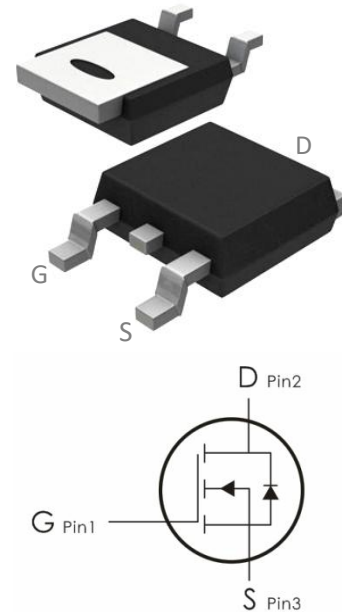


Description:

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) $V_{DS}=20V, I_D=45A, R_{DS(ON)} < 8m\ \Omega @ V_{GS}=10V$
- 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	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current	45	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	28	
I_{DM}	Pulsed Drain Current	130	A
P_D	Power Dissipation	45	W
E_{AS}	Single pulse avalanche energy ^(Note 5)	180	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ^(Note 2)	3.2	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	20	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=20V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	0.5	0.7	1.2	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=20A$	---	6.3	8	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=20A$	---	8.5	13	$\text{m}\Omega$
		$V_{GS}=2.5V, I_D=20A$	---	14	18	$\text{m}\Omega$
G_{FS}	Forward Transconductance	$V_{DS}=5V, I_D=20A$	10	---	---	S
Dynamic Characteristics ^(Note 4)						
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$	---	1540	---	pF
C_{oss}	Output Capacitance		---	210	---	
C_{rss}	Reverse Transfer Capacitance		---	200	---	
Switching Characteristics ^(Note 4)						
$t_{d(on)}$	Turn-On Delay Time	$V_{GS}=10V, V_{DS}=10V,$ $R_L=0.5\Omega, R_{GEN}=3\Omega$	---	4.5	---	ns
t_r	Rise Time		---	9.2	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	18.7	---	ns
t_f	Fall Time		---	3.3	---	ns
Q_g	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=10V,$ $I_D=20A$	---	23.5	---	nC
Q_{gs}	Gate-Source Charge		---	2.8	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	5.75	---	nC
Drain-Source Diode Characteristics						

I_s	Max. Diode Forward Current ^(Note 2)	----	---	---	30	A
V_{SD}	Diode Forward Voltage ^(Note 3)	V _{GS} =0V, I _S =20A	---	---	1.2	V
t_{rr}	Reverse Recovery Time	I _F =20A, T _J =25°C	---	18	---	ns
Q_{rr}	Reverse Recovery Charge	diF/dt=100A/μs ^(Note 3)	---	9.5	---	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition: T_J=25°C, V_{DD}=10V, V_G=10V, L=0.5mH, R_G=25Ω

