A3G200N1700MDSK

1700V, 200A, 13mΩ, N-Channel, Silicon Carbide MOSFET

Features

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low RDS(on)
- Optimized package with Separate Driver Source Pin
- Easy to parallel and simple to drive
- 3rd Generation SiC MOSFET Technology

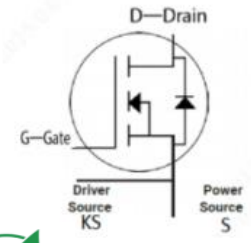
Potential Applications

- High Frequency Switching application
- PV inverter, converter, and industrial motor drives
- DC/DC converter
- Solar applications
- UPS systems

Product Summary

V_{DS}	1700V
I_D	200A





Package

Symbol	Parameter	Value	Unit
V_{isol}	Isolation test voltage (DC 2mA 60s)	3.5	kV
T_J, T_{stg}	Junction and Storage Temperature Range	-55 to +175	°C
M_s	Mounting force per clamp (M4)	20 – 50	N
$R_{\theta JC}$	Thermal Resistance, Junction-to-case	0.185	°C/W
M	Weight	33	g

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	1700	V
V_{GS}	Gate-Source Voltage	-10/+22	V
I_D	Drain Current (continuous)	200	A
I_D	Drain Current (continuous) Tc=100°C	155	A
I_{DM}	Drain Current (pulsed)	385	A
Pd	Power Dissipation	810	W

Electrical Characteristics (T_C=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-source Break down Voltage	V_{GS}=0V, I_D=250uA	1700			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=1700V, V_{GS}=0V		5	200	uA
I_{GSS}	Gate-body Leakage Current	V_{DS}=0V, V_{GS}=-10 to 20V		20	500	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=20mA	2	3	4	V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS}=18V, I_D=100A		13	15.6	mΩ
V_{GSon}	Recommended turn-on Voltage	Static		18		V
V_{GSoff}	Recommended turn-off Voltage			-5		V
R_G	Gate Resistance	V_{AC}=25mV, f=1MHz		1.2		Ω
C_{iss}	Input Capacitance	V_{DS}=1200V, f=1MHz V_{AC}=25mV		12800		pF
C_{oss}	Output Capacitance			411		
C_{rss}	Reverse Transfer Capacitance			32		

E_{on}	Turn-On Switching Energy	V_{DD}=1200V, V_{GS}=-5/+18V		6.5		mJ
E_{off}	Turn-Off Switching Energy	I_D=100A, Load=150uH		4.2		mJ
E_{oss}	Coss Stored Energy	V_{DS}=1200V; f=1MHz		302		µJ
Q_{GS}	Gate-Source Charge	V_{DD}=1200V		106		nC
Q_{GD}	Gate-Drain Charge	V_{GS}=-5/+18V		100		nC
Q_G	Total Gate Charge	I_D=100A		325		nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=1200V		58		ns
t_r	Rise Time	V_{GS}=-5/+18V, I_D=100A		71		ns
$t_{d(off)}$	Turn-off Delay Time	R_{Gext}=2.5Ω, RL=150uH		103		ns
t_f	Fall Time			38		ns
g_{fs}	Transconductance	V_{DS}=20V; I_D=100A		85		S

Typical Performance-Reverse Diode (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{FSD}	Forward Voltage	V_{GS}=0V, I_F=70A		3.6	6	V
I_S	Continuous Diode Forward Current	V_{GS}=0V, T_C=25°C		200		A
t_{rr}	Reverse Recovery Time	V_{GS}=-5V, I_F=100A, T_j=175°C		78		ns
Q_{rr}	Reverse Recovery Charge	V_R=1200V, di/dt=1900A/µs		1680		nC
I_{rrm}	Peak Reverse Recovery Current			32		A

