

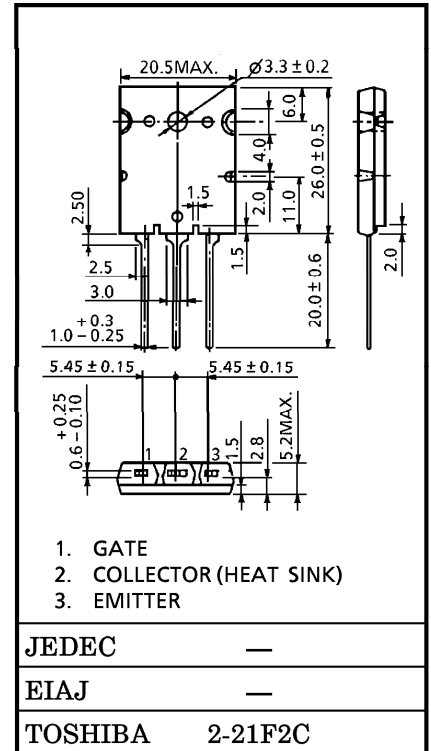
TOSHIBA INSULATED GATE BIPOLAR TRANSISTOR SILICON N CHANNEL MOS TYPE

GT60M301

HIGH POWER SWITCHING APPLICATIONS

- The 3rd Generation
- FRD Included Between Emitter and Collector
- Enhancement-Mode
- High Speed IGBT : $t_f = 0.25 \mu s$ (Typ.)
FRD : $t_{rr} = 0.7 \mu s$ (Typ.)
- Low Saturation Voltage : $V_{CE(sat)} = 3.4V$ (Max.)

Unit in mm

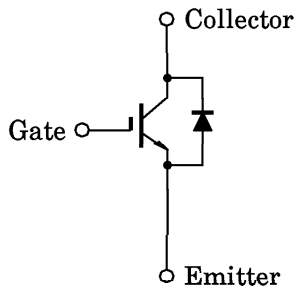


Weight : 9.75g

MAXIMUM RATINGS (Ta = 25°C)

