PRODUCT FEATURES

☐ IGBT CHIP(T4 Fast Trench+Field Stop technology)

☐ High short circuit capability,self limiting short circuit current

☐ $V_{CE(sat)}$ with positive temperature coefficient

☐ Fast switching and short tail current

☐ Free wheeling diodes with fast and soft reverse recovery

☐ Low switching losses

☐ Temperature sense included

APPLICATIONS

☐ High frequency switching application

☐ Medical applications

☐ Motion/servo control

☐ UPS systems

IGBT-inverter

ABSOLUTE MAXIMUM RATINGS(T_C =25°C unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_{CES}	Collector Emitter Voltage	T_J=25℃	1200	V
V_{GES}	Gate Emitter Voltage		±20	
I_C	DC Collector Current	T_C=25℃, T_{Jmax}=175℃	150	A
		T_C=95℃, T_{Jmax}=175℃	100	
I_{CM}	Repetitive Peak Collector Current	tp=1ms	200	
P_{tot}	Power Dissipation Per IGBT	T_C=25℃, T_{Jmax}=175℃	550	W

Diode-inverter

ABSOLUTE MAXIMUM RATINGS (T_C =25°C unless otherwise specified)

Symbol	Parameter/Test Conditions		Values	Unit
V_{RRM}	Repetitive Reverse Voltage	T_J=25℃	1200	V
$I_{F(AV)}$	Average Forward Current		100	A
I_{FRM}	Repetitive Peak Forward Current	tp=1ms	200	
I^2t		T_J =125℃, t=10ms, V_R=0V	1850	A^2S

MMG100H120H6HN

IGBT-inverter
ELECTRICAL CHARACTERISTICS *(T$_C$ =25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
V$_{GE(th)}$	Gate Emitter Threshold Voltage	V$_{CE}$=V$_{GE}$, I$_C$=4mA	5.4	6.0	6.5	
V$_{CE(sat)}$	Collector Emitter Saturation Voltage	I$_C$=100A, V$_{GE}$=15V, T$_J$=25℃		2.1	2.5	V
		I$_C$=100A, V$_{GE}$=15V, T$_J$=125℃		2.5		
I$_{CES}$	Collector Leakage Current	V$_{CE}$=1200V, V$_{GE}$=0V, T$_J$=25℃			1	mA
		V$_{CE}$=1200V, V$_{GE}$=0V, T$_J$=125℃			10	mA
I$_{GES}$	Gate Leakage Current	V$_{CE}$=0V,V$_{GE}$=±15V, T$_J$=25℃	-400		400	nA
R$_{gint}$	Integrated Gate Resistor			7.5		Ω
Q$_g$	Gate Charge	V$_{CE}$=600V, I$_C$=100A , V$_{GE}$=15V		0.47		μC
C$_{ies}$	Input Capacitance	V$_{CE}$=25V, V$_{GE}$=0V, f =1MHz		6.2		nF
C$_{res}$	Reverse Transfer Capacitance			350		pF
t$_{d(on)}$	Turn on Delay Time	V$_{CC}$=600V,I$_C$=100A R$_G$ =7.5Ω, V$_{GE}$=±15V, Inductive Load	T$_J$=25℃		150		ns
			T$_J$=125℃		160		ns
			T$_J$=150℃		170		ns
t$_r$	Rise Time		T$_J$=25℃		65		ns
			T$_J$=125℃		70		ns
			T$_J$=150℃		75		ns
t$_{d(off)}$	Turn off Delay Time	V$_{CC}$=600V,I$_C$=100A R$_G$ =7.5Ω, V$_{GE}$=±15V, Inductive Load	T$_J$=25℃		400		ns
			T$_J$=125℃		450		ns
			T$_J$=150℃		480		ns
t$_f$	Fall Time		T$_J$=25℃		40		ns
			T$_J$=125℃		60		ns
			T$_J$=150℃		70		ns
E$_{on}$	Turn on Energy	V$_{CC}$=600V,I$_C$=100A R$_G$ =7.5Ω, V$_{GE}$=±15V, Inductive Load	T$_J$=125℃		11.5		mJ
			T$_J$=150℃		12.5		mJ
E$_{off}$	Turn off Energy		T$_J$=125℃		5.5		mJ
			T$_J$=150℃		6.0		mJ
I$_{SC}$	Short Circuit Current	tpsc≤10μS , V$_{GE}$=15V T$_J$=125℃,V$_{CC}$=600V		400		A
R$_{thJC}$	Junction to Case Thermal Resistance （Per IGBT）				0.27	K /W

