

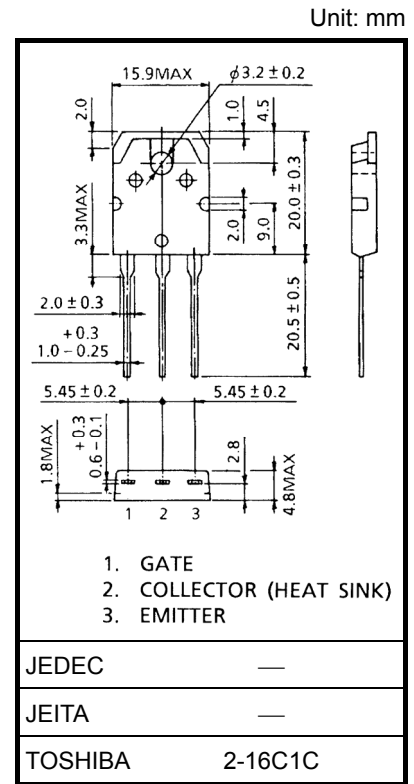
# GT15Q301

HIGH POWER SWITCHING APPLICATIONS  
MOTOR CONTROL APPLICATIONS

- Third-generation IGBT
- Enhancement mode type
- 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

## ABSOLUTE MAXIMUM RATINGS (Ta = 25°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 (Tc = 25°C)		$P_C$	170	W
Junction Temperature		$T_J$	150	°C
Storage Temperature Range		$T_{stg}$	-55~150	°C

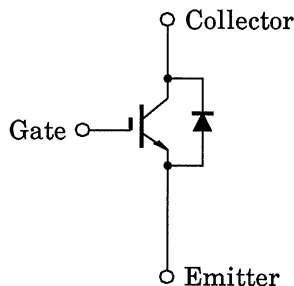


Weight: 4.6 g (typ.)

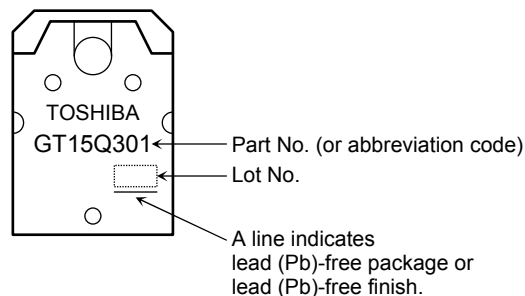
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

