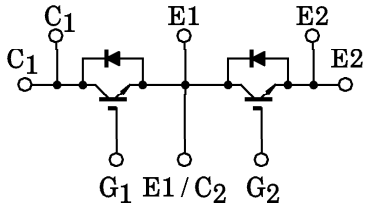
TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

MG180V2YS40

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

EQUIVALENT CIRCUIT



- The Electrodes are Isolated from Case
- High Input Impedance
- Includes a Complete Half Bridge in One Package.
- Enhancement-Mode
- High Speed : $t_f = 1.5\mu s$ (Max.) ($I_C = 180A$)
  $t_{rr} = 0.6\mu s$ (Max.) ($I_F = 180A$)
- Outline : TOSHIBA 2-109D2A
  (See page 3 for the device outline)
- Weight : 550g (Typ.)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	1700	V
Gate-Emitter Voltage		V_{GES}	±20	V
Collector Current	DC	I_C	180	A
	1ms	I_{CP}	360	
Forward Current	DC	I_F	180	A
	1ms	I_{FM}	360	
Collector Power Dissipation (Tc = 25°C)		P_C	1800	W
Junction Temperature		T_j	150	°C
Storage Temperature Range		T_{stg}	−40~125	°C
Isolation Voltage		V_{Isol}	4000 (AC 1 min.)	V
Screw Torque (Terminal / Mounting)		—	3 / 3	N·m

