
2SC2734

Silicon NPN Epitaxial

HITACHI

ADE-208-1074 (Z)

1st. Edition

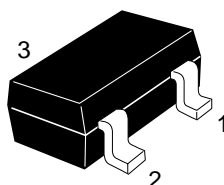
Mar. 2001

Application

- UHF frequency converter
- Local oscillator, wide band amplifier

Outline

MPAK



- 1. Emitter
- 2. Base
- 3. Collector

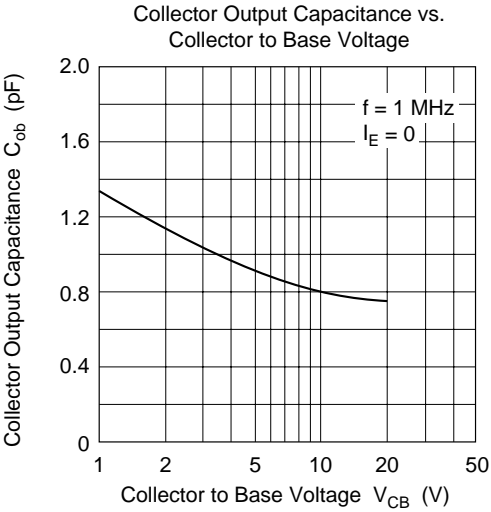
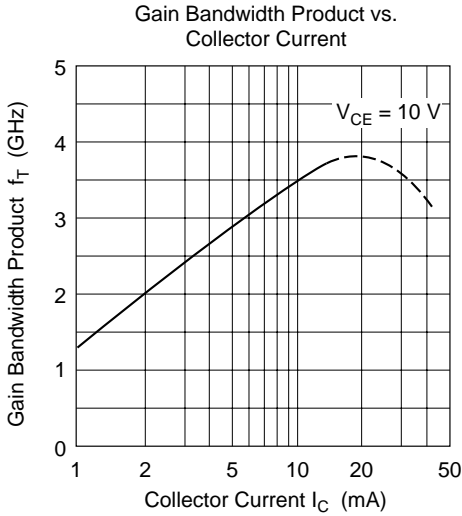
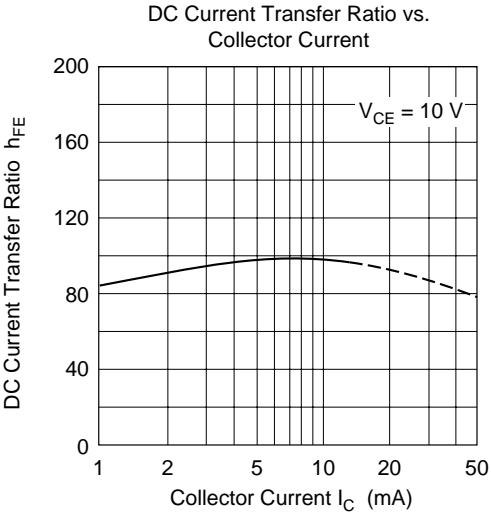
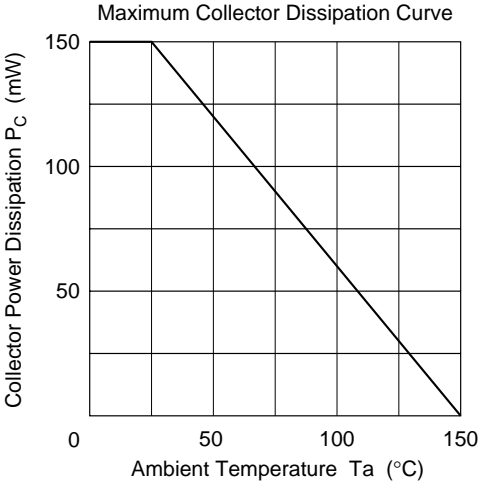
Note: Marking is "GC".