## EQUIVALENT CIRCUIT



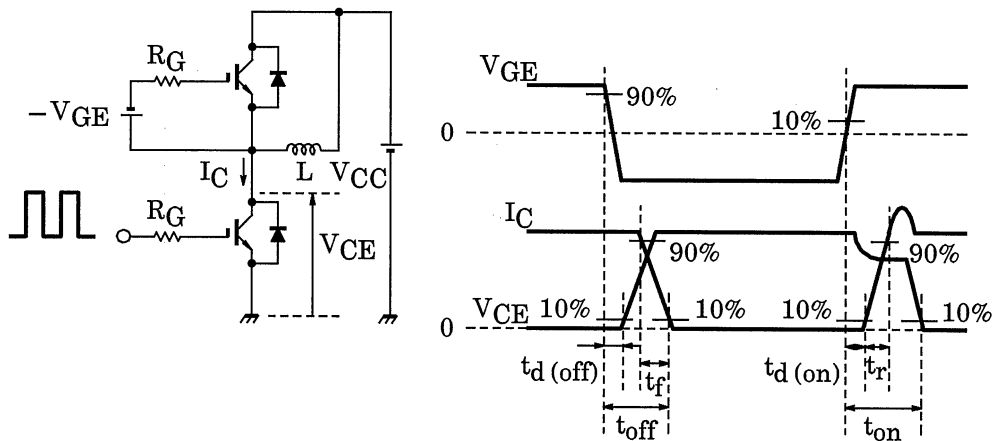
## MARKING

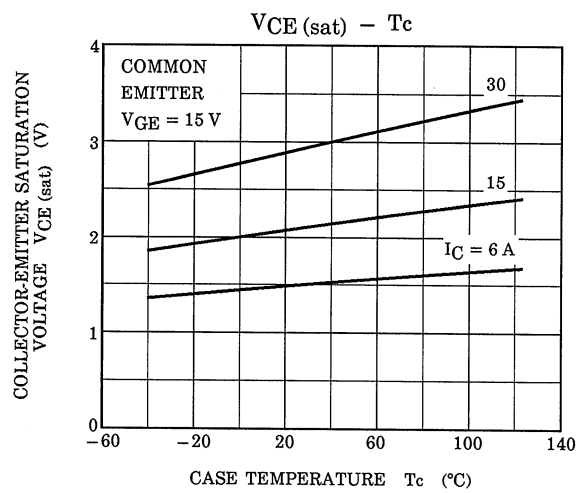
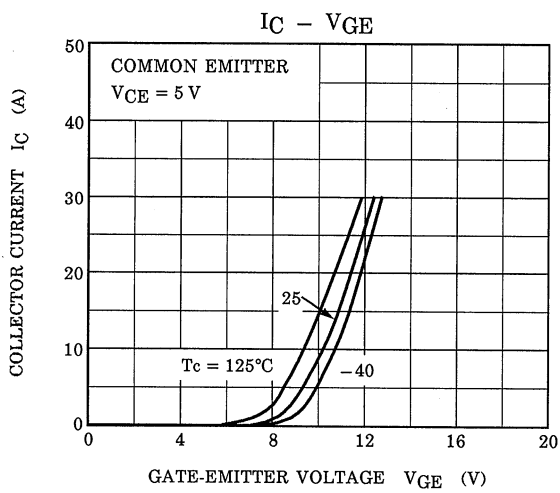
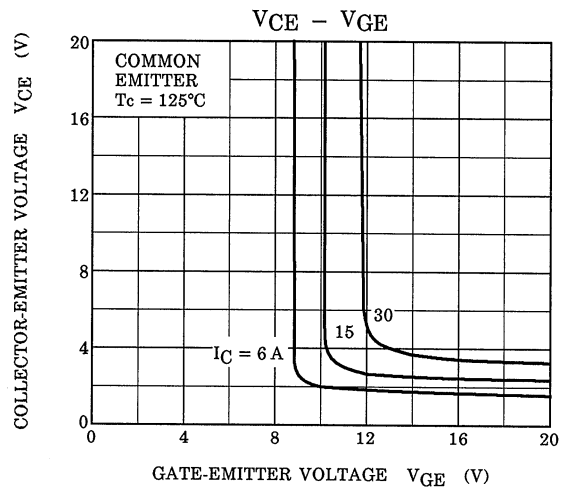
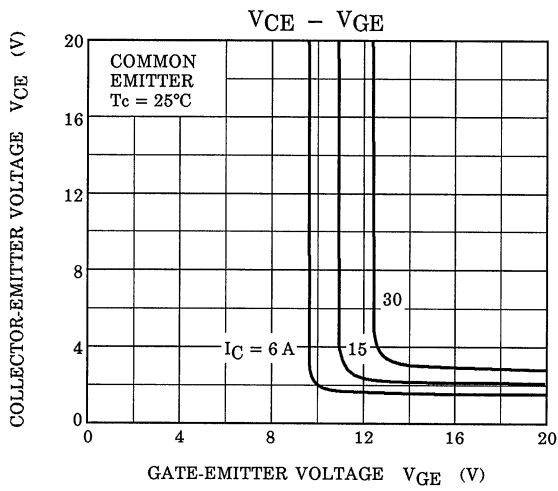
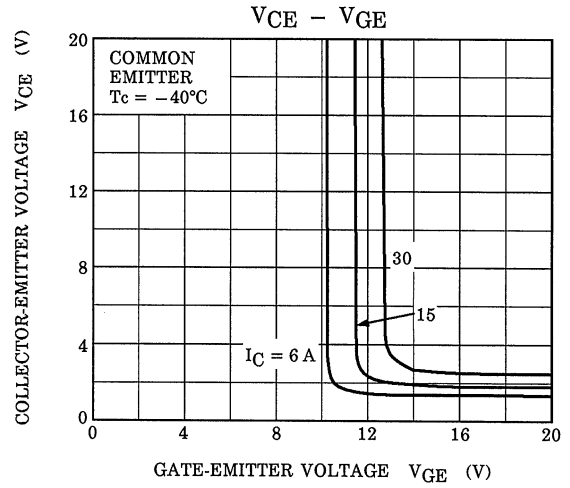
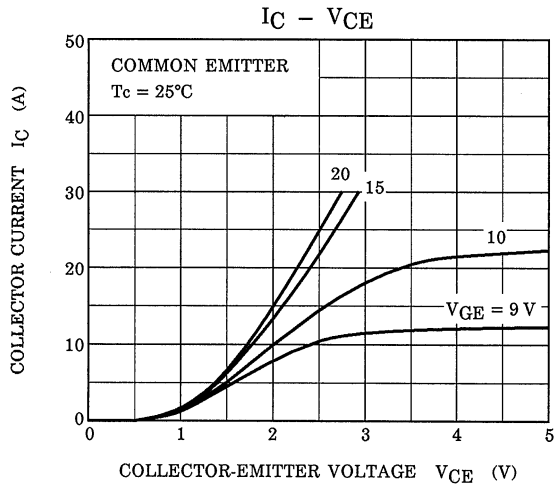


