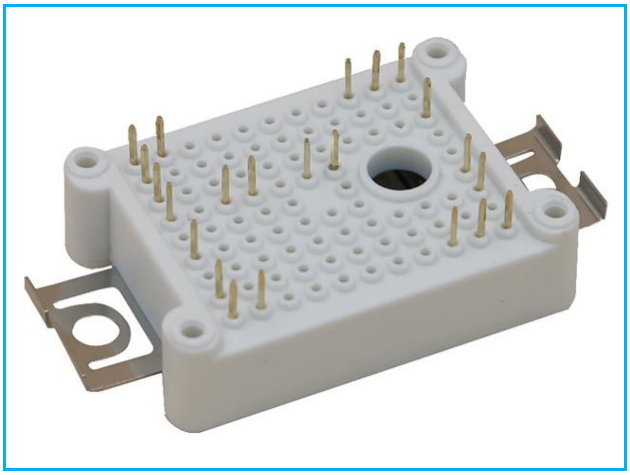
MMG35CB120X6TC

1200V 35A Six-Pack Module

November 2020 Version 01 RoHS Compliant

PRODUCT FEATURES



☐ IGBT CHIP(Trench+FS)

☐ 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

生效日期： 2020.12.1

☐ Motion/servo control

☐ Inverter and power supplies

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℃	1200	V
V_{GES}	Gate Emitter Voltage		±20	
I_C	DC Collector Current	T_C=25℃, T_{Jmax}=175℃	54	A
		T_C=100℃, T_{Jmax}=175℃	35	
I_{CM}	Repetitive Peak Collector Current	tp=1ms	70	
P_{tot}	Power Dissipation Per IGBT	T_C=25℃, T_{Jmax}=175℃	214	W

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℃	1200	V
$I_{F(AV)}$	Average Forward Current		35	A
I_{FRM}	Repetitive Peak Forward Current	tp=1ms	70	
I^2t		T_J=125℃, t=10ms, V_R=0V	250	A^2s

MacMic Science & Technology Co., Ltd.

Add：#18, Hua Shan Zhong Lu, New District, Changzhou City, Jiangsu Province, P. R .of China

Tel.：+86-519-85163708 Fax：+86-519-85162291 Post Code：213022 Website：www.macmicst.com

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=1.2mA		5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector Emitter Saturation Voltage	I_C=35A, V_{GE}=15V, T_J=25℃			1.85	2.25	
		I_C=35A, V_{GE}=15V, T_J=125℃			2.15		
		I_C=35A, V_{GE}=15V, T_J=150℃			2.2		
I_{CES}	Collector Leakage Current	V_{CE}=1200V, V_{GE}=0V, T_J=25℃				100	μA
		V_{CE}=1200V, V_{GE}=0V, T_J=150℃				10	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℃		14		ns
			T_J=125℃		18		ns
			T_J=150℃		20		ns
t_r	Rise Time		T_J=25℃		26		ns
			T_J=125℃		28		ns
			T_J=150℃		30		ns
$t_{d(off)}$	Turn off Delay Time	V_{CC}=600V,I_C=35A R_G =15Ω, V_{GE}=±15V, Inductive Load	T_J=25℃		195		ns
			T_J=125℃		240		ns
			T_J=150℃		250		ns
t_f	Fall Time		T_J=25℃		150		ns
			T_J=125℃		270		ns
			T_J=150℃		290		ns
E_{on}	Turn on Energy	V_{CC}=600V,I_C=35A R_G =15Ω, V_{GE}=±15V, Inductive Load	T_J=125℃		4.13		mJ
			T_J=150℃		4.5		mJ
E_{off}	Turn off Energy		T_J=125℃		3.03		mJ
			T_J=150℃		3.2		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-ELECTRICAL CHARACTERISTICS *(T_C=25°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℃		1.95	2.45	V
		I_F=35A , V_{GE}=0V, T_J=125℃		1.55		
		I_F=35A , V_{GE}=0V, T_J=150℃		1.5		
t_{rr}	Reverse Recovery Time	I_F=35A , V_R=600V dI_F/dt=-1500A/μs T_J =150℃		320		ns
I_{RRM}	Max. Reverse Recovery Current			47		A
Q_{RR}	Reverse Recovery Charge			6.8		μC
E_{rec}	Reverse Recovery Energy			2.37		mJ
R_{thJCD}	Junction to Case Thermal Resistance （ Per Diode）			0.8	0.9	K /W

