

TENTATIVE

TOSHIBA INTEGRATED IGBT MODULE SILICON N CHANNEL IGBT

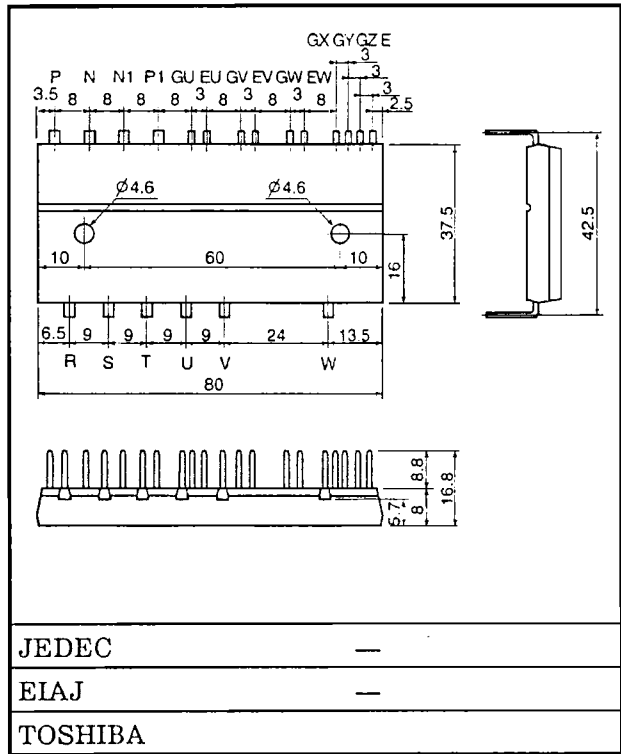
MIG20J855H

HIGH POWER SWITCHING APPLICATIONS

Unit in mm

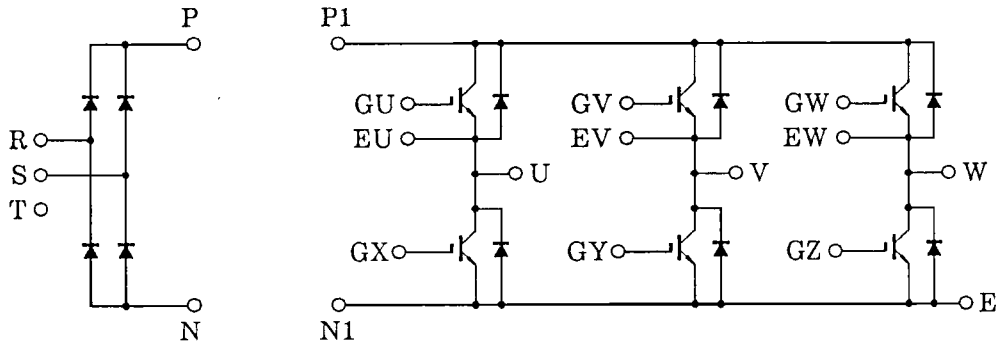
MOTOR CONTROL APPLICATIONS

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



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 (T _c =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-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	$R_{th(j-c)}$	—	—	—	2.30	$^{\circ}C/W$

(Note 1) Switching Time Test Circuit & Timing Chart