Typical Performance

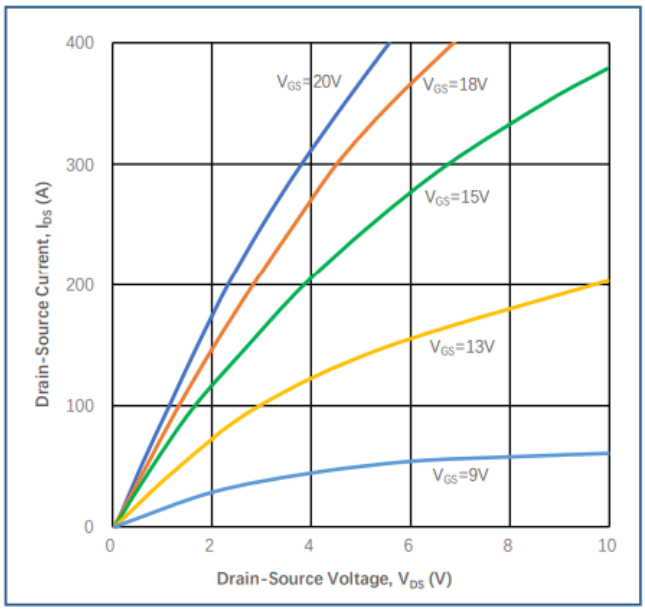


Figure 1
Output Characteristics (T_J=25°C)

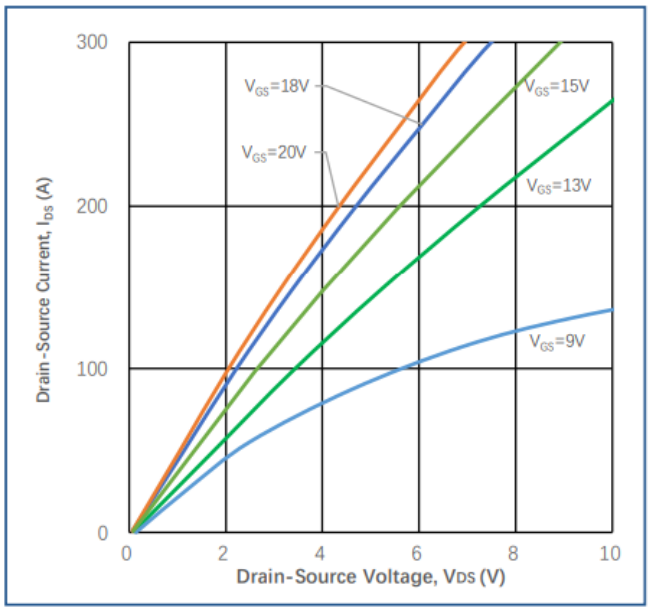


Figure 2
Output Characteristics (T_J=175°C)