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		>200	
F	Mounting Force Per Clamp		20~50	N
Weight			25	g

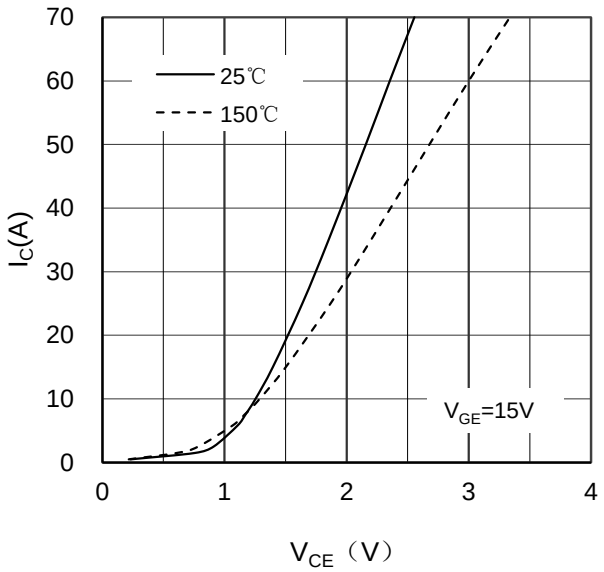


Figure 1. Typical Output Characteristics IGBT

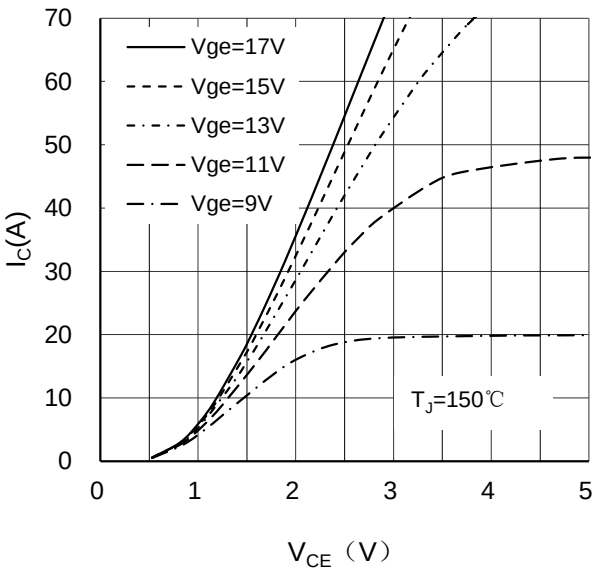


Figure 2. Typical Output Characteristics IGBT

