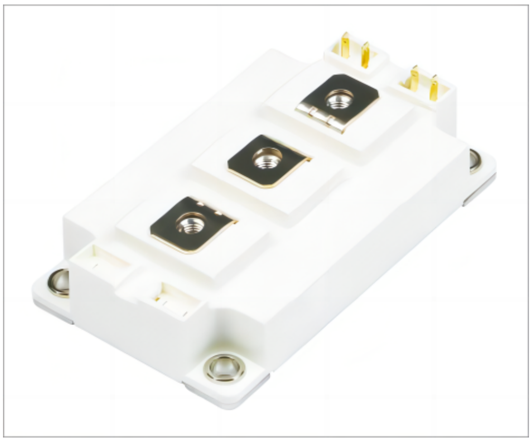
RSC120HF120 **T2H**

All-SiC Power Module

V_{DS}=1200V $R_{DS(on)}$=12.5mΩ

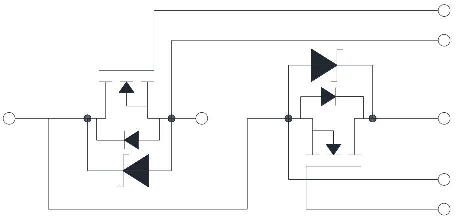


Applications

- Induction Heating
- Solar and Wind Inverters
- DC/AC Converters

Features

- Ultra Low Loss
- High-Frequency Operation
- Zero Reverse Recovery Current from Diode
- Zero Turn-Off Tail Current from MOSFET
- Ease of Paralleling



Equivalent Circuit Schematic

Absolute Maximum Ratings (T_C =25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Drain-Source Voltage	$V_{DS\,max}$		1200	V
Continuous Drain Current	I_D	V_{GS}=20V, T_c=25℃	180	A
		V_{GS}=20V, T_c=80℃	120	
Gate- Source Voltage	$V_{GS\,max}$	Absolute Maximum Values	-10/+25	V
Gate-Source Voltage	$V_{GS\,op}$	Recommended Operational Values	-5/+20	V
Maximum Pulsed Drain-Source Current	$I_{D(pulsed)}$	V_{GS}=20V, T_{vj}=25℃, t_{pmax} Limited by $T_{vj\,max}$	240	A
Operating Junction Temperature	$T_{vj\,op}$		-40～+175	℃

MOSFET Characteristics (T_C =25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=30mA	1.9	2.3	4	V
		V_{DS}=V_{GS}, I_D=30mA, T_{vj}=175℃		1.6		
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=1200V, V_{GS}=0V		2	200	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=-10V/+25V		20	500	nA
On State Resistance	$R_{DS(on)}$	V_{GS}=20V, I_{DS}=100A		11.5	17	mΩ
		V_{GS}=20V, I_{DS}=100A, T_{vj}=175℃		21.5		mΩ
Input Capacitance	C_{iss}	V_{DS}=1000V, V_{AC}=25mV f=1MHz		8400		pF
Output Capacitance	C_{oss}			500		pF
Reverse Transfer Capacitance	C_{rss}			32		pF
Gate-Source Charge	Q_{GS}	V_{DS}=800V, V_{GS} =-5V/+20V I_D=100A		108		nC
Gate-Drain Charge	Q_{GD}			58		nC
Total Gate Charge	Q_G			390		nC
Turn-On Delay Time	$t_{d(on)}$	I_D=100A V_{DS}=600V V_{GS} =-5V/+20V R_G=2.5Ω Inductive Load		TBD		ns
Rise Time	t_r			TBD		ns
Turn-Off Delay Time	$t_{d(off)}$			TBD		ns
Fall Time	t_f			TBD		ns
Energy Dissipation during Turn-On Time	E_{on}			TBD		mJ
Energy Dissipation during Turn-Off Time	E_{off}			TBD		mJ

