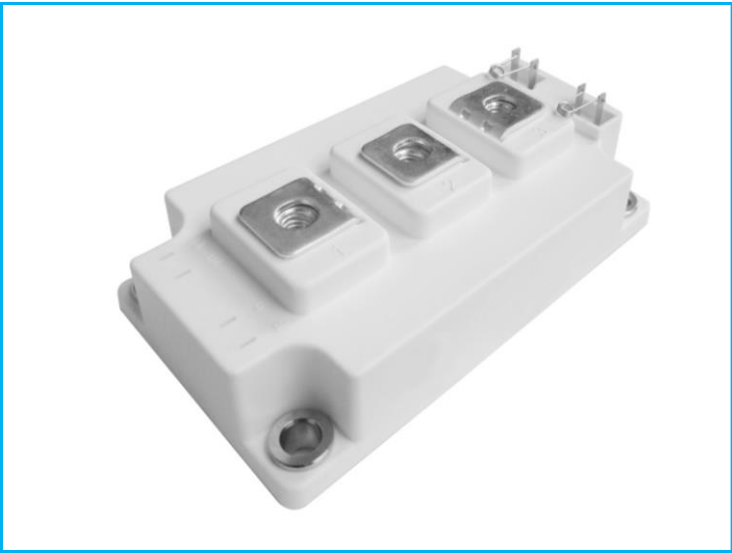


PRODUCT FEATURES

- ☐ 1200V SiC Module
- ☐ High blocking voltage with low on-resistance
- ☐ High speed switching with low capacitance
- ☐ 175℃ operating junction temperature capability
- ☐ Ultra fast and robust intrinsic body diode



APPLICATIONS

- ☐ EV Motor drivers
- ☐ Solar inverters
- ☐ High voltage DC/DC converters
- ☐ Switch mode power supplies

MODULE CHARACTERISTICS($T_{vj}=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_{isol}	Isolation test voltage	RMS, f = 50 Hz, t = 5 s	3500	V
CTI	Comparative tracking index		>200	
T_{stg}	Storage Temperature		-40~125	℃
Torque	to heatsink	Recommended (M6)	3~5	Nm
	to terminal	Recommended (M5)	2.5~5	Nm
Weight			300	g
P_{tot}	Power Dissipation Per Mosfet	$T_{\text{C}}=25^{\circ}\text{C}$, $T_{\text{vjmax}}=175^{\circ}\text{C}$	555	W

MOSFET

ABSOLUTE MAXIMUM RATINGS($T_{vj}=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_{DSS}	Drain - source voltage	$V_{\text{GS}}=0\text{V}$, $I_{\text{D}}=100\mu\text{A}$	1200	V
V_{GSS}	Gate-source Voltage (Dynamic)	Duty cycle<1%, and pulse width<200ns	-10/+23	V
V_{GSon}	Recommended turn-on voltage		15...18	V
V_{GSoff}	Recommended turn-off voltage		-5...-2	V
I_{D}	Continuous DC Drain Current	$V_{\text{GS}}=18\text{V}$, $T_{\text{C}}=120^{\circ}\text{C}$, $T_{\text{vj}}=175^{\circ}\text{C}$	120	A
I_{DM}	Pulsed Drain Current	tp limited by SOA	320	A

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MMN08D120BC6IV

ELECTRICAL CHARACTERISTICS ($T_{vj}=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=20\text{mA}, T_{vj}=25^{\circ}\text{C}$	2.0	2.8	4.0	V
$R_{DS(on)}$	Static drain-source on-state resistance	$I_D=120\text{A}, V_{GS}=18\text{V}, T_{vj}=25^{\circ}\text{C}$		9.3		m Ω
		$I_D=120\text{A}, V_{GS}=18\text{V}, T_{vj}=125^{\circ}\text{C}$		11.5		
		$I_D=120\text{A}, V_{GS}=18\text{V}, T_{vj}=175^{\circ}\text{C}$		14.0		
I_{DSS}	Reverse Bias Drain Current	$V_{DS}=1200\text{V}, V_{GS}=0\text{V}$			100	μA
I_{GSS}	Gate-Source Leakage Current	$V_{DS}=0\text{V}, V_{GS}=-5\dots 20\text{V}$			± 400	nA
Q_G	Gate Charge	$V_{DS}=800\text{V}, V_{GS}=-3.5/18\text{V}$		0.33		μC
$R_{G(int)}$	Internal Gate Resistance	$f=100\text{kHz}$		1		Ω
C_{iss}	Input Capacitance	$V_{DS}=800\text{V}, V_{GS}=0\text{V}, f=100\text{kHz}$		8.2		nF
C_{oss}	Output Capacitance			0.65		
C_{rss}	Reverse Transfer Capacitance			0.03		
$t_{d(on)}$	Turn on Delay Time	$V_{DS}=800\text{V}, I_D=160\text{A}$ $R_G=5\Omega$ $V_{GS}=-3.5/18\text{V}$ $di/dt_{on}=6300\text{A}/\mu\text{s}$ $dv/dt_{off}=26000\text{V}/\mu\text{s}$ $(T_{vj}=175^{\circ}\text{C})$	$T_{vj}=25^{\circ}\text{C}$		48	ns
			$T_{vj}=175^{\circ}\text{C}$		67	
t_r	Rise Time		$T_{vj}=25^{\circ}\text{C}$		37	
			$T_{vj}=175^{\circ}\text{C}$		35	
$t_{d(off)}$	Turn off Delay Time		$T_{vj}=25^{\circ}\text{C}$		147	
			$T_{vj}=175^{\circ}\text{C}$		160	
t_f	Fall Time		$T_{vj}=25^{\circ}\text{C}$		33	
			$T_{vj}=175^{\circ}\text{C}$		33	
E_{on}	Turn on Energy	$(T_{vj}=175^{\circ}\text{C})$	$T_{vj}=25^{\circ}\text{C}$		3.10	mJ
			$T_{vj}=175^{\circ}\text{C}$		3.22	
E_{off}	Turn off Energy		$T_{vj}=25^{\circ}\text{C}$		4.86	
			$T_{vj}=175^{\circ}\text{C}$		4.90	
$R_{th,jc}$	Junction to Case Thermal Resistance				0.27	K /W
T_{vjop}	Operating Temperature		-40		175	$^{\circ}\text{C}$

