

100V N-Channel Power MOSFET

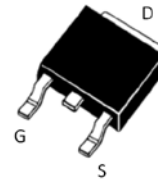
DESCRIPTION :

- Excellent $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% ΔV_{ds} Tested
- Pb-Free Lead Plating
- RoHS compliant

V_{DSS}	100V
$I_D (@V_{GS}=10V)$	80A
$R_{DS(ON)_Typ. @V_{GS}=10V}$	5.8m Ω

TYPICAL APPLICATIONS :

- Load Switch
- PWM Application
- Power Management



TO-252

MAXIMUM RATINGS (at $T_C = 25^\circ\text{C}$, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C=25^\circ\text{C}$ $T_C=100^\circ\text{C}$	I_D	80 56	A
Pulsed Drain Current ⁽¹⁾		I_{DM}	Refer to Fig.4	A
Single Pulsed Avalanche Energy ⁽²⁾		E_{AS}	238	mJ
Power dissipation	$T_C=25^\circ\text{C}$ $T_C=100^\circ\text{C}$	P_D	111 44	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	$^\circ\text{C}$

Notes : 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. EAS condition: Starting $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $V_G=10\text{V}$, $R_G=25\text{ohm}$, $L=3\text{mH}$, $I_{AS}=13\text{A}$, $V_{DD}=0\text{V}$ during time in avalanche.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction – Ambient Junction - Case	$R_{\theta(j-A)}$ $R_{\theta(j-C)}$	40 1.1	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS (at $T_J = 25\text{ }^\circ\text{C}$, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	100			V
Zero Gate Voltage Drain Current VDS = 80 V, VGS = 0 V $T_J=25^\circ\text{C}$	I_{DSS}			1	μA
Gate-Source Leakage Current VGS = $\pm 20\text{V}$, VDS = 0V	I_{GSS}			± 100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	1.2	1.7	2.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A VGS = 4.5V, ID = 20A	$R_{DS(on)}$		5.8 7.6	6.9 9.9	m Ω
Input capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{iss}		2615		pF
Output capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{oss}		806		pF
Reverse transfer capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{rss}		22		pF
Gate Resistance f=1MHz, VDS=0 V, VGS=0 V	R_g		1.8		Ω
Total Gate Charge VDS= 50V, ID= 20A, VGS= 0 to 10V	Q_G		44		nC
Gate to Source Charge VDS= 50V, ID= 20A, VGS= 0 to 10V	Q_{GS}		9		nC
Gate to Drain Charge VDS= 50V, ID= 20A, VGS= 0 to 10V	Q_{GD}		9		nC
Turn-on delay time VDD=50 V, VGS= 10V, ID= 20A, $R_{GEN}=6.2\Omega$	$t_{d(ON)}$		11		ns
Turn-on Rise time VDD=50 V, VGS= 10V, ID= 20A, $R_{GEN}=6.2\Omega$	tr		18		ns
Turn-off delay time VDD=50 V, VGS= 10V, ID= 20A, $R_{GEN}=6.2\Omega$	$t_{d(OFF)}$		50		ns
Turn-off Fall time VDD=50 V, VGS= 10V, ID= 20A, $R_{GEN}=6.2\Omega$	tf		40		ns