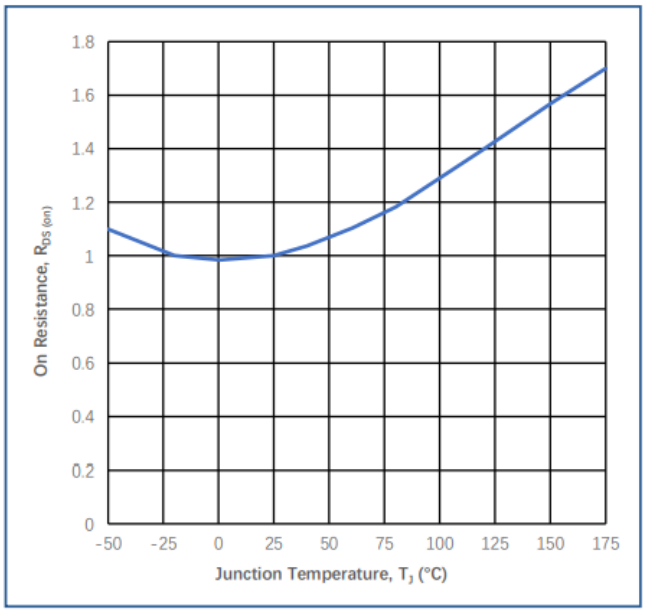


Figure 3
Normalized On-Resistance vs. Temperature

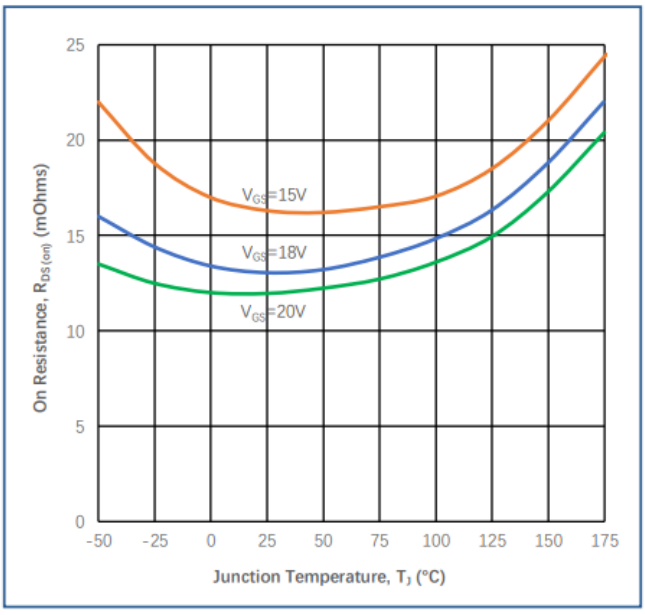


Figure 4
On-Resistance vs. Temperature

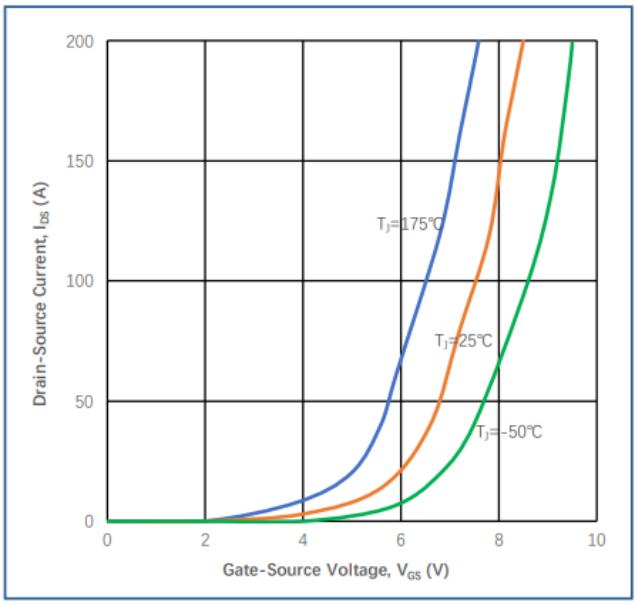


Figure 5
Transfer Characteristic

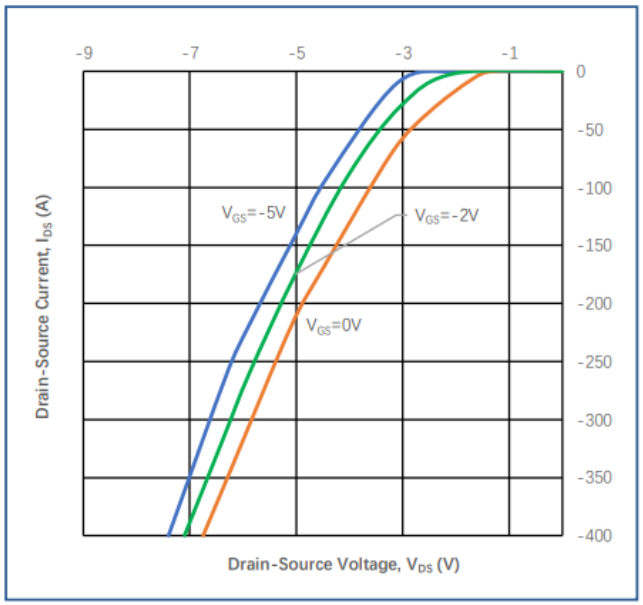


Figure 6
Body Diode Characteristic at 25°C

