TOSHIBA GTR Module Silicon N Channel IGBT

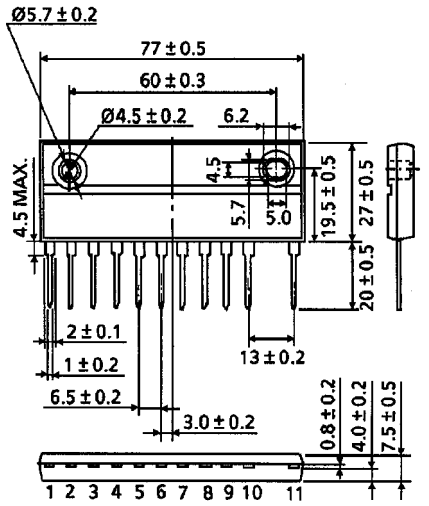
MP6754

High Power Switching Applications

Motor Control Applications

- The electrodes are isolated from case.
- 6 IGBTs are built into 1 package.
- Enhancement-mode
- Low saturation voltage
  : $V_{CE\ (sat)}$ = 4.0V (Max) (I_C = 10A)
- High speed : t_f = 0.35μs (Max) (I_C = 10A)
  t_{rr} = 0.15μs (Max) (I_F = 10A)

Unit: mm

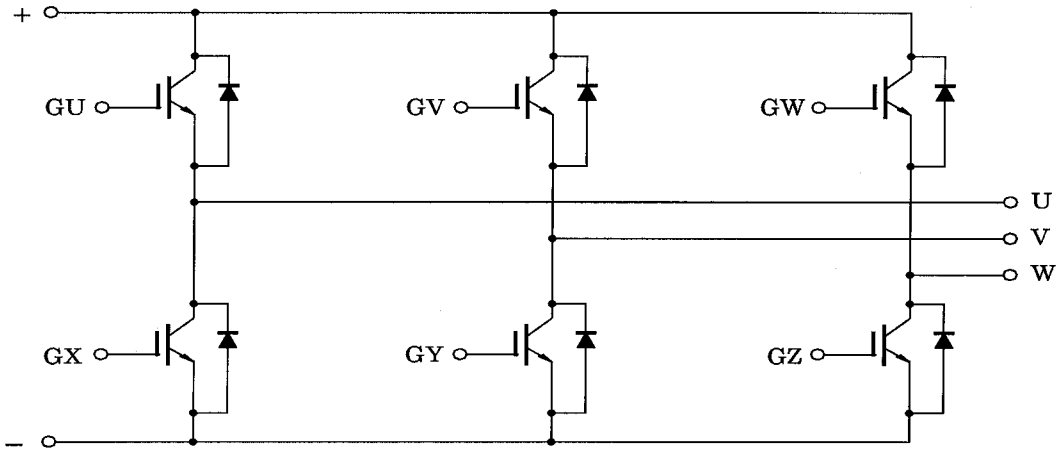


1. (+) 2. GU 3. U 4. GV 5. V 6. GW
7. W 8. GX 9. GY 10. GZ 11. (−)

JEDEC	—
EIAJ	—
TOSHIBA	2-78A1A

Weight: 44g (Typ.)

Equivalent Circuit

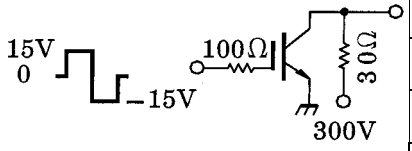


000707EAA2

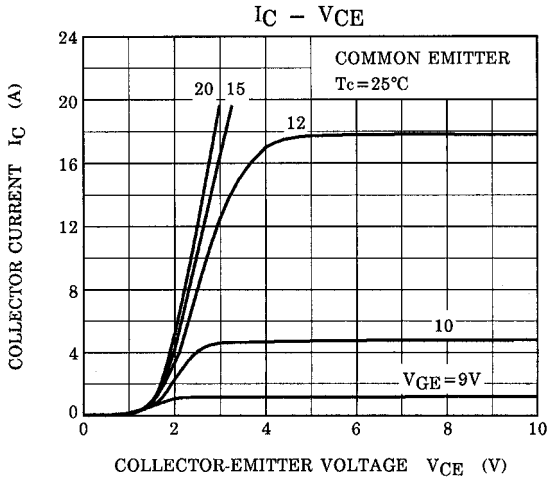
Maximum Ratings (Ta = 25°C)