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

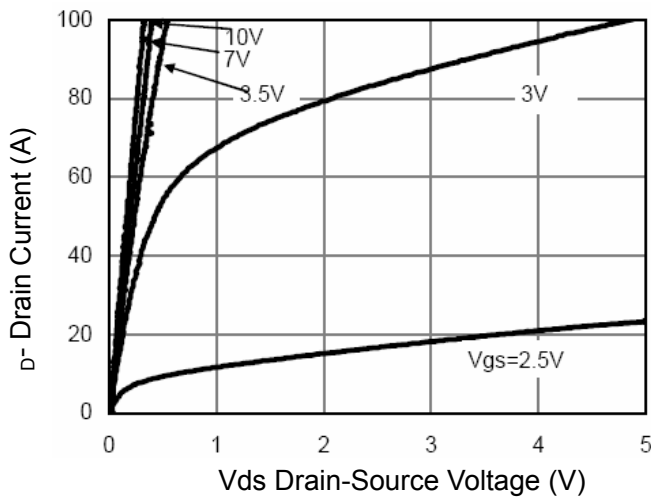


Figure 1 Output Characteristics

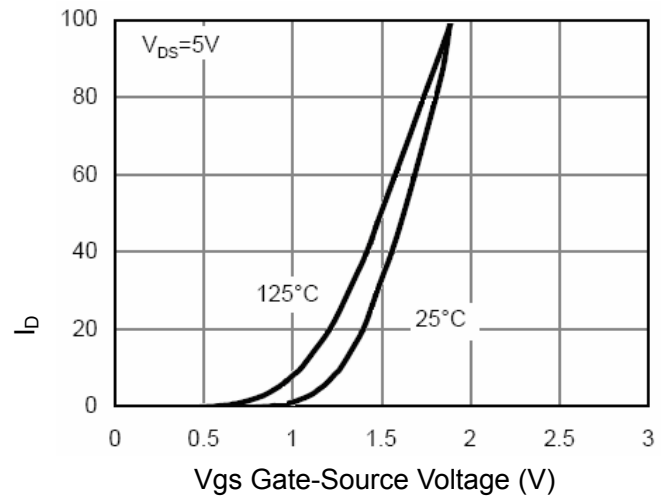


Figure 2 Transfer Characteristics

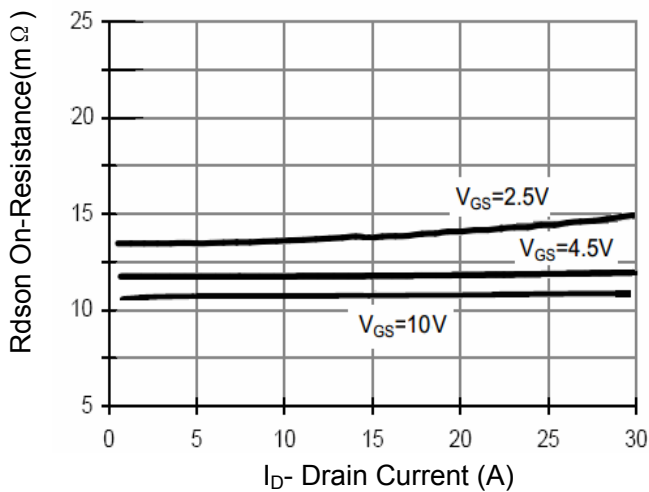


Figure 3 Rdson- Drain Current

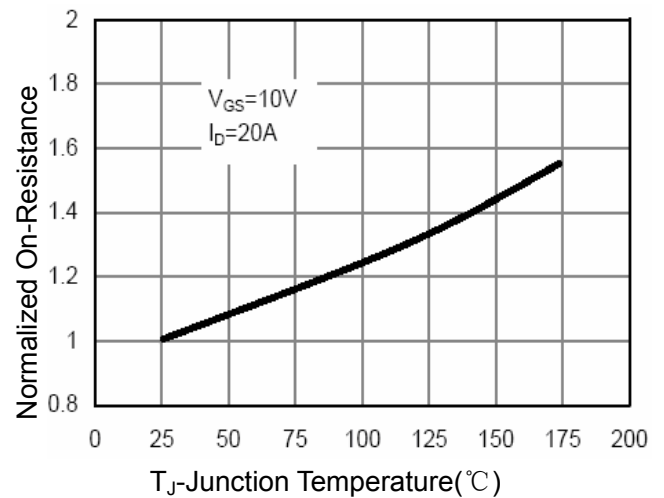
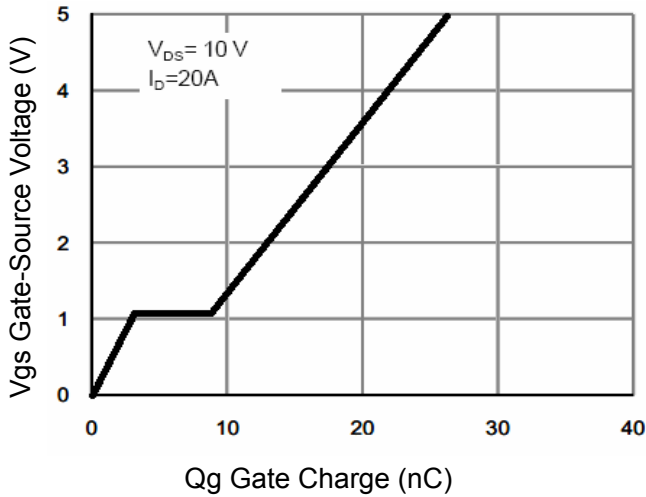


