

## 150A 1200V Half bridge module

### 1 Description

These Insulated Gate Bipolar Transistor used advanced trench and Fieldstop technology design, provided excellent  $V_{CEsat}$  and switching speed ,low gate charge. Which accords with the RoHS standard.

### 2 Features

- FS Trench Technology, Positive temperature coefficient
- Low saturation voltage:  $V_{CE(sat)}$ , typ = 2.55V @  $I_c = 150A$  and  $T_j = 25^\circ C$
- Extremely enhanced avalanche capability

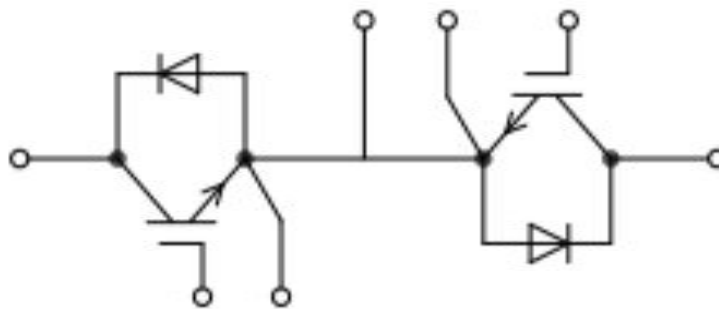
### 3 Applications

- Welding
- UPS
- Three-level Inverter
- AC and DC servo drive amplifier



Type	$V_{CE}$	$I_c$	$V_{CEsat}, T_j=25^\circ C$	$T_{jop}$	Package
DGB150H120L2T	1200V	150A ( $T_j=100^\circ C$ )	2.55V (Typ)	150°C	62MM

### 4 Equivalent Circuit Schematic



**5 Electrical Characteristics**

**5.1 Absolute Maximum Ratings (IGBT) (Tc=25°C,unless otherwise specified)**

Parameter	Symbol	Value	Units
Collector-to-Emitter Voltage	$V_{CE}$	1200	V
Gate-to-Emitter Voltage	$V_{GE}$	±20	V
DC Collector current	$I_c$	150	A
Pulsed Collector Current #1	$I_{CM}$	1200	A
$T_{vj} = 150^{\circ}C$ , $V_{CC} = 600V, V_{GE} = 15V$ , Short circuit withstand time,	$T_{sc}$	6	us

Notes: #1 Pulse duration is limited by  $T_{j,max}$

**5.2 Absolute Maximum Ratings (Diode) (Tc=25°C,unless otherwise specified)**

PARAMETER	SYMBOL	VALUE	UNIT
Peak Repetitive Reverse Voltage	$V_{RRM}$	1200	V
DC Blocking Voltage	$V_R$	1200	V
Average Rectified Forward Current	$I_{F(AV)}$	150	A
Repetitive Peak Surge Current	$I_{FRM}$	300	A
Nonrepetitive Peak Surge Current	$I_{FSM}$	750	A

**5.53IGBT Module**

Parameter	Symbol	VALUE	Units
Junction Temperature Range	$T_{jmax}$	-40~175	°C
Operating Junction Temperature	$T_{jop}$	-40~150	°C
Storage Temperature Range	$T_{stg}$	-40~120	°C
Isolation Voltage $R_{MS}, f=50Hz, t=1min$	$V_{ISO}$	3500	V

**5.4Thermal Characteristics (IGBT Module)**

Parameter	Symbol	Rating	Units
Thermal Resistance Junction to Case	IGBT	0.155	°C/W
	Diode	0.31	

**5.5Module characteristics**

Parameter	Symbol	Conditions	VALUE	Units
Material of module baseplate			Cu+Ni	
Internal isolation		Basic insulation	Improved Al2O3ceramic	
Mounting torque of screws to heat sink	Ms	M5	3.0-6.0	N·m
Mounting torque of screws to terminals	Mt	M6	2.5-5.0	N·m
Comperative tracking index	$C_{TI}$		>175	
Strayinductancemodule	$L_{sCE}$		20	nH