Diode-inverter
ELECTRICAL CHARACTERISTICS *(T$_C$ =25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
V$_F$	Forward Voltage	I$_F$=100A , V$_{GE}$=0V, T$_J$=25℃		1.65	2.15	V
		I$_F$=100A , V$_{GE}$=0V, T$_J$=125℃		1.65		
t$_{rr}$	Reverse Recovery Time	I$_F$=100A , V$_R$=600V dI$_F$/dt=-1500A/μs T$_J$ =125℃		480		ns
I$_{RRM}$	Max. Reverse Recovery Current			85		A
Q$_{RR}$	Reverse Recovery Charge			19.4		μC
E$_{rec}$	Reverse Recovery Energy			7.6		mJ
R$_{thJCD}$	Junction to Case Thermal Resistance （Per Diode）				0.5	K /W

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NTC CHARACTERISTICS *(T$_C$ =25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
R$_{25}$	Resistance	T$_C$ =25℃		5		KΩ
B$_{25/50}$	R$_2$ = R$_{25}$ exp [B$_{25/50}$(1/T$_2$ - 1/(298.15 K))]			3375		K

MODULE CHARACTERISTICS *(T$_C$ =25°C unless otherwise specified)*

Symbol	Parameter/Test Conditions		Values	Unit
T$_{Jmax}$	Max. Junction Temperature		175	℃
T$_{Jop}$	Operating Temperature		-40~150	
T$_{stg}$	Storage Temperature		-40~125	
V$_{isol}$	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), t=1minute	3000	V
CTI	Comparative Tracking Index		>225	
Md	Mounting Torque	Recommended（M5）	2.5~5	Nm
Weight			200	g
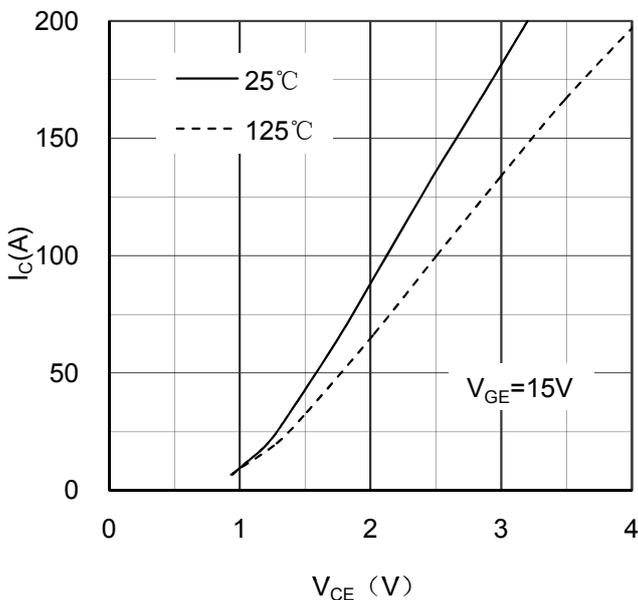
Figure 1. Typical Output Characteristics IGBT-inverter
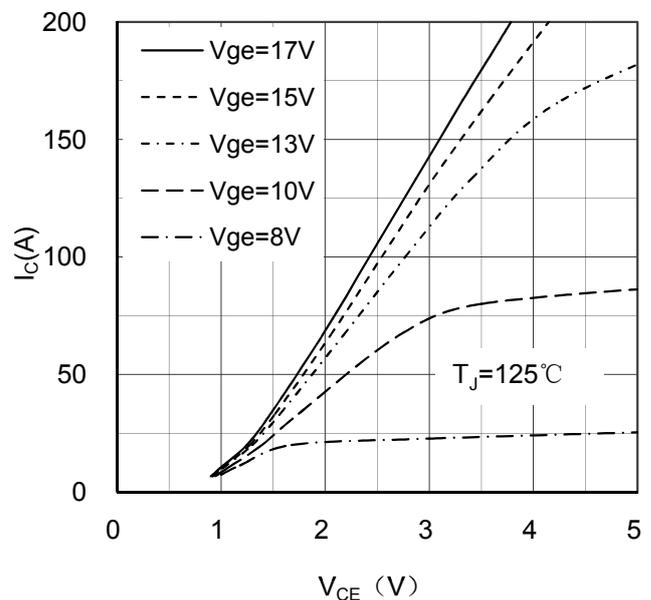
Figure 2. Typical Output Characteristics IGBT-inverter
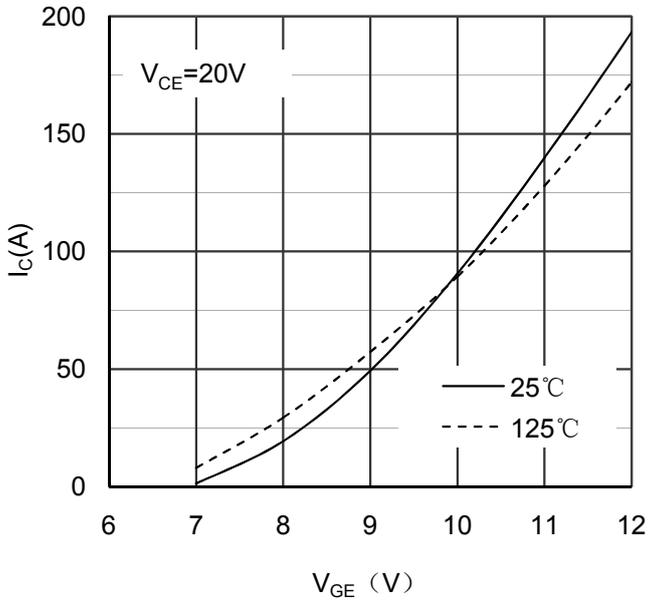
Figure 3. Typical Transfer characteristics IGBT-inverter
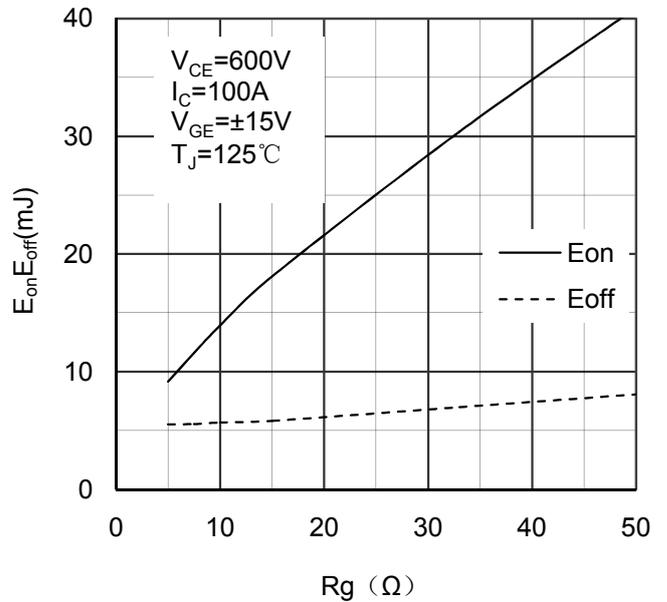
Figure 4. Switching Energy vs Gate Resistor IGBT-inverter
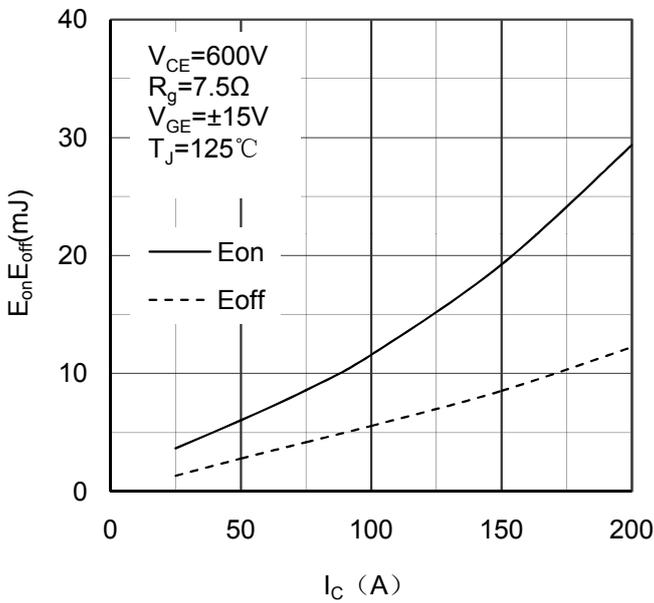
Figure 5. Switching Energy vs Collector Current IGBT-inverter
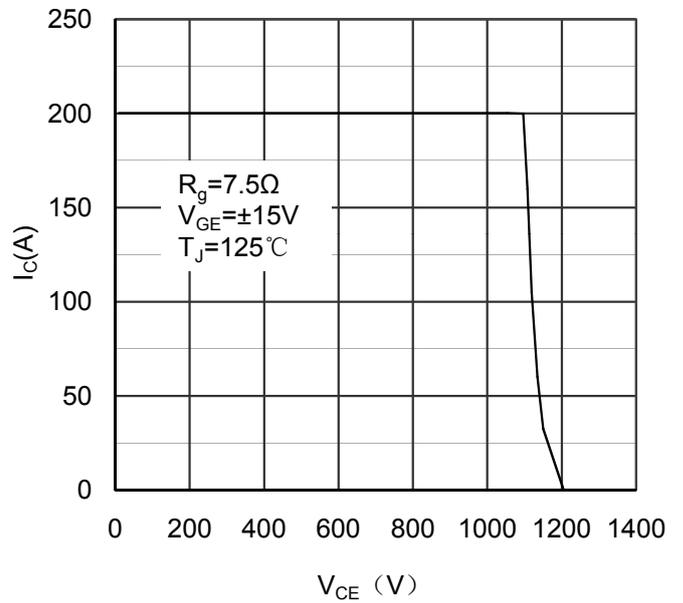
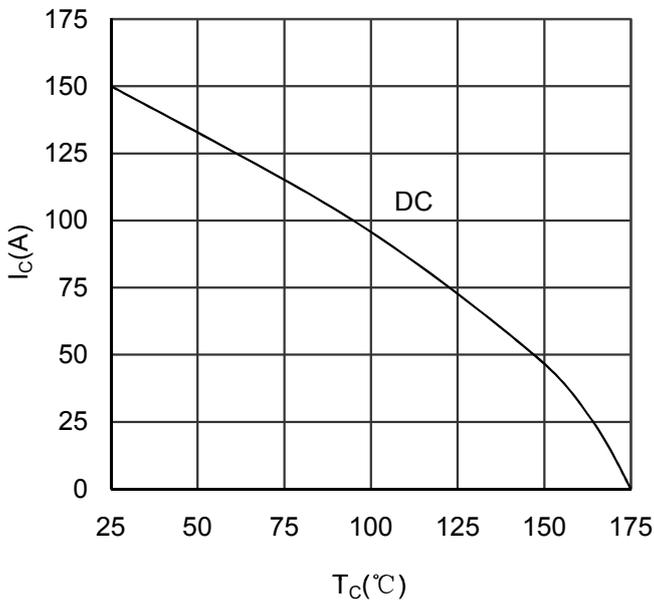Figure 6. Reverse Biased Safe Operating Area IGBT-inverter

