ANGM150B170R6

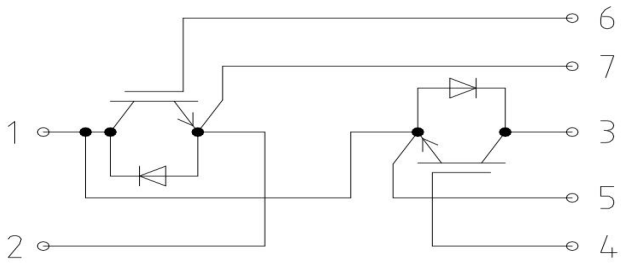
1700V 150A IGBT Module

PRODUCT FEATURES

- ☐ IGBT CHIP(Trench+FS)
- ☐ Low saturation voltage and positive temperature coefficient
- ☐ Fast switching and short tail current
- ☐ Free wheeling diodes with fast and soft reverse recovery
- ☐ Ultra Low Loss,High Ruggedness
- ☐ High short circuit capability

APPLICATIONS

- ☐ High frequency switching application
- ☐ Medical applications
- ☐ Motion/servo control
- ☐ UPS systems



IGBT

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

Symbol	Parameter/ Test Conditions		Values	Unit
V_{CES}	Collector Emitter Voltage	T_J= 25 °C	1700	V
V_{GES}	Gate Emitter Voltage		±20	
I_C	DC Collector Current	T_C= 25 °C, T_{Jmax}= 175 °C	246	A
		T_C= 100 °C, T_{Jmax}= 175 °C	150	
I_{CM}	Repetitive Peak Collector Current	tp= 1 ms	300	
P_{tot}	Power Dissipation Per IGBT	T_C= 25 °C, T_{Jmax}= 175 °C	1.2	kW

Diode

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

Symbol	Parameter/ Test Conditions		Values	Unit
V_{RRM}	Repetitive Reverse Voltage	T_J= 25 °C	1700	V
$I_{F(AV)}$	Average Forward Current		150	A
I_{FRM}	Repetitive Peak Forward Current	tp= 1 ms	300	
I^2t		T_J= 150 °C，t=10ms，V_R=0V	16.2	kA^2s

MODULE CHARACTERISTICS(T_C = 25 °C unless otherwise specified)

Symbol	Parameter/ Test Conditions		Values	Unit
T_{Jmax}	Max. Junction Temperature		175	°C
T_{Jop}	Operating Temperature		-40~150	
T_{stg}	Storage Temperature		-40~125	
V_{isol}	Isolation Breakdown Voltage	AC，50Hz(R.M.S)，t=1minute	4000	V
CTI	Comparative Tracking Index		＞200	
Torque	to heatsink	Recommended （M6）	3~5	Nm
	to terminal	Recommended （M6）	3~5	Nm
Weight			320	g

IGBT

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=6mA		5.5	6.0	6.5	V
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	I_C=150A, V_{GE}=15V, T_J=25°C			1.85	2.2	
		I_C=150A, V_{GE}=15V, T_J=125°C			2.05		
		I_C=150A, V_{GE}=15V, T_J=150°C			2.15		
I_{CES}	Collector Leakage Current	V_{CE}=1700V, V_{GE}=0V, T_J=25°C				1	mA
		V_{CE}=1700V, V_{GE}=0V, T_J=150°C				10	mA
I_{GES}	Gate Leakage Current	V_{CE}=0V, V_{GE}=±20V, T_J=25°C				±500	nA
R_{gint}	Integrated Gate Resistor				1.8		Ω
Q_g	Gate Charge	V_{CE}=900V, I_C=150A, V_{GE}=15V			1.2		μC
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f =1MHz			14.2		nF
C_{res}	Reverse Transfer Capacitance				450		pF
$t_{d(on)}$	Turn on Delay Time	V_{CC}=900V, I_C=150A R_G =3.6Ω, V_{GE}=±15V, Inductive Load	T_J= 25 °C		120		ns
			T_J= 150 °C		140		ns
t_r	Rise Time		T_J= 25 °C		70		ns
			T_J= 150 °C		80		ns
$t_{d(off)}$	Turn off Delay Time	V_{CC}=900V, I_C=150A R_G =3.6Ω, V_{GE}=±15V, Inductive Load	T_J= 25 °C		502		ns
			T_J= 150 °C		550		ns
t_f	Fall Time		T_J= 25 °C		230		ns
			T_J= 150 °C		340		ns
E_{on}	Turn on Energy	V_{CC}=900V, I_C=150A R_G =3.6Ω, V_{GE}=±15V, Inductive Load	T_J= 25 °C		50		mJ
			T_J= 150 °C		68		mJ
E_{off}	Turn off Energy		T_J= 25 °C		25		mJ
			T_J= 150 °C		40		mJ
I_{SC}	Short Circuit Current	tpsc≤10μS, V_{GE}=15V T_J=150°C, V_{CC}=900V			800		A
R_{thJC}	Junction to Case Thermal Resistance (Per IGBT)					0.14	K /W

