

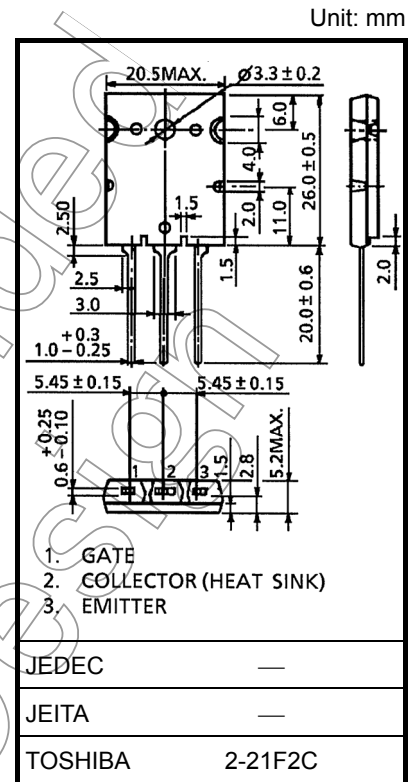
GT50J301

HIGH POWER SWITCHING APPLICATIONS
MOTOR CONTROL APPLICATIONS

- Third generation IGBT
- Enhancement mode type
- High speed : $t_f = 0.30\mu s$ (Max.)
- Low saturation voltage : $V_{CE(sat)} = 2.7V$ (Max.)
- FRD included between emitter and collector

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V_{CES}	600	V
Gate-Emitter Voltage	V_{GES}	± 20	V
Collector Current	DC	I_C	A
	1ms	I_{CP}	
Forward Current	DC	I_F	A
	1ms	I_{FM}	
Collector Power Dissipation ($T_c = 25^\circ C$)	P_C	200	W
Junction Temperature	T_j	150	$^\circ C$
Storage Temperature	T_{stg}	-55~150	$^\circ C$
Screw Torque	—	0.8	N · m

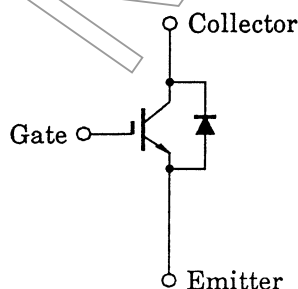


Weight: 9.75 g (typ.)

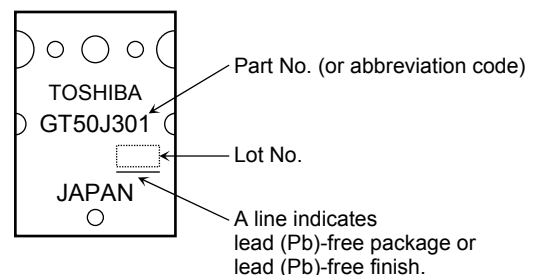
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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



