TOSHIBA GTR MODULE SILICON N CHANNEL IGBT

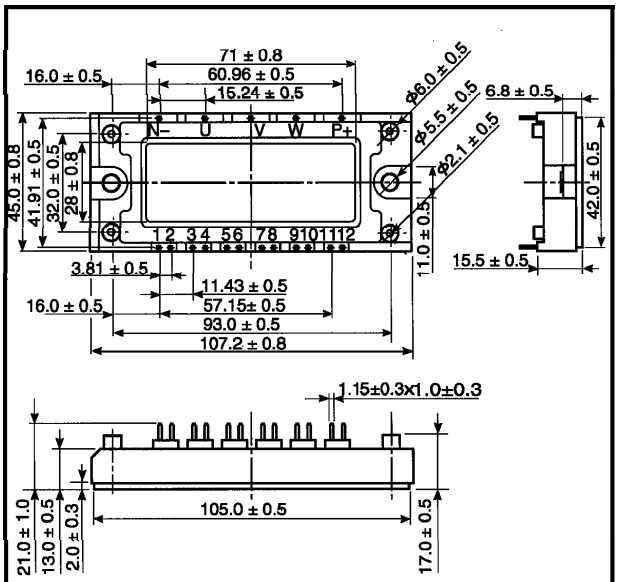
MG15Q6ES51

HIGH POWER SWITCHING APPLICATIONS

MOTOR CONTROL APPLICATIONS

- The Electrodes are Isolated from Case.
- High Input Impedance.
- 6 IGBTs Built Into 1 Package.

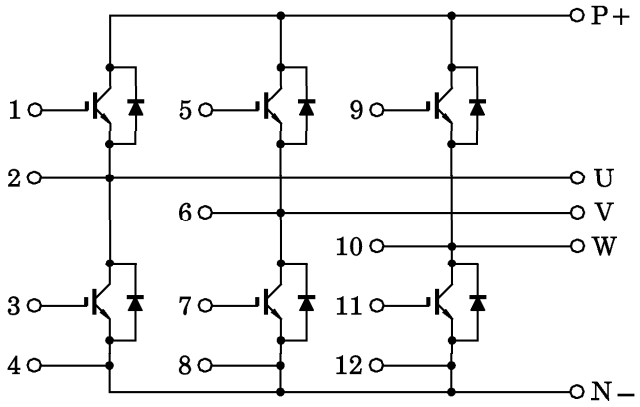
Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	2-108E1A

Weight : 185 g

EQUIVALENT CIRCUIT



961001EAA1

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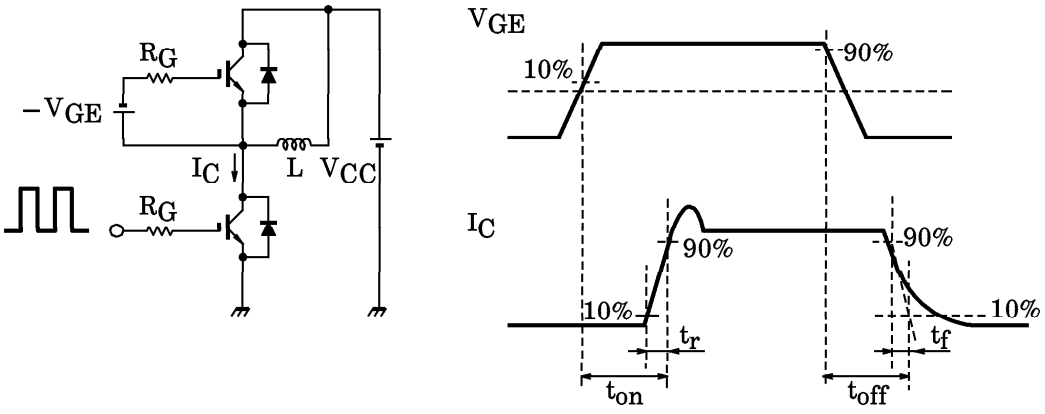
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Emitter Voltage		V_{CES}	1200	V
Gate-Emitter Voltage		V_{GES}	±20	V
Collector Current	DC	I_C (25°C / 80°C)	25 / 15	A
	1 ms	I_{CP} (25°C / 80°C)	50 / 30	
Forward Current	DC	I_F	15	A
	1 ms	I_{FM}	30	
Collector Power Dissipation (Tc = 25°C)		P_C	145	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		—	6	N·m

