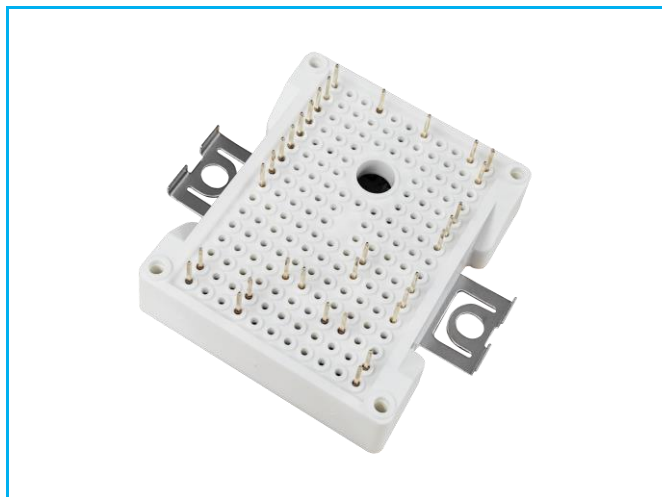


PRODUCT FEATURES

- ☐ Substrate for Low Thermal Resistance
- ☐ Low saturation voltage and positive temperature coefficient
- ☐ Fast switching and short tail current
- ☐ Free wheeling diodes with fast and soft reverse recovery
- ☐ Solder Contact Technology, Rugged mounting due to integrated Mounting clamps
- ☐ Temperature sense included

APPLICATIONS

- ☐ AC motor control
- ☐ Motion/servo control
- ☐ Inverter and power supplies



Rectifier+Inverter

IGBT-inverter

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

Symbol	Parameter/Test Conditions		Values	Unit
V_{CES}	Collector Emitter Voltage	$T_J=25^{\circ}\text{C}$	1200	V
V_{GES}	Gate Emitter Voltage		± 20	
I_C	DC Collector Current	$T_C=25^{\circ}\text{C}, T_{Jmax}=175^{\circ}\text{C}$	54	A
		$T_C=100^{\circ}\text{C}, T_{Jmax}=175^{\circ}\text{C}$	35	
I_{CM}	Repetitive Peak Collector Current	$tp=1\text{ms}$	70	
P_{tot}	Power Dissipation Per IGBT	$T_C=25^{\circ}\text{C}, T_{Jmax}=175^{\circ}\text{C}$	214	W

Diode-inverter

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

Symbol	Parameter/Test Conditions		Values	Unit
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^{\circ}\text{C}$	1200	V
$I_{F(AV)}$	Average Forward Current		35	A
I_{FRM}	Repetitive Peak Forward Current	$tp=1\text{ms}$	70	
I^2t		$T_J=125^{\circ}\text{C}, t=10\text{ms}, V_R=0\text{V}$	250	A^2s

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MMG35CE120XT6TC

IGBT-inverter

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

Symbol	Parameter/Test Conditions			Min.	Typ.	Max.	Unit	
V _{GE(th)}	Gate Emitter Threshold Voltage	V _{CE} =V _{GE} , I _C =1.2mA		5.0	5.7	6.5	V	
V _{CE(sat)}	Collector Emitter Saturation Voltage	I _C =35A, V _{GE} =15V, T _J =25℃			1.8	2.25		
		I _C =35A, V _{GE} =15V, T _J =125℃			2			
		I _C =35A, V _{GE} =15V, T _J =150℃			2.05			
I _{CES}	Collector Leakage Current	V _{CE} =1200V, V _{GE} =0V, T _J =25℃				1	mA	
I _{GES}	Gate Leakage Current	V _{CE} =0V,V _{GE} =±20V, T _J =25℃		-400		400	nA	
R _{Gint}	Integrated Gate Resistor				0		Ω	
Q _G	Gate Charge	V _{CE} =600V, I _C =35A , V _{GE} =15V			0.21		μC	
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V, f =1MHz			2.8		nF	
C _{res}	Reverse Transfer Capacitance				110		pF	
t _{d(on)}	Turn on Delay Time	V _{CC} =600V,I _C =35A, R _G =15Ω, V _{GE} =±15V, Inductive Load	T _J =25℃		20		ns	
			T _J =150℃		25		ns	
t _r	Rise Time		T _J =25℃		22		ns	
			T _J =150℃		24		ns	
t _{d(off)}	Turn off Delay Time		T _J =25℃		230		ns	
			T _J =150℃		290		ns	
t _f	Fall Time		T _J =25℃		210		ns	
			T _J =150℃		270		ns	
E _{on}	Turn on Energy	V _{CC} =600V,I _C =35A, R _G =15Ω, V _{GE} =±15V, Inductive Load	T _J =25℃		2		mJ	
			T _J =125℃		3.38		mJ	
			T _J =150℃		3.75		mJ	
E _{off}	Turn off Energy		T _J =25℃		1.84		mJ	
			T _J =125℃		3.2		mJ	
			T _J =150℃		3.5		mJ	
I _{SC}	Short Circuit Current		tpsc≤10μs , V _{GE} =15V T _J =150℃,V _{CC} =800V			145		A
R _{thJC}	Junction to Case Thermal Resistance （ Per IGBT ）				0.6	0.7	K /W	