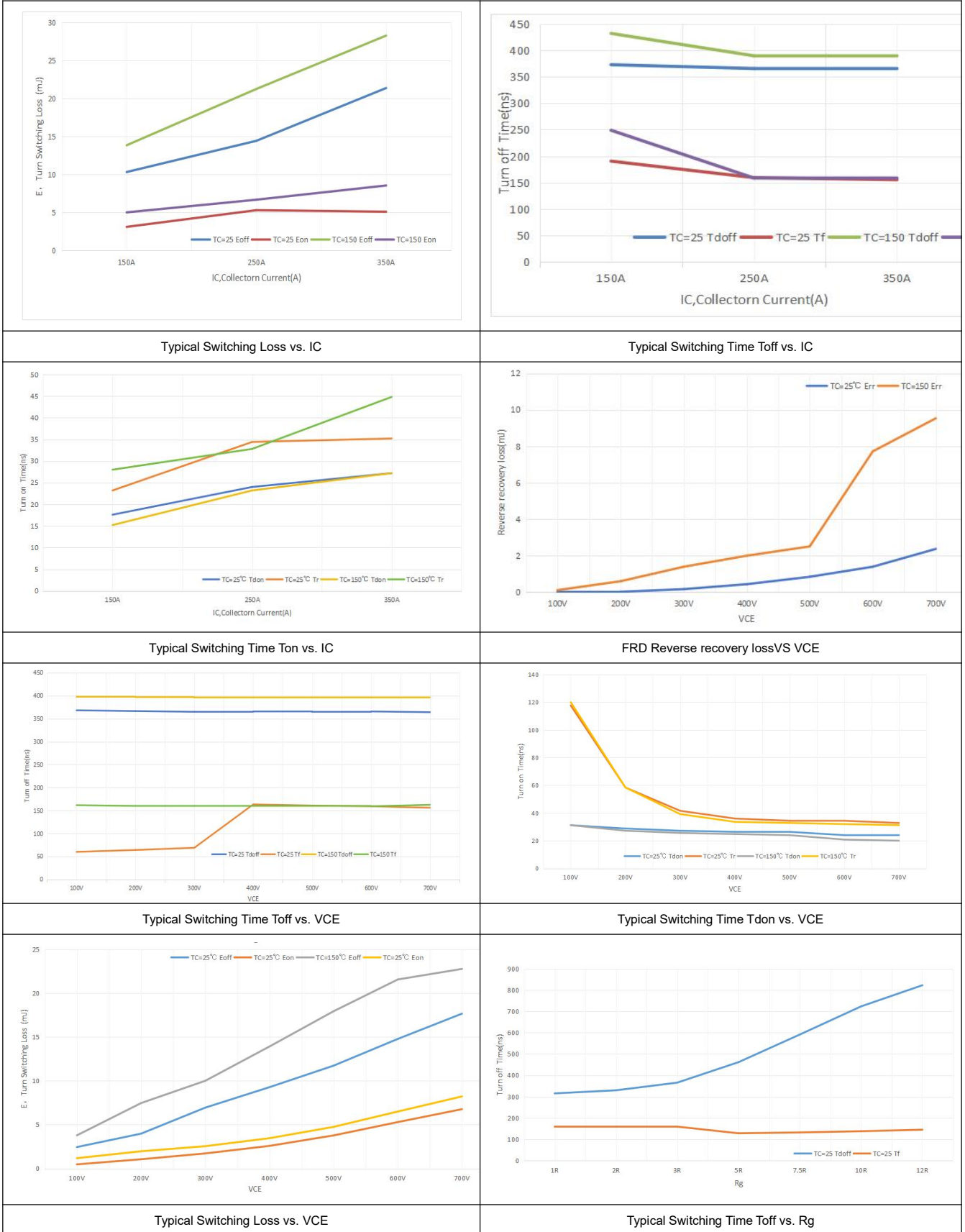
**5.5 Electrical Characteristics (IGBT) (Tc=25°C, unless otherwise specified)**