Diode Characteristics (T_C =25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	I_F=100A		1.4	1.8	V
		I_F=100A, T_{vj}=175℃		2.25	2.7	V
Reverse Current	I_R	V_R=1200V		60	300	uA
		V_R=1200V, T_{vj}=175℃		200	2000	

NTC Thermistor

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Rated Resistance	R_{25}			5.0		kΩ
Deviation of R100	ΔR/R	T_C=100, R_{100}=493.3Ω	-5		5	%
Power Dissipation	P_{25}			20.0		mW
B-Value	$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$		3375		K

Module Characteristics (T_C =25℃ unless otherwise specified)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Case Isolation Voltage	V_{isol}	t=1min, f=50Hz	2500			V
Maximum Junction Temperature	$T_{j\,max}$				175	℃
Operating Junction Temperature	$T_{vj\,op}$		-40		175	℃
Storage Temperature	T_{stg}		-40		125	℃
Stray Inductance Module	L_{sCE}			TBD		nH
Thermal Resistance Junction to Case	R_{thJC}	Per MOSFET		TBD		K/W
Module Electrodes Torque	M_t	Recommended(M6)	3.0		6.0	N·m
Module to Sink Torque	M_s	Recommended(M6)	3.0		6.0	
Weight of Module	G			300		g

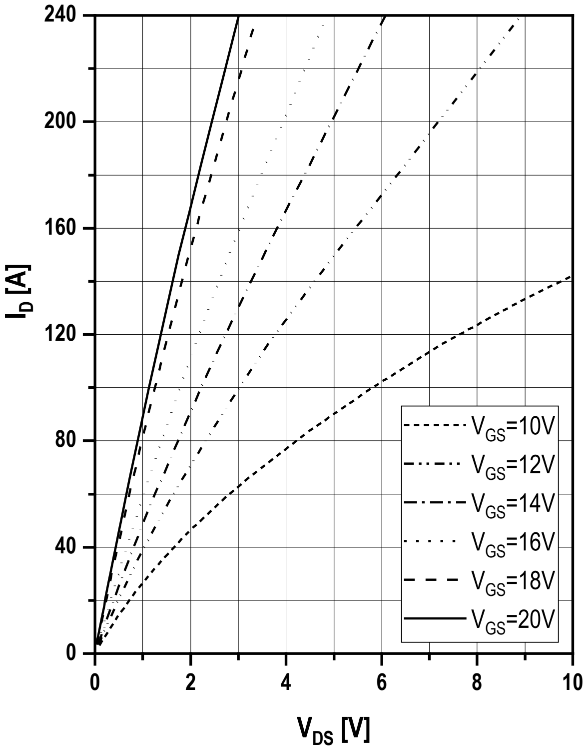


Fig.1 Output Characteristic (MOSFET), T_{vj}=25℃, I_D=f(V_{DS})

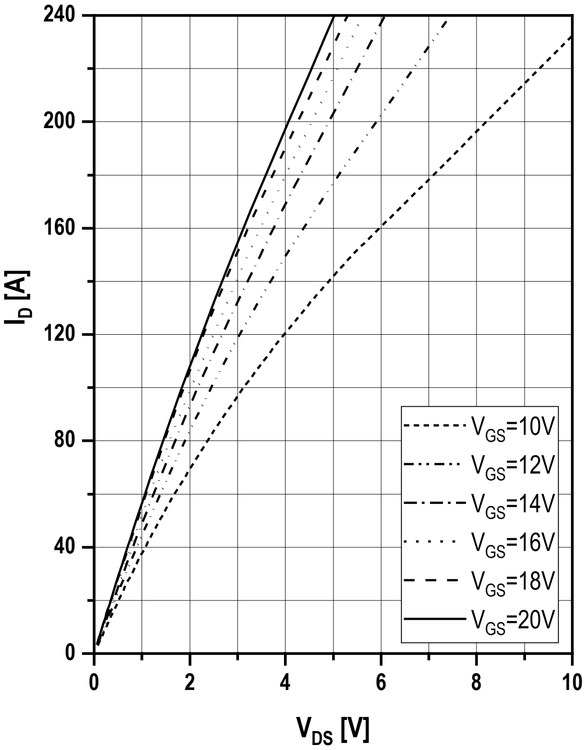


Fig.2 Output Characteristic (MOSFET), T_{vj}=125℃, I_D=f(V_{DS})

