
2SC2736

Silicon NPN Epitaxial

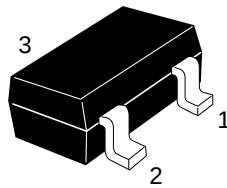
HITACHI

Application

- UHF/VHF frequency converter
- Local oscillator

Outline

MPAK



1. Emitter
2. Base
3. Collector

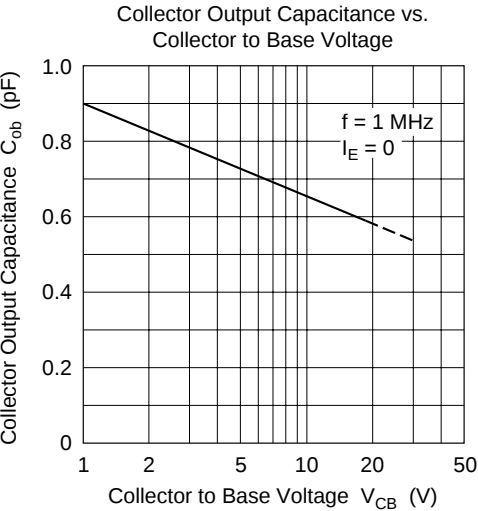
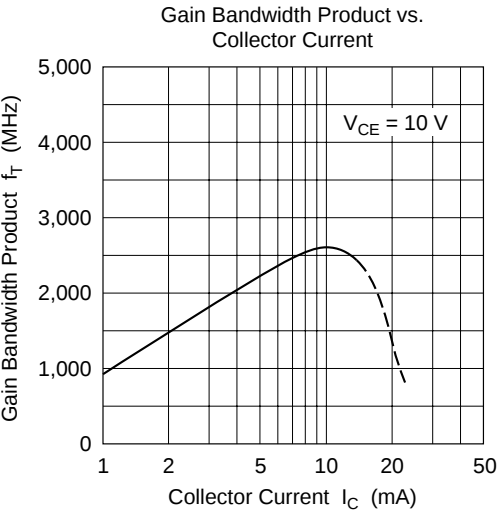
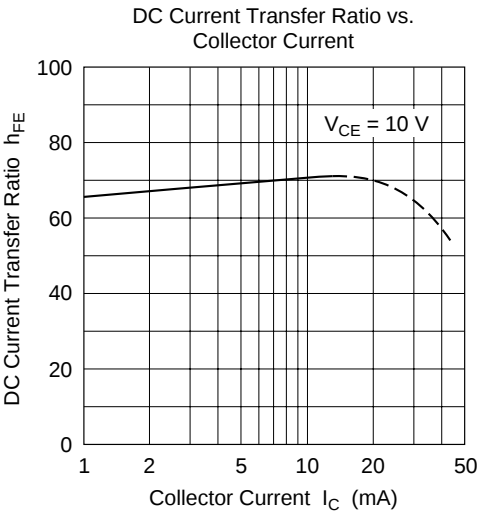
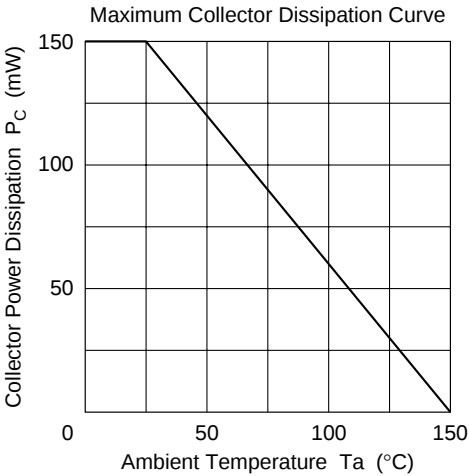
Absolute Maximum Ratings (Ta = 25°C)

