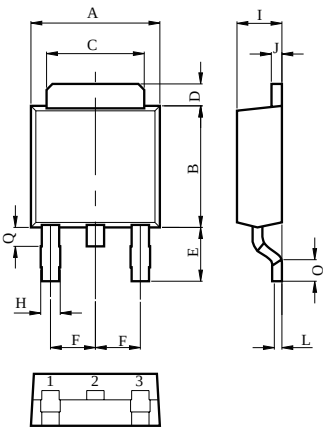
N-Channel Power MOSFET



DIM	MILLIMETERS
A	6 50 ± 0 2
B	5 60 ± 0 2
C	5 20 ± 0 2
D	1 50 ± 0 2
E	2 70 ± 0 2
F	2 30 ± 0 1
H	1 00 MAX
I	2 30 ± 0 2
J	0 5 ± 0 1
L	0 50 ± 0 10
O	1 6 ± 0 2
Q	0 95 MAX

1 GATE
2 DRAIN
3 SOURCE

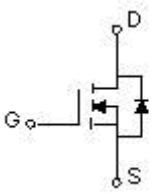
D-PAK (TO-252)

GENERAL DESCRIPTION

This advanced high voltage MOSFET is designed to stand high energy in the avalanche mode and switch efficiently. This new high energy device also offers a drain Designed for high voltage, high speed power supplies , converters, power motor controls and bridge circuits power supplies

FEATURE

- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability



APPLICATION

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	40	A
Pulsed Drain Current	I_{DM}	160	A
Single Pulsed Avalanche Energy	E_{AS}(1)	320	mJ
Power Dissipation (T_A=25℃)	P_D	1.25	W
Power Dissipation (T_C=25℃)	P_D	102	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	100	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{stg}	-55 ~+150	℃
Lead Temperature for Soldering Purposes(1/8" from case for 10s)	T_L	260	℃

(1).E_{AS} condition: V_{DD}=50V,L=0.5mH, R_G=25Ω, Starting T_J = 25°C

ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)\ DSS}$	V_{GS} = 0V, I_D =250μA	100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =100V, V_{GS} =0V			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±100	nA
On characteristics (note1)						
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2		4	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =28A		14	17	mΩ
Forward transconductance	g_{Fs}	V_{DS} =25V, I_D =28A	32			S
Dynamic characteristics (note 2)						
Input capacitance	C_{iss}	V_{DS} =30V,V_{GS} =0V, f =1MHz		3400		pF
Output capacitance	C_{oss}			290		
Reverse transfer capacitance	C_{rss}			221		
Switching characteristics (note 2)						
Total gate charge	Q_g	V_{DS}=30V, V_{GS}=10V, I_D=30A		94		nC
Gate-source charge	Q_{gs}			16		
Gate-drain charge	Q_{gd}			24		
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V,V_{GS}=10V,R_G= 2.5Ω, I_D=2A, R_L=15Ω		15		ns
Turn-on rise time	t_r			11		
Turn-off delay time	$t_{d(off)}$			52		
Turn-off fall time	t_f			13		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage(note1)	V_{SD}	V_{GS} =0V, I_S=28A			1.2	V
Continuous drain-source diode forward current	I_S				40	A
Pulsed drain-source diode forward current	I_{SM}				160	A

Notes:

1. Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.
2. Guaranteed by design, not subject to production.

Typical Electrical and Thermal Characteristics (Curves)