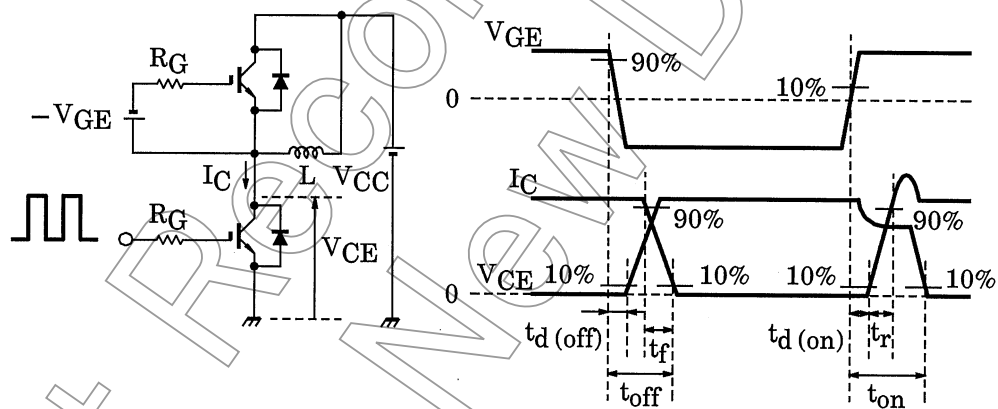
MARKING

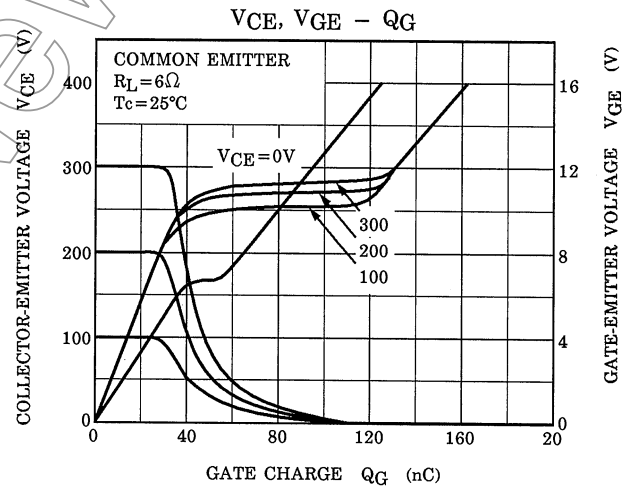
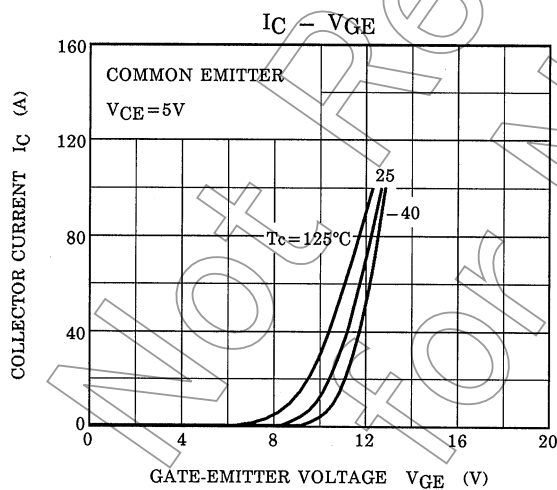