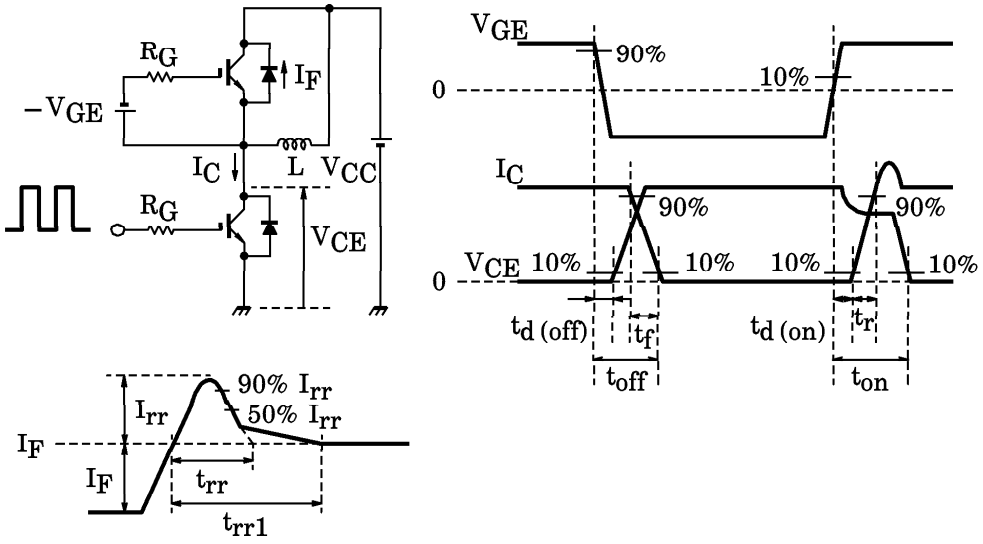
961001EAA2

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

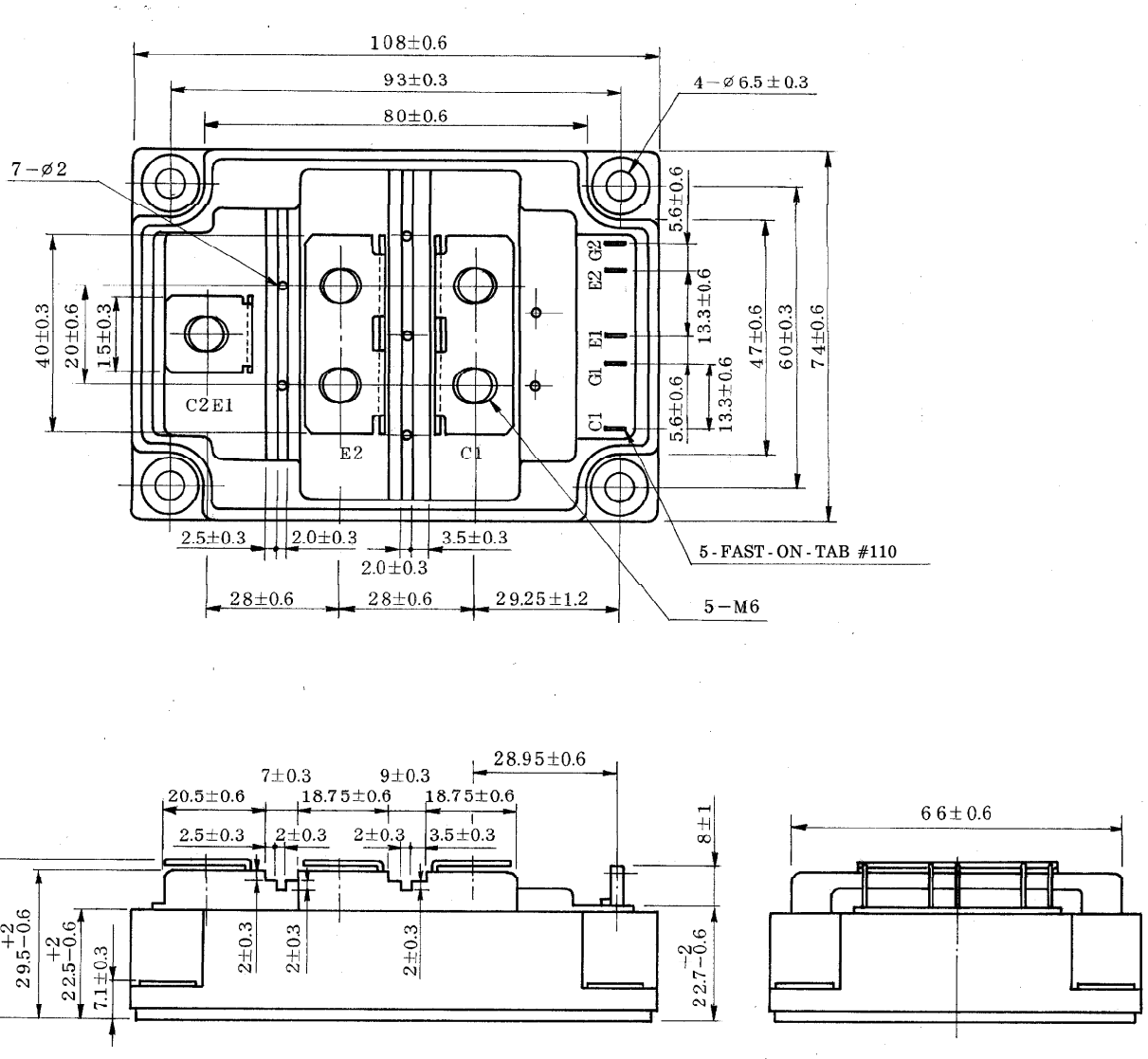
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	$V_{GE}=\pm20V$, $V_{CE}=0$	—	—	±150	nA
Collector Cut-off Current		I_{CES}	$V_{CE}=1700V$, $V_{GE}=0$	—	—	1.5	mA
Gate-Emitter Cut-off Voltage		$V_{GE\ (off)}$	$I_C=180mA$, $V_{CE}=5V$	4.0	—	8.0	V
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$	$I_C=180A$, $V_{GE}=15V$	—	3.2	4.5	V
Input Capacitance		C_{ies}	$V_{CE}=10V$, $V_{GE}=0$, f=1MHz	—	24600	—	pF
Switching Time	Turn-on Delay Time	$t_{d\ (on)}$	Inductive Load $V_{CC}=900V$ $I_C=180A$ $V_{GE}=\pm15V$ $R_G=2.7\Omega$ (Note 1)	—	0.1	—	μs
	Rise Time	t_r		—	0.1	—	
	Turn-on Time	t_{on}		—	0.5	—	
	Turn-off Delay Time	$t_{d\ (off)}$		—	0.4	—	
	Fall Time	t_f		—	0.5	1.5	
	Turn-off Time	t_{off}		—	1.0	—	
Forward Voltage		V_F	$I_F=180A$, $V_{GE}=0$	—	3.7	5.0	V
Reverse Recovery Time		t_{rr}	$I_F=180A$, $V_{GE}=-15V$ $di/dt=1000A/\mu s$ (Note.1)	—	0.3	0.6	μs
Thermal Resistance		$R_{th\ (j-c)}$	Transistor Stage	—	—	0.069	°C / W
			Diode Stage	—	—	0.25	

