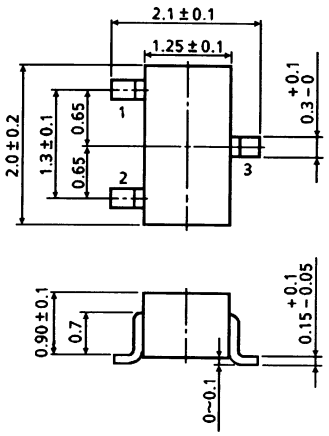
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

2SC4213

For Muting and Switching Applications

- High emitter-base voltage: V_{EBO} = 25 V (min)
- High reverse h_{FE}: Reverse h_{FE} = 150 (typ.) (V_{CE} = −2 V, I_C = −4 mA)
- Low on resistance: R_{ON} = 1 Ω (typ.) (I_B = 5 mA)
- High DC current gain: h_{FE} = 200 to 1200
- Small package

Unit: mm



1. BASE
2. EMITTER
3. COLLECTOR

USM

JEDEC	—
JEITA	SC-70
TOSHIBA	2-2E1A

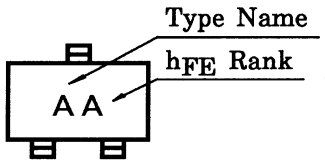
Weight: 0.006 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

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	100	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55 to 125	°C

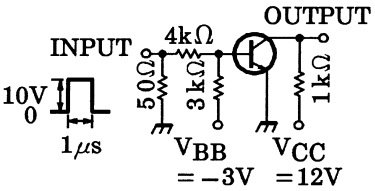
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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).

Marking



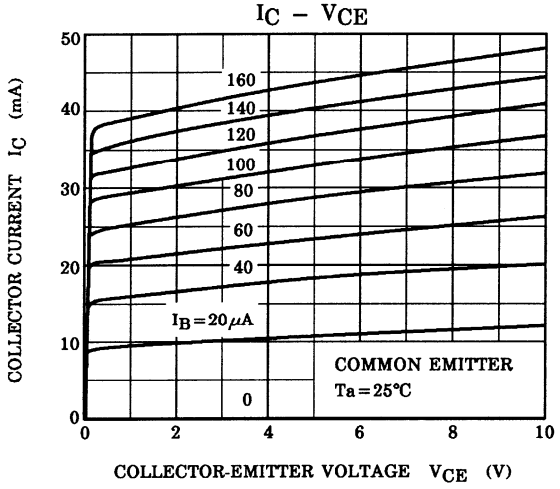
Start of commercial production
1987-05

Electrical Characteristics (Ta = 25°C)

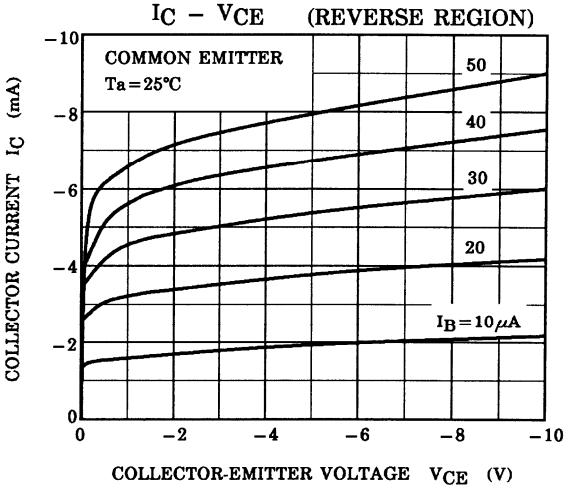
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = 50 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current		I_{EBO}	V_{EB} = 25 V, I_C = 0	—	—	0.1	μA
DC current gain		h_{FE} (Note)	V_{CE} = 2 V, I_C = 4 mA	200	—	1200	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 30 A, I_B = 3 mA	—	0.042	0.1	V
Base-emitter voltage		V_{BE}	V_{CE} = 2 V, I_C = 4 mA	—	0.61	—	V
Transition frequency		f_T	V_{CE} = 6 V, I_C = 4 mA	—	30	—	MHz
Collector output capacitance		C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	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	—	

Note: h_{FE} classification A: 200 to 700, B: 350 to 1200

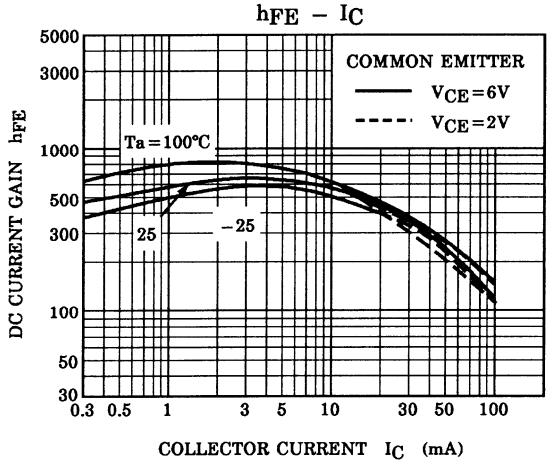
$I_C - V_{CE}$



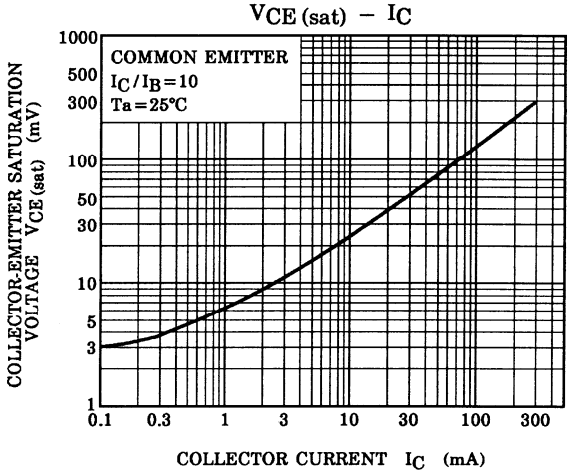
$I_C - V_{CE}$ (REVERSE REGION)