Diode-inverter

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

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
V _F	Forward Voltage	I _F =35A , V _{GE} =0V, T _J =25°C		1.95	2.45	V
		I _F =35A , V _{GE} =0V, T _J =125°C		1.55		
		I _F =35A , V _{GE} =0V, T _J =150°C		1.5		
t _{rr}	Reverse Recovery Time	I _F =35A , V _R =600V dI _F /dt=-1800A/μs T _J =150°C		230		ns
I _{RRM}	Max. Reverse Recovery Current			56		A
Q _{RR}	Reverse Recovery Charge			5.9		μC
E _{rec}	Reverse Recovery Energy			1.92		mJ
R _{thJCD}	Junction to Case Thermal Resistance (Per Diode)			0.8	0.9	K /W

MMG35CE120XT6TC

Diode-RECTIFIER

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

Symbol	Parameter/Test Conditions		Values	Unit
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^{\circ}\text{C}$	1600	V
I_{FRMS}	R.M.S. Forward Current Per Diode	$T_C=100^{\circ}\text{C}$	60	A
I_{RMS}	R.M.S. Current at rectifier output		60	
I_{FSM}	Non Repetitive Surge Forward Current	$T_J=45^{\circ}\text{C}$, $t=10\text{ms}$, 50Hz	500	
		$T_J=45^{\circ}\text{C}$, $t=8.3\text{ms}$, 60Hz	560	
I^2t		$T_J=45^{\circ}\text{C}$, $t=10\text{ms}$, 50Hz	1250	A^2s
		$T_J=45^{\circ}\text{C}$, $t=8.3\text{ms}$, 60Hz	1250	

Diode-RECTIFIER

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

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
V_F	Forward Voltage	$I_F=35\text{A}$, $T_J=25^{\circ}\text{C}$		1.1	1.25	V
		$I_F=35\text{A}$, $T_J=150^{\circ}\text{C}$		1.0		
I_R	Reverse Leakage Current	$V_R=1600\text{V}$, $T_J=25^{\circ}\text{C}$			50	μA
		$V_R=1600\text{V}$, $T_J=150^{\circ}\text{C}$			1	mA
R_{thJCD}	Junction to Case Thermal Resistance (Per Diode)			0.8	0.9	K/W

NTC CHARACTERISTICS ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter/Test Conditions		Min.	Typ.	Max.	Unit
R_{25}	Resistance	$T_C=25^{\circ}\text{C}$		5		$\text{k}\Omega$
$B_{25/50}$	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298.15 \text{ K}))]$			3375		K

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

Symbol	Parameter/Test Conditions		Values	Unit
T_{Jmax}	Max. Junction Temperature	Inverter	175	$^{\circ}\text{C}$
		Rectifier	150	
T_{Jop}	Operating Temperature		-40~150	
T_{stg}	Storage Temperature		-40~125	
V_{isol}	Isolation Breakdown Voltage	AC, 50Hz(R.M.S), $t=1\text{minute}$	3000	V
CTI	Comparative Tracking Index		>200	
F	Mounting Force Per Clamp		40~80	N
Weight			40	g

