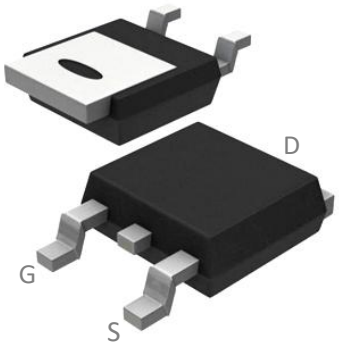
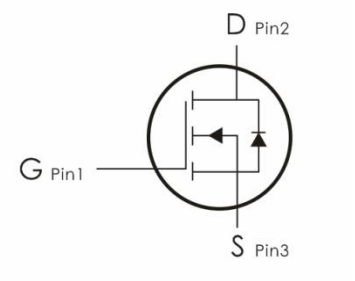
Description：

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,$R_{DS(ON)}$< 8mΩ @V_{GS}=4.5 V
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.

Absolute Maximum Ratings：(T_A=25℃ 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-TC=100℃	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	℃

Thermal Characteristics：

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

Package Marking and Ordering Information：

Part NO.	Marking	Package
DOD50N02	50N02	TO-252

Electrical Characteristics： (T_A=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	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}=±12V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	0.5	0.7	1.2	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=4.5V,I_D=20A	---	6.3	8	mΩ
		V_{GS}=2.5V,I_D=10A	---	8.5	13	mΩ
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=1MHz	---	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=0.5Ω,R_{GEN}=3Ω	---	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
trr	Reverse Recovery Time	I_F=20A,T_J=25℃	---	18	---	ns
Qrr	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：Tj=25℃,V_{DD}=10V,V_G=10V,L=0.5mH,Rg=25Ω

Typical Characteristics：

(T_A=25℃ unless otherwise noted)