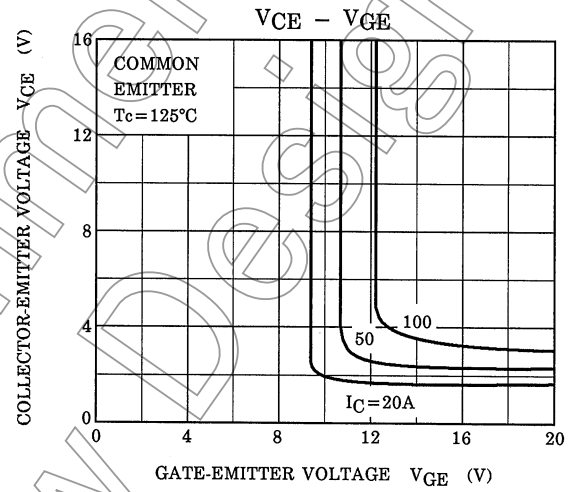
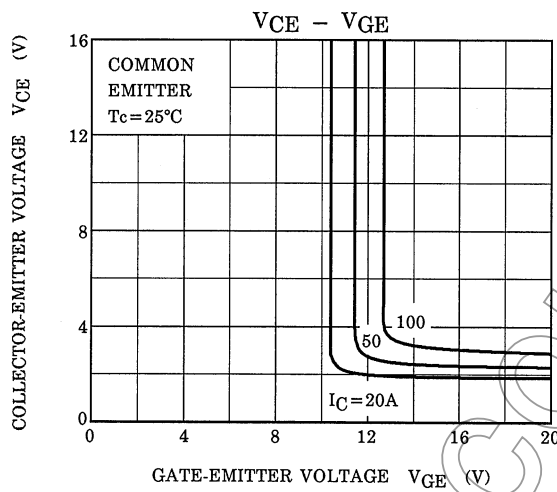
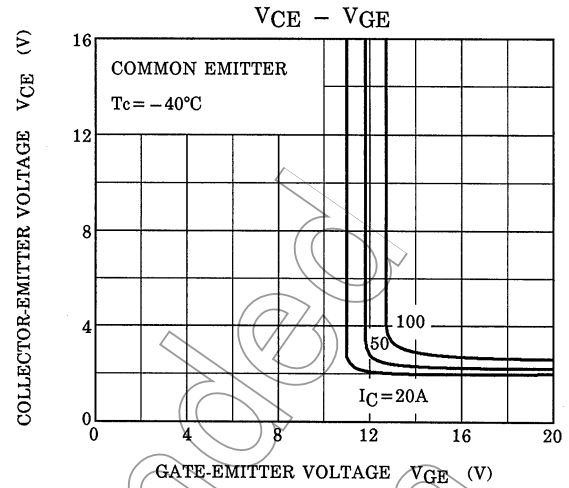
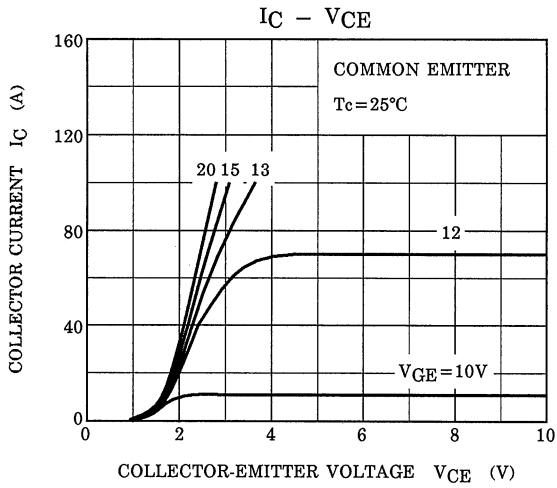