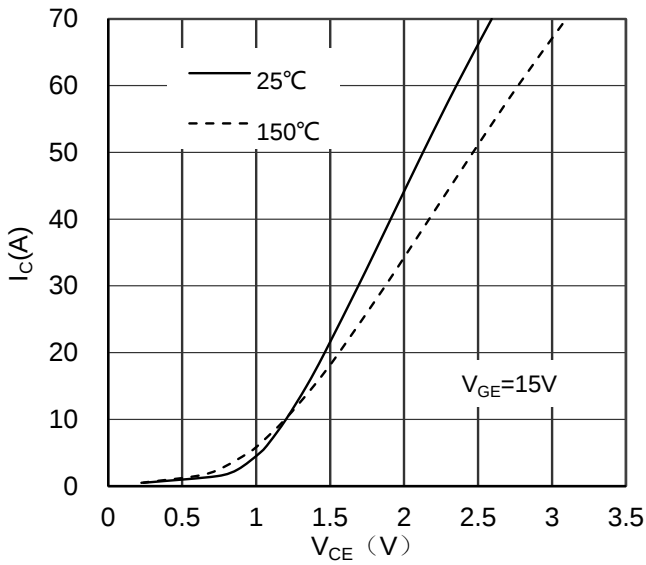


Figure 1. Typical Output Characteristics IGBT-inverter

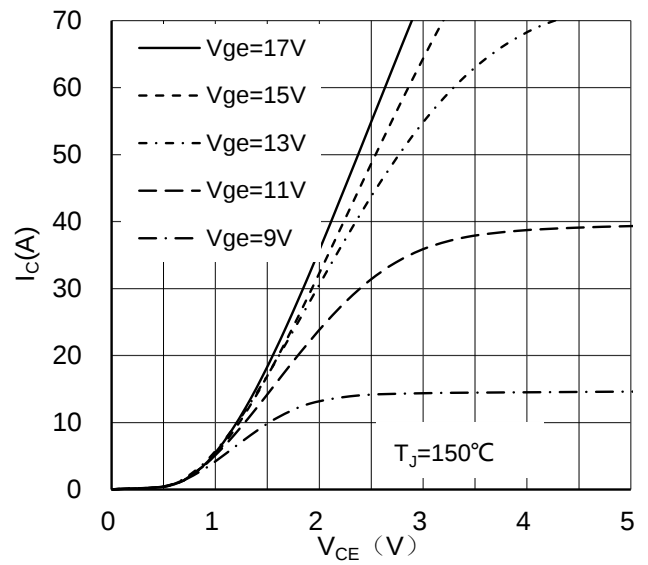


Figure 2. Typical Output Characteristics IGBT-inverter

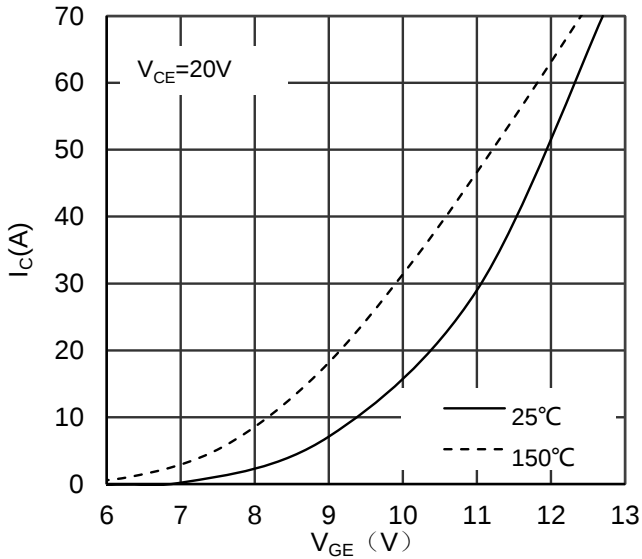


Figure 3. Typical Transfer characteristics IGBT-inverter

