

# FUJITSU GENERAL ELECTRONICS LIMITED

## FGI-6I075A120A1

### IGBT MODULE

### 1200V/75A IPM

■ Features

- DC input, 3-phase AC output IGBT IPM
- Built-in various protection functions (Over heating protection, Under voltage protection)
- Short-circuit warranty type IGBT (5μs/125°C)



■ Dimensions

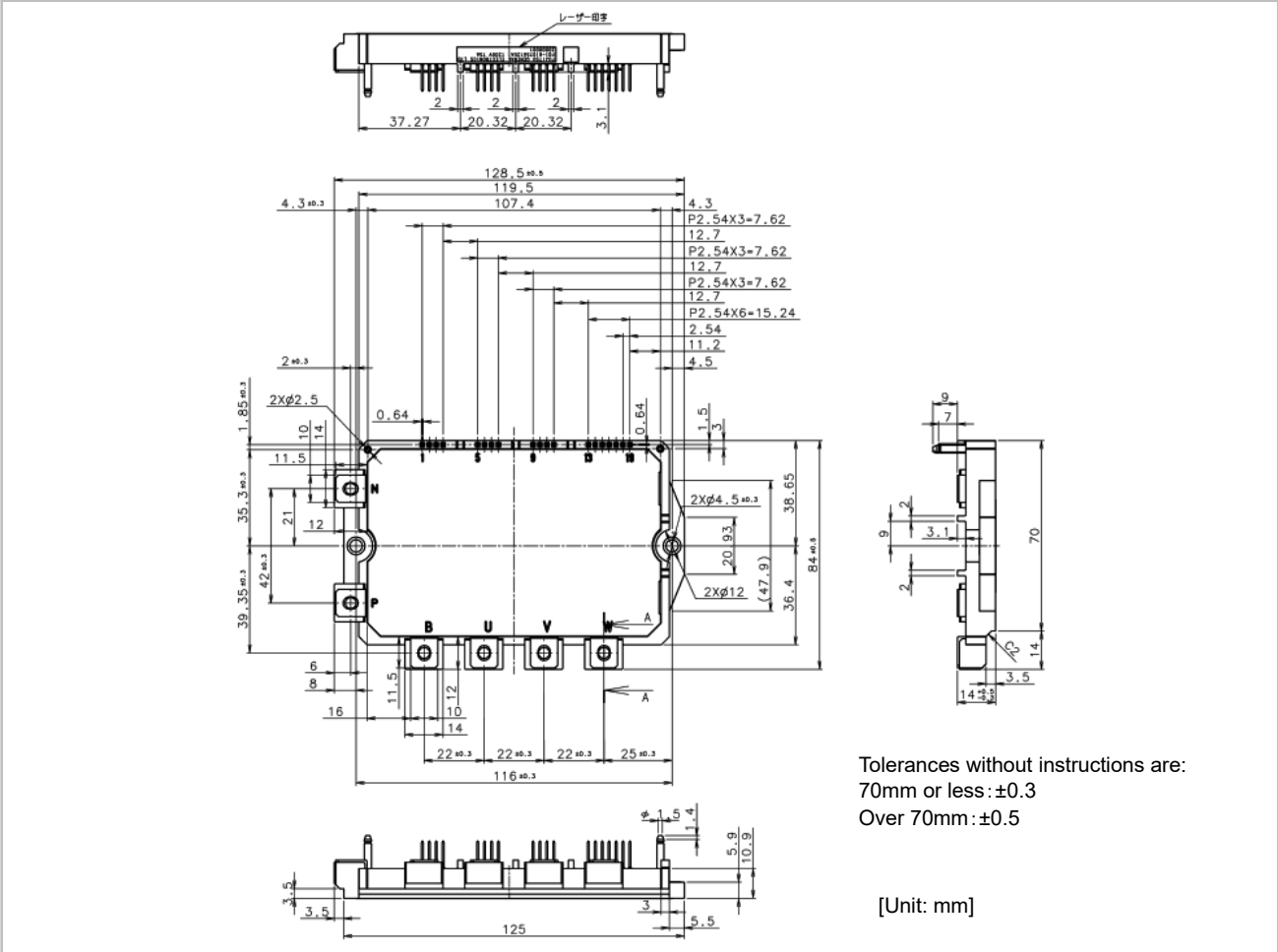


Fig.1. Dimensions

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### ■ Pin Functions

Pin No.	Name	Function	Pin No.	Name	Function
1	GND U	Ground terminal (U)	11	Vin W	Driver input (W)
2	N.C.	No Connect	12	Vcc W	Power supply (W)
3	Vin U	Driver input (U)	13	GND	Ground terminal (Under arm)
4	Vcc U	Power supply (U)	14	Vcc	Power supply for Under arm
5	GND V	Ground terminal (V)	15	N.C.	No Connect
6	N.C.	No Connect	16	Vin X	Driver input (X)
7	Vin V	Driver input (V)	17	Vin Y	Driver input (Y)
8	Vcc V	Power supply (V)	18	Vin Z	Driver input (Z)
9	GND W	Ground terminal (W)	19	ALM	Alarm output (X,Y,Z)
10	N.C.	No Connect			

