200V N-Channel Power MOSFET

DESCRIPTION：

·Fast Switching

·Very low on-resistance

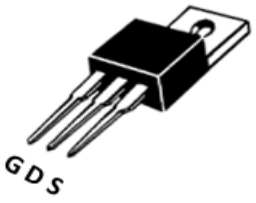
·Enhancement mode

·100% Avalanche Tested

·100% ΔVds Tested

·Halogen-free and RoHS-compliant

V_{DSS}	200V
I_D @V_{GS}=10V	113A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	8.0mΩ



TO-220

TYPICAL APPLICATIONS：

·Load Switch

·PWM Application

·Power Management

MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current(1)	Tc=25℃ Tc=100℃	I_D	113 79	A
Pulsed Drain Current (2)		I_{DM}	452	A
Avalanche Current(3)		I_{AS}	70	A
Avalanche Energy(3)		E_{AS}	735	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	333 167	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+175	℃

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}

3.This single pulse measurement was taken under the following condition [L = 0.3 mH, V GS = 10 V, V DS = 100 V] while its value is limited by T_{J_Max}

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction-to-Case	$R_{\theta JA}$ $R_{\theta JC}$	31 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	$V_{(BR)DSS}$	200			V
Zero Gate Voltage Drain Current VDS = 200 V, VGS = 0 V	I_{DSS}			1.0	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	2.2	3.0	3.8	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A	$R_{DS(on)}$		8.0	9.6	mΩ
Diode Forward Voltage IS = 20A, VGS = 0V	V_{SD}		0.7	1.0	V
Diode Continuous Current	I_S			333	A
Input capacitance f=1MHz, VDS=100 V, VGS=0 V	C_{iss}		6100		pF
Output capacitance f=1MHz, VDS=100 V, VGS=0 V	C_{oss}		436		pF
Reverse transfer capacitance f=1MHz, VDS=100 V, VGS=0 V	C_{rss}		15		pF
Gate Resistance VGS = 0V, VDS= 0V, f = 1MHz	R_G		2.2		Ω
Total Gate Charge VDS= 100V, ID= 20A, VGS= 0 to 10V	Q_G		88		nC
Gate to Source Charge VDS= 100V, ID= 20A, VGS= 0 to 10V	Q_{GS}		25.0		nC
Gate to Drain Charge VDS= 100V, ID= 20A, VGS= 0 to 10V	Q_{GD}		21.0		nC
Turn-on delay time VDS= 100V, VGS= 10V, ID= 20A, R_{GEN}=3Ω	$td_{(ON)}$		19.0		ns
Rise time VDS=100V, VGS= 10V, ID= 20A, R_{GEN}=3Ω	tr		35		ns
Turn-off delay time VDS=100V, VGS= 10V, ID= 20A, R_{GEN}=3Ω	$td_{(OFF)}$		59		ns
Fall time VDS= 100V, VGS= 10V, ID= 20A, R_{GEN}=3Ω	tf		37		ns
Revers Recovery Time IF=20A, di/dt = 100A/us	Trr		125		ns
Revers Recovery Charge IF=20A, di/dt = 100A/us	Qrr		659.0		nC

