

TOSHIBA SEMICONDUCTOR

TECHNICAL DATA

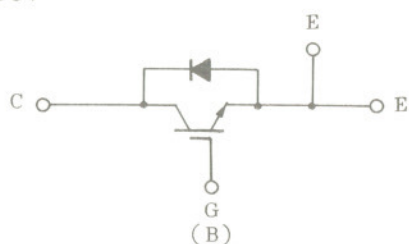
TOSHIBA GTR MODULE
MG400Q1US1/MG400Q1US2
SILICON N CHANNEL IGBT

HIGH POWER SWITCHING APPLICATIONS.
MOTOR CONTROL APPLICATIONS.

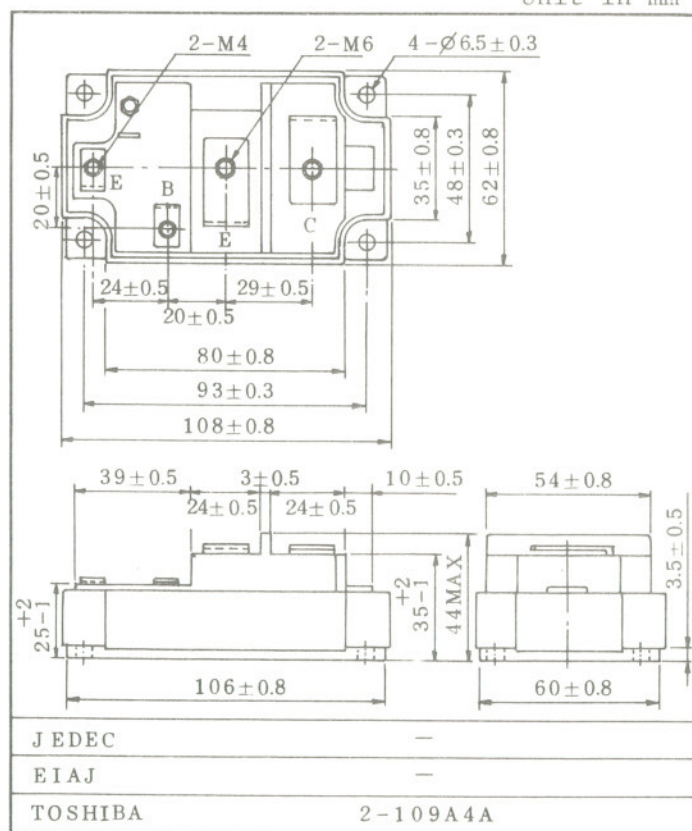
- High Input Impedance
- High Speed : $t_f=0.5\mu s(\text{Max.})$
 $t_{rr}=0.5\mu s(\text{Max.})$
- Low Saturation Voltage : $V_{CE}(\text{sat})=4.0V(\text{Max.})$
- Enhancement-Mode
- The Electrodes are Isolated from Case.

