

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

# HN4C05JU

Low Frequency Amplifier Applications

Unit: mm

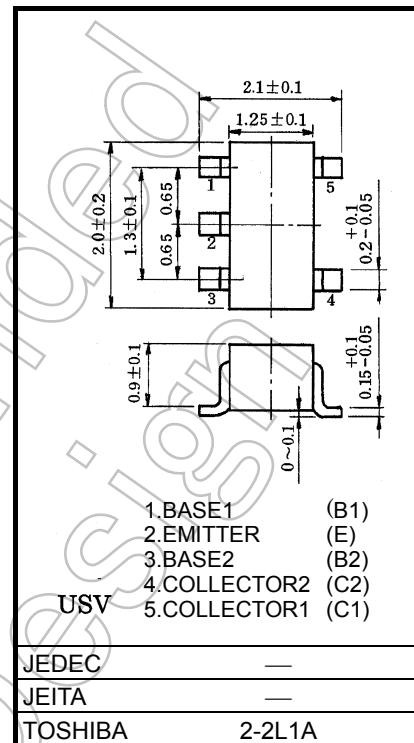
Muting Applications

Switching Applications

- Low Saturation Voltage :  $V_{CE(sat)(1)} = 15\text{mV}$  (Typ.)  
:@  $I_C = 10\text{mA}$  /  $I_B = 0.5\text{mA}$
- High Collector Current :  $I_C = 400\text{mA}$ (Max.)

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

Characteristic	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	15	V
Collector-emitter voltage	$V_{CEO}$	12	V
Emitter-base voltage	$V_{EBO}$	5	V
Collector current	$I_C$	400	mA
Base current	$I_B$	50	mA
Collector power dissipation	$P_C^*$	200	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.

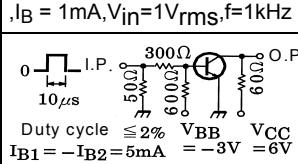
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

\* Total rating. Power dissipation per element should not exceed 130mW.

Weight: 0.0062g (Typ.)

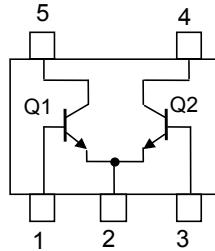
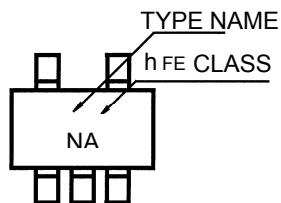
**Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)**

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = 15\text{V}$ , $I_E = 0$	—	—	0.1	μA
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 5\text{V}$ , $I_C = 0$	—	—	0.1	μA
DC current gain	$h_{FE}$ (Note)	$V_{CE} = 2\text{V}$ , $I_C = 10\text{mA}$	300	—	1000	
Collector-emitter saturation voltage	$V_{CE(sat)(1)}$	$I_C = 10\text{mA}$ , $I_B = 0.5\text{mA}$	—	15	30	mV
	$V_{CE(sat)(2)}$	$I_C = 200\text{mA}$ , $I_B = 10\text{mA}$	—	110	250	
Collector-emitter saturation voltage	$V_{BE(sat)}$	$V_{CE} = 200\text{mA}$ , $I_C = 10\text{mA}$	—	0.87	1.2	V
Transition frequency	$f_T$	$V_{CE} = 2\text{V}$ , $I_C = 10\text{mA}$	80	130	—	MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = 10\text{V}$ , $I_E = 0$ , $f = 1\text{MHz}$	—	4.2	—	pF
"ON" resistance	$R_{on}$	, $I_B = 1\text{mA}$ , $V_{in} = 1\text{V}_{rms}$ , $f = 1\text{kHz}$	—	0.9	—	Ω
Switching time	Turn on time	$t_{on}$	—	85	—	ns
	Storage time	$t_{stg}$	—	170	—	
	Fall down time	$t_f$	—	40	—	