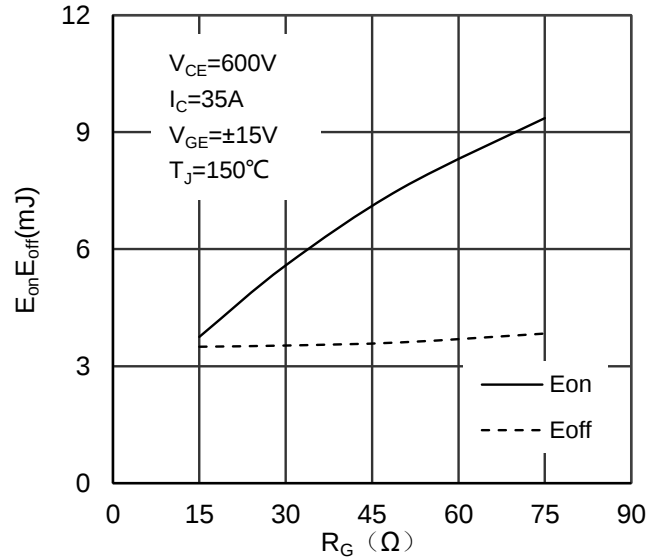


Figure 4. Switching Energy vs Gate Resistor IGBT-inverter

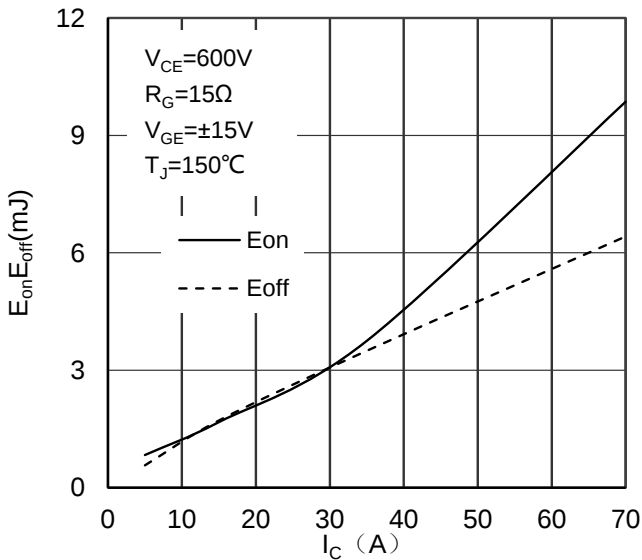


Figure 5. Switching Energy vs Collector Current IGBT-inverter

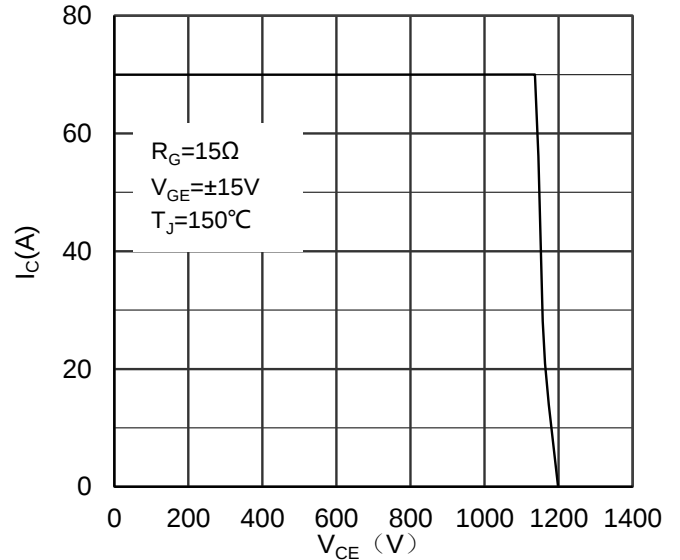


Figure 6. Reverse Biased Safe Operating Area IGBT-inverter