Diode-inverter

ELECTRICAL CHARACTERISTICS (T C =25°C unless otherwise specified)

Symbol	Parameter/ Test Conditions		Min.	Typ.	Max.	Unit
V_F	Collector Emitter Voltage	I_F=450A,V_{GE}=0V,T_J= 2 5 °C		1.8	2.2	V
		IF=450A,VGE=0V,T_J= 1 2 5 °C		1.95		
		IF=450A,VGE=0V,T_J= 1 5 0 °C		1.9		
Trr	Gate Emitter Voltage	I_F=450A , V_R=600V dI_F/dt=-2100A/μs TJ =150℃		800		nS
I_{RRM}	DC Collector Current			160		A
Q_{RR}	Repetitive Peak Collector Current			85		μC
E_{rec}	Power Dissipation Per IGBT			40		mJ
R_{thJCD}	Junctionto CaseThermal Resistance（Per Diode）				0.24	kW

IGBT Typical Performance

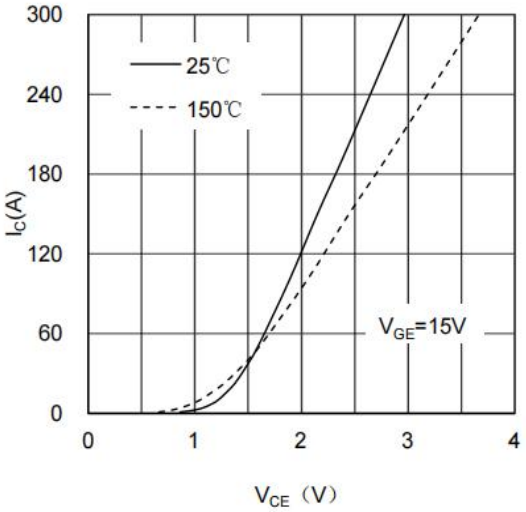


Figure1 Typical Output Characteristics IGBT-inverter

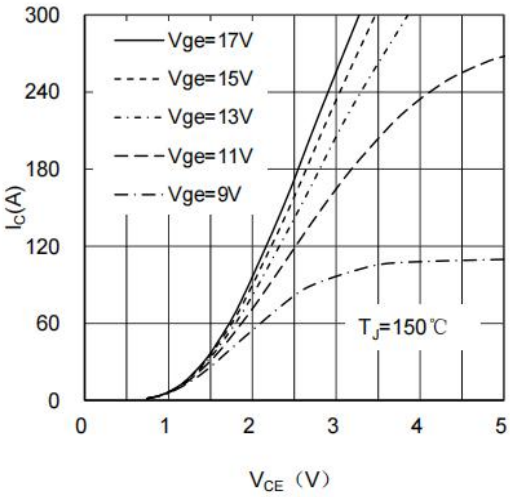


Figure2 Typical Output Characteristics IGBT-inverter

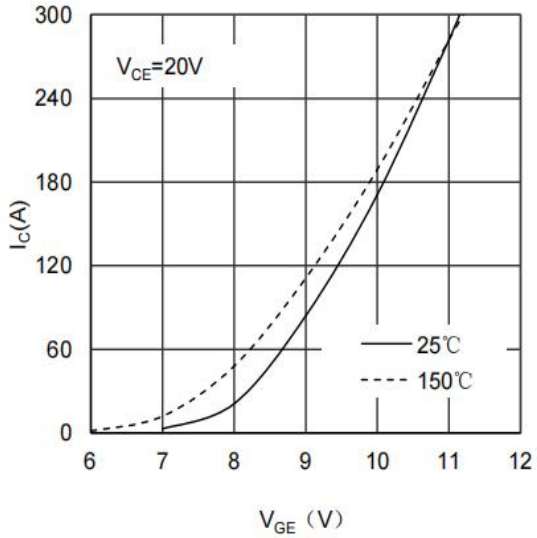


Figure3 Typical Transfer characteristics IGBT-inverter

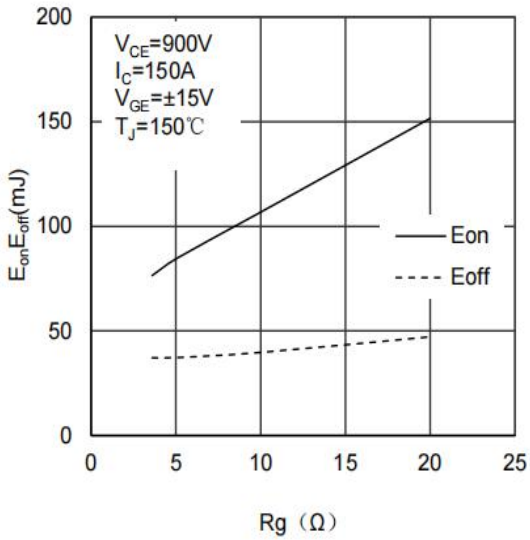


Figure4 Switching Energy vs Gate Resistor IGBT-inverter

