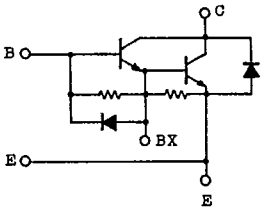
TOSHIBA SEMICONDUCTOR
TECHNICAL DATA

TOSHIBA GTR MODULE
MG400G1UL1
SILICON NPN TRIPLE DIFFUSED TYPE

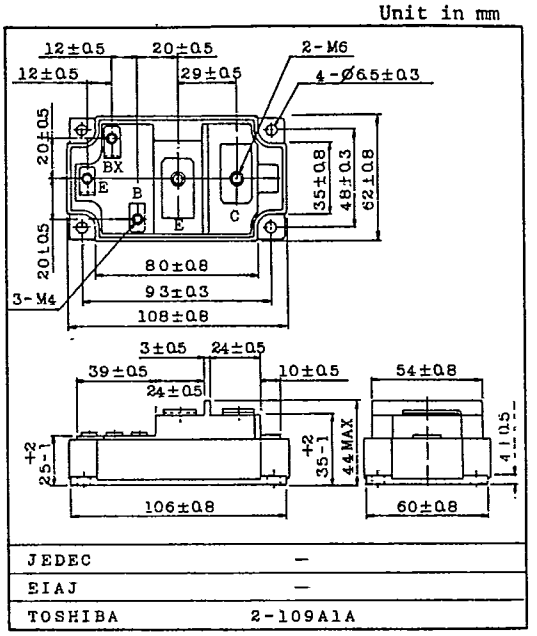
HIGH POWER SWITCHING APPLICATIONS.
MOTOR CONTROL APPLICATIONS.

- The Collector is Isolated from Case.
- With Built-in Free Wheeling Diode
- High DC Current Gain
  : h_{FE}=100(Min.) (I_C=400A)
- Low Saturation Voltage
  : $V_{CE(sat)}$=2V(Max.) (I_C=400A)

EQUIVALENT CIRCUIT



Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	2-109A1A

Weight : 490g

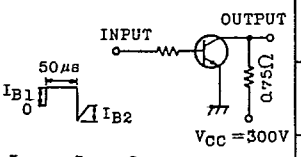
MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	600	V
Collector-Emitter Sustaining Voltage		$V_{CEX(SUS)}$	600	V
		$V_{CEO(SUS)}$	450	
Emitter-Base Voltage		V_{EBO}	6	V
Collector Current	DC	I_C	400	A
	1ms	I_{CP}	800	
Forward Current	DC	I_F	400	A
	1ms	I_{FM}	800	
Base Current		I_B	40	A
Collector Power Dissipation (Tc=25°C)		P_C	1600	W
Junction Temperature		Tj	150	°C
Storage Temperature Range		Tstg	-40~125	°C
Isolation Voltage		V_{Isol}	2500 (AC 1 Minute)	V
Screw Torque	Terminal (M4/M6)	-	20/30	kg·cm
	Mounting	-	30	

TOSHIBA SEMICONDUCTOR
TECHNICAL DATA

MG400G1UL1

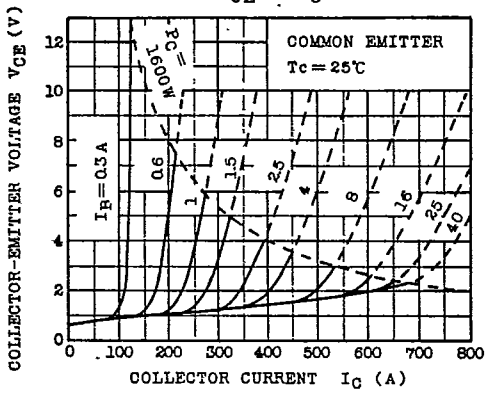
ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	V_{CB}=600V, I_E=0	-	-	4	mA
Emitter Cut-off Current		I_{EBO}	V_{EB}=6V, I_C=0	-	-	800	mA
Collector-Emitter Sustaining Voltage		$V_{CEO(SUS)}$	I_C=0.5A, L=40mH	450	-	-	V
DC Current Gain		h_{FE}	V_{CE}=5V, I_C=400A	100	-	-	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C=400A, I_B=8A	-	1.6	2.0	V
Base-Emitter Saturation Voltage		$V_{BE(sat)}$		-	2.2	2.7	V
Switching Time	Turn-on Time	t_{on}	 $I_{B1}=-I_{B2}=8A$ DUTY CYCLE=0.5%	-	3	4	μs
	Storage Time	t_{stg}		-	8	12	
	Fall Time	t_f		-	0.6	2	
Forward Voltage		V_F	I_F=400A, I_B=0	-	-	1.7	V
Reverse Recovery Time		t_{rr}	I_F=400A, V_{BE}=-3V di/dt=200A/μs	-	-	1.5	μs
Thermal Resistance		$R_{th(j-c)}$	Transistor	-	-	0.078	°C/W
			Diode	-	-	0.325	

