

TOSHIBA INTEGRATED IGBT MODULE SILICON N CHANNEL IGBT

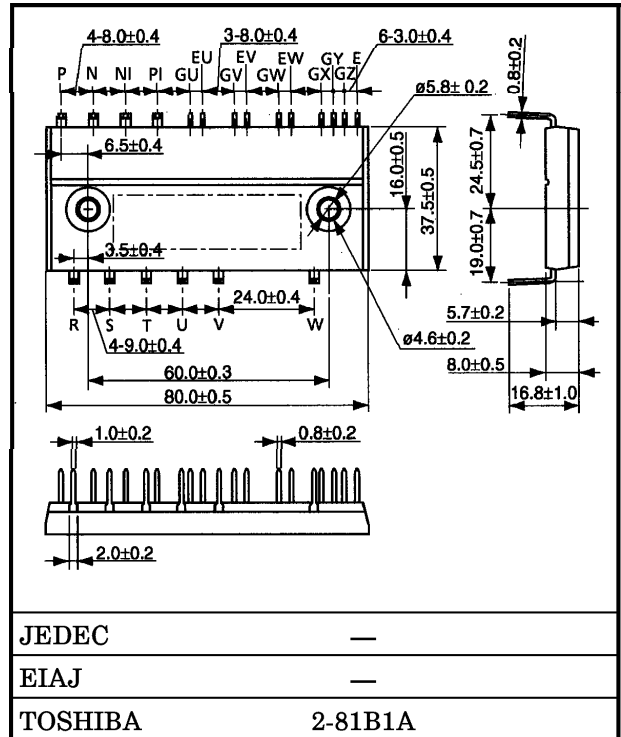
# MIG10Q805H

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

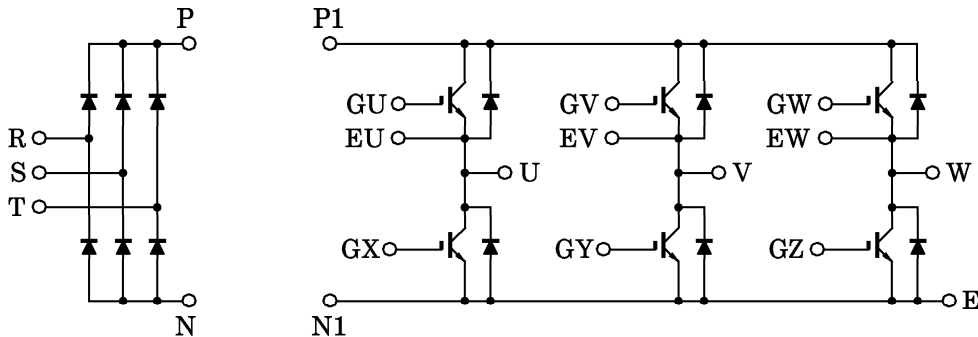
- Integrates Inverter, Converter Power Circuits in One Package.
- Output (Inverter Stage)  
: 3φ 10A / 1200V IGBT
- Input (Converter Stage)  
: 3φ 15A / 1600V Silicon Rectifier
- The Electrodes are Isolated from Case.

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 <sub>CES</sub>	1200	V	
	Gate-Emitter Voltage	V <sub>GES</sub>	±20	V	
	Collector Current	DC	I <sub>C</sub>	10	A
		1ms	I <sub>CP</sub>	20	A
	Forward Current	DC	I <sub>F</sub>	10	A
		1ms	I <sub>FM</sub>	20	A
Collector Power Dissipation (T <sub>c</sub> = 25°C)		P <sub>C</sub>	56	W	
Converter	Repetitive Peak Reverse Voltage	V <sub>RRM</sub>	1600	V	
	Average Output Rectified Current	I <sub>O</sub>	15	A	
	Peak One Cycle Surge Forward Current (50Hz, Non-Repetitive)	I <sub>FSM</sub>	250	A	
Module	Junction Temperature	T <sub>j</sub>	150	°C	
	Storage Temperature Range	T <sub>stg</sub>	-40~125	°C	
	Isolation Voltage	V <sub>Isol</sub>	2500 (AC 1 minute)	V	
	Screw Torque	—	1.5	N·m	

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

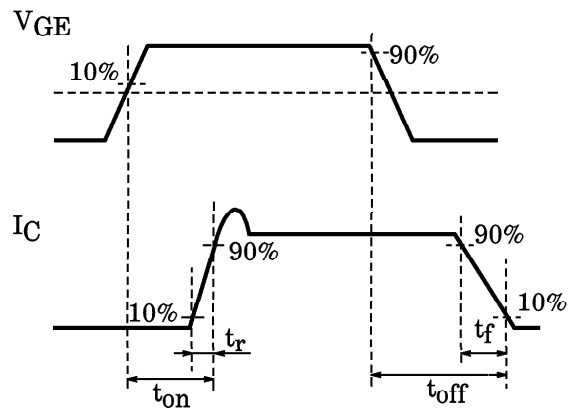
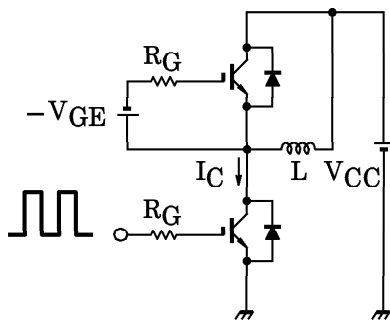
a. Inverter stage

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	I <sub>GES</sub>	V <sub>GE</sub> = ±20V, V <sub>CE</sub> = 0	—	—	±500	nA
Collector Cut-off Current	I <sub>CES</sub>	V <sub>CE</sub> = 1200V, V <sub>GE</sub> = 0	—	—	1.0	mA
Gate-Emitter Cut-off Voltage	V <sub>GE (off)</sub>	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 5V	3.0	—	6.0	V
Collector-Emitter Saturation Voltage	V <sub>CE (sat)</sub>	I <sub>C</sub> = 10A, V <sub>GE</sub> = 15V	—	2.80	3.40	V
Input Capacitance	C <sub>ies</sub>	V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0, f = 1MHz	—	1200	—	pF
Switching Time	Rise Time	V <sub>CC</sub> = 600V I <sub>C</sub> = 10A V <sub>GE</sub> = ±15V R <sub>G</sub> = 120Ω (Note 1)	—	0.07	0.15	μs
	Turn-on Time		—	0.15	0.30	
	Fall Time		—	0.10	0.30	
	Turn-off Time		—	0.60	1.20	
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10A, V <sub>GE</sub> = 0,	—	2.20	3.0	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 10A, V <sub>GE</sub> = -10V di / dt = 150A / μs	—	0.10	0.25	μs
Thermal Resistance	R <sub>th (j-c)</sub>	Transistor	—	—	2.20	°C / W
		Diode	—	—	3.09	

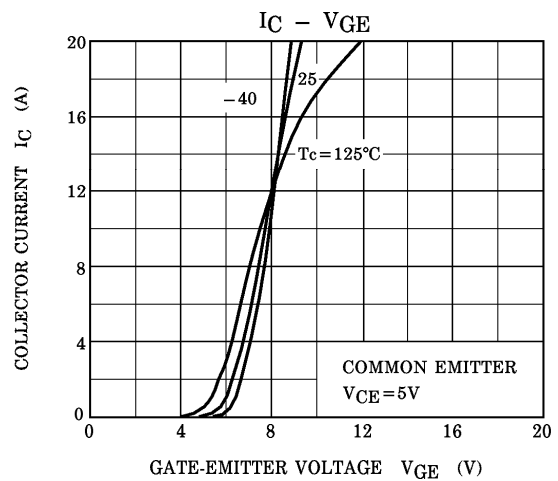
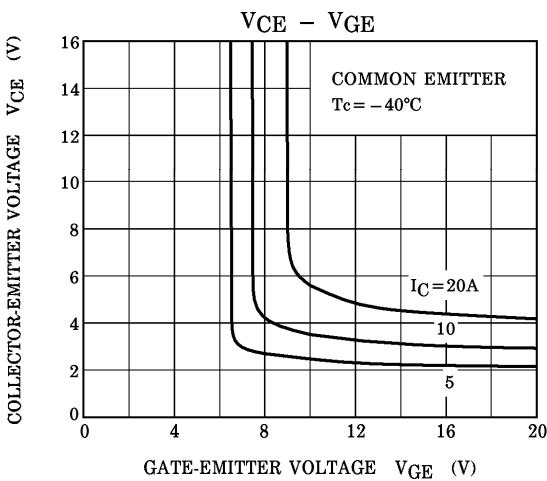
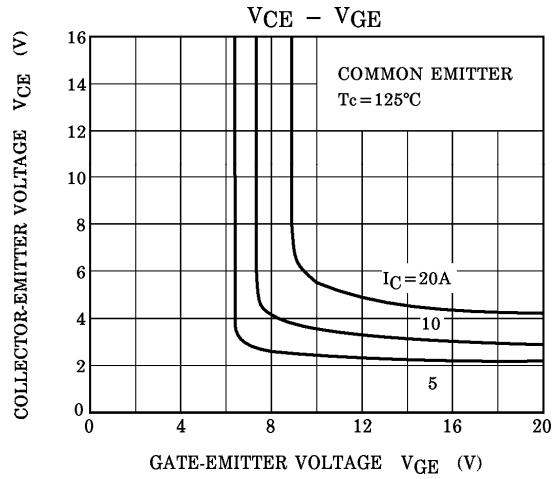
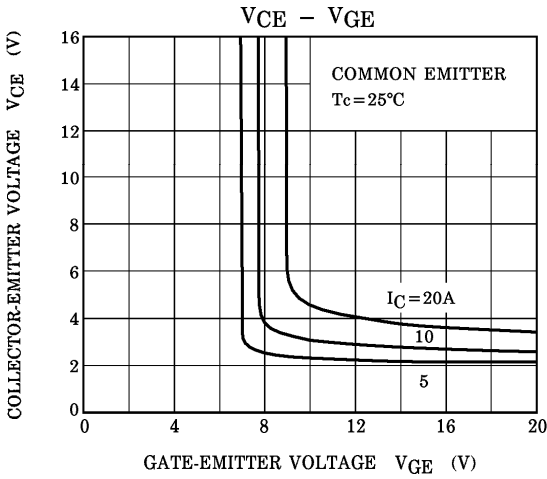
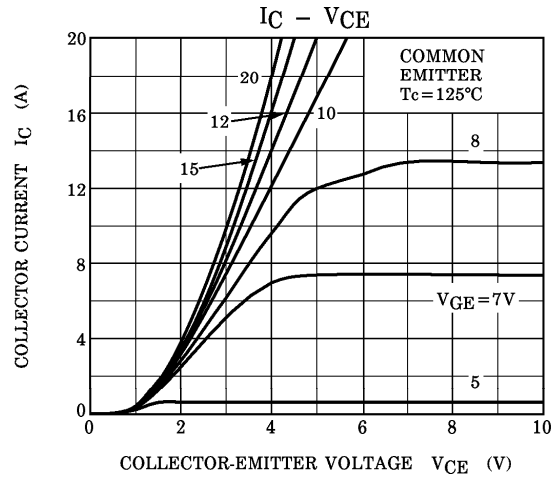
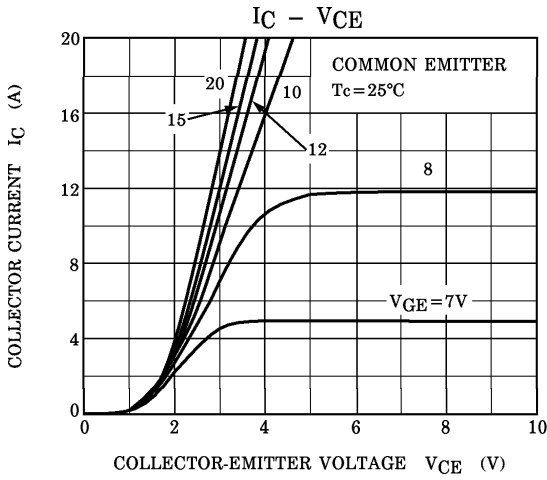
b. Converter stage

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Repetitive Peak Reverse Current	$I_{RRM}$	$V_{RRM} = 1600V$	—	—	50	$\mu A$
Peak Forward Voltage	$V_{FM}$	$I_{FM} = 15A$	—	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	$^{\circ}C/W$

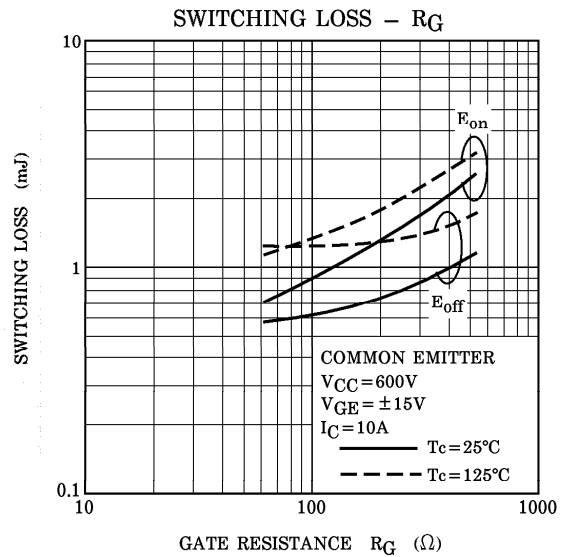
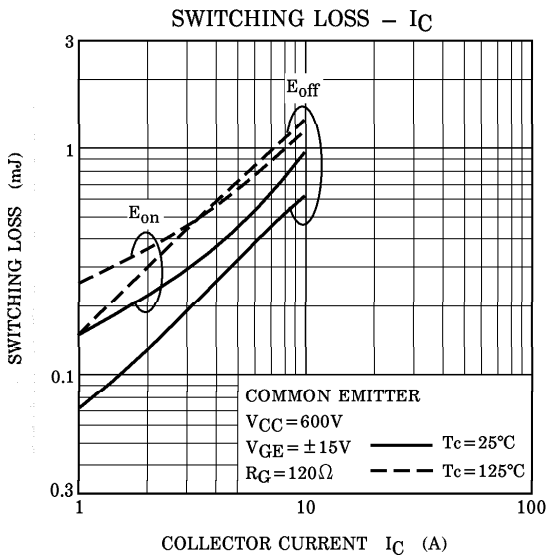
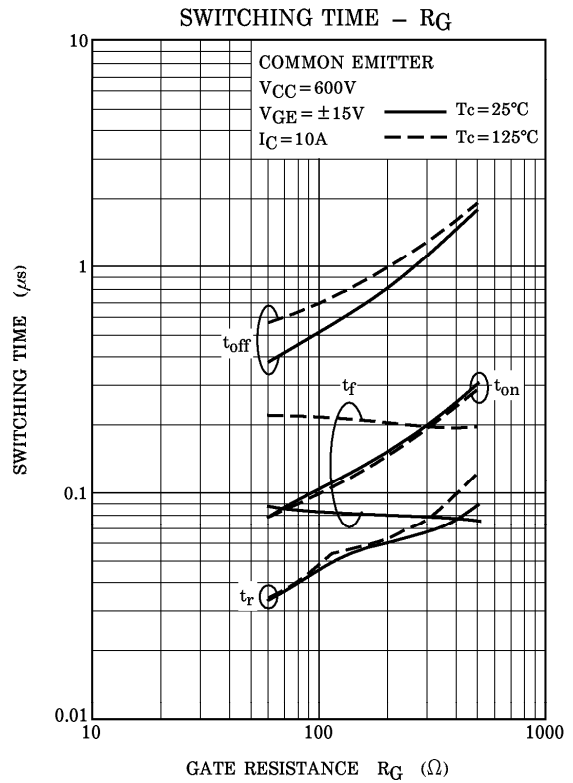
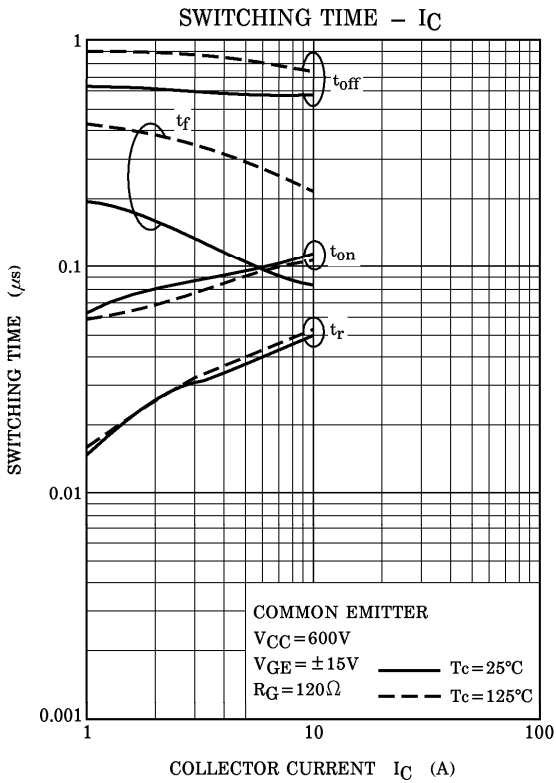
(Note 1) Switching Time Test Circuit & Timing Chart



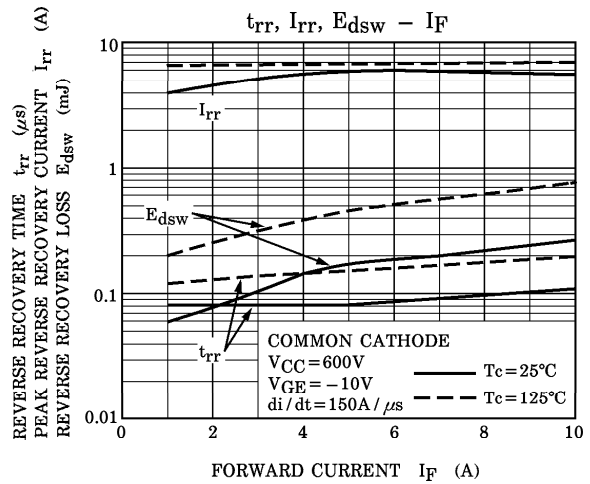
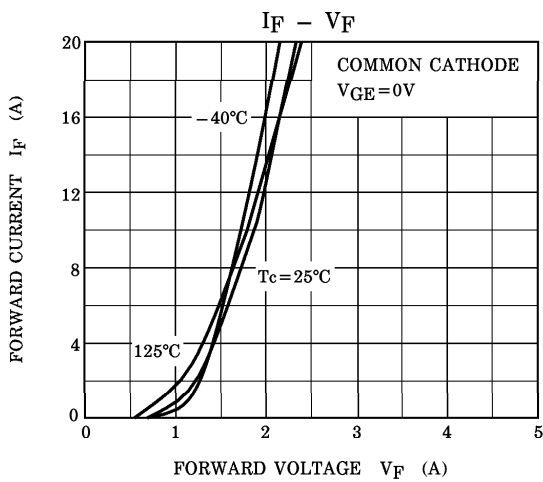
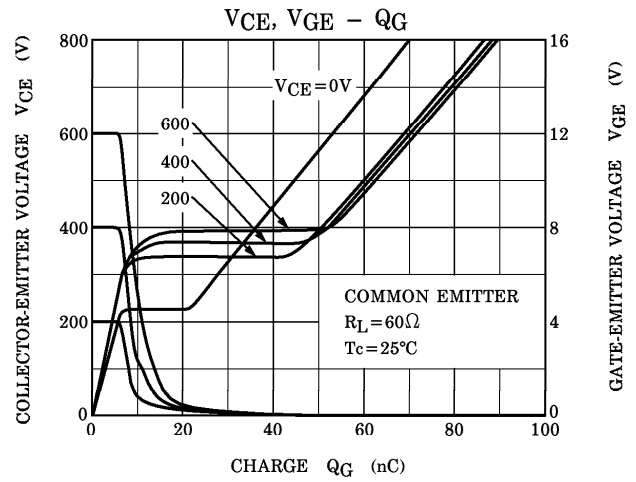
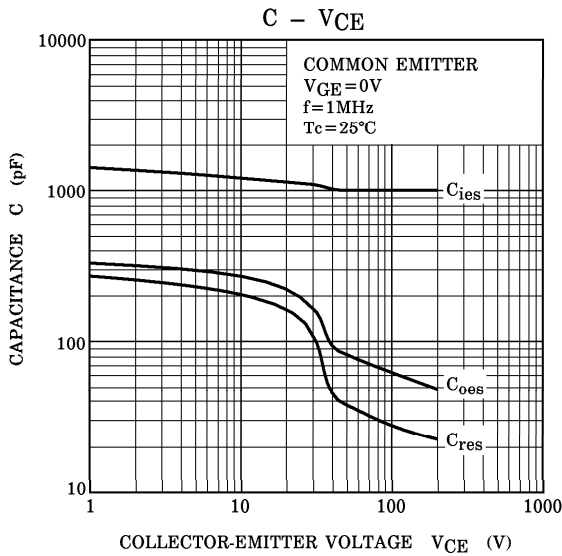
a. INVERTER STAGE



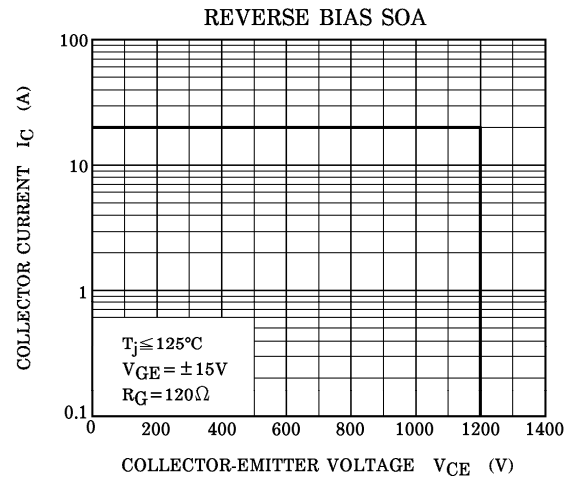
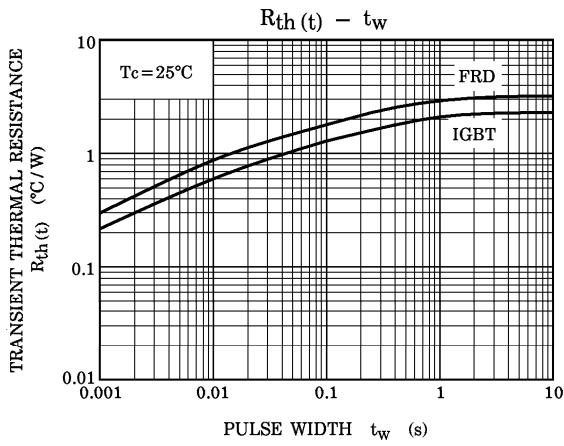
**a. INVERTER STAGE**



**a. INVERTER STAGE**



**a. INVERTER STAGE**



**b. CONVERTER STAGE**