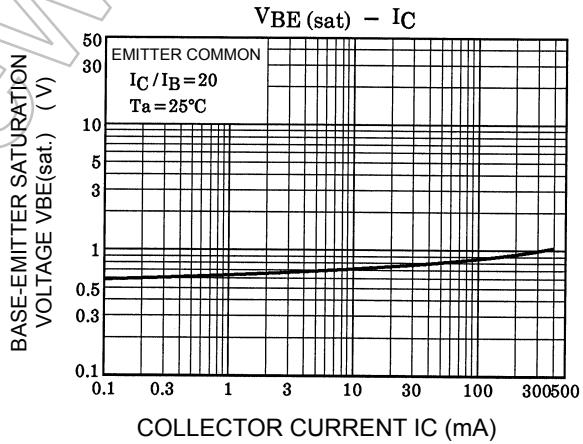
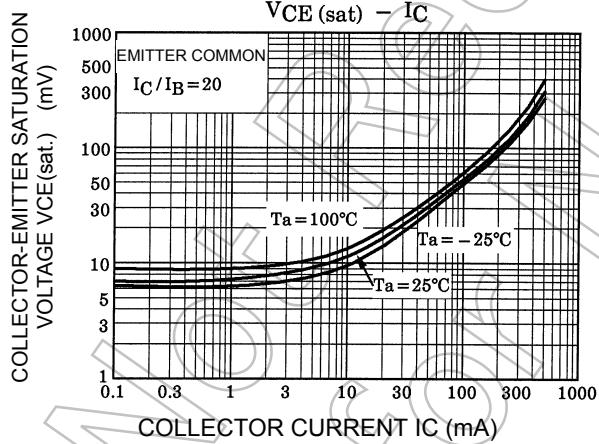
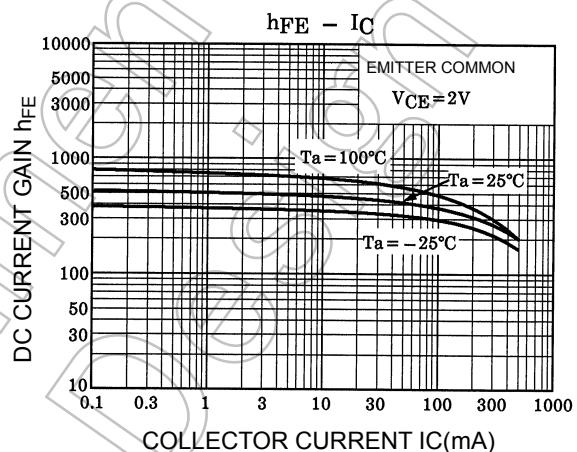
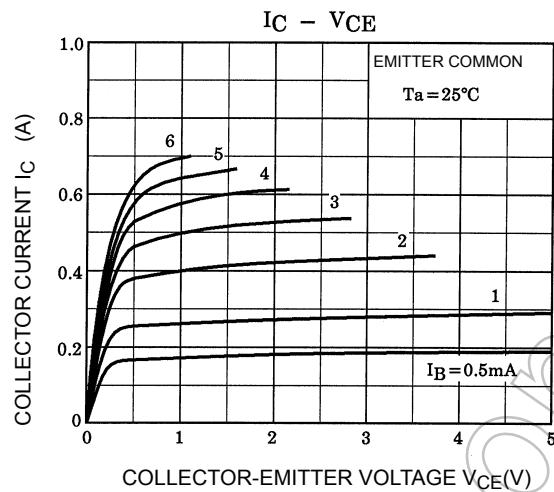
(Note)  $h_{FE}$  Classifications A:300 to 600, B:500 to 1000Start of commercial production  
1999-11

## Marking

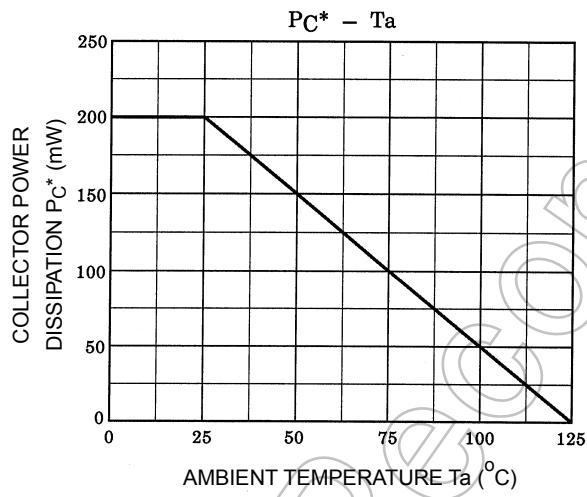
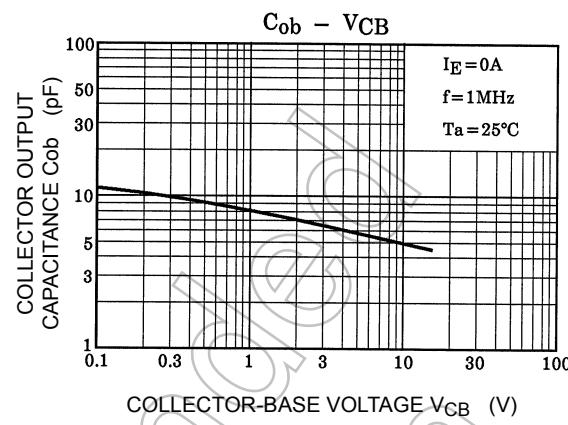
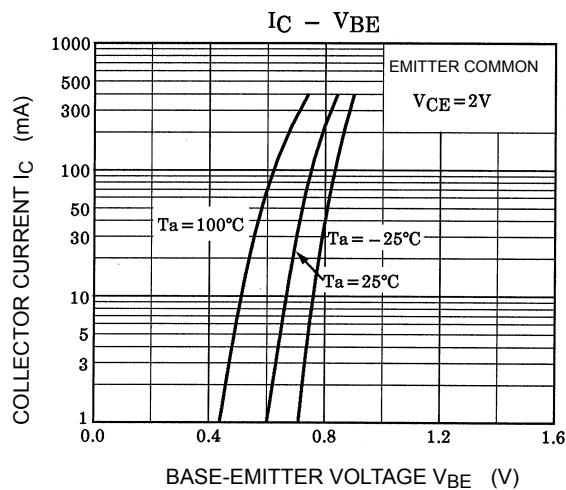
## Equivalent Circuit (Top View)



(Q1, Q2 Common)



(Q1, Q2 Common)



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