MMN08D120BC6IV

Body DIODE

ABSOLUTE MAXIMUM RATINGS($T_{vj}=25^{\circ}C$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
I_S	DC Body Diode Forward Current	$V_{GS}=-3.5V, T_C=50^{\circ}C, T_{vj}=175^{\circ}C$	120	A

ELECTRICAL CHARACTERISTICS ($T_{vj}=25^{\circ}C$ unless otherwise specified)

Symbol	Parameter/Test Conditions			Min.	Typ.	Max.	Unit
V _{SD}	Diode Forward Voltage	I _{SD} =120A , V _{GS} =3.5V, T _{vj} =25℃			5.53		V
		I _{SD} =120A , V _{GS} =3.5V, T _{vj} =125℃			5.20		
		I _{SD} =120A , V _{GS} =3.5V, T _{vj} =175℃			3.85		
t _{rr}	Reverse recovery time	V _{DS} =800V, V _{GS} =-3.5V, I _{SD} =160A, -di/dt=5900A/μs (T _{vj} =175℃)	T _{vj} =25℃		46		A
			T _{vj} =175℃		55		
I _{rrm}	Peak reverse recovery current		T _{vj} =25℃		76		A
			T _{vj} =175℃		132		
Q _{rr}	Reverse recovery charge		T _{vj} =25℃		1.84		μC
			T _{vj} =175℃		4.68		
E _{rec}	Reverse recovery energy		T _{vj} =25℃		1.18		mJ
			T _{vj} =175℃		3.00		