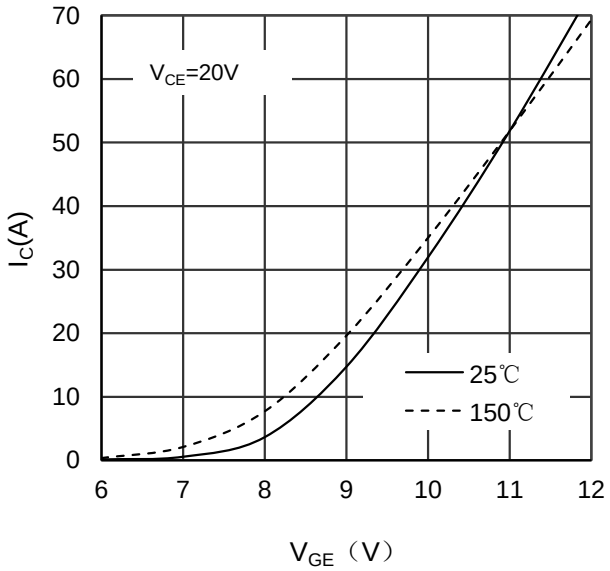


Figure 3. Typical Transfer characteristics IGBT

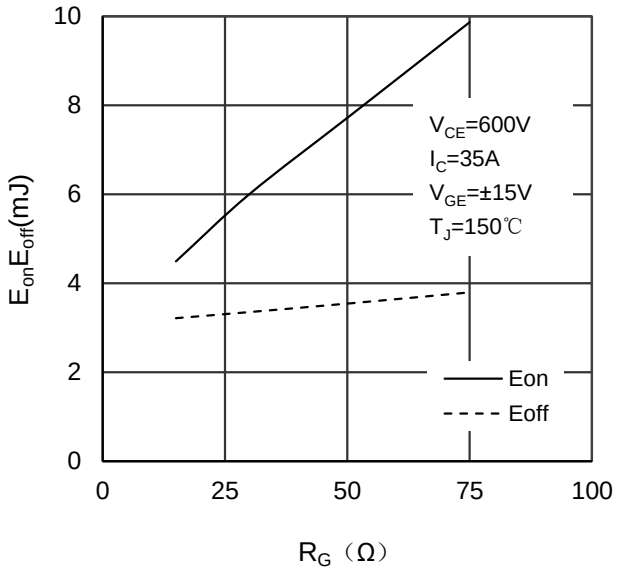


Figure 4. Switching Energy vs Gate Resistor IGBT

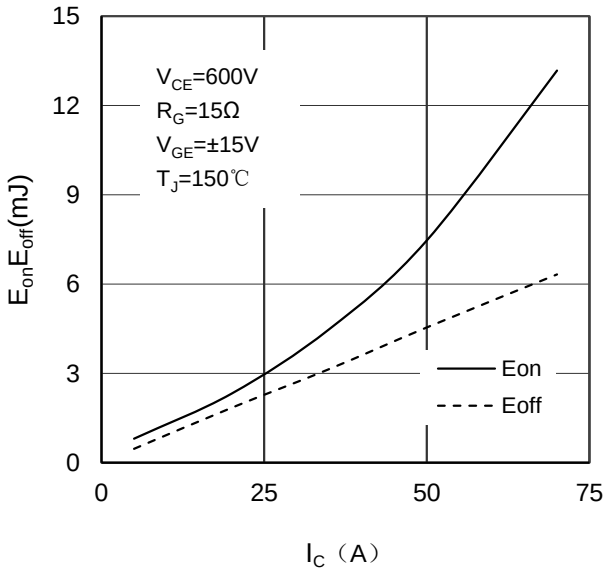


Figure 5. Switching Energy vs Collector Current IGBT