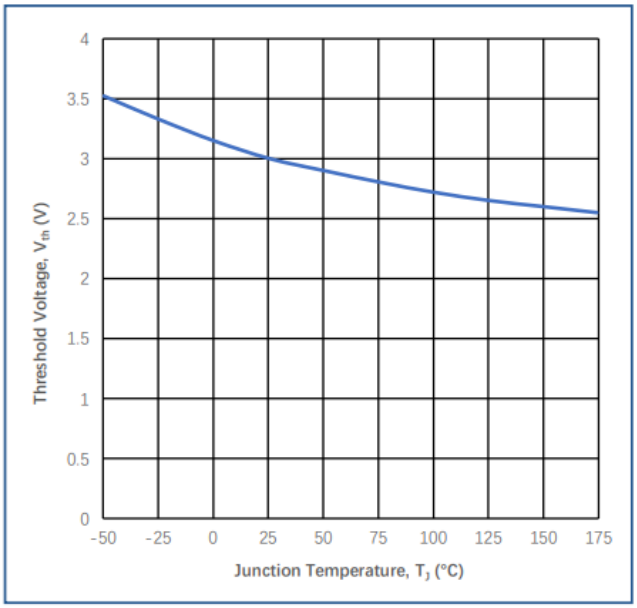


Figure 7
Threshold Voltage vs. Temperature

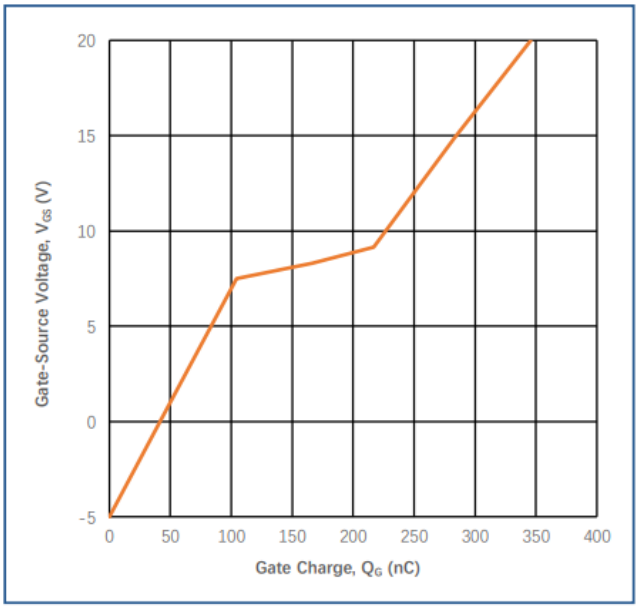


Figure 8
Gate Charge Characteristics

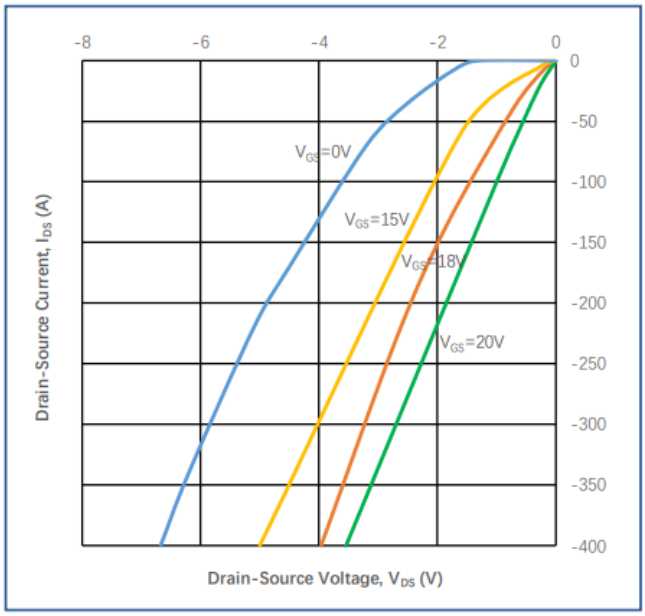


Figure 9

3rd Quadrant Characteristic at 25°C

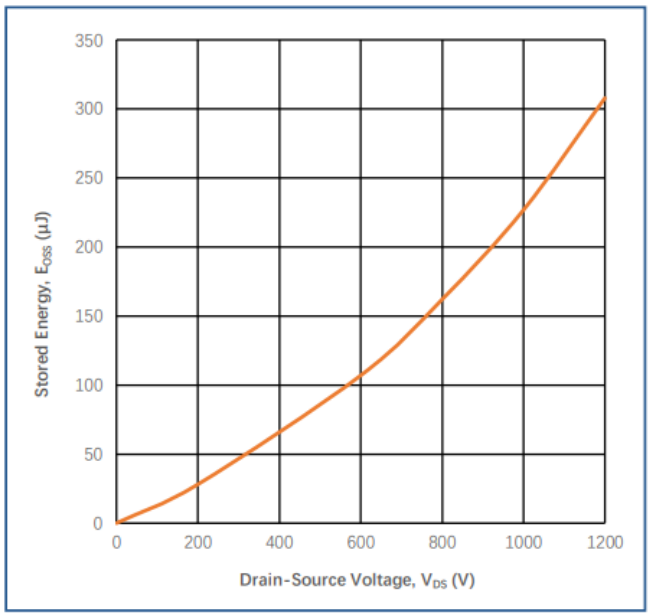


Figure 10

Output Capacitor Stored Energy

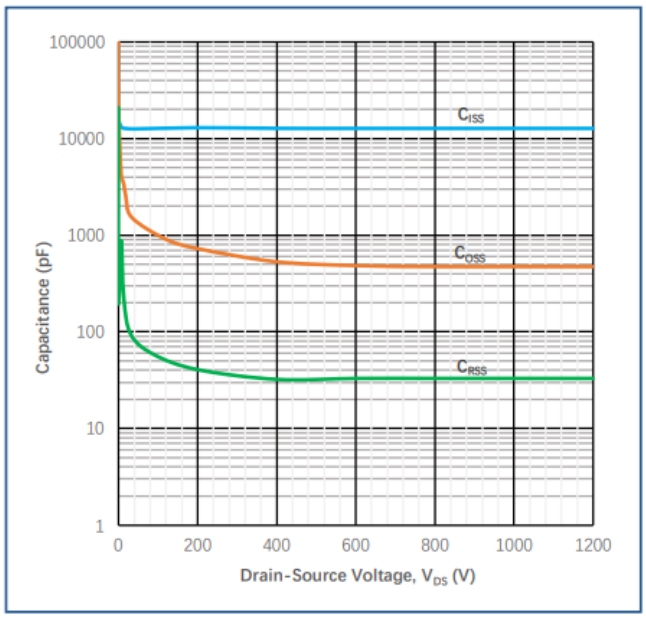