EQUIVALENT CIRCUIT

MG400Q1US1

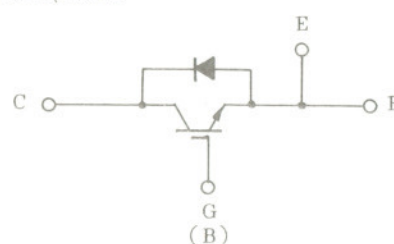


Unit in mm

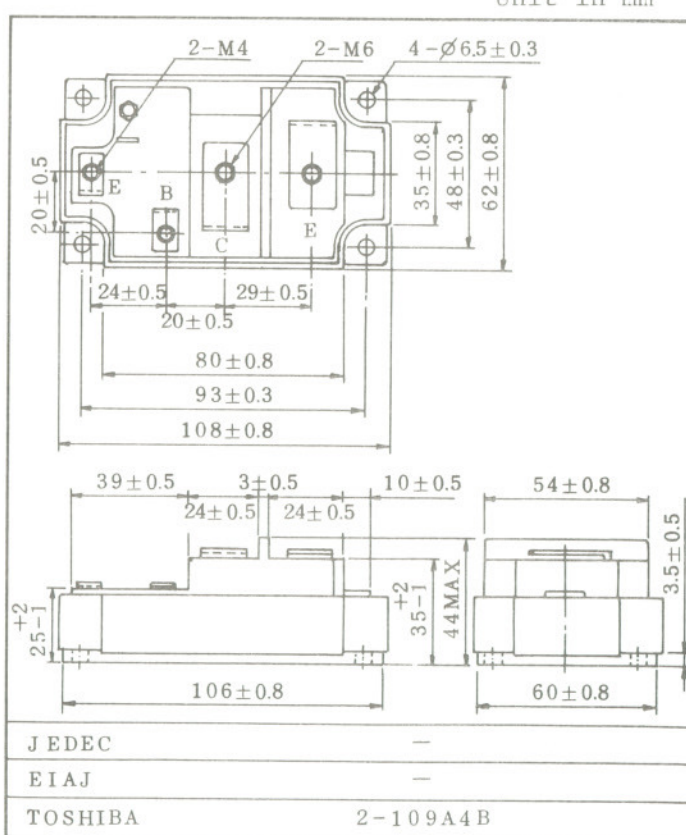


Weight : 465g

MG400Q1US2



Unit in mm



Weight : 465g

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MG400Q1US1-1

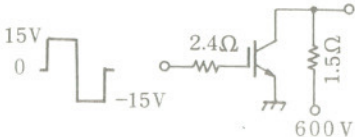
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MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V _{CES}	1200	V
Gate-Emitter Voltage		V _{GES}	±20	V
Collector Current	DC	I _C	400	A
	1ms	I _{CP}	800	
Forward Current	DC	I _F	400	A
	1ms	I _{FM}	800	
Collector Power Dissipation (Ta=25°C)		P _C	2400	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/M4/M6/Mounting)		-	2/3/3	Nm

ELECTRICAL CHARACTERISTICS (Ta=25°C)

