

TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

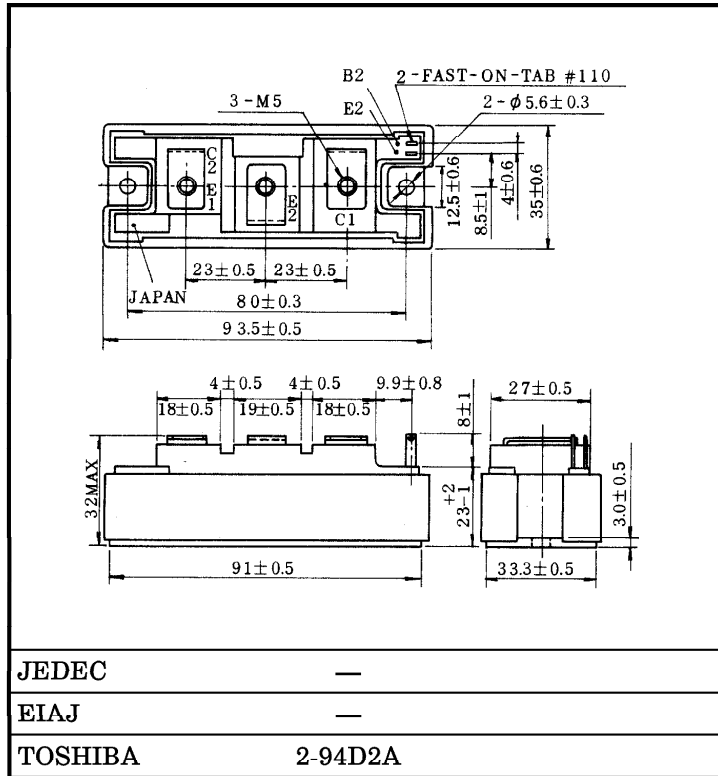
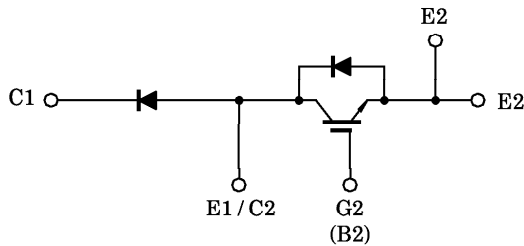
MG50J1ZS40

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.)
- Enhancement-Mode
- The Electrodes are Isolated from Case.

EQUIVALENT CIRCUIT



Weight : 202g

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	50
	1ms	I_{CP}	100
Forward Current	DC	I_F	50
	1ms	I_{FM}	100
Collector Power Dissipation	P_C	250	W
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	-40~150	°C
Isolation Voltage	V_{Isol}	2500 (AC, 1 minute)	V
Screw Torque (Terminal / Mounting)	—	3 / 3	N · m

