

TENTATIVE TOSHIBA INTEGRATED IGBT MODULE SILICON N CHANNEL IGBT

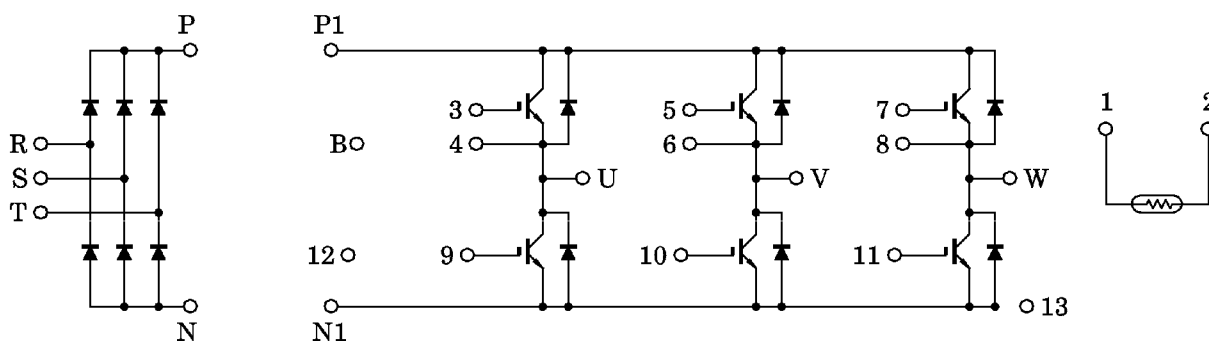
# MIG50J806E, MIG50J806EA

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

- Integrates Inverter, Converter Power Circuits and Thermistor in One Package.
- Output (Inverter Stage) : 3 $\phi$  50 A / 600 V IGBT
- Input (Converter Stage) : 3 $\phi$  30 A / 800 V Silicon Rectifier
- The Electrodes are Isolated from Case.
- Outline
  - MIG50J806E : 2-108E5A
  - MIG50J806EA : 2-108E6A
- Weight : 190 g

