60V N-Channel Power MOSFET

V_{DSS}	60V
I_D	227A
$R_{DS(ON)_Typ.}$ @V_{GS}=10V	1.8mΩ

DESCRIPTION：

·Fast Switching

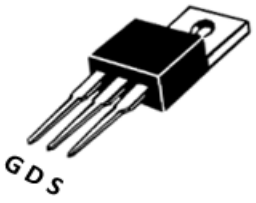
·Very low on-resistance

·Enhancement mode

·100% Avalanche Tested

·100% ΔVds Tested

·Halogen-free and RoHS-compliant



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}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current(1)	Tc=25℃ Tc=100℃	I_D	227 143	A
Pulsed Drain Current (2)		I_{DM}	908	A
Avalanche Current(3)		I_{AS}	68	A
Avalanche Energy(3)		E_{AS}	231	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	200 80	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}

3.This single pulse measurement was taken under the following condition [L = 0.1 mH, V_{GS} = 10 V, V_{DS} = 30 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	$R_{\theta JA}$ $R_{\theta JC}$	60 0.78	℃/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	$V_{(BR)DSS}$	60			V
Zero Gate Voltage Drain Current VDS = 60 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	$V_{GS(th)}$	1.0	1.7	2.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 60A VGS = 4.5V, ID = 60A	$R_{DS(on)}$		1.8 2.2	2.4 2.6	mΩ
Diode Forward Voltage IS = 20A, VGS = 0V	V_{SD}		0.8	1.0	V
Diode Continuous Current	I_S			200	A
Input capacitance f=1MHz, VDS=30 V, VGS=0 V	C_{iss}		3822		pF
Output capacitance f=1MHz, VDS=30 V, VGS=0 V	C_{oss}		1372		pF
Reverse transfer capacitance f=1MHz, VDS=30 V, VGS=0 V	C_{rss}		54		pF
Gate Resistance VGS = 0V, VDS= 0V, f = 1MHz	R_G		1.0		Ω
Total Gate Charge VDS=30V, ID= 60A, VGS= 10V	Q_G		75		nC
Gate to Source Charge VDS=30V, ID= 60A, VGS= 0 to 10V	Q_{GS}		9.2		nC
Gate to Drain Charge VDS=30V, ID= 60A, VGS= 0 to 10V	Q_{GD}		17.1		nC
Turn-on delay time VDS= 30V, VGS= 10V, ID= 60A, R_{GEN}=3.5Ω	$td_{(ON)}$		12.2		ns
Rise time VDS= 30V, VGS= 10V, ID= 60A, R_{GEN}=3.5Ω	tr		16		ns
Turn-off delay time VDS= 30V, VGS= 10V, ID= 60A, R_{GEN}=3.5Ω	$td_{(OFF)}$		49		ns
Fall time VDS= 30V, VGS= 10V, ID= 60A, R_{GEN}=3.5Ω	tf		26		ns
Revers Recovery Time IF=60A, di/dt = 104A/us	Trr		45		ns
Revers Recovery Charge IF=60A, di/dt = 104A/us	Qrr		98		nC

