

SEMICONDUCTOR
TOSHIBA
TECHNICAL DATA

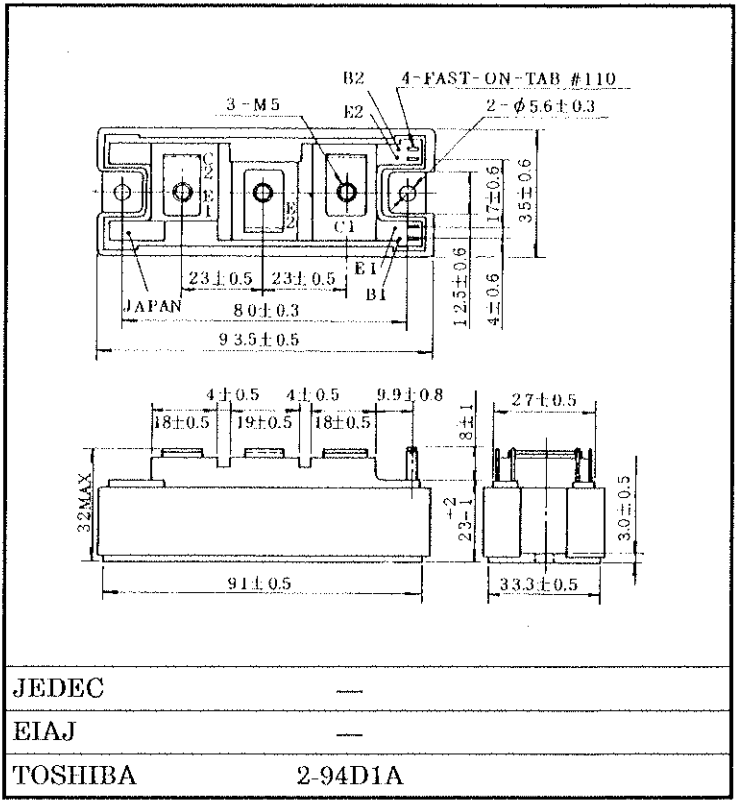
TOSHIBA GTR MODULE
MG50J2YS40
SILICON N CHANNEL IGBT

(MG50J2YS40)

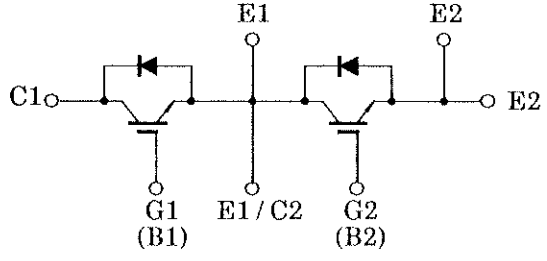
HIGH POWER SWITCHING APPLICATIONS.
MOTOR CONTROL APPLICATIONS.

Unit in mm

- High Input Impedance
- High Speed : $t_f = 0.35 \mu s$ (Max.)
: $t_{rr} = 0.15 \mu s$ (Max.)
- Low Saturation Voltage
: $V_{CE(sat)} = 3.5V$ (Max.)
- Includes a Complete Half Bridge in One Package.
- Enhancement-Mode
- The Electrodes are Isolated from Case.



EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°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	P_C	250	W
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	-40~125	°C
Isolation Voltage	V_{Isol}	2500 (AC, 1 min.)	V
Screw Torque (Terminal / Mounting)	—	3 / 3	N · m

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GES}	V _{GE} = ±20V, V _{CE} = 0	—	—	±500	nA
Collector Cut-off Current		I _{CES}	V _{CE} = 600V, V _{GE} = 0	—	—	1.0	mA
Collector-Emitter Breakdown Voltage		V _{(BR)CES}	I _C = 10mA, V _{GE} = 0	600	—	—	V
Gate-Emitter Cut-off Voltage		V _{GE(off)}	I _C = 50mA, V _{CE} = 5V	3.0	—	6.0	V
Collector-Emitter Saturation Voltage		V _{CE(sat)}	I _C = 50A, V _{GE} = 15V	—	2.7	3.5	V
Input Capacitance		C _{ies}	V _{CE} = 10V, V _{GE} = 0, f = 1MHz	—	4000	—	pF
Switching Time	Rise Time	t _r		—	0.30	0.60	μs
	Turn-on Time	t _{on}		—	0.40	0.80	
	Fall Time	t _f		—	0.18	0.35	
	Turn-off Time	t _{off}		—	0.60	1.00	
Forward Voltage		V _F	I _F = 50A, V _{GE} = 0	—	1.7	2.5	V
Reverse Recovery Time		t _{rr}	I _F = 50A, V _{GE} = -10V di / dt = 100A / μs	—	0.08	0.15	μs
Thermal Resistance		R _{th(j-c)}	Transistor	—	—	0.50	°C / W
			Diode	—	—	1.00	

