

TOSHIBA**GT10Q301**

TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR SILICON N CHANNEL IGBT

GT10Q301

HIGH POWER SWITCHING APPLICATIONS

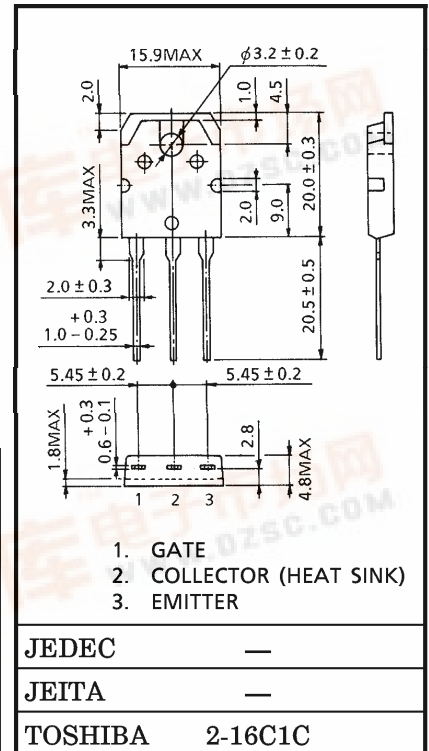
MOTOR CONTROL APPLICATIONS

- 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

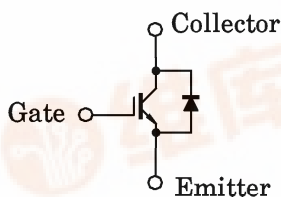
MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	± 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 ($T_c = 25^\circ C$)		P_C	140	W
Junction Temperature		T_j	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$