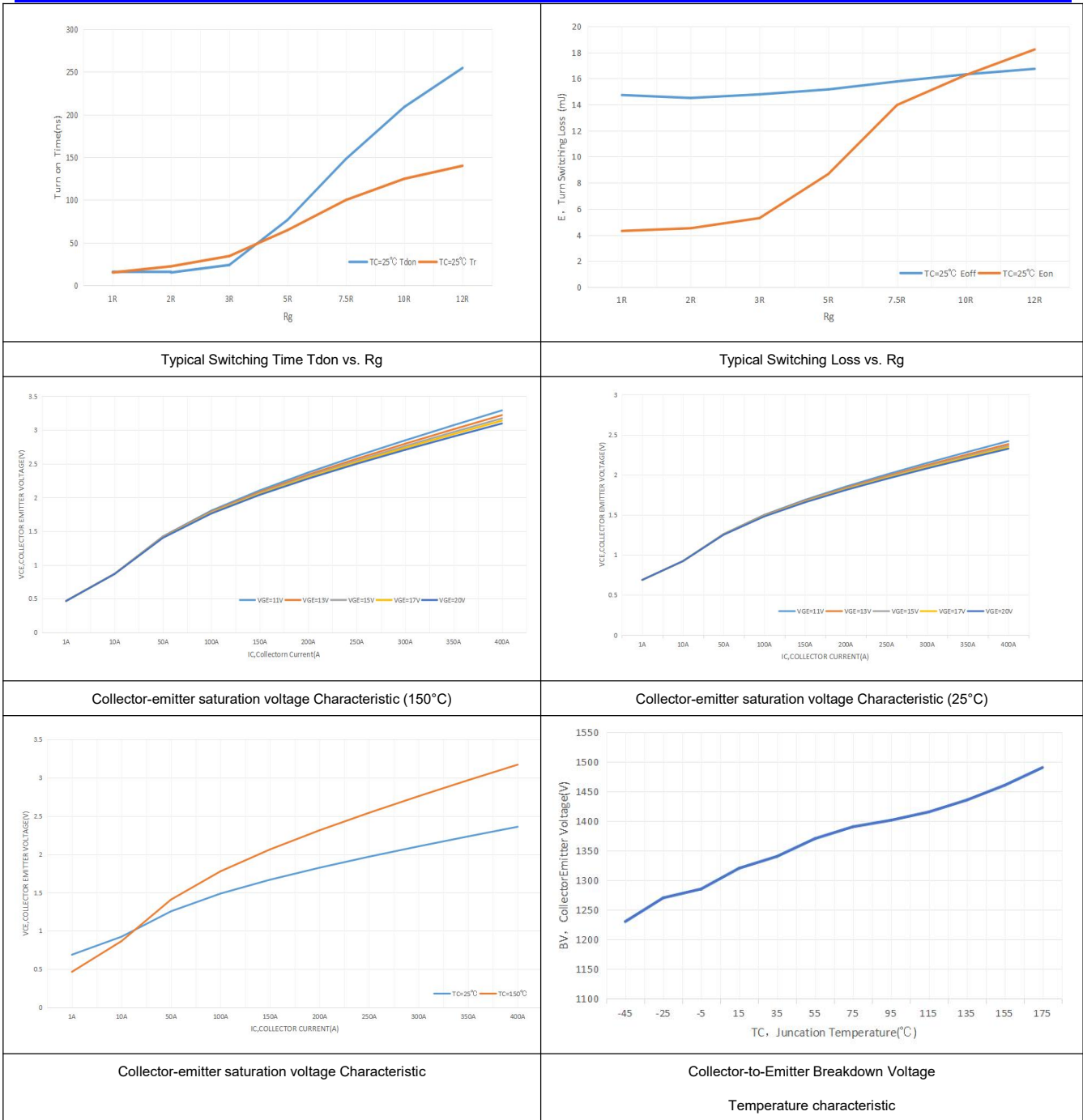
Parameter	Symbol	Conditions	Value			Units
			Min	Typ	Max	
<b>Static Characteristics</b>						
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C=1mA, V_{GE}=0V, T_j=25^\circ C$	1200	--	--	V
Collector-to-Emitter Leakage Current	$I_{CES}$	$V_{CE}=1200V, V_{GE}=0V, T_j=25^\circ C$	--	--	100	$\mu A$
		$V_{CE}=1200V, V_{GE}=0V, T_j=150^\circ C$	--	--	5.0	mA
Gate-to-Emitter Leakage	$I_{GES}$	$V_{GE}=\pm 20V, V_{CE}=0V, T_j=25^\circ C$	--	--	$\pm 100$	nA
Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=3mA$	4.5	5.6	6.5	V
Collector-emitter saturation voltage	$V_{CEsat}$	$V_{GE}=15V, I_C=150A, T_j=25^\circ C$	--	2.55	3.0	V
		$V_{GE}=15V, I_C=150A, T_j=150^\circ C$	--	3.1	--	V
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{CE}=25V, V_{GE}=0V, f=1MHz, T_a=25^\circ C$	--	18.7	--	nF
Output Capacitance	$C_{oss}$		--	0.46	--	