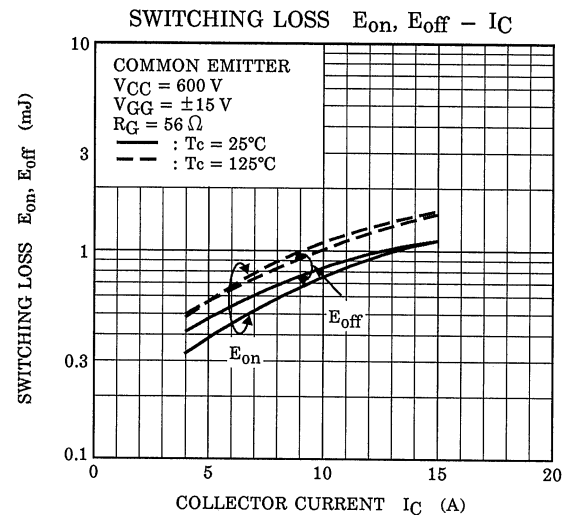
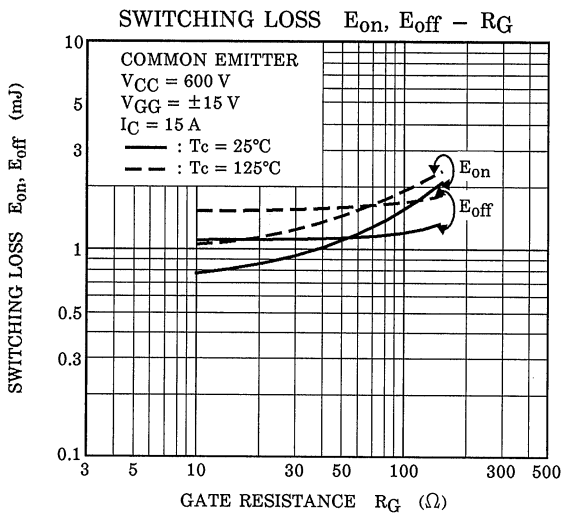
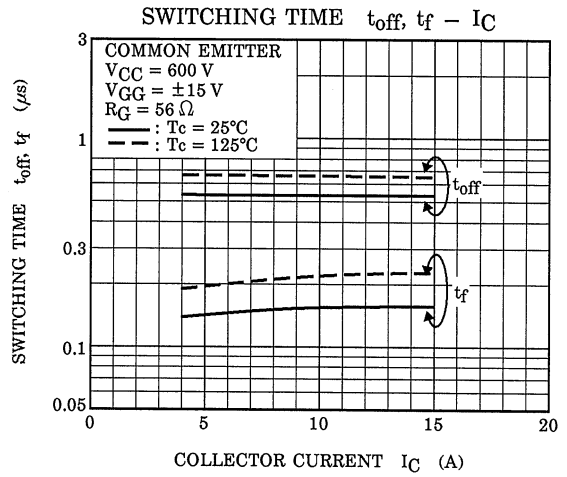
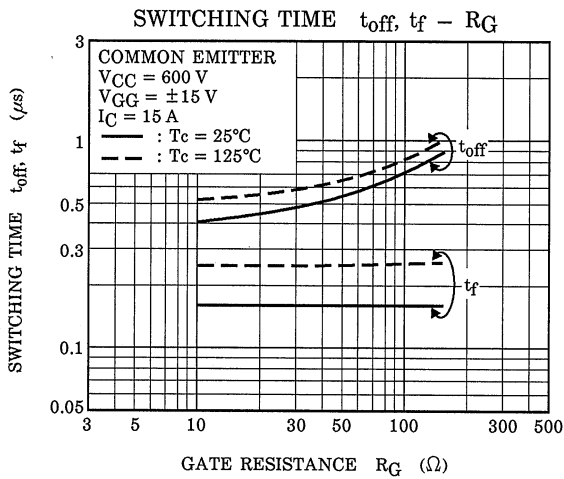
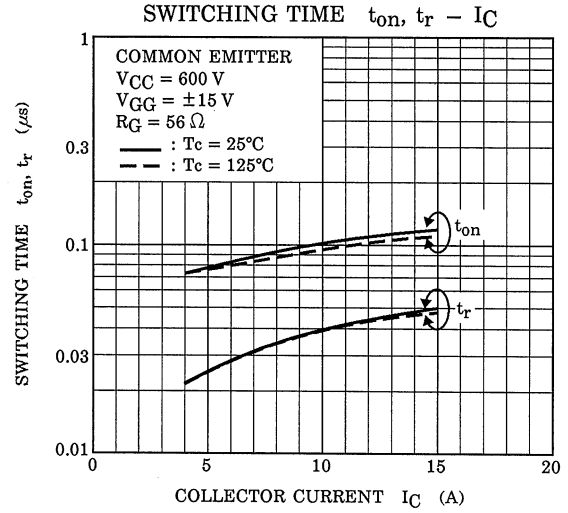
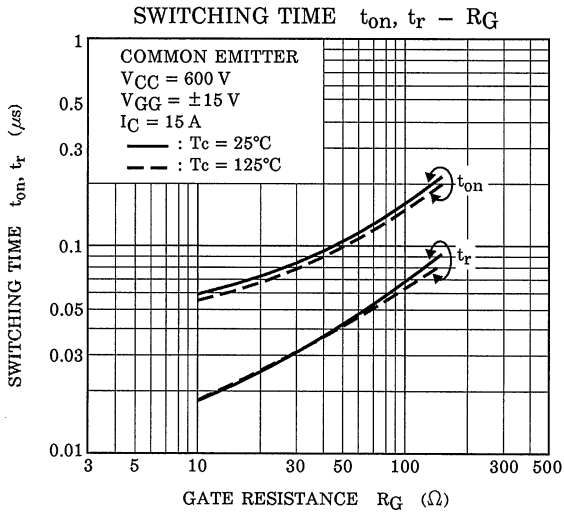
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