Typical Performance Characteristics

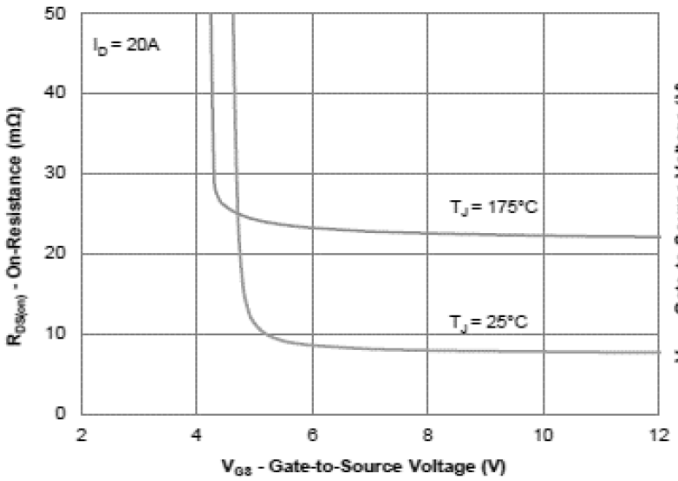


Figure 1. $R_{DS(ON)}$ VS. V_{GS}

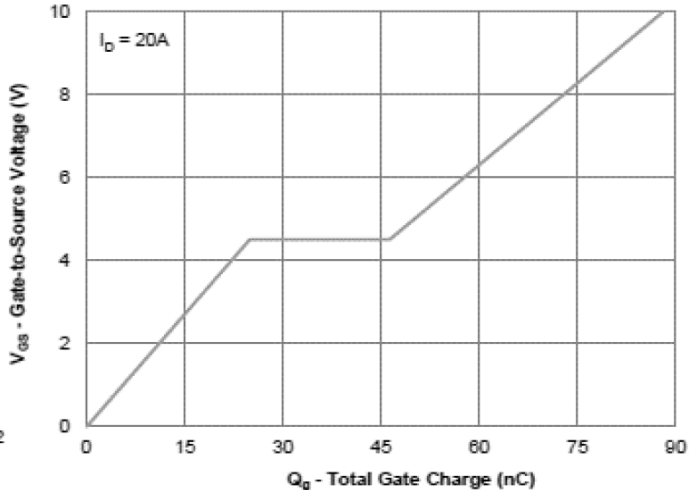


Figure 2. Gate Charge Curve

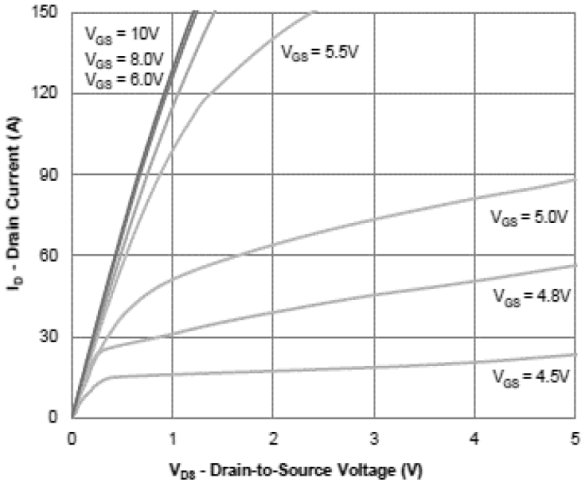


Figure 3. Saturation Characteristics

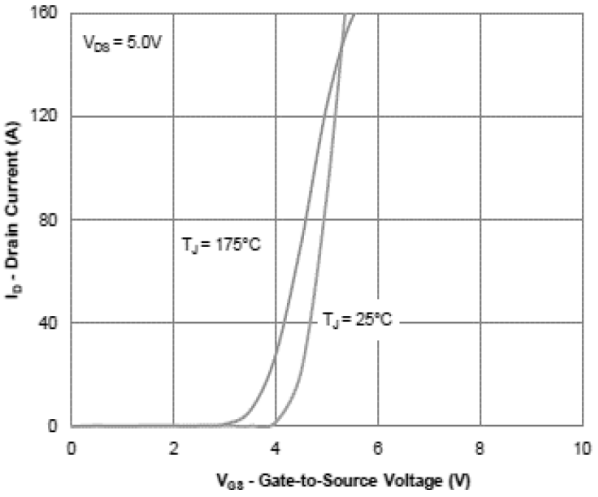


Figure 4. Transfer Characteristics

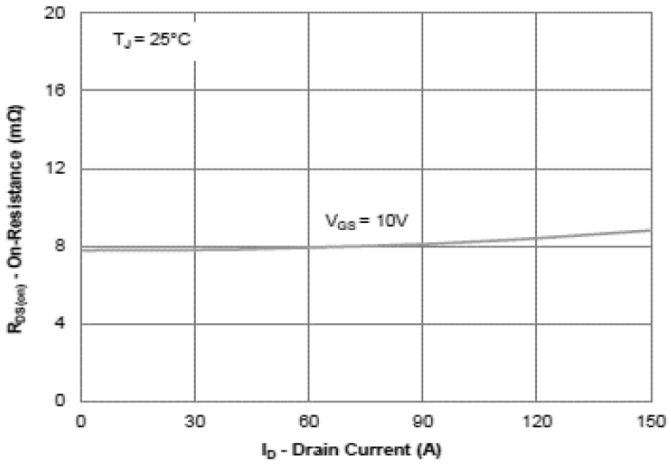


Figure 5. $R_{DS(ON)}$ vs. Drain Current

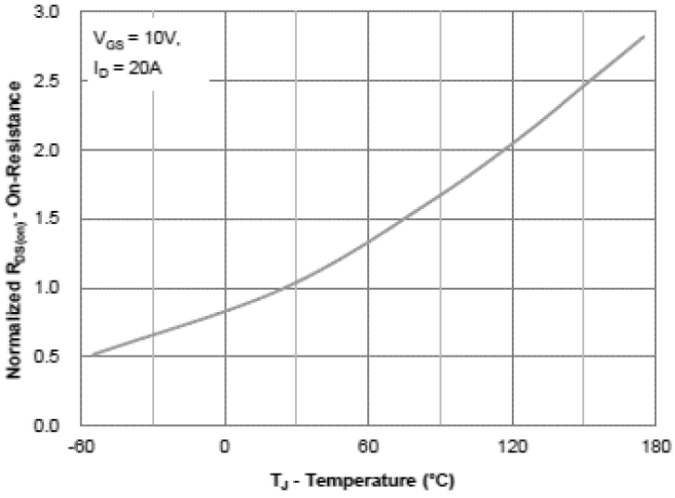


Figure 6. $R_{DS(ON)}$ vs. Junction Temperature

