

TOSHIBA INTEGRATED IGBT MODULE SILICON N CHANNEL IGBT

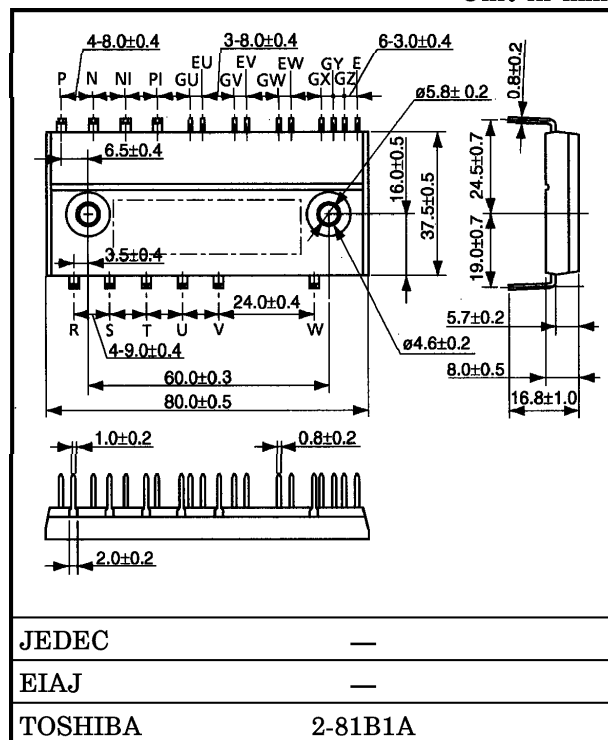
MIG20J805H

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

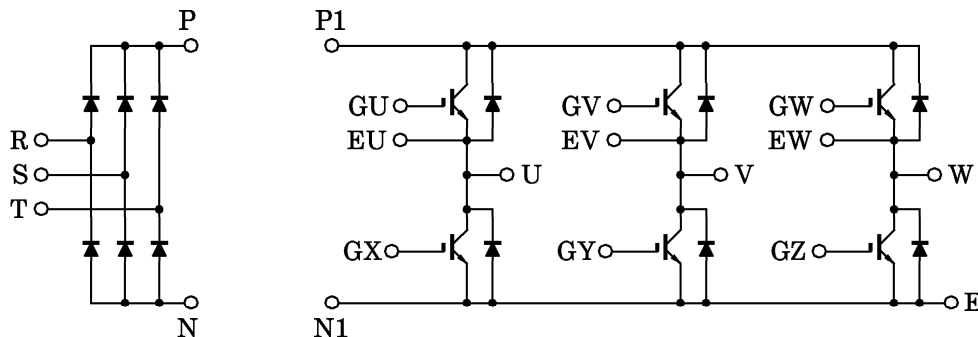
- Integrates Inverter, Converter Power Circuits in One Package.
- Output (Inverter Stage)
: 3 ϕ 20A / 600V IGBT
- Input (Converter Stage)
: 3 ϕ 20A / 800V Silicon Rectifier
- The Electrodes are Isolated from Case.

Unit in mm



Weight : 66g

EQUIVALENT CIRCUIT



961001EAA1

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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
Converter	Collector Power Dissipation (T _c = 25°C)		P _C	60	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	°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)

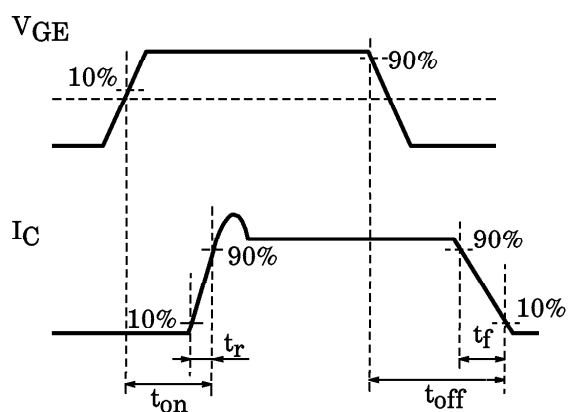
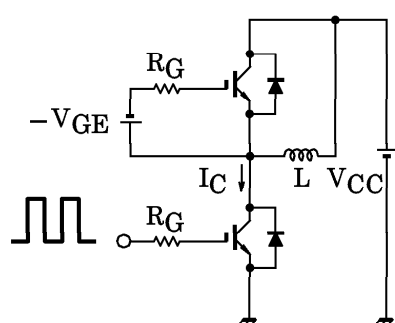
a. Inverter stage

