

**TOSHIBA**

**HN1B04FU**

TOSHIBA TRANSISTOR SILICON NPN EPITAXIAL TYPE (PCT PROCESS) SILICON PNP EPITAXIAL TYPE (PCT PROCESS)

# HN1B04FU

AUDIO FREQUENCY GENERAL PURPOSE AMPLIFIER APPLICATIONS.

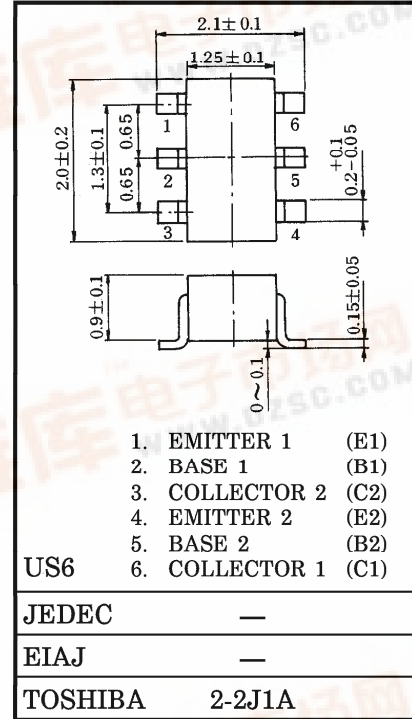
Unit in mm

Q1:

- High Voltage and High Current  
:  $V_{CEO} = 50V, I_C = 150mA$  (Max.)
- High  $h_{FE}$  :  $h_{FE} = 120 \sim 400$
- Excellent  $h_{FE}$  Linearity  
:  $h_{FE}(I_C = 0.1mA) / h_{FE}(I_C = 2mA) = 0.95$  (Typ.)

Q2:

- High Voltage and High Current  
:  $V_{CEO} = -50V, I_C = -150mA$  (Max.)
- High  $h_{FE}$  :  $h_{FE} = 120 \sim 400$
- Excellent  $h_{FE}$  Linearity  
:  $h_{FE}(I_C = -0.1mA) / h_{FE}(I_C = -2mA) = 0.95$  (Typ.)

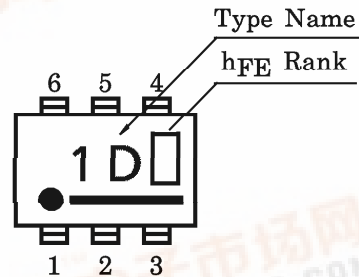


Weight : 6.8mg

Q1 MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	60	V
Collector-Emitter Voltage	$V_{CEO}$	50	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Collector Current	$I_C$	150	mA
Base Current	$I_B$	30	mA

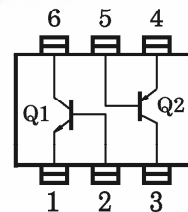
MARKING



Q2 MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	-50	V
Collector-Emitter Voltage	$V_{CEO}$	-50	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Current	$I_C$	-150	mA
Base Current	$I_B$	-30	mA

EQUIVALENT CIRCUIT (TOP VIEW)



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Q1, Q2 COMMON MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector Power Dissipation	PC*	200	mW
Junction Temperature	Tj	125	°C
Storage Temperature Range	Tstg	-55~125	°C

\* Total Rating

Q1 ELECTRICAL CHARACTERISTICS (Ta = 25°C)