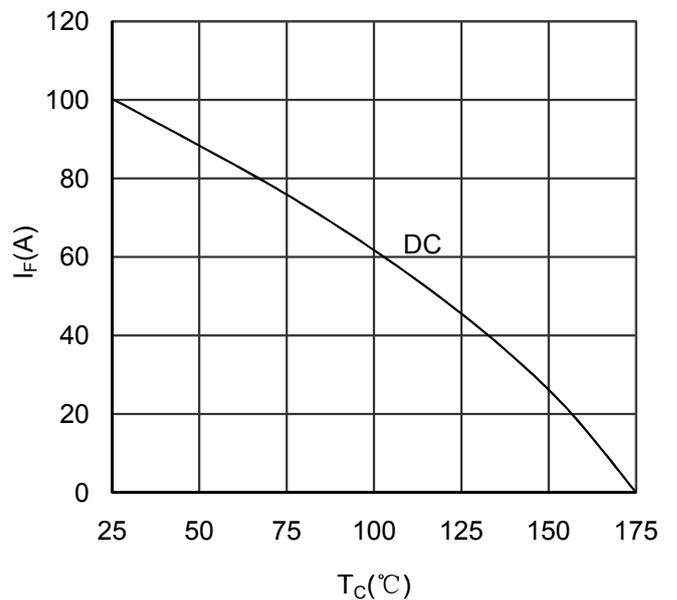Figure 7. Collector Current vs Case temperature IGBT -inverter