Figure 4 Rdson-Junction Temperature



Qg Gate Charge (nC)
Figure 5 Gate Charge

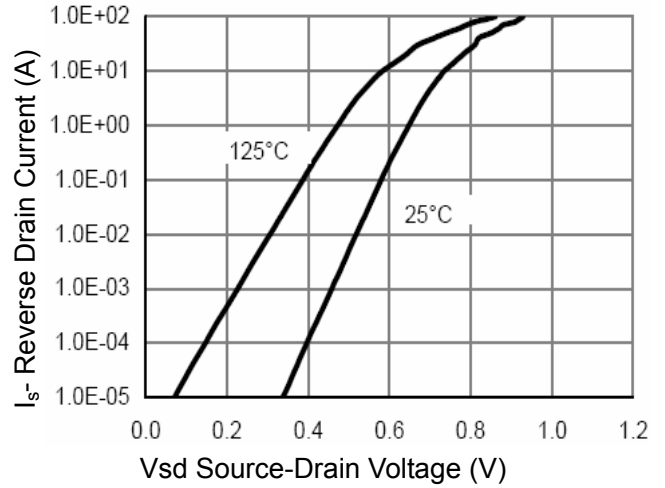


Figure 6 Source- Drain Diode Forward

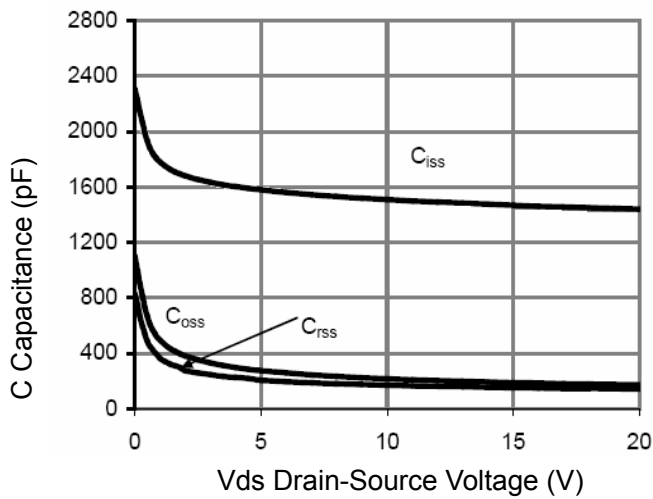


Figure 7 Capacitance vs Vds

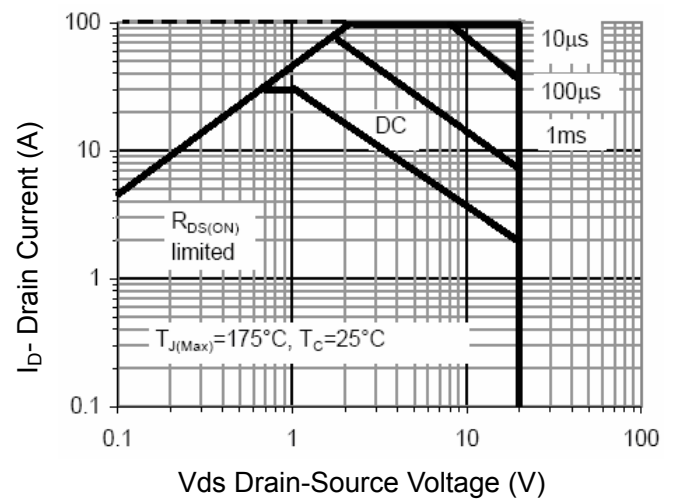


Figure 8 Safe Operation Area

