TENTATIVE TOSHIBA INTEGRATED IGBT MODULE SILICON N CHANNEL IGBT

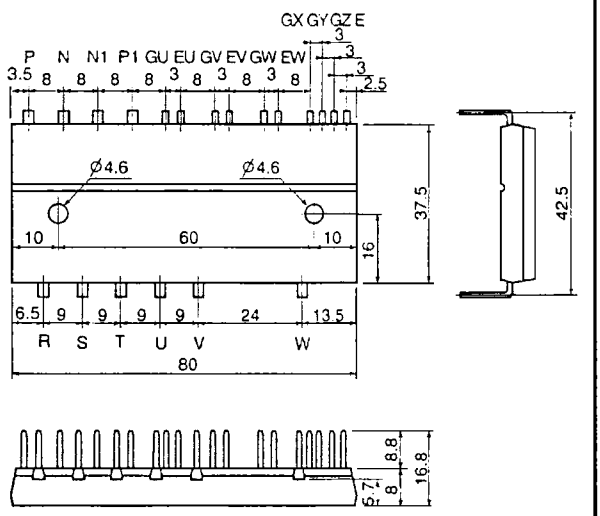
MIG20J855H

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

- Integrates Inverter, Converter Power Circuits in One Package.
- Output (Inverter Stage)
  : 3ϕ 20A / 600V High Speed Type IGBT
  $V_{CE\,(sat)}$ = 2.80V (MAX.)
  t_f = 0.30μs (MAX.)
  t_{rr} = 0.15μs (MAX.)
- Input (Converter Stage)
  : 1ϕ 30A / 800V Silicon Rectifier
  V_F = 1.30V (MAX.)
- The Electrodes are Isolated from Case.

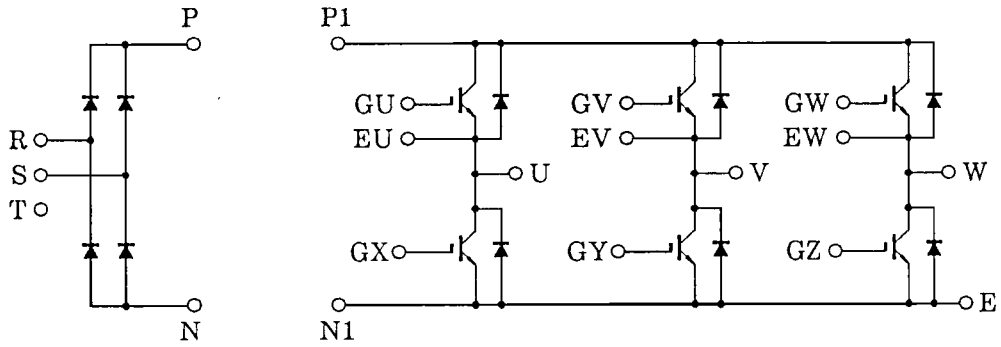
Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	

Weight : 66g

EQUIVALENT CIRCUIT



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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	20	A
		1ms	I_{CP}	40	A
	Forward Current	DC	I_F	20	A
		1ms	I_{FM}	40	A
	Collector Power Dissipation (Tc = 25°C)		P_C	60	W
Converter	Repetitive Peak Reverse Voltage		V_{RRM}	800	V
	Average Output Rectified Current		I_O	30	A
	Peak One Cycle Surge Forward Current (50Hz, 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		—	1.5	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} = ±20V, V_{CE} = 0	—	—	±500	nA
Collector Cut-off Current		I_{CES}	V_{CE} = 600V, V_{GE} = 0	—	—	1.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE\,(off)}$	I_C = 2mA, V_{CE} = 5V	5.0	—	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE\,(sat)}$	I_C = 20A, V_{GE} = 15V	—	2.10	2.80	V
Input Capacitance		C_{ies}	V_{CE} = 10V, V_{GE} = 0, f = 1MHz	—	—	—	pF
Switching Time	Rise Time	t_r	V_{CC} = 300V I_C = 20A V_{GE} = ±15V R_G = 62Ω (Note 1)	—	0.07	0.15	μs
	Turn-on Time	t_{on}		—	0.15	0.30	
	Fall Time	t_f		—	0.15	0.30	
	Turn-off Time	t_{off}		—	0.50	1.00	
Forward Voltage		V_F	I_F = 20A, V_{GE} = 0	—	2.30	2.80	V
Reverse Recovery Time		t_{rr}	I_F = 20A, V_{GE} = −10V di / dt = 50A / μs	—	0.08	0.15	μs
Thermal Resistance		$R_{th\,(j\text{-}c)}$	Transistor	—	—	2.08	°C / W
			Diode	—	—	3.09	

b. Converter stage

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Repetitive Peak Reverse Current	I_{RRM}	V_{RRM}=800V	—	—	50	μA
Peak Forward Voltage	V_{FM}	I_{FM}=30A	—	1.05	1.30	V
Peak One Cycle Surge Forward Current	I_{FSM}	50Hz sine-half-wave	400	—	—	A
Thermal Resistance	$R_{th\,(j\text{-}c)}$	—	—	—	2.30	°C / W

(Note 1) Switching Time Test Circuit & Timing Chart