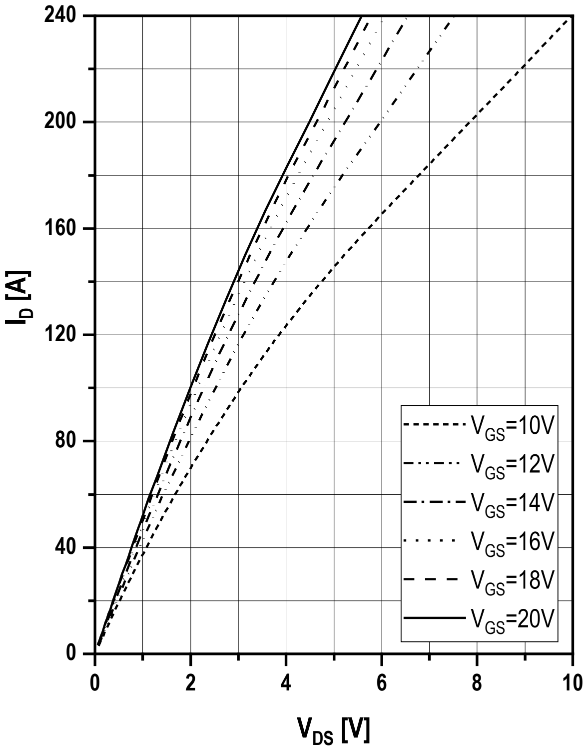


Fig.3 Output Characteristic (MOSFET), T_{vj}=150℃, I_D=f(V_{DS})

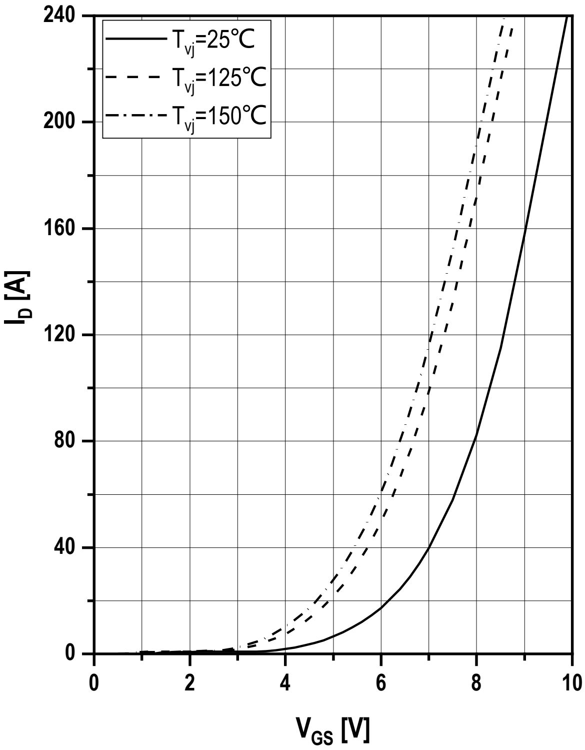


Fig.4 Transfer Characteristic (MOSFET), I_D=f(V_{GS})

