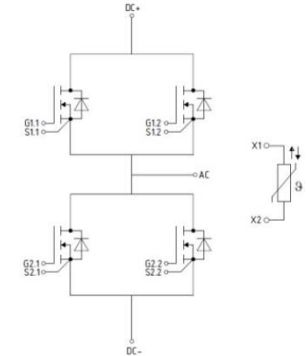
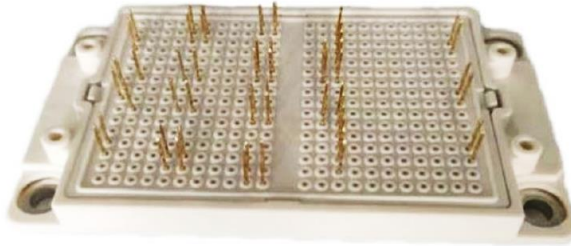


Product Summary

Product Type	V _{CES}	I _D	R _{DS(ON)}	Package
ATSCM5R3N120HEY3B	1200V	250A	5.3_mΩ	Easy 3B



Features

- V_{DS} =1200V
- I_{D nom}=250A
- Low switching losses
- Press-FIT contact technology
- Integrated NTC temperature sensor

Applications

- High-frequency switching application
- Solar application
- Servo Drives

IGBT, Inverter Maximum Rated Values

Parameter	Symbol	Note or test condition	Values	Unit
Drain-source voltage	V _{DSS}	T _{vj} = 25°C	1200	V
Implemented drain current	I _{DN}		250	A
Continuous DC drain current	I _{DDC}	V _{GS} =18V, T _{vj} = 175°C; T _H = 65°C	212.5	A
Repetitive peak drain current	I _{DRM}	T _C = 25°C, T _{vj, max} = 150 °C	500	W
Gate-source voltage, max. static voltage	V _{GS}		- 7/20	V

IGBT, Inverter Characteristic value

Parameter	Symbol	Note or test condition	Min.	Typ.	Max.	Unit
Drain-source on-resistance	R _{DS(on)}	I _D =200A, V _{GS} =15V T _{vj} = 25°C		5.3		mΩ
		I _D =200A, V _{GS} =15V T _{vj} = 125°C		6.05		
Gate Threshold Voltage	V _{GS(th)}	I _D =80mA, V _{DS} =V _{GS} , T _{vj} = 25°C	2.0	2.77	3.6	V
Drain-source leakage current	I _{DSS}	V _{DS} =1200V		8.62	100	μC
Internal gate resistor	R _{Gint}	T _{vj} = 25°C		1.15		Ω
Total gate charge	Q _G	V _{DS} = 800V, V _{GS} = -3/18V, T _{vj} = 25°C		993		nF
Input Capacitance	C _{iss}	f=100 kHz, V _{DS} =800V, V _{GS} =0V T _{vj} = 125°C		31.5		nF
Out Capacitance	C _{oss}			1.82		nF
Reverse Transfer Capacitance	C _{rss}			0.13		nF
Turn-on delay time, inductive load	t _r	I _D =200A, V _{DS} =600V, V _{GS} = -3/18V, R _{Gon} =2.7Ω , R _{Goff} =1Ω	T _{vj} = 25°C T _{vj} = 125°C T _{vj} = 175°C	0.13 0.13 0.13		ns
Rise time, inductive load	t _r	I _D =200A, V _{DS} =600V, V _{GS} = -3/18V, R _{Gon} =2.7Ω , R _{Goff} =1Ω	T _{vj} = 25°C T _{vj} = 125°C T _{vj} = 175°C			ns

Parameter	Symbol	Note or test condition	Min.	Typ.	Max.	Unit
Turn-off delay time, inductive load	$t_{d,off}$	$I_D=200A, V_{DS}=600V,$ $V_{GS}= -3/18V,$ $R_{Gon}=2.7\Omega, R_{Goff}=1\Omega$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 175^{\circ}C$	0.14 0.22 0.22		ns
Fall time, inductive load 下降时间	t_f	$I_D=200A, V_{DS}=600V,$ $V_{GS}= -3/18V,$ $R_{Gon}=2.7\Omega, R_{Goff}=1\Omega$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 175^{\circ}C$	0.12 0.15 0.17		ns
Turn-on energy loss per pulse	E_{on}	$I_D=200A, V_{DS}=600V,$ $V_{GS}= -3/18V,$ $R_{Gon}=2.7\Omega, R_{Goff}=1\Omega$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 175^{\circ}C$	1.05 1.27 1.36		mJ
Turn-off energy loss per pulse	E_{off}	$I_D=200A, V_{DS}=600V,$ $V_{GS}= -3/18V,$ $R_{Gon}=2.7\Omega, R_{Goff}=1\Omega$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 175^{\circ}C$	0.64 0.93 0.99		mJ
Thermal resistance, junction to heat sink	$R_{th,Jc}$	Per IGBT			0.273	K/W