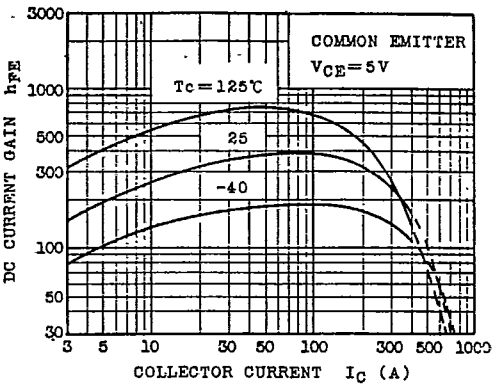
TOSHIBA SEMICONDUCTOR
TECHNICAL DATA

MG400G1UL1

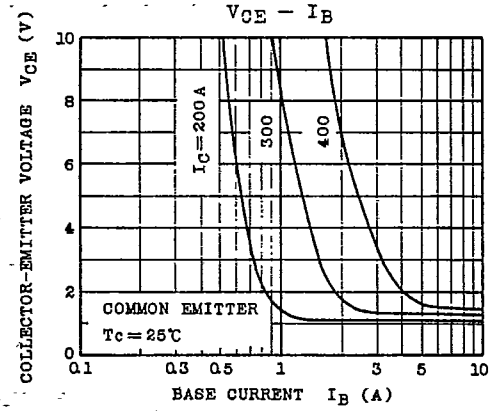
$V_{CE} - I_C$



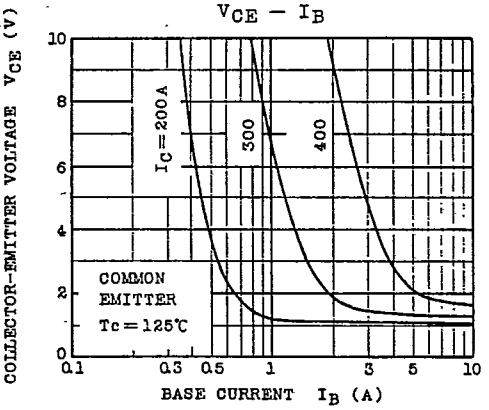
$h_{FE} - I_C$



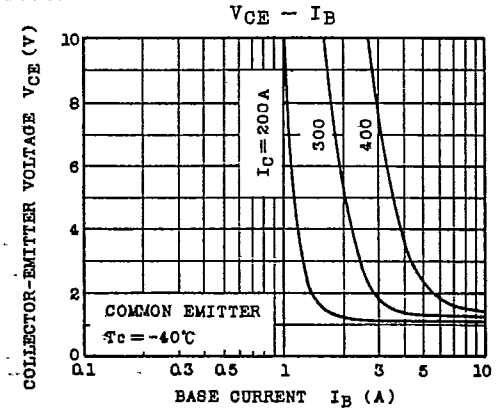
$V_{CE} - I_B$



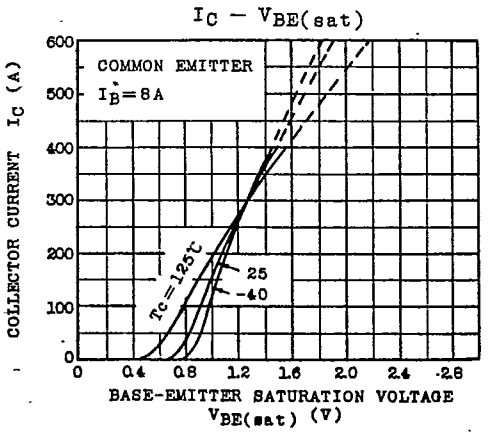
$V_{CE} - I_B$



$V_{CE} - I_B$



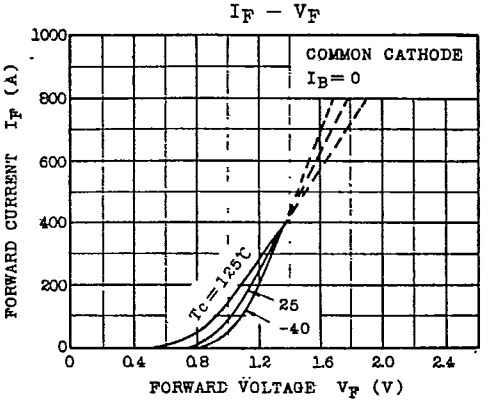
$I_C - V_{BE(sat)}$



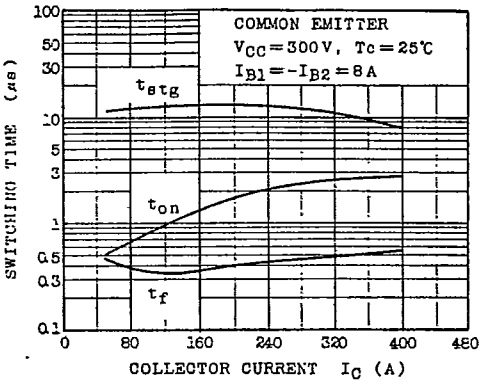
TOSHIBA SEMICONDUCTOR
TECHNICAL DATA

MG400G1UL1

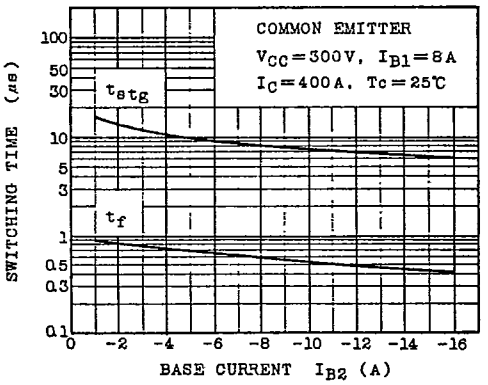
$I_F - V_F$



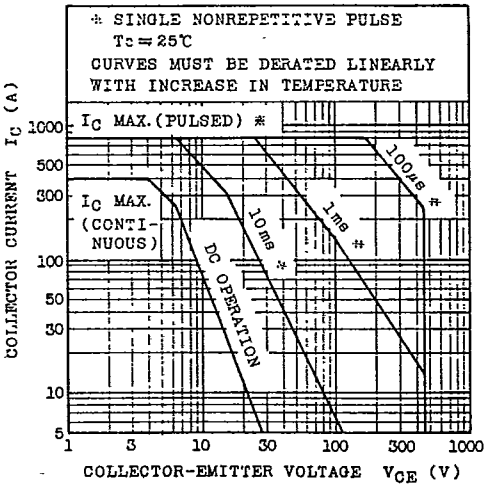
SWITCHING TIME — I_C



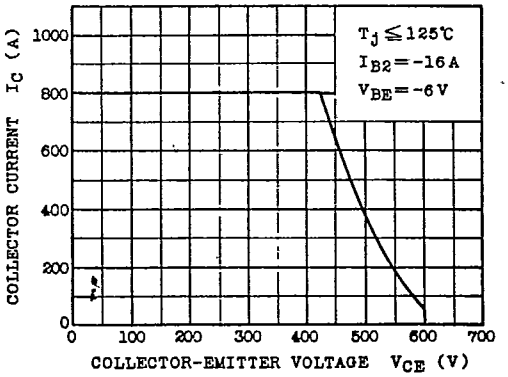
SWITCHING TIME — I_{B2}



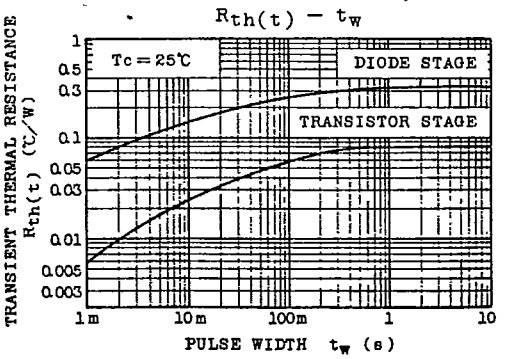
SAFE OPERATING AREA



REVERSE BIAS SOA



$R_{th(t)} - t_w$



MG400G1UL1-4 *

TOSHIBA CORPORATION

TOSHIBA SEMICONDUCTOR
TECHNICAL DATA

TOSHIBA GTR MODULE

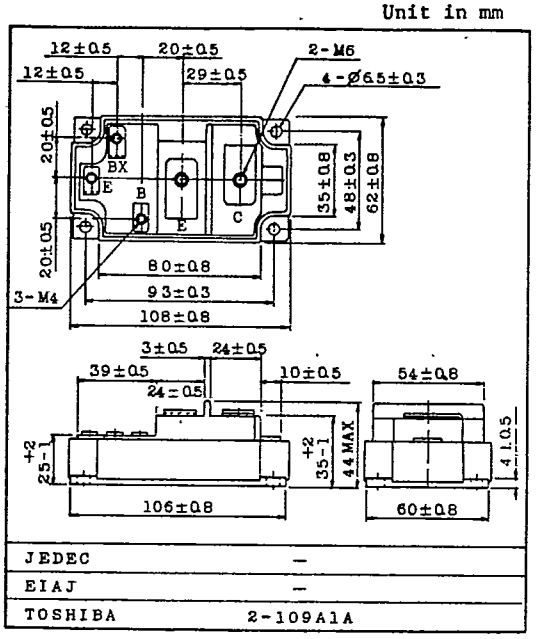
MG400H1UL1