Unit in mm



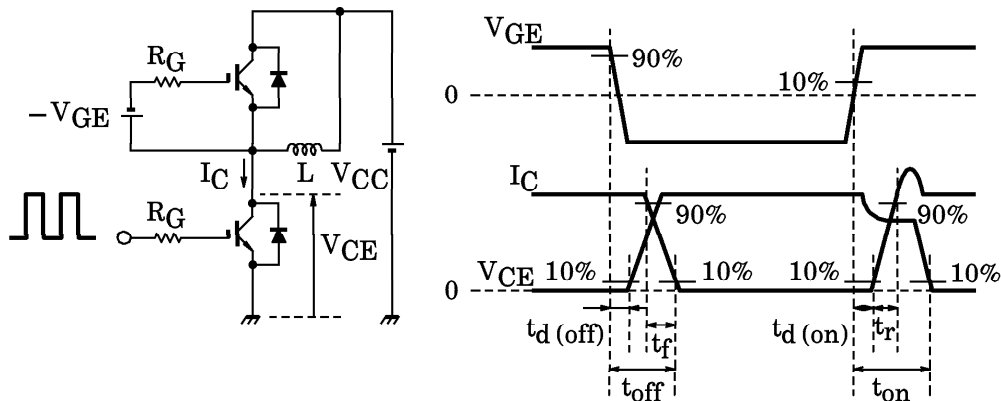
EQUIVALENT CIRCUIT

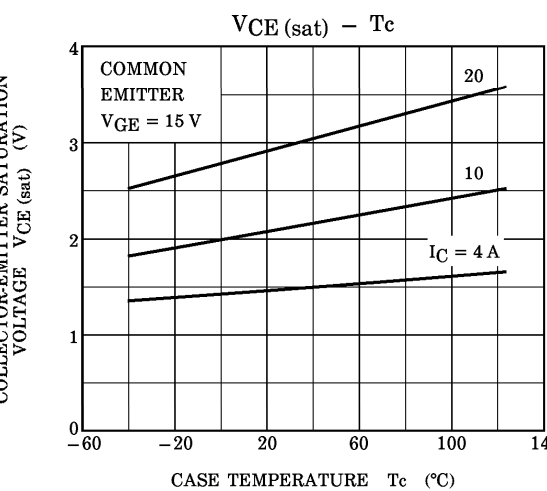
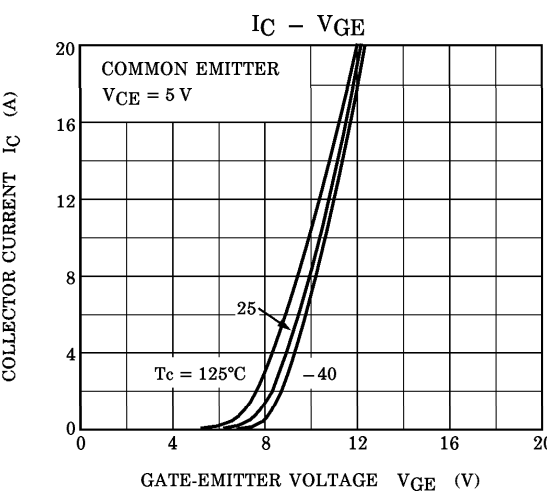