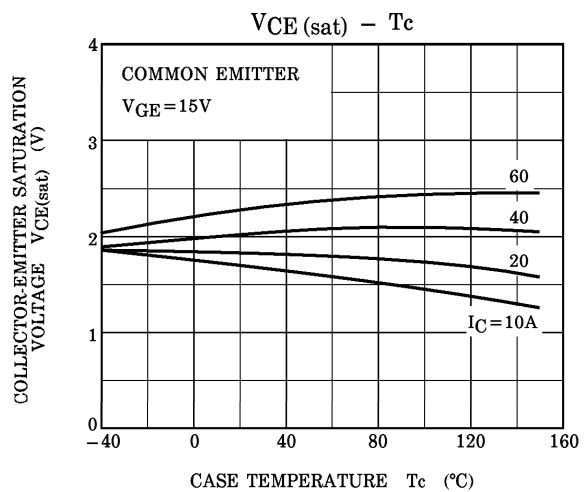
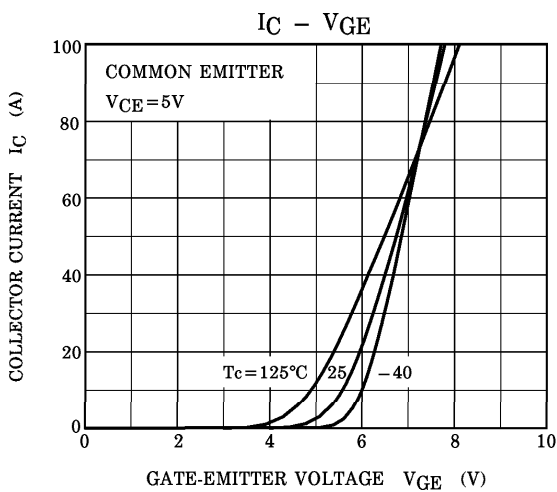
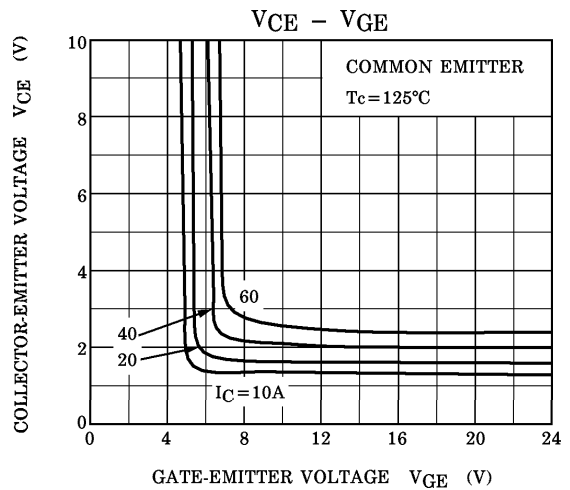
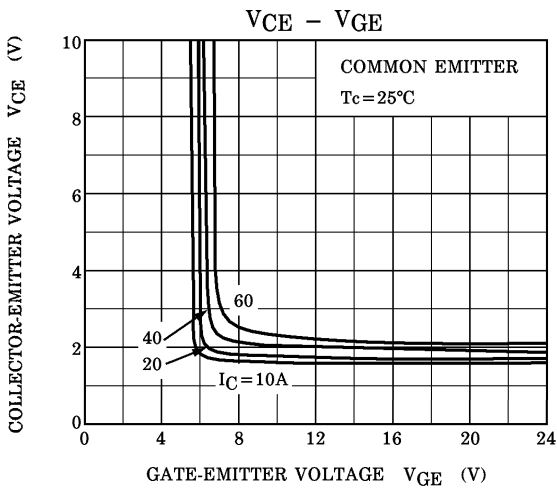
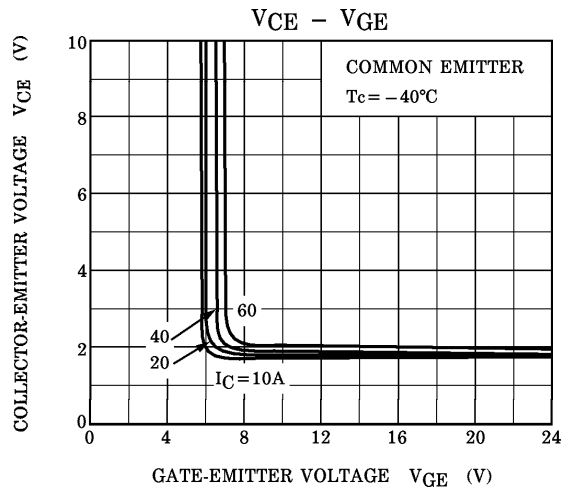
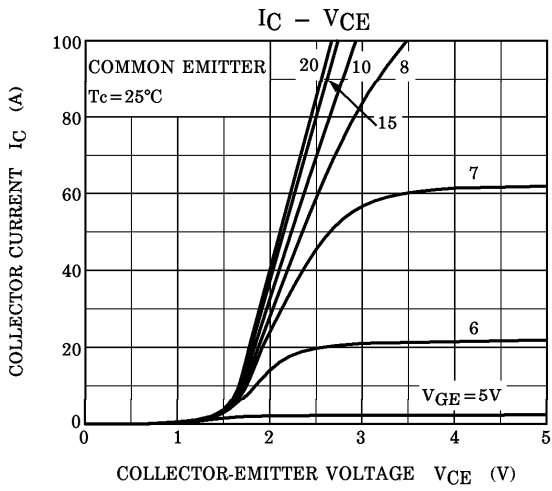
CARACTERISTICS	SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage	V_{CES}	900	V
Gate-Emitter Voltage	V_{GES}	±25	V
Collector Current	DC	I_C	60
	1ms	I_{CP}	120
Emitter-Collector Forward Current	DC	I_{ECF}	15
	1ms	I_{ECFP}	120
Junction Temperature (Tc = 25°C)	P_C	200	W
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	-55~150	°C
Screw Torque	—	0.8	N·m