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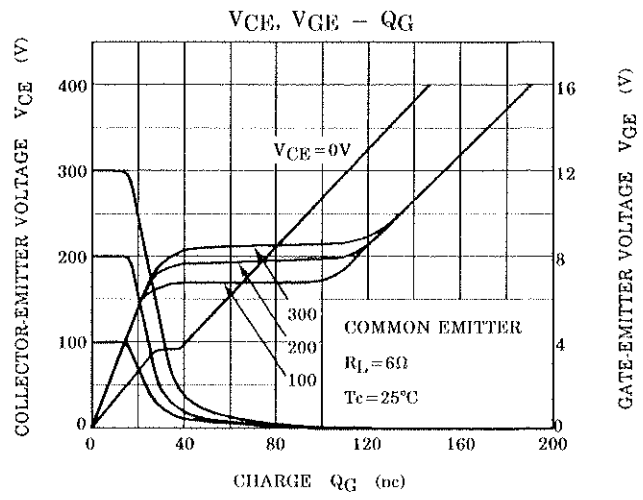
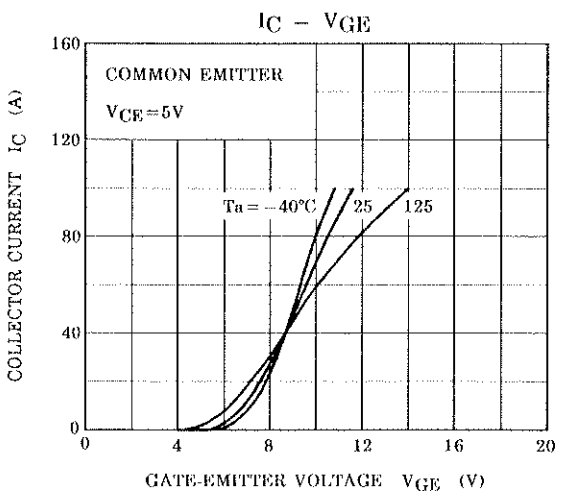
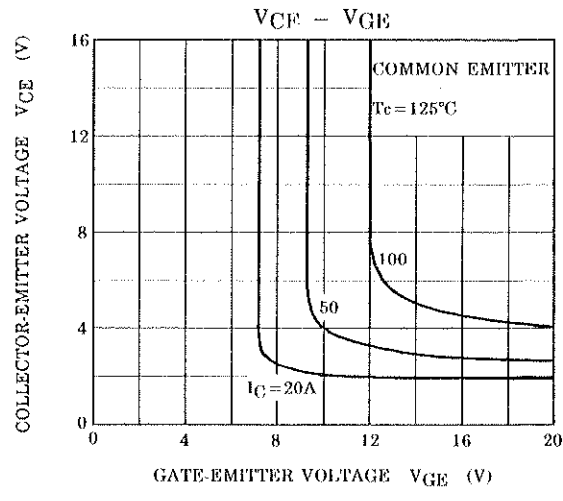
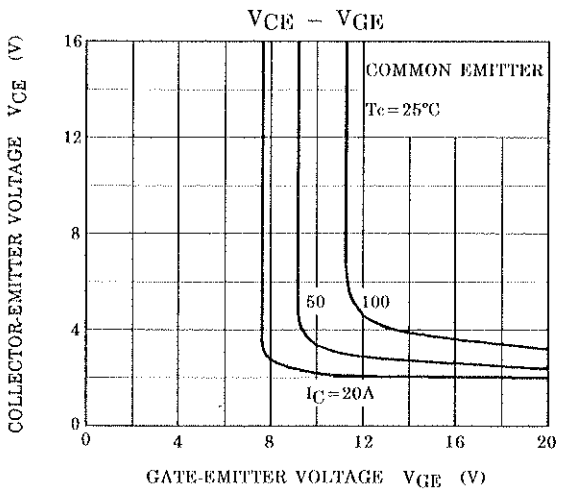
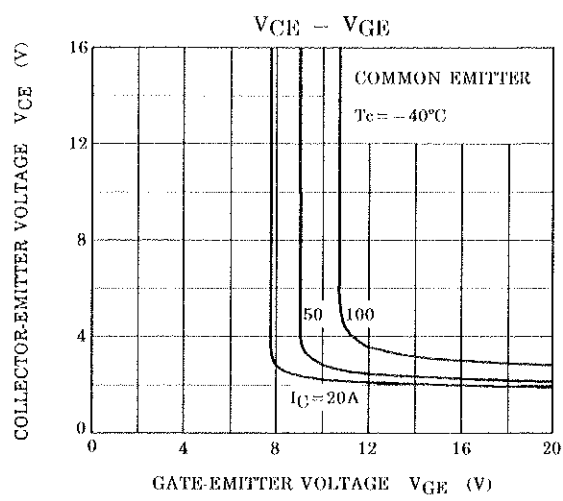
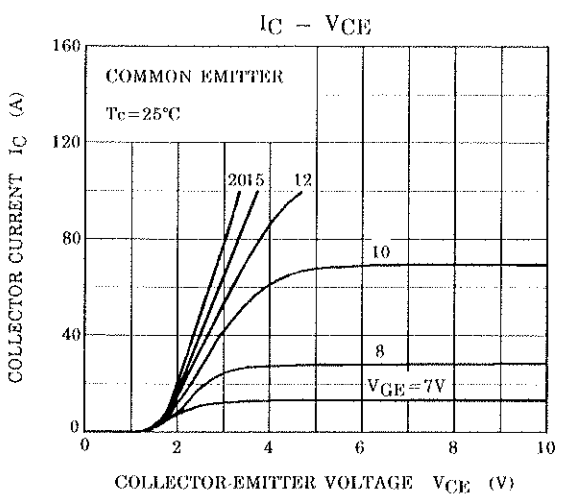