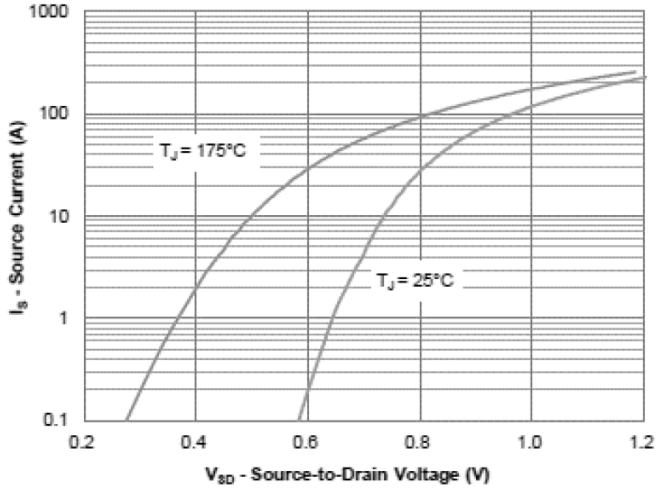


Figure 7. Body-Diode Characteristics

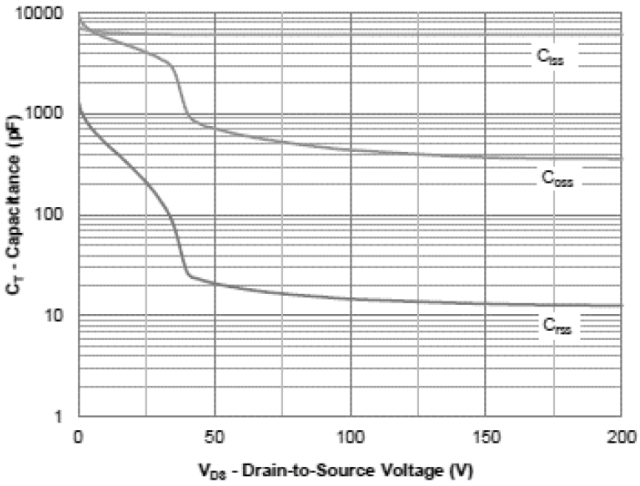


Figure 8. Capacitance Characteristics

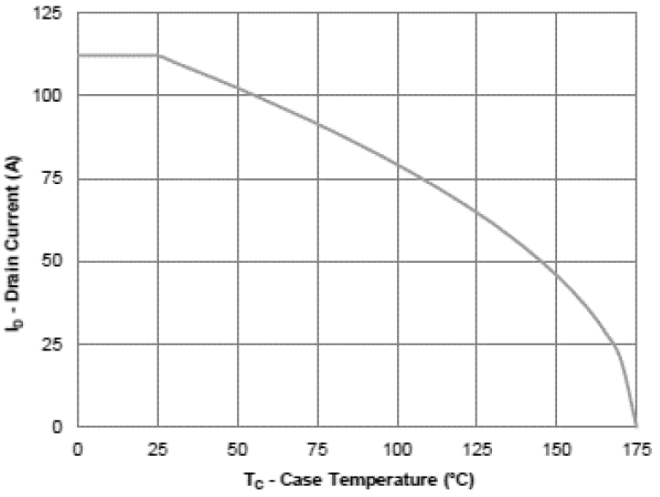


Figure 9. Current De-rating

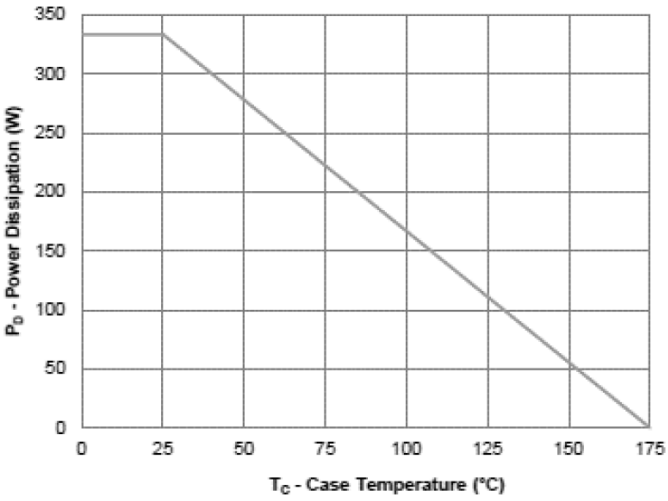


Figure10. Power De-rating

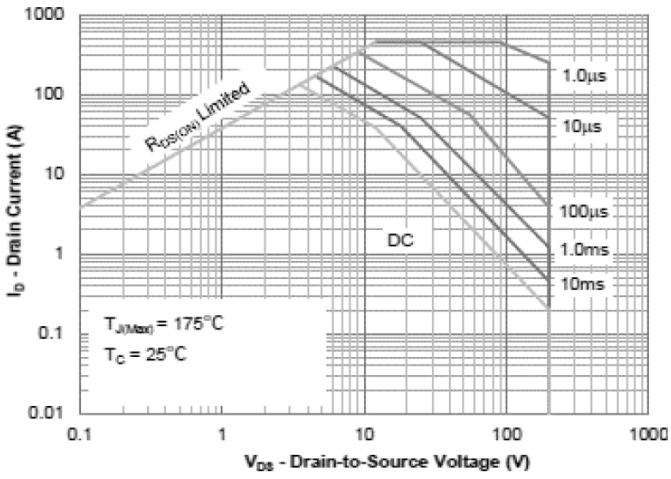
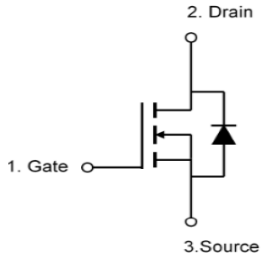
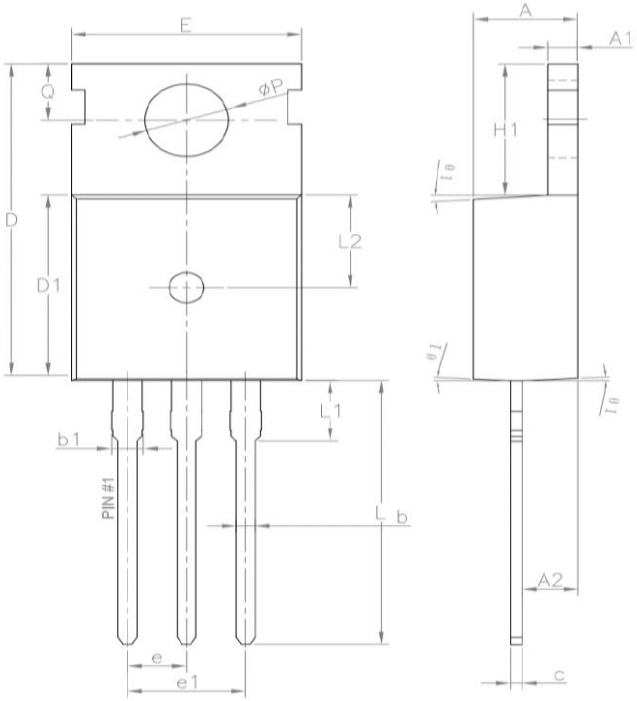


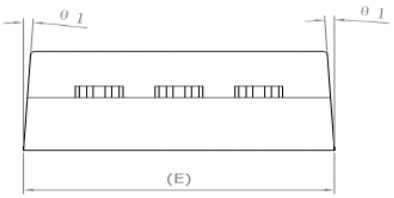
Figure 11. Safe Operating Area