Reverse Transfer Capacitance	$C_{rss}$		--	0.22	--	
<b>IGBT Characteristics</b>						
Turn-on delay time	$t_{d(on)}$	$V_{CE}=600V, I_C=150A, R_g=5.0\Omega, V_{GE}=\pm 15V, \text{感性负载}, T_j=25^\circ C$	--	32	--	nS
Rise time	$t_r$		--	37	--	nS
Turn-off delay time	$t_{d(off)}$		--	188	--	nS
Fall time	$t_f$		--	116	--	nS
Turn-on energy	$E_{on}$		--	4.8	--	mJ
Turn-off energy	$E_{off}$		--	4.6	--	mJ
Total switching energy	$E_{ts}$		--	9.4	--	mJ
Turn-on delay time	$t_{d(on)}$	$V_{CE}=600V, I_C=150A, R_g=5.0\Omega, V_{GE}=\pm 15V, \text{感性负载}, T_j=150^\circ C$	--	28.8	--	nS
Rise time	$t_r$		--	36	--	nS
Turn-off delay time	$t_{d(off)}$		--	208.8	--	nS
Fall time	$t_f$		--	196	--	nS
Turn-on energy	$E_{on}$		--	7.1	--	mJ
Turn-off energy	$E_{off}$		--	7.19	--	mJ
Total switching energy	$E_{ts}$		--	14.29	--	mJ
Gate charge	$Q_g$	$V_{CE}=600V, V_{GE}=-15V \text{ to } 15V$	--	0.7	--	$\mu C$