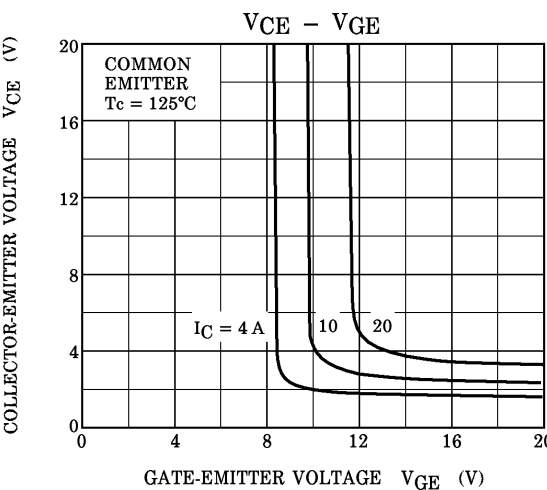
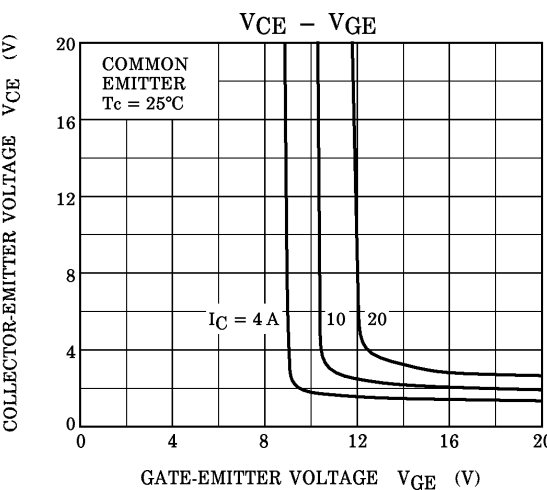
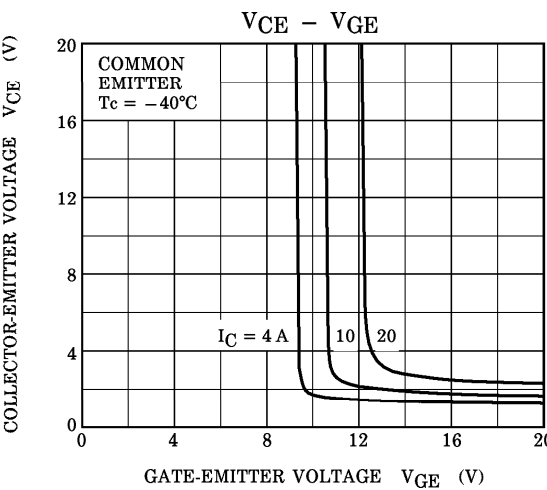
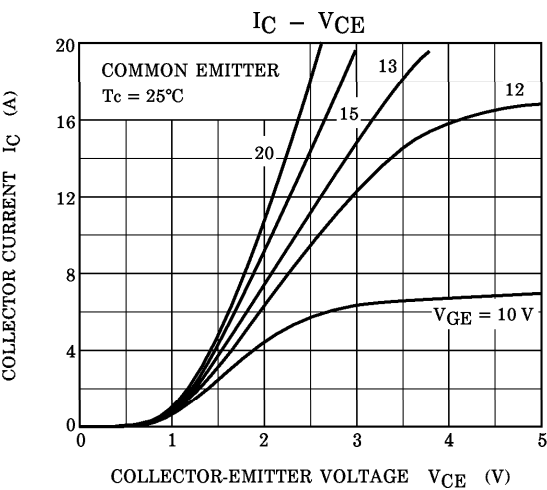