Note 1 Switching Time and Reverse Recovery Time Test Circuit & Timing Chart



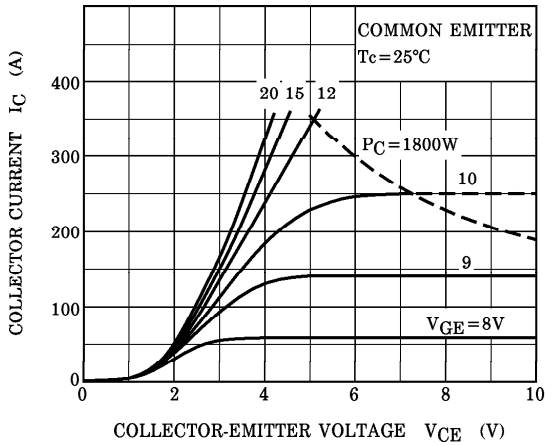
OUTLINE : TOSHIBA 2-109D2A

Unit in mm

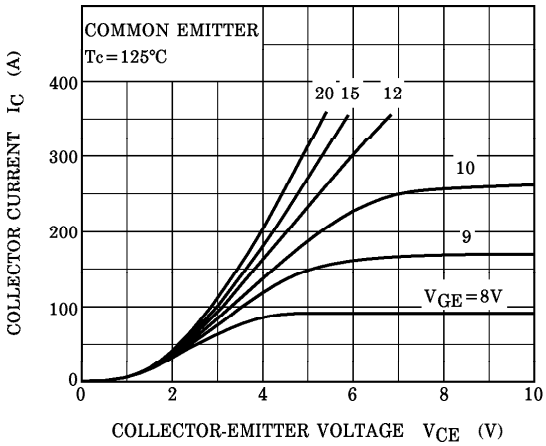


Weight : 550g (Typ.)