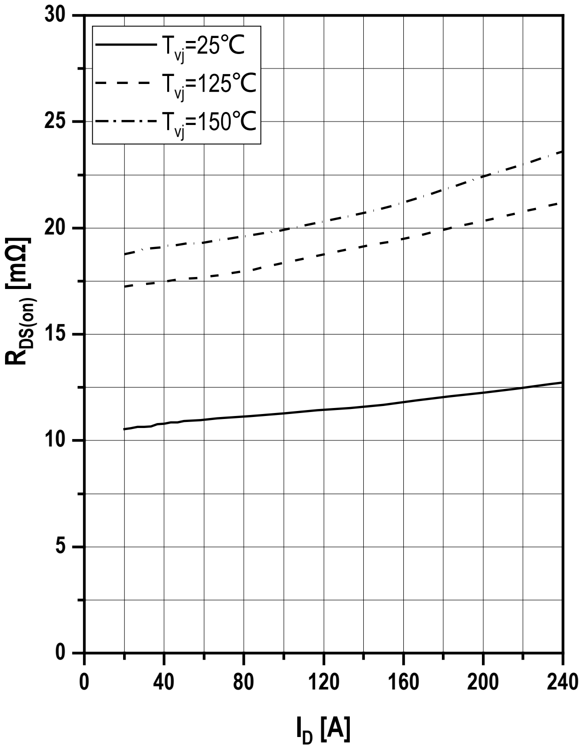


Fig.5 Drain Source On-Resistance (MOSFET), V_{GS}=20V, $R_{DS(on)}$=f(I_D)

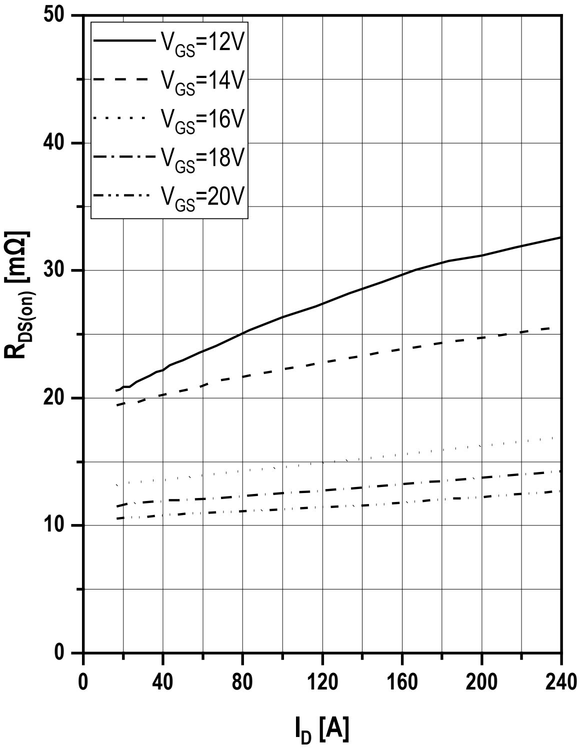


Fig.6 Drain Source On-Resistance (MOSFET), T_{vj}=25℃, $R_{DS(on)}$=f(I_D)

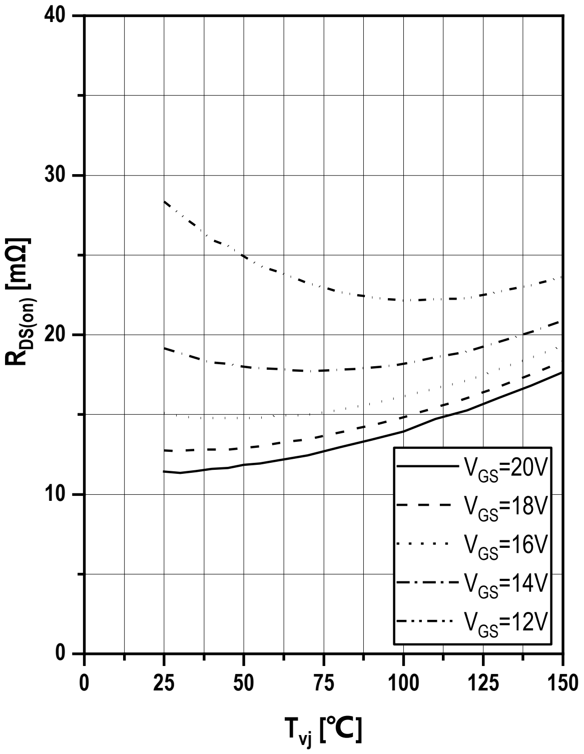


Fig.7 Drain Source On-Resistance (MOSFET), $R_{DS(on)}$=f(T_{vj})