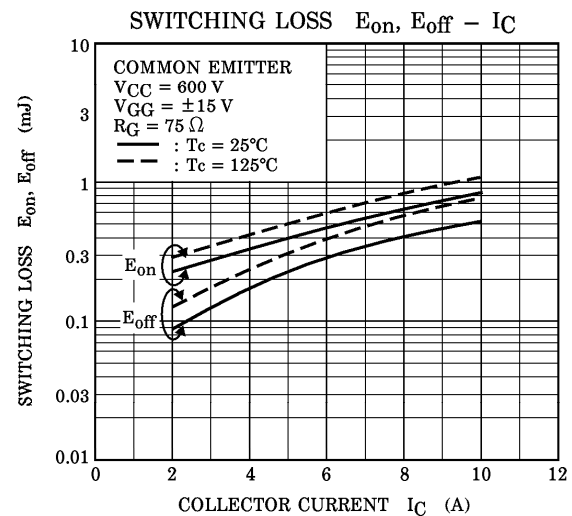
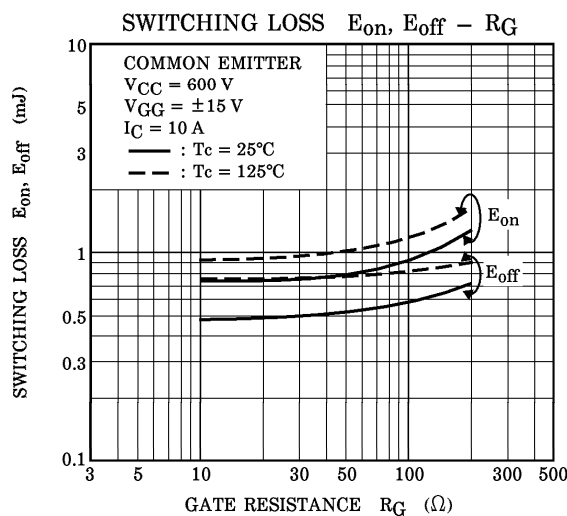
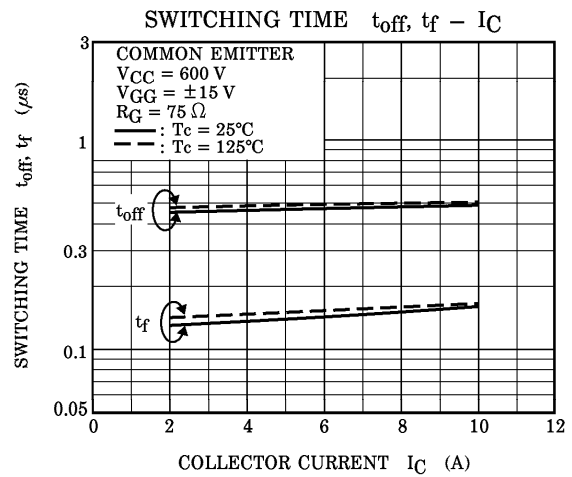
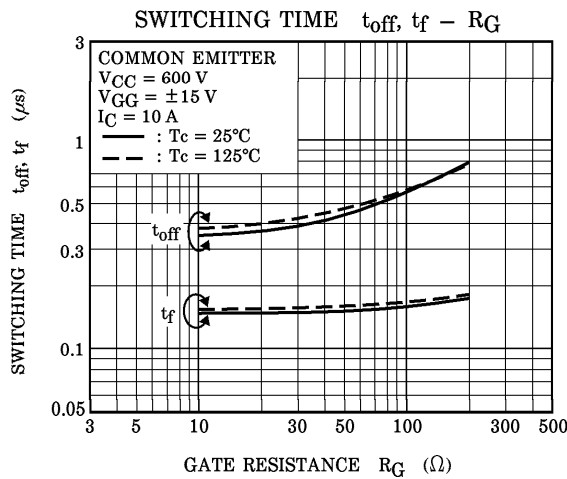
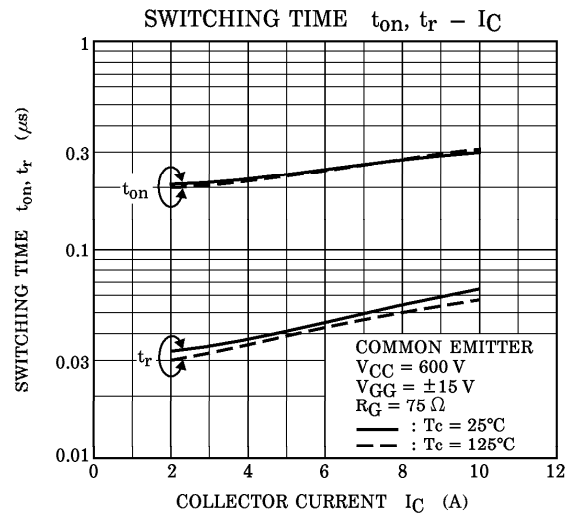
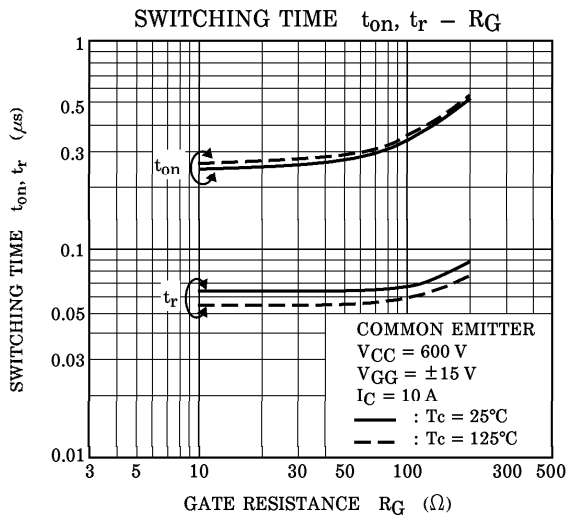
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