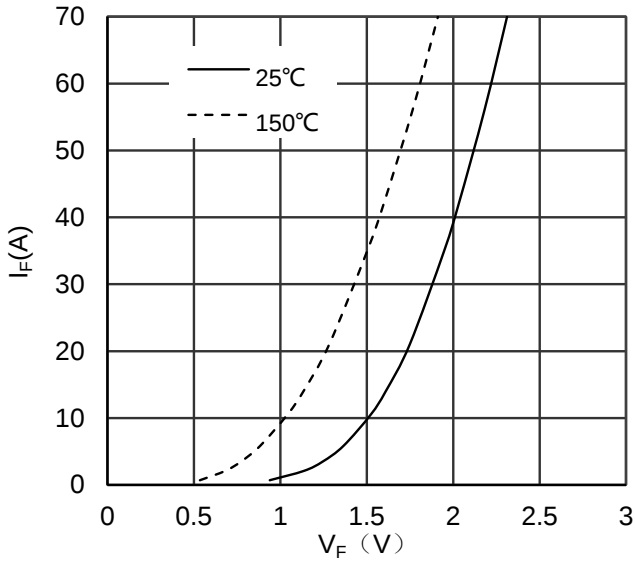


Figure 7. Diode Forward Characteristics Diode -inverter

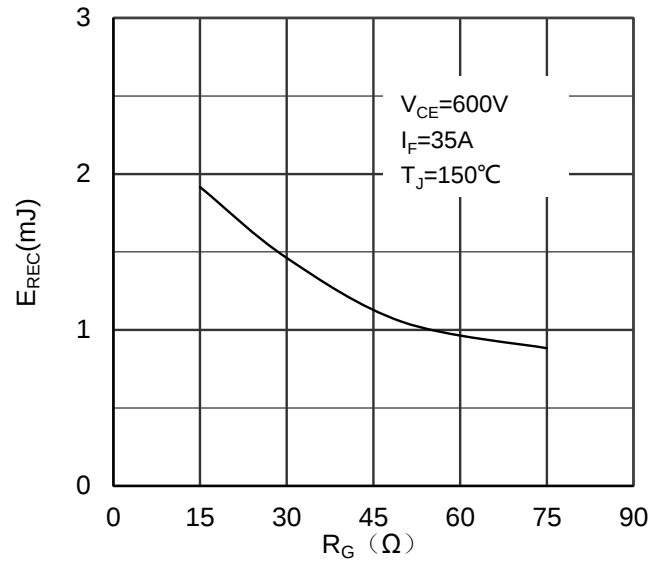


Figure 8. Switching Energy vs Gate Resistor Diode -inverter

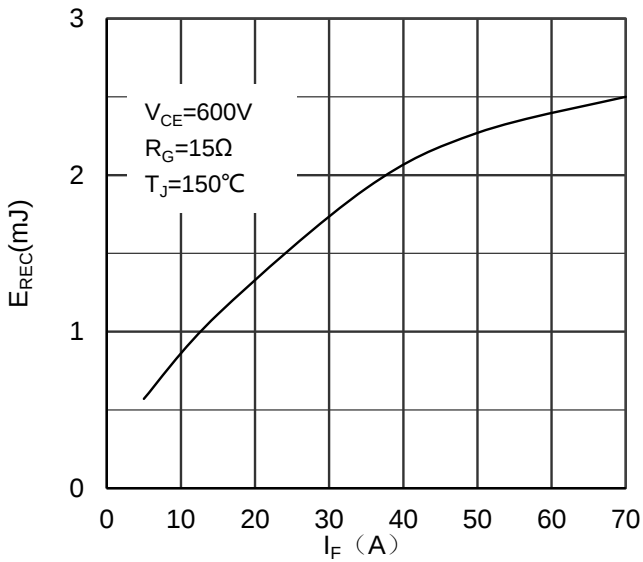


Figure 9. Switching Energy vs Forward Current Diode-inverter