Diode, Inverter Characteristic value

Parameter	Symbol	Note or test condition	Min.	Typ.	Max.	Unit
Forward voltage	V_{SD}	$I_F = 200 A, V_{GE} = -3V$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	3.8 3.5 3.3	5.35	V V V
DC body diode forward current	I_{SD}	$T_H= 65^{\circ}C$		85		A

NTC-Thermistor Characteristic value

Parameter	Symbol	Note or test condition	Min.	Typ.	Max.	Unit
Rated resistance	R_{25}	$T_C = 25^{\circ}C$		5.00		K Ω
Deviation of R_{100}	$\Delta R/R$	$T_C=100^{\circ}C, R_{100}=465\Omega$	-7.3		7.3	
Power dissipation	P_{25}	$T_C = 25^{\circ}C$	2		24	mW
B-value	B_{25}/B_{50}	$B=[(T_a \cdot T_b)/(T_b - T_a)] \cdot \ln(R_a/R_b),$ $T_b=50^{\circ}C \pm 0.01^{\circ}C$		3380		K
B-value	B_{25}/B_{80}	$B=[(T_a \cdot T_b)/(T_b - T_a)] \cdot \ln(R_a/R_b),$ $T_b=80^{\circ}C \pm 0.01^{\circ}C$		3468		K
B-value	B_{25}/B_{100}	$B=[(T_a \cdot T_b)/(T_b - T_a)] \cdot \ln(R_a/R_b),$ $T_b=100^{\circ}C \pm 0.01^{\circ}C$		3523		K

Module Characteristic value

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Isolation Voltage	V_{ISOL}	RMS, f=50HZ, 1min			2500	V
Stray inductance module	L_{sCE}			30		nH
Operation Junction Temperature	T_{jop}		-40		150	$^{\circ}C$
Storage Temperature Range	T_{stg}		-40		125	$^{\circ}C$
Mounting Torque	M	Screw M5	2		2.3	N.m
Weight of Module	G			24		g