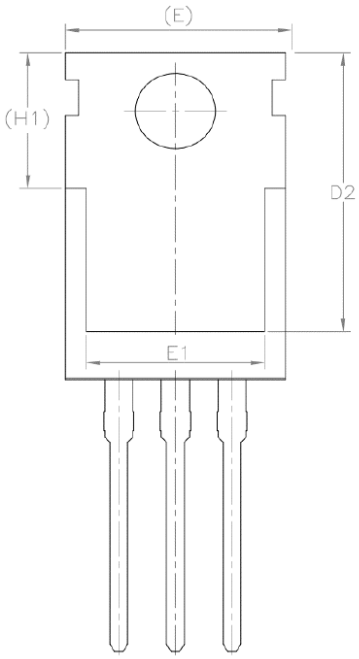
·Circuit diagram



·Package outlines : Dimensions in (mm)







SYMBOL	MIN	NOM	MAX
A	4.40	4.50	4.60
A1	1.27	1.30	1.33
A2	2.30	2.40	2.50
b	0.70	–	0.90
b1	1.27	–	1.40
c	0.45	0.50	0.60
D	15.30	15.70	16.10
D1	9.10	9.20	9.30
D2	13.10	–	13.70
E	9.70	9.90	10.20
E1	7.80	8.00	8.20
e	2.54BSC		
e1	5.08BSC		
H1	6.30	6.50	6.70
L	12.78	13.08	13.38
L1	–	–	3.50
L2	4.60REF		
ØP	3.55	3.60	3.65
Q	2.73	–	2.87
θ1	1°	3°	5°

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