**5.6 Electrical Characteristics (Diode) (Tc=25°C, unless otherwise specified)**

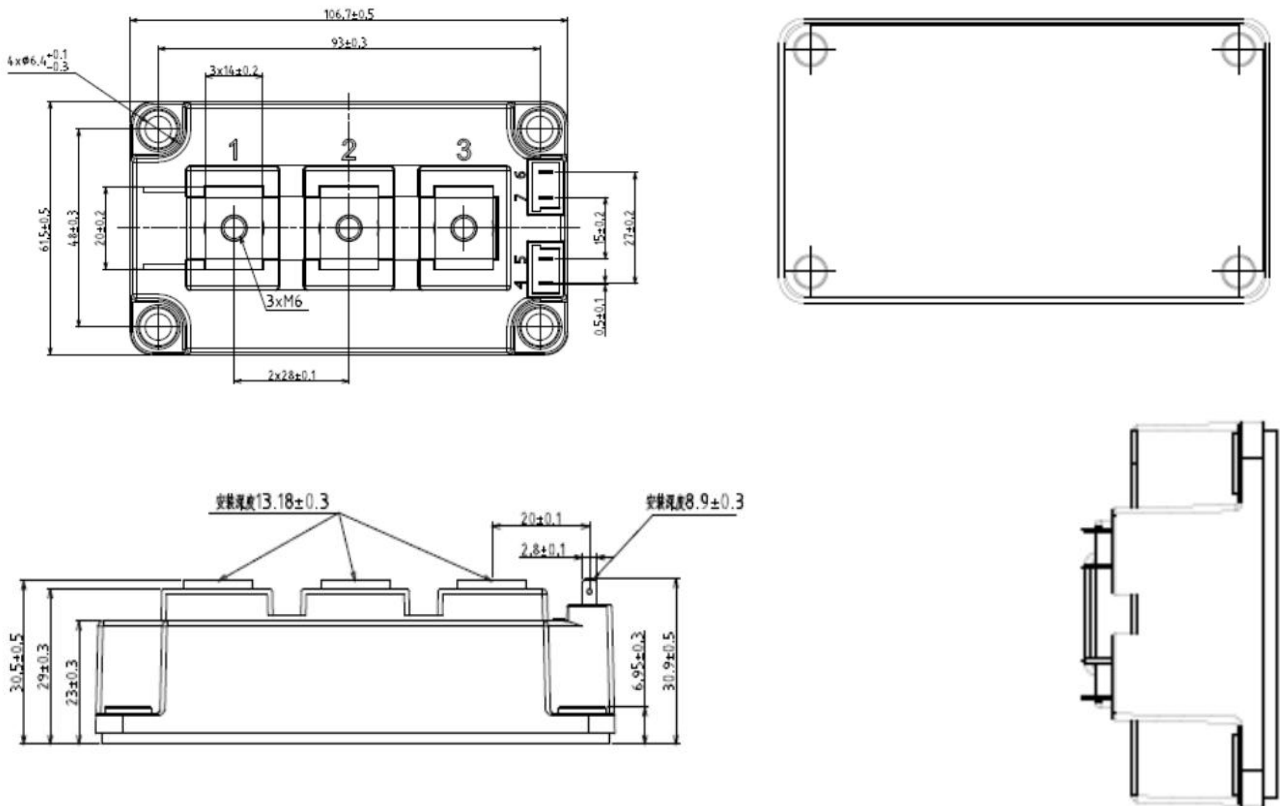
Parameter	Symbol	Conditions	Value			Units
			Min	Typ	Max	
Diode forward voltage	$V_F$	$I_F=150A, T_j=25^\circ C$	--	2.8	--	V
		$I_F=150A, T_j=150^\circ C$	--	1.8	--	V
Diode reverse recovery time	$t_{rr}$	$V_{CE}=600V, I_C=150A, R_g=5\Omega, V_{GE}=\pm 15V, TC=25^\circ C$	--	66	--	ns
Diode peak reverse recovery current	$I_{rrm}$		--	50	--	A
Diode reverse recovery charge	$Q_{rr}$		--	2.6	--	$\mu C$
Reverse recovery energy	$E_{rec}$		--	1.55	--	mJ
Diode reverse recovery time	$t_{rr}$	$V_{CE}=600V, I_C=150A, R_g=5\Omega, V_{GE}=\pm 15V, TC=150^\circ C$	--	315	--	ns
Diode peak reverse recovery current	$I_{rrm}$		--	95	--	A
Diode reverse recovery charge	$Q_{rr}$		--	18	--	$\mu C$
Reverse recovery energy	$E_{rec}$		--	7.4	--	mJ

6 Typical Characteristic Curves

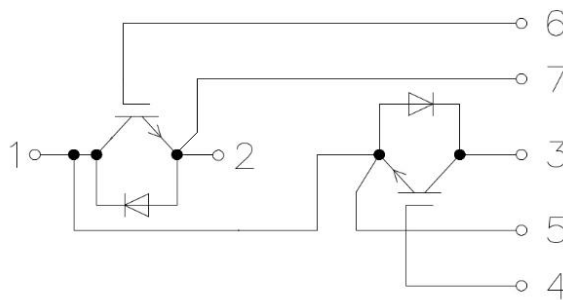




## 7 Dimensions



### 7.1 Circuit Schematic



## 8 Attentions

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- Product promotion is endless, our company will be dedicated to provide customers with better products.

## 9 Appendix

Revision history:

Date	REV.	Description	Page
2024.6.23	1.0	Original	