100V N-Channel Power MOSFET

DESCRIPTION：

·Ultra-low $R_{DS(ON)}$

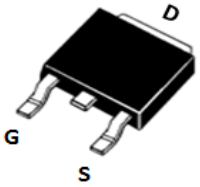
·Low Gate Charge

·100% UIS and Rg Tested

·Pb-free Lead Plating

·Halogen-free and RoHS-compliant

V_{DS}	100V
I_D @V_{GS}=10V	183A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	3.1mΩ



TO-263-3L

APPLICATIONS:

·Motor Driving in Power Tool, E-vehicle, Robotics

·Current Switching in DC/DC & AC/DC (SR) Sub-systems

·Power Management in Telecom., Industrial Automation, CE

MAXIMUM RATINGS (at T_C = 25 °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(1)	Tc=25℃ Tc=100℃	I_D	183 116	A
Pulsed Drain Current (2)		I_{DM}	732	A
Avalanche Energy(3)		E_{AS}	600	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	250 100	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

Notes:1. Computed continuous current assumes the condition of T_{J_MAX} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under T_{J_MAX} = 150°C.
3. E_{AS} of 600mJ is based on starting T_J = 25°C, L= 0.5mH, L_{AS} = 49.7A, V_{GS} = 10V, V_{DD} = 50V, 100% test at L = 0.5mH,I_{AS}=49.7A

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction-to-Case	$R_{\theta JA}$ $R_{\theta JC}$	68 0.5	℃/W

ELECTRICAL CHARATERISTICS (at T_J = 25 °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 °C VDS = 80 V, VGS = 0 V, T_J = 55 °C	I_{DSS}			1.0 5.0	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	2.0	3.2	4.0	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A	$R_{DS(on)}$		3.1	3.7	mΩ
Forward Transconductance VDS = 5 V, ID = 20A	g_{FS}		47.8		S
Diode Forward Voltage IS = 1A ,VGS = 0V	V_{SD}		0.7	1.0	V
Diode Continuous Current	I_S			183	A
Input capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{iss}		7168		pF
Output capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{oss}		1067		pF
Reverse transfer capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{rss}		36		pF
Gate Resistance VGS = 0V, VDS= 0V, f = 1MHz	R_G		2.7		Ω
Total Gate Charge VDS= 50V, ID= 20A, VGS= 10V VDS= 50V, ID= 20A, VGS= 6V	Q_G		104 66		nC
Gate to Source Charge VDS= 50V, ID= 20A, VGS= 0 to 10V	Q_{GS}		39		nC
Gate to Drain Charge VDS= 50V, ID= 20A, VGS= 0 to 10V	Q_{GD}		21		nC
Turn-on delay time VDS= 50V, VGS= 10V, R_L=2.5Ω, R_{GEN}=3Ω	$td_{(ON)}$		22		ns
Rise time VDS= 50V, VGS= 10V, R_L=2.5Ω, R_{GEN}=3Ω	tr		32		ns
Turn-off delay time VDS= 50V, VGS= 10V, R_L=2.5Ω, R_{GEN}=3Ω	$td_{(OFF)}$		62		ns
Fall time VDS= 50V, VGS= 10V, R_L=2.5Ω, R_{GEN}=3Ω	tf		36		ns
Revers Recovery Time IF=15A, di/dt = 100A/us	Trr		95		ns
Revers Recovery Charge IF=15A, di/dt = 100A/us	Qrr		299		nC