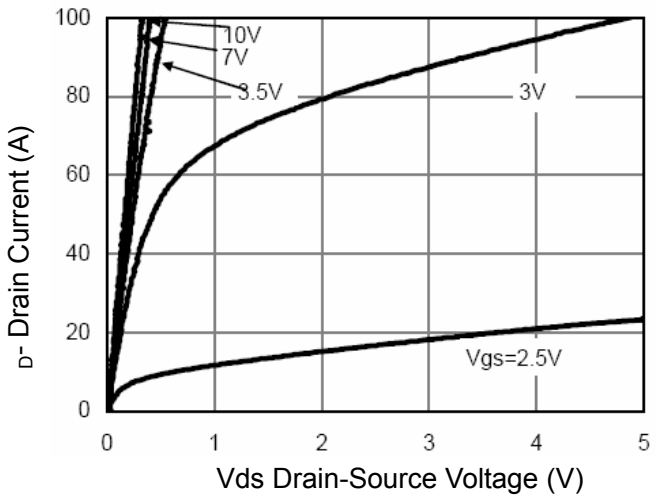


Figure 1 Output Characteristics

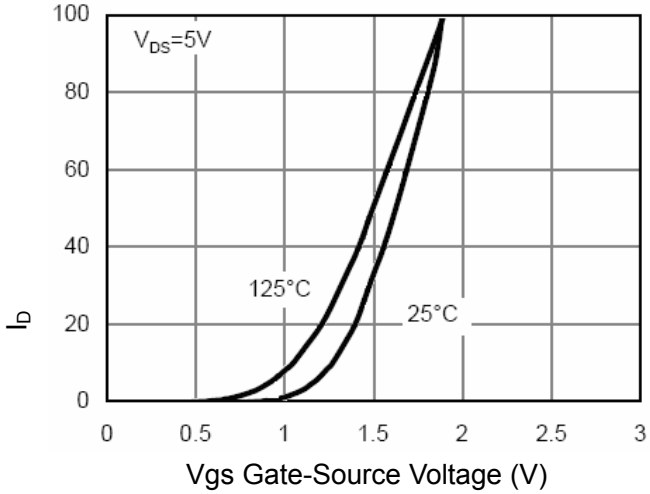


Figure 2 Transfer Characteristics

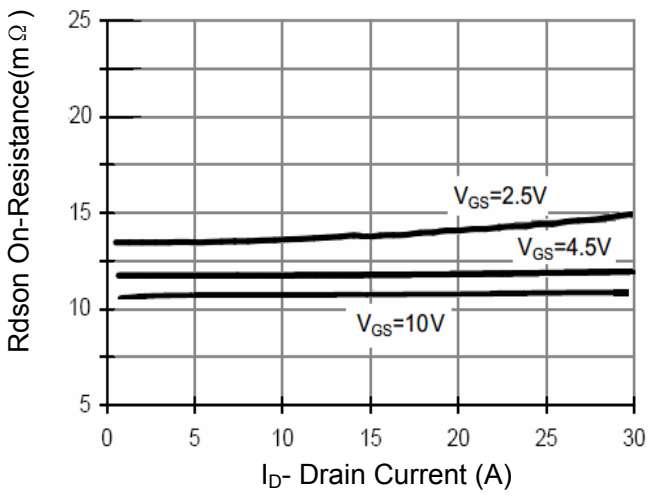


Figure 3 Rdson- Drain Current

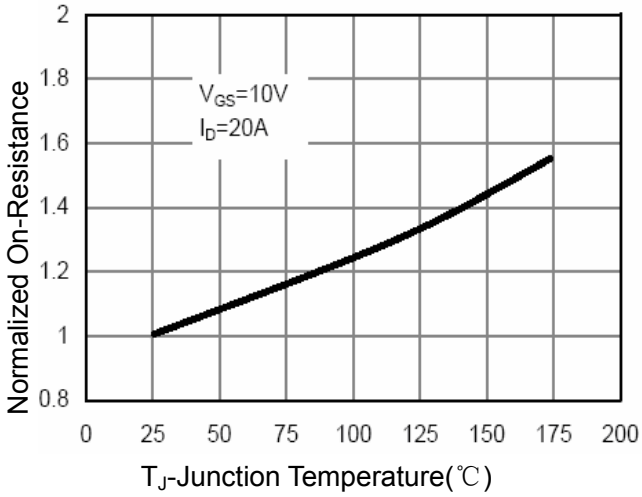


Figure 4 Rdson-Junction Temperature

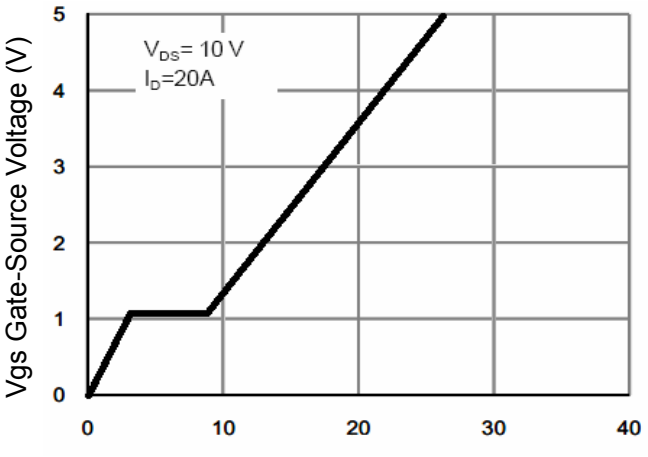


Figure 5 Gate Charge

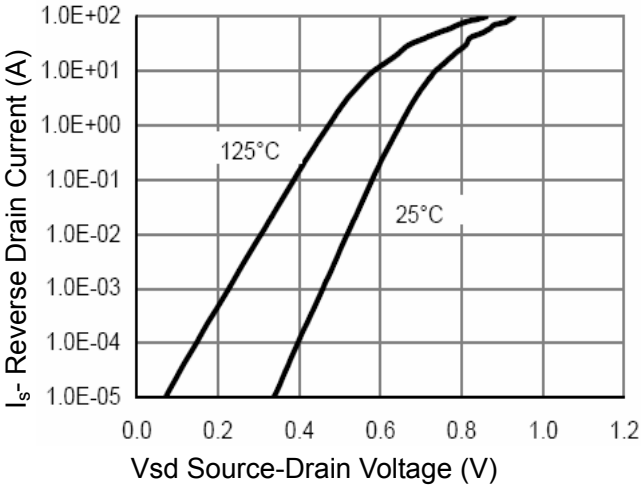


Figure 6 Source- Drain Diode Forward