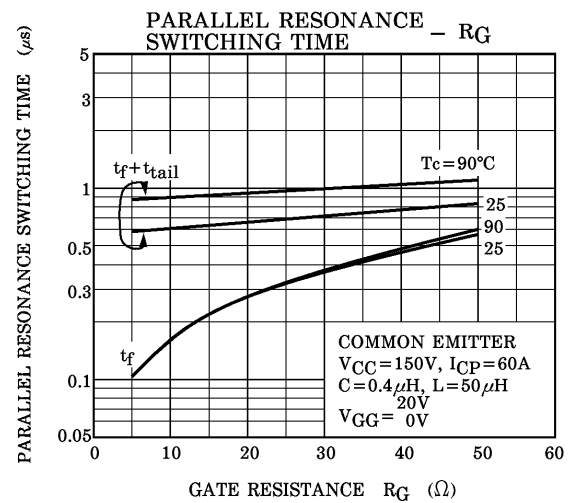
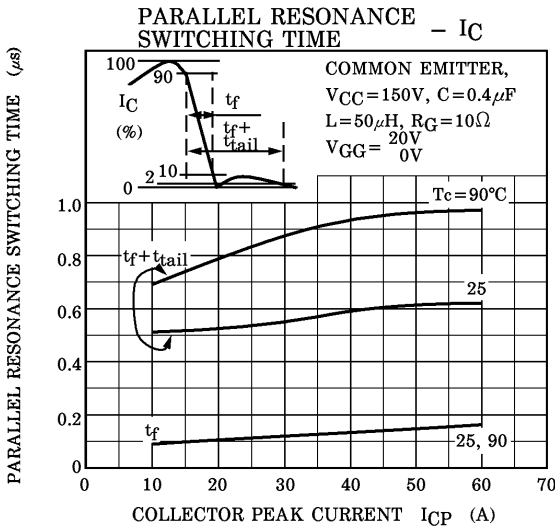
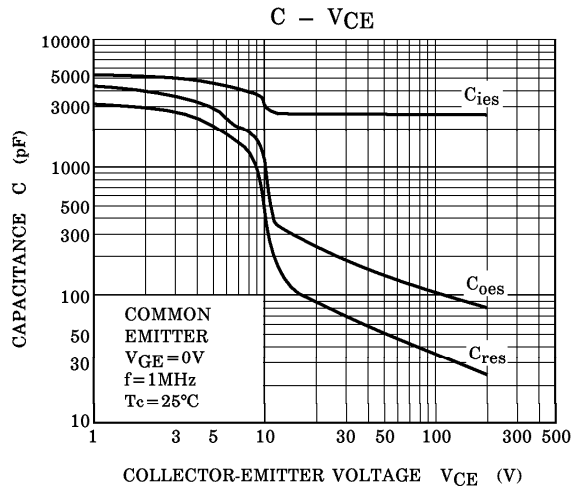
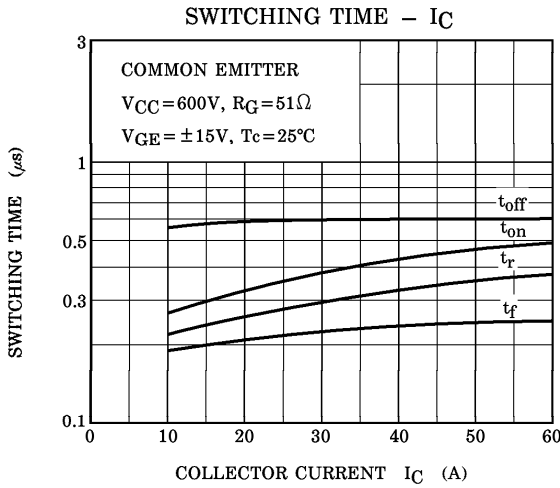
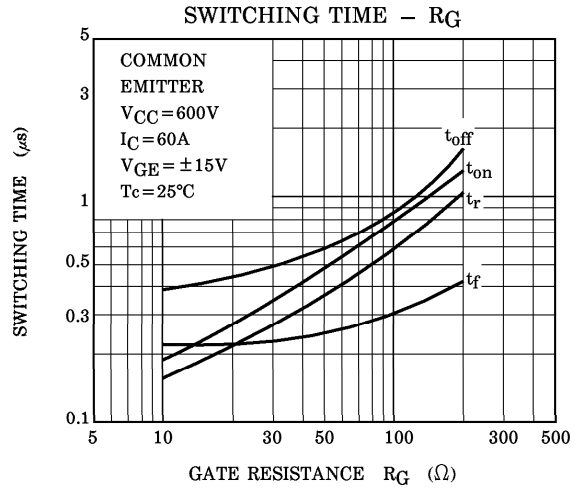
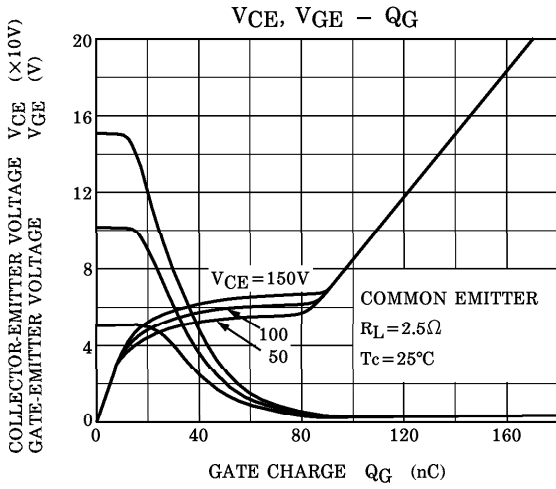
EQUIVALENT CIRCUIT



