TOSHIBA

INSULATED GATE BIPOLAR TRANSISTOR

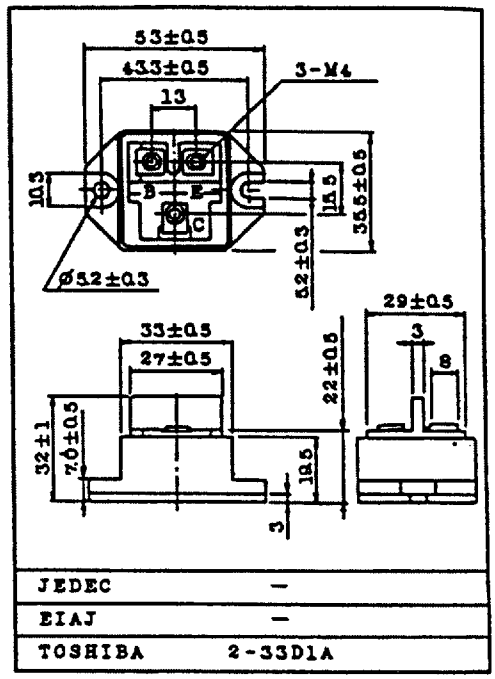
MG50Q1BS1

Unit in mm

High Power Switching Applications

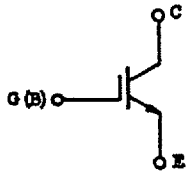
Motor Control Applications

- High Input Impedance
- High Speed: t_f = 0.5μs (Max.)
- Low Saturation Voltage
  : $V_{CE(sat)}$ = 4.0V (Max.)
- Enhancement-Mode
- The Electrodes are Isolated from Case.



Weight : 90g

Equivalent Circuit



Maximum Ratings (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATINGS	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	±20	V
Collector Current	DC	I_C	50	A
	1ms	I_{CP}	100	
Collector Power Dissipation (Tc = 25°C)		P_C	300	W
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	-40 ~ 125	°C
Isolation Voltage		V_{Isol}	2500 (AC 1 minute)	V
Screw Torque (Terminal/Mounting)		—	2/3	N•m

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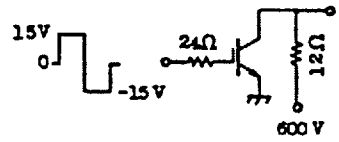
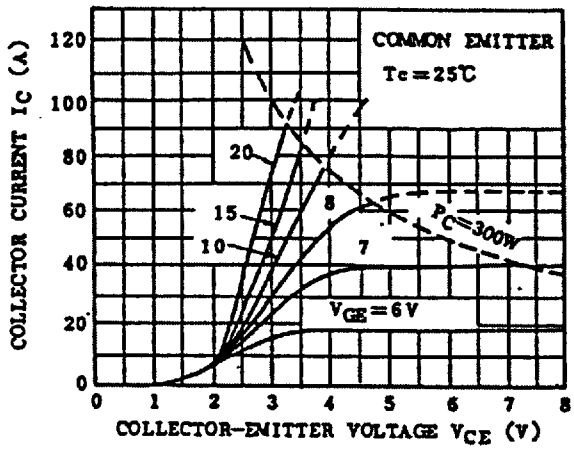
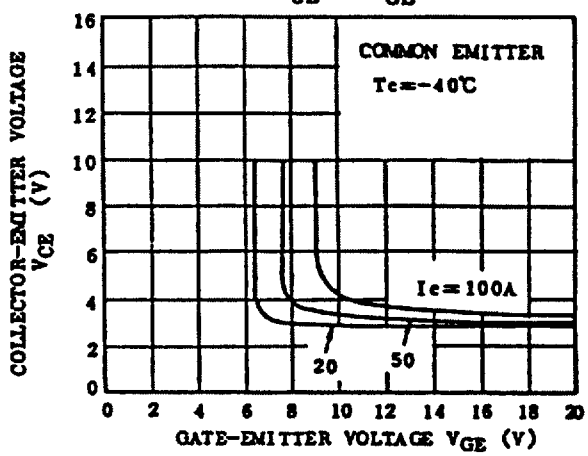
Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MX.	UNIT
Gate Leakage Current		I_{GES}	V_{GE} = ±20V, V_{CE} = 0	–	–	±500	nA
Collector Cut-off Current		I_{CES}	V_{CE} = 1200V, V_{GE} = 0	–	–	1.0	mA
Collector-Emitter Breakdown Voltage		$V_{(BR)CES}$	I_C = 2mA, V_{GE} = 0	1200	–	–	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	–	3.0	4.0	V
Input Capacitance		C_{ies}	V_{CE} = 10V, V_{GE} = 0, f = 1MHz	–	7800	–	pF
Switching Time	Rise Time	t_r		–	0.3	0.6	µs
	Turn-on Time	t_{on}		–	0.4	0.8	
	Fall Time	t_f		–	0.25	0.5	
	Turn-off Time	t_{off}		–	0.8	1.5	
Thermal Resistance		$R_{th\ (j-c)}$	–	–	–	0.41	°C/W