SILICON NPN TRIPLE DIFFUSED TYPE

HIGH POWER SWITCHING APPLICATIONS.
MOTOR CONTROL APPLICATIONS.

FEATURES:
- The Collector is Isolated from Case.
- With Built-in Free Wheeling Diode
- High DC Current Gain
  : h_{FE}=80(Min.)(I_C=400A)
- Low Saturation Voltage
  : $V_{CE(sat)}$=2V(Max.)(I_C=400A)
- Excellent Collector Current Balance by Direct Parallel Connection of Each All Terminals.
- High Speed : t_f=4μs(Max.)(I_C=400A)

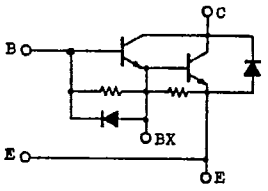
Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	2-109A1A

Weight : 490g

EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		V_{CBO}	600	V
Collector-Emitter Sustaining Voltage		$V_{CEX(SUS)}$	600	V
		$V_{CEO(SUS)}$	550	
Emitter-Base Voltage		V_{EBO}	6	V
Collector Current	DC	I_C	400	A
	1ms	I_{CP}	800	
Forward Current	DC	I_F	400	A
	1ms	I_{FM}	800	
Base Current		I_B	50	A
Collector Power Dissipation (Tc=25°C)		P_C	1600	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)	-	20/30	kg·cm