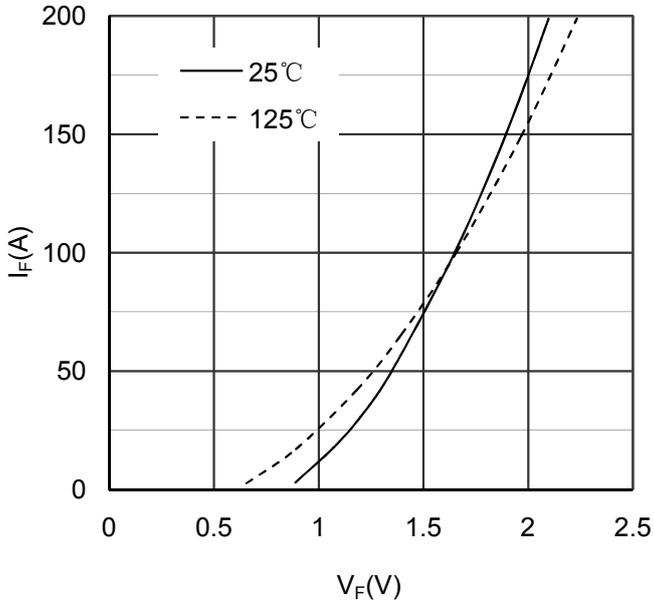Figure 8. Forward current vs Case temperature Diode -inverter

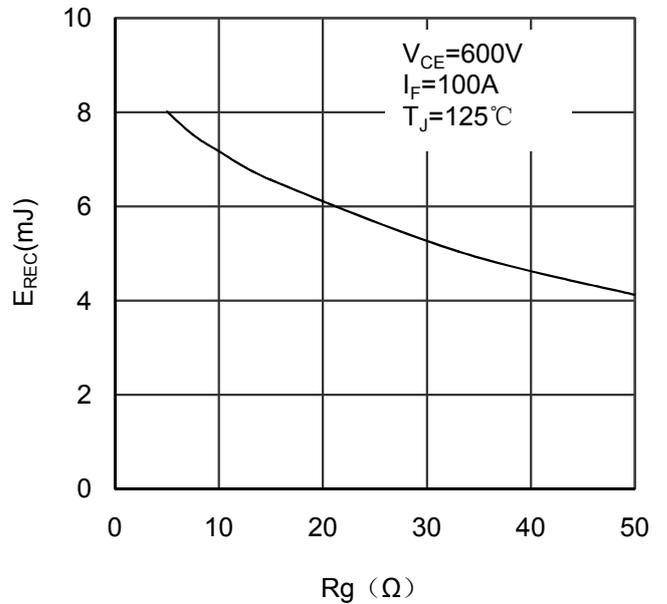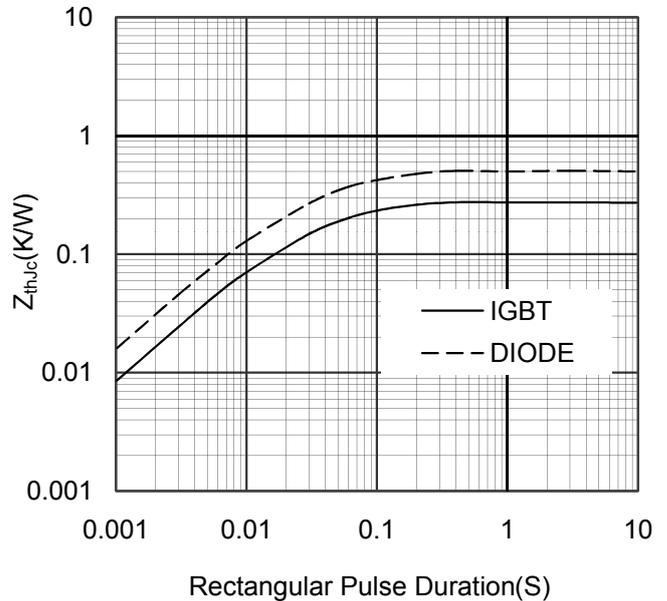Figure 9. Diode Forward Characteristics Diode -inverter