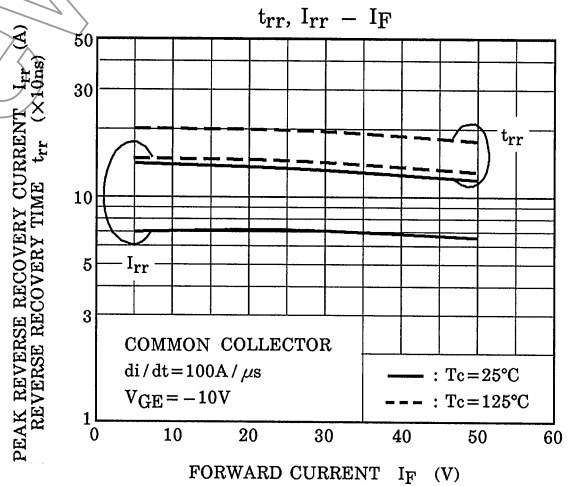
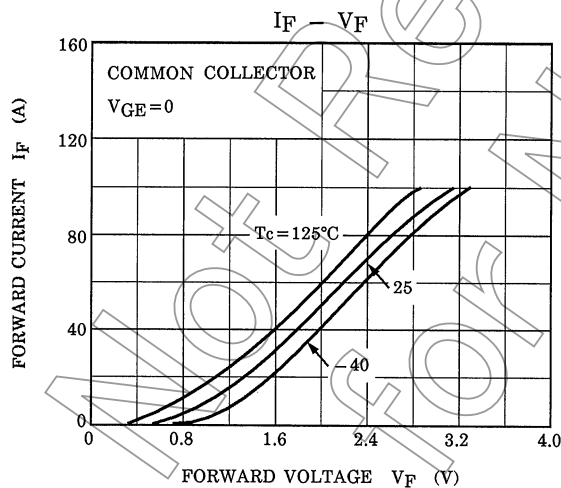
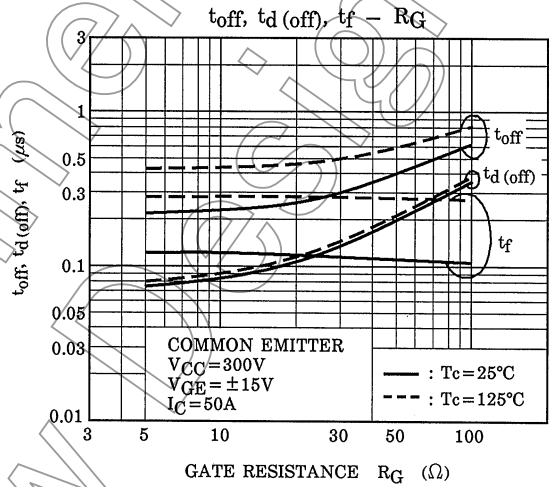
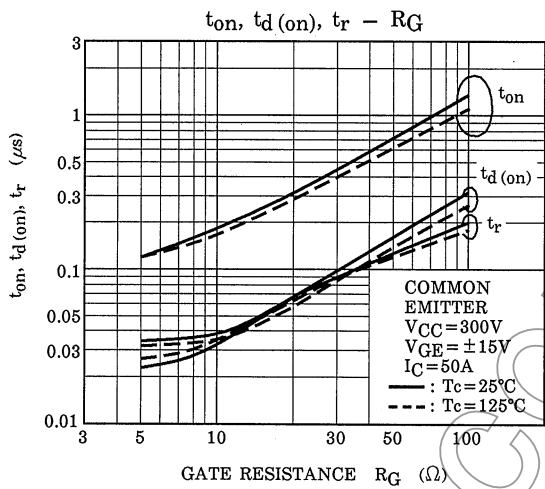
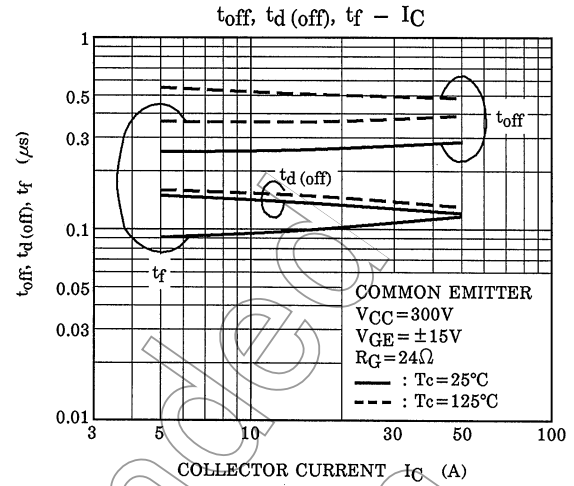
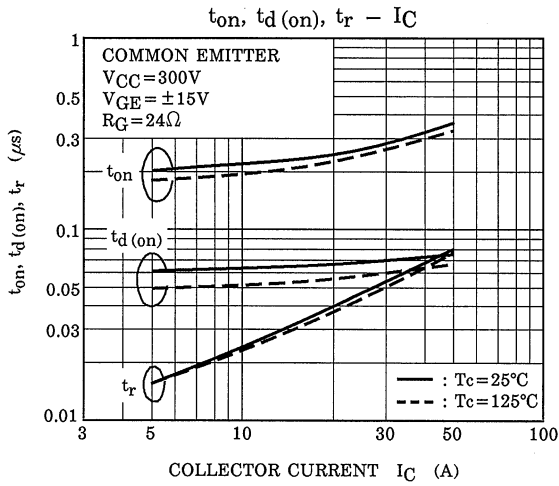
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