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	2.60	V
Input Capacitance		C _{ies}	V _{CE} = 10V, V _{GE} = 0, f = 1MHz	—	1850	—	pF
Switching Time	Rise Time	t _r	V _{CC} = 300V I _C = 20A V _{GE} = ±15V R _G = 62Ω (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 = 20A, V _{GE} = 0	—	1.7	2.7	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	

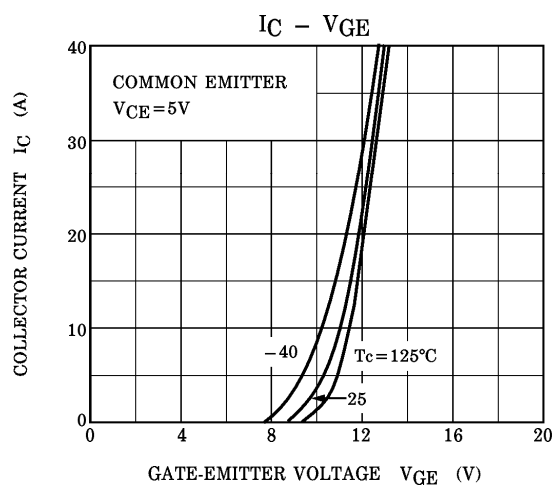
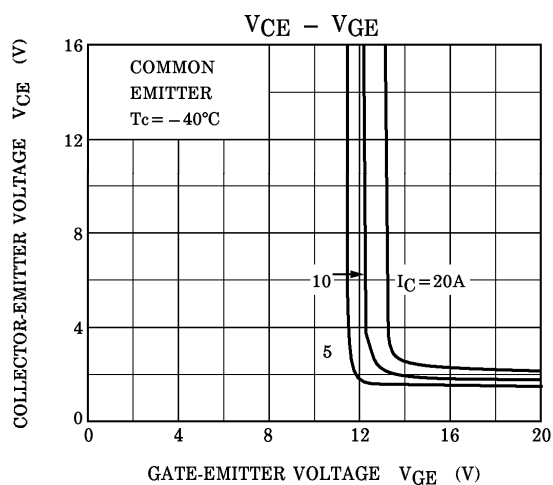
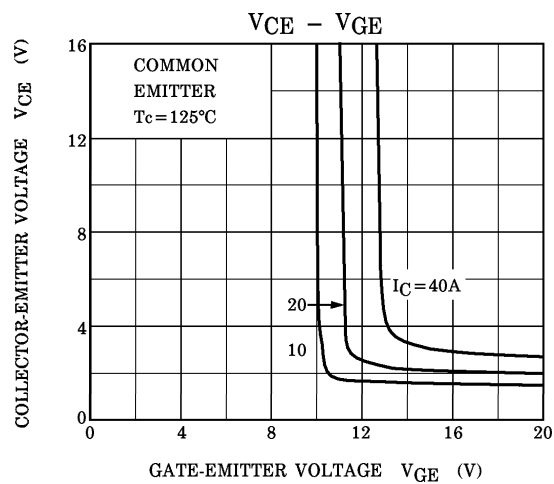
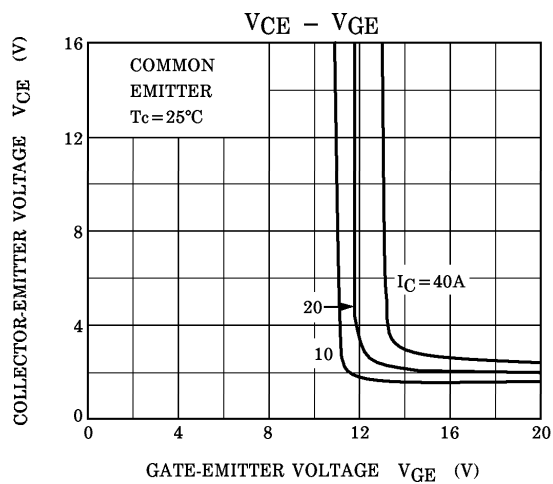
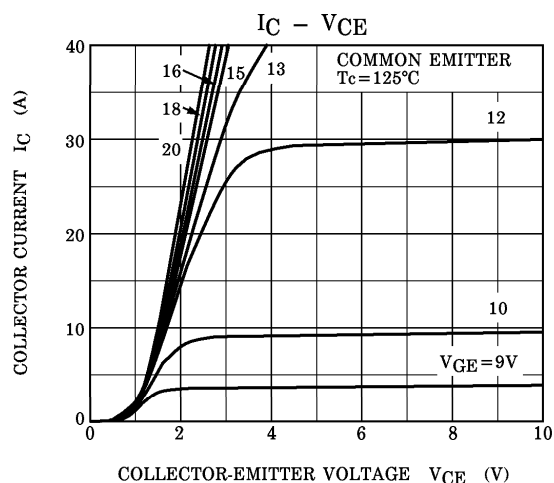
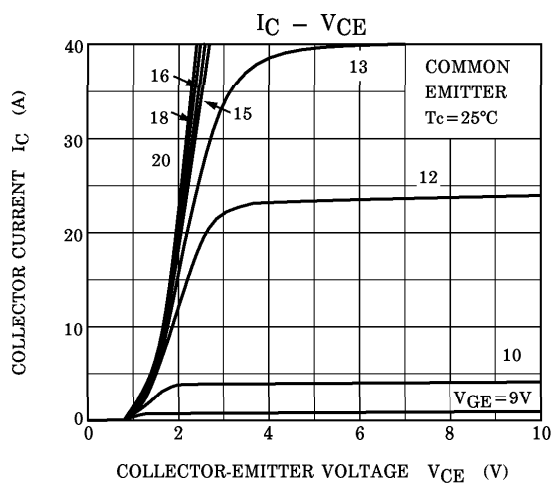
b. Converter stage