Typical Performance Characteristics

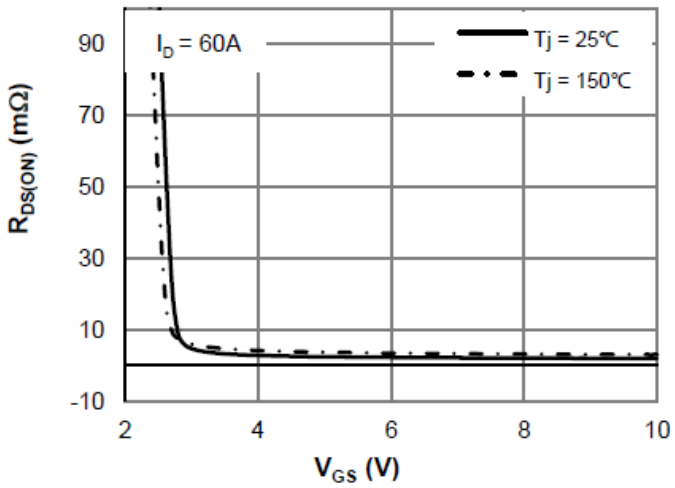


Figure 1. $R_{DS(ON)}$ vs. V_{GS}

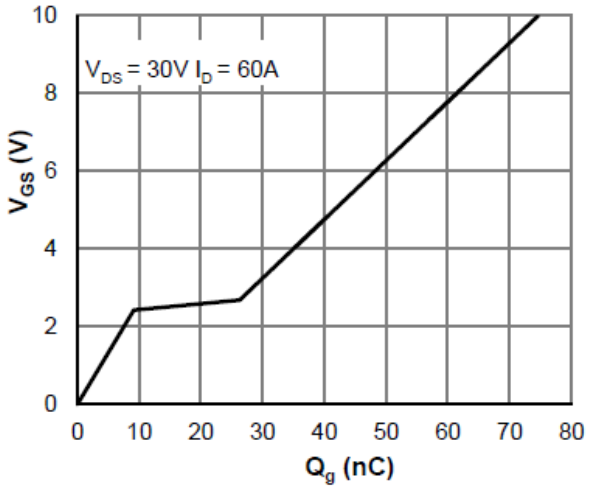


Figure 2. Gate Charge

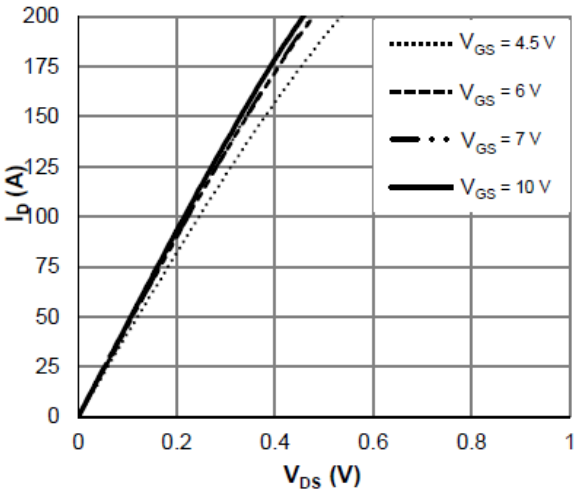


Figure 3. Saturation Characteristics

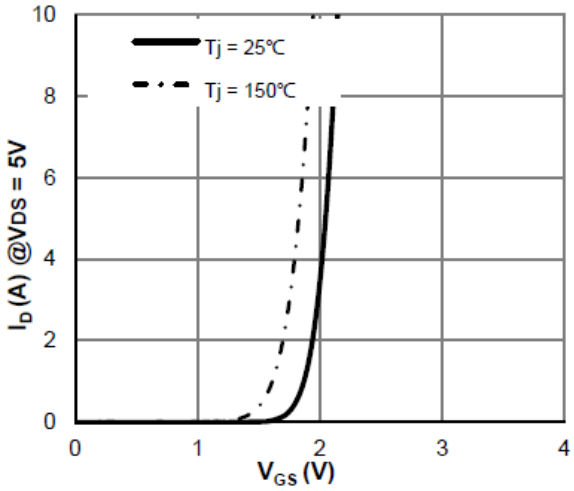


Figure 4. Transfer Characteristics

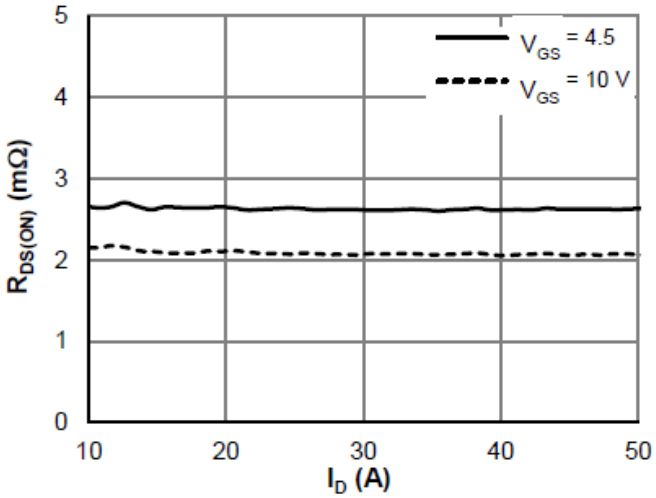


Figure 5. $R_{DS(ON)}$ vs. Drain Current