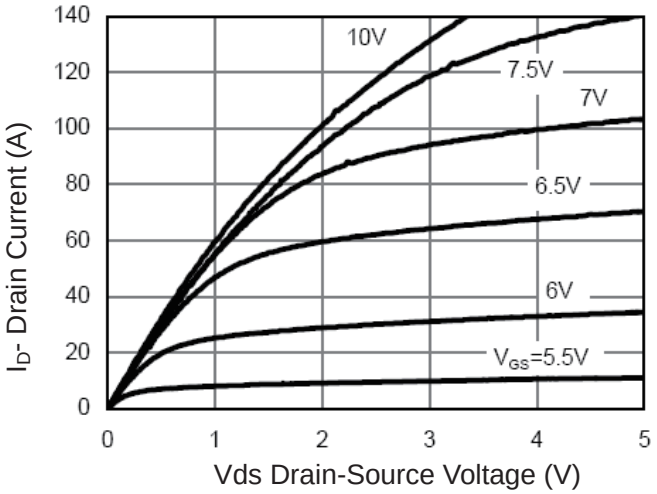


Figure 1 Output Characteristics

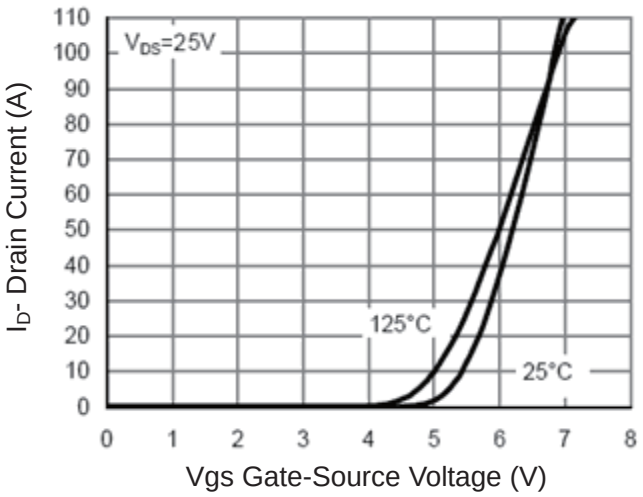


Figure 2 Transfer Characteristics

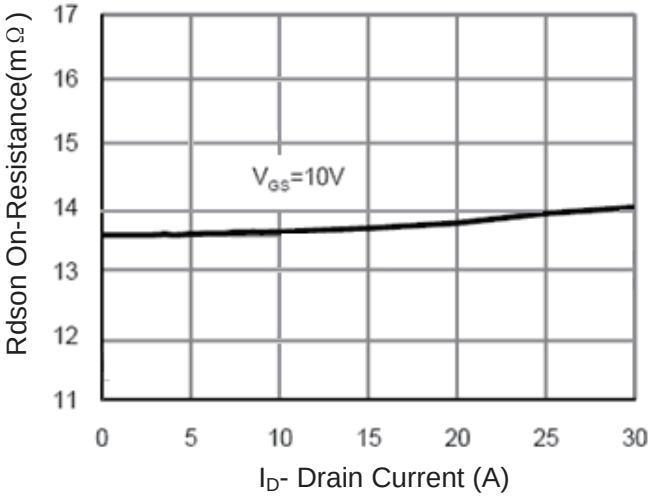


Figure 3 Rdson- Drain Current

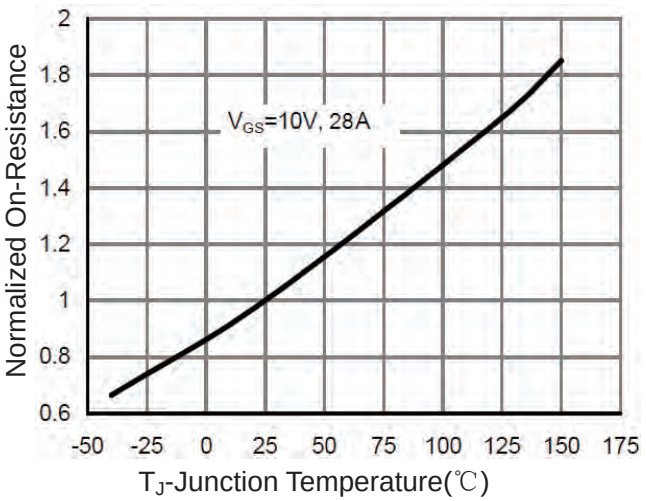


Figure 4 Rdson-JunctionTemperature