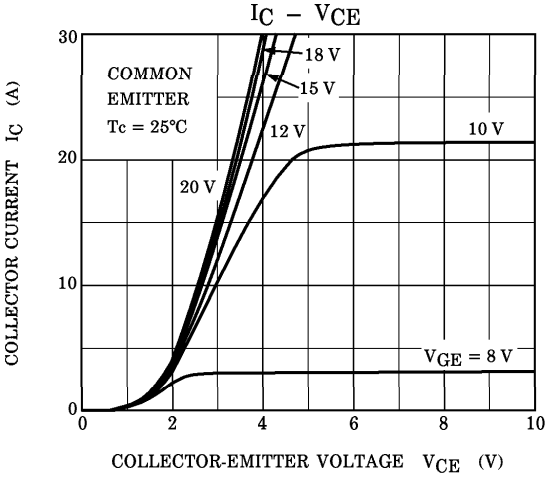
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GES}	V_{GE} = ±20 V, V_{CE} = 0		—	—	±500	nA
Collector Cut-off Current		I_{CES}	V_{CE} = 1200 V, V_{GE} = 0		—	—	0.5	mA
Gate-Emitter Cut-off Voltage		$V_{GE\ (off)}$	I_C = 15 mA, V_{CE} = 5 V		—	6.0	—	V
Collector-Emitter Saturation Voltage		$V_{CE\ (sat)}$	I_C = 15 A, V_{GE} = 15 V	T_j = 25°C	—	2.8	3.2	V
				T_j = 125°C	—	3.1	3.7	
Input Capacitance		C_{ies}	V_{CE} = 10 V, V_{GE} = 0, f = 1 MHz		—	1850	—	pF
Switching Time	Rise Time	t_r	V_{CC} = 600 V, I_C = 15 A, V_{GE} = ±15 V, R_G = 82 Ω, T_j = 125°C (Note 1)		—	0.07	0.15	μs
	Turn-on Time	t_{on}			—	0.15	0.30	
	Fall Time	t_f			—	0.07	0.10	
	Turn-off Time	t_{off}			—	0.60	0.90	
Forward Voltage		V_F	I_F = 15 A, V_{GE} = 0		—	2.0	2.8	V
Reverse Recovery Time		t_{rr}	I_F = 15 A, V_{GE} = −10 V, di / dt = 200 A / μs		—	0.10	0.25	μs
Thermal Resistance		$R_{th\ (j-c)}$	Transistor Stage		—	—	0.86	°C / W
			Diode Stage		—	—	1.5	

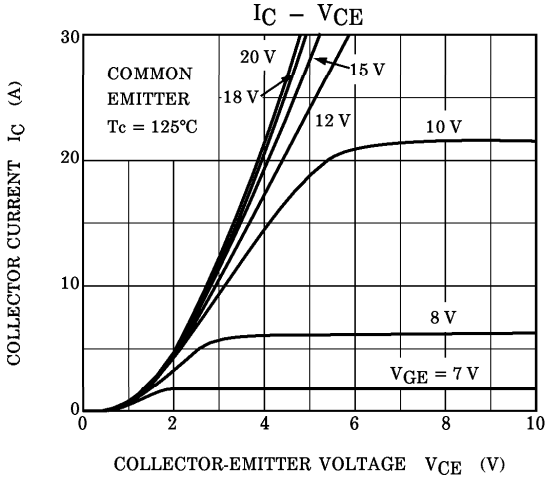
(Note 1) Switching Time Test Circuit & Timing Chart