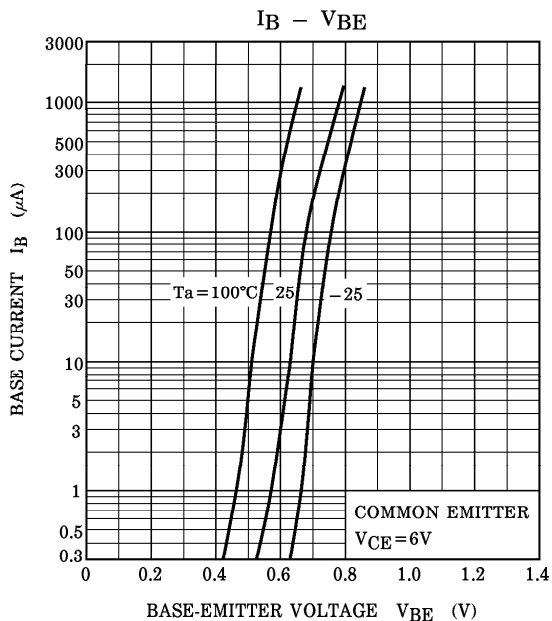
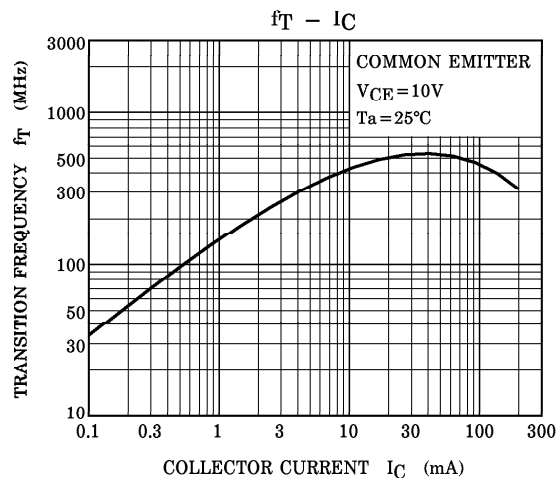
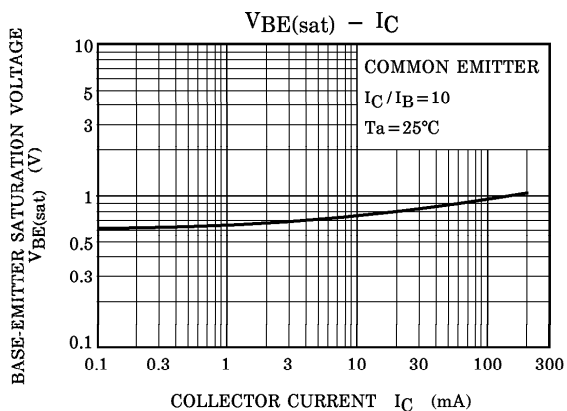
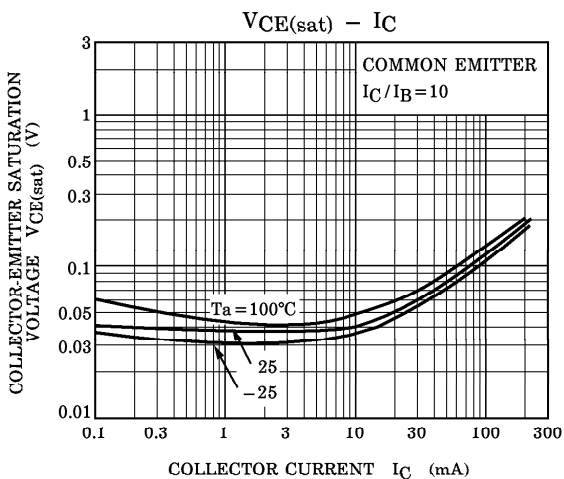
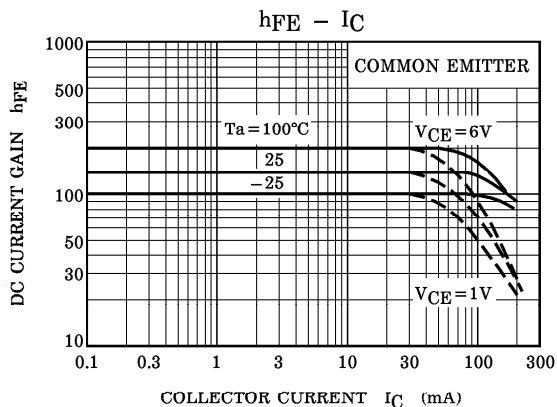
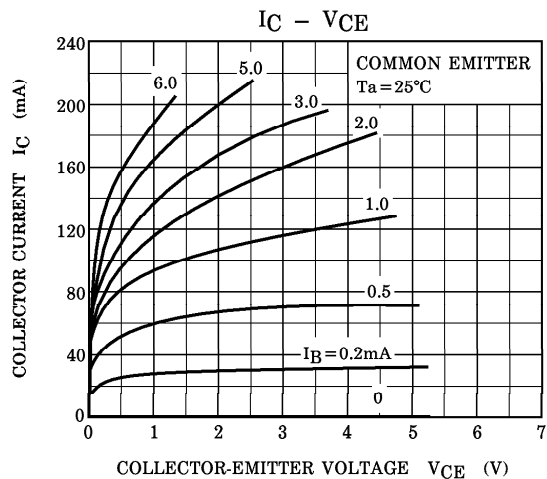
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	ICBO	V <sub>CB</sub> = 60V, I <sub>E</sub> = 0	—	—	0.1	μA
Emitter Cut-off Current	IEBO	V <sub>EB</sub> = 5V, I <sub>C</sub> = 0	—	—	0.1	μA
DC Current Gain	h <sub>FE</sub> (Note)	V <sub>CE</sub> = 6V, I <sub>C</sub> = 2mA	120	—	400	
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = 100mA, I <sub>B</sub> = 10mA	—	0.1	0.25	V
Transition Frequency	f <sub>T</sub>	V <sub>CE</sub> = 10V, I <sub>C</sub> = 1mA	—	150	—	MHz
Collector Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10V, I <sub>E</sub> = 0, f = 1MHz	—	2	—	pF