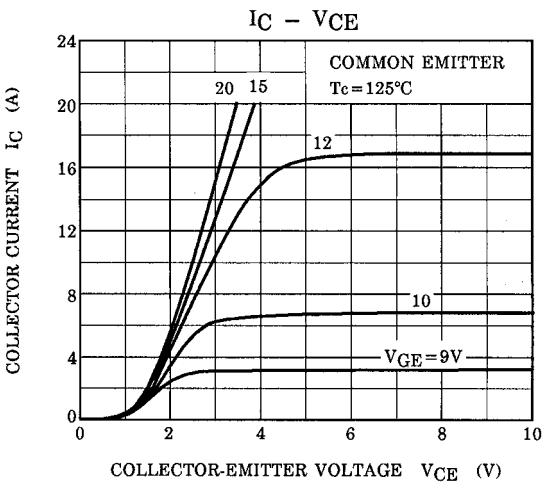
Characteristic		Symbol	Rating	Unit
Collector-emitter voltage		V_{CES}	600	V
Gate-emitter voltage		V_{GES}	± 20	V
Collector current	DC	I_C	10	A
	1ms	I_{CP}	20	
Forward current	DC	I_F	10	A
	1ms	I_{FM}	20	
Collector power dissipation (Tc = 25°C)		P_C	40	W
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−40 ~ 125	°C
Isolation voltage		V_{ISOL}	2500 (AC 1 minute)	V
Screw torque		—	1.5	N·m

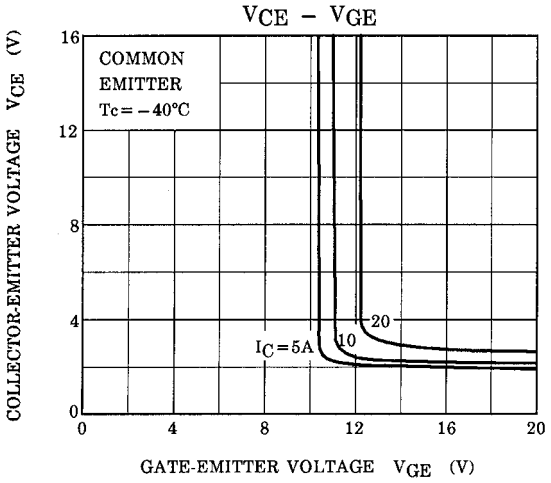
Electrical Characteristics (Ta = 25°C)

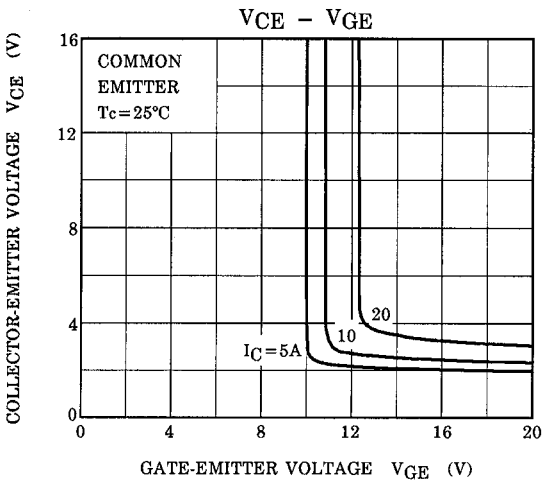
Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GES}	V_{GE} = ± 20V, V_{CE} = 0	—	—	± 500	nA
Collector cut-off current		I_{CES}	V_{CE} = 600V, V_{GE} = 0	—	—	1.0	mA
Gate-emitter cut-off voltage		$V_{GE\ (off)}$	I_C = 10mA, V_{CE} = 5V	6.0	—	9.0	V
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 10A, V_{GE} = 15V	—	3.0	4.0	V
Input capacitance		C_{ies}	V_{CE} = 10V, V_{GE} = 0, f = 1MHz	—	620	—	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		—	0.2	0.35	
	Turn-off time	t_{off}		—	0.4	0.8	
Forward voltage		V_F	I_F = 10A, V_{GE} = 0	—	1.7	2.5	V
Reverse recovery time		t_{rr}	I_F = 10A, V_{GE} = −10V di / dt = 100A / μs	—	0.08	0.15	μs
Thermal resistance		$R_{th\ (j-c)}$	Transistor	—	—	3.09	°C / W
			Diode	—	—	3.09	