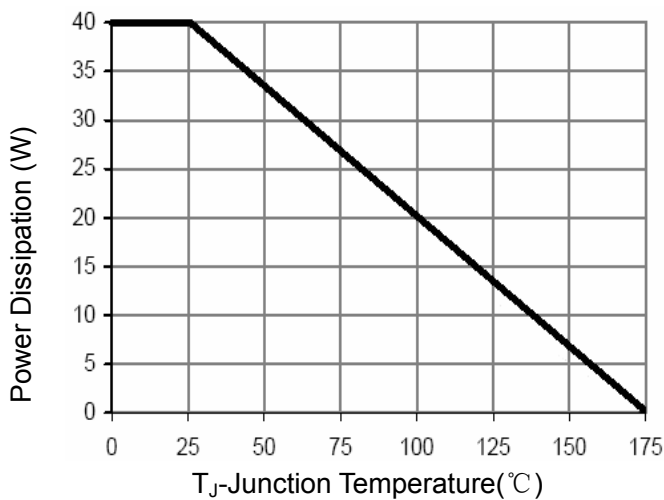


Figure 9 Power De-rating

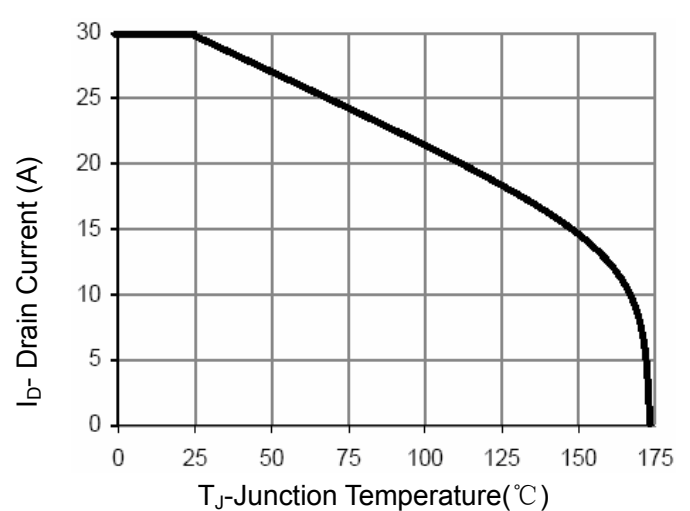
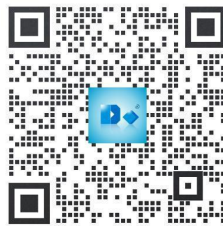
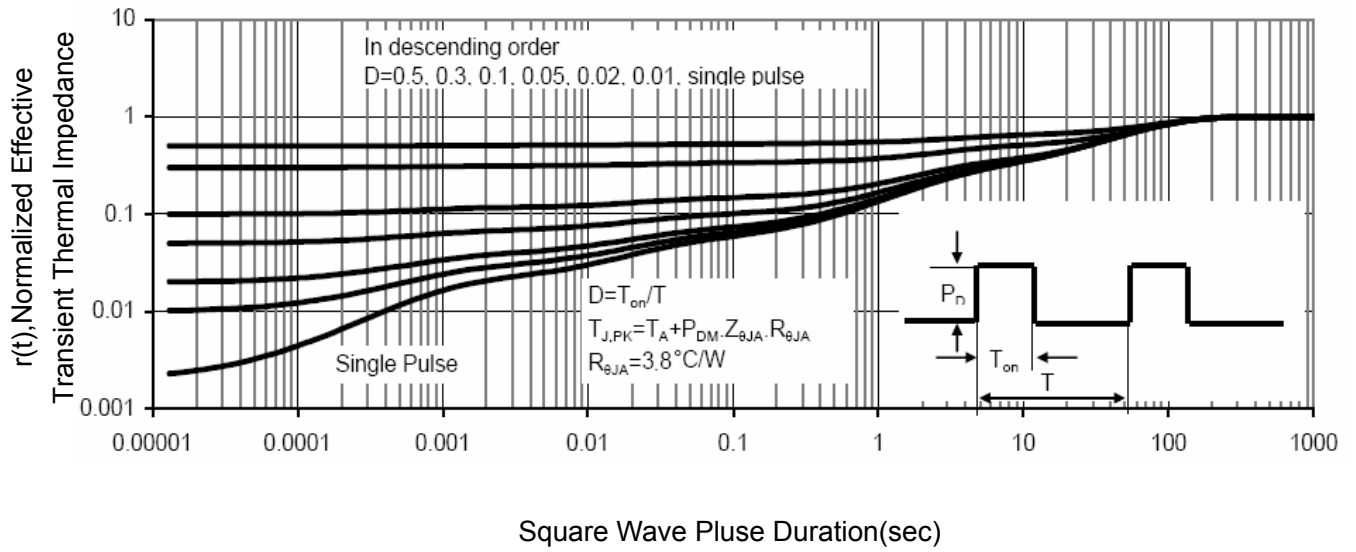


Figure 10 Current De-rating



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