TENTATIVE TOSHIBA INTEGRATED IGBT MODULE SILICON N CHANNEL IGBT

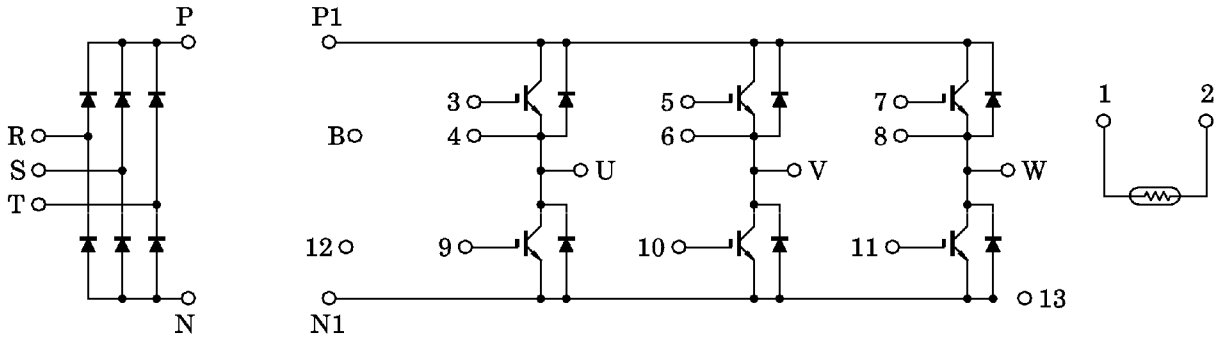
MIG50J806E, MIG50J806EA

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

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

EQUIVALENT CIRCUIT

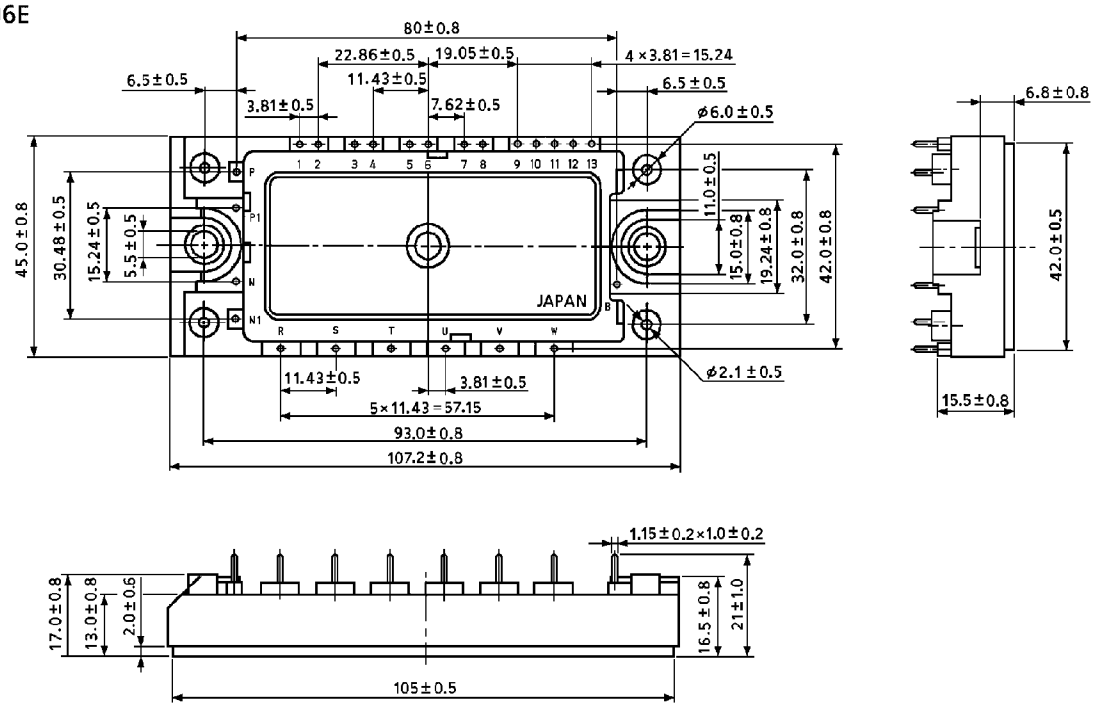


961001EAA1

Package Dimension

Unit : mm

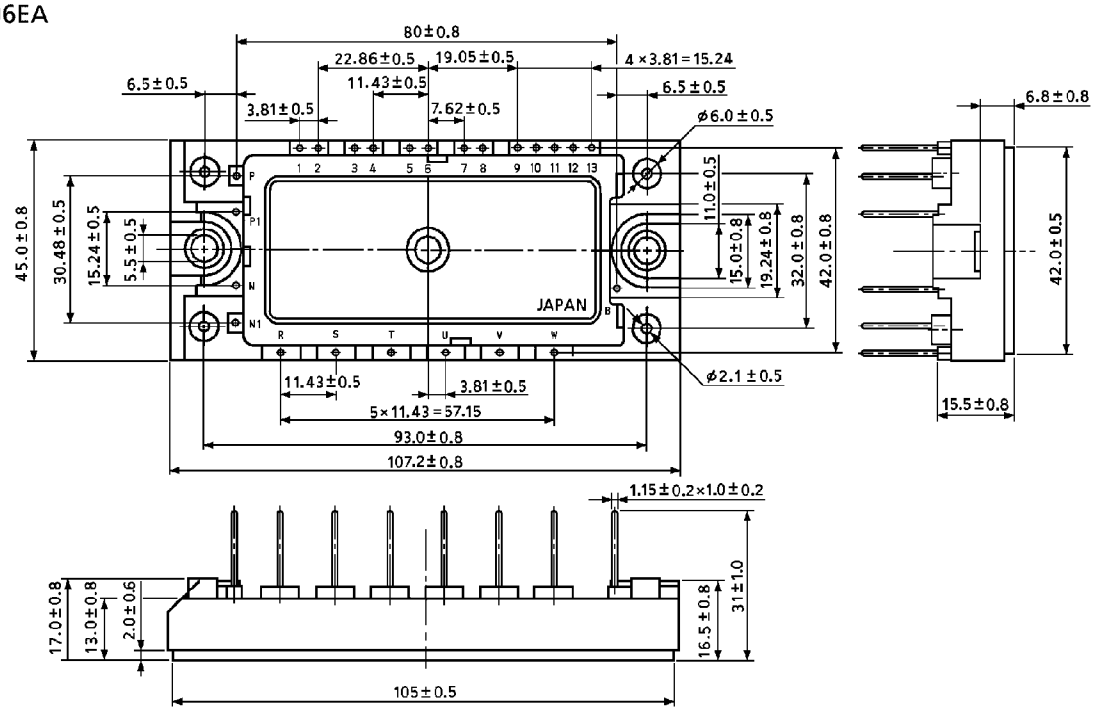
MIG50J806E



2-108E5A

Unit : mm

MIG50J806EA



2-108E6A

MAXIMUM RATINGS (Ta = 25°C)

STAGE	CHARACTERISTIC		SYMBOL	RATING	UNIT
Inverter	Collector-Emitter Voltage		V_{CES}	600	V
	Gate-Emitter Voltage		V_{GES}	±20	V
	Collector Current	DC	I_C	50	A
		1 ms	I_{CP}	100	A
	Forward Current	DC	I_F	50	A
		1 ms	I_{FM}	100	A
	Collector Power Dissipation (Tc = 25°C)		P_C	200	W
Converter	Repetitive Peak Reverse Voltage		V_{RRM}	800	V
	Average Output Rectified Current		I_O	30	A
	Peak One Cycle Surge Forward Current (50 Hz, Non-Repetitive)		I_{FSM}	400	A
Module	Junction Temperature		T_j	150	°C
	Storage Temperature Range		T_{stg}	−40~125	°C
	Isolation Voltage		V_{Isol}	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_{GES}	V_{GE} = ±20 V, V_{CE} = 0		—	—	±500	nA