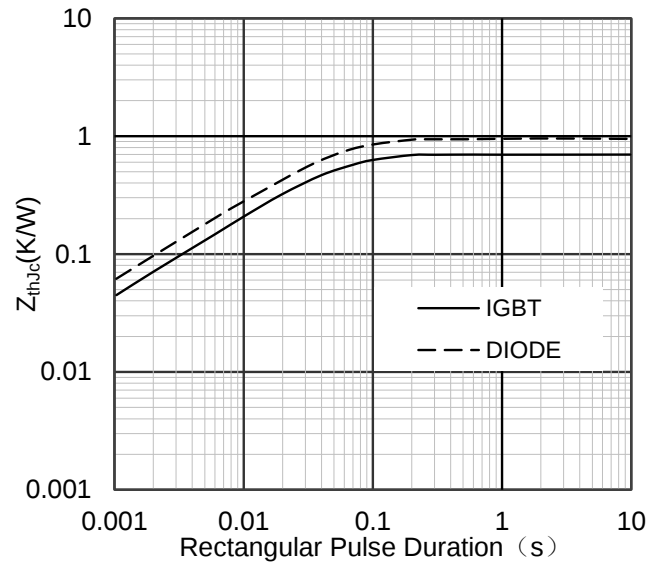


Figure 10. Transient Thermal Impedance of Diode and IGBT-inverter

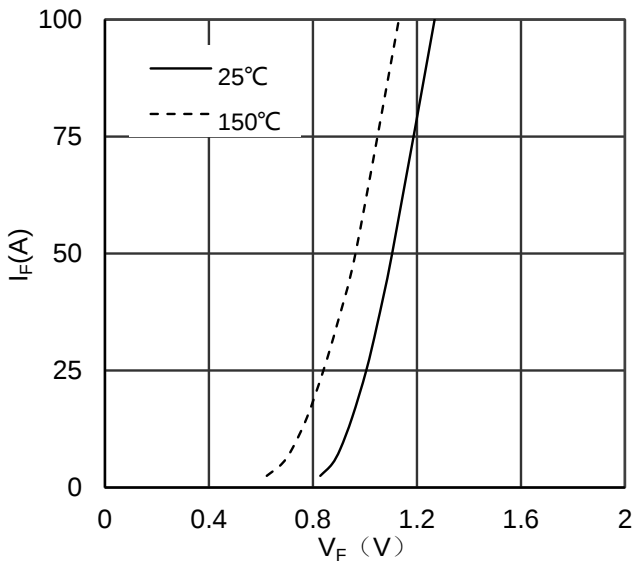


Figure 11. Diode Forward Characteristics Diode- rectifier

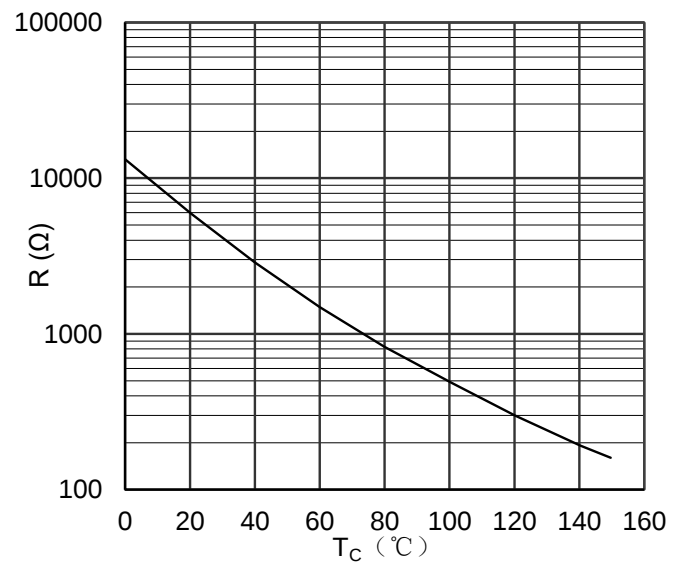


Figure 12. NTC Characteristics

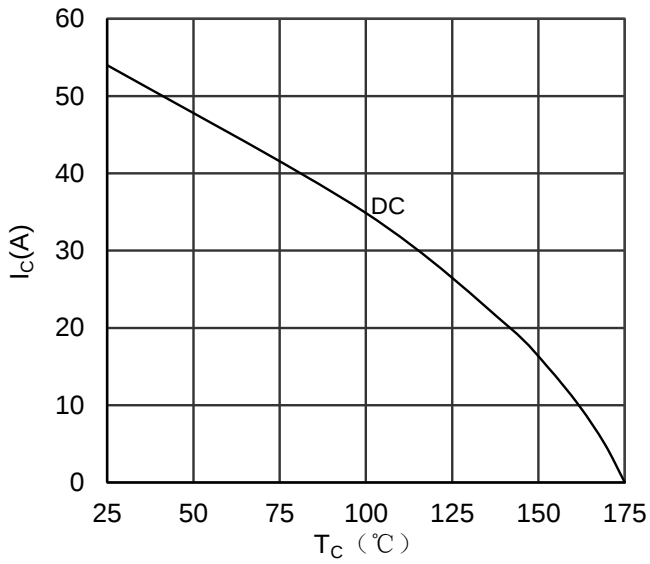


