

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

HN3B02FU

AUDIO FREQUENCY GENERAL PURPOSE AMPLIFIER APPLICATIONS.

Unit in mm

Q1

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

Q2

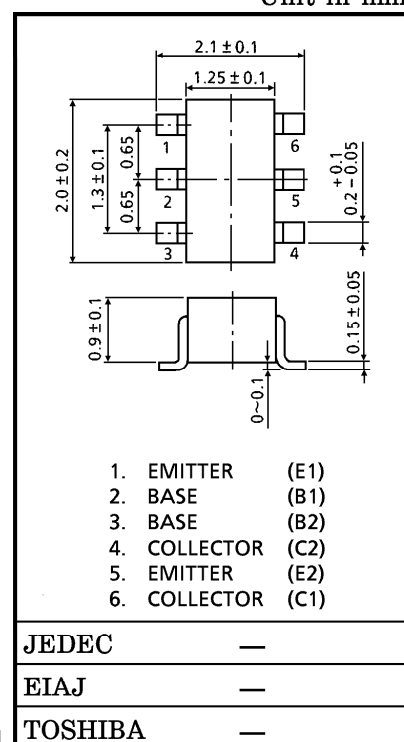
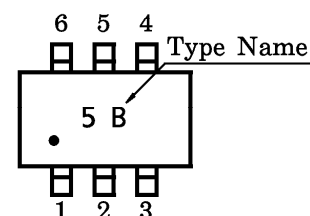
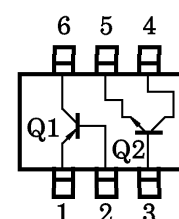
- High Voltage : $V_{CEO} = 60\text{ V}$
- High Current : $I_C = 150\text{ mA (Max.)}$
- High h_{FE} : $h_{FE} = 120 \sim 400$
- Excellent h_{FE} Linearity
: $h_{FE}(I_C = 0.1\text{ mA}) / h_{FE}(I_C = 2\text{ mA}) = 0.95\text{ (Typ.)}$

Q1 MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

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	-50	mA

Q2 MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

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****EQUIVALENT CIRCUIT (TOP VIEW)**

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Q1, Q2 COMMON MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector Power Dissipation	P_C (*)	200	mW
Junction Temperature	T_j	125	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-55 \sim 125$	$^\circ\text{C}$

(*) Total Rating

Q1 ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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

Q2 ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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