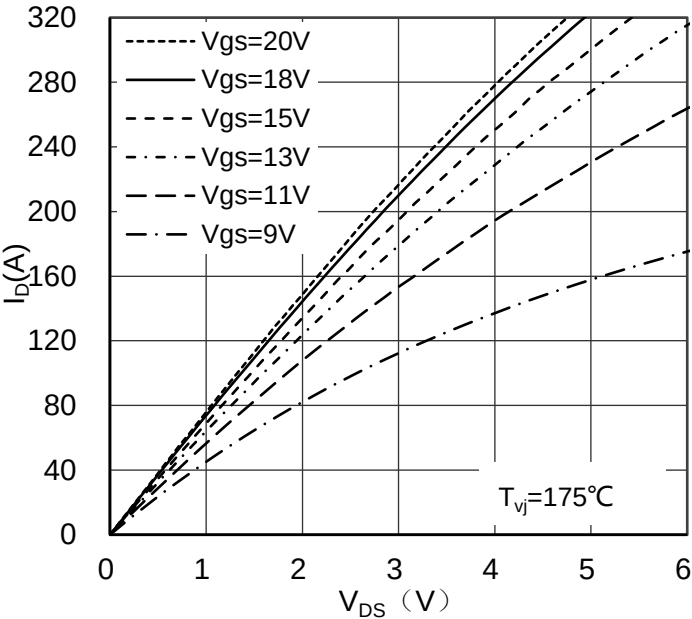


Figure 1. Typical Output Characteristics

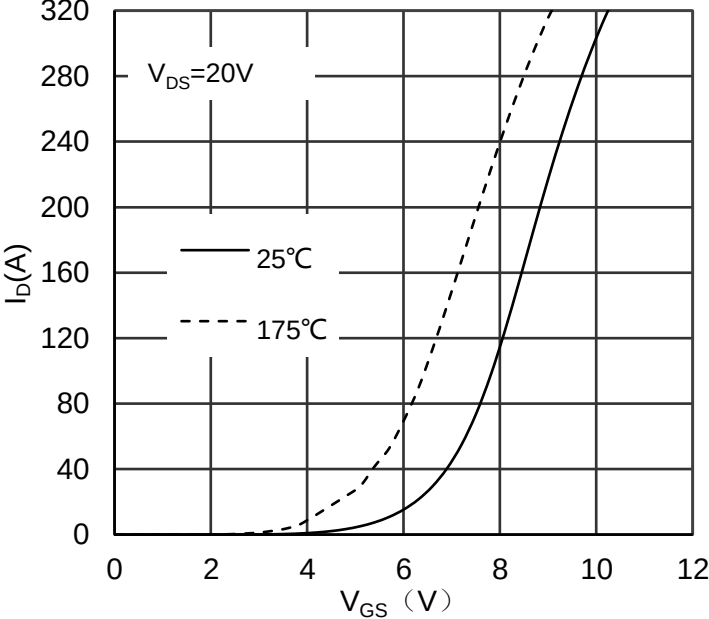


Figure 2. Typical Transfer characteristics

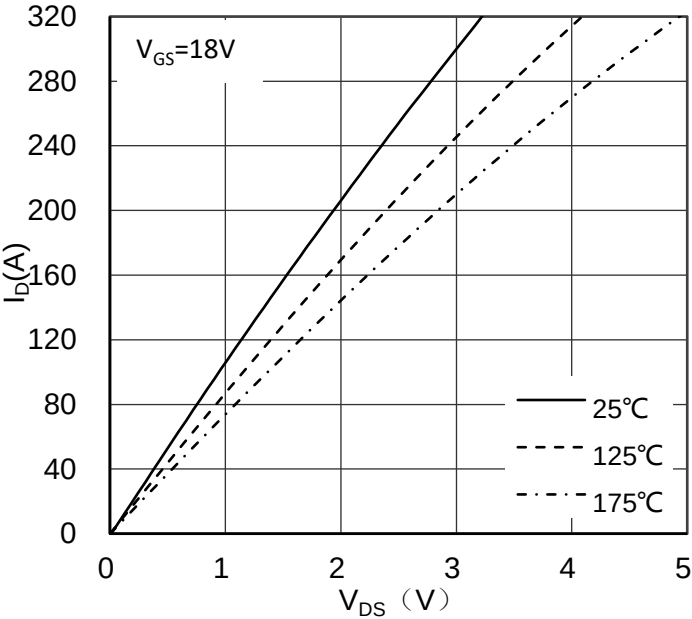


Figure 3. Typical Output Characteristics

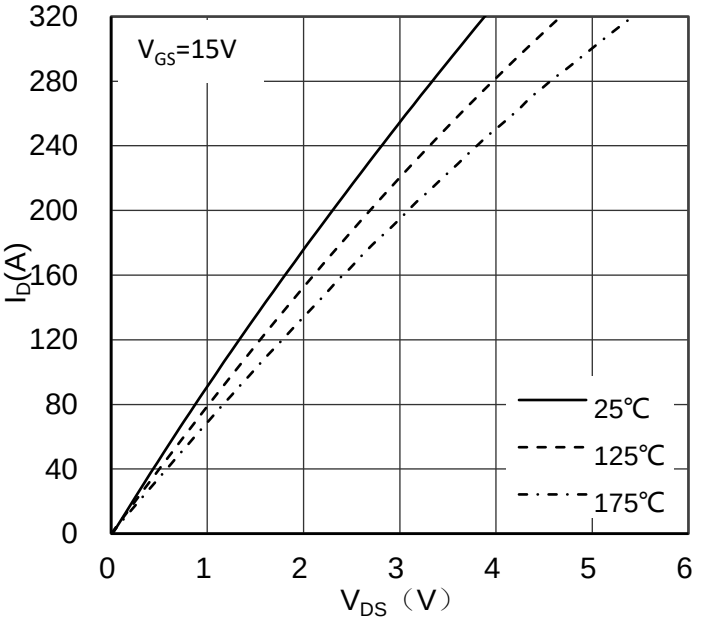