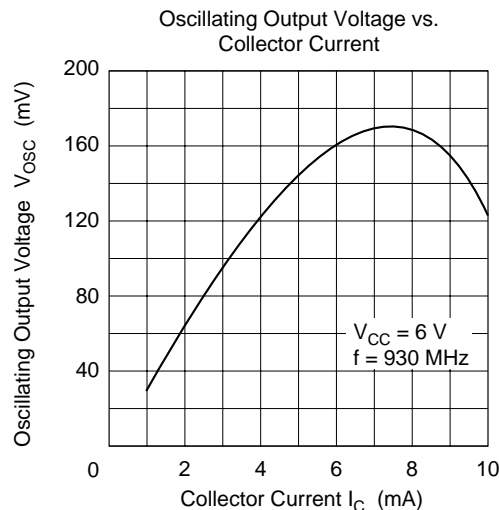
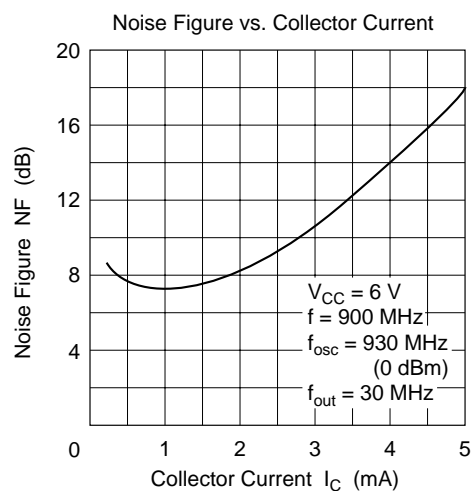
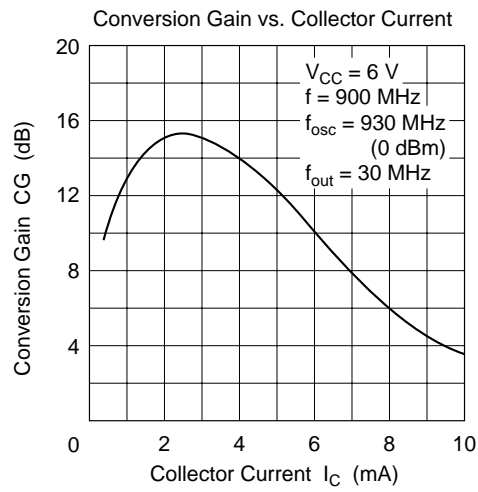
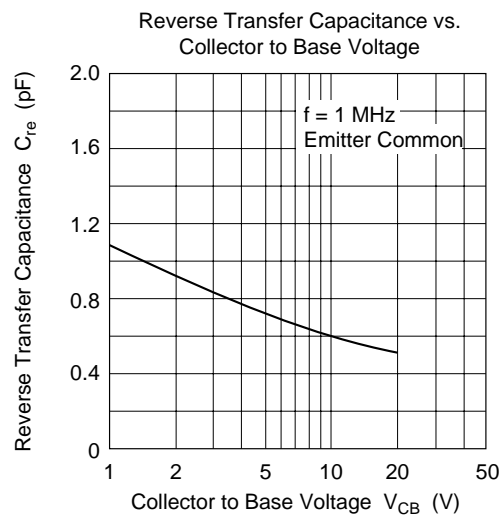
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