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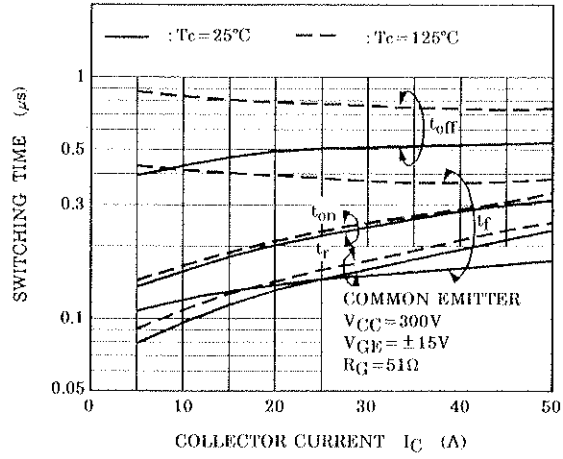
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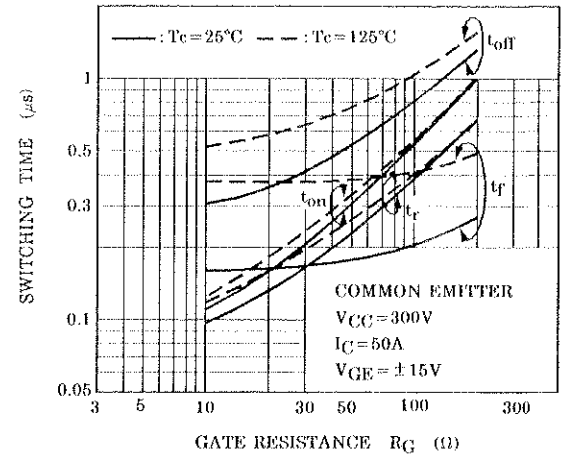
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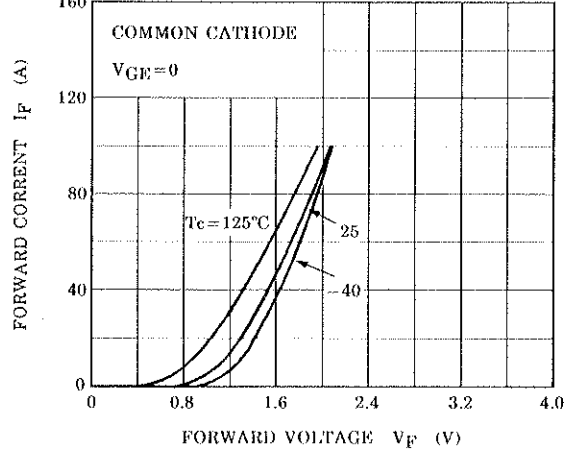
SWITCHING TIME - I_C