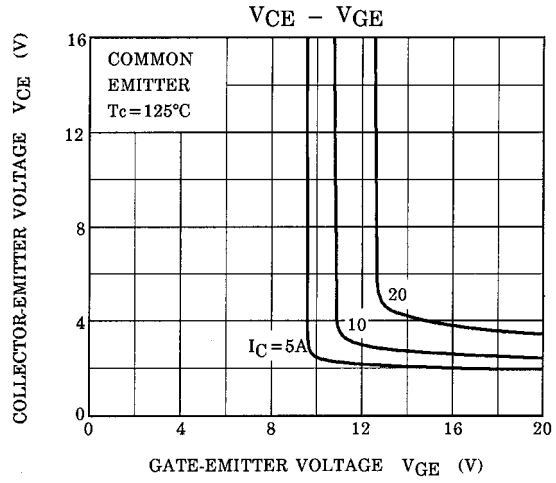
000707EAA2

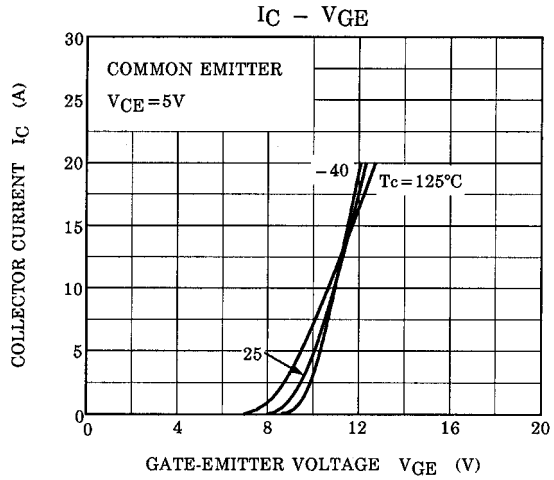

I_C – V_{CE}
COMMON EMITTER
Tc=25°C
20
15
12
10
V_{GE}=9V
COLLECTOR CURRENT I_C (A)
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)


I_C – V_{CE}
COMMON EMITTER
Tc=125°C
20
15
12
10
V_{GE}=9V
COLLECTOR CURRENT I_C (A)
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)

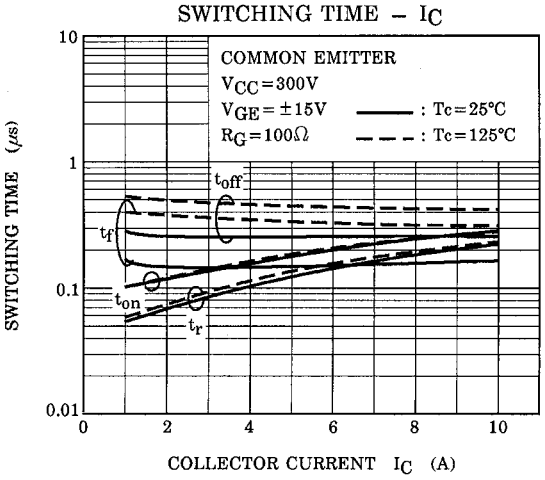

V_{CE} – V_{GE}
COMMON
EMITTER
Tc=–40°C
I_C=5A
20
10
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)
GATE-EMITTER VOLTAGE V_{GE} (V)