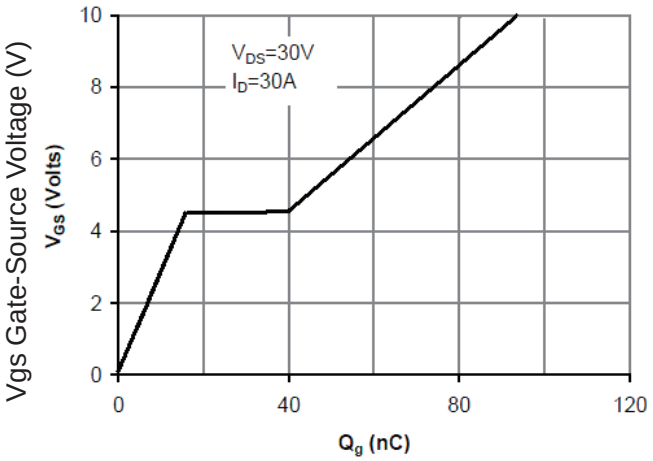


Figure 5 Gate Charge

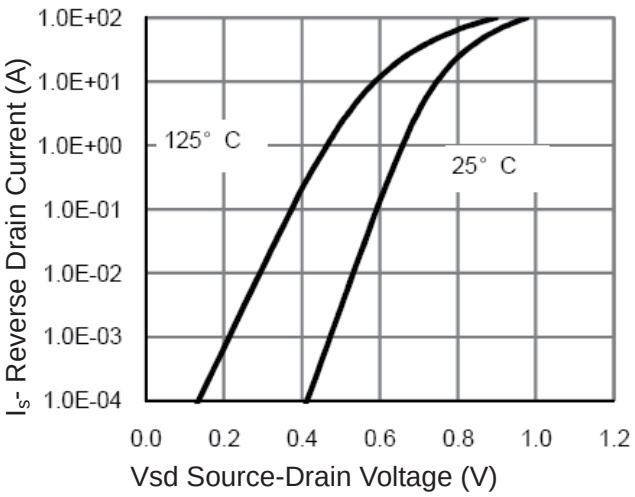


Figure 6 Source- Drain Diode Forward

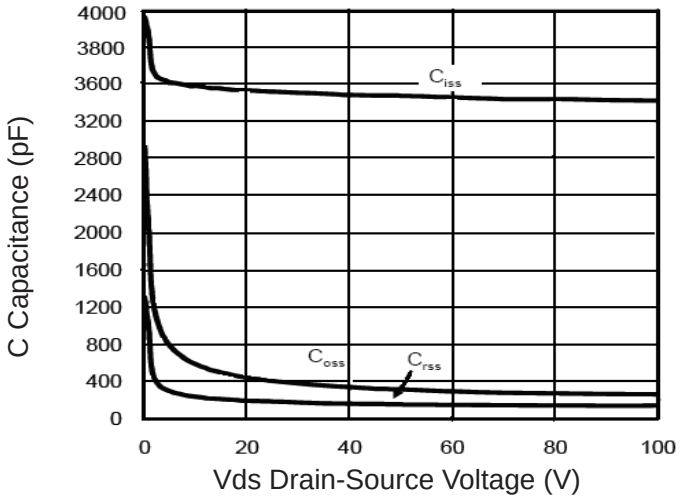


Figure 7 Capacitance vs Vds

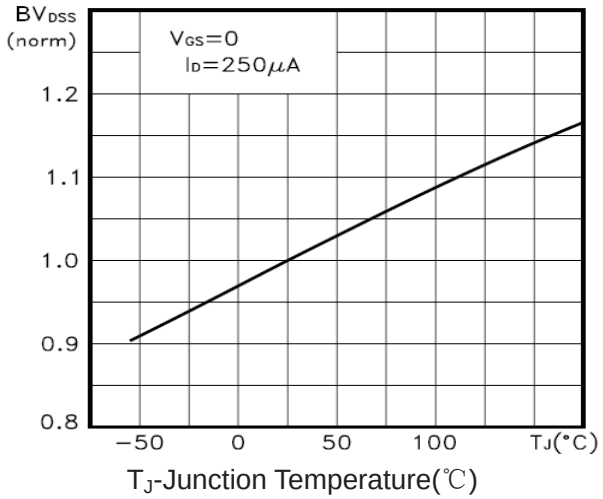


Figure 9 BV_{DSS} vs Junction Temperature