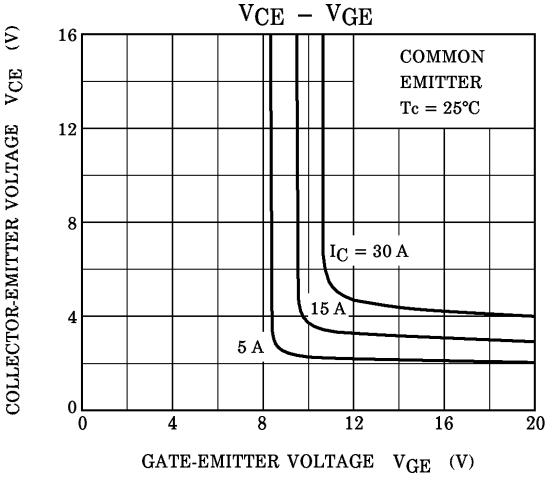
$I_C - V_{CE}$



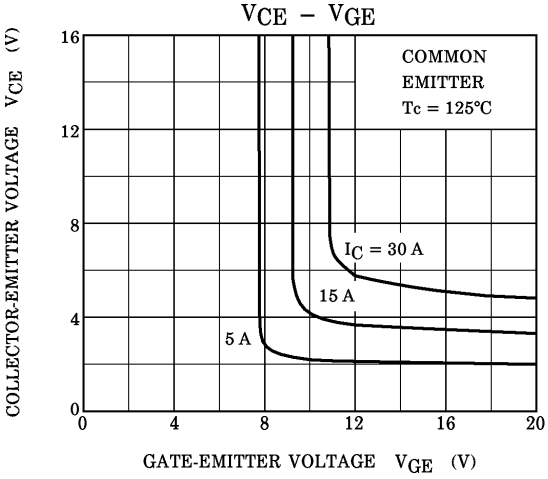
$I_C - V_{CE}$



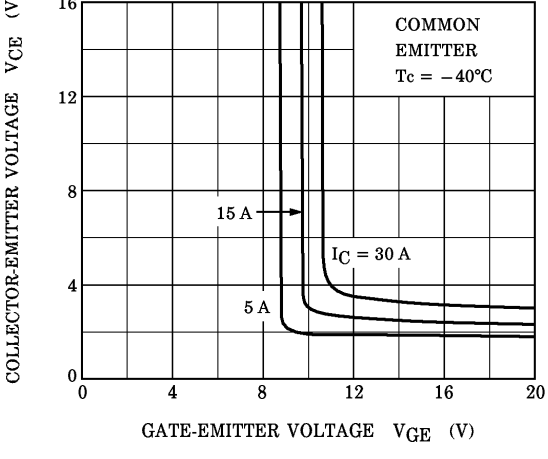
$V_{CE} - V_{GE}$



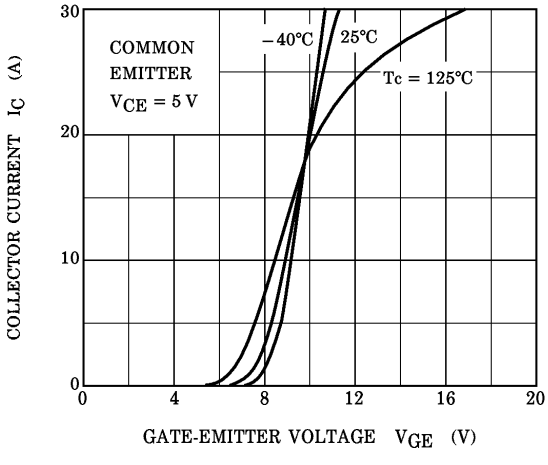
$V_{CE} - V_{GE}$



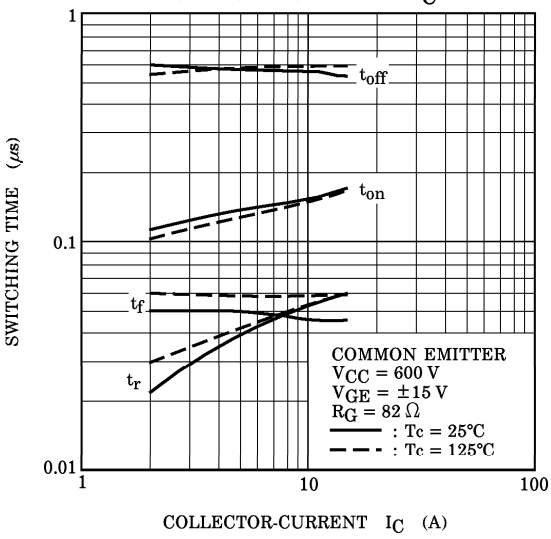
$V_{CE} - V_{GE}$