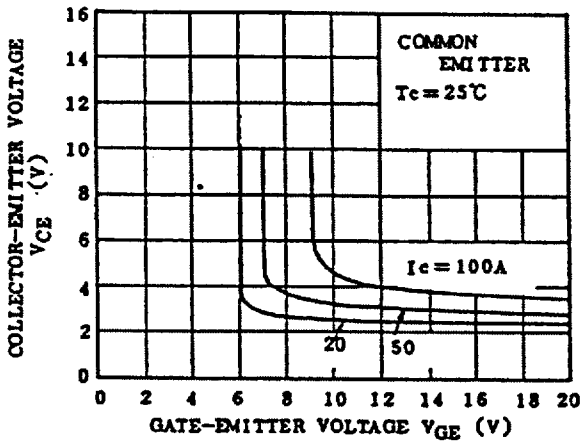
$I_C - V_{CE}$



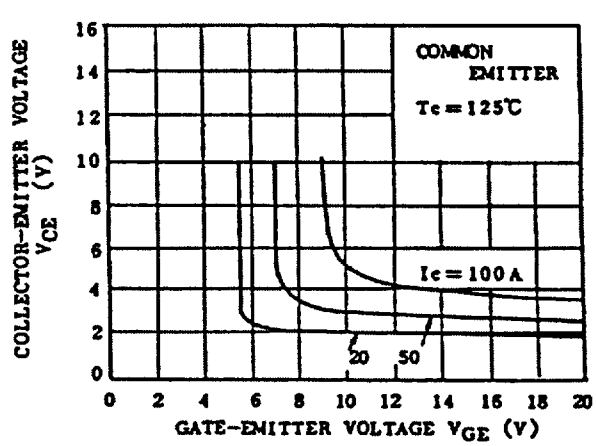
$V_{CE} - V_{GE}$



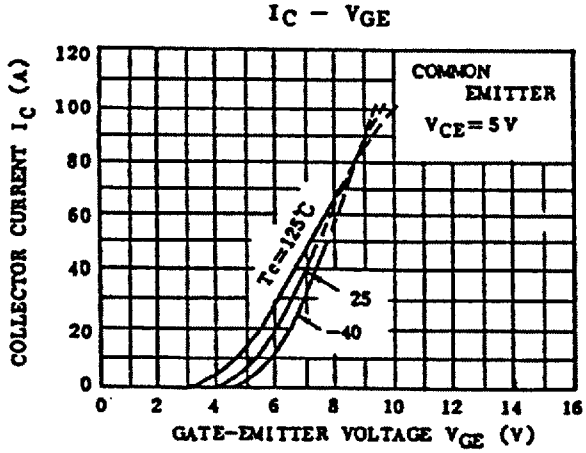
$V_{CE} - V_{GE}$



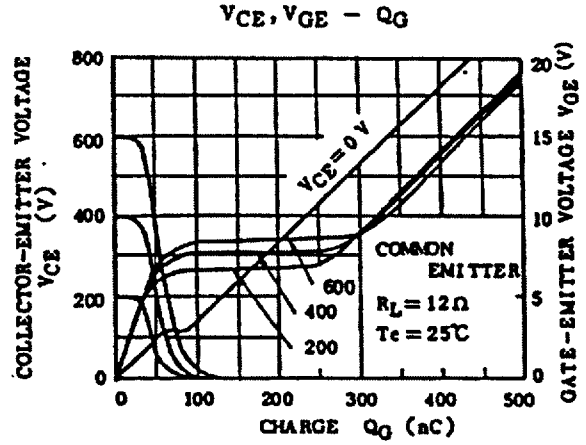
$V_{CE} - V_{GE}$



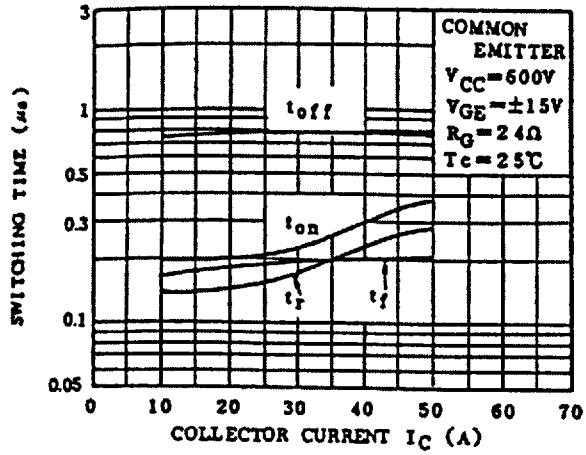
$I_C - V_{GE}$