	Mounting	-	30	

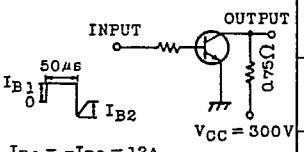
EGA-MG400H1UL1-1

TOSHIBA CORPORATION

TOSHIBA SEMICONDUCTOR
TECHNICAL DATA

MG400H1UL1

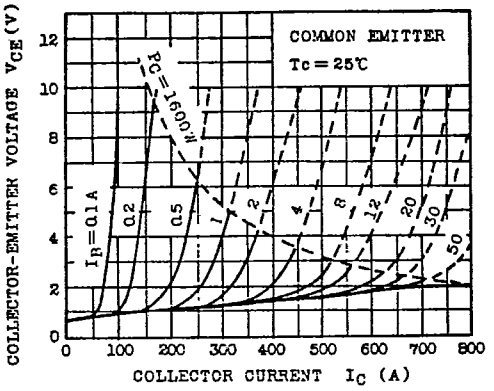
ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I_{CBO}	V_{CB}=600V, I_E=0	-	-	4.0	mA
Emitter Cut-off Current		I_{EBO}	V_{EB}=6V, I_C=0	-	-	800	mA
Collector-Emitter Sustaining Voltage		$V_{CEO(SUS)}$	I_C=0.5A, L=40mH	550	-	-	V
DC Current Gain		h_{FE}	V_{CE}=5V, I_C=400A	80	-	-	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C=400A, I_B=12A	-	-	2.0	V
Base-Emitter Saturation Voltage		$V_{BE(sat)}$		-	-	2.7	V
Switching Time	Turn-on Time	t_{on}	 I_{B1} = -I_{B2} = 12A DUTY CYCLE = 0.5%	-	-	4	μs
	Storage Time	t_{stg}		-	-	12	
	Fall Time	t_f		-	-	4	
Forward Voltage		V_F	I_F=400A, I_B=0	-	-	1.7	V
Reverse Recovery Time		t_{rr}	I_F=400A, V_{BE}=-3V di/dt=100A/μs	-	-	1.5	μs
Thermal Resistance		$R_{th(j-c)}$	Transistor	-	-	0.078	°C/W
			Diode	-	-	0.325	