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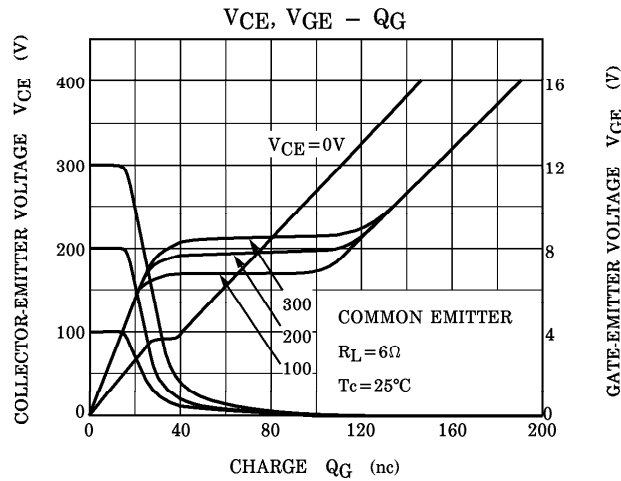
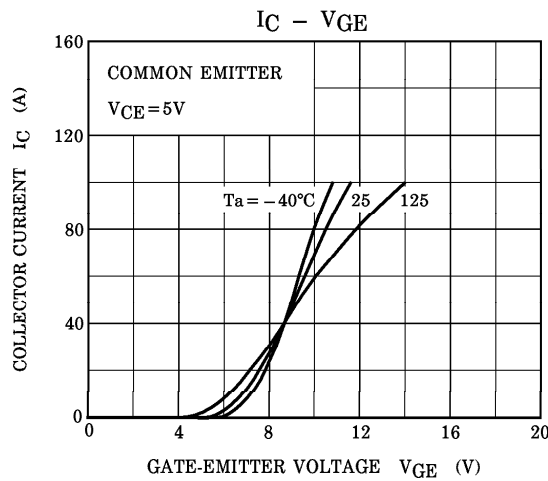
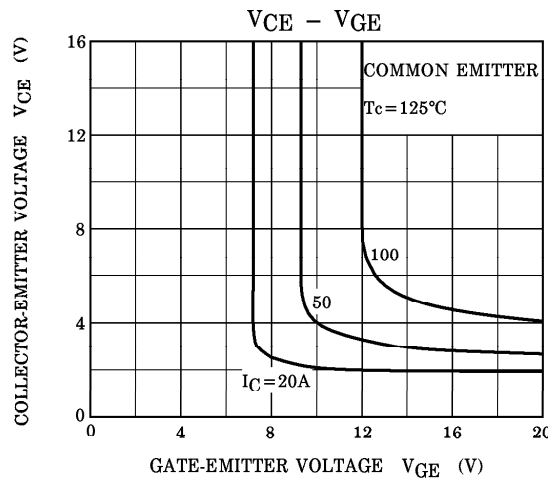
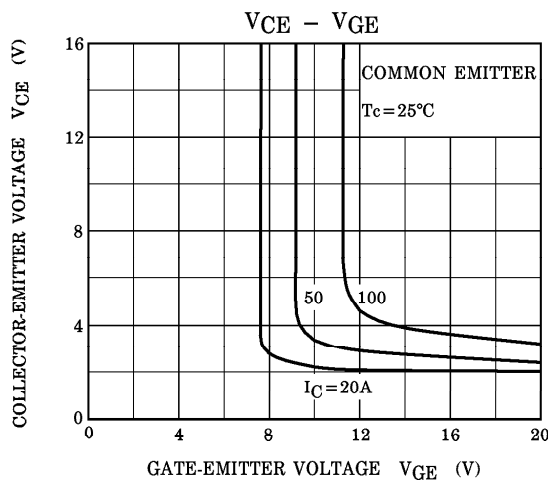
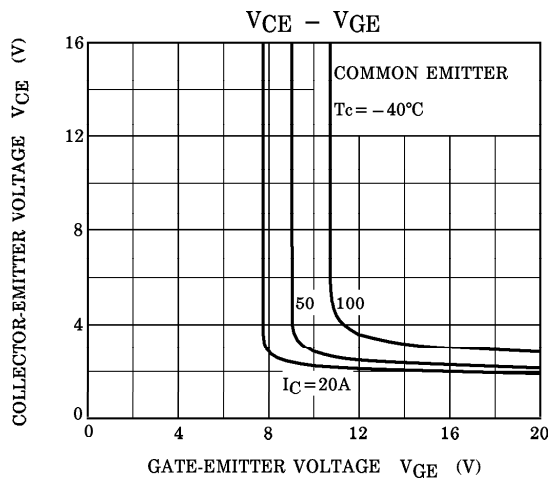
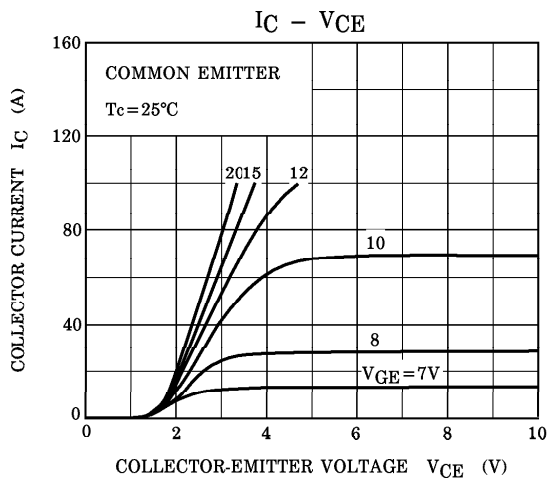
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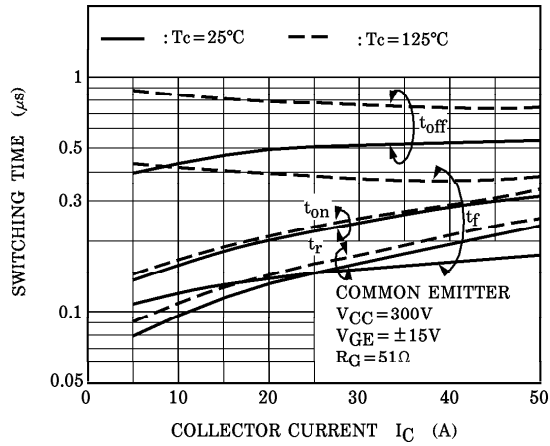
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