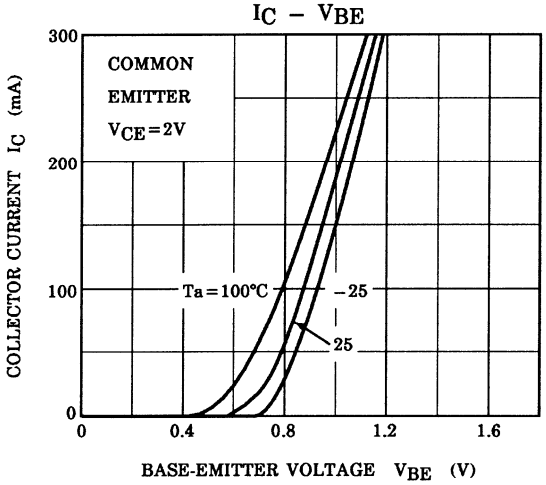
$h_{FE} - I_C$



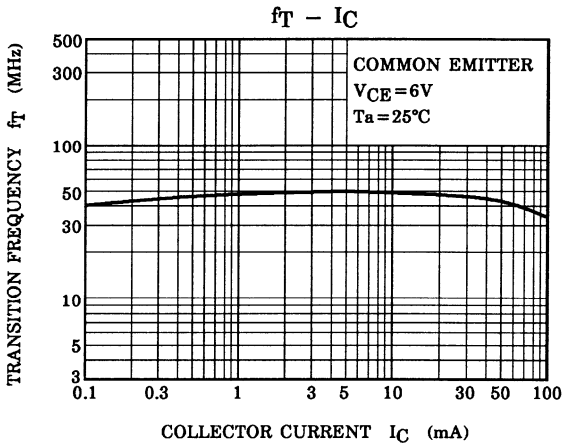
$V_{CE\,(sat)} - I_C$



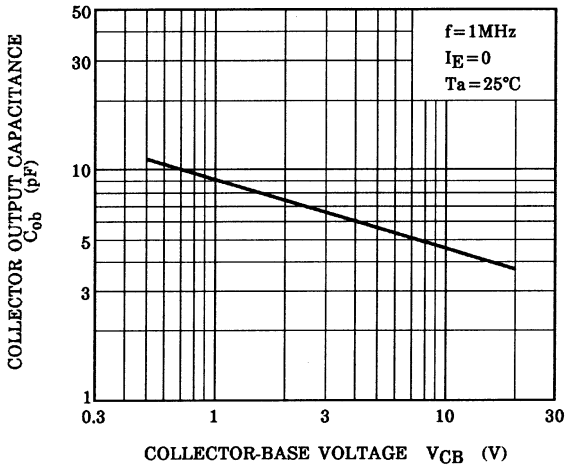
$I_C - V_{BE}$



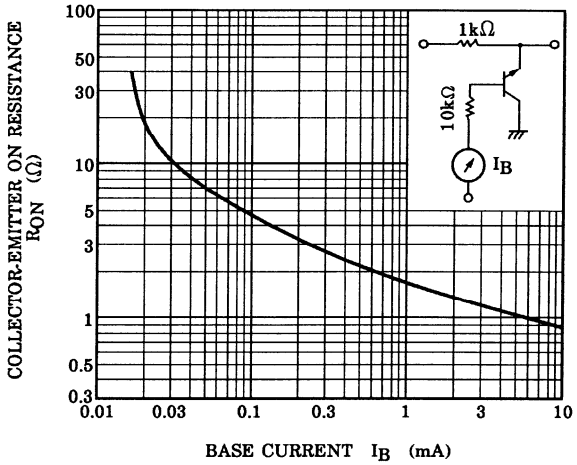
$f_T - I_C$



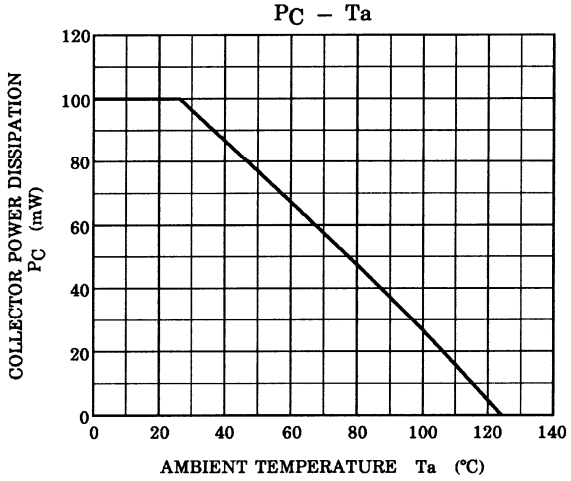
C_{ob} – V_{CB}



R_{ON} – I_B



P_C – Ta



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