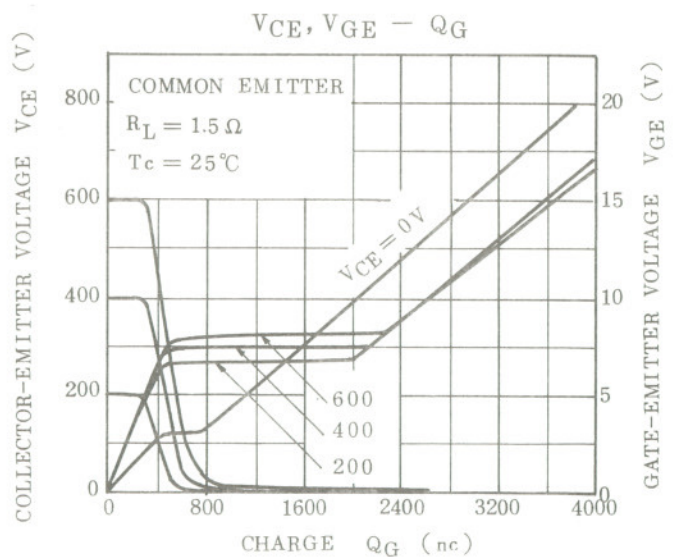
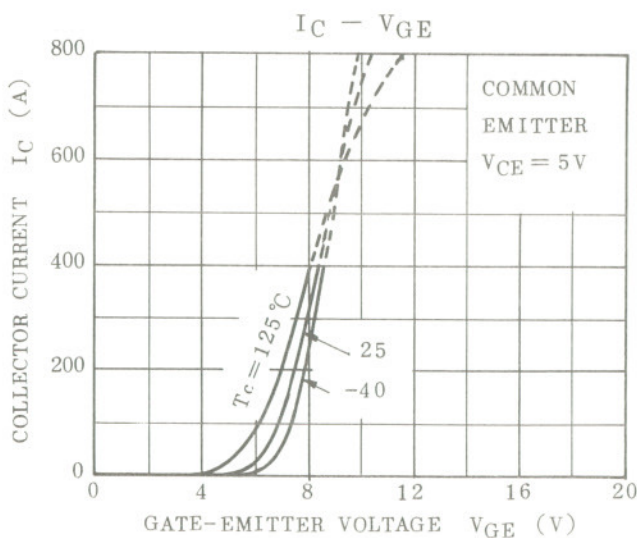
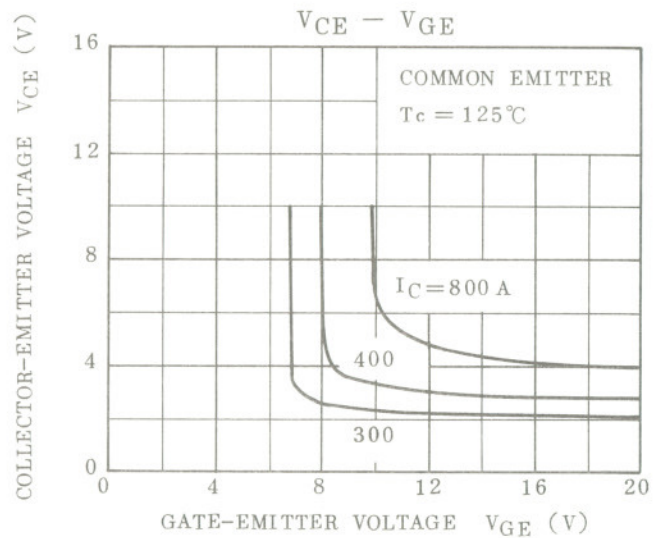
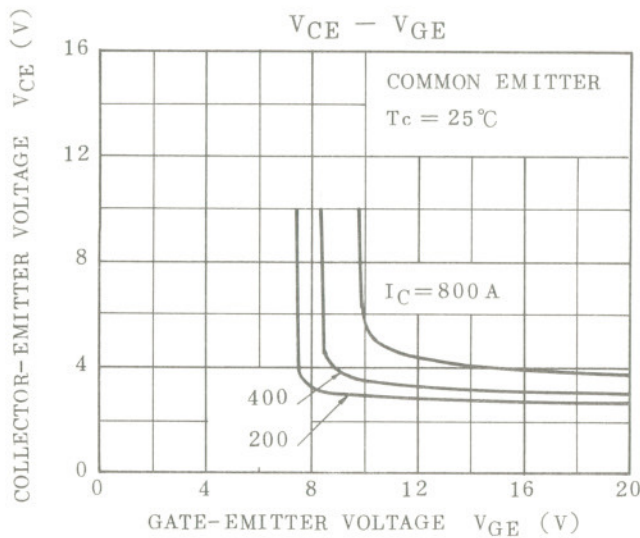
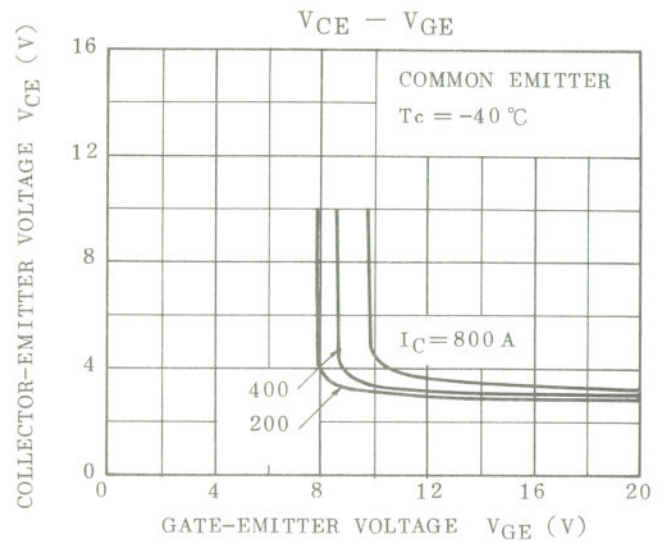
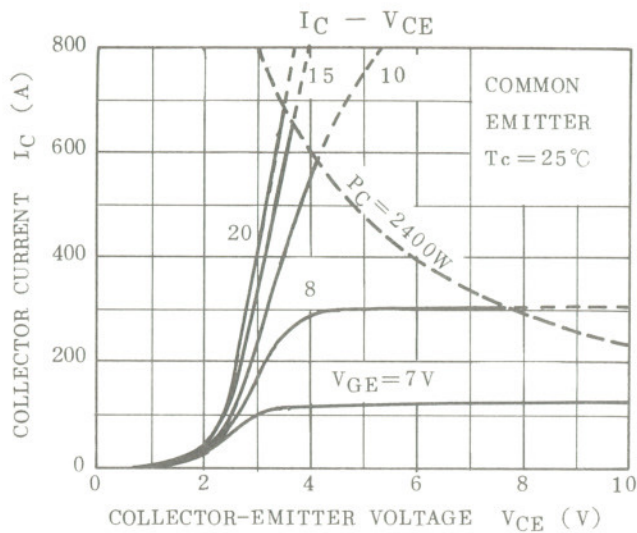
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GES}	V _{GE} =±20V, V _{CE} =0	-	-	±500	nA
Collector Cut-off Current		I _{CES}	V _{CE} =1200V, V _{GE} =0	-	-	4	mA
Collector-Emitter Voltage		V _{CES}	I _C ≤ 4mA, V _{GE} =0 Note 1	1200	-	-	V
Gate-Emitter Cut-off Voltage		V _{GE(OFF)}	I _C =400mA, V _{CE} =5V	3.0	-	6.0	V
Collector-Emitter Saturation Voltage		V _{CE(sat)}	I _C =400A, V _{GE} =15V	-	3.0	4.0	V
Input Capacitance		C _{ies}	V _{CE} =10V, V _{GE} =0, f=1MHz	-	59000	-	pF
Switching Time	Rise Time	t _r		-	0.3	0.60	μs
	Turn-on Time	t _{on}		-	0.4	0.80	
	Fall Time	t _f		-	0.2	0.50	
	Turn-off Time	t _{off}		-	0.8	1.5	
Forward Voltage		V _F	I _F =400A, V _{GE} =0	-	2.0	3.0	V
Reverse Recovery Time		t _{rr}	I _F =400A, V _{GE} =-10V di/dt=300A/μs	-	0.25	0.5	μs
Thermal Resistance	R _{th(j-c)}	Transistor		-	-	0.052	°C/W
		Diode		-	-	0.20	