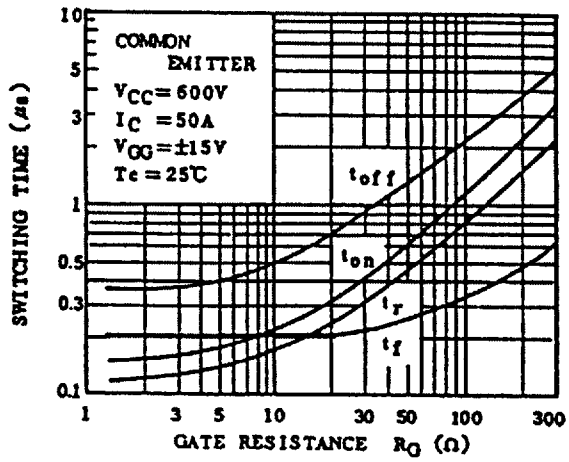
$V_{CE}, V_{GE} - Q_G$



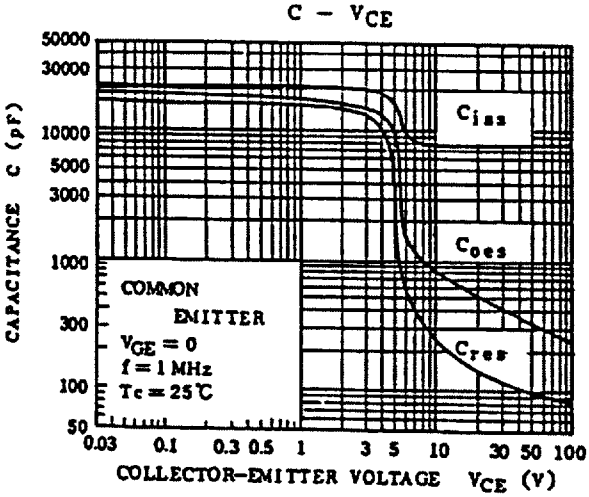
SWITCHING TIME – I_C



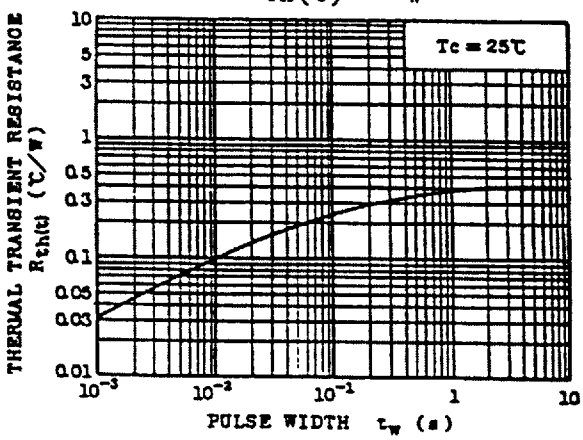
SWITCHING TIME – R_G



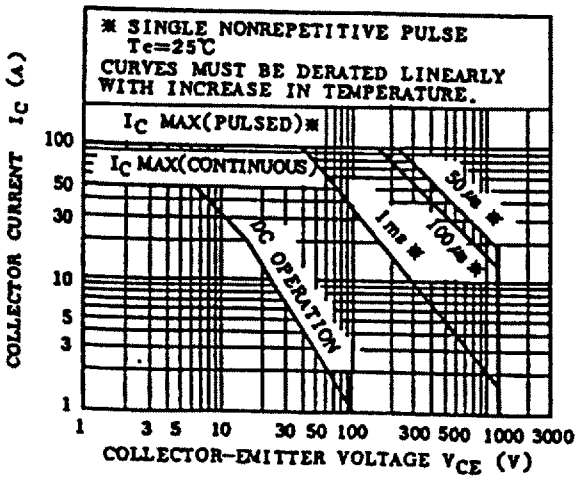
C – V_{CE}



$R_{th}(t)$ – t_w



SAFE OPERATING AREA



REVERSE BIAS SOA