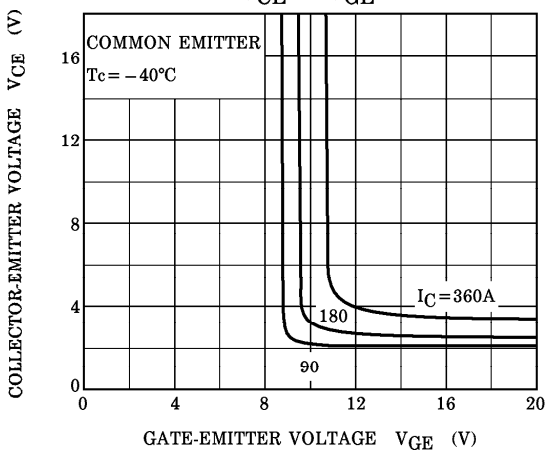
I_C – V_{CE}



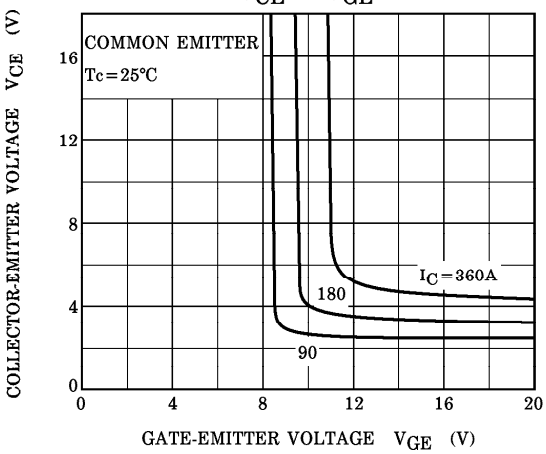
I_C – V_{CE}



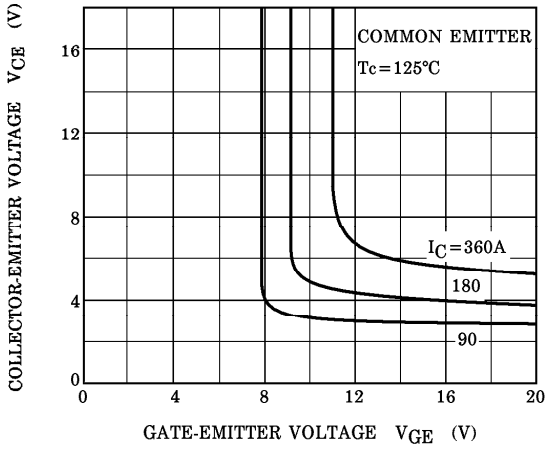
V_{CE} – V_{GE}



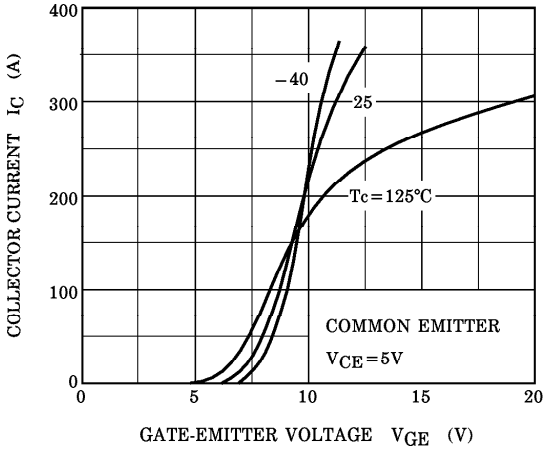
V_{CE} – V_{GE}



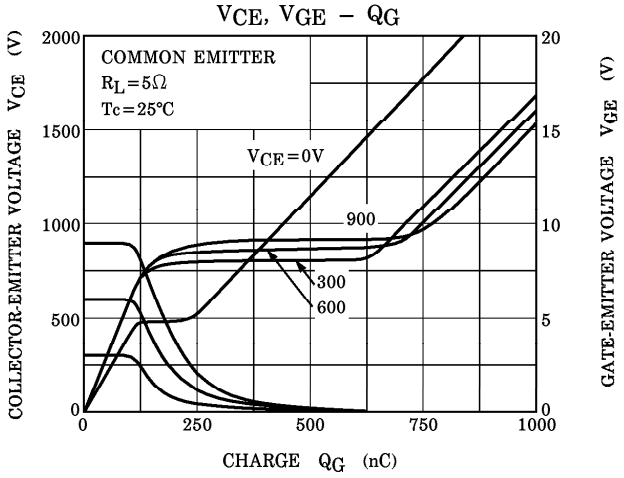
V_{CE} – V_{GE}