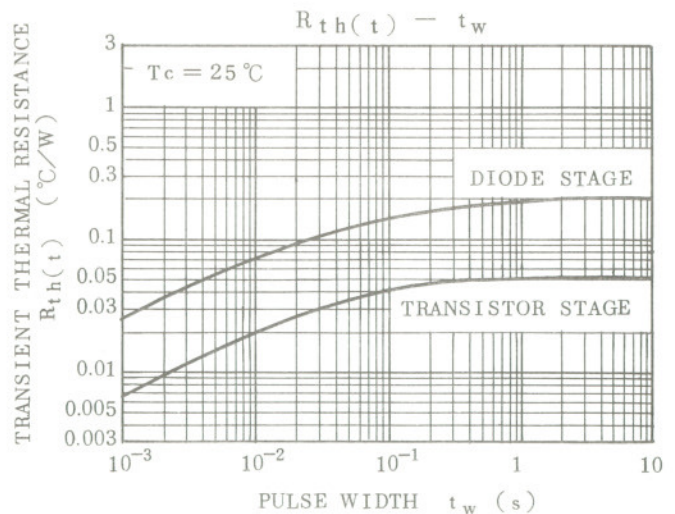
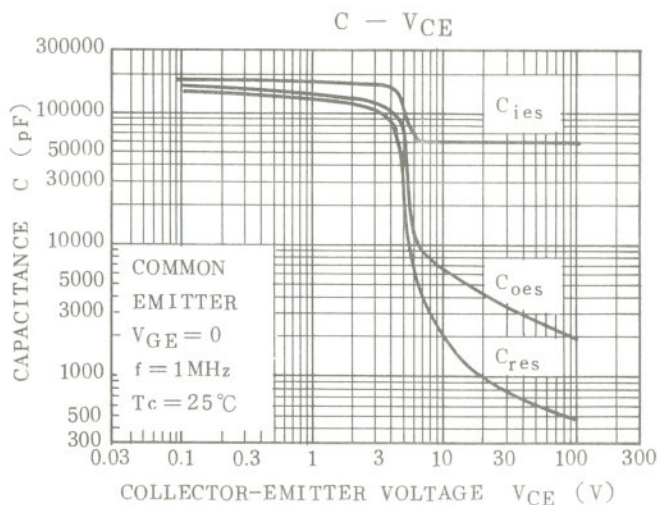
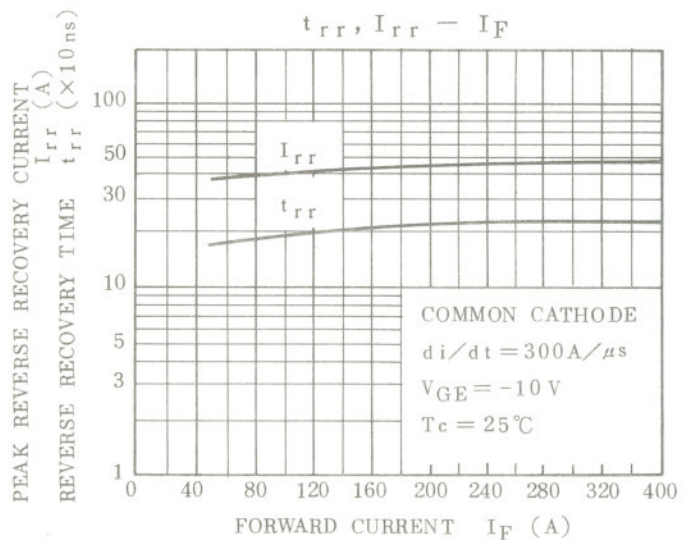
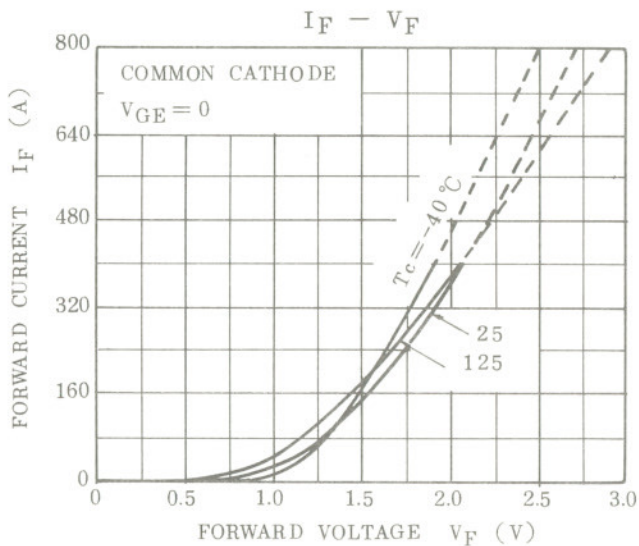
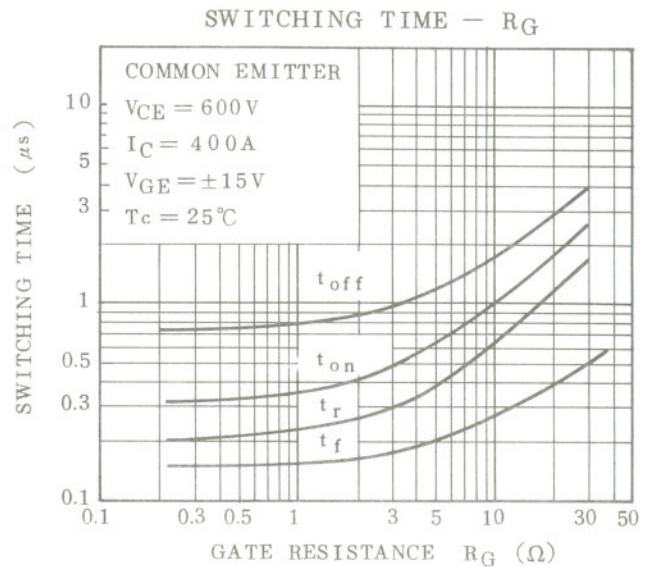
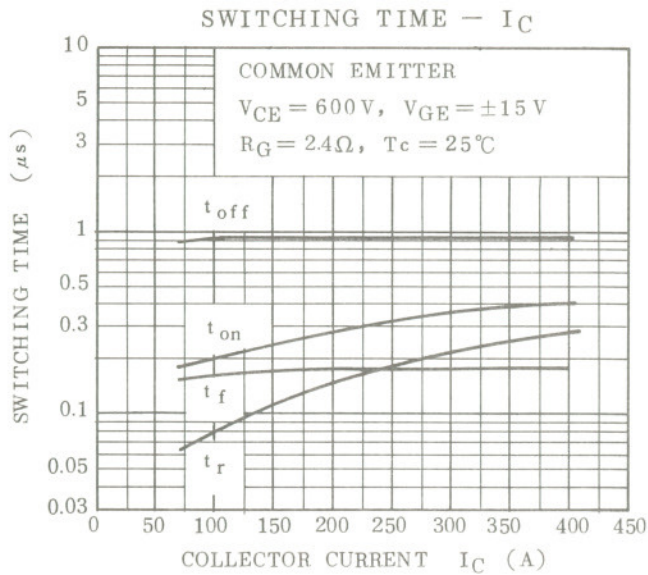
Note 1: Do not apply the over rating voltage

