---	3.8	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	415	---	pF
C _{Oss}	Output Capacitance		---	58	---	
C _{rss}	Reverse Transfer Capacitance		---	1.4	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =325V, I _D =5A, R _{GEN} =25 Ω .	---	7	---	ns
t _r	Rise Time		---	22	---	ns
t _{d(off)}	Turn-Off Delay Time		---	15	---	ns
t _f	Fall Time		---	23	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =520V,	---	13	---	nC
Q _{gs}	Gate-Source Charge	I _D =45A	---	4.9	---	nC

Q_{gd}	Gate-Drain "Miller" Charge		---	2.3	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =10A	---	---	1.2	V
I_S	Diode Forward Current	---	---	---	5	A
I_{SM}	Max. Pulsed Forward Current		---	---	16	
T_{rr}	Reverse Recovery Time	V _{GS} = 0 V, I _S = 10 A, di _F / dt = 100 A/μs	---	378	---	NS
Q_{rr}	Reverse Recovery Charge		---	1.35	---	NC

Notes:

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L = 40 mH, I_{AS} = 5 A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C
3. I_{SD} ≤ 4A, di/dt ≤ 200A/μs, V_{DD} ≤ BVDSS, 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°C unless otherwise noted)

Table 7 Reverse diode characteristics

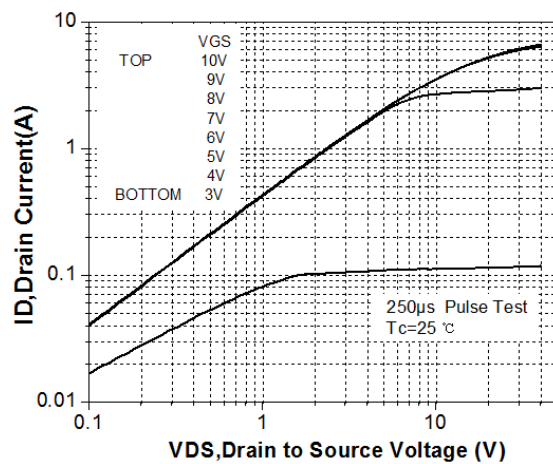


Figure 1. On-Region Characteristics

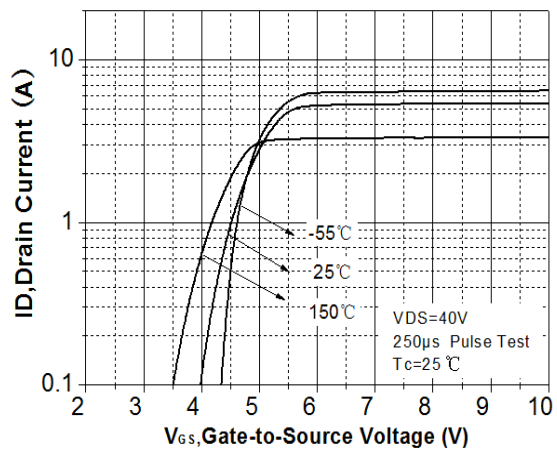


Figure 2. Transfer Characteristics

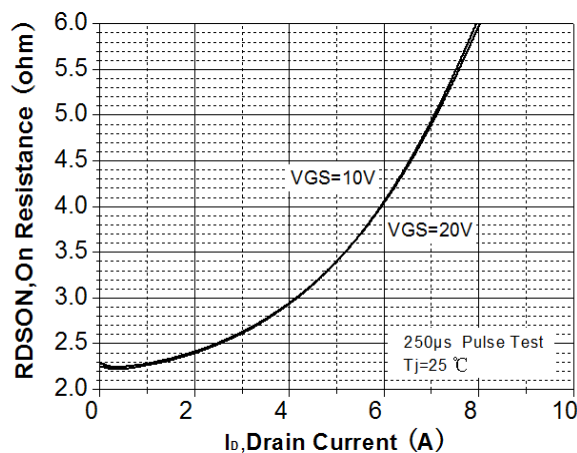


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

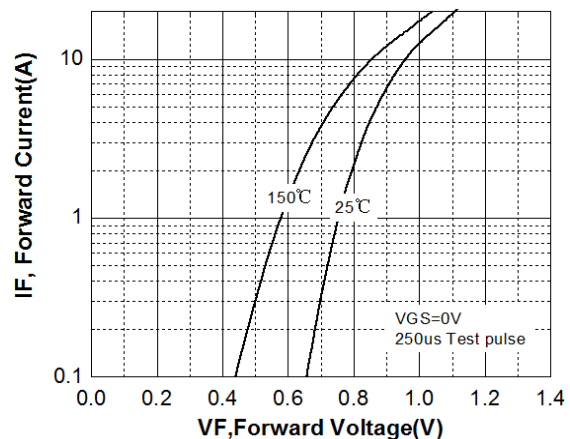


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

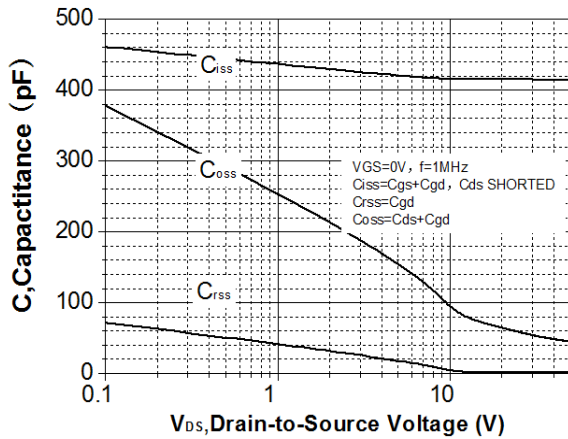


Figure 5. Capacitance Characteristics

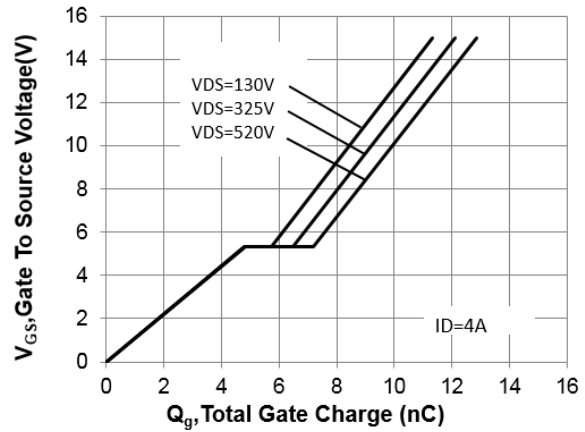


Figure 6. Gate Charge Characteristics

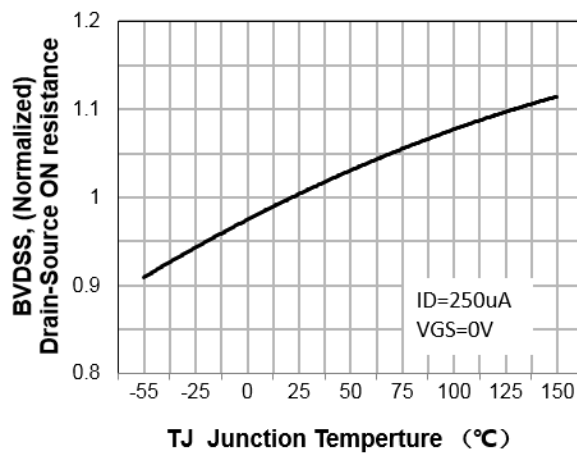


Figure 7. Breakdown Voltage Variation vs Temperature

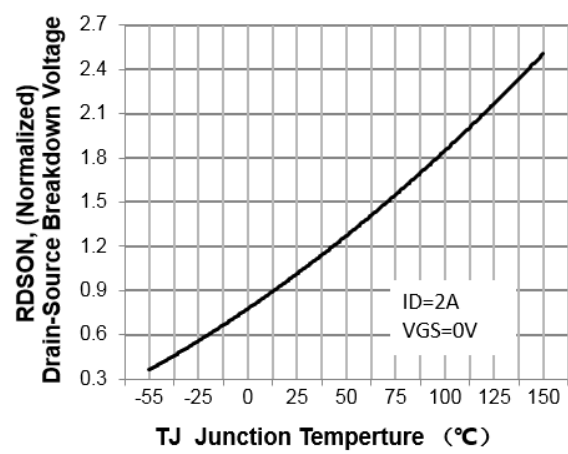


Figure 8. On-Resistance Variation vs Temperature

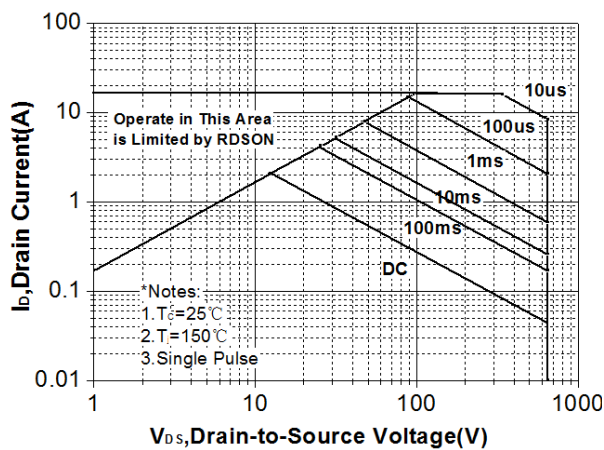


Figure 9. Maximum Safe Operating Area

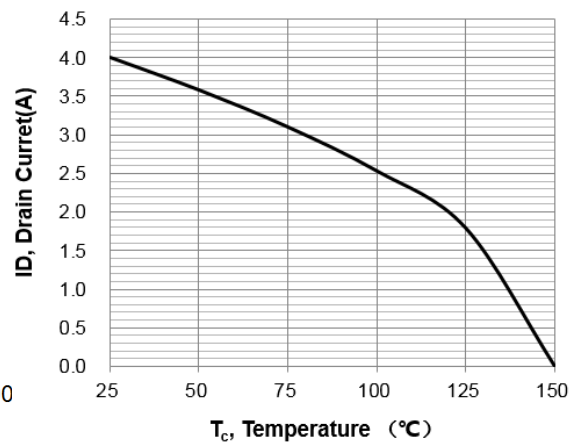


Figure 10. Maximum Drain Current vs Case Temperature

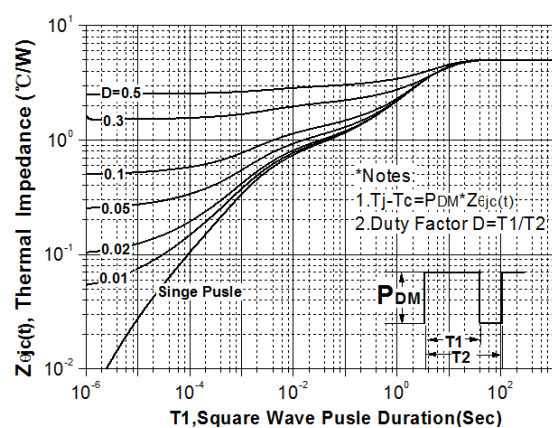


Figure 11. Transient Thermal Response Curve



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