Typical Performance Characteristics

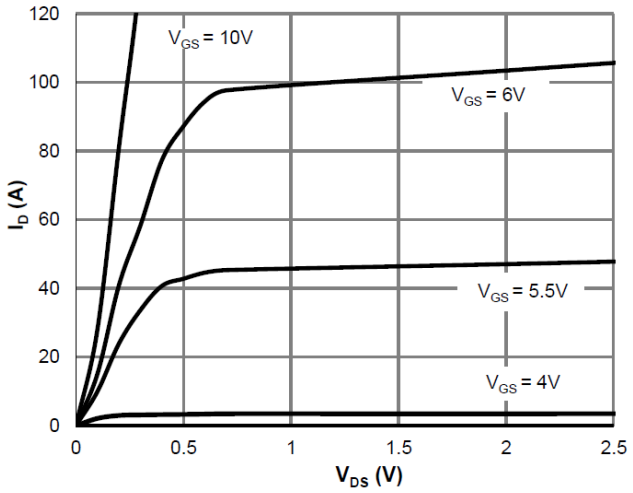


Figure 1. Saturation Characteristics

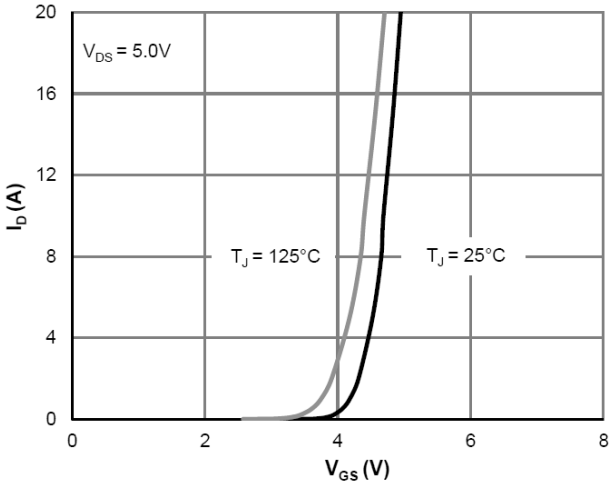


Figure 2. Transfer Characteristics

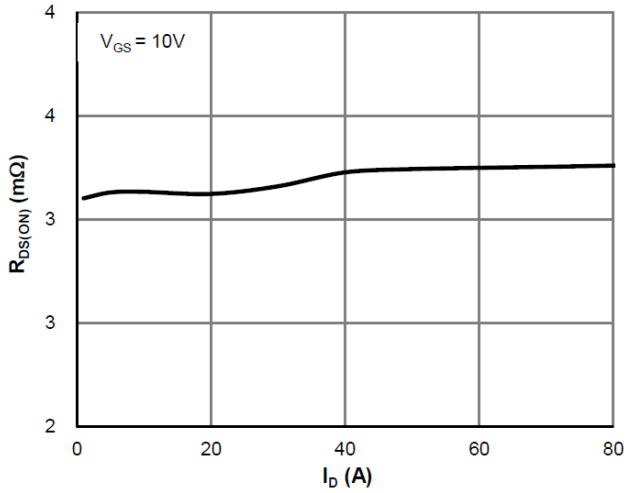


Figure 3. $R_{DS(ON)}$ vs. Drain Current

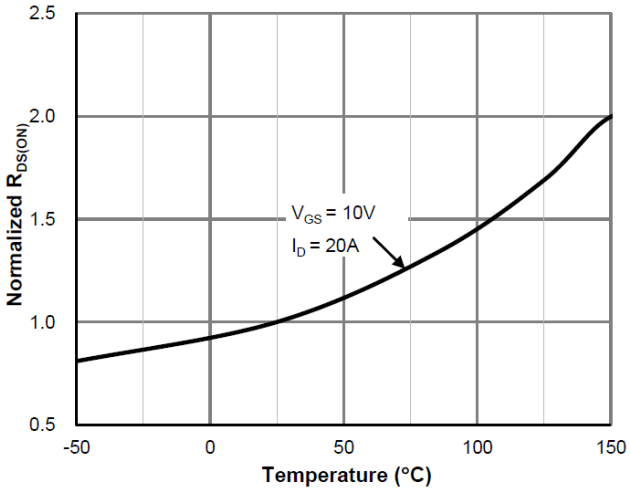


Figure 4. $R_{DS(ON)}$ VS. Junction Temperature

