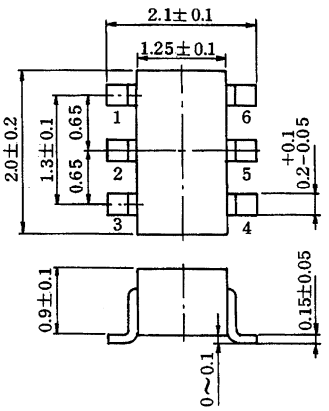
TOSHIBA Transistor Silicon Npn Epitaxial Type (PCT Process)

HN1C03FU

For Muting and Switching Applications

- Including two devices in US6 (ultra super mini type with 6 leads)
- High emitter-base voltage: V_{EBO} = 25V (min)
- High reverse h_{FE}: reverse h_{FE} = 150 (typ.)(V_{CE} =−2V, I_C =−4mA)
- Low on resistance: R_{ON} = 1Ω (typ.)(I_B = 5mA)

Unit: mm



1. EMITTER1 (E1)
2. BASE 1 (B1)
3. COLLECTOR2 (C2)
4. EMITTER2 (E2)
5. BASE2 (B2)
6. COLLECTOR1 (C1)

JEDEC	—
JEITA	—
TOSHIBA	2-2J1A

Weight: 6.8 mg (typ.)

Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

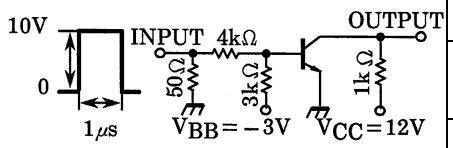
Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-emitter voltage	V_{CEO}	20	V
Emitter-base voltage	V_{EBO}	25	V
Collector current	I_C	300	mA
Base current	I_B	60	mA
Collector power dissipation	P_C*	200	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55 to 150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

* Total rating

Start of commercial production
1990-10

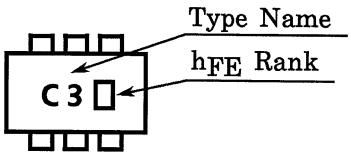
Electrical Characteristics (Ta = 25°C) (Q1,Q2 Common)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = 50V, I_E = 0	—	—	0.1	μA
Emitter cut-off current		I_{EBO}	V_{EB} = 25V, I_C = 0	—	—	0.1	μA
DC current gain		h_{FE} (Note1)	V_{CE} = 2V, I_C = 4mA	200	—	1200	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 30mA, I_B = 3mA	—	0.042	0.1	V
Base-emitter voltage		V_{BE}	V_{CE} = 2V, I_C = 4mA	—	0.61	—	V
Transition frequency		f_T	V_{CE} = 6V, I_C = 4mA	—	30	—	MHz
Collector output capacitance		C_{ob}	V_{CB} = 10V, I_E = 0, f = 1MHz	—	4.8	7	pF
Switching time	Turn-on time	t_{on}	 DUTY CYCLE ≦ 2%	—	160	—	ns
	Storage time	t_{stg}		—	500	—	
	Fall time	t_f		—	130	—	

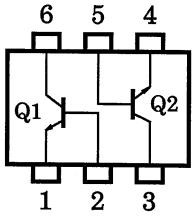
Note1: h_{FE} Classification

A:200 to 700, B:350 to 1200

Marking

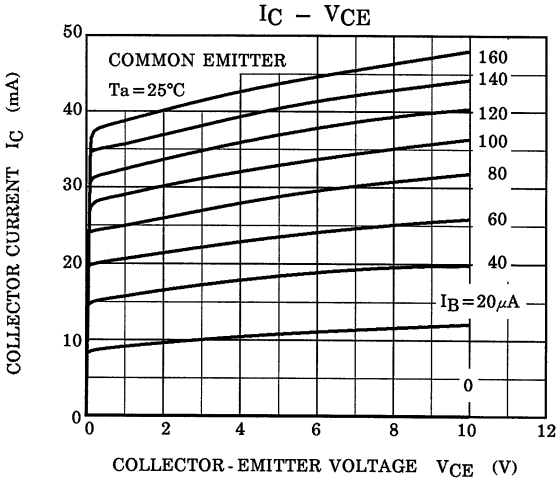


Equivalent Circuit (top view)