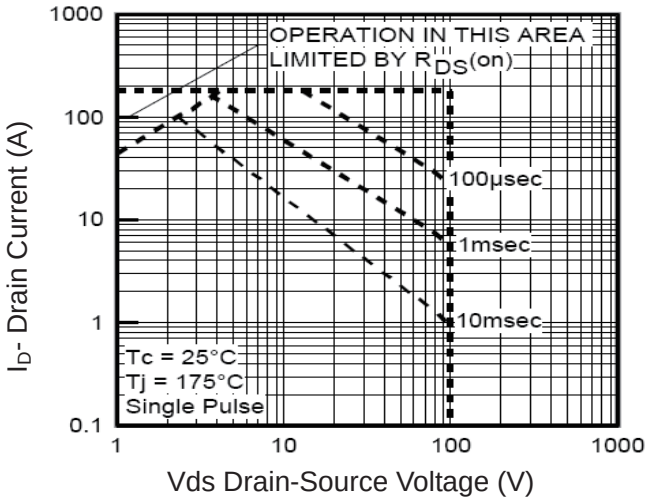


Figure 8 Safe Operation Area

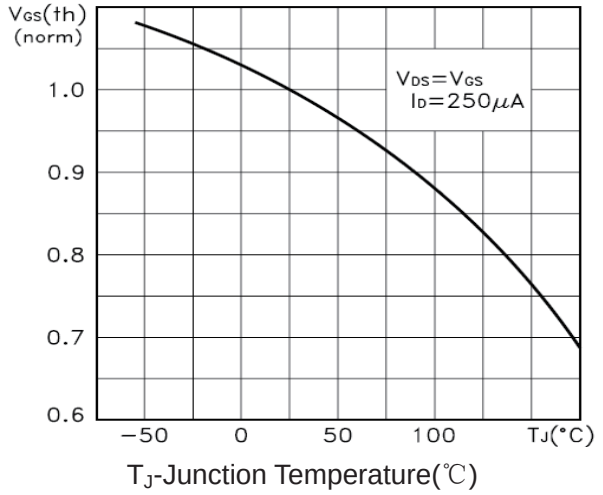
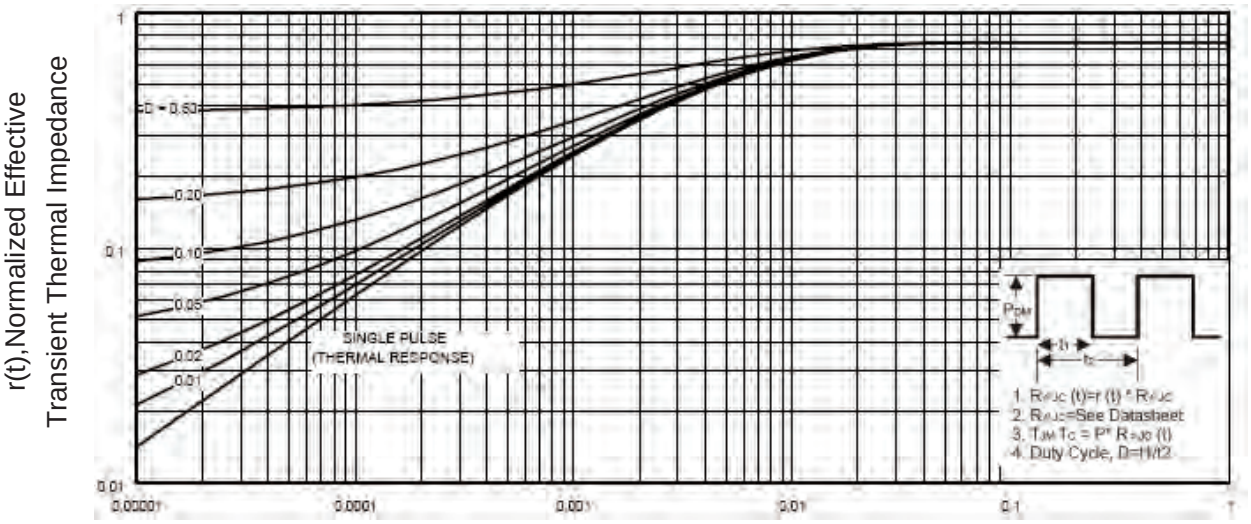


Figure 10 $V_{GS(th)}$ vs Junction Temperature



Square Wave Pluse Duration(sec)

Figure 11 Normalized Maximum Transient Thermal Impedance