Characteristics diagrams

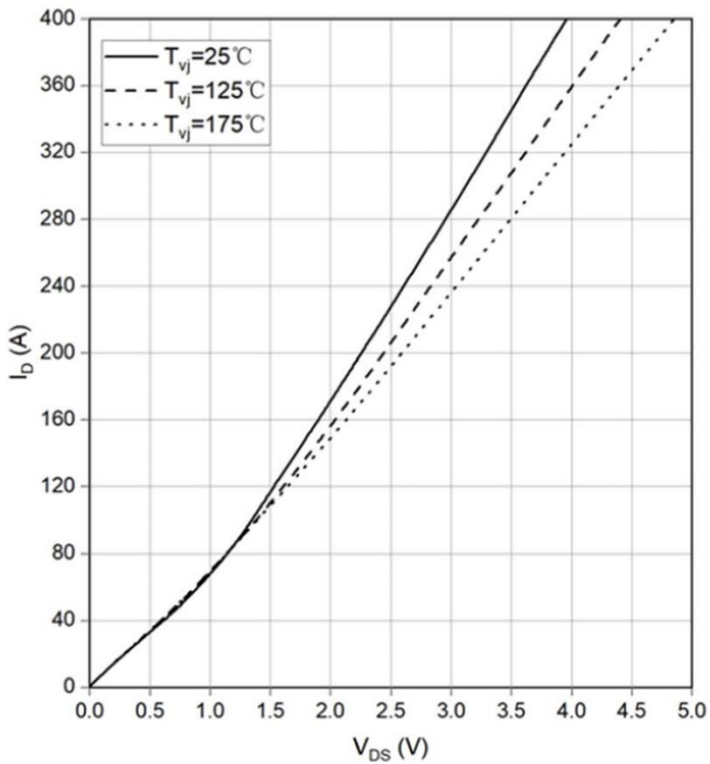


Fig 1 Output characteristic MOSFET, $I_D=f(V_{DS})$, $V_{GS}=18V$

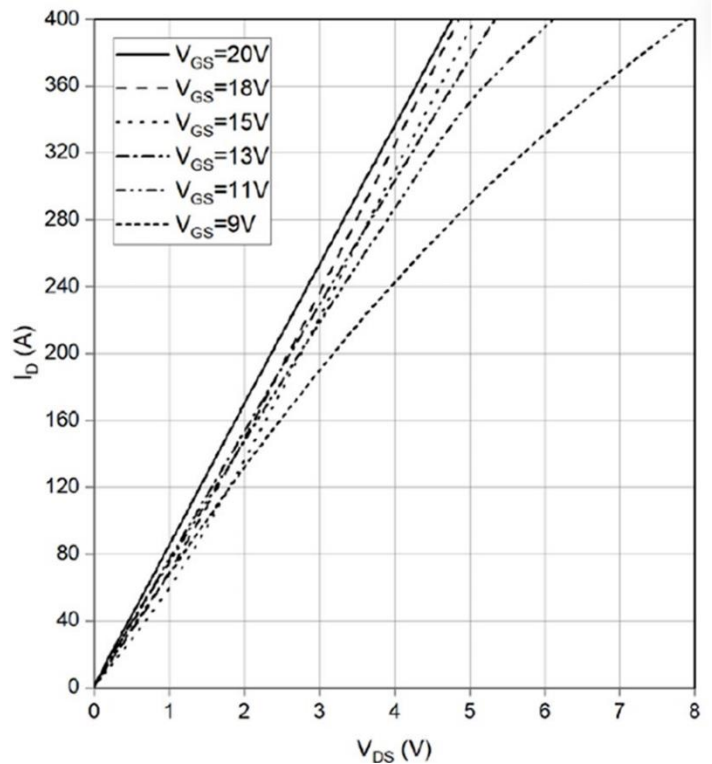


Fig 2 Output Characteristic, MOSFET $I_D=f(V_{DS})$, $T_{vj}=175^{\circ}C$

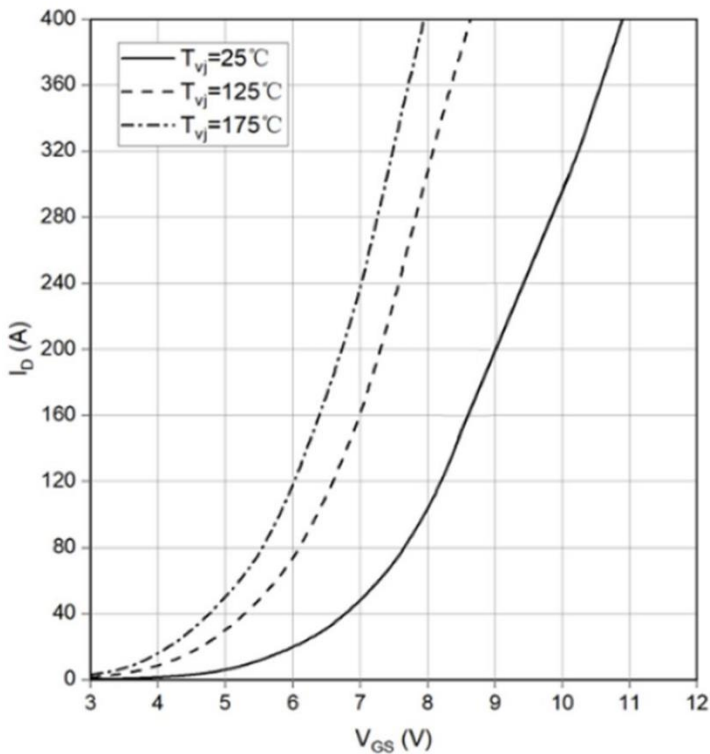


Fig 3 Transfer Characteristic, MOSFET $I_D=f(V_{GS})$, $V_{DS}=20V$