## EQUIVALENT CIRCUIT

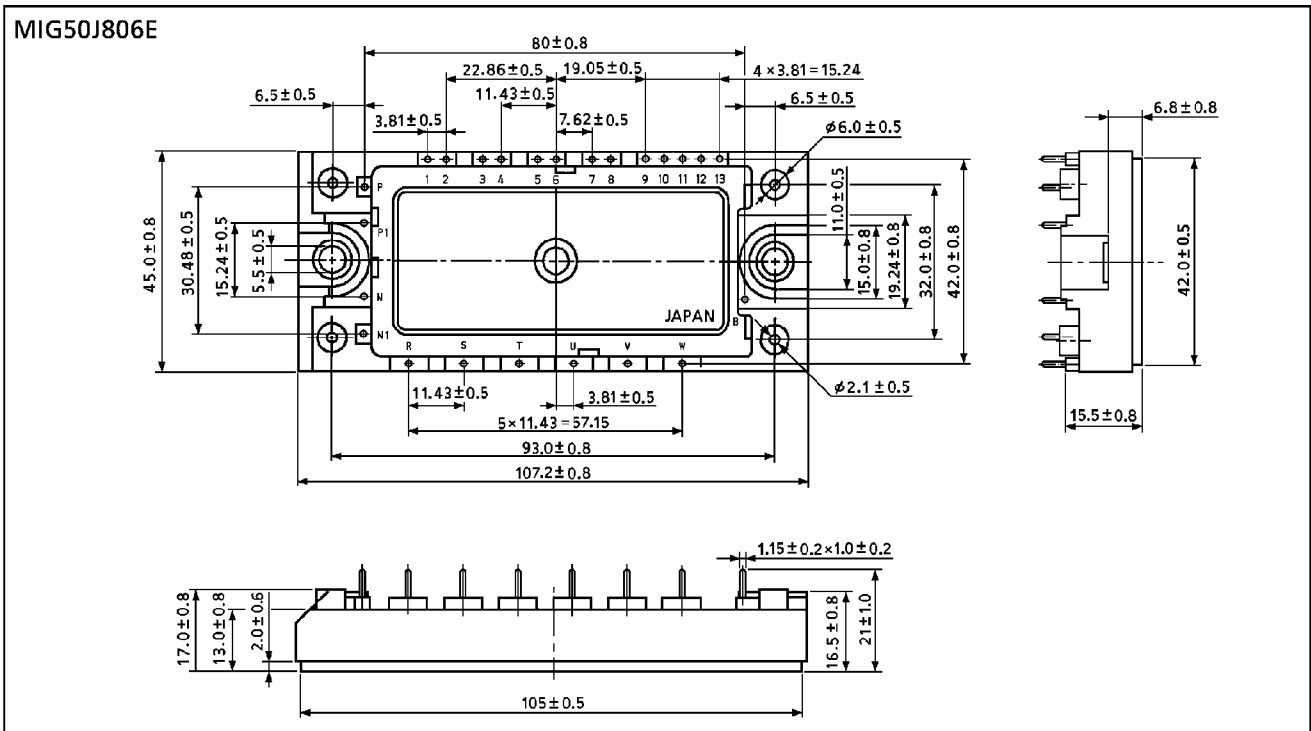


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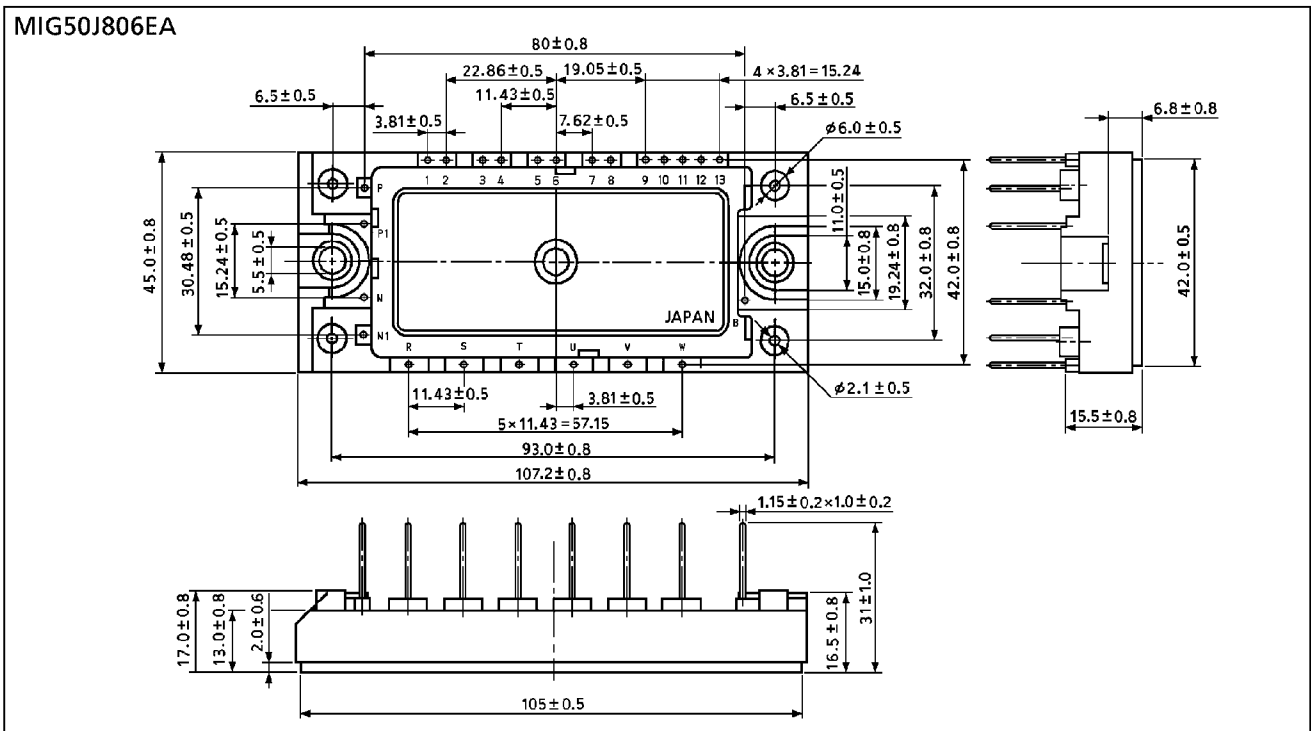
**Package Dimension**