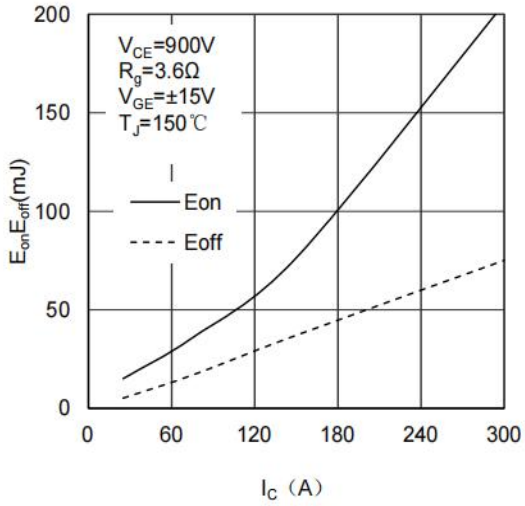


Figure5 Switching Energy vs Collector Current IGBT-inverter

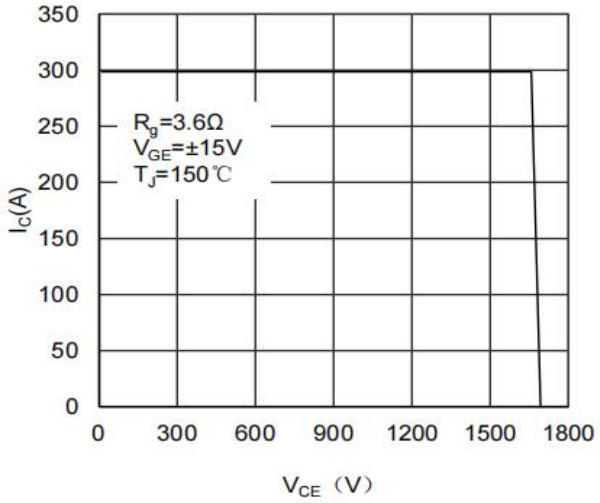


Figure6 Reverse Biased Safe Operating Area IGBT-inverter

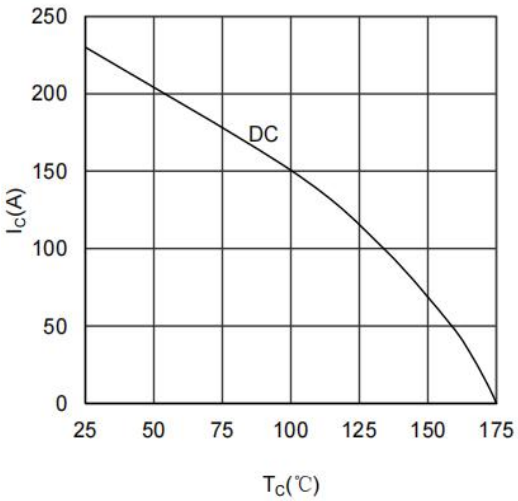


Figure7 Collector Current vs Case temperature IGBT-inverter

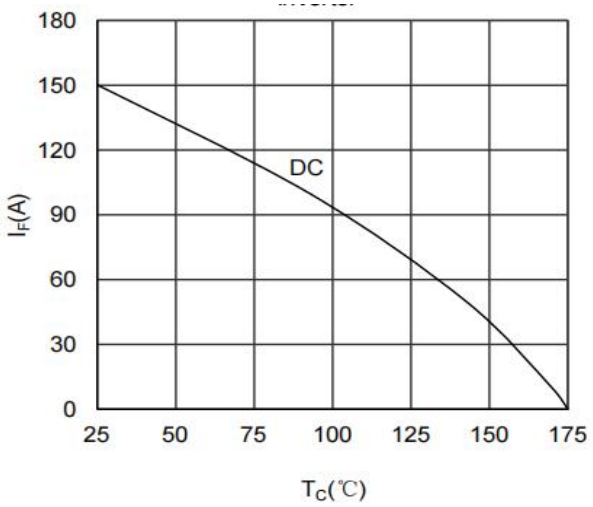


Figure8 Forward current vs Case temperature Diode-inverter

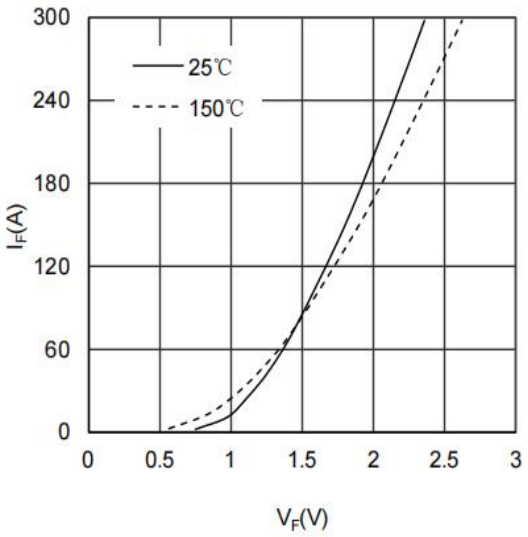