Typical Performance Characteristics

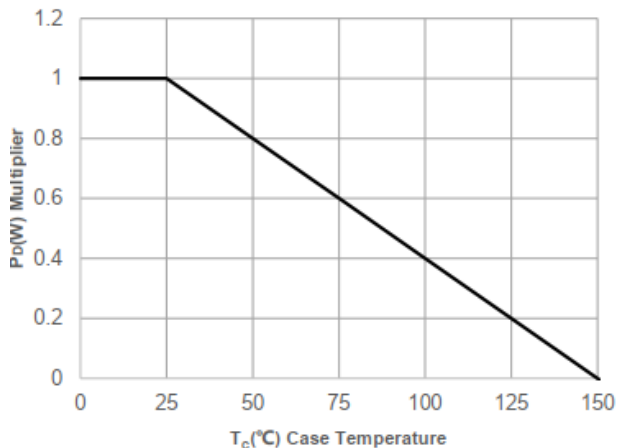


Figure 1. Power De-rating

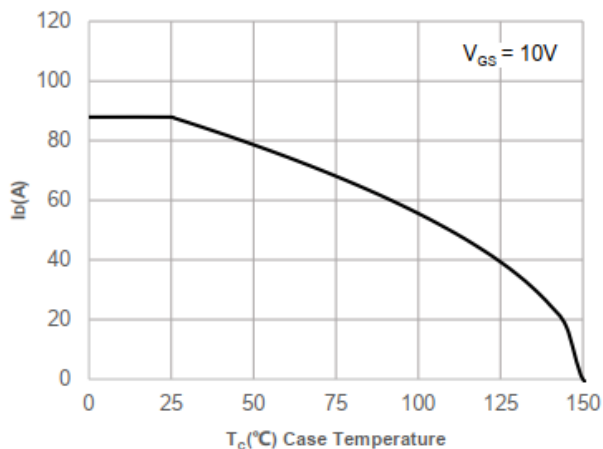


Figure 2. Current De-rating

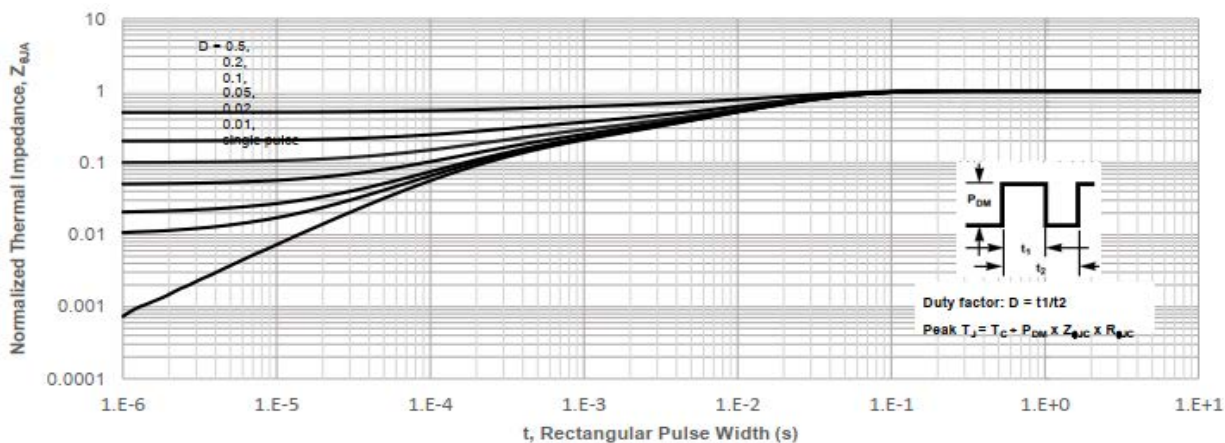


Figure 3. Normalized Maximum Transient Thermal Impedance

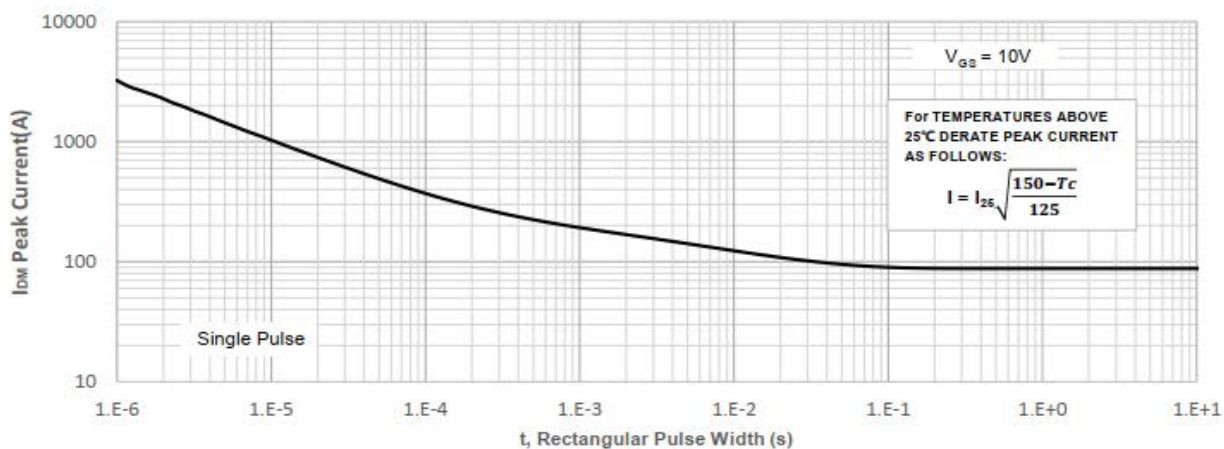


Figure 4. Peak Current Capacity

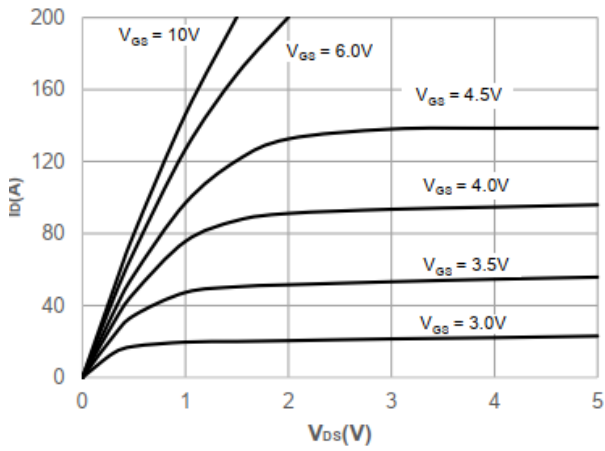


Figure 5. Output Characteristics