Figure 11

Capacitances vs. Drain-source

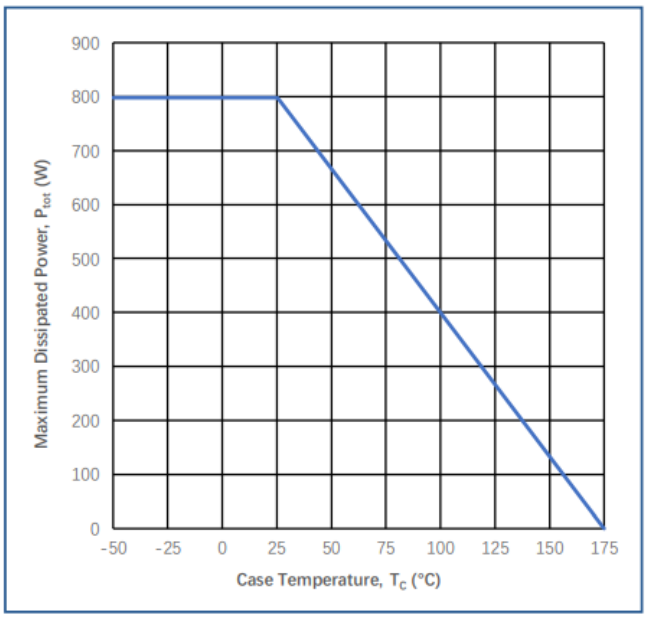


Figure 12

Max Power Dissipation Derating vs T_C

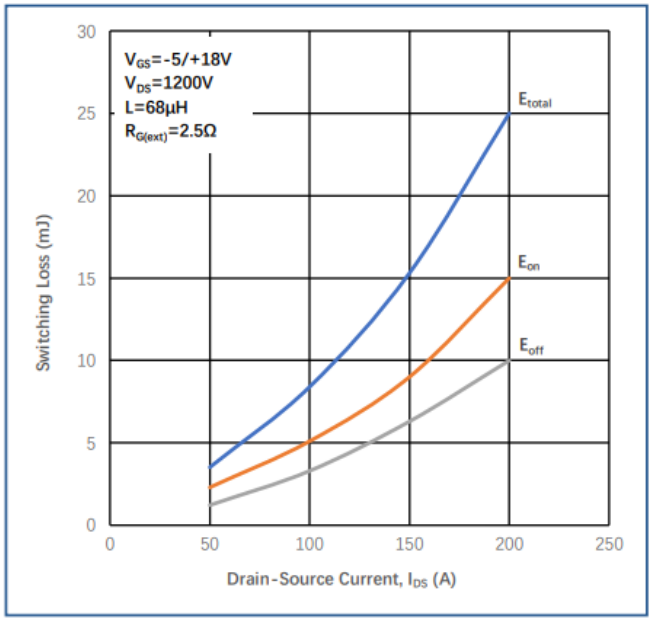


Figure 13
Switching Energy vs. Drain Current

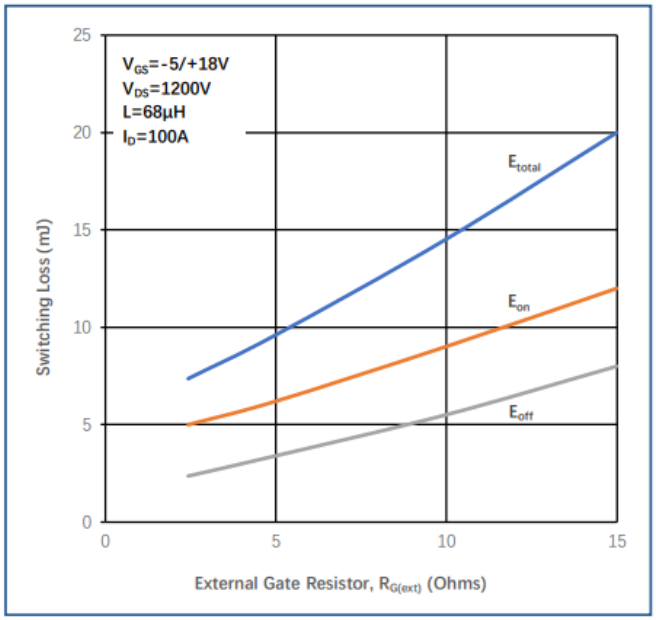


Figure 14
Switching Energy vs. $R_{G(ext)}$

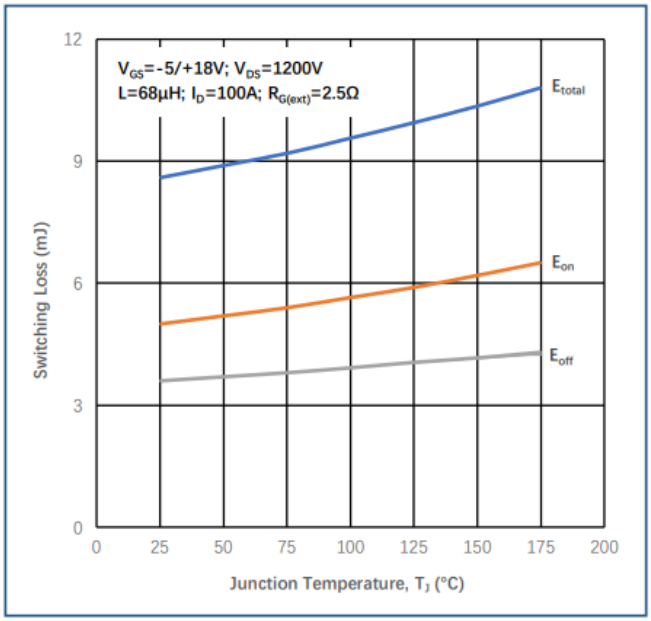