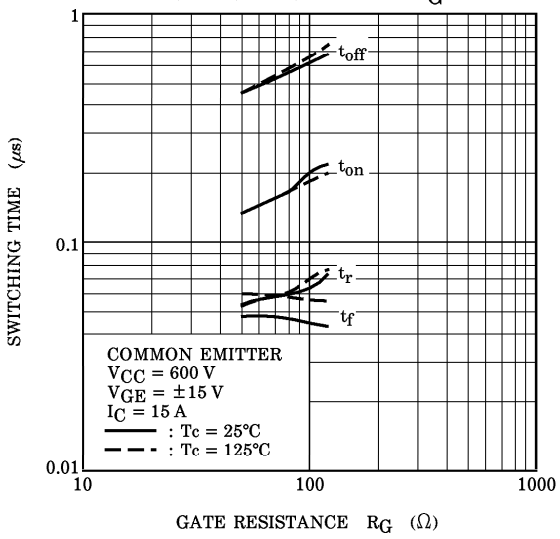
$I_C - V_{CE}$



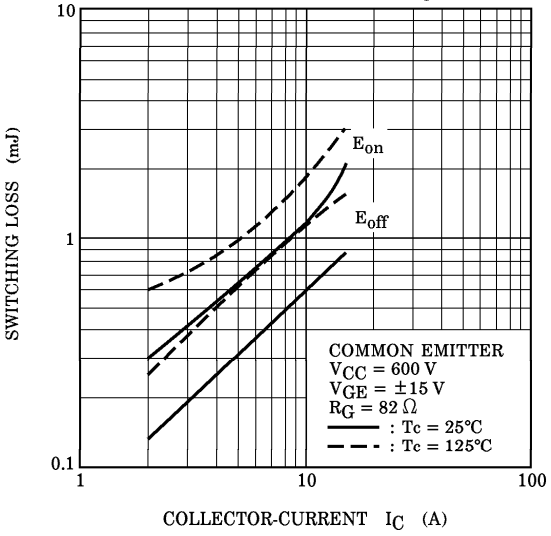
SWITCHING TIME – I_C



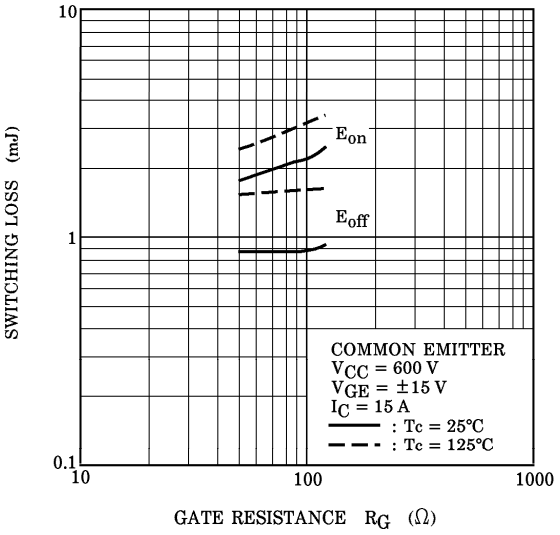
SWITCHING TIME – R_G



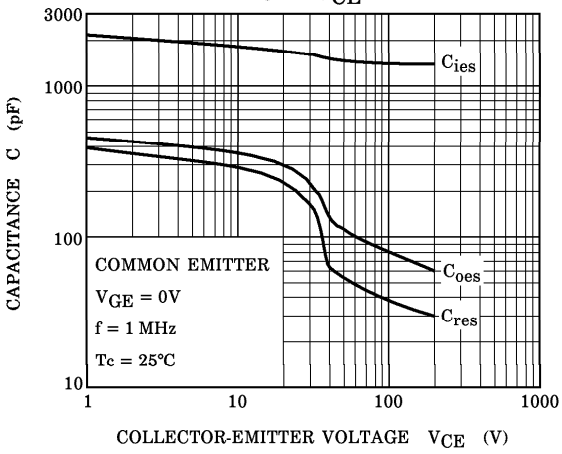
SWITCHING LOSS – I_C



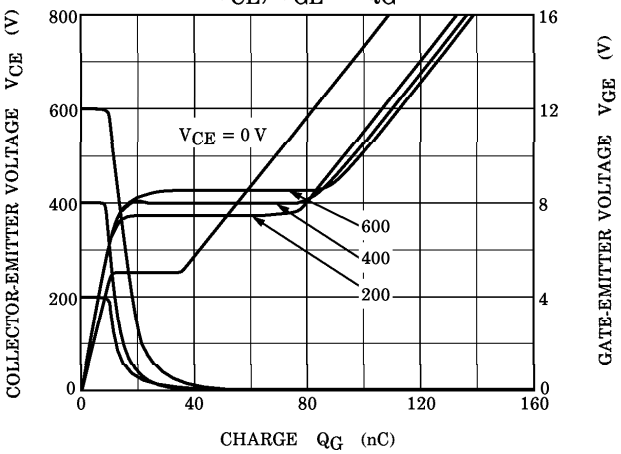
SWITCHING LOSS – R_G