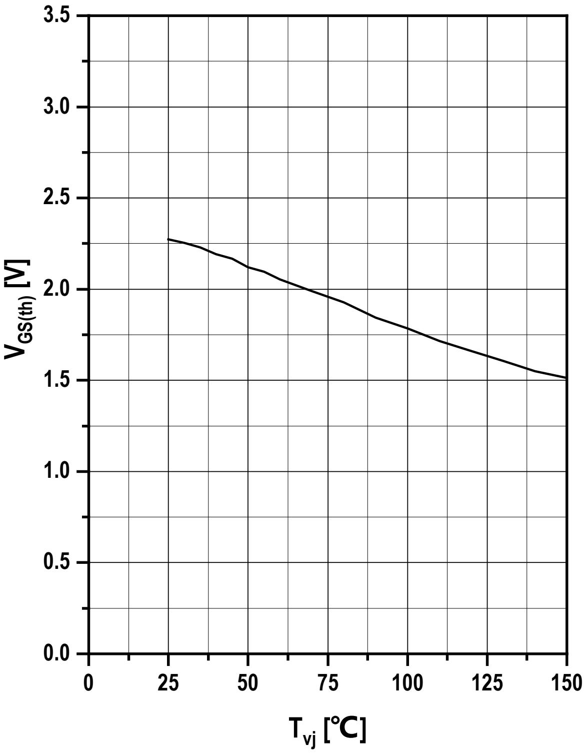


Fig.8 Threshold Voltage (MOSFET), $V_{GS(th)}$=f(T_{vj})

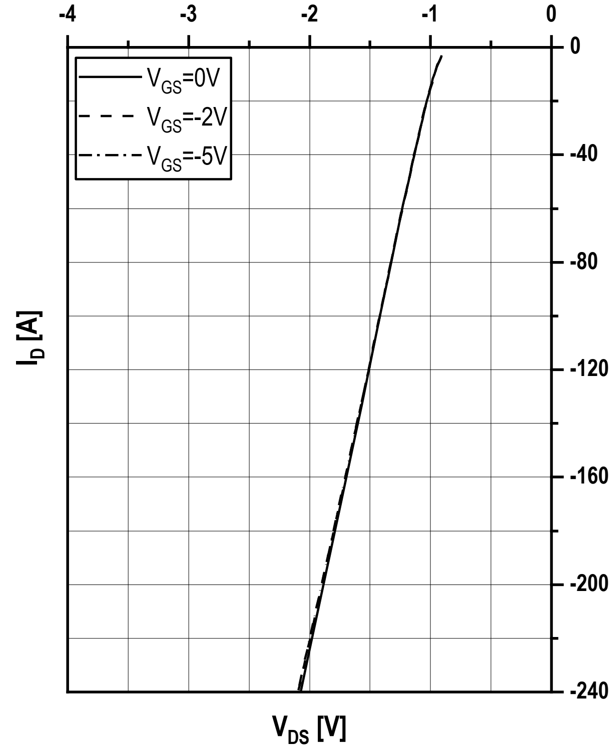


Fig.9 Output Characteristic (Diode), T_{vj}=25℃, I_D=f(V_{DS})