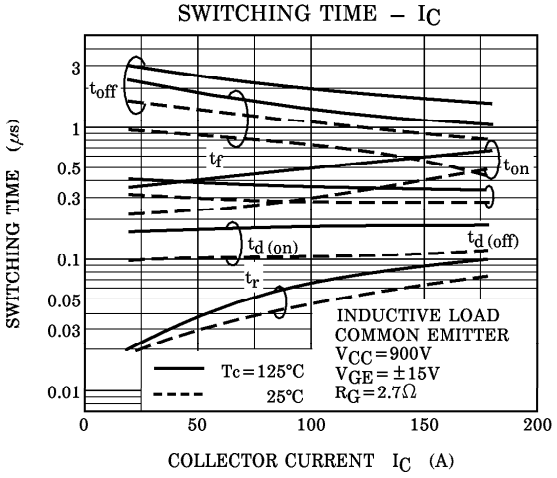
I_C – V_{GE}



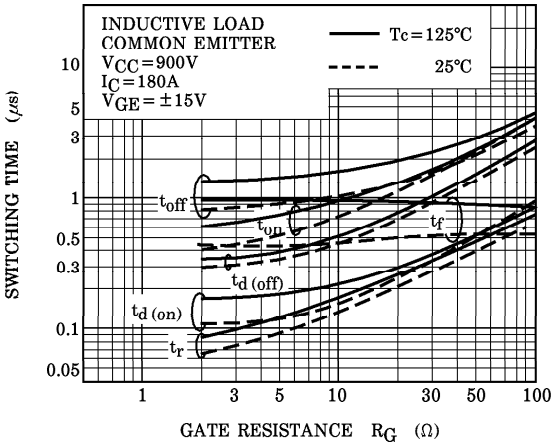
V_{CE}, V_{GE} – Q_G



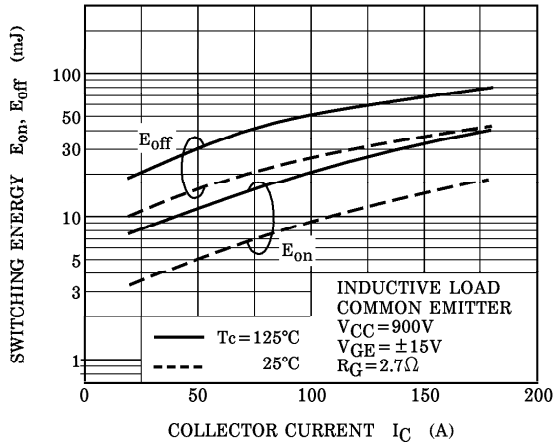
SWITCHING TIME – I_C



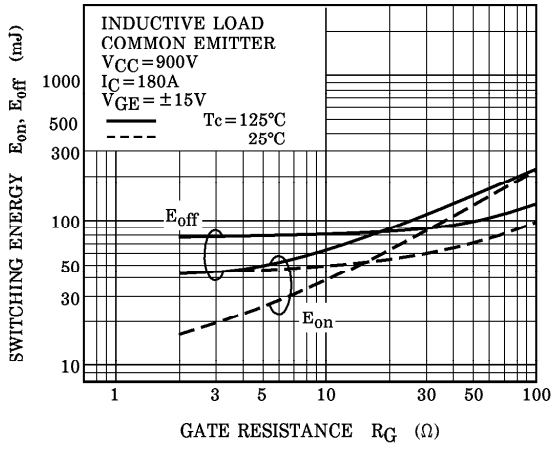
SWITCHING TIME – R_G



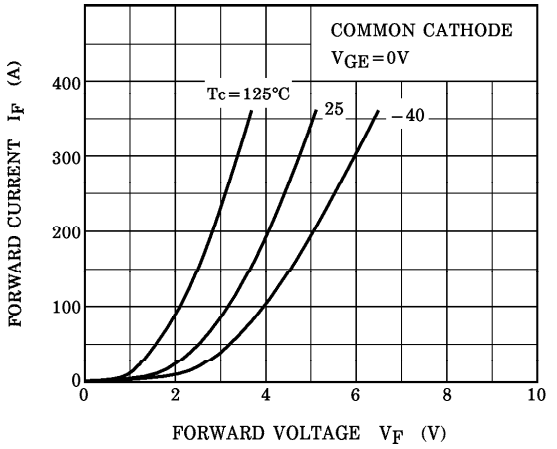
SWITCHING ENERGY – I_C