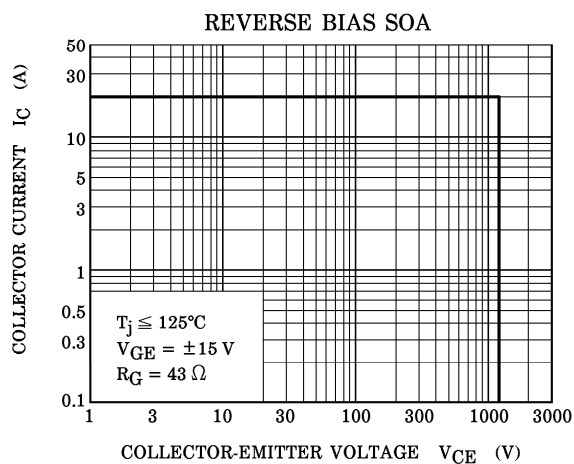
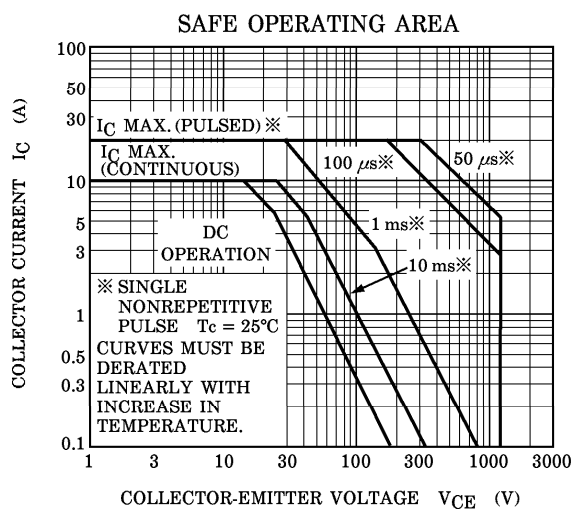
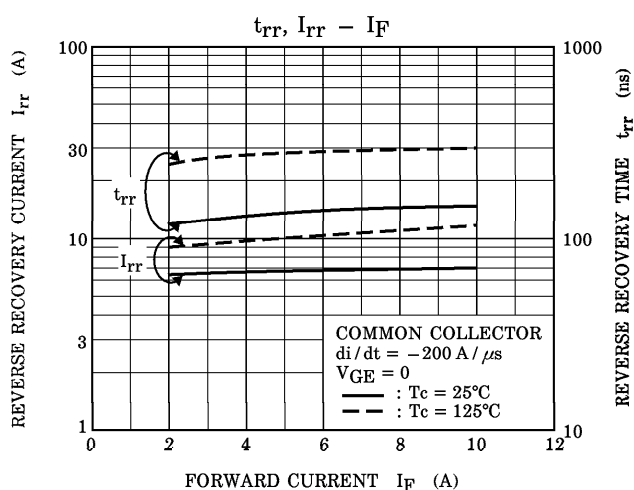
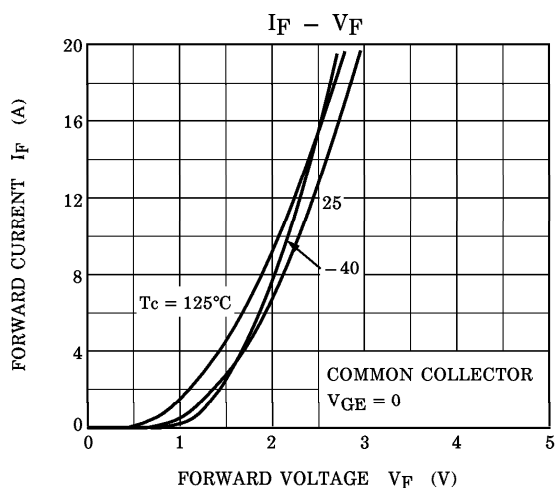
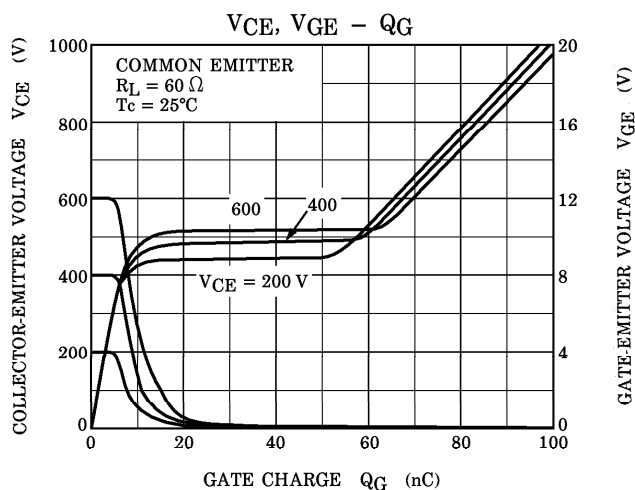
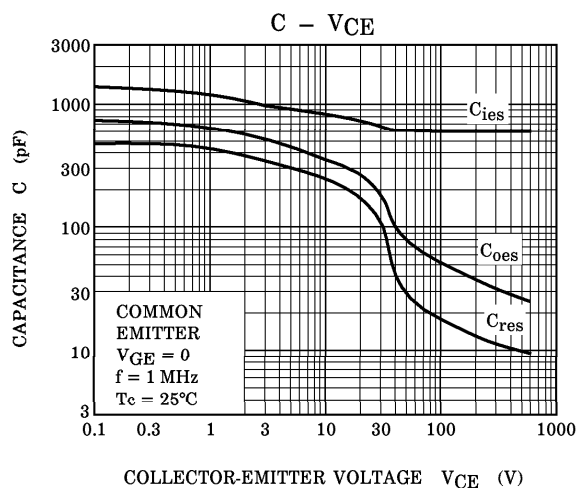
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	$V_{\text{GE}} = \pm 20 \text{ V}, V_{\text{CE}} = 0$	—	—	± 500	nA
Collector Cut-Off Current		I_{CES}	$V_{\text{CE}} = 1200 \text{ V}, V_{\text{GE}} = 0$	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{\text{GE}} (\text{OFF})$	$I_{\text{C}} = 1 \text{ mA}, V_{\text{CE}} = 5 \text{ V}$	4.0	—	7.0	V
Collector-Emitter Saturation Voltage		$V_{\text{CE}} (\text{sat})$	$I_{\text{C}} = 10 \text{ A}, V_{\text{GE}} = 15 \text{ V}$	—	2.1	2.7	V
Input Capacitance		C_{ies}	$V_{\text{CE}} = 50 \text{ V}, V_{\text{GE}} = 0, f = 1 \text{ MHz}$	—	600	—	pF