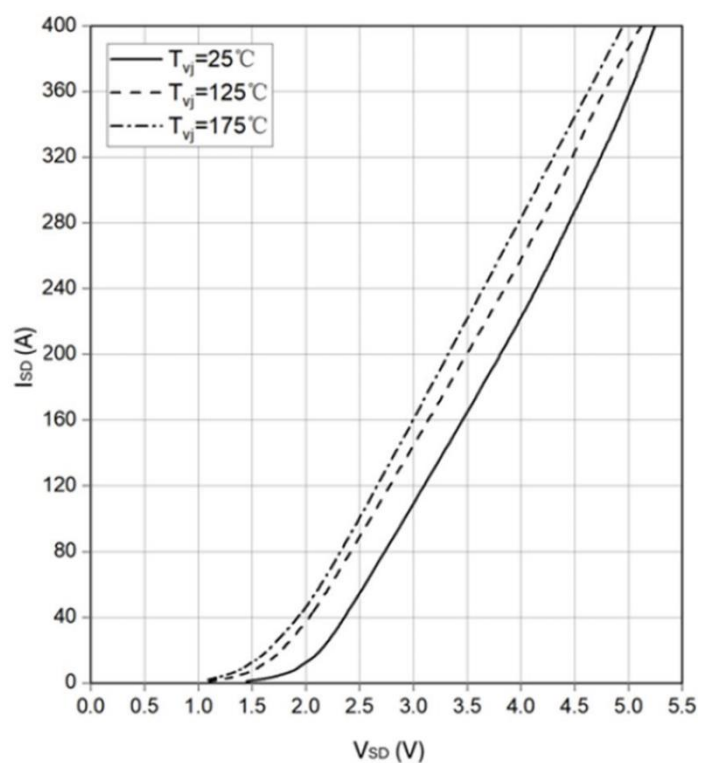


Fig 4 Forward Characteristic, Body Diode $I_{SD}=f(V_{SD})$, $V_{GS}=0V$

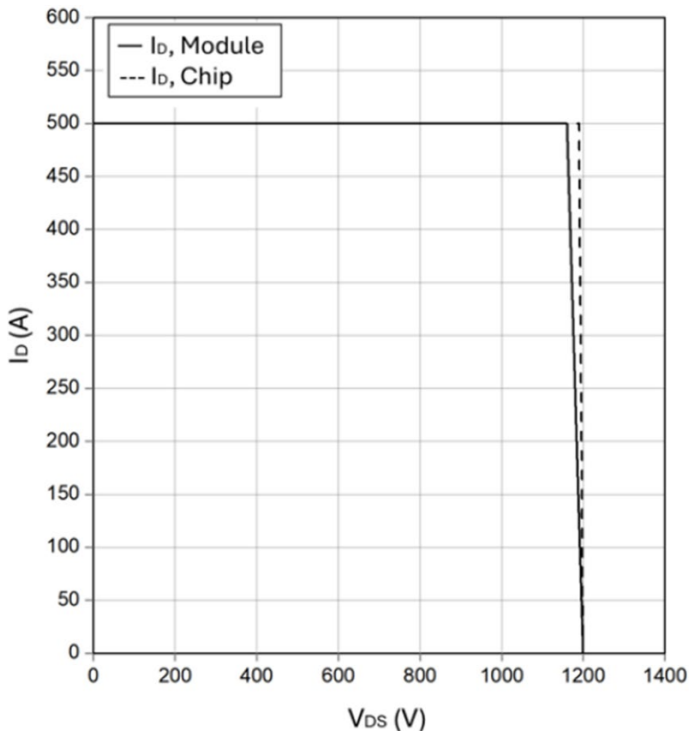


Fig 5 Reverse bias safe Operating area, MOSFET
 $I_D = f(V_{DS})$, $R_{Goff} = 1\Omega$, $T_{vj} = 175^\circ\text{C}$, $V_{GS} = -3/18\text{V}$