Figure 10. Switching Energy vs Gate Resistor Diode - inverter
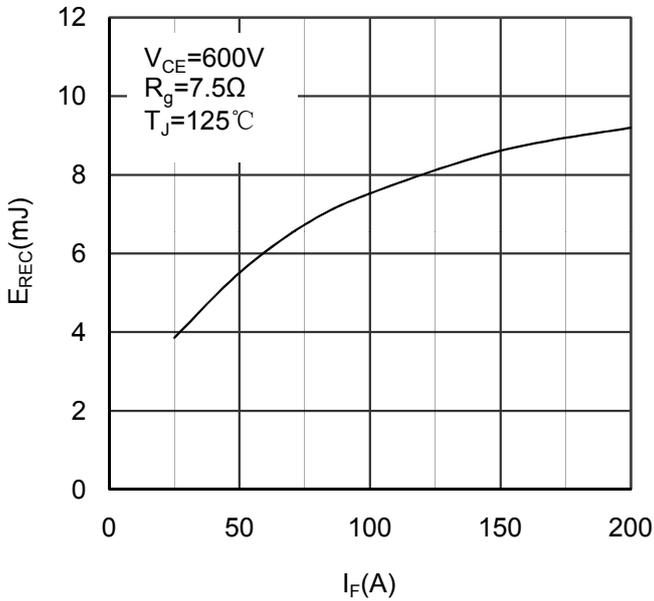
Figure 11. Switching Energy vs Forward Current Diode-inverter