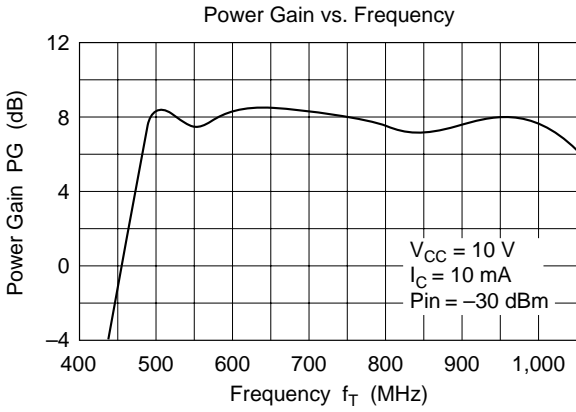
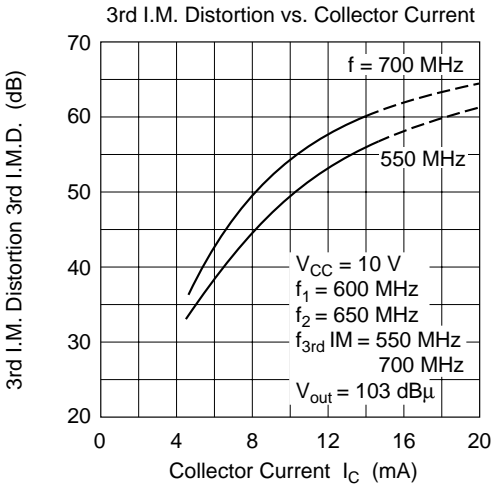
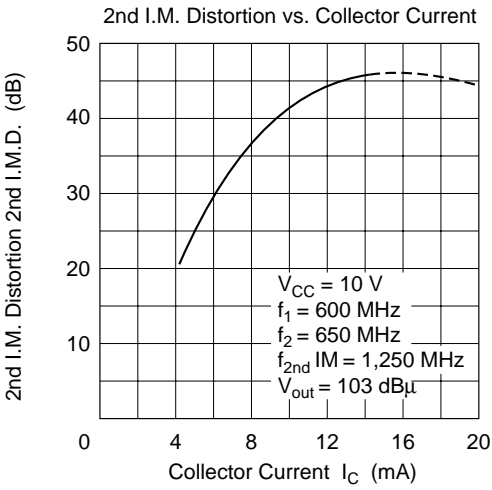
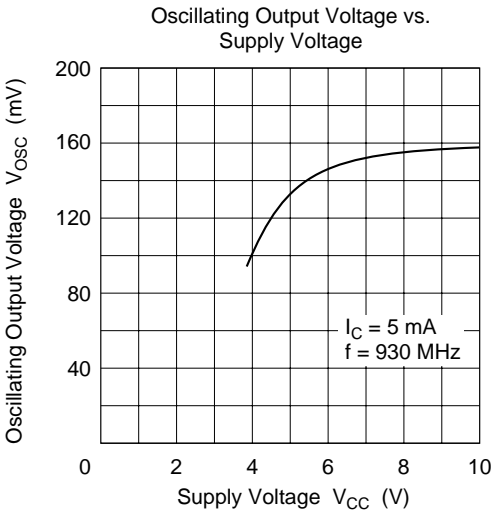
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	20	V
Collector to emitter voltage	V_{CEO}	11	V
Emitter to base voltage	V_{EBO}	3	V
Collector current	I_{C}	50	mA
Collector power dissipation	P_{C}	150	mW
Junction temperature	T_{j}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Electrical Characteristics ($T_a = 25^\circ\text{C}$)