V_{CE} – V_{GE}
COMMON
EMITTER
Tc=25°C
I_C=5A
20
10
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)
GATE-EMITTER VOLTAGE V_{GE} (V)

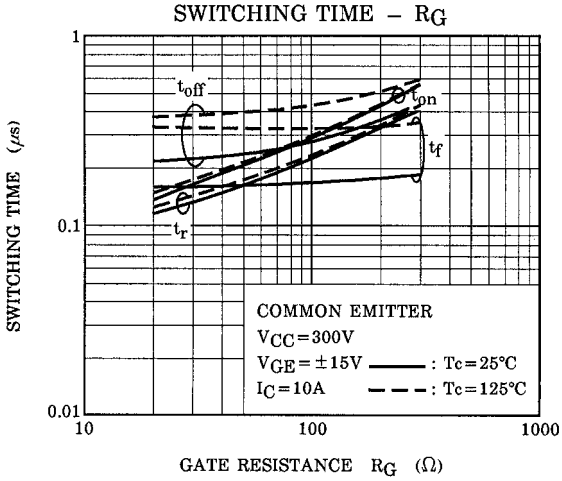

V_{CE} – V_{GE}
COMMON
EMITTER
Tc=125°C
I_C=5A
20
10
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)
GATE-EMITTER VOLTAGE V_{GE} (V)


I_C – V_{GE}
COMMON EMITTER
V_{CE}=5V
–40
Tc=125°C
25
COLLECTOR CURRENT I_C (A)
GATE-EMITTER VOLTAGE V_{GE} (V)

