

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

HN1B04FU

AUDIO FREQUENCY GENERAL PURPOSE AMPLIFIER APPLICATIONS.

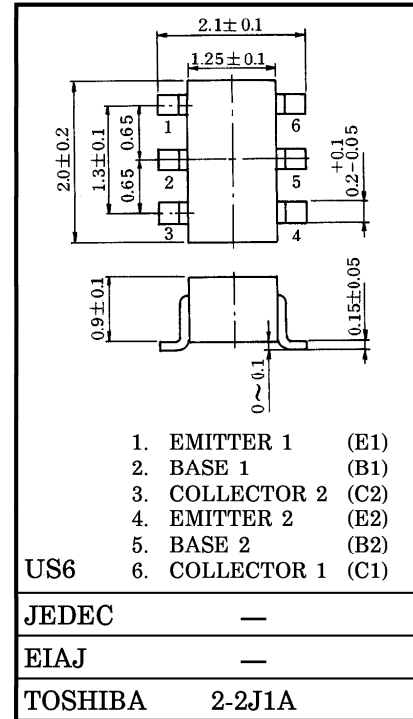
Unit in mm

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.)

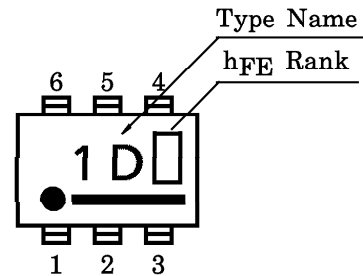


Weight : 6.8mg

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

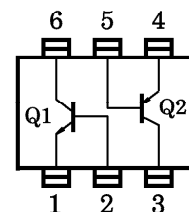
MARKING



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	P_C^*	200	mW
Junction Temperature	T_j	125	°C
Storage Temperature Range	T_{stg}	-55~125	°C

* Total Rating

Q1 ELECTRICAL CHARACTERISTICS (Ta = 25°C)

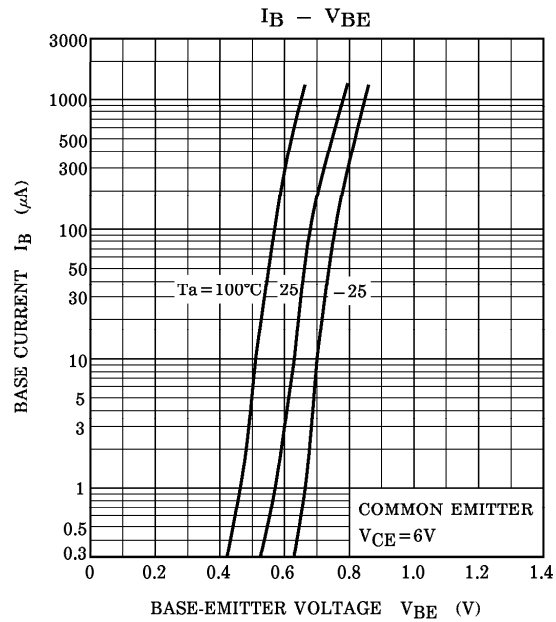