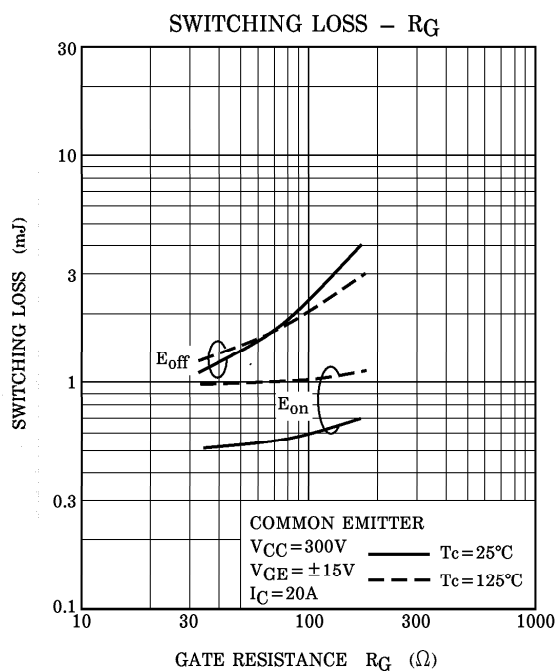
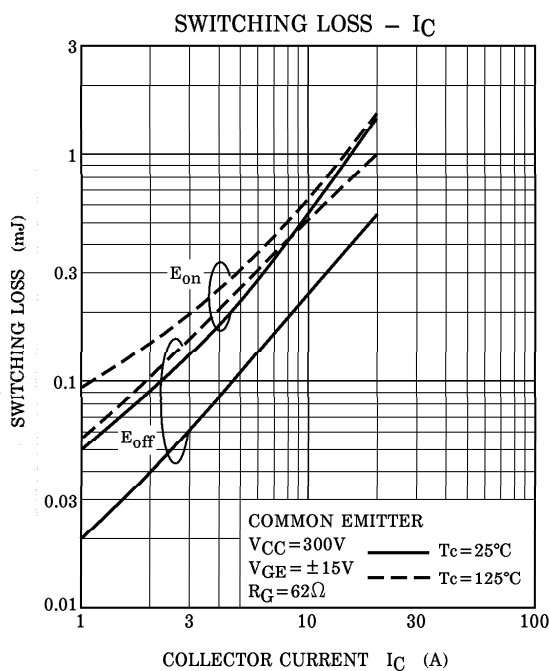
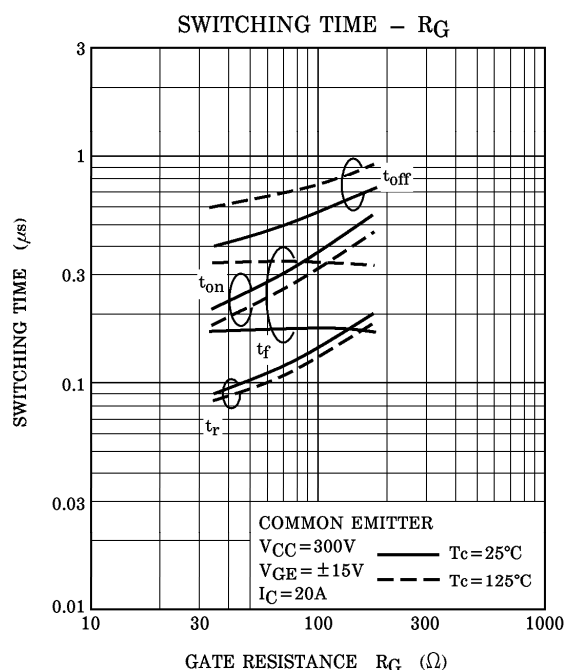
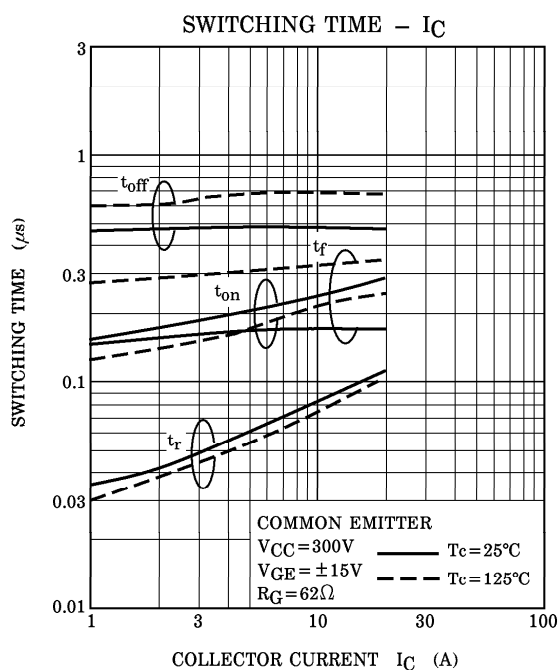
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Repetitive Peak Reverse Current	I_{RRM}	$V_{RRM} = 800V$	—	—	50	μA
Peak Forward Voltage	V_{FM}	$I_{FM} = 20A$	—	1.05	1.20	V
Peak One Cycle Surge Forward Current	I_{FSM}	50Hz sine-half-wave	250	—	—	A
Thermal Resistance	$R_{th(j-c)}$	—	—	—	2.80	$^{\circ}C/W$