MG400Q1US1-2

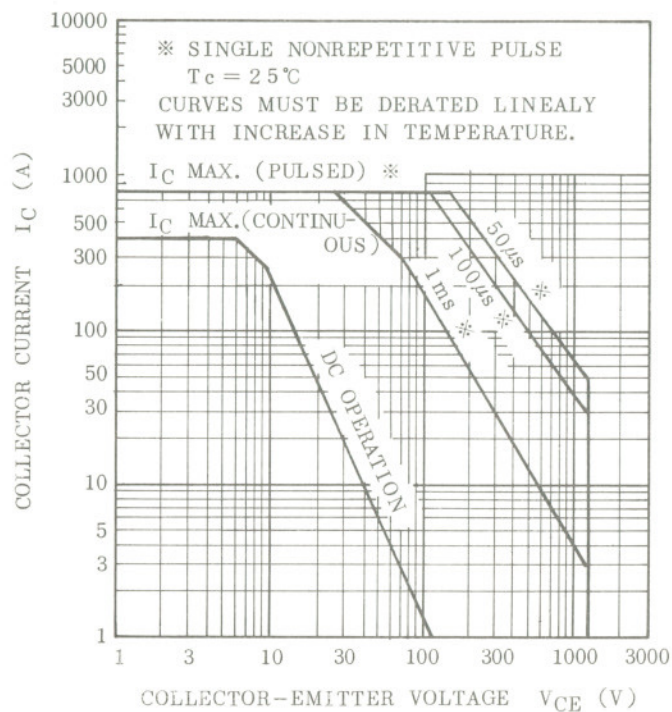
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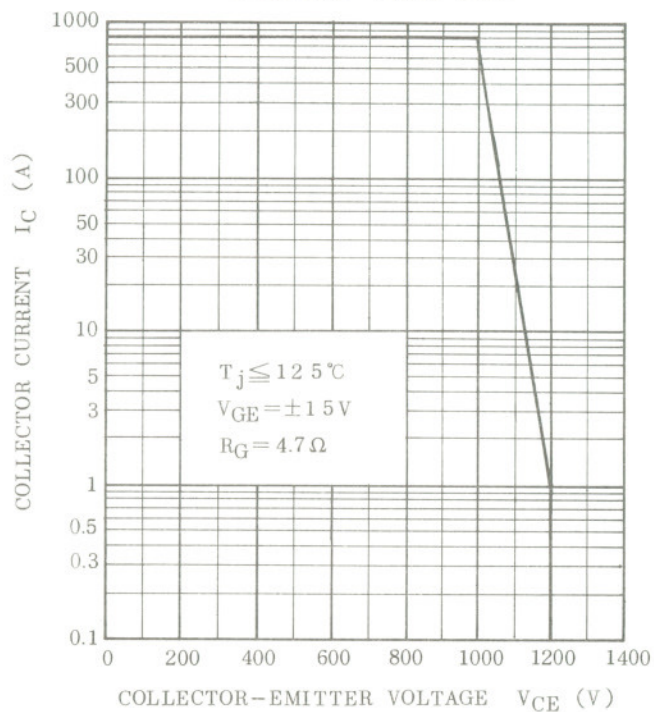




SAFE OPERATING AREA



REVERSE BIAS SOA



MG400Q1US1-5 *

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