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## ■ Block Diagram

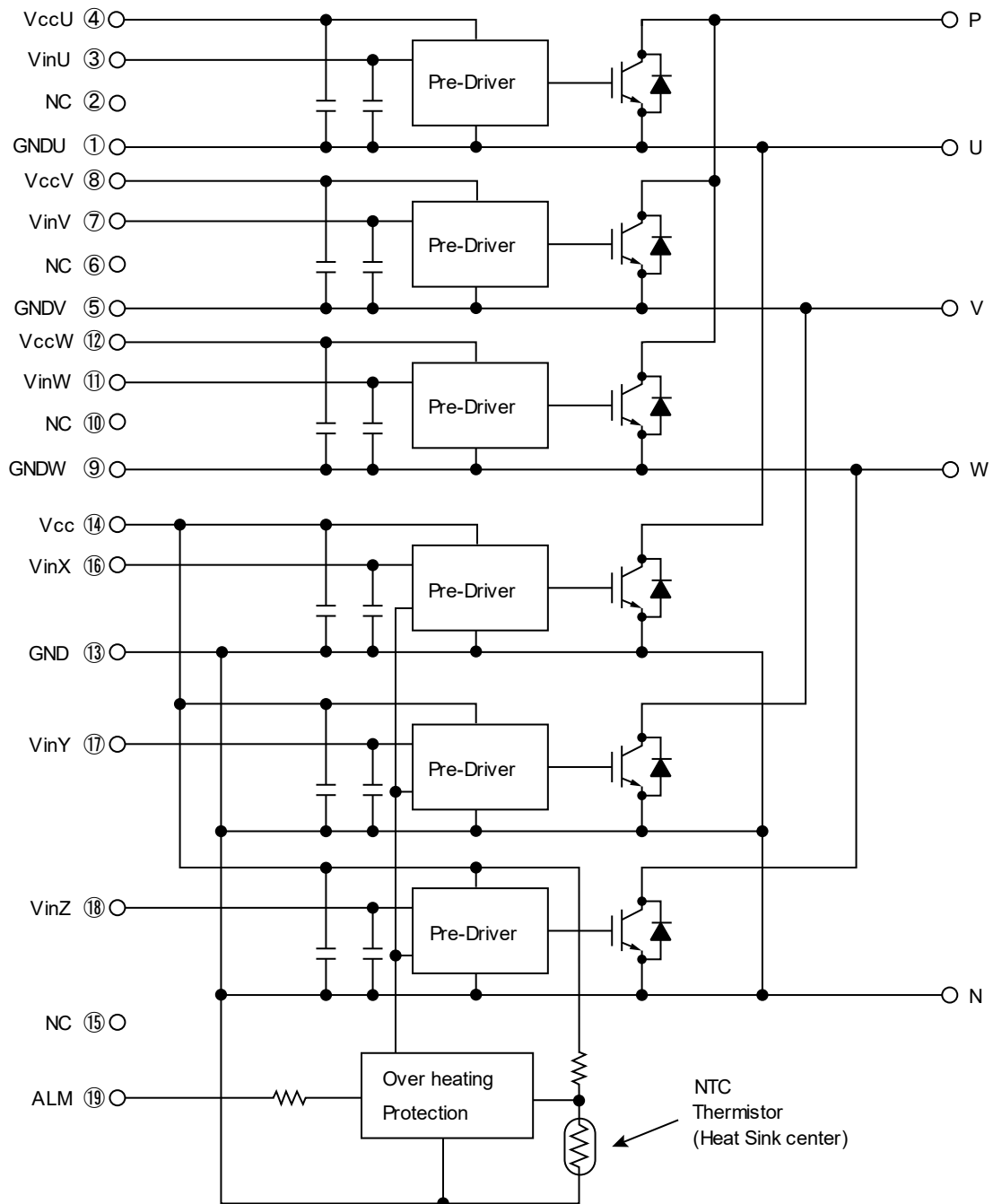


Fig.2. Block Diagram

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## ■ Absolute Maximum Ratings (Tc=25°C, Vcc=15V unless otherwise specified)

Items		Symbol	Min.	Max.	Units
Collector-Emitter Voltage (*1)		V <sub>CES</sub>	0	1200	V
Short Circuit Voltage		V <sub>SC</sub>	-	600	V
Collector Current	DC	I <sub>c</sub>	-	75	A
	1ms	I <sub>cp</sub>	-	150	A
	Duty=65% (*2)	-I <sub>c</sub>	-	75	A
Collector Power Dissipation	1 device (*3)	P <sub>c</sub>	-	305	W
Supply Voltage of Pre-Driver (*4)		V <sub>CC</sub>	-0.3	20	V
Input Signal Voltage (*5)		V <sub>in</sub>	-0.5	V <sub>CC</sub> +0.5	V
Alarm Signal Voltage (*6)		V <sub>ALM</sub>	-0.5	V <sub>CC</sub>	V
Alarm Signal Current (*7)		I <sub>ALM</sub>	-	20	mA
Junction Temperature		T <sub>j</sub>	-	175	°C
Operating Case Temperature		T <sub>opr</sub>	-20	110	°C
Storage Temperature		T <sub>stg</sub>	-40	125	°C
Solder Temperature (*8)		T <sub>sol</sub>	-	260	°C
Isolating Voltage (*9)		V <sub>iso</sub>	-	AC2500	V <sub>rms</sub>
Screw Torque	Terminal	-	-	1.7	N · m
	Mounting				

Note\*1: V<sub>CES</sub> shall be applied to the input voltage between terminal P-(U, V, W) and (U, V, W)-N.