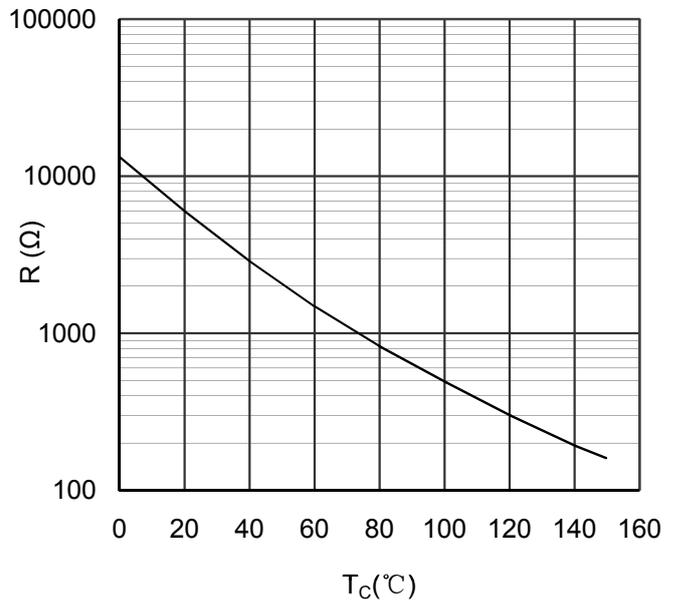Figure 12. Transient Thermal Impedance of Diode and IGBT-inverter
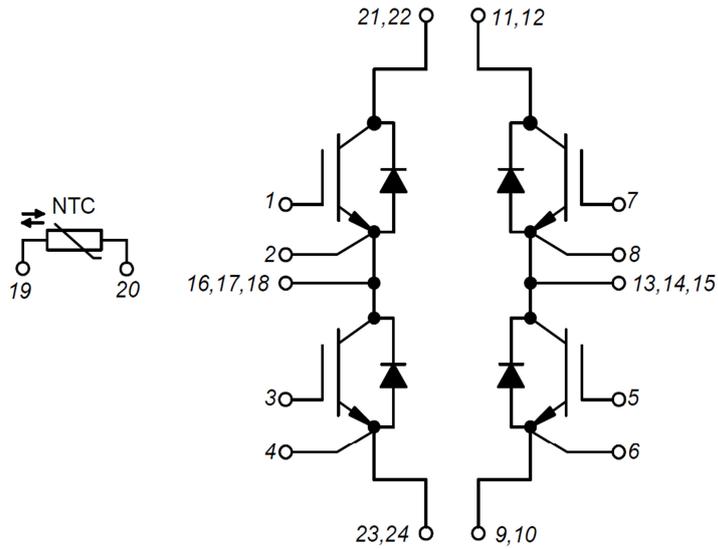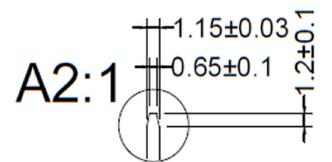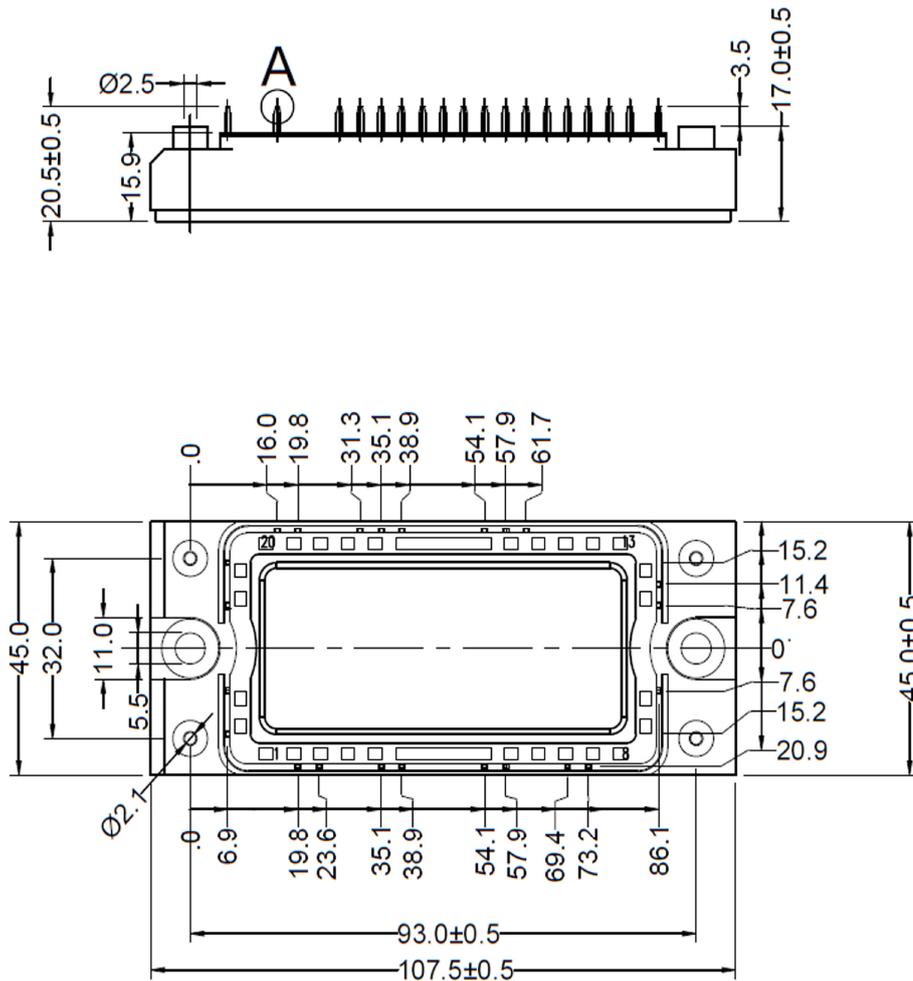
Figure 13. NTC Characteristics

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Figure 14. Circuit Diagram

Dimensions in (mm)
Figure 15. Package Outline