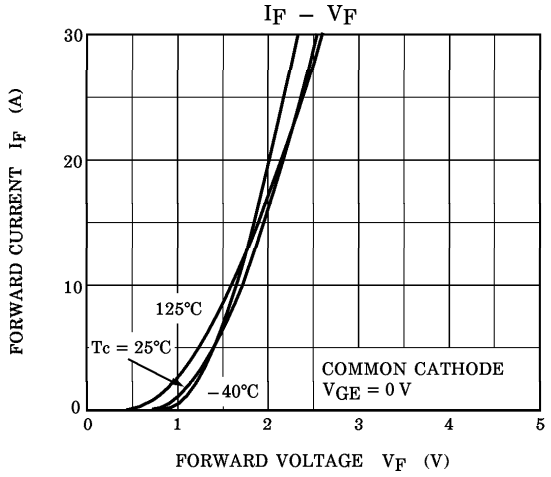
C – V_{CE}



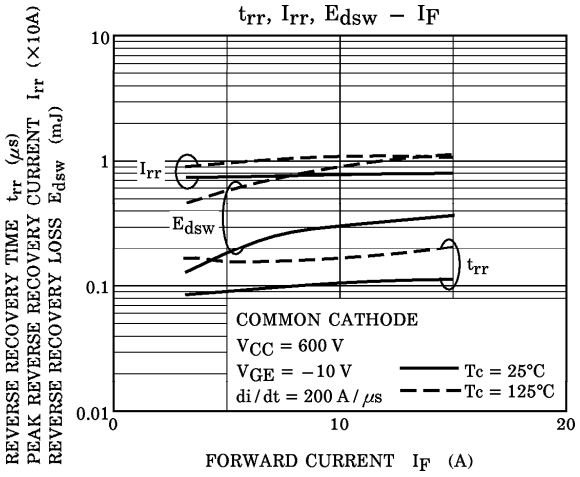
V_{CE}, V_{GE} – Q_G



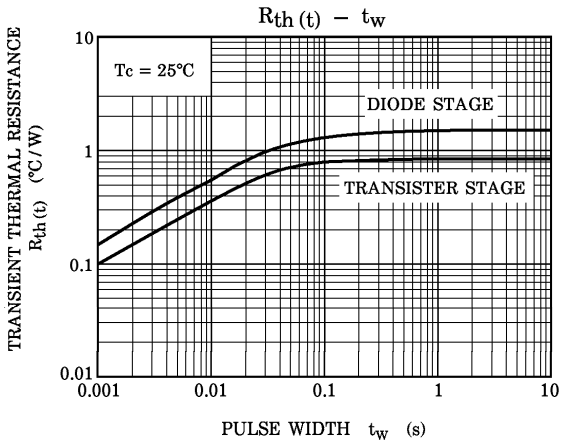
I_F – V_F



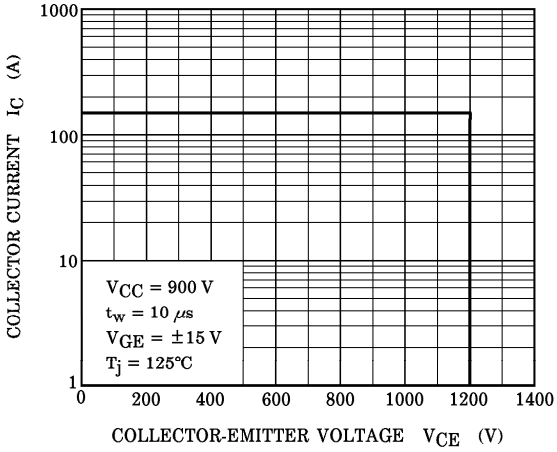
t_{rr}, I_{rr}, E_{dsw} – I_F



$R_{th\,(t)}$ – t_w



SHORT CIRCUIT SOA



REVERSE BIAS SOA