Figure 13. Collector Current vs Case temperature
IGBT -inverter

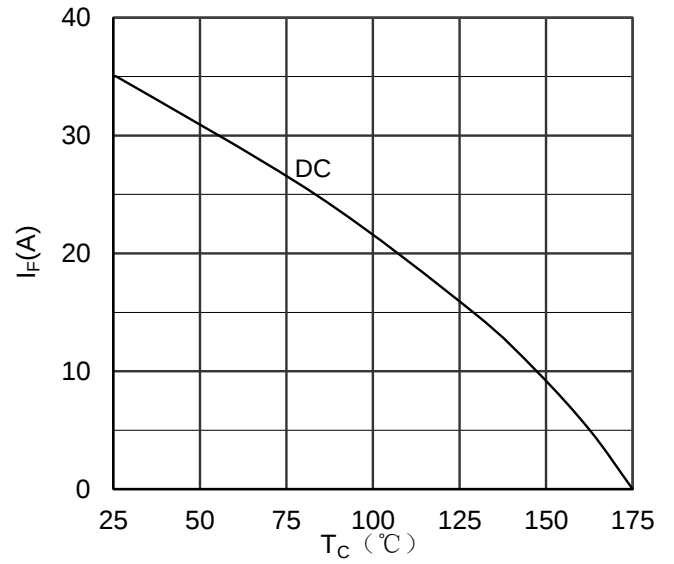


Figure 14. Forward current vs Case temperature
Diode -inverter

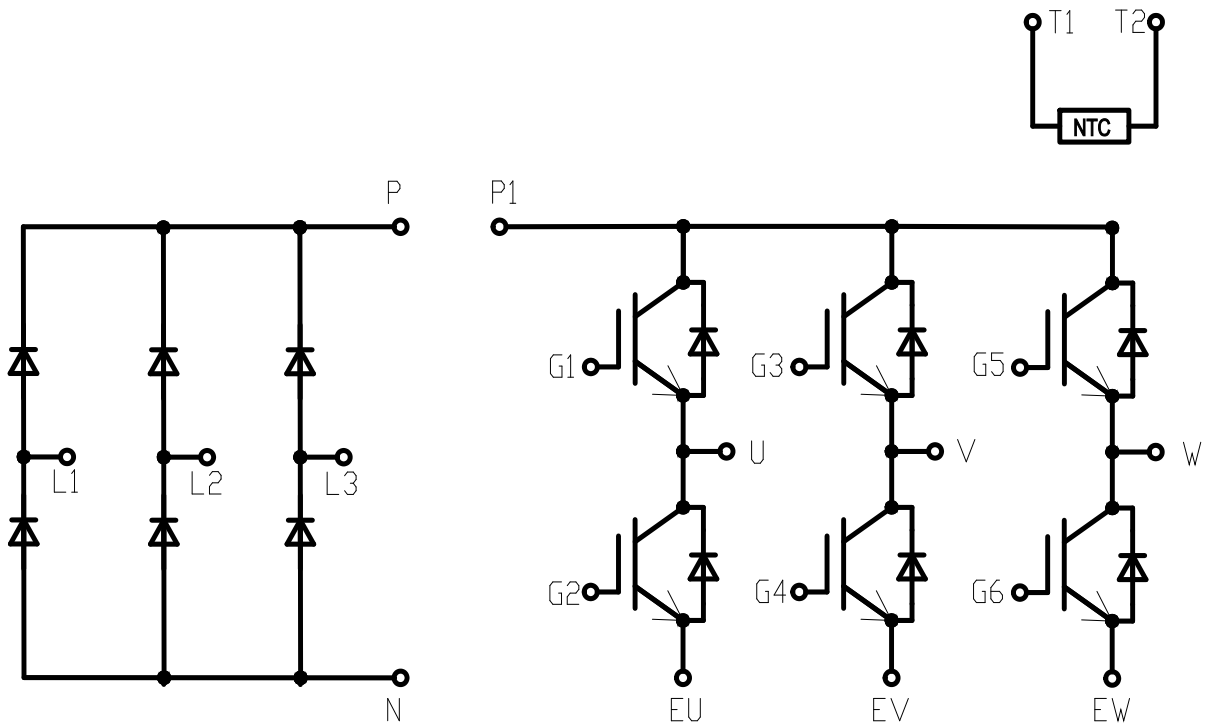


Figure 15. Circuit Diagram



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