Switching Time	Rise Time	t_{r}	Inductive Load $V_{\text{CC}} = 600 \text{ V}, I_{\text{C}} = 10 \text{ A}$ $V_{\text{GG}} = \pm 15 \text{ V}, R_{\text{G}} = 75 \Omega$ (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}	$I_{\text{F}} = 10 \text{ A}, V_{\text{GE}} = 0$	—	—	3.0	V
Reverse Recovery Time		t_{rr}	$I_{\text{F}} = 10 \text{ A}, di/dt = -200 \text{ A}/\mu\text{s}$	—	—	350	ns
Thermal Resistance (IGBT)		$R_{\text{th}} (\text{j-c})$	—	—	—	0.89	$^\circ\text{C}/\text{W}$
Thermal Resistance (Diode)		$R_{\text{th}} (\text{j-c})$	—	—	—	1.79	$^\circ\text{C}/\text{W}$

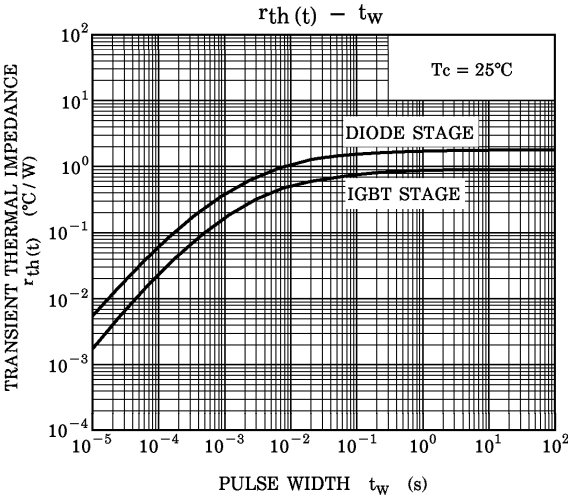
(Note) : Switching time measurement circuit and input/output waveforms











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