Figure 3. Typical Output Characteristics

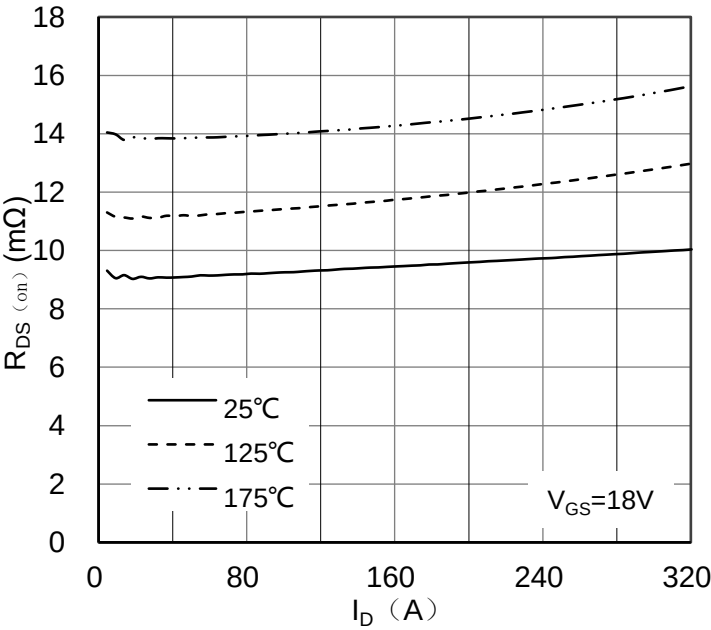


Figure 5. Typical Drain source on-resistance

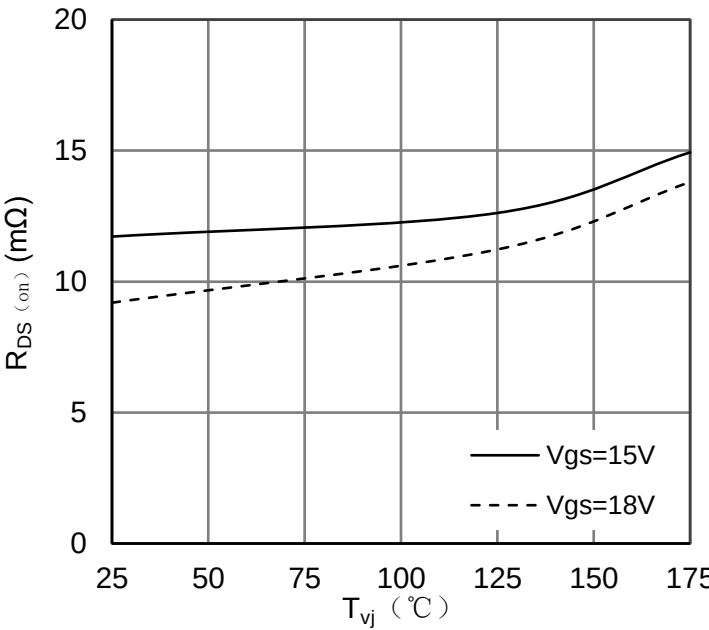


Figure 6. Typical Drain source on-resistance

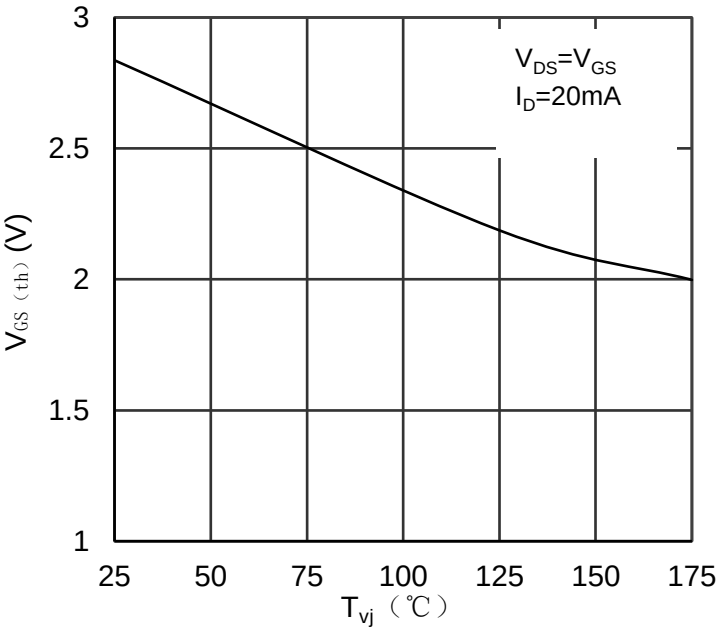


Figure 7. Typical Gate-source threshold voltage