Unit : mm



2-108E5A

Unit : mm



2-108E6A

## MAXIMUM RATINGS (Ta = 25°C)

STAGE	CHARACTERISTIC	SYMBOL	RATING	UNIT	
Inverter	Collector-Emitter Voltage	V <sub>CES</sub>	600	V	
	Gate-Emitter Voltage	V <sub>GES</sub>	±20	V	
	Collector Current	DC	I <sub>C</sub>	50	A
		1 ms	I <sub>CP</sub>	100	A
	Forward Current	DC	I <sub>F</sub>	50	A
		1 ms	I <sub>FM</sub>	100	A
Collector Power Dissipation (T <sub>c</sub> = 25°C)		P <sub>C</sub>	200	W	
Converter	Repetitive Peak Reverse Voltage	V <sub>RRM</sub>	800	V	
	Average Output Rectified Current	I <sub>O</sub>	30	A	
	Peak One Cycle Surge Forward Current (50 Hz, Non-Repetitive)	I <sub>FSM</sub>	400	A	
Module	Junction Temperature	T <sub>j</sub>	150	°C	
	Storage Temperature Range	T <sub>stg</sub>	-40~125	°C	
	Isolation Voltage	V <sub>Isol</sub>	2500 (AC 1 minute)	V	
	Screw Torque	—	6	N·m	

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

## a. Inverter stage

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I <sub>GES</sub>	V <sub>GE</sub> = ±20 V, V <sub>CE</sub> = 0	—	—	±500	nA
Collector Cut-Off Current		I <sub>CES</sub>	V <sub>CE</sub> = 600 V, V <sub>GE</sub> = 0	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		V <sub>GE (off)</sub>	I <sub>C</sub> = 5 mA, V <sub>CE</sub> = 5 V	5.0	—	8.0	V
Collector-Emitter Saturation Voltage		V <sub>CE (sat)</sub>	I <sub>C</sub> = 50 A	—	2.3	2.8	V
			V <sub>GE</sub> = 15 V				
Input Capacitance		C <sub>ies</sub>	V <sub>CE</sub> = 10 V, V <sub>GE</sub> = 0, f = 1 MHz	—	—	—	pF
Switching Time	Rise Time	t <sub>r</sub>	V <sub>CC</sub> = 300 V	—	0.10	0.20	μs
	Turn-On Time	t <sub>on</sub>	I <sub>C</sub> = 50 A	—	0.25	0.50	
	Fall Time	t <sub>f</sub>	V <sub>GE</sub> = ±15 V	—	0.15	0.30	
	Turn-Off Time	t <sub>off</sub>	R <sub>G</sub> = 24 Ω (Note 1)	—	0.50	0.80	
Forward Voltage		V <sub>F</sub>	I <sub>F</sub> = 50 A, V <sub>GE</sub> = 0	—	2.0	2.8	V
Reverse Recovery Time		t <sub>rr</sub>	I <sub>F</sub> = 50 A, V <sub>GE</sub> = -10 V di/dt = 100 A/μs	—	0.08	0.15	μs
Thermal Resistance		R <sub>th (j-c)</sub>	Transistor	—	—	0.6	°C/W
			Diode	—	—	1.5	

## b. Converter stage

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Repetitive Peak Reverse Current		I <sub>RRM</sub>	V <sub>RRM</sub> = 800 V	—	—	50	μA
Peak Forward Voltage		V <sub>FM</sub>	I <sub>FM</sub> = 30 A	—	1.05	1.20	V
Peak One Cycle Surge Forward Current		I <sub>FSM</sub>	50 Hz sine-half-wave	400	—	—	A
Thermal Resistance		R <sub>th (j-c)</sub>	—	—	—	1.56	°C/W

## c. Thermistor

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Zero-power Resistance		R <sub>25</sub>	I <sub>TM</sub> = 0.2 mA, T <sub>c</sub> = 25°C	17.31	20	23.14	kΩ
B Value		B <sub>25/85</sub>	T <sub>c</sub> = 25°C / T <sub>c</sub> = 85°C	—	3760	—	K