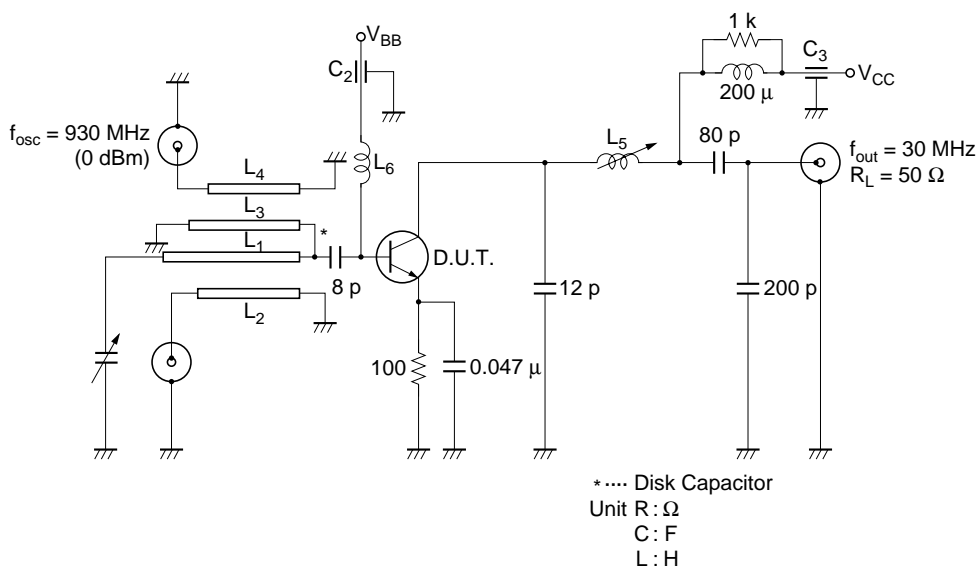
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(\text{BR})\text{CBO}}$	20	—	—	V	$I_{\text{C}} = 10\text{ }\mu\text{A}$, $I_{\text{E}} = 0$
Collector to emitter breakdown voltage	$V_{(\text{BR})\text{CEO}}$	11	—	—	V	$I_{\text{C}} = 1\text{ mA}$, $R_{\text{BE}} = \infty$
Emitter to base breakdown voltage	$V_{(\text{BR})\text{EBO}}$	3	—	—	V	$I_{\text{E}} = 10\text{ }\mu\text{A}$, $I_{\text{C}} = 0$
Collector cutoff current	I_{CBO}	—	—	0.5	μA	$V_{\text{CB}} = 10\text{ V}$, $I_{\text{E}} = 0$
Collector to emitter saturation voltage	$V_{\text{CE}(\text{sat})}$	—	—	0.7	V	$I_{\text{C}} = 10\text{ mA}$, $I_{\text{B}} = 5\text{ mA}$
DC current transfer ratio	h_{FE}	20	90	200		$V_{\text{CE}} = 10\text{ V}$, $I_{\text{C}} = 5\text{ mA}$
Gain bandwidth product	f_{T}	1.4	3.5	—	GHz	$V_{\text{CE}} = 10\text{ V}$, $I_{\text{C}} = 10\text{ mA}$
Collector output capacitance	C_{ob}	—	0.9	1.5	pF	$V_{\text{CB}} = 10\text{ V}$, $I_{\text{E}} = 0$, $f = 1\text{ MHz}$
Conversion gain	CG	—	15	—	dB	$V_{\text{CC}} = 6\text{ V}$, $I_{\text{C}} = 2\text{ mA}$, $f = 900\text{ MHz}$, $f_{\text{OSC}} = 930\text{ MHz (0dBm)}$, $f_{\text{out}} = 30\text{ MHz}$
Noise figure	NF	—	9	—	dB	$V_{\text{CC}} = 6\text{ V}$, $I_{\text{C}} = 2\text{ mA}$, $f = 900\text{ MHz}$, $f_{\text{OSC}} = 930\text{ MHz (0dBm)}$, $f_{\text{out}} = 30\text{ MHz}$
Oscillating output voltage	V_{OSC}	—	140	—	mV	$V_{\text{CC}} = 6\text{ V}$, $I_{\text{C}} = 5\text{ mA}$, $f = 930\text{ MHz}$







Conversion Gain, Noise Figure Test Circuit

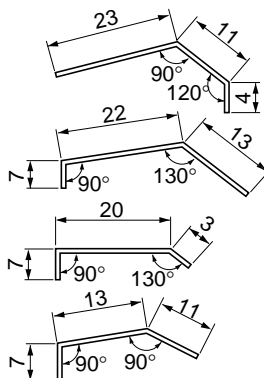


L_1 : $\phi 1$ mm Enameled Copper wire

L_2 : $\phi 1$ mm Enameled Copper wire

L_3 : $\phi 1$ mm Enameled Copper wire

L_4 : $\phi 1$ mm Enameled Copper wire



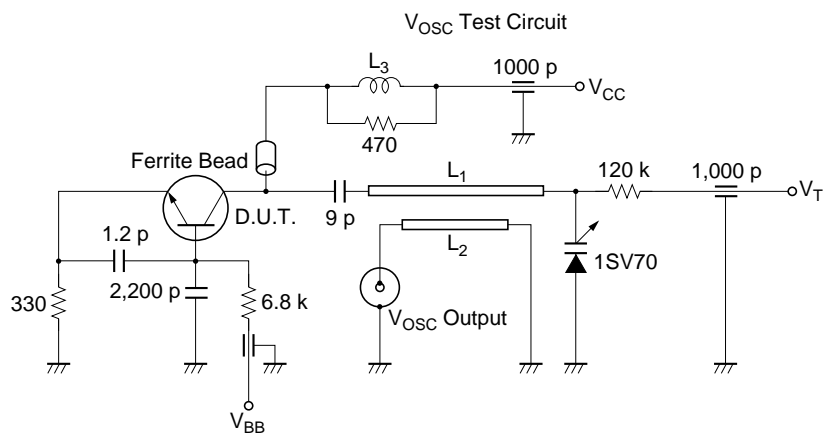
Unit : mm

L_5 : Bobbin $\phi 5$ mm inside dia, $\phi 0.2$ mm 20 Turns Enameled Copper wire

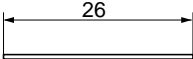
L_6 : $\phi 0.5$ mm Enameled Copper wire 1 Turn inside dia $\phi 6$ mm