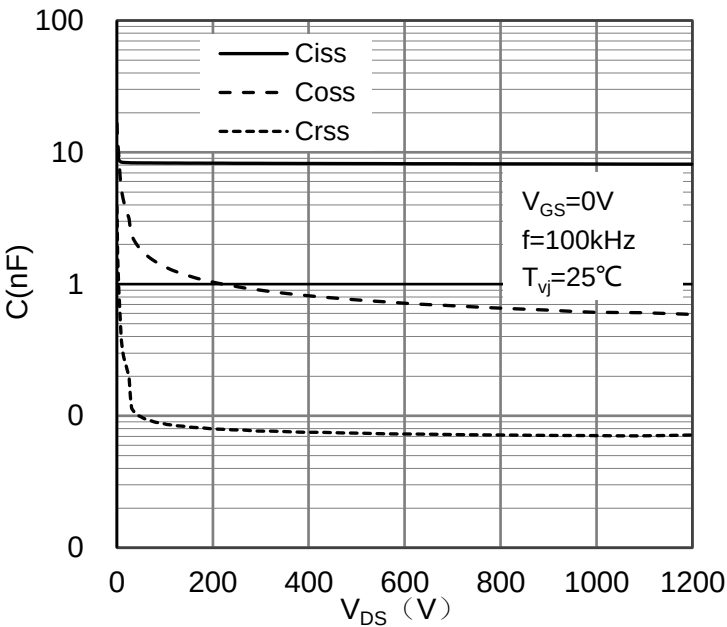


Figure 8. Typical capacitance

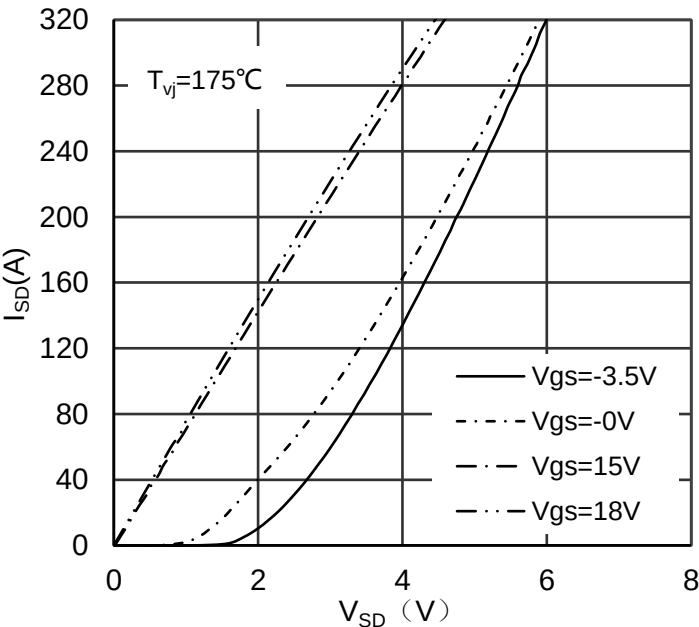


Figure 9. Typical Body Diode Forward

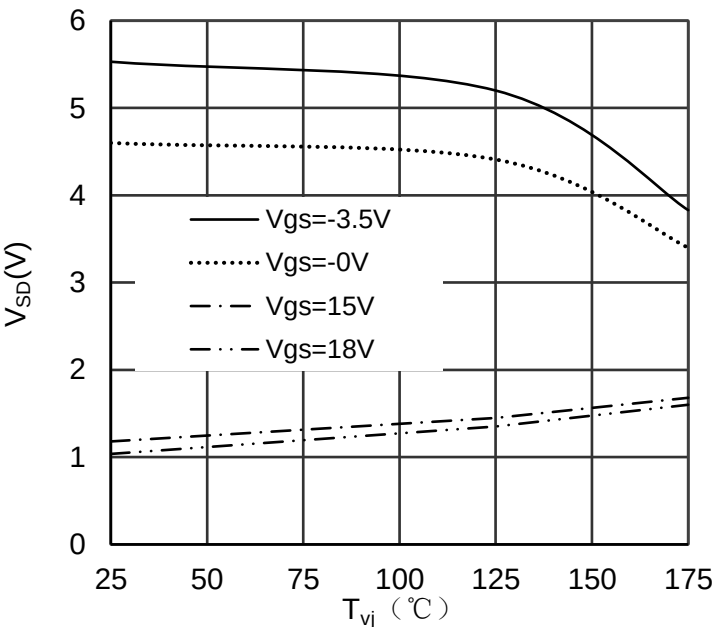


Figure 10. Typical Body Diode Forward Voltage

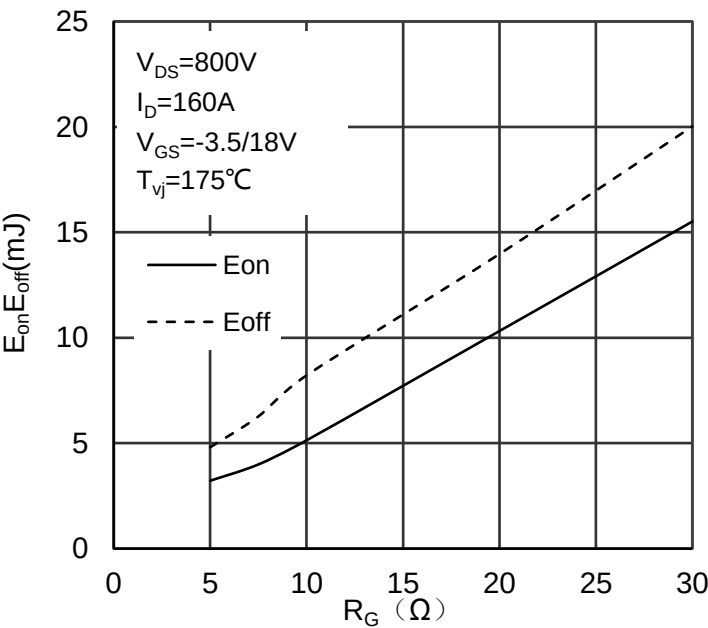