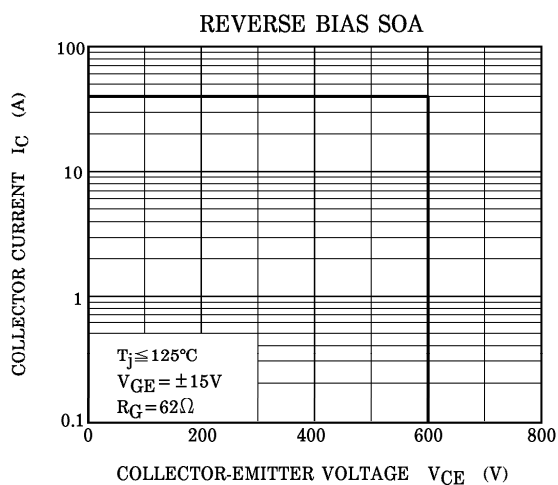
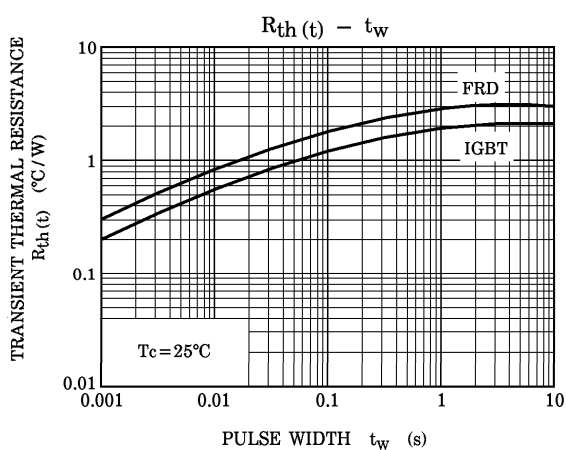
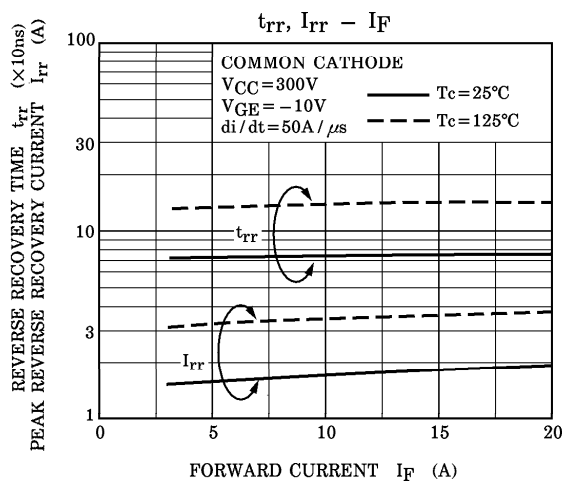
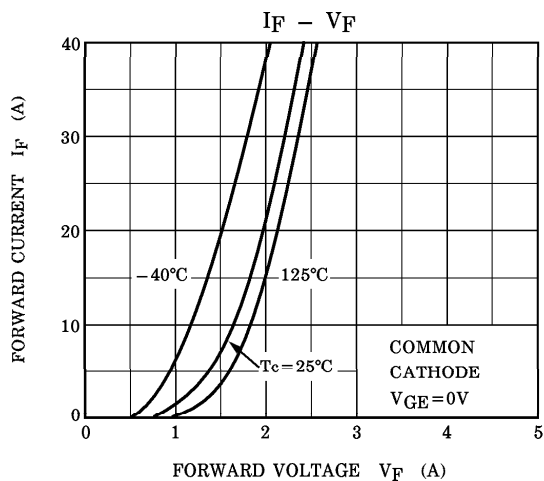