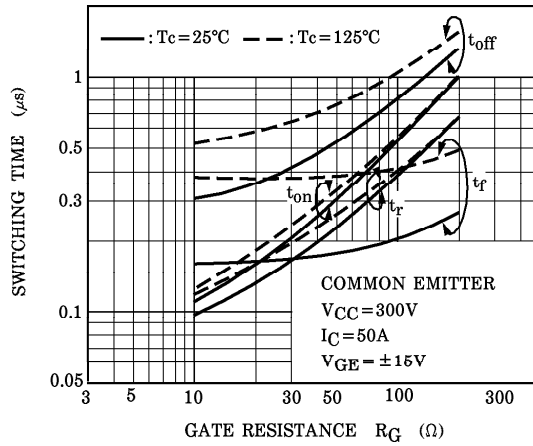
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	$V_{GE} = \pm 20V, V_{CE} = 0$	—	—	± 500	nA
Collector Cut-off Current		I_{CES}	$V_{CE} = 600V, V_{GE} = 0$	—	—	1.0	mA
Collector-Emitter Breakdown Voltage		$V_{(BR)CES}$	$I_C = 10mA, V_{GE} = 0$	600	—	—	V
Gate-Emitter 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}	$I_F = 50A, V_{GE} = -10V$ $di/dt = 100A/\mu s$	—	0.08	0.15	μs
Thermal Resistance		$R_{th(j-c)}$	Transistor	—	—	0.50	$^{\circ}C/W$
			Diode	—	—	1.00	



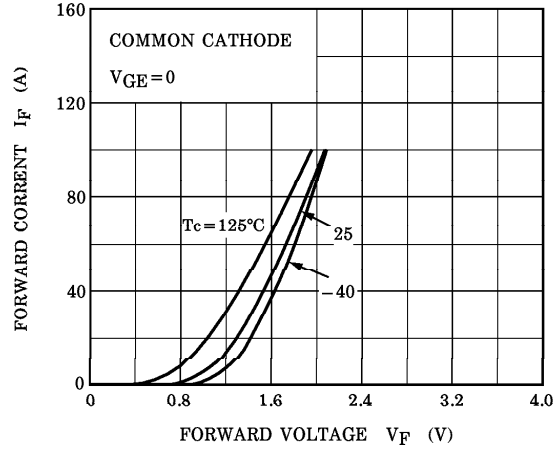
SWITCHING TIME - I_C



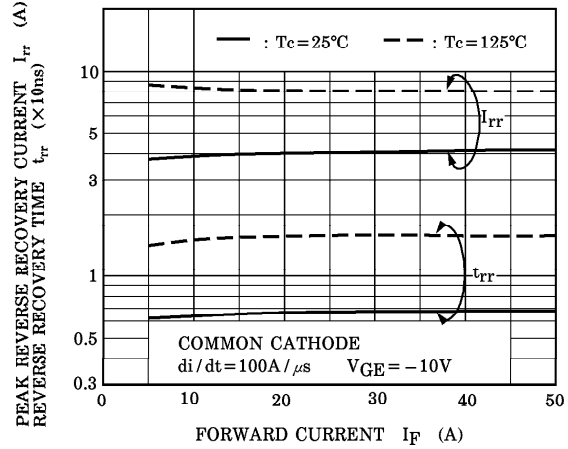
SWITCHING TIME - R_G



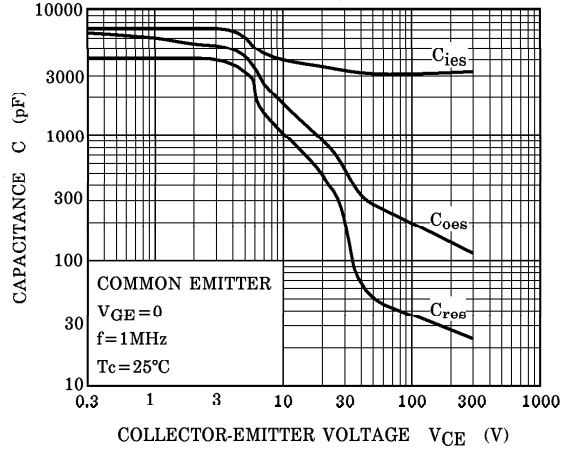
$I_F - V_F$



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



C - V_{CE}



$R_{th}(t) - t_w$