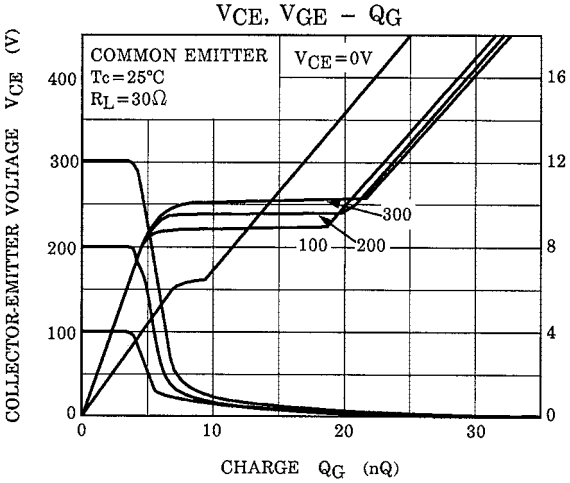
SWITCHING TIME – I_C



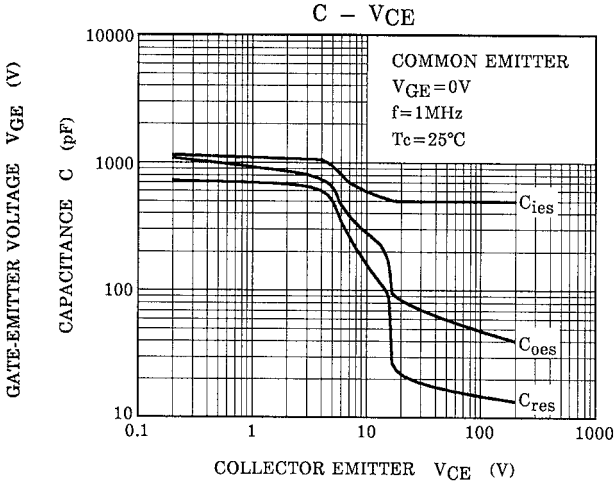
SWITCHING TIME – R_G



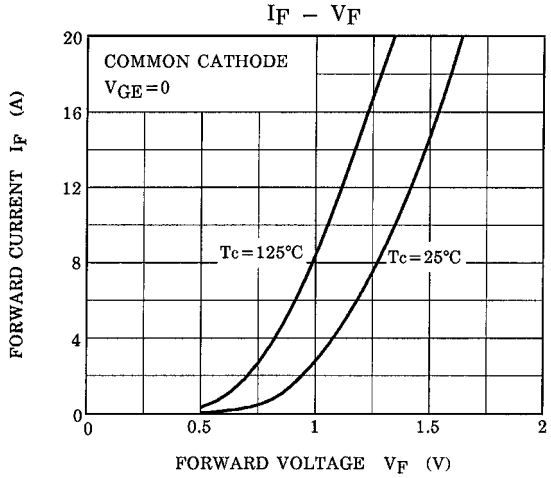
V_{CE}, V_{GE} – Q_G



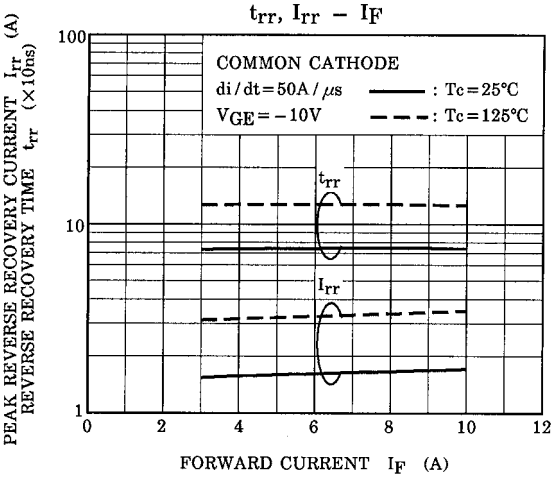
C – V_{CE}



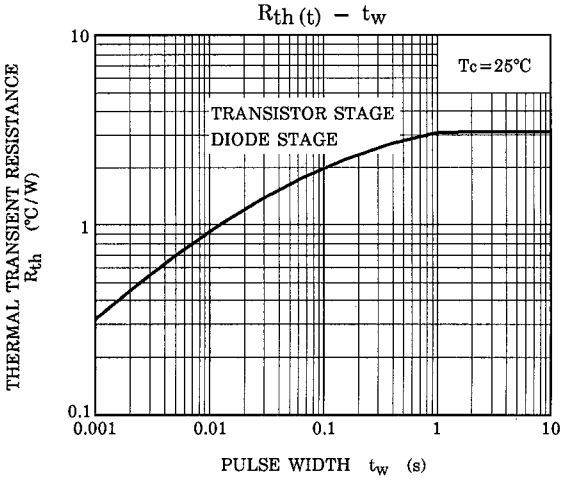
I_F – V_F



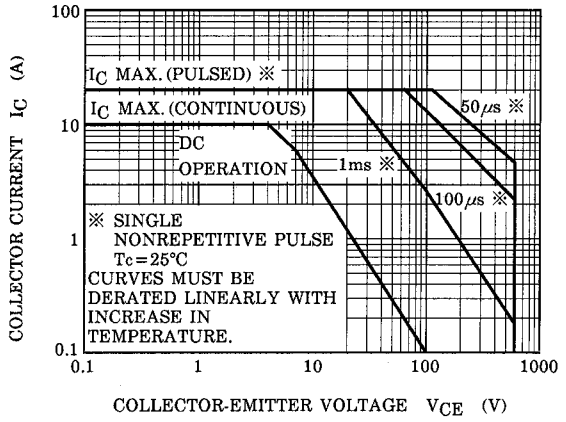
t_{rr}, I_{rr} – I_F



$R_{th\,(t)} - t_w$



SAFE OPERATING AREA



REVERSE BIAS SOA