Figure9 Diode Forward Characteristics Diode-inverter

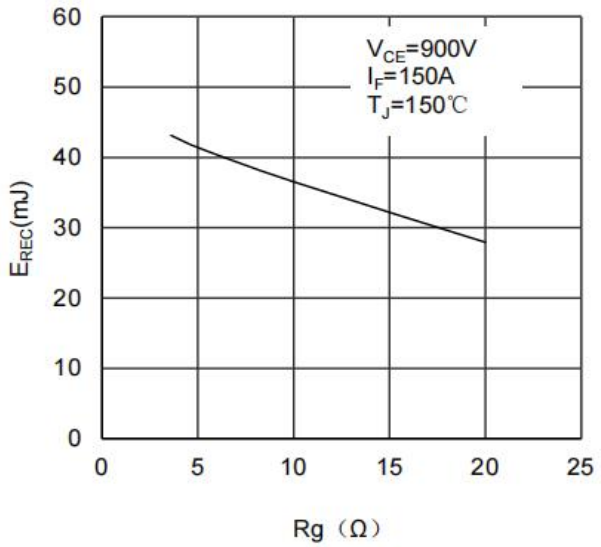


Figure10 Switching Energy vs Gate Resistor Diode-inverter

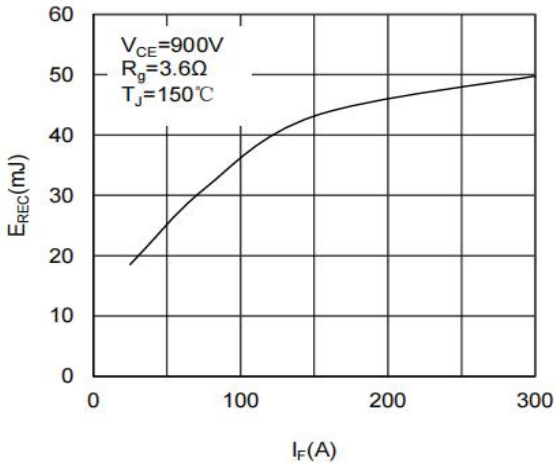


Figure11 Switching Energy vs Forward Current Diode-inverter

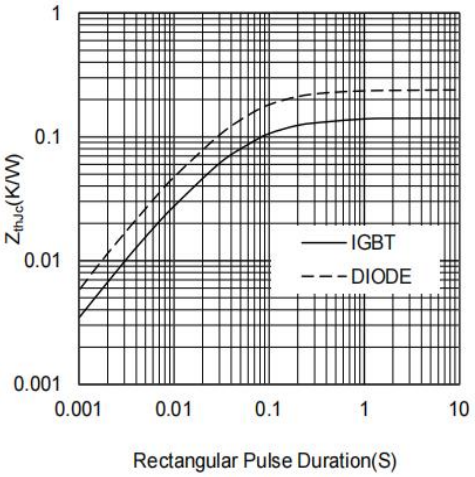
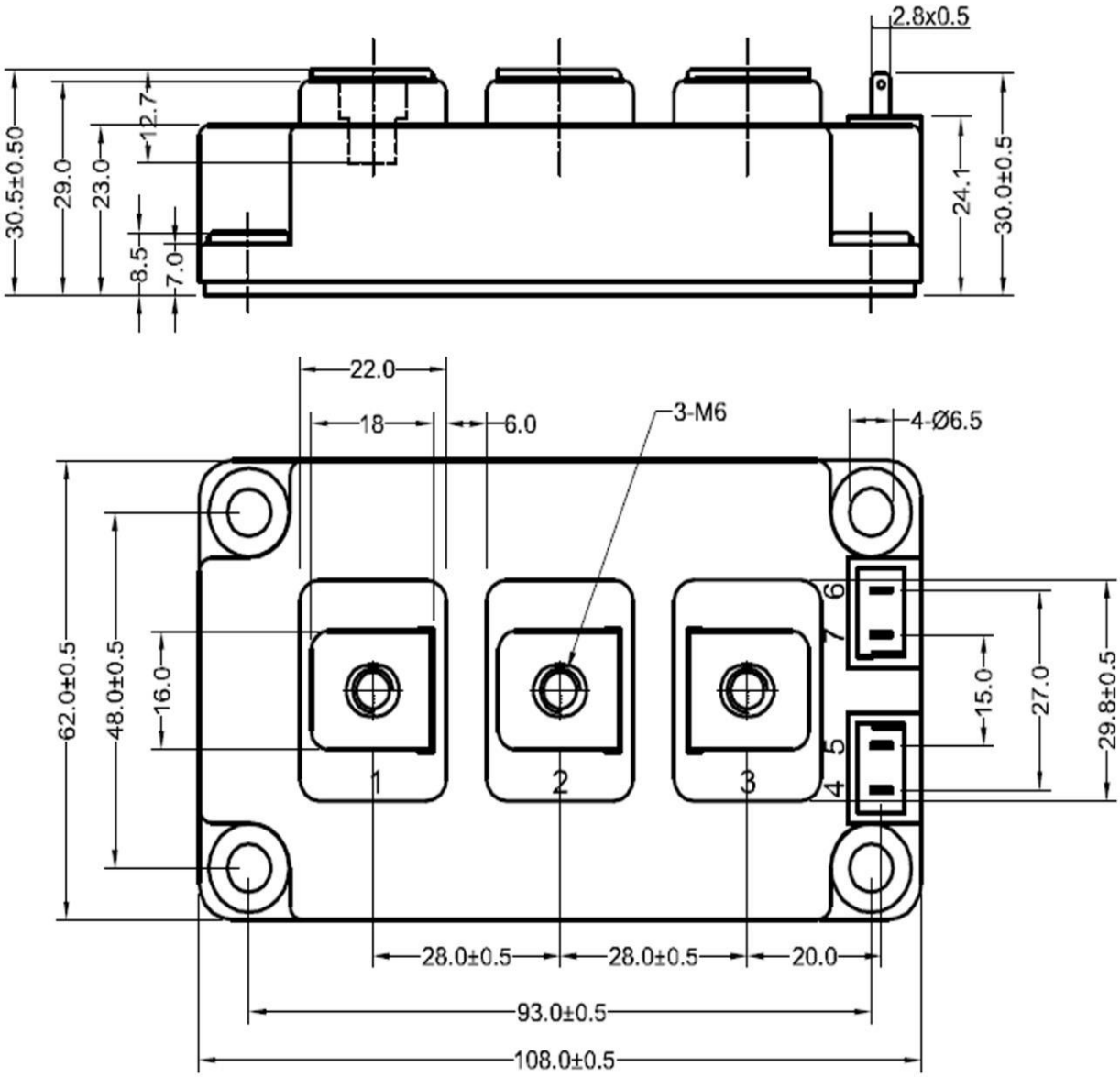


Figure12 Transient Thermal Impedance of Diode and IGBT-inverter

Package Dimensions: 62MM



Dimensions in (mm)
Figure 13 Package Outline