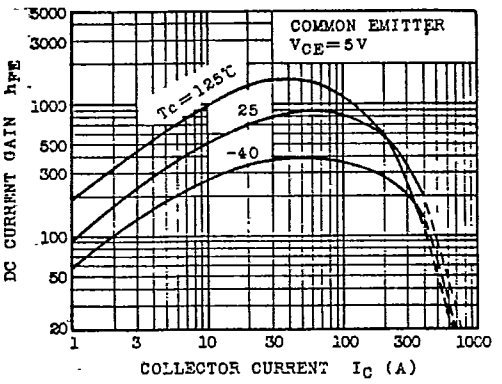
TOSHIBA SEMICONDUCTOR
TECHNICAL DATA

MG400H1UL1

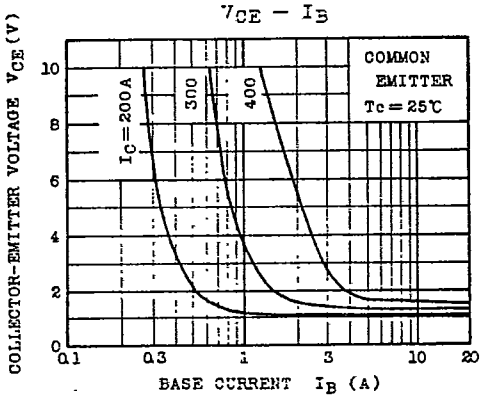
$V_{CE} - I_C$



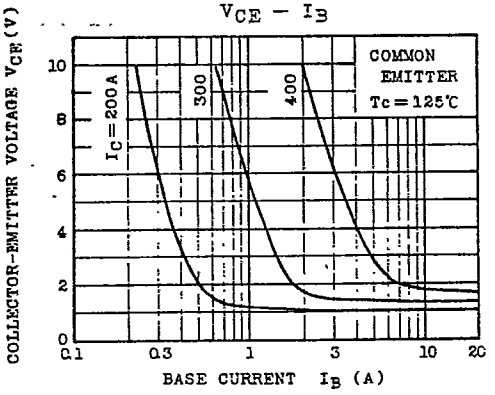
$h_{FE} - I_C$



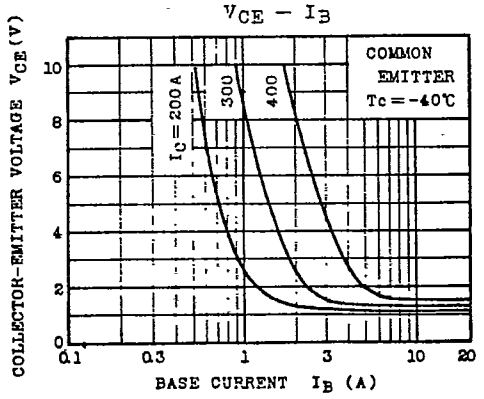
$V_{CE} - I_B$



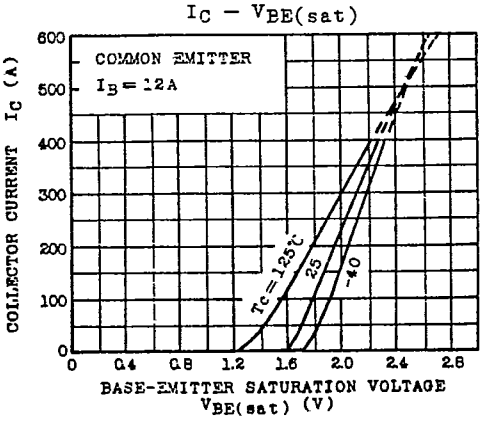
$V_{CE} - I_B$



$V_{CE} - I_B$



$I_C - V_{BE(sat)}$



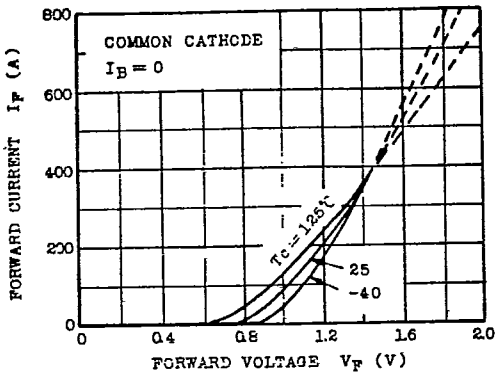
EGA-MG400H1UL1-3