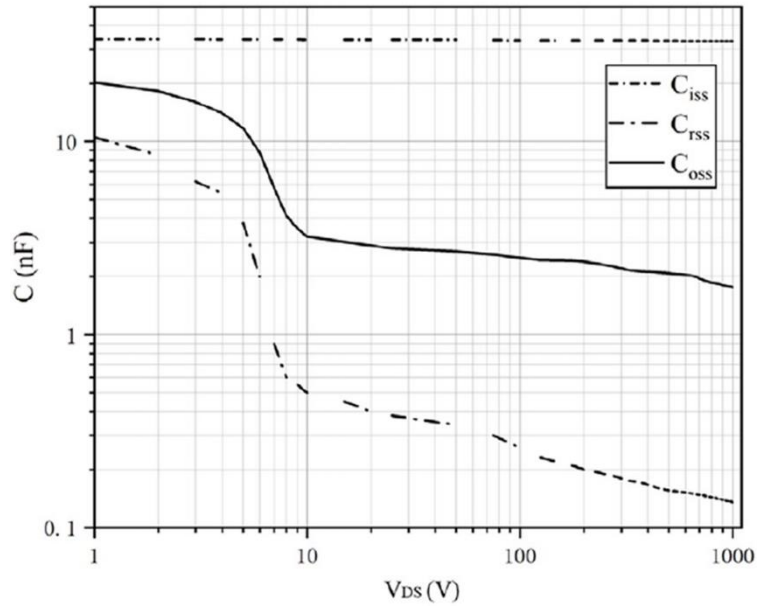


Fig 6 Capacity characteristic, MOSFET
 $C = f(V_{DS})$, $T_{vj} = 125^\circ\text{C}$

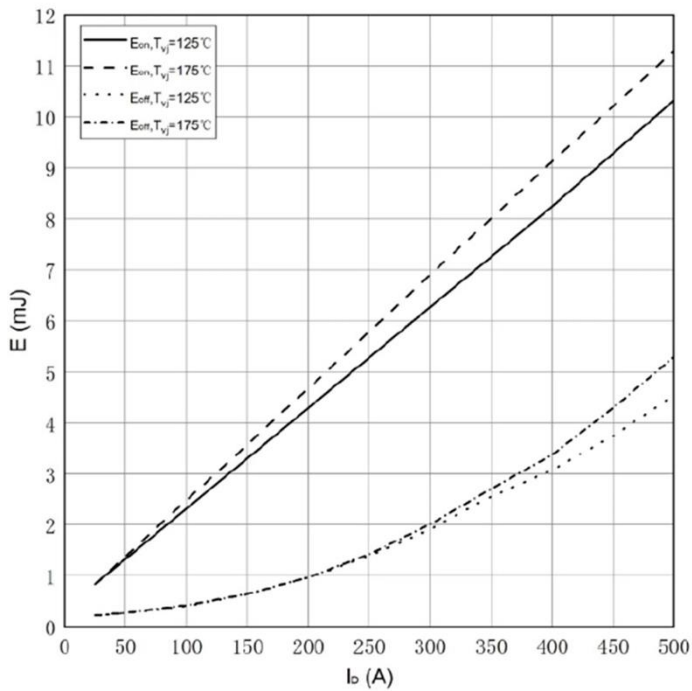


Fig 7 Switching Losses, MOSFET $E_{on} = f(I_D)$, $E_{off} = f(I_D)$
 $V_{DS} = 600\text{V}$, $R_{Gon} = 2.7\Omega$, $R_{Goff} = 1\Omega$, $V_{GS} = -3/18$

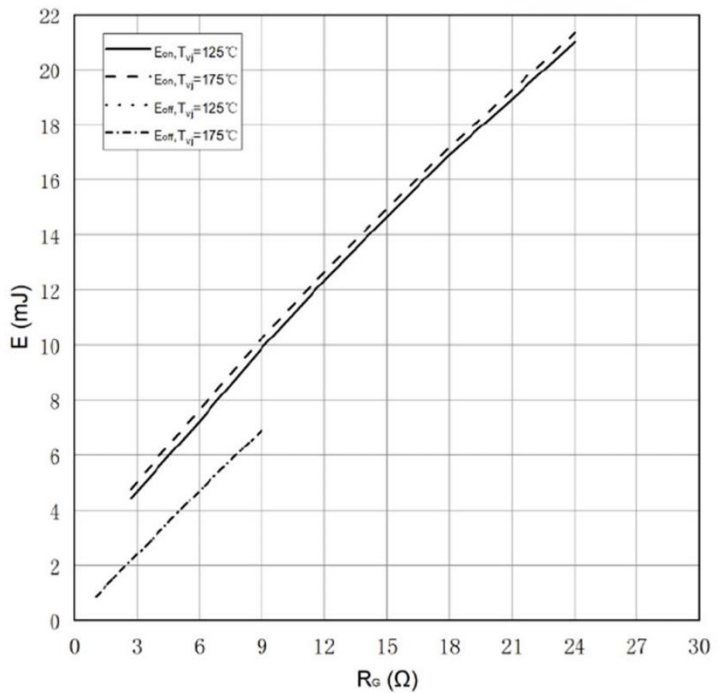


Fig 8 Switching Losses, MOSFET $E_{on} = f(R_G)$, $E_{off} = f(R_G)$,
 $V_{DS} = 600\text{V}$, $I_D = 200\text{A}$, $V_{GS} = 3/18\text{V}$