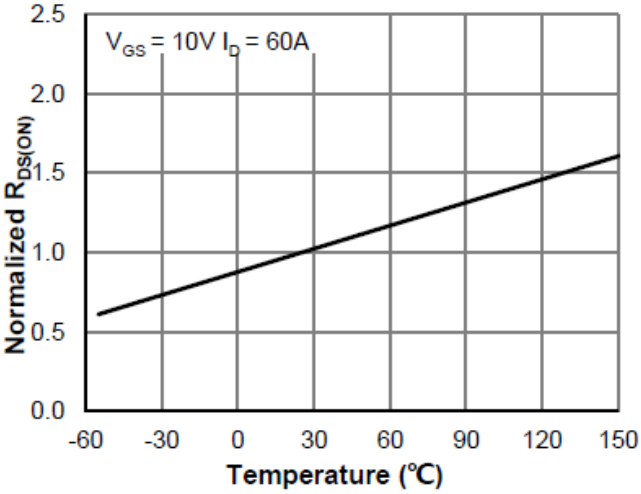


Figure 6. $R_{DS(ON)}$ vs. Junction Temperature

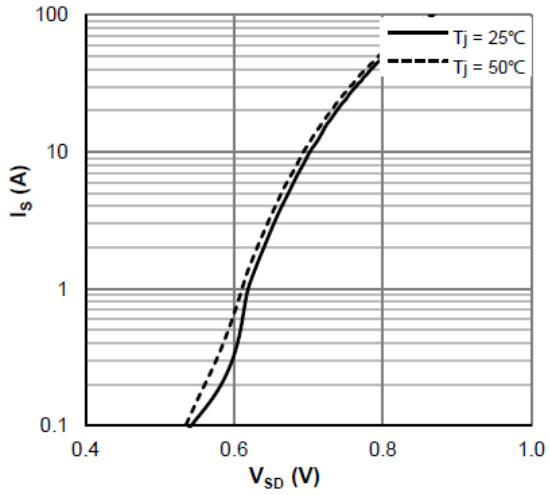


Figure 7. Body-Diode Characteristics

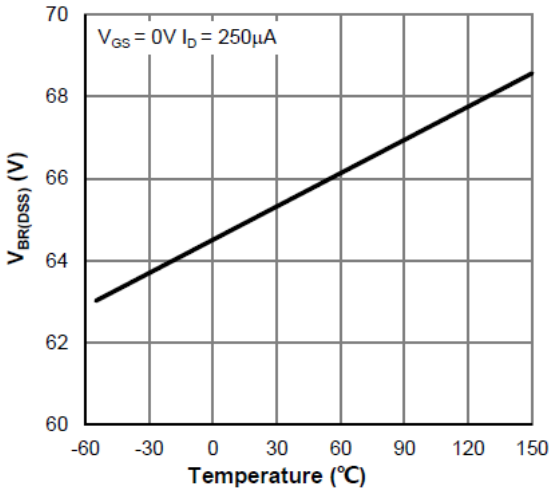


Figure 8. $V_{BR(DSS)}$ vs. Junction Temperature

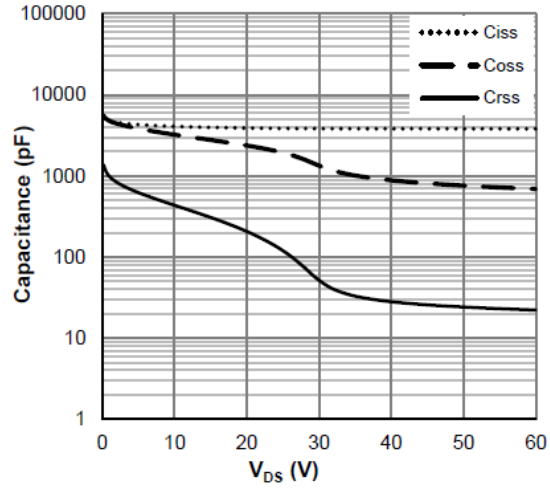


Figure 9. Capacitance Characteristics

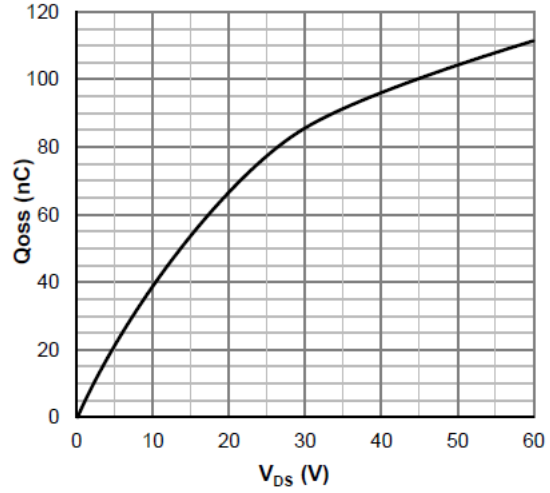