Figure 11. Typical Switching Energy

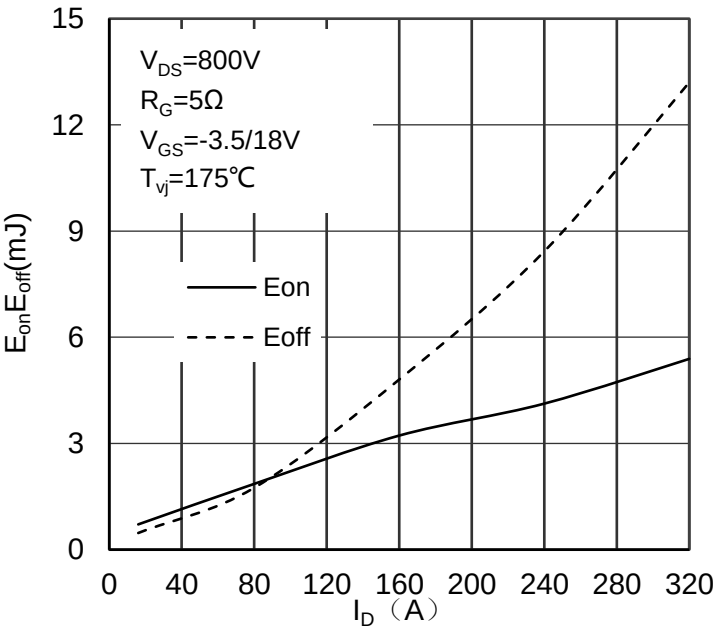


Figure 12. Typical Switching Energy

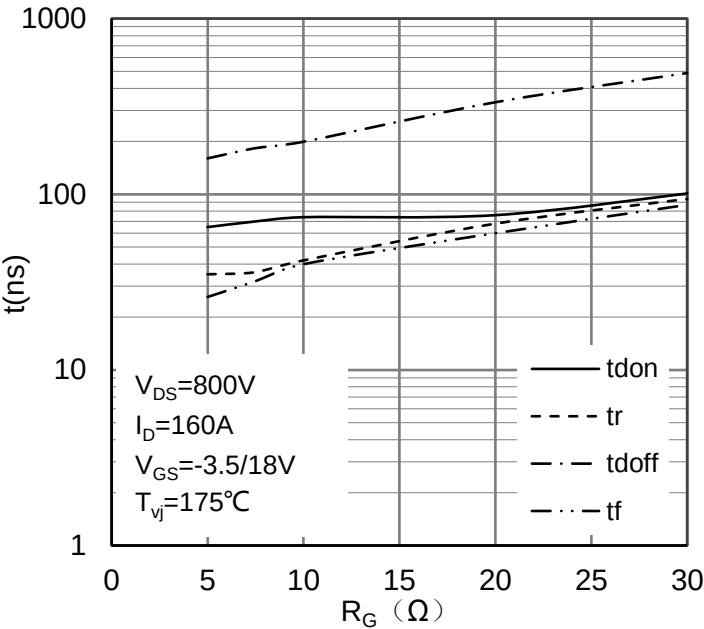


Figure 13. Typical Switching Times

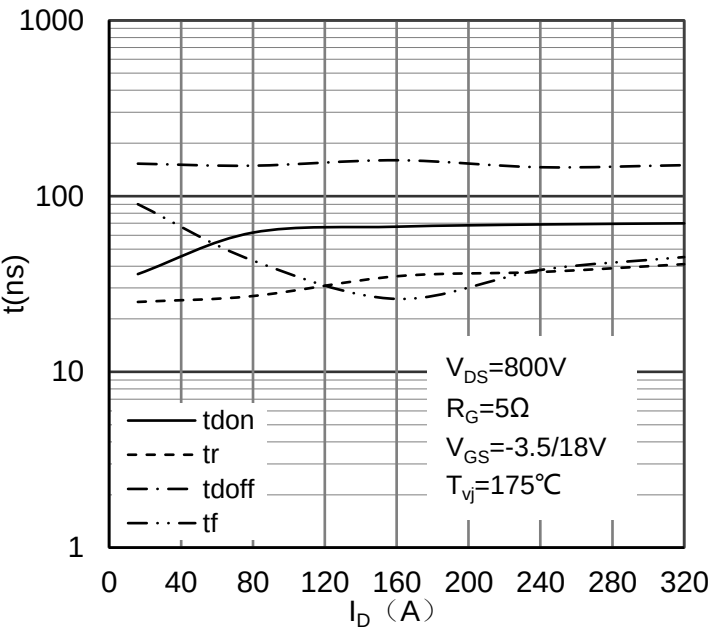


Figure 14. Typical Switching Times

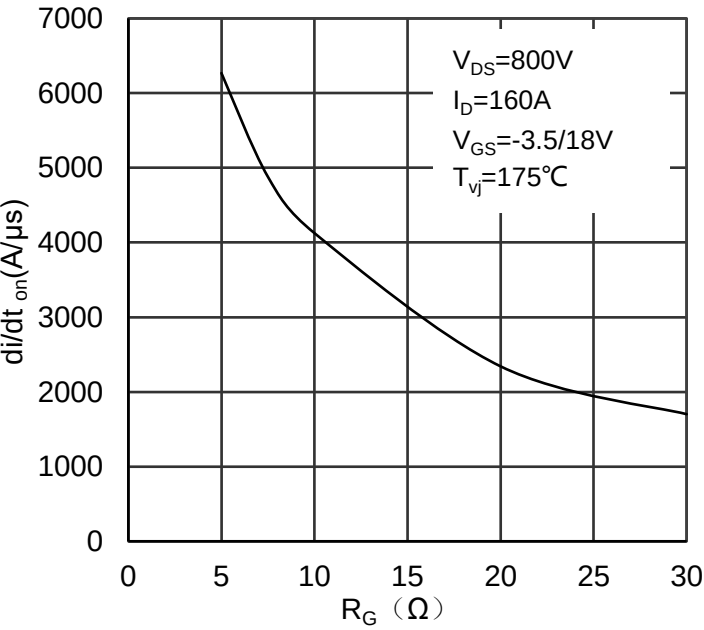