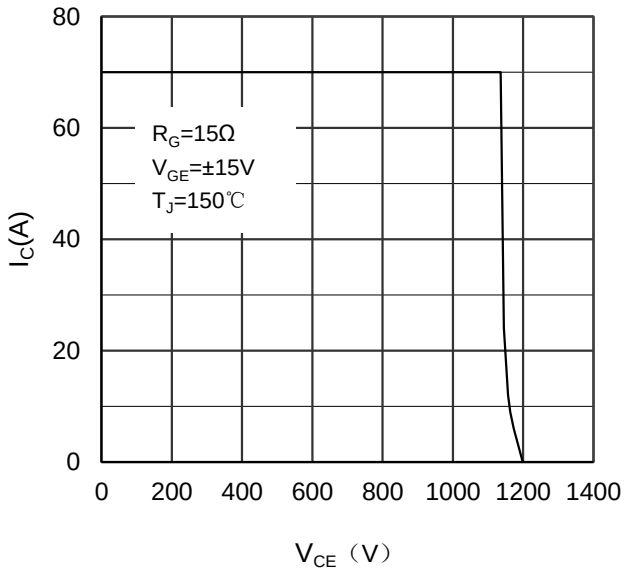


Figure 6. Reverse Biased Safe Operating Area IGBT

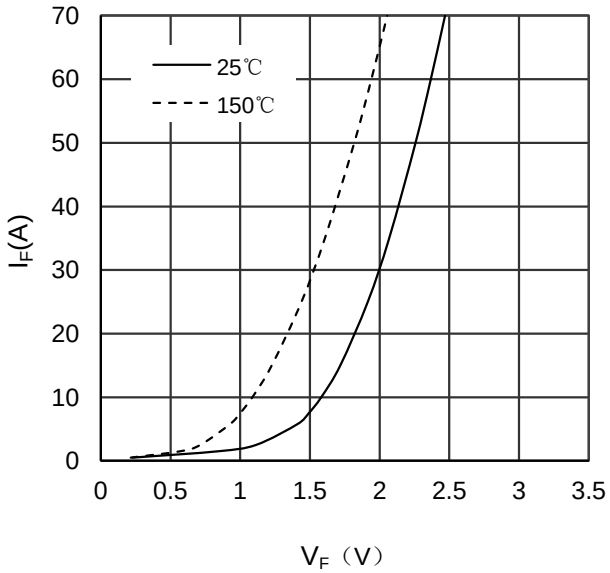


Figure 7. Diode Forward Characteristics Diode

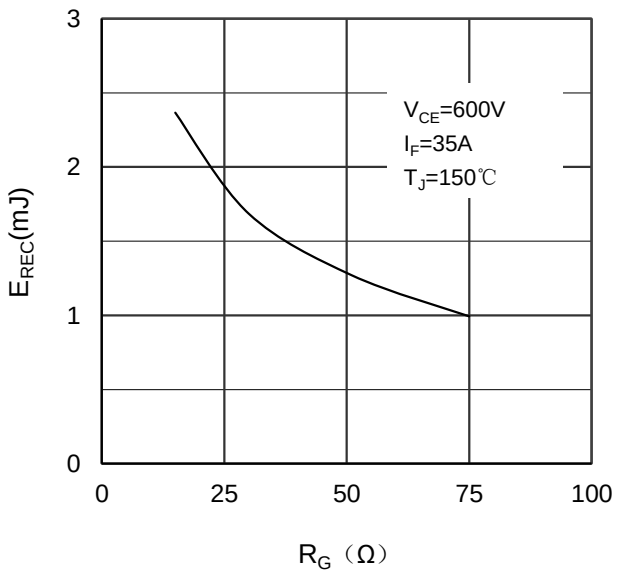


Figure 8. Switching Energy vs Gate Resistor Diode

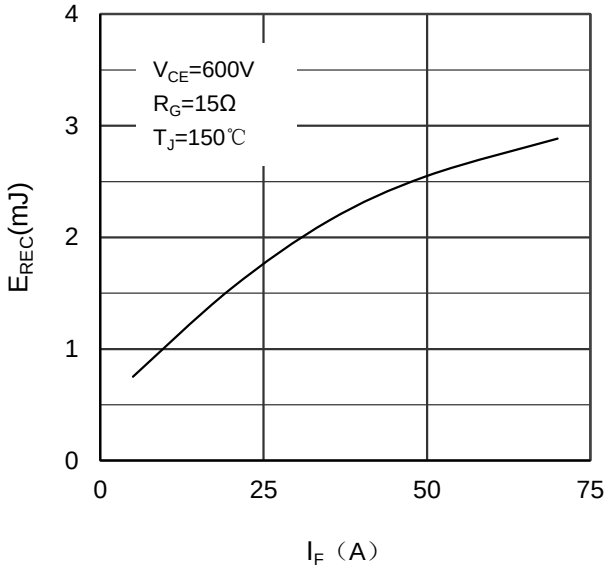