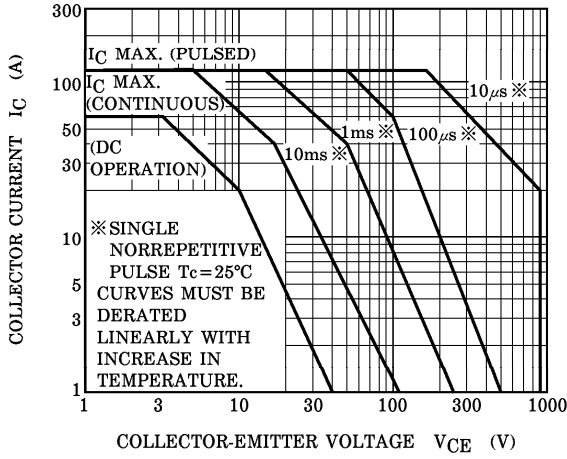
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 25V, V_{CE} = 0$	—	—	± 500	nA
Collector Cut-off Current		I_{CES}	$V_{CE} = 900V, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cut-off Voltage		$V_{GE(OFF)}$	$I_C = 60mA, V_{CE} = 5V$	3.0	—	6.0	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)(1)}$	$I_C = 10A, V_{GE} = 15V$	—	1.8	2.4	V
Collector-Emitter Saturation Voltage		$V_{CE(sat)(2)}$	$I_C = 60A, V_{GE} = 15V$	—	2.3	3.4	V
Input Capacitance		C_{ies}	$V_{CE} = 30V, V_{GE} = 0$ $f = 1MHz$	—	2700	—	pF
Switching Time	Rise Time	t_r		—	0.25	0.60	μs
	Turn-on Time	t_{on}		—	0.35	0.80	
	Fall Time	t_f		—	0.25	0.40	
	Turn-off Time	t_{off}		—	0.50	1.00	
Emitter-Collector Forward Voltage		V_{ECF}	$I_{EC} = 15A, V_{GE} = 0$	—	1.5	2.0	V
Reverse Recovery Time		t_{rr}	$I_F = 15A, di/dt = -20A$	—	0.7	2.5	μs
Thermal Resistance		$R_{th(j-c)}$	IGBT	—	—	0.625	$^{\circ}C/W$
Thermal Resistance		$R_{th(j-c)}$	Diode	—	—	4.0	$^{\circ}C/W$