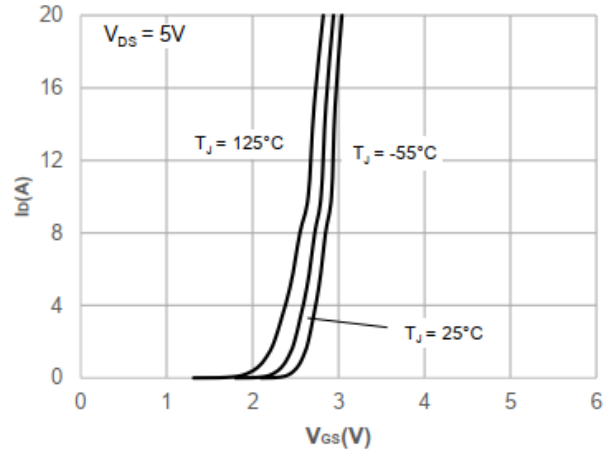


Figure 6. Typical Transfer Characteristics

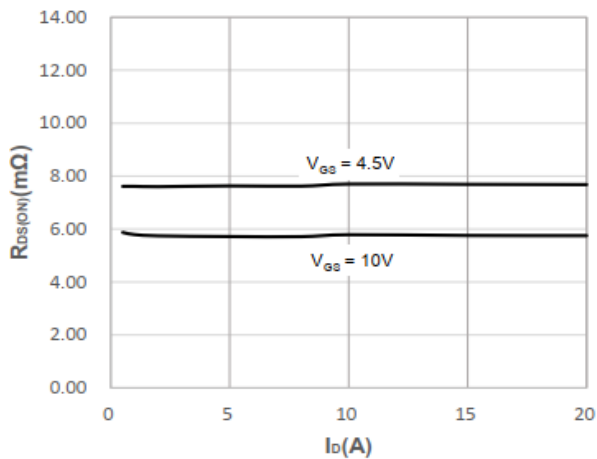


Figure 7. On-resistance vs. Drain Current

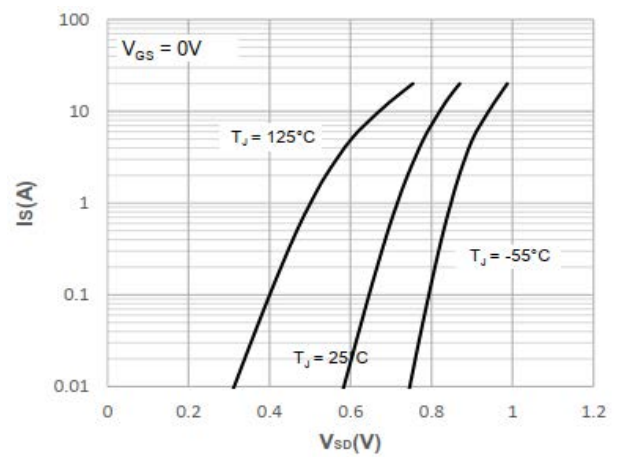


Figure 8. Body Diode Characteristics

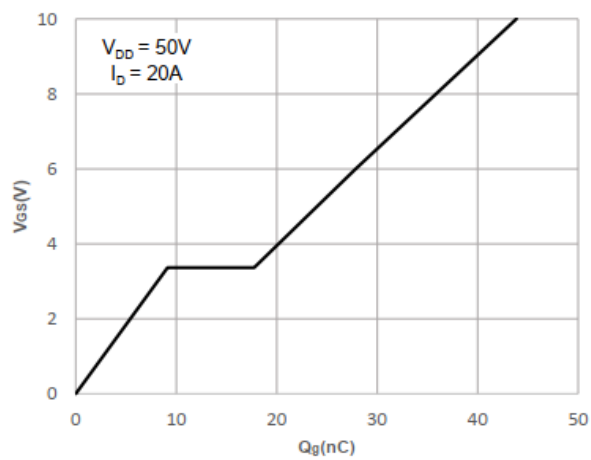


Figure 9. Gate Charge Characteristics

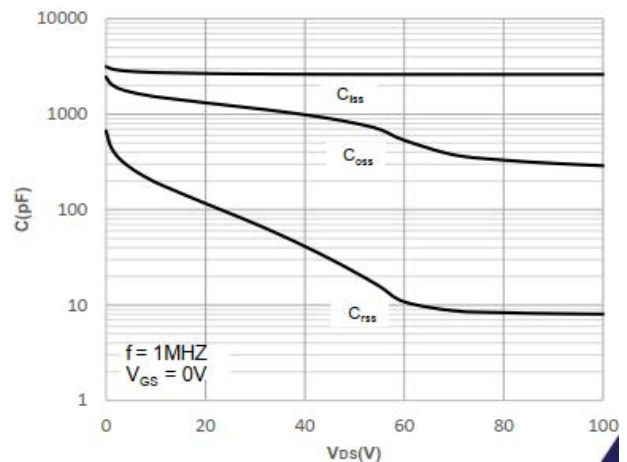


Figure 10. Capacitance Characteristics