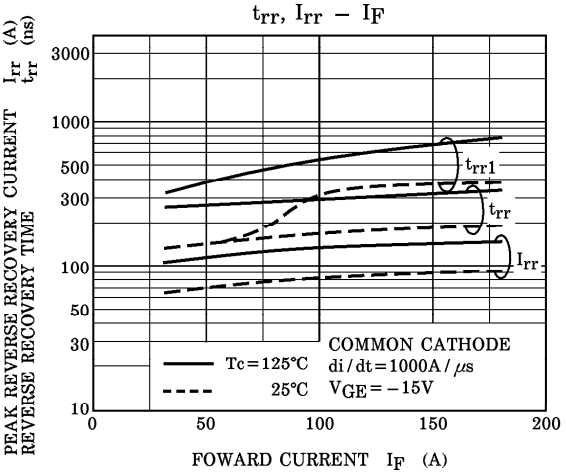
SWITCHING ENERGY – R_G



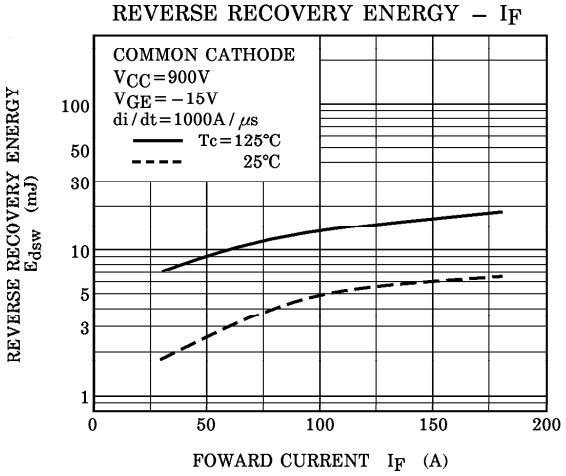
I_F – V_F



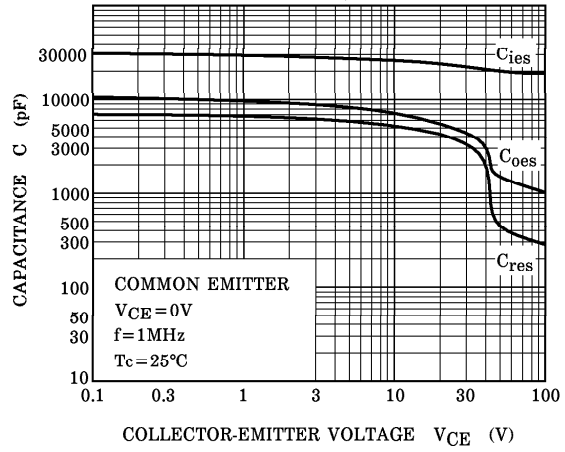
t_{rr}, I_{rr} – I_F



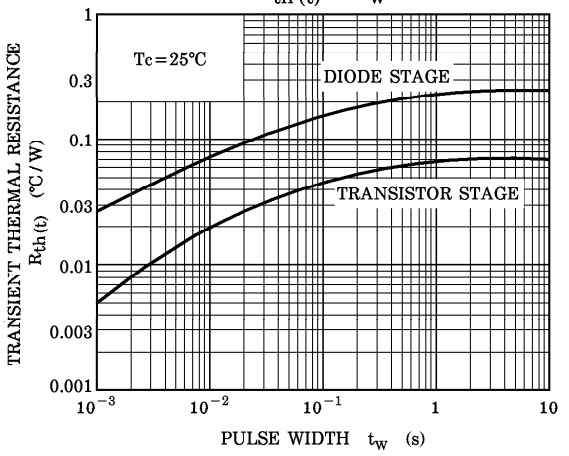
REVERSE RECOVERY ENERGY – I_F



C – V_{CE}



$R_{th\,(t)}$ – t_w



REVERSE BIAS SOA