C_1 : 20 pF max. Air Trimmer Condenser

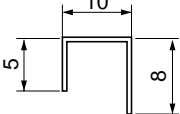
C_2, C_3 : 1000 pF Air Core Capacitor



L₁ : ϕ 1 mm Enameled Copper wire

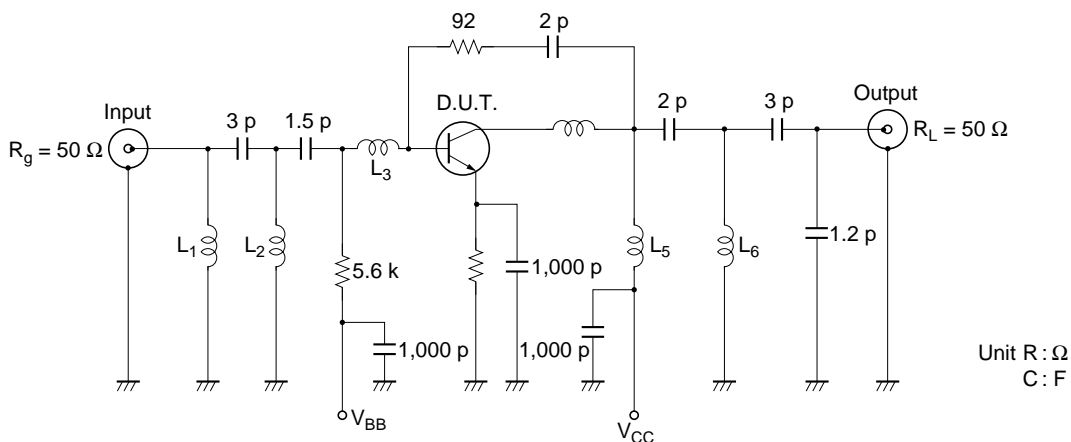


L₂ : ϕ 0.8 mm Enameled Copper wire



L₃ : ϕ 0.3 mm Enameled Copper wire, 10 Turns with 470 Ω Resistor

Circuit Example-UHF Wide Bandwidth Amplifier ($f = 500 \text{ MHz to } 950 \text{ MHz}$)



L_1 : $\phi 0.5 \text{ mm}$ Copper wire 5 Turns inside dia $\phi 3 \text{ mm}$

L_2 : $\phi 0.5 \text{ mm}$ Copper wire 2 Turns inside dia $\phi 2 \text{ mm}$

L_3 : $\phi 0.5 \text{ mm}$ Copper wire 2 Turns inside dia $\phi 2 \text{ mm}$

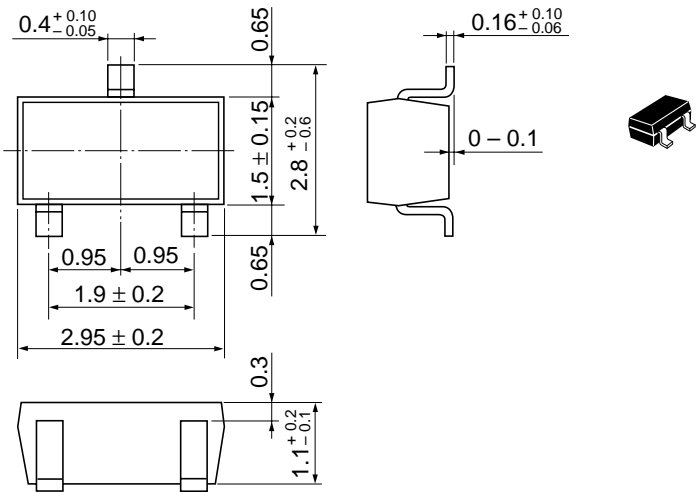
L_4 : $\phi 0.5 \text{ mm}$ Copper wire 1.5 Turns inside dia $\phi 2 \text{ mm}$

L_5 : $\phi 0.5 \text{ mm}$ Copper wire 4 Turns inside dia $\phi 2 \text{ mm}$

L_6 : $\phi 0.5 \text{ mm}$ Copper wire 3 Turns inside dia $\phi 2 \text{ mm}$

Package Dimensions

As of January, 2001
Unit: mm



Hitachi Code	MPAK
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.011 g

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