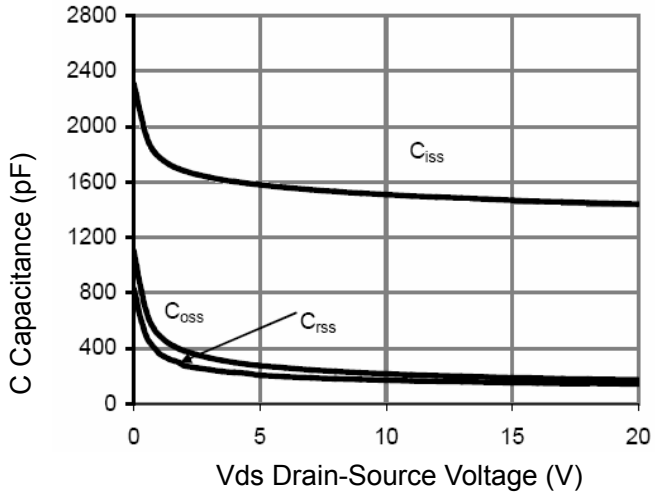


Figure 7 Capacitance vs Vds

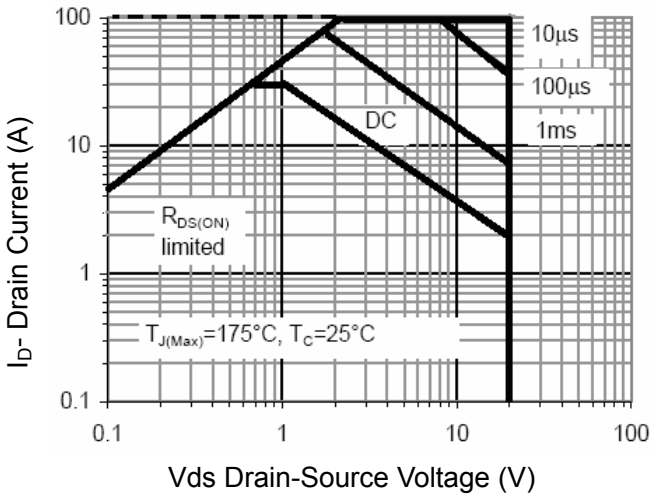


Figure 8 Safe Operation Area

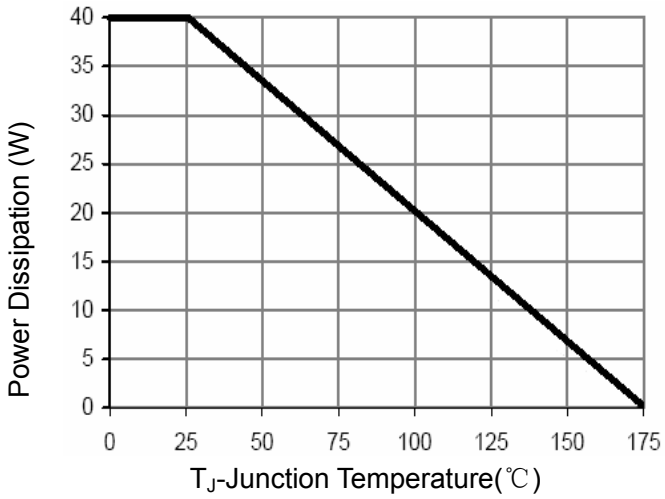


Figure 9 Power De-rating

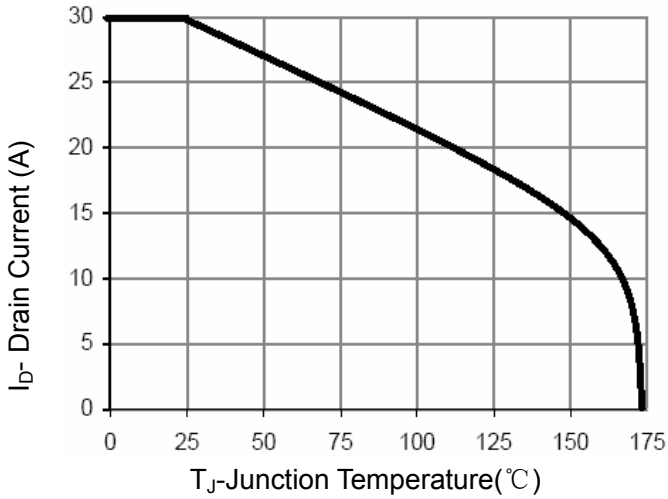
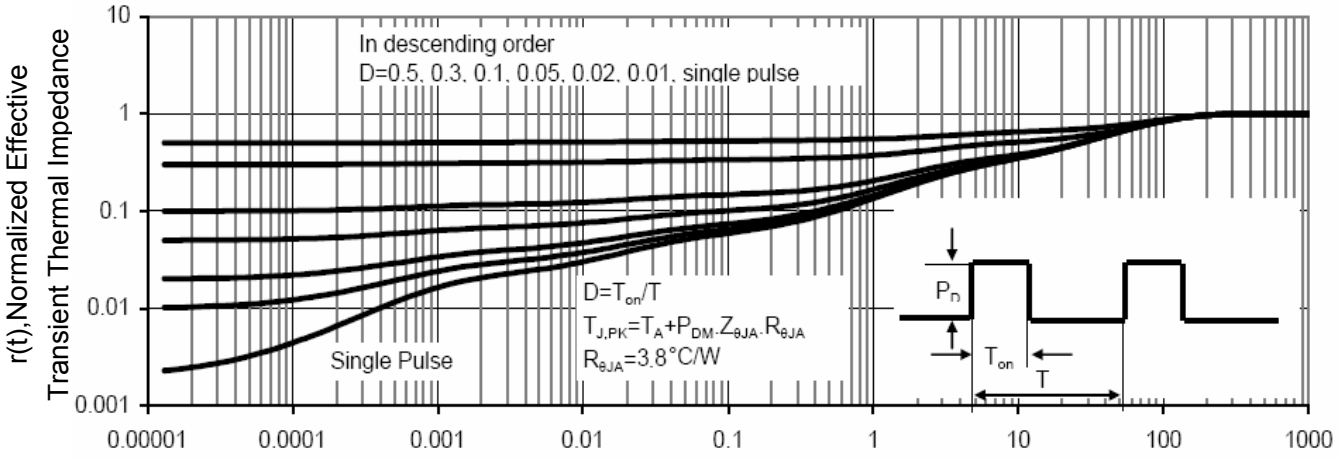


Figure 10 Current De-rating



Square Wave Pluse Duration(sec)

Figure 11 Normalized Maximum Transient Thermal Impedance