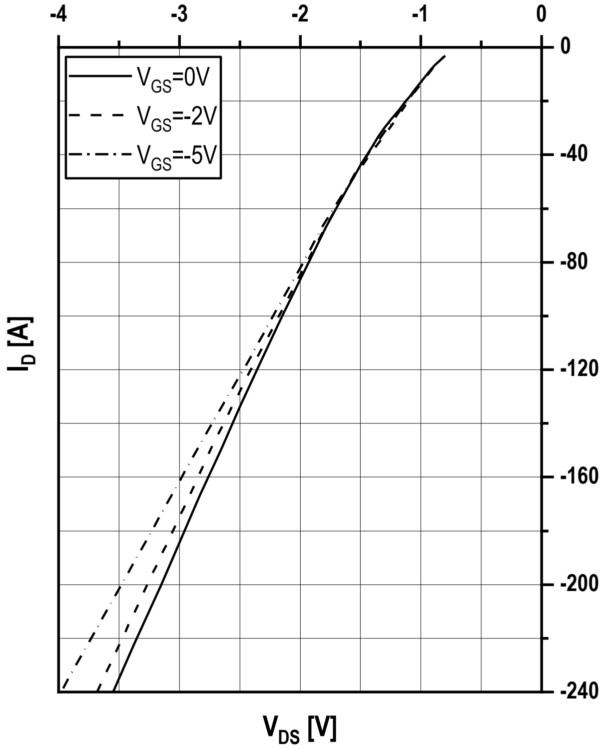


Fig.10 Output Characteristic (Diode), T_{vj}=125℃, I_D=f(V_{DS})

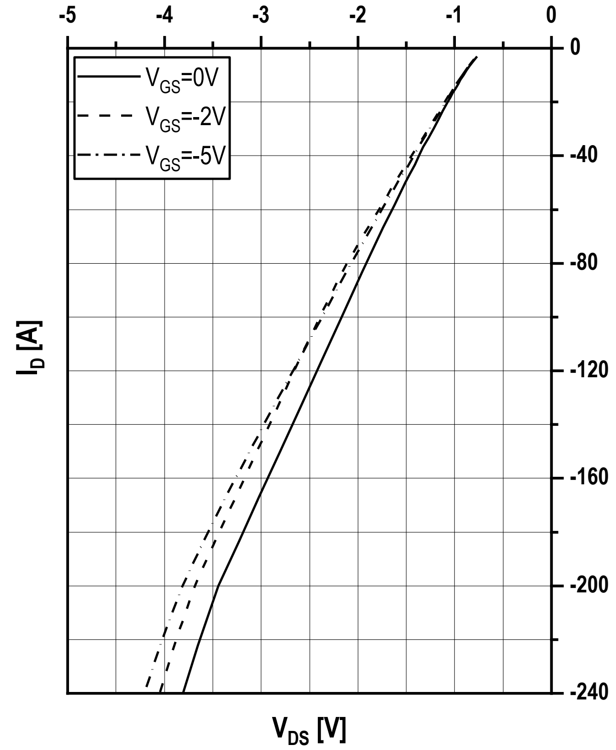


Fig.11 Output Characteristic (Diode), T_{vj}=150℃, I_D=f(V_{DS})