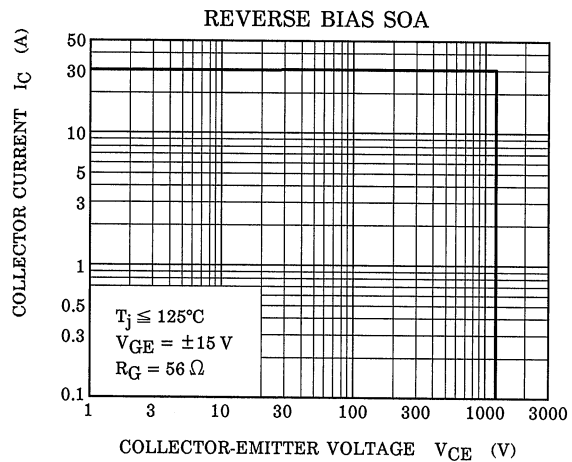
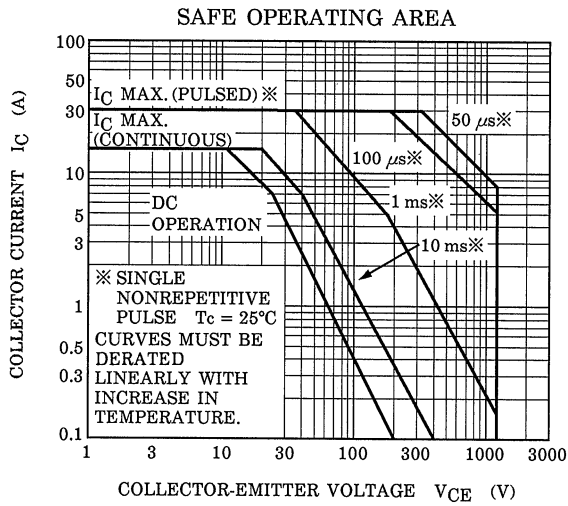
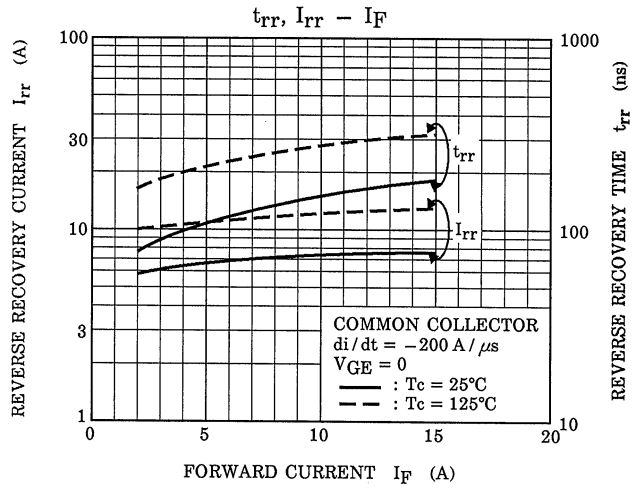
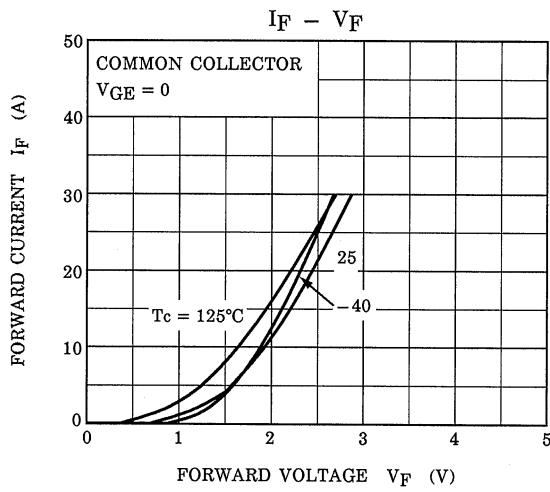
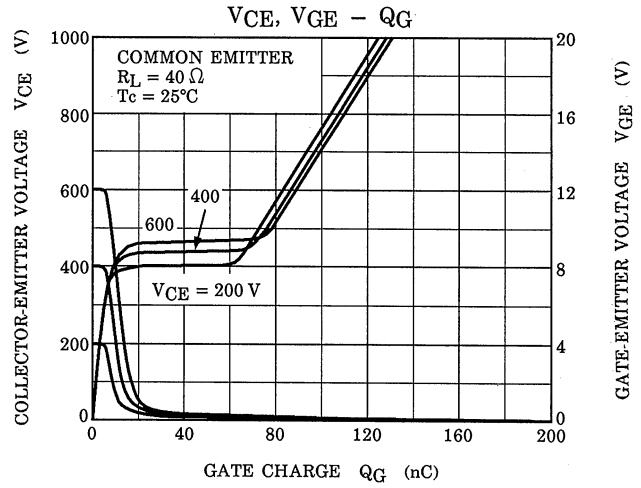
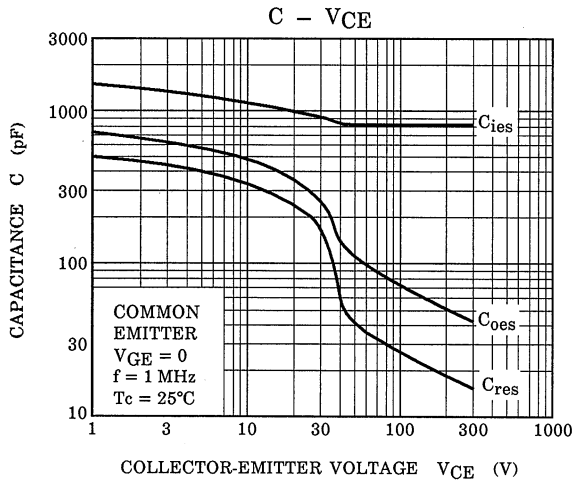
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Gate Leakage Current		$I_{GES}$	$V_{GE} = \pm 20\text{ V}, V_{CE} = 0$	—	—	$\pm 500$	nA
Collector Cut-Off Current		$I_{CES}$	$V_{CE} = 1200\text{ V}, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-Off