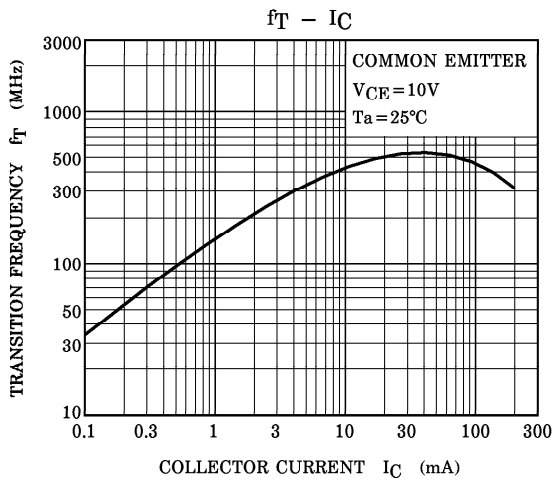
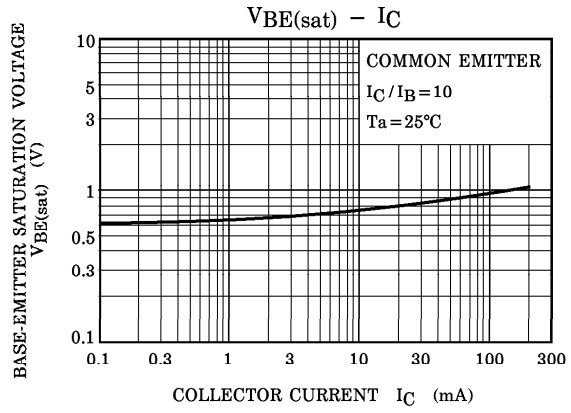
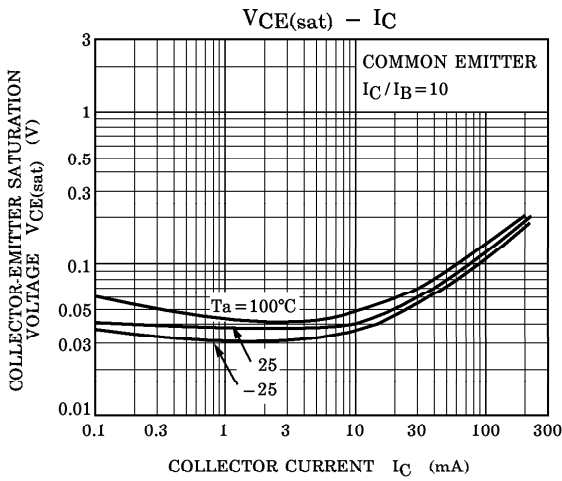
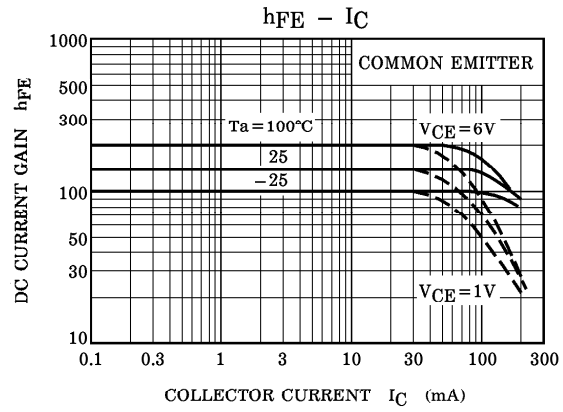
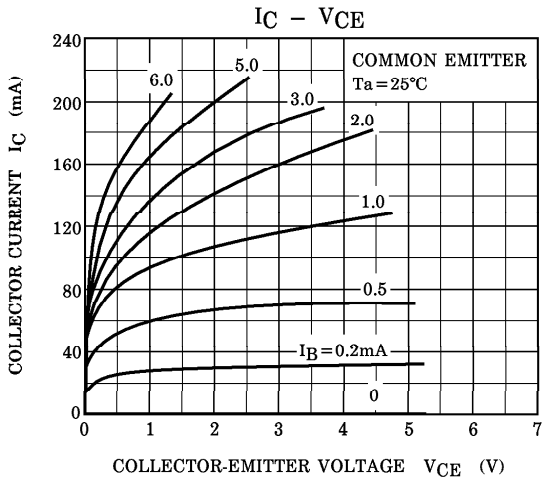
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB} = 60V, I_E = 0$	—	—	0.1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = 5V, I_C = 0$	—	—	0.1	μA
DC Current Gain	h_{FE} (Note)	$V_{CE} = 6V, I_C = 2mA$	120	—	400	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 100mA, I_B = 10mA$	—	0.1	0.25	V
Transition Frequency	f_T	$V_{CE} = 10V, I_C = 1mA$	—	150	—	MHz
Collector Output Capacitance	C_{ob}	$V_{CB} = 10V, I_E = 0,$ $f = 1MHz$	—	2	—	pF