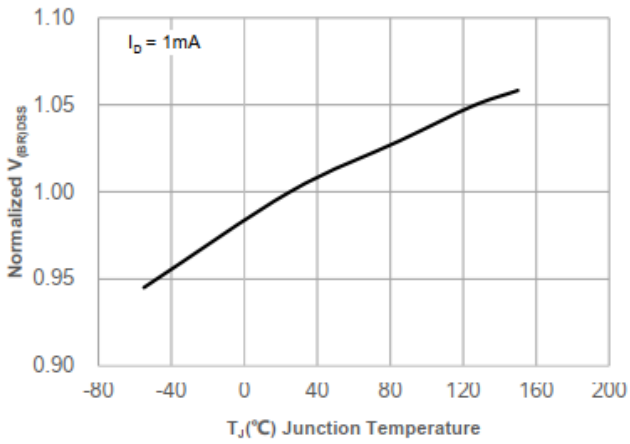


Figure 11. Normalized Breakdown voltage vs. Junction Temperature

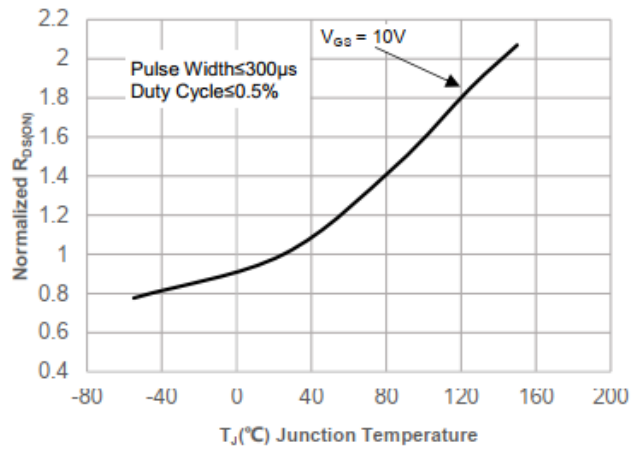


Figure 12. Normalized on Resistance vs. Junction Temperature

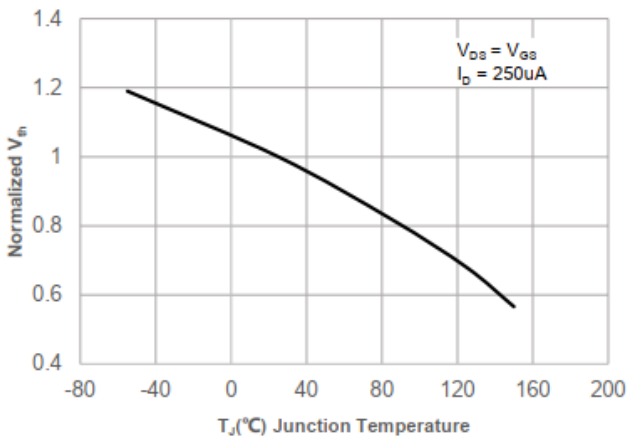


Figure 13. Normalized Threshold Voltage vs. Junction Temperature

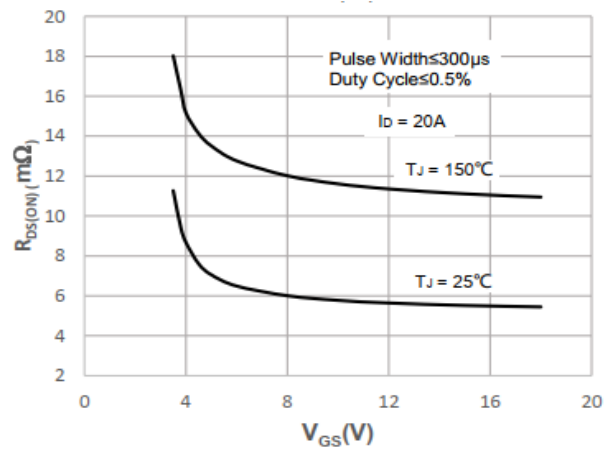


Figure 14. $R_{DS(ON)}$ vs. V_{GS}

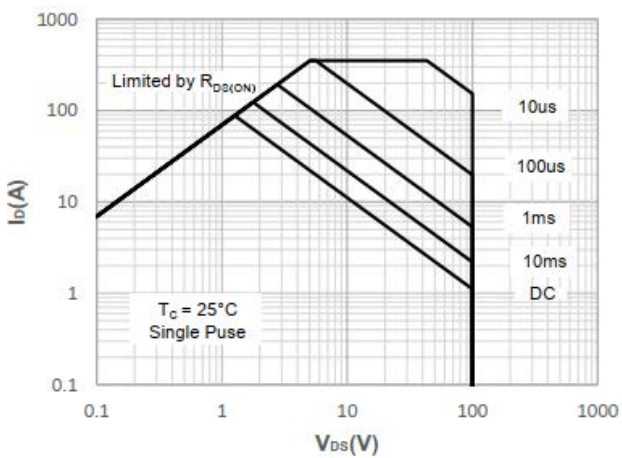
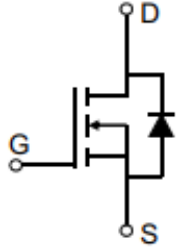
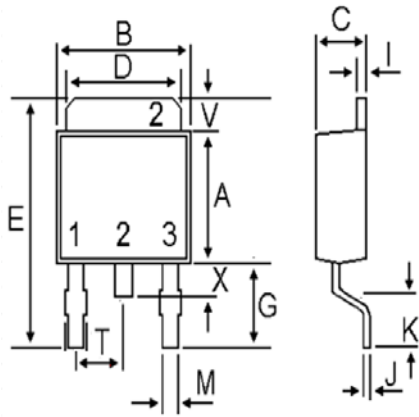


Figure 15. Maximum Safe Operating Area

- Circuit diagram



- TO-252 Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	5.97	6.22
B	6.30	6.75
C	2.18	2.40
D	4.95	5.50
E	9.40	10.41
G	2.75	3.20
I	0.46	0.89
J	0.46	0.61
K	1.40	1.78
M	0.64	0.89
T	2.28	2.30
V	0.89	1.27
X	---	1.05

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