Q2 ELECTRICAL CHARACTERISTICS (Ta = 25°C)

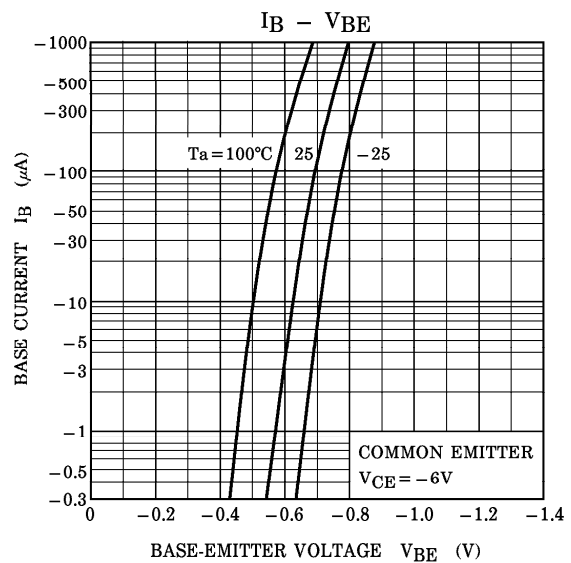
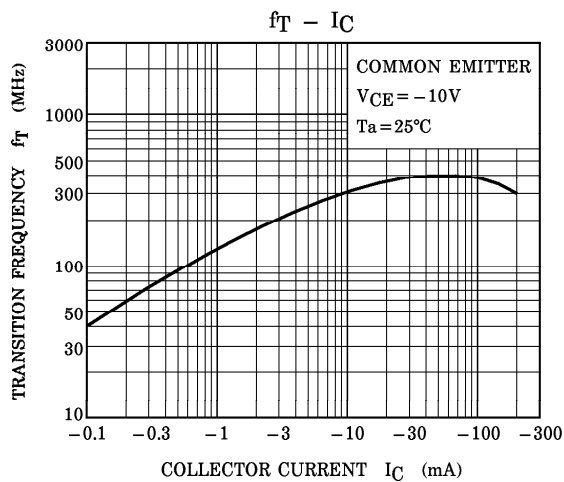
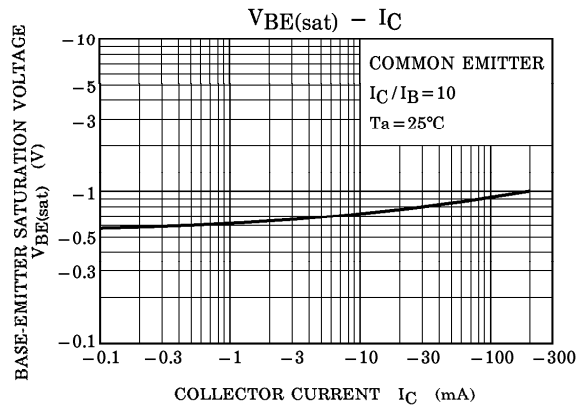
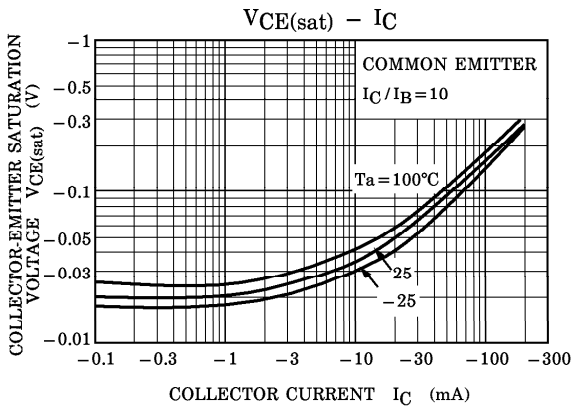
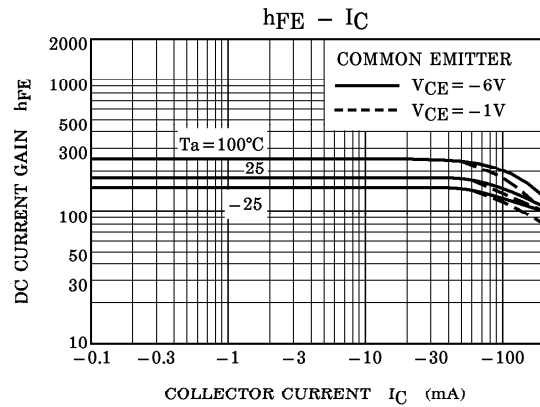
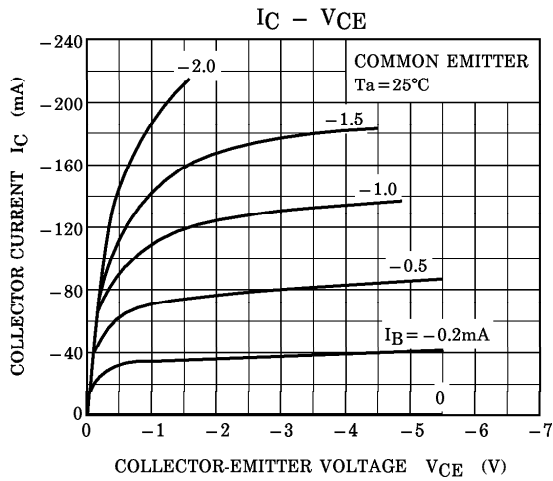
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	ICBO	V <sub>CB</sub> = -50V, I <sub>E</sub> = 0	—	—	-0.1	μA
Emitter Cut-off Current	IEBO	V <sub>EB</sub> = -5V, I <sub>C</sub> = 0	—	—	-0.1	μA
DC Current Gain	h <sub>FE</sub> (Note)	V <sub>CE</sub> = -6V, I <sub>C</sub> = -2mA	120	—	400	