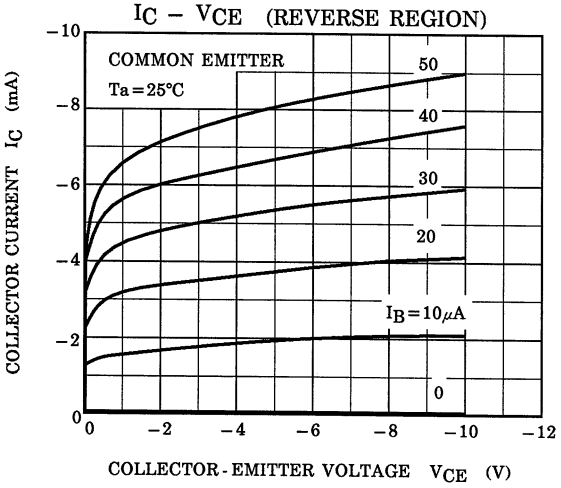


(Q1, Q2 Common)

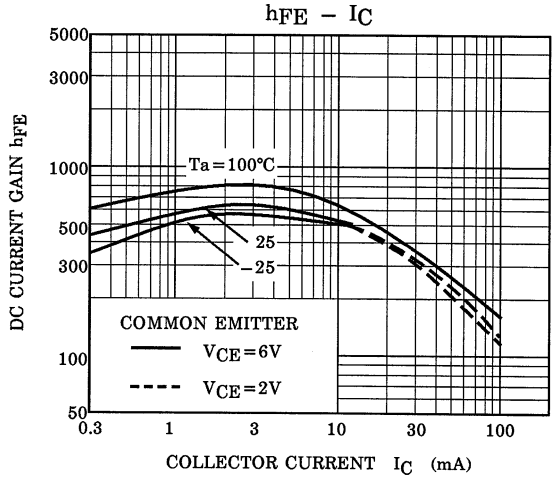
I_C – V_{CE}



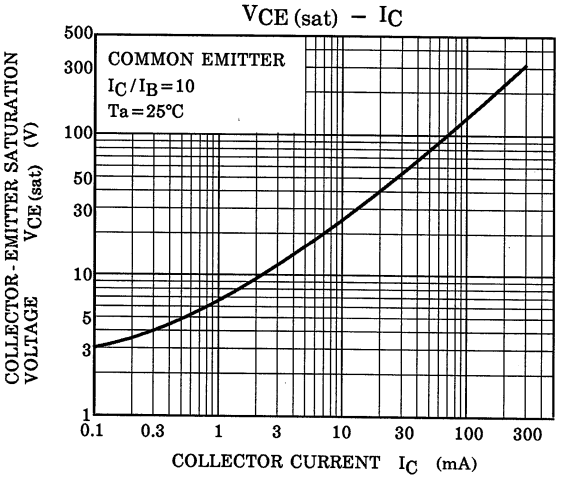
I_C – V_{CE} (REVERSE REGION)