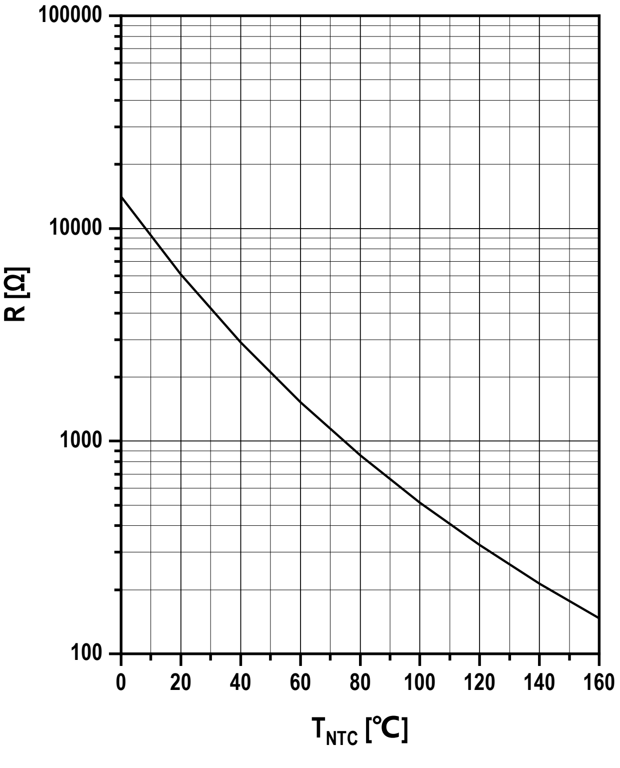
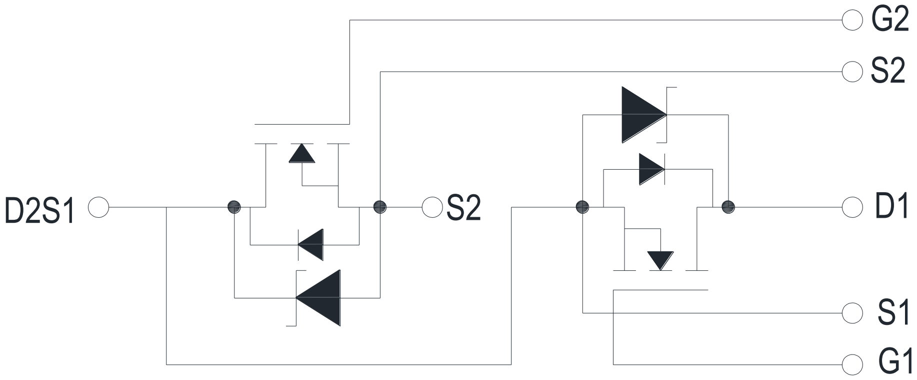
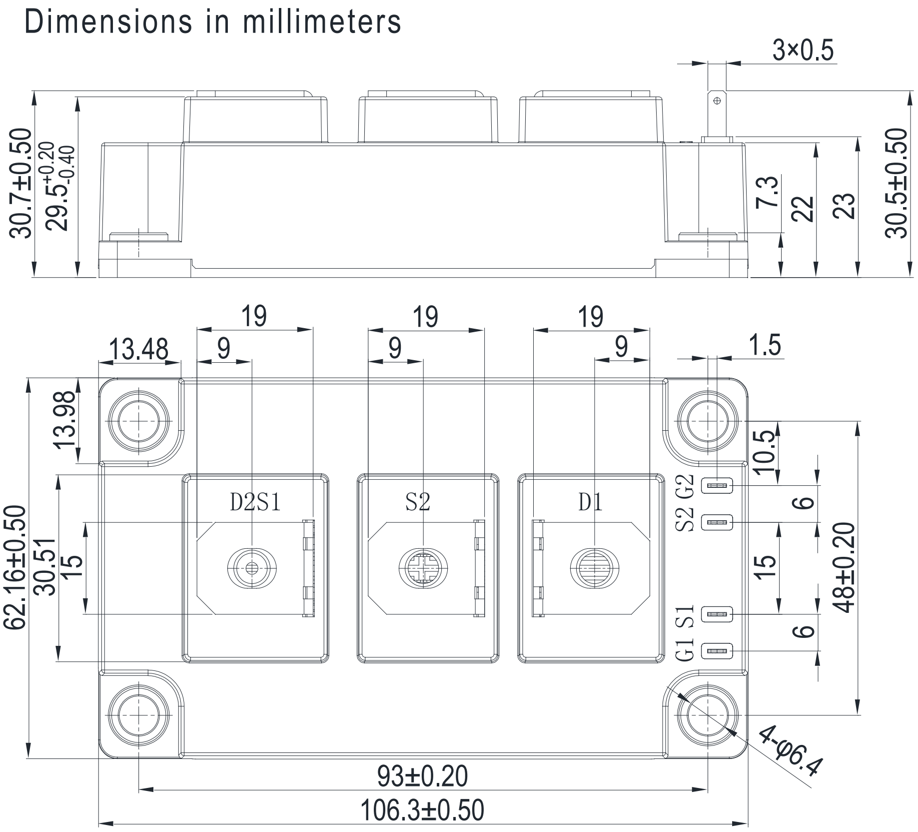


Fig.12 NTC-Thermistor-Temperature Characteristic (typical), R=f(T)

- **Circuit Diagram**



- **Package Dimensions**



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