Collector Cut-Off Current		I_{CES}	V_{CE} = 600 V, V_{GE} = 0		—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE\ (off)}$	I_C = 5 mA, V_{CE} = 5 V		5.0	—	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$	I_C = 50 A, V_{GE} = 15 V	T_j = 25°C	—	2.3	2.8	V
				T_j = 125°C	—	—	—	
Input Capacitance		C_{ies}	V_{CE} = 10 V, V_{GE} = 0, f = 1 MHz		—	—	—	pF
Switching Time	Rise Time	t_r	V_{CC} = 300 V, I_C = 50 A, V_{GE} = ±15 V, R_G = 24 Ω (Note 1)		—	0.10	0.20	μs
	Turn-On Time	t_{on}			—	0.25	0.50	
	Fall Time	t_f			—	0.15	0.30	
	Turn-Off Time	t_{off}			—	0.50	0.80	
Forward Voltage		V_F	I_F = 50 A, V_{GE} = 0		—	2.0	2.8	V
Reverse Recovery Time		t_{rr}	I_F = 50 A, V_{GE} = −10 V, di / dt = 100 A / μs		—	0.08	0.15	μs
Thermal Resistance		$R_{th\ (j-c)}$	Transistor		—	—	0.6	°C / W
			Diode		—	—	1.5	

b. Converter stage

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

c. Thermistor

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Zero-power Resistance	R_{25}	I_{TM} = 0.2 mA, Tc = 25°C	17.31	20	23.14	kΩ
B Value	$B_{25\ /\ 85}$	Tc = 25°C / Tc = 85°C	—	3760	—	K