Figure 15. Typical Current slope

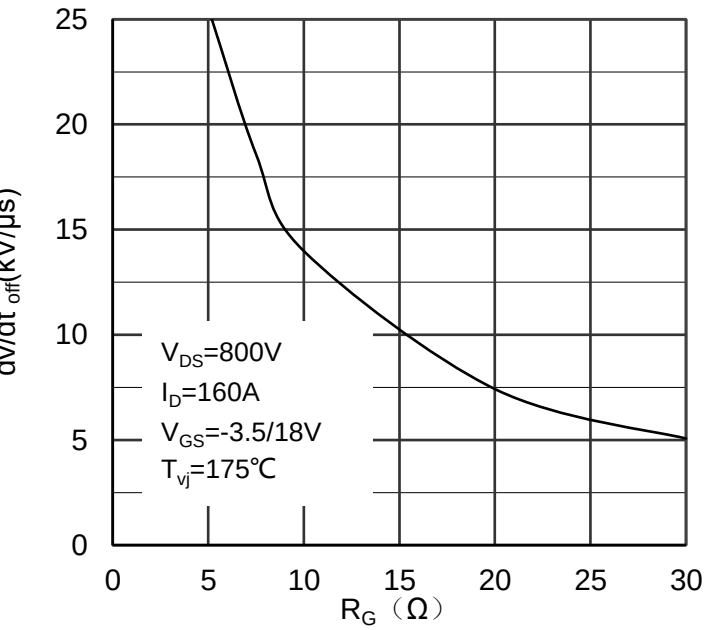


Figure 16. Typical Voltage slope

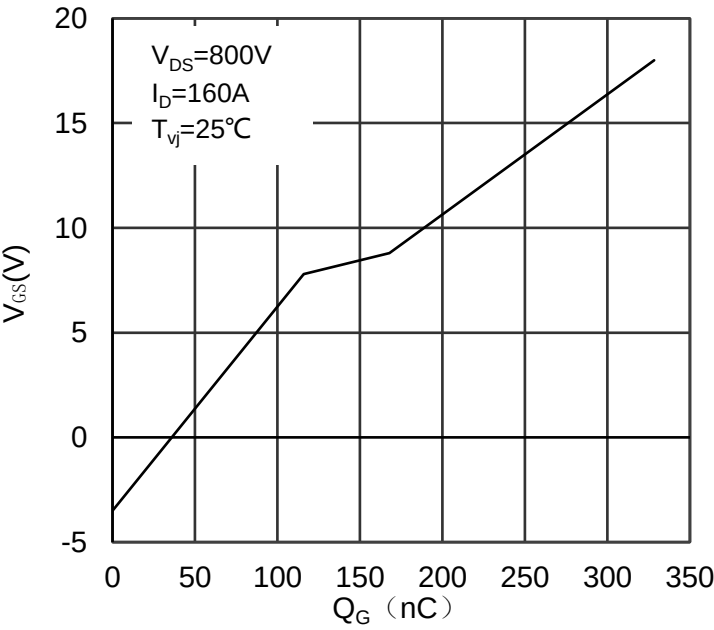


Figure 17. Typical Gate Charge Characteristics

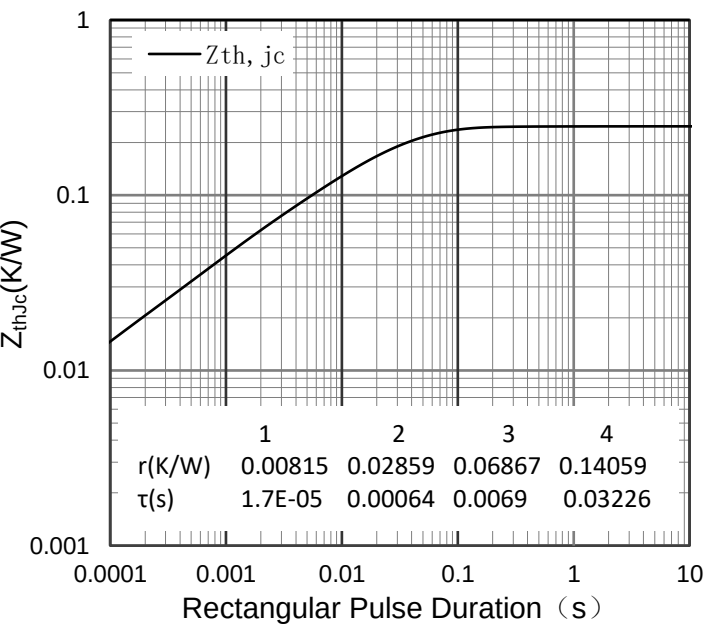


Figure 18. Transient Thermal Impedance-typ.