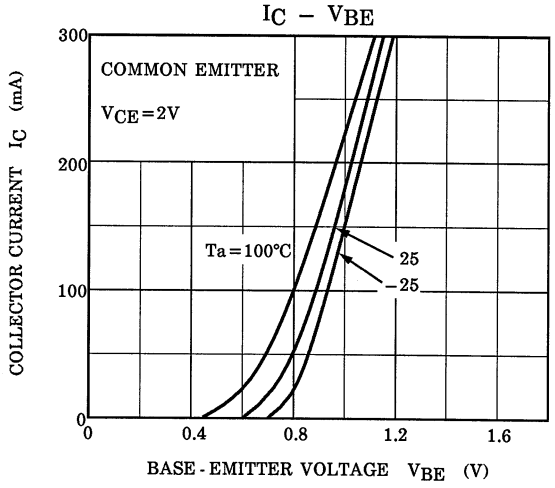
h_{FE} – I_C



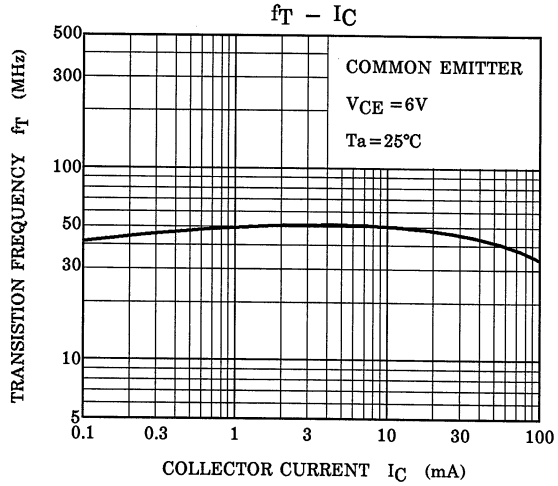
$V_{CE\,(sat)}$ – I_C



I_C – V_{BE}

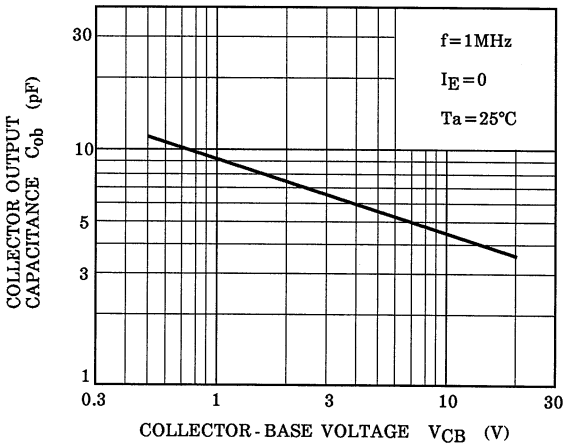


f_T – I_C

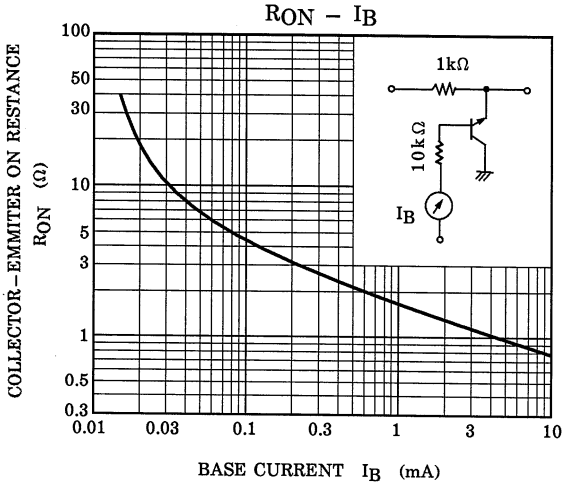


(Q1, Q2 Common)

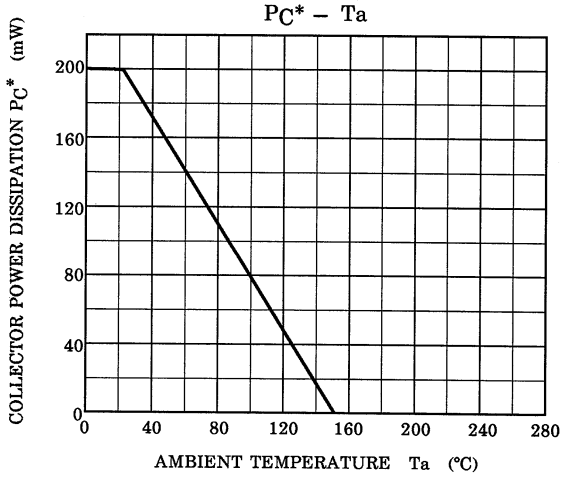
C_{ob} – V_{CB}



R_{ON} – I_B



P_C^* – Ta



*: Total Rating

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