Note\*2: Duty=125°C/R<sub>th(j-c)D</sub> / (I<sub>f</sub>×V<sub>f</sub> Max.)×100

Note\*3: P<sub>c</sub>=125°C/R<sub>th(j-c)Q</sub>

Note\*4: V<sub>CC</sub> shall be applied to the input voltage between terminal No.4 and 1, 8 and 5, 12 and 9, 14 and 13.

Note\*5: V<sub>in</sub> shall be applied to the input voltage between terminal No.3 and 1, 7 and 5, 11 and 9, 16~18 and 13.

Note\*6: V<sub>ALM</sub> shall be applied to the voltage between terminal 19 and 13.

Note\*7: I<sub>ALM</sub> shall be applied to the input current to terminal No.19.

Note\*8: Immersion time 10 ± 1sec. 1time.

Note\*9: Terminal to base, 50/60Hz sine wave 1min. All terminals should be connected together during the test.

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## ■ Electrical Characteristics (T<sub>j</sub>=25°C V<sub>cc</sub>=15V unless otherwise specified)

Items	Symbol	Conditions	Min.	Typ.	Max.	Units	
Collector Current at off signal input	I <sub>CES</sub>	V <sub>CE</sub> =1200V	-	-	20	μA	
Collector-Emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>c</sub> =75A	Terminal	-	-	2.35	V
			Chip	-	1.7	-	V
Forward voltage of FWD	V <sub>F</sub>	I <sub>F</sub> =75A	Terminal	-	-	2.85	V
			Chip	-	1.65	-	V
Switching time	t <sub>on</sub>	V <sub>DC</sub> =600V, T <sub>J</sub> =125°C, I <sub>c</sub> =75A	-	-	-	0.5	μs
	t <sub>off</sub>		-	-	1	μs	
	t <sub>tr</sub>		V <sub>DC</sub> =600V, I <sub>F</sub> =75A	-	-	1	μs
Supply current of P-side pre-driver(per one unit)	I <sub>ccp</sub>	Switching Frequency=0-15kHz	-	-	18	mA	
Supply current of N-side pre-driver	I <sub>ccn</sub>	T <sub>c</sub> =-20~110°C	-	-	60	mA	
Input signal threshold voltage	V <sub>inth(on)</sub>	Vin-GND	ON	0.6	1.0	1.3	V
	V <sub>inth(off)</sub>		OFF	1.5	1.9	2.2	V
Over Current Protection Level	I <sub>OC</sub>	T <sub>J</sub> =125°C	-	-	-	A	
Over Current Protection Delay time	t <sub>diOC</sub>	T <sub>J</sub> =125°C	-	-	-	μs	
Short Circuit Protection Delay time	t <sub>SC</sub>	T <sub>J</sub> =125°C	-	-	-	μs	
Over Heating Protection Temperature Level	T <sub>OH</sub>	Module center	175	-	-	°C	
Over Heating Protection Hysteresis	T <sub>H</sub>		-	40	-	°C	
Under Voltage Protection Level	V <sub>UV</sub>		7.2	8.2	9.2	V	
Under Voltage Protection Hysteresis	V <sub>H</sub>		-	0.7	-	V	
Alarm Signal Hold Time	t <sub>ALM(OC)</sub>	ALM-GND	-	-	-	ms	
	t <sub>ALM(UV)</sub>	T <sub>c</sub> =-20~110°C	V <sub>cc</sub> ≥10V	-	-	-	ms
	t <sub>ALM(TOH)</sub>			-	-	-	ms
Resistance for current limit	R <sub>ALM</sub>		-	1240	-	Ω	

## ■ Thermal Characteristics (T<sub>c</sub>= 25°C)

Items		Symbol	Min.	Typ.	Max.	Units
Junction to Case Thermal Resistance (*10)	Inverter	IGBT	-	-	0.41	°C/W
		FWD	-	-	0.67	°C/W
Case to Fin Thermal Resistance with Compound		R <sub>th(c-f)</sub>	-	0.05	-	°C/W

Note \*10: For 1 device, the measurement point of the case is just under the chip.

## ■ Weight

Items	Symbol	Min.	Typ.	Max.	Units
Weight	Wt	-	217	-	g

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- (4) Please pay special attention to the operational power source voltage range, category temperature/humidity range when using this product. If used exceeding the guaranteed values, we are not liable for any defect or breakdown that has happened after the use. Even if used within the guaranteed values, be sure to have redundancy design with which equipment using our product is not contrary to various laws due to operation of our product.