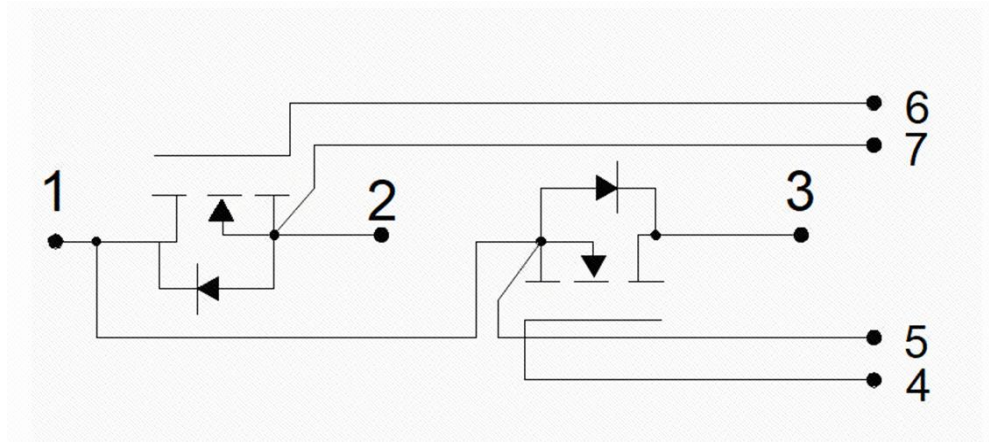


Figure 19. Circuit Diagram

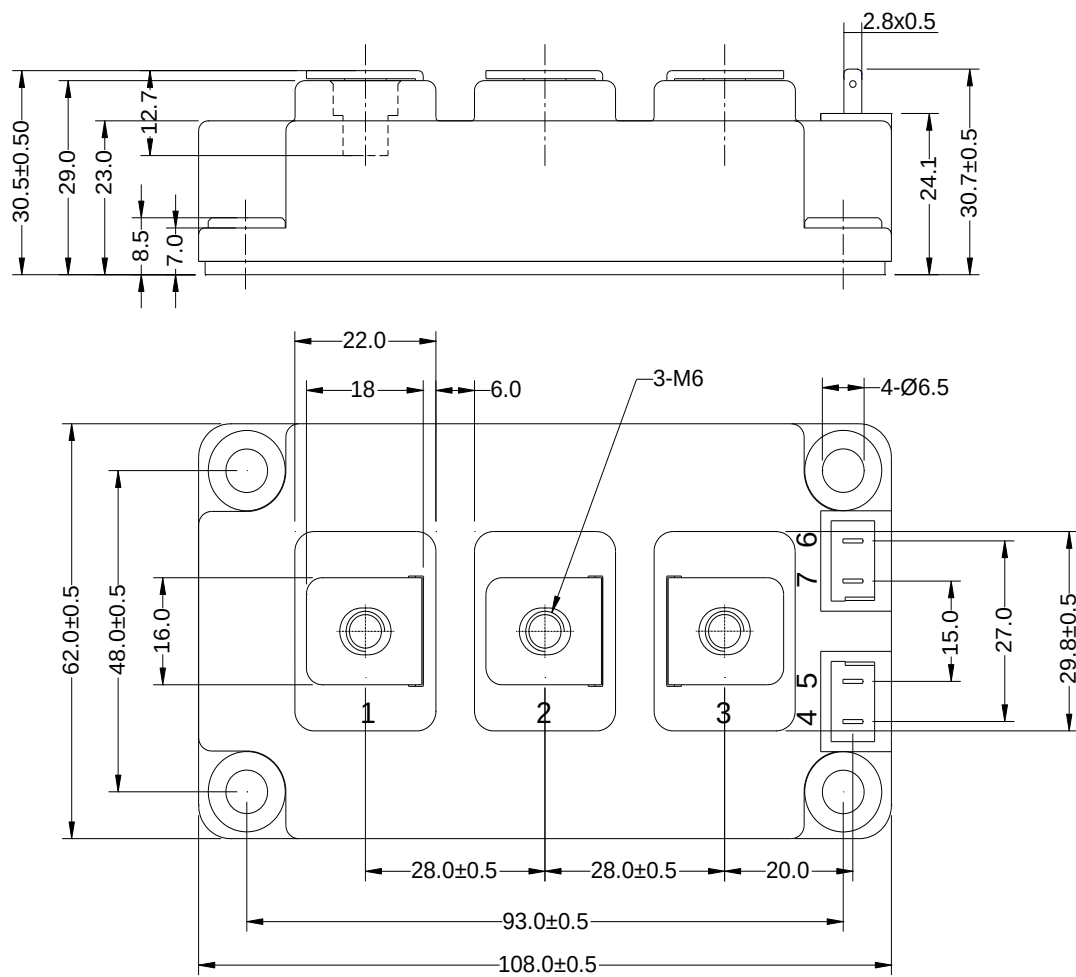


Figure 20. Package Outline