Figure 15
Switching Energy vs. Temperature

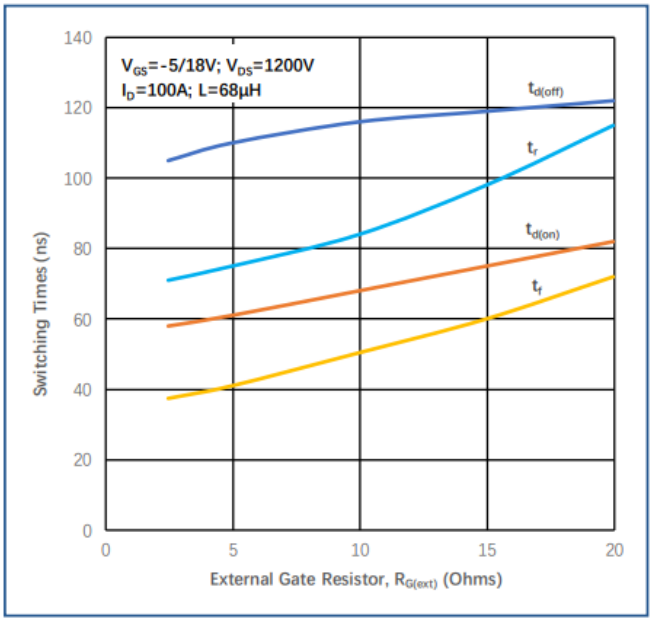


Figure 16
Switching Times vs. $R_{G(ext)}$

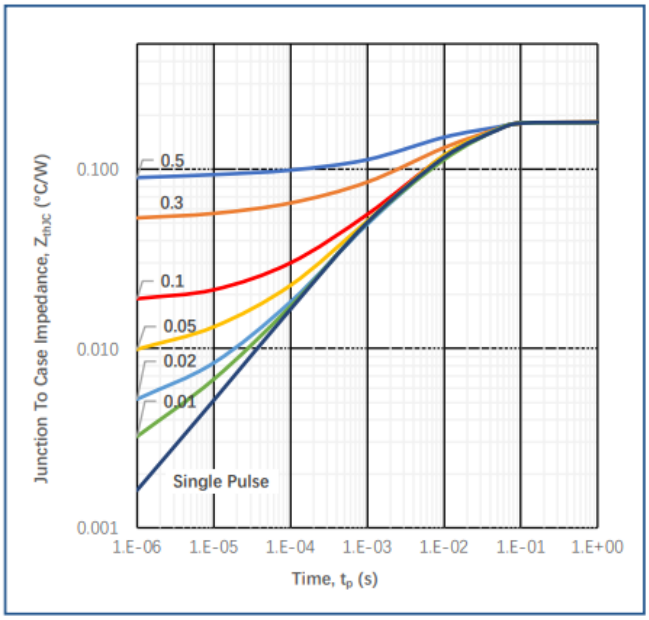


Figure 17
Transient Thermal Impedance

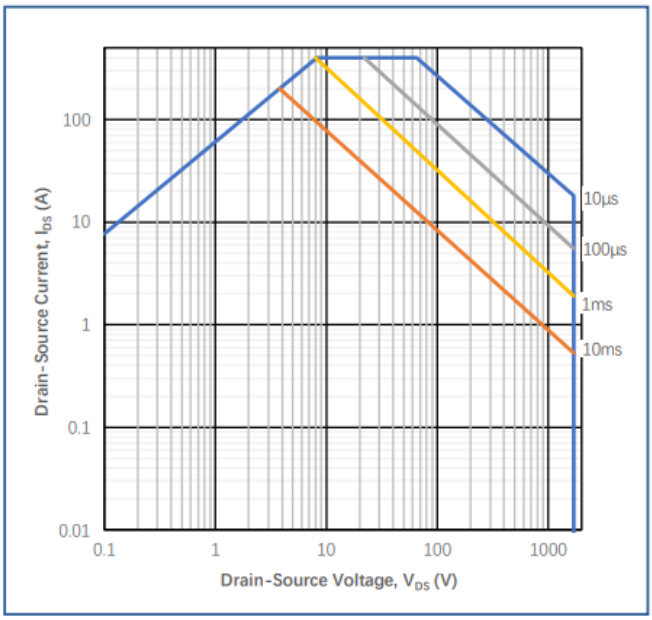
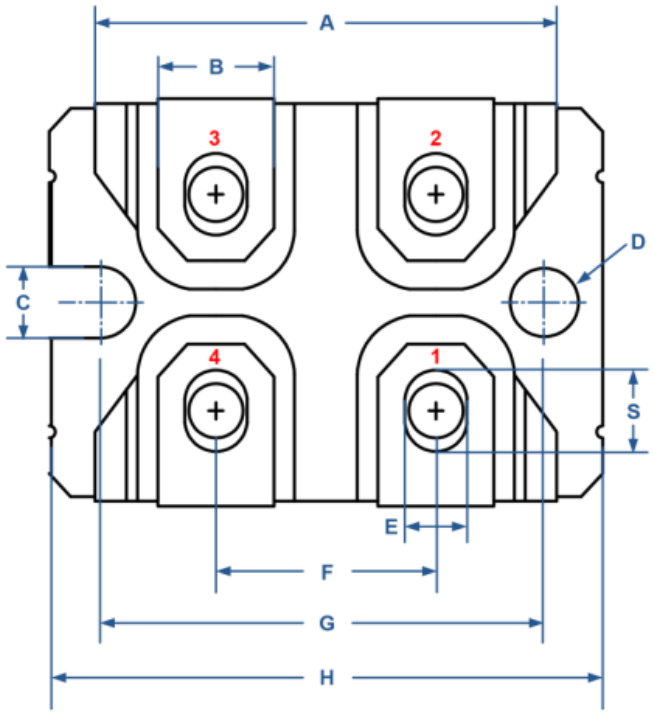
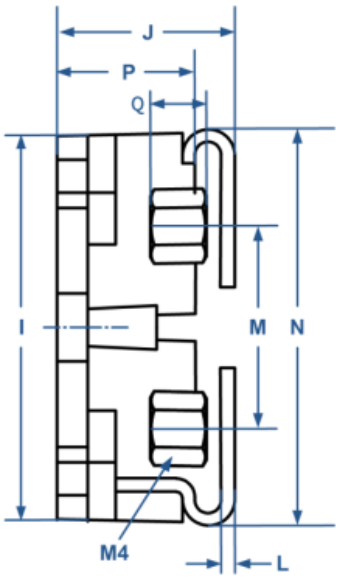
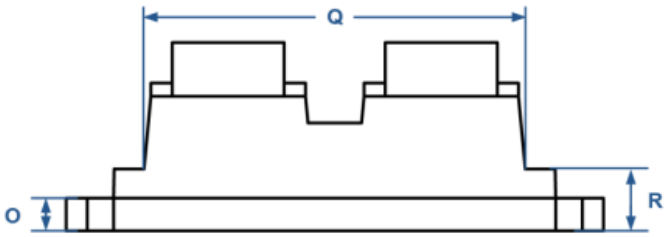


Figure 18
Safe Operating Area

Package Drawing (mm) SOT-227







Symbol	Millimeters		Symbol	Millimeters	
	Min.	Max.		Min.	Max.
A	31.40	31.60	K *	9.40	9.60
B	7.70	8.10	L	0.75	0.85
C	4.20	4.40	M	12.40	12.80
D	4.20	4.40	N *	24.50	25.40
E	4.10	4.30	O *	1.90	2.10
F	14.90	15.10	P	3.10	3.95
G	30.10	30.40	Q *	26.60	27.00
H *	38.00	38.40	R *	3.80	4.20
I / T	23.80	24.20	S	5.10	5.40
J *	12.20	12.70	Mark * as main/key dimensions.		

Pin	Symbol	Description
1	S	Power Source
2	KS	Driver Source
3	G	Gate
4, Tab	D	Drain

Note:

1. All metal surfaces are Sn plated (matte), except area of cut.
2. Burr or mold flash size (0.5 mm) is not included in the dimensions.

Revision version	Description	Date
1.0	Initial	05.2026