Figure10. Coss Stored Energy

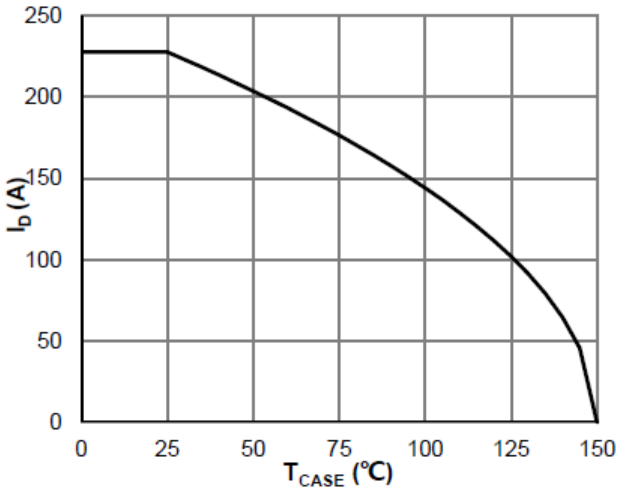


Figure 11. Current De-rating

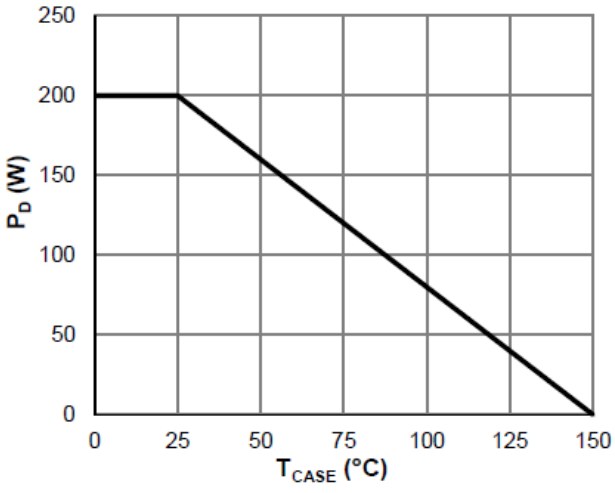


Figure 12. Power De-rating

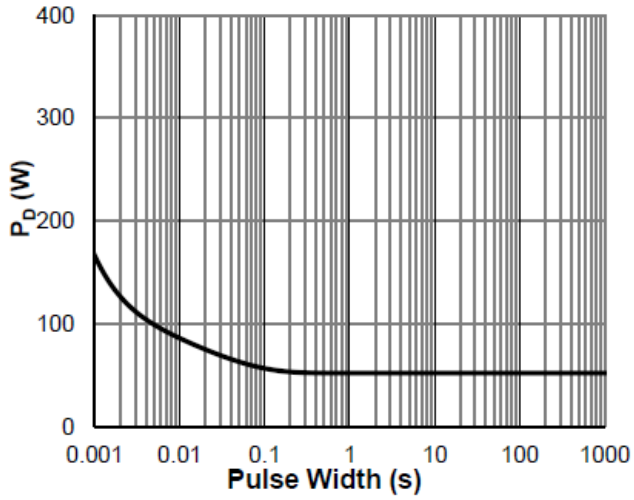


Figure 13. Single Pulse Power Rating, Junction-to-Case

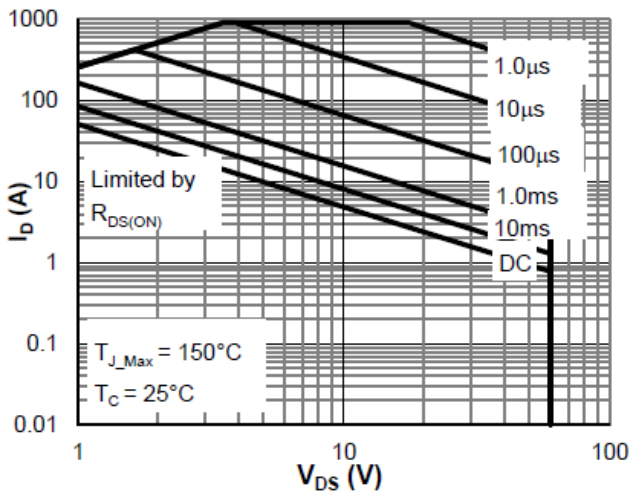


Figure 14. Maximum Safe Operating Area

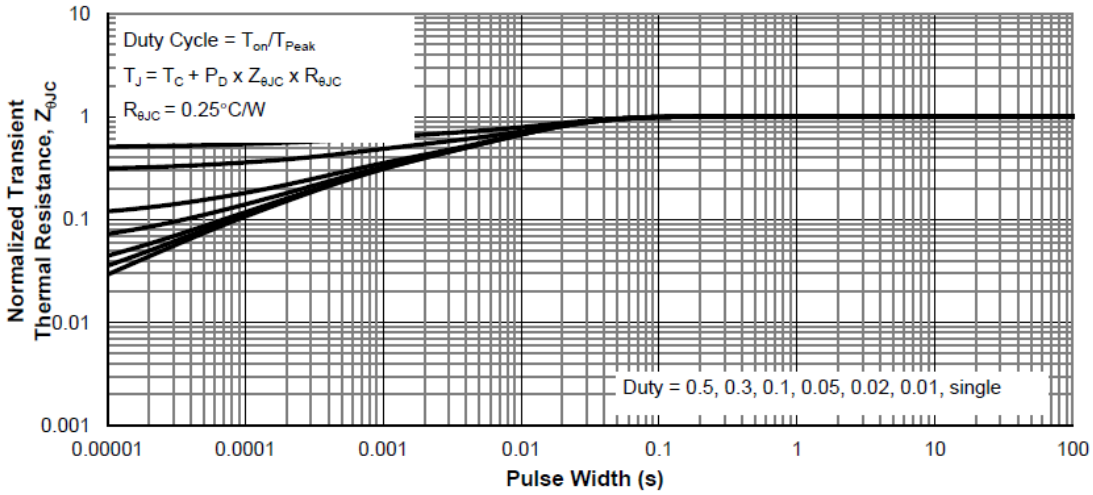
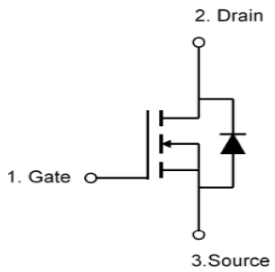