Q2 ELECTRICAL CHARACTERISTICS (Ta = 25°C)

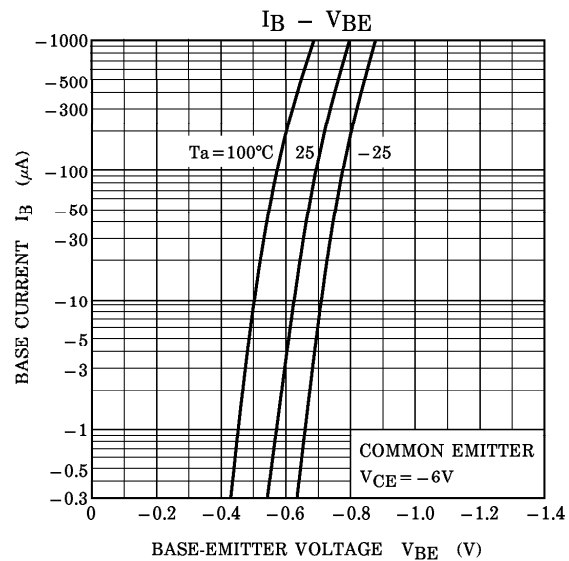
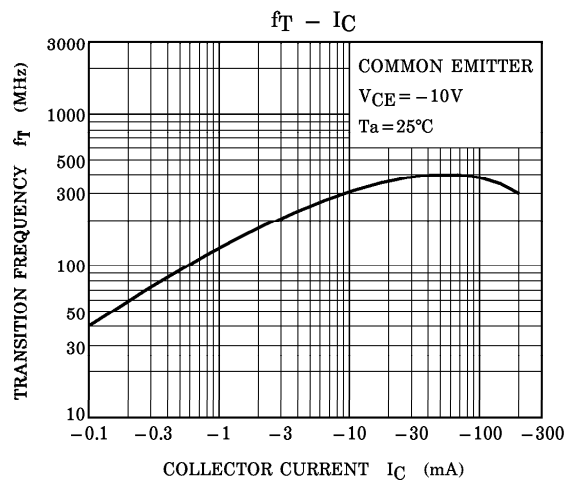
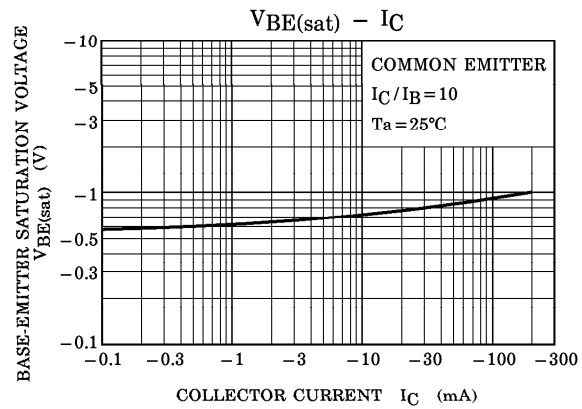
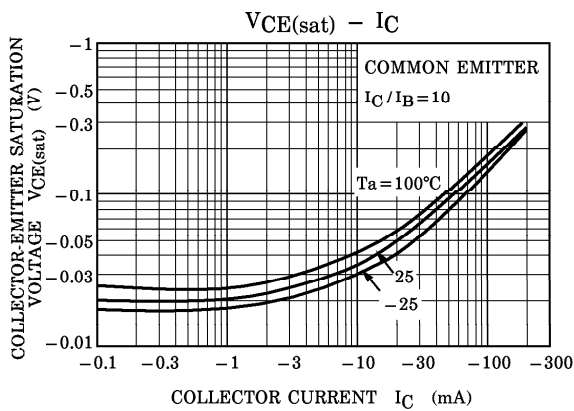
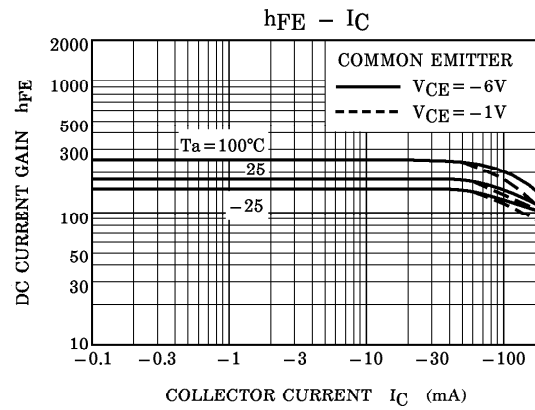
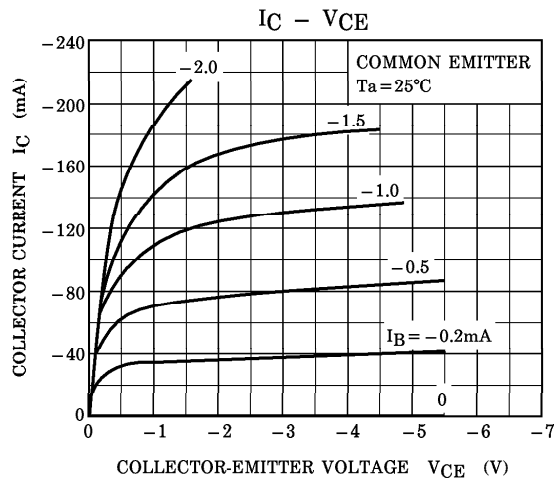
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current	I_{CBO}	$V_{CB} = -50V, I_E = 0$	—	—	-0.1	μA
Emitter Cut-off Current	I_{EBO}	$V_{EB} = -5V, I_C = 0$	—	—	-0.1	μA
DC Current Gain	h_{FE} (Note)	$V_{CE} = -6V, I_C = -2mA$	120	—	400	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = -100mA, I_B = -10mA$	—	-0.1	-0.3	V
Transition Frequency	f_T	$V_{CE} = -10V, I_C = -1mA$	—	120	—	MHz
Collector Output Capacitance	C_{ob}	$V_{CB} = -10V, I_E = 0,$ $f = 1MHz$	—	4	—	pF

Note : h_{FE} Classification Y (Y) : 120~240, GR (G) : 200~400
 () Marking Symbol

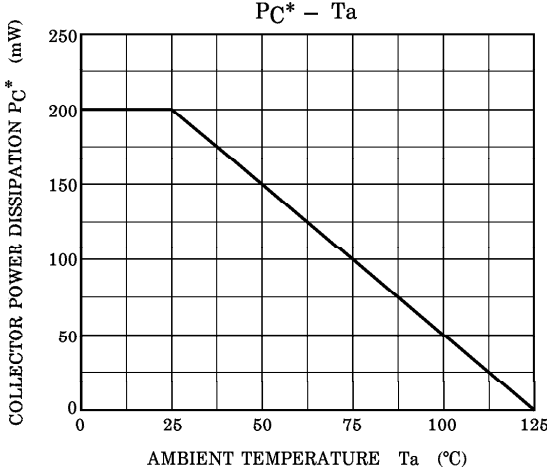
Q1 (NPN TRANSISTOR)



Q2 (PNP TRANSISTOR)



(Q1, Q2 COMMON)



*: Total Rating