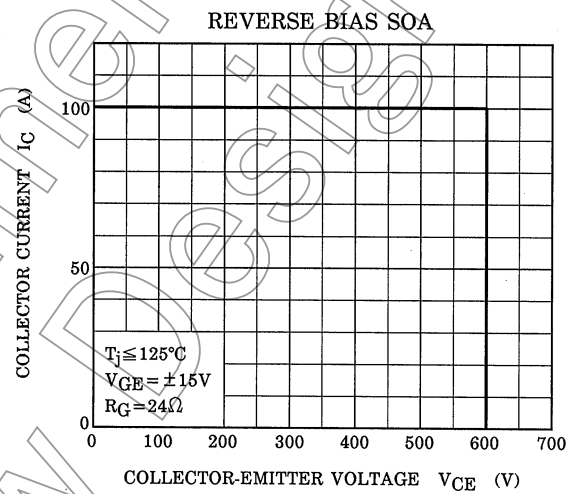
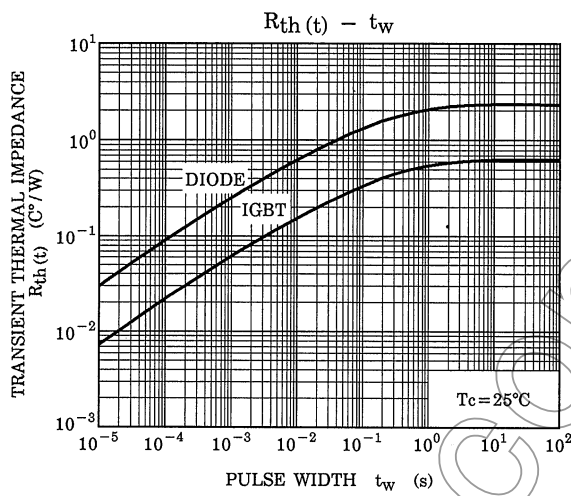
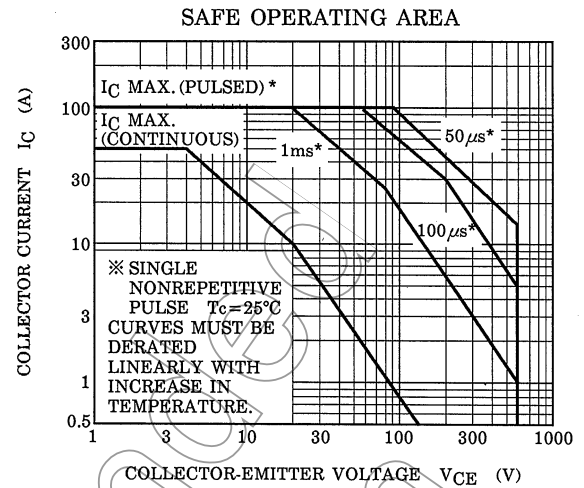
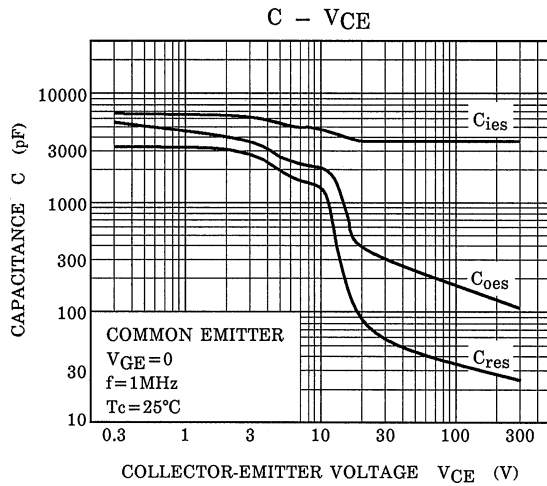
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 500	nA
Collector Cut-off Current		I_{CES}	$V_{CE} = 600V, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE (OFF)}$	$I_C = 5mA, V_{CE} = 5V$	5.0	7.0	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE (sat)}$	$I_C = 50A, V_{GE} = 15V$	—	2.1	2.7	V
Input Capacitance		C_{ies}	$V_{CE} = 10V, V_{GE} = 0$ $f = 1MHz$	—	4500	—	pF
Switching Time	Turn-on delayTime	$t_d (on)$	Inductive Load $V_{CC} = 300V$ $V_{GE} = \pm 15V$ $I_C = 50A$ $R_G = 24\Omega$ (Note 1)	—	0.08	—	μs
	Rise Time	t_r		—	0.12	—	
	Turn-on Time	t_{on}		—	0.40	—	
	Turn-off delayTime	$t_d (off)$		—	0.20	—	
	Fall Time	t_f		—	0.15	0.30	
	Turn-off Time	t_{off}		—	0.50	—	
Forward Voltage		V_F	$I_F = 50A, V_{GE} = 0$	—	2.4	3.5	V
Reverse Recovery Time		t_{rr}	$I_F = 50A, V_{GE} = 10V$ $di / dt = 100A / \mu s$	—	0.1	0.2	μs
Thermal Resistance		$R_{th (j-c)}$	IGBT	—	—	0.625	$^{\circ}C / W$
Thermal Resistance		$R_{th (j-c)}$	DIODE	—	—	2.50	$^{\circ}C / W$

Note 1: Switching time measurement circuit and input / output waveforms









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20070701-EN

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