

TENTATIVE

TOSHIBA INTEGRATED IGBT MODULE SILICON N CHANNEL IGBT

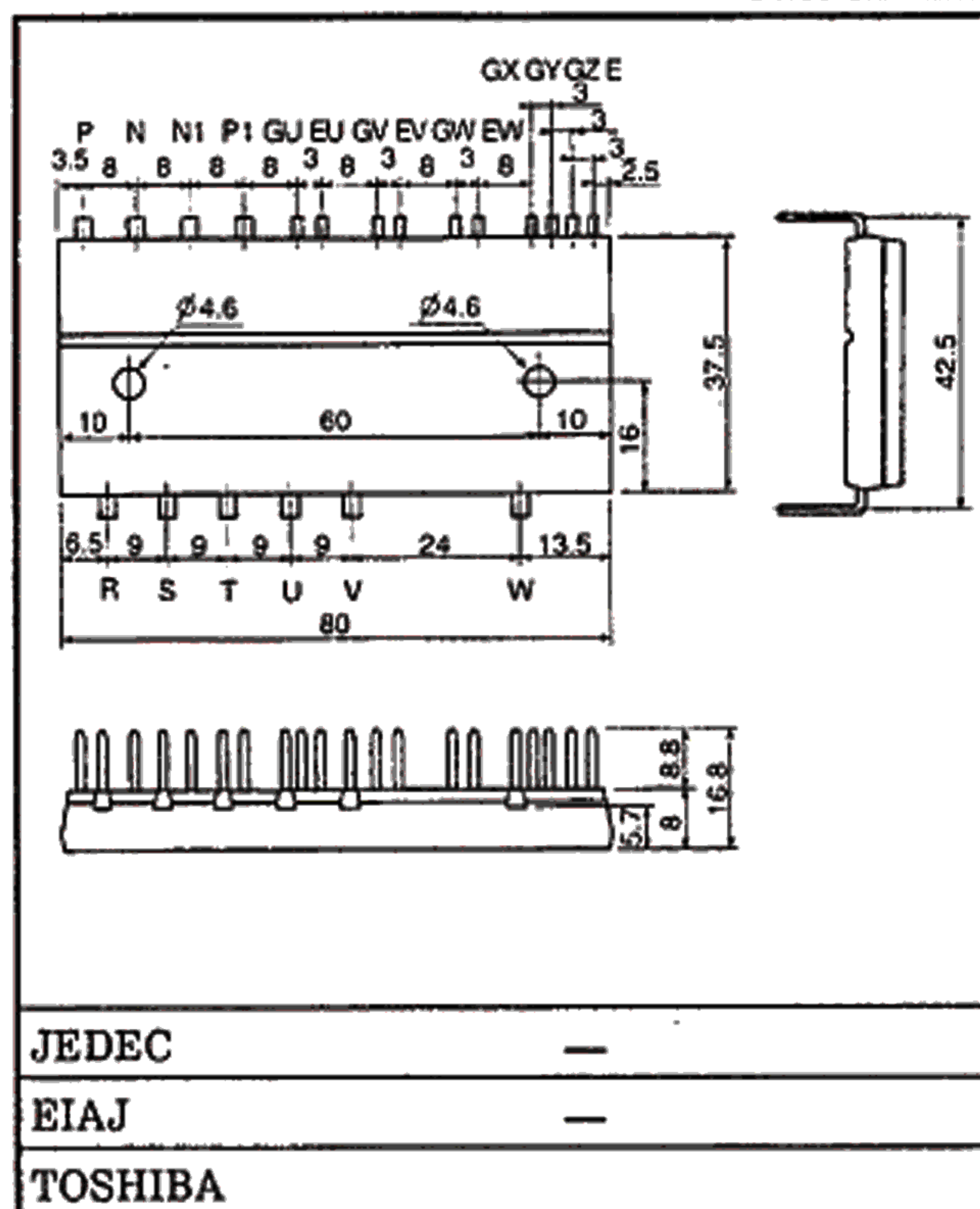
MIG15J805H

HIGH POWER SWITCHING APPLICATIONS

Unit in mm

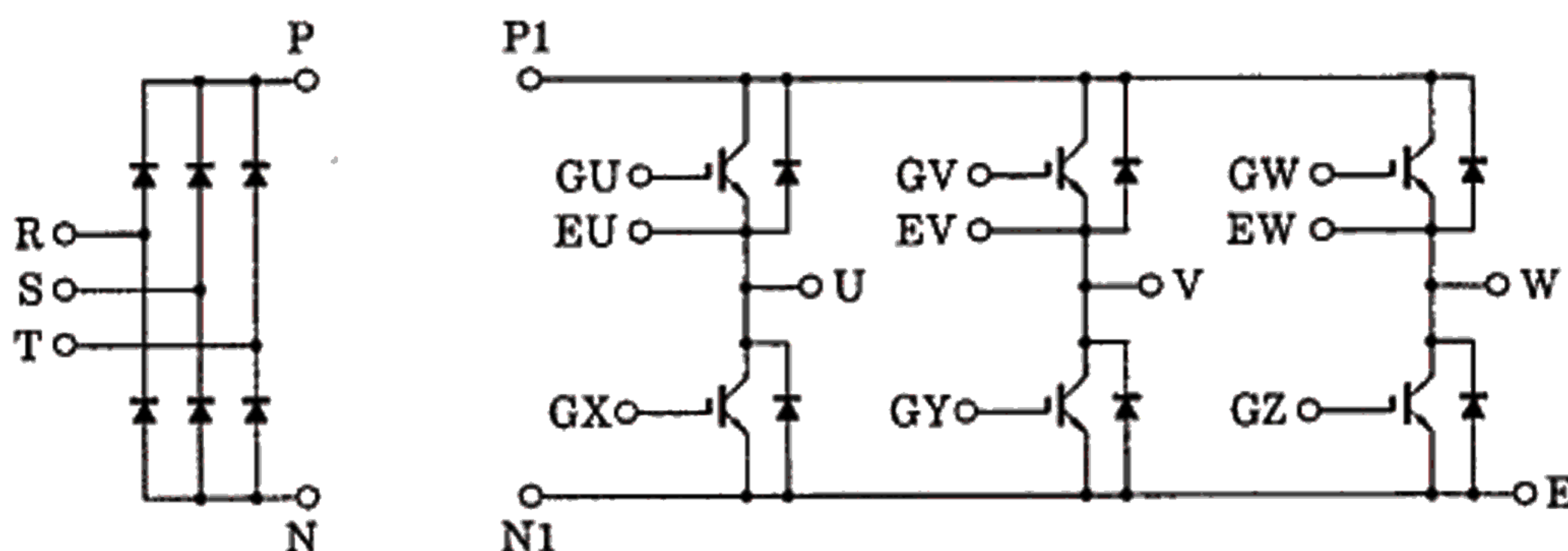
MOTOR CONTROL APPLICATIONS

- Integrates Inverter, Converter Power Circuits in One Package.
- Output (Inverter Stage)
: 3 ϕ 15A/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)
: 3 ϕ 20A/800V Silicon Rectifier
 $V_F = 1.30V$ (MAX.)
- The Electrodes are Isolated from Case.



Weight : 66g

EQUIVALENT CIRCUIT



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MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

STAGE	CHARACTERISTIC	SYMBOL	RATING	UNIT
Inverter	Collector-Emitter Voltage	V_{CES}	600	V
	Gate-Emitter Voltage	V_{GES}	± 20	V
	Collector Current	DC	15	A
		1ms	30	A
	Forward Current	DC	15	A
		1ms	30	A
Converter	Collector Power Dissipation ($T_c = 25^\circ\text{C}$)	P_C	55	W
	Repetitive Peak Reverse Voltage	V_{RRM}	800	V
	Average Output Rectified Current	I_O	20	A
	Peak One Cycle Surge Forward Current (50Hz, Non-Repetitive)	I_{FSM}	250	A
Module	Junction Temperature	T_j	150	$^\circ\text{C}$
	Storage Temperature Range	T_{stg}	$-40 \sim 125$	$^\circ\text{C}$
	Isolation Voltage	V_{Isol}	2500 (AC 1 minute)	V
	Screw Torque	—	1.5	N·m

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