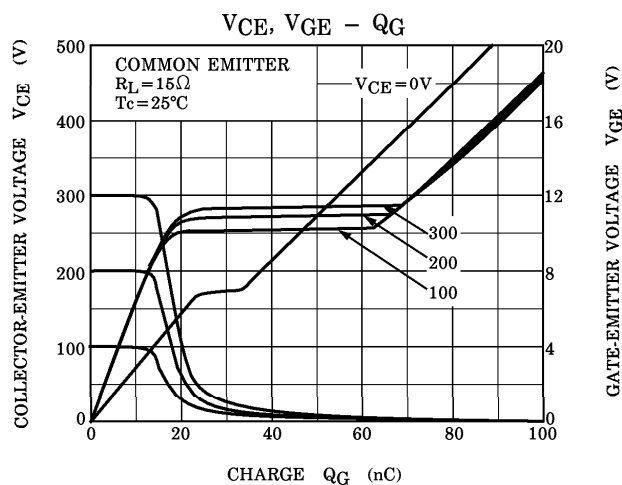
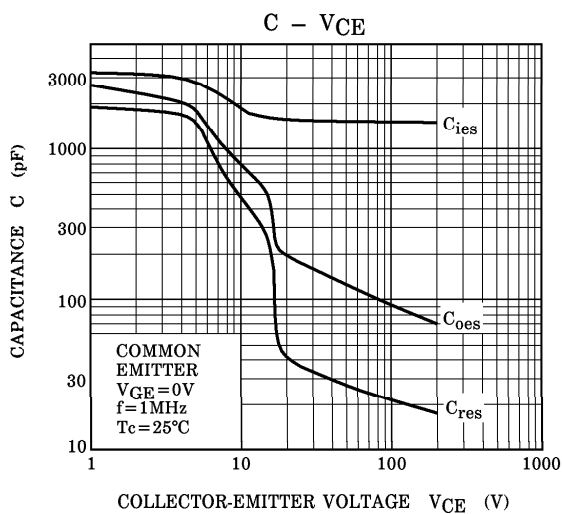
(Note 1) Switching Time Test Circuit & Timing Chart



a. INVERTER STAGE







b. CONVERTER STAGE