Figure 9. Switching Energy vs Forward Current Diode

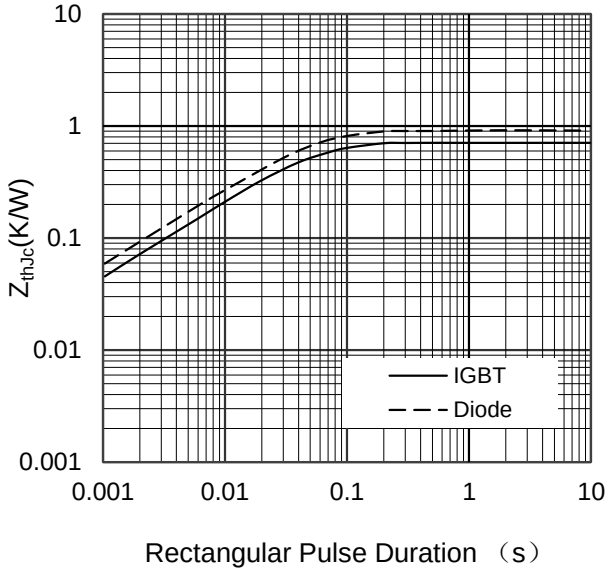


Figure 10. Transient Thermal Impedance of Diode and IGBT

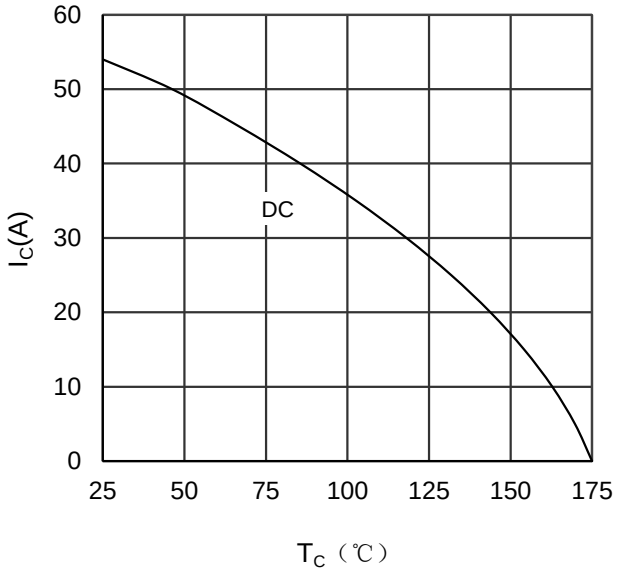


Figure 11. Collector Current vs Case temperature IGBT

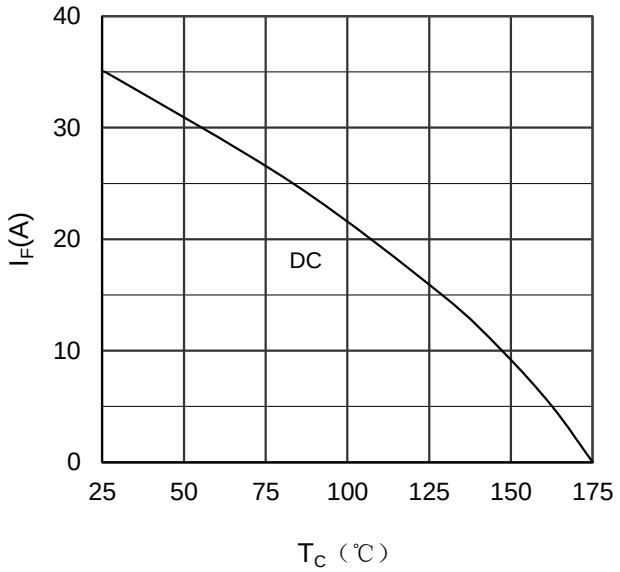