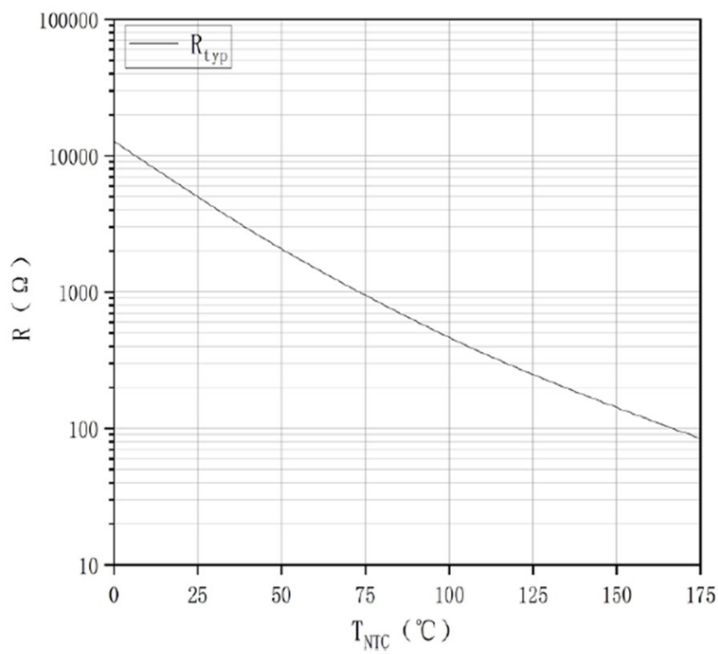
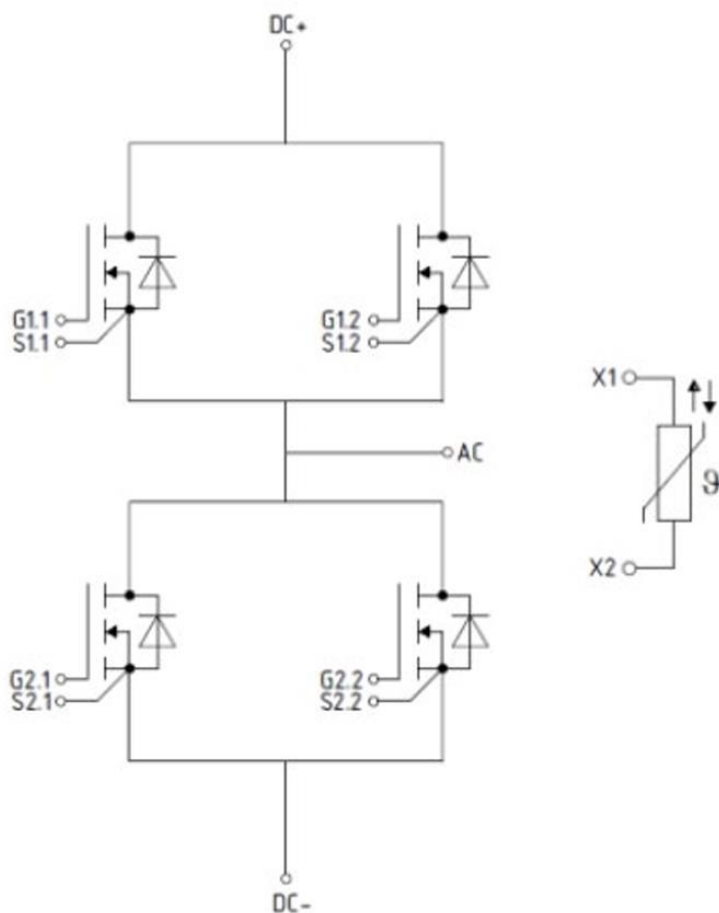


Fig 9 NTC Temperature Characteristic $R=f(T_{NTC})$

Circuit Diagram



Package Outlines