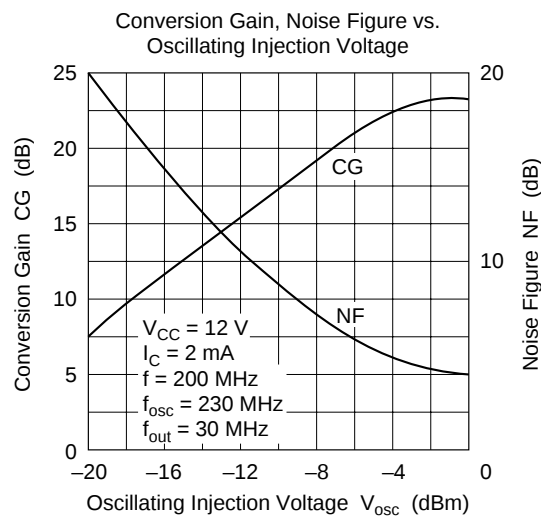
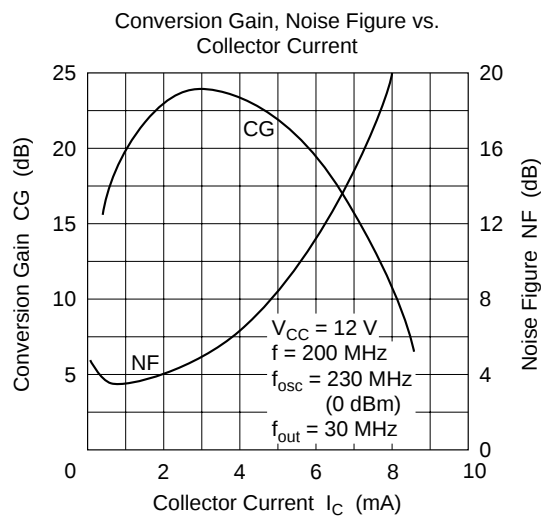
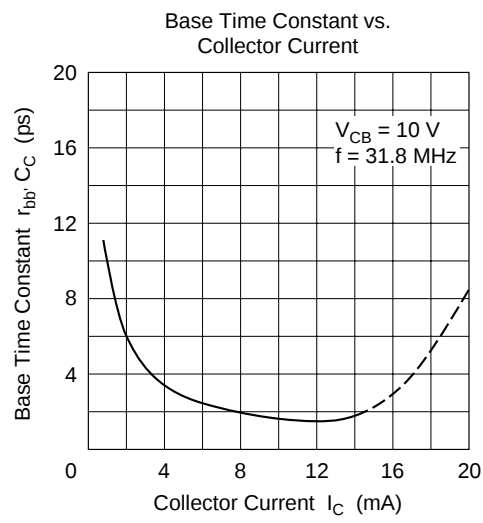
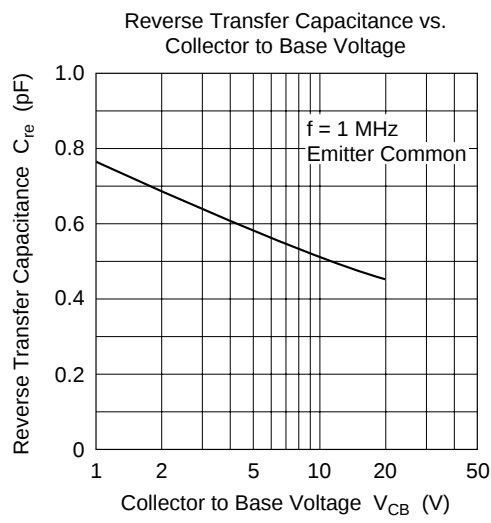
Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	30	V
Collector to emitter voltage	V_{CEO}	20	V
Emitter to base voltage	V_{EBO}	3	V
Collector current	I_C	50	mA
Collector power dissipation	P_C	150	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