TOSHIBA CORPORATION

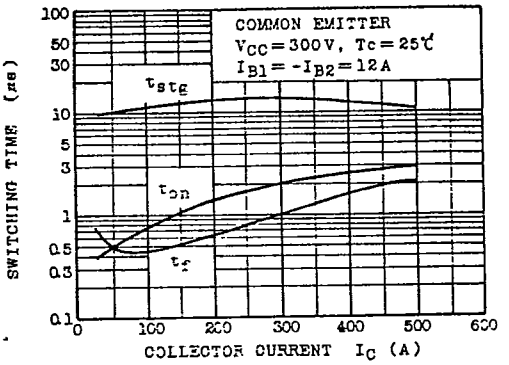
TOSHIBA SEMICONDUCTOR
TECHNICAL DATA

MG400H1UL1

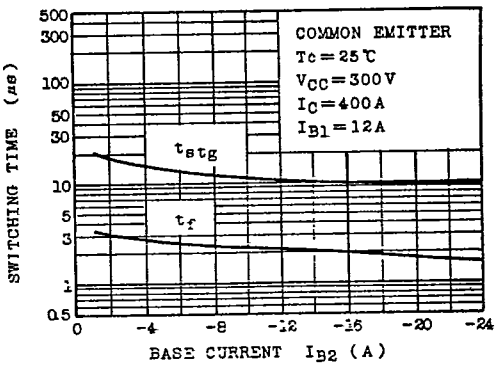
$I_F - V_F$



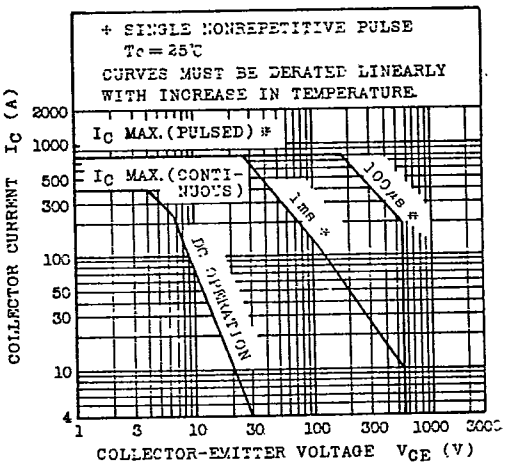
SWITCHING TIME — I_C



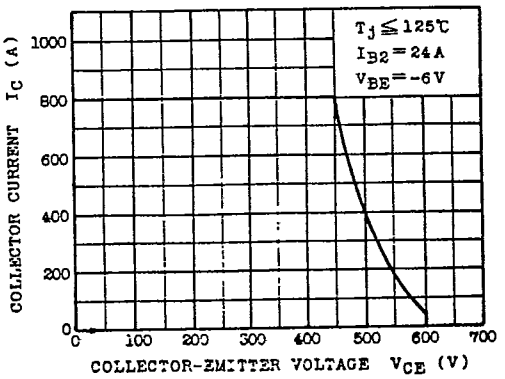
SWITCHING TIME — I_{B2}



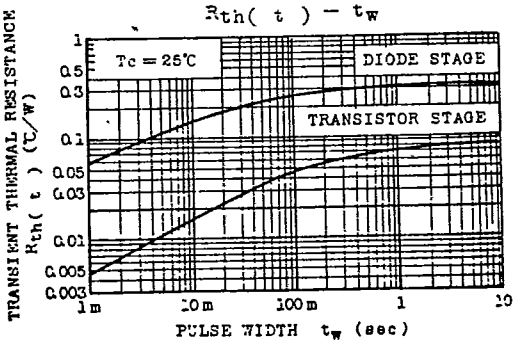
SAFE OPERATING AREA



REVERSE BIAS SOA



$R_{th}(t) - t_w$



EGA-MG400H1UL1-4 *

TOSHIBA CORPORATION