Voltage		$V_{GE (OFF)}$	$I_C = 1.5\text{ mA}, V_{CE} = 5\text{ V}$	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	$t_r$	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	$t_{on}$		—	0.12	—	
	Fall Time	$t_f$		—	0.16	0.40	
	Turn-Off Time	$t_{off}$		—	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

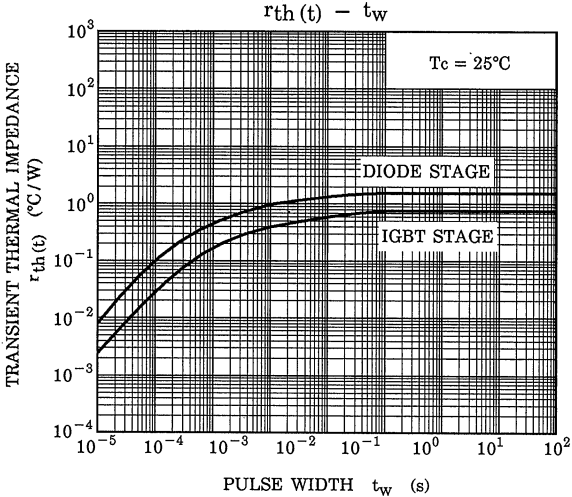
Note : Switching time measurement circuit and input / output waveforms











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