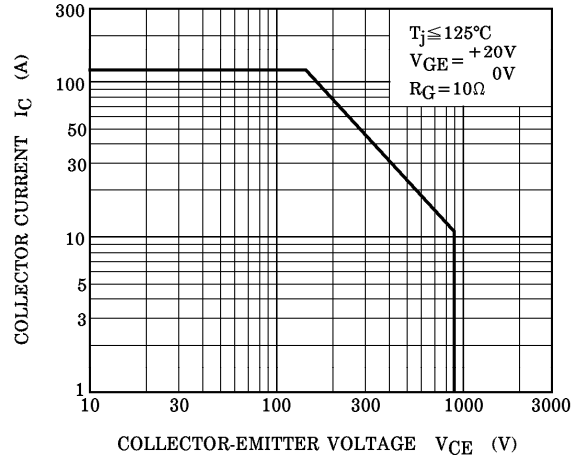




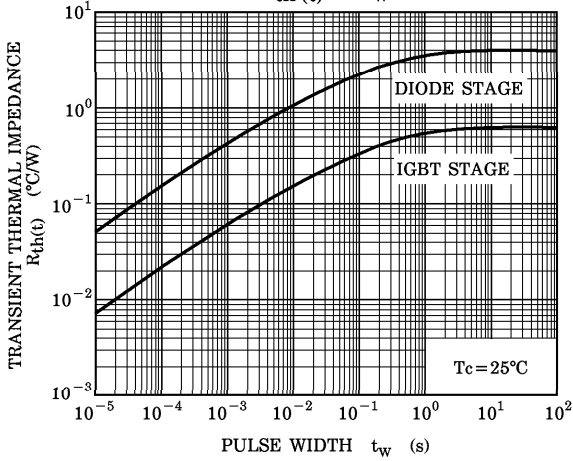
SAFE OPERATING AREA



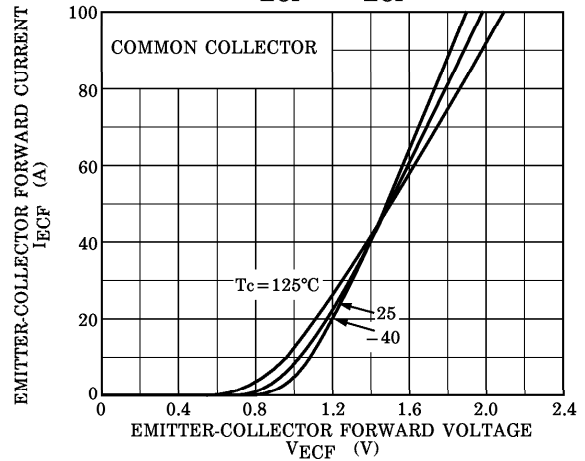
REVERSE BIAS SOA



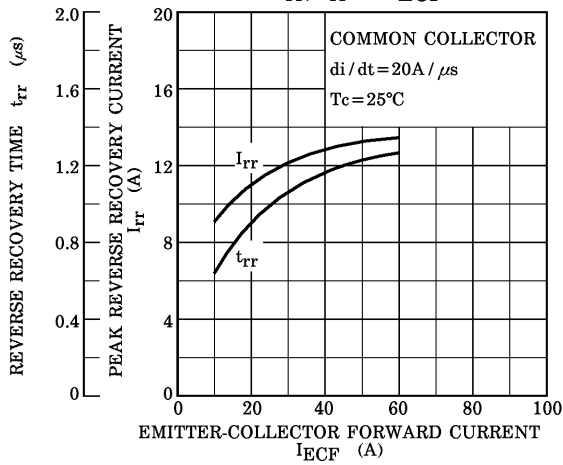
$R_{th}(t) - t_w$



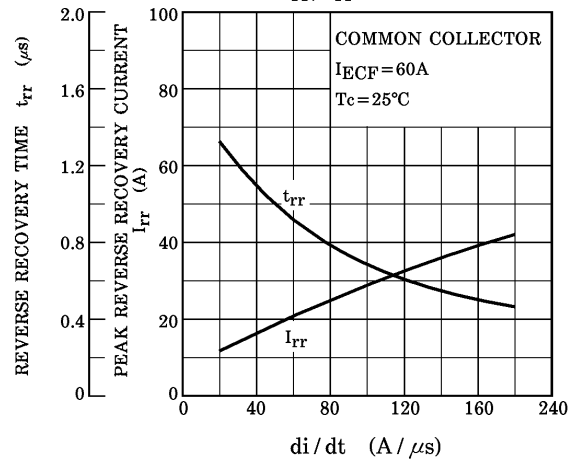
$I_{ECF} - V_{ECF}$



$I_{rr}, t_{rr} - I_{ECF}$



$I_{rr}, t_{rr} - di/dt$



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