

TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR SILICON N CHANNEL IGBT

# GT15Q301

HIGH POWER SWITCHING APPLICATIONS

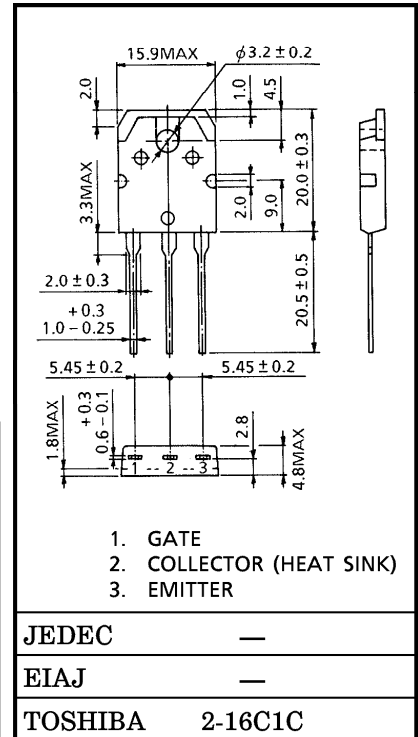
MOTOR CONTROL APPLICATIONS

- 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 ( $T_a = 25^\circ C$ )

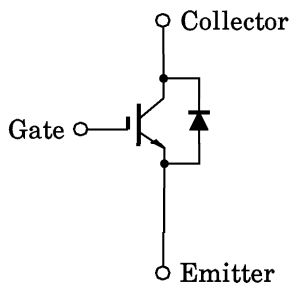
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	$V_{CES}$	1200	V
Gate-Emitter Voltage	$V_{GES}$	$\pm 20$	V
Collector Current	DC	$I_C$	15 A
	1ms	$I_{CP}$	30 A
Emitter-Collector Forward Current	DC	$I_F$	15 A
	1ms	$I_{FM}$	30 A
Collector Power Dissipation ( $T_c = 25^\circ C$ )	$P_C$	170	W
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55~150	$^\circ C$

Unit in mm



Weight : 4.6 g

EQUIVALENT CIRCUIT



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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	$I_{GES}$	$V_{GE} = \pm 20\text{ V}, V_{CE} = 0$	—	—	$\pm 500$	nA
Collector Cut-Off Current	$I_{CES}$	$V_{CE} = 1200\text{ V}, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage	$V_{GE(OFF)}$	$I_C = 1.5\text{ mA}, V_{CE} = 5\text{ V}$	4.0	—	7.0	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 15\text{ A}, V_{GE} = 15\text{ V}$	—	2.1	2.7	V
Input Capacitance	$C_{ies}$	$V_{CE} = 50\text{ V}, V_{GE} = 0, f = 1\text{ MHz}$	—	950	—	pF
Switching Time	Rise Time	Inductive Load $V_{CC} = 600\text{ V}, I_C = 15\text{ A}$ $V_{GG} = \pm 15\text{ V}, R_G = 56\ \Omega$ (Note)	—	0.05	—	$\mu\text{s}$
	Turn-On Time		—	0.12	—	
	Fall Time		—	0.16	0.40	
	Turn-Off Time		—	0.56	—	
Peak Forward Voltage	$V_F$	$I_F = 15\text{ A}, V_{GE} = 0$	—	—	3.0	V
Reverse Recovery Time	$t_{rr}$	$I_F = 15\text{ A}, di/dt = -200\text{ A}/\mu\text{s}$	—	—	350	ns
Thermal Resistance (IGBT)	$R_{th(j-c)}$	—	—	—	0.74	°C/W
Thermal Resistance (Diode)	$R_{th(j-c)}$	—	—	—	1.56	°C/W

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