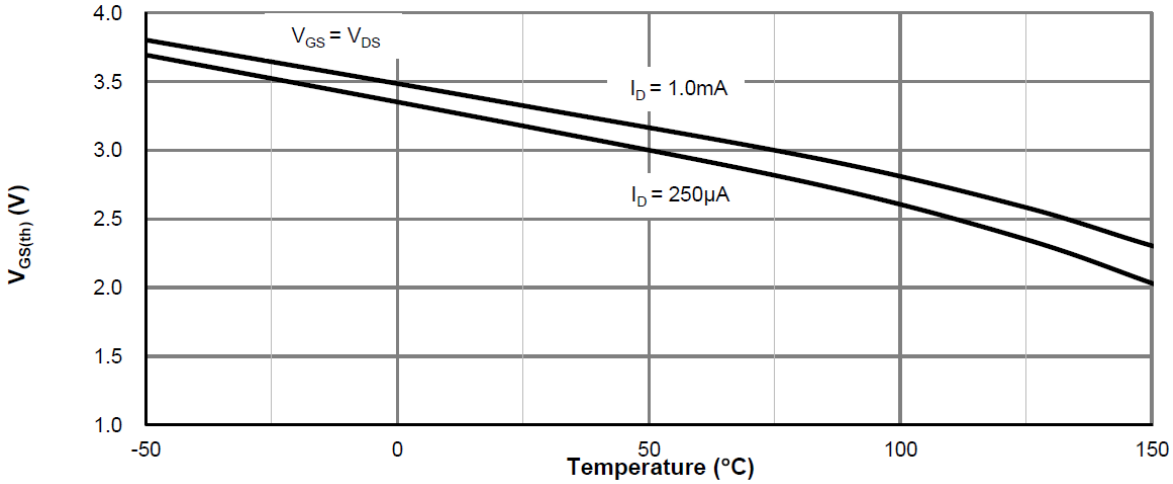


Figure 5. $V_{GS(th)}$ vs. Junction Temperature

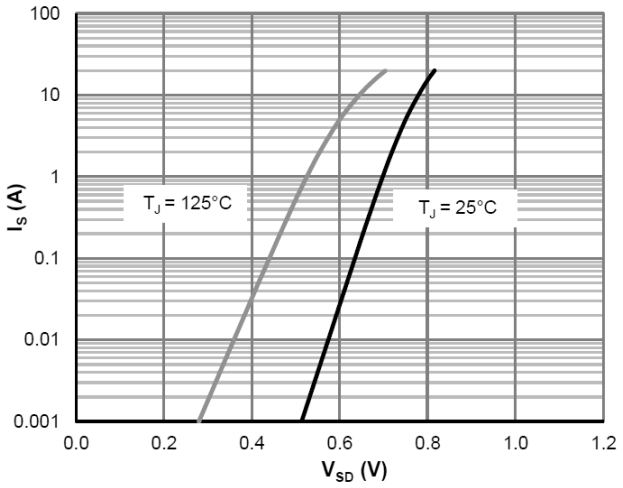


Figure 6. Body-Diode Characteristics

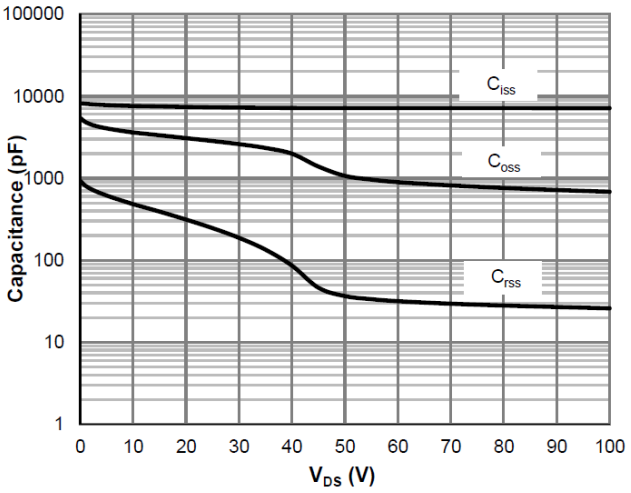


Figure 7. Capacitance Characteristics

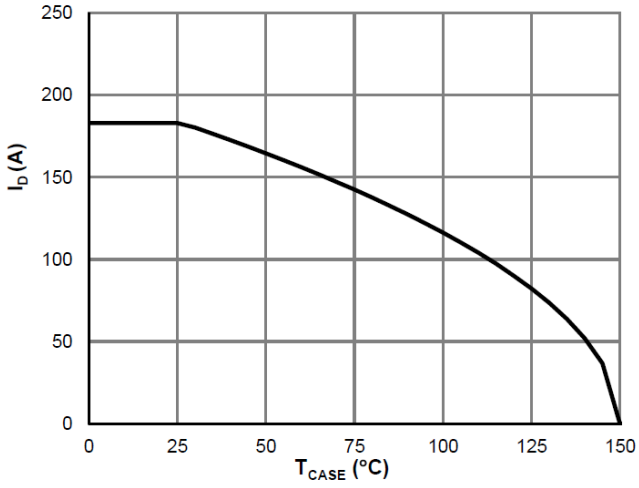


Figure 8. Current De-rating

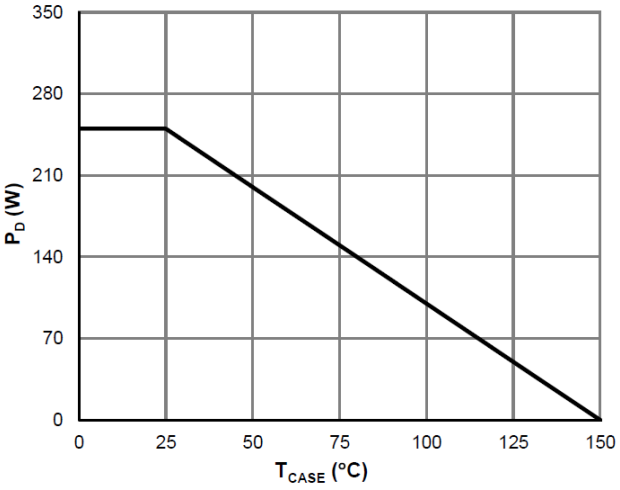