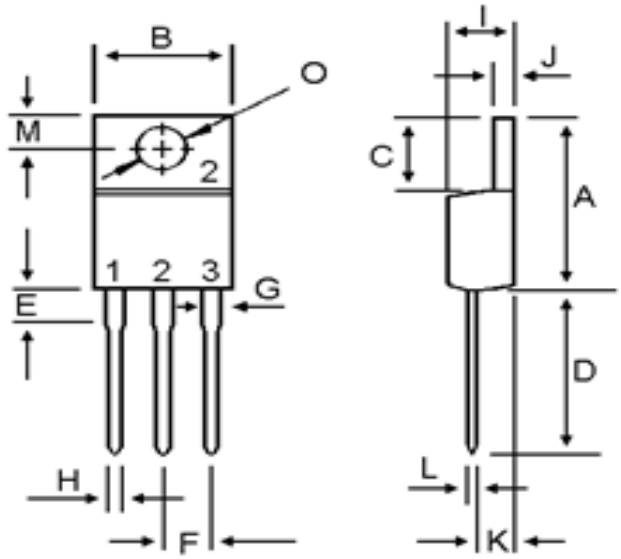


Figure 15. Normalized Maximum Transient Thermal Impedance

·Circuit diagram



·Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	14.68	16.80
B	9.70	10.50
C	5.02	6.90
D	12.95	14.62
E	3.10	4.19
F	2.41	2.67
G	1.10	1.70
H	0.69	1.01
I	4.22	4.98
J	1.14	1.40
K	2.20	3.30
L	0.28	0.61
M	2.40	3.00
O	3.40	4.00

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