Figure 12. Forward current vs Case temperature Diode

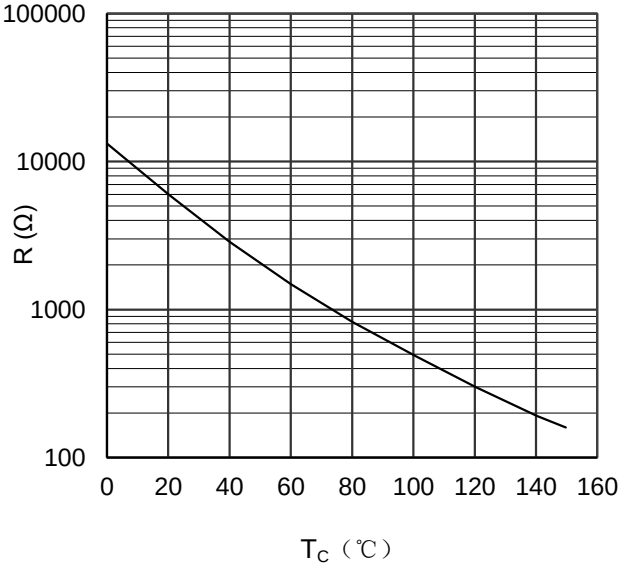


Figure 13. NTC Characteristics

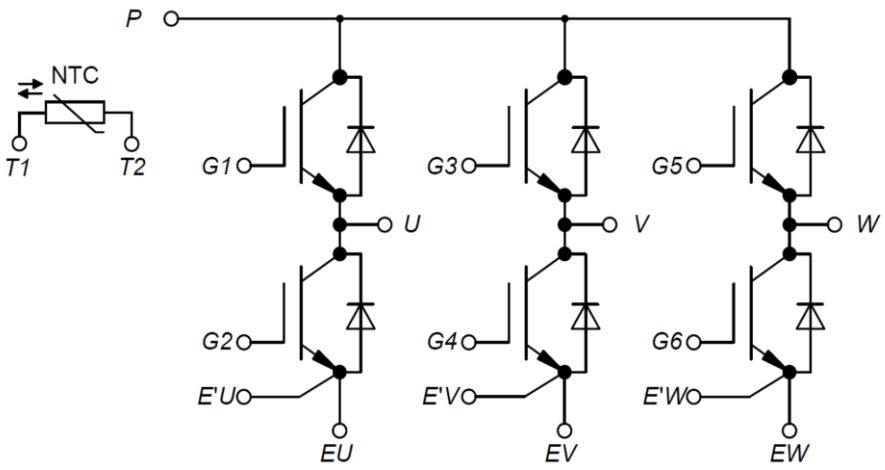
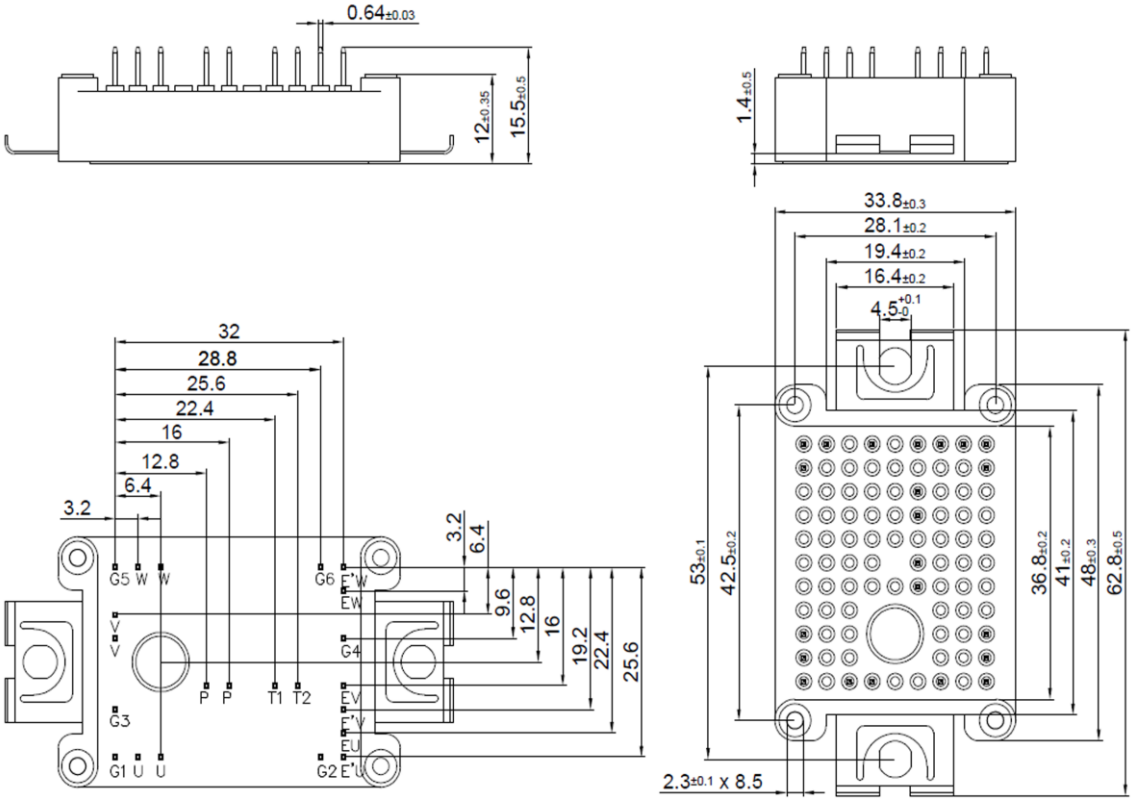


Figure 14. Circuit Diagram



Dimensions in (mm)

Figure 15. Package Outline