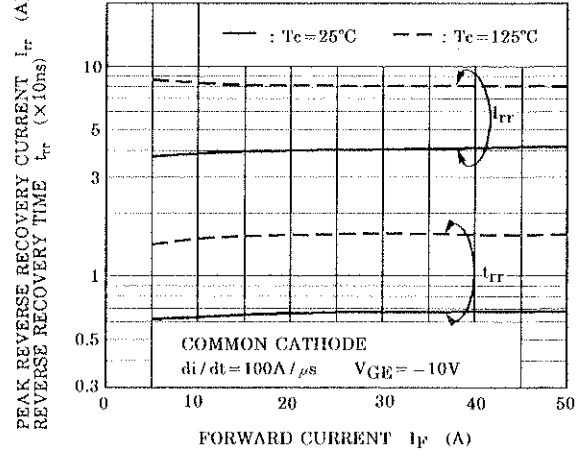
SWITCHING TIME - R_G



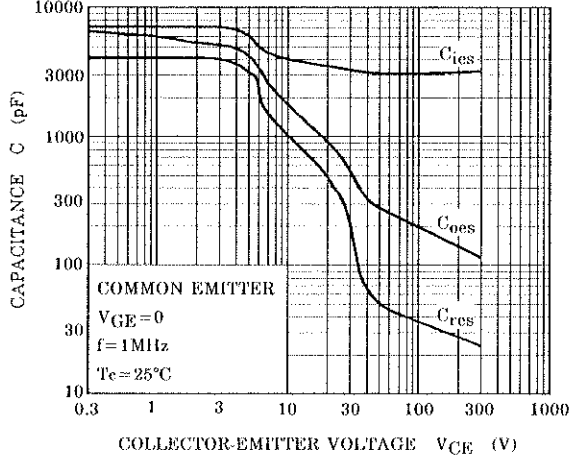
$I_F - V_F$



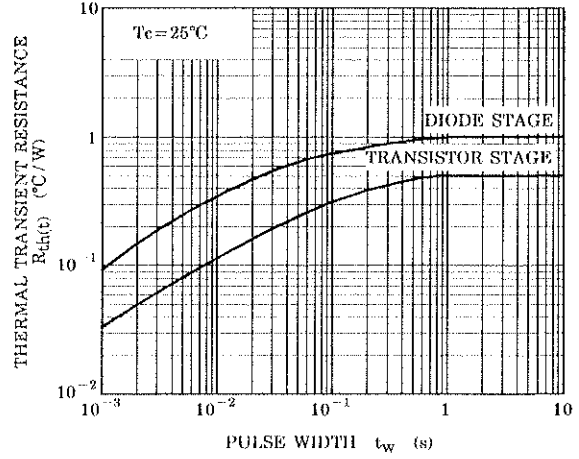
$t_{rr}, I_{rr} - I_F$



C - V_{CE}



$R_{th}(t) - t_w$



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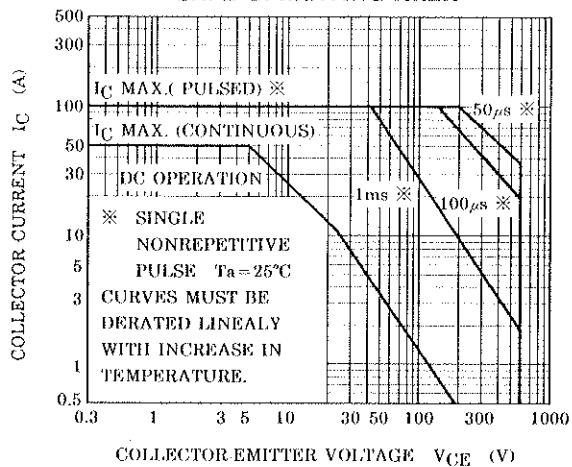
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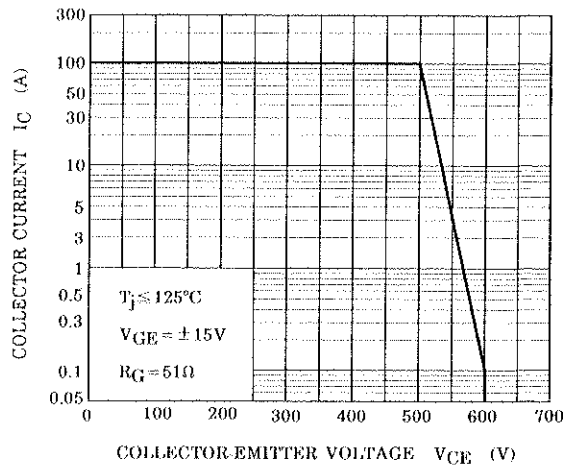
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SAFE OPERATING AREA



REVERSE BIAS SOA



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