a. Inverter stage

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	I_{GES}	$V_{GE} = \pm 20\text{V}$, $V_{CE} = 0$	—	—	± 500	nA
Collector Cut-off Current	I_{CES}	$V_{CE} = 600\text{V}$, $V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-off Voltage	$V_{GE}(\text{off})$	$I_C = 1.5\text{mA}$, $V_{CE} = 5\text{V}$	5.0	—	8.0	V
Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C = 15\text{A}$, $V_{GE} = 15\text{V}$	—	2.10	2.80	V
Input Capacitance	C_{ies}	$V_{CE} = 10\text{V}$, $V_{GE} = 0$, $f = 1\text{MHz}$	—	—	—	pF
Switching Time	Rise Time	$V_{CC} = 300\text{V}$ $I_C = 15\text{A}$ $V_{GE} = \pm 15\text{V}$ $R_G = 82\Omega$ (Note 1)	—	0.07	0.15	μs
	Turn-on Time		—	0.15	0.30	
	Fall Time		—	0.15	0.30	
	Turn-off Time		—	0.50	1.00	
Forward Voltage	V_F	$I_F = 15\text{A}$, $V_{GE} = 0$	—	2.30	2.80	V
Reverse Recovery Time	t_{rr}	$I_F = 15\text{A}$, $V_{GE} = -10\text{V}$ $di/dt = 50\text{A}/\mu\text{s}$	—	0.08	0.15	μs
Thermal Resistance	$R_{th(j-c)}$	Transistor	—	—	2.27	$^\circ\text{C}/\text{W}$
		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}	$I_{FM}=20A$	—	1.05	1.30	V
Peak One Cycle Surge Forward Current	I_{FSM}	50Hz sine-half-wave	250	—	—	A
Thermal Resistance	$R_{th(j-c)}$	—	—	—	2.80	$^{\circ}C/W$

(Note 1) Switching Time Test Circuit & Timing Chart