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = -100mA, I <sub>B</sub> = -10mA	—	-0.1	-0.3	V
Transition Frequency	f <sub>T</sub>	V <sub>CE</sub> = -10V, I <sub>C</sub> = -1mA	—	120	—	MHz
Collector Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> = -10V, I <sub>E</sub> = 0, f = 1MHz	—	4	—	pF

Note : h<sub>FE</sub> Classification Y (Y) : 120~240, GR (G) : 200~400  
 ( ) Marking Symbol

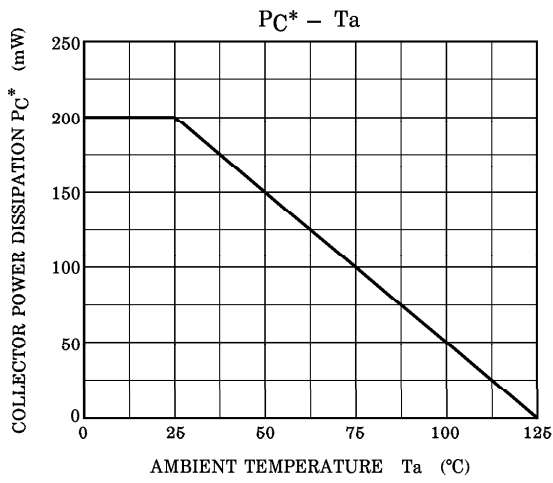
## Q1 (NPN TRANSISTOR)



Q2 (PNP TRANSISTOR)



(Q1, Q2 COMMON)



\*: Total Rating