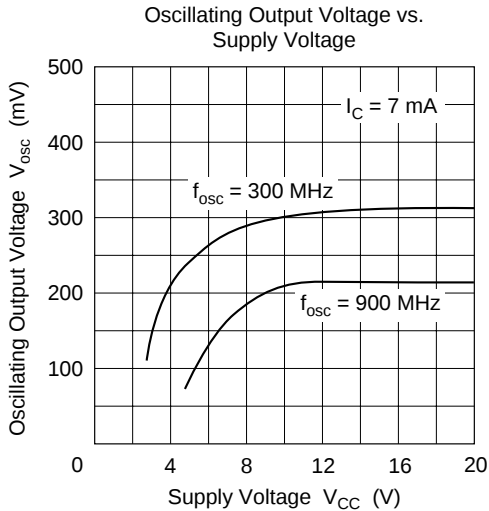
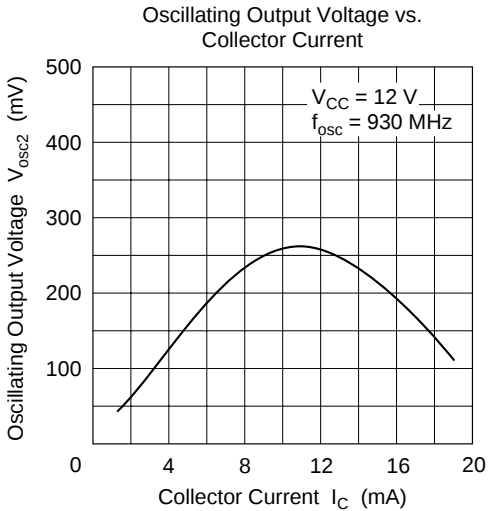
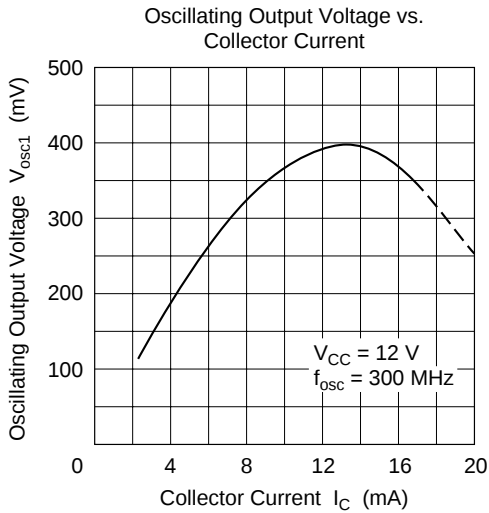
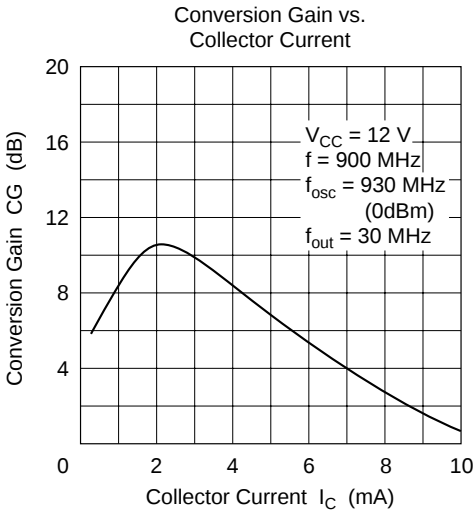
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	30	—	—	V	$I_C = 10\text{ }\mu\text{A}$, $I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	20	—	—	V	$I_C = 1\text{ mA}$, $R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	3	—	—	V	$I_E = 10\text{ }\mu\text{A}$, $I_C = 0$
Collector cutoff current	I_{CBO}	—	—	500	nA	$V_{CB} = 15\text{ V}$, $I_C = 0$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	0.7	V	$I_C = 10\text{ mA}$, $I_B = 5\text{ mA}$
DC current transfer ratio	h_{FE}	30	—	200		$V_{CE} = 10\text{ V}$, $I_C = 5\text{ mA}$
Collector output capacitance	C_{ob}	—	—	1.0	pF	$V_{CB} = 10\text{ V}$, $I_E = 0$, $f = 1\text{ MHz}$
Gain bandwidth product	f_T	1400	2200	—	MHz	$V_{CE} = 10\text{ V}$, $I_C = 5\text{ mA}$
Conversion gain	CG_1	—	22.5	—	dB	$V_{CC} = 12\text{ V}$, $I_C = 2\text{ mA}$, $f = 200\text{ MHz}$, $f_{OSC} = 230\text{ MHz (0dBm)}$
	CG_2	—	10	—	dB	$V_{CC} = 12\text{ V}$, $I_C = 2\text{ mA}$, $f = 900\text{ MHz}$, $f_{OSC} = 930\text{ MHz (0dBm)}$, $f_{Out} = 30\text{ MHz}$
Noise figure	NF	—	4.0	—	dB	$V_{CC} = 12\text{ V}$, $I_C = 2\text{ mA}$, $f = 200\text{ MHz}$, $f_{OSC} = 230\text{ MHz (0dBm)}$
Oscillating output voltage	V_{OSC1}	—	300	—	mV	$V_{CC} = 12\text{ V}$, $I_C = 7\text{ mA}$, $f_{OSC} = 300\text{ MHz}$
	V_{OSC2}	—	200	—	mV	$V_{CC} = 12\text{ V}$, $I_C = 7\text{ mA}$, $f_{OSC} = 930\text{ MHz}$

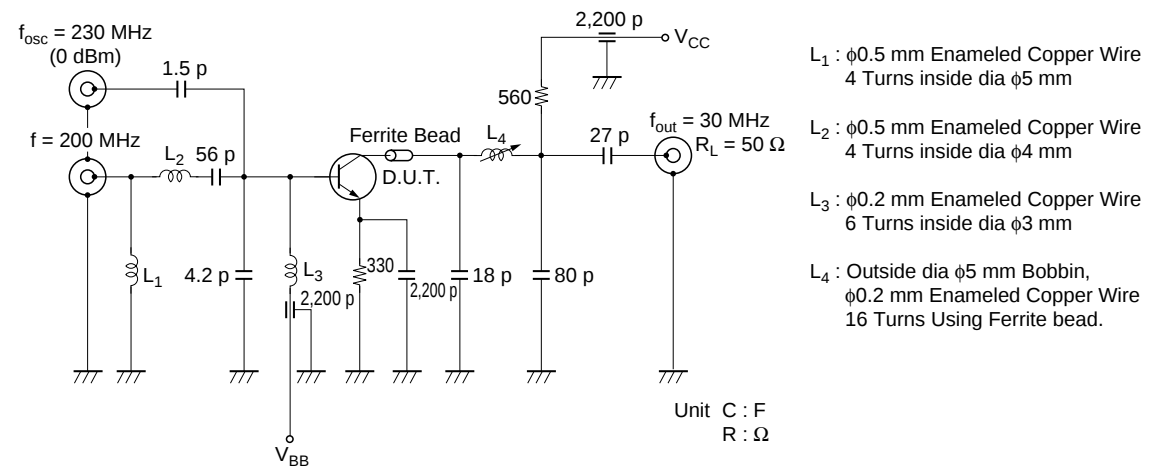
Note: Marking is “TC”.