Figure9. Power De-rating

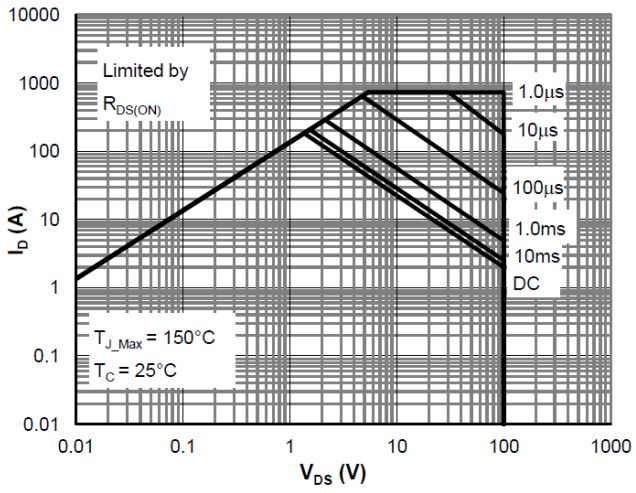


Figure 10. Single Pulse Power Rating, Junction-to-Case

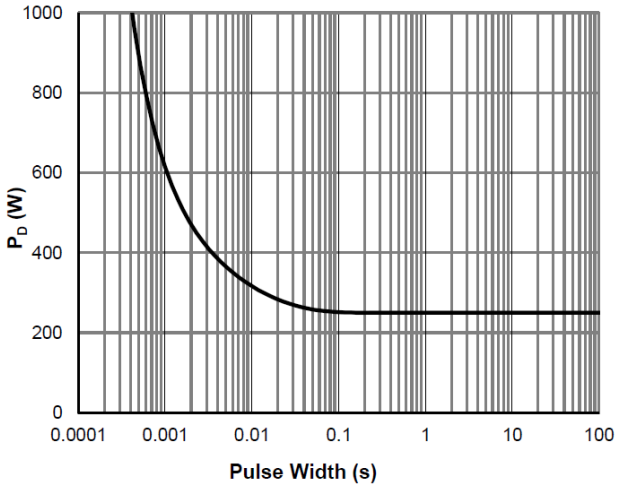


Figure 11. Maximum Safe Operating Area

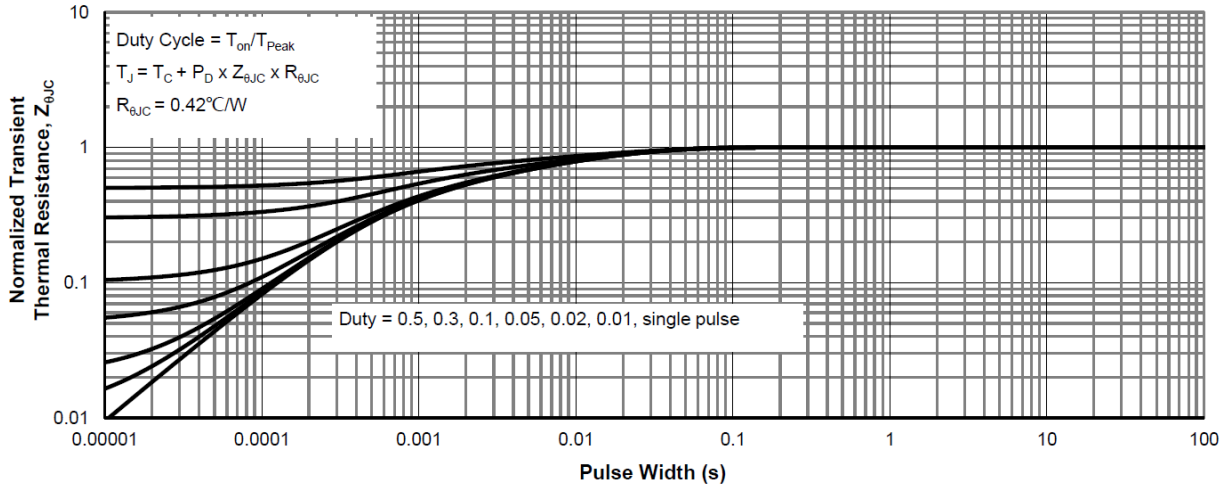
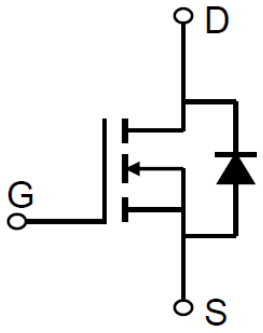
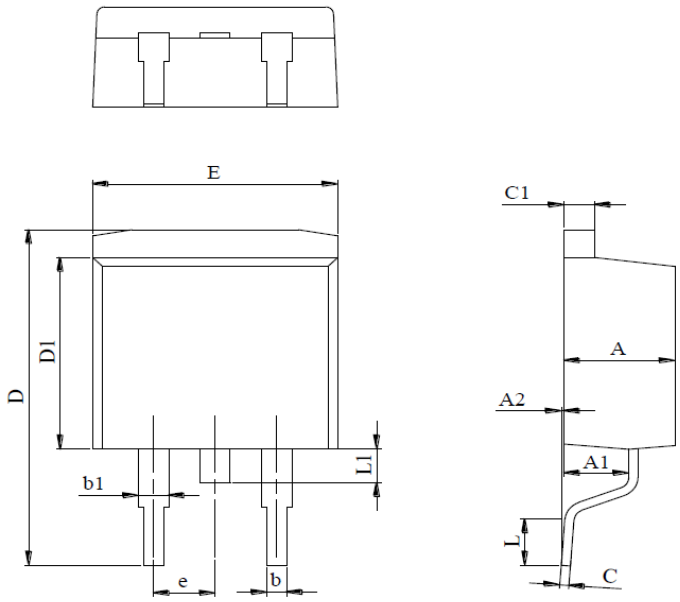


Figure12. Normalized Maximum Transient Thermal Impedance

·Circuit diagram



·Package outlines : Dimensions in (mm)



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	4.24		4.77
A1	2.30		2.89
A2	0.00	0.10	0.25
b	0.70		0.96
b1	1.17		1.70
C	0.30		0.60
C1	1.15		1.42
D	14.10		15.88
D1	8.50		9.60
E	9.78		10.36
L	1.78		2.79
L1			1.75
e		2.54	

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