

TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR SILICON N CHANNEL IGBT

GT10Q301

Unit in mm

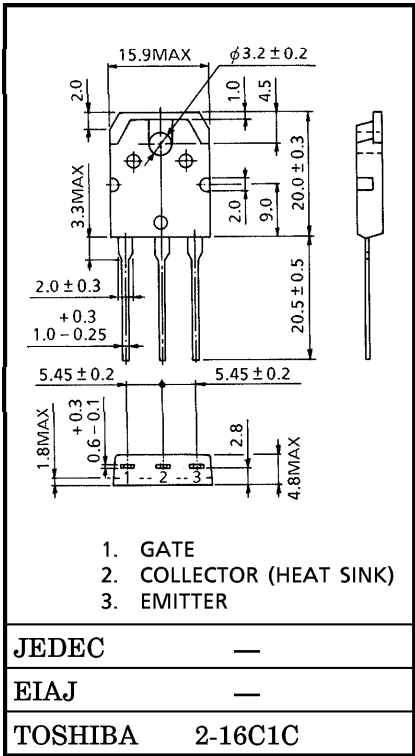
HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

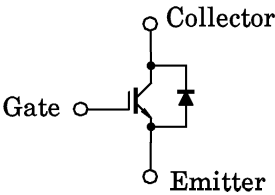
- The 3rd Generation
- Enhancement-Mode
- High Speed : $t_f = 0.32 \mu s$ (Max.)
- Low Saturation Voltage : $V_{CE(sat)} = 2.7 V$ (Max.)
- FRD included between Emitter and Collector

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V_{CES}	1200	V
Gate-Emitter Voltage	V_{GES}	± 20	V
Collector Current	DC	I_C	10 A
	1 ms	I_{CP}	20 A
Emitter-Collector Forward Current	DC	I_F	10 A
	1 ms	I_{FM}	20 A
Collector Power Dissipation (Tc = 25°C)	P_C	140	W
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	-55~150	°C



EQUIVALENT CIRCUIT



961001EAA1

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

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}	$V_{CE} = 1200\text{ V}, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE}(\text{OFF})$	$I_C = 1\text{ mA}, V_{CE} = 5\text{ V}$	4.0	—	7.0	V
Collector-Emitter Saturation Voltage		$V_{CE}(\text{sat})$	$I_C = 10\text{ A}, V_{GE} = 15\text{ V}$	—	2.1	2.7	V
Input Capacitance		C_{ies}	$V_{CE} = 50\text{ V}, V_{GE} = 0,$ $f = 1\text{ MHz}$	—	600	—	pF
Switching Time	Rise Time	t_r	Inductive Load $V_{CC} = 600\text{ V}, I_C = 10\text{ A}$ $V_{GG} = \pm 15\text{ V}, R_G = 75\ \Omega$ (Note)	—	0.07	—	μs
	Turn-On Time	t_{on}		—	0.30	—	
	Fall Time	t_f		—	0.16	0.32	
	Turn-Off Time	t_{off}		—	0.50	—	
Peak Forward Voltage		V_F	$I_F = 10\text{ A}, V_{GE} = 0$	—	—	3.0	V
Reverse Recovery Time		t_{rr}	$I_F = 10\text{ A}, di/dt = -200\text{ A}/\mu\text{s}$	—	—	350	ns
Thermal Resistance (IGBT)		$R_{th(j-c)}$	—	—	—	0.89	$^{\circ}\text{C}/\text{W}$
Thermal Resistance (Diode)		$R_{th(j-c)}$	—	—	—	1.79	$^{\circ}\text{C}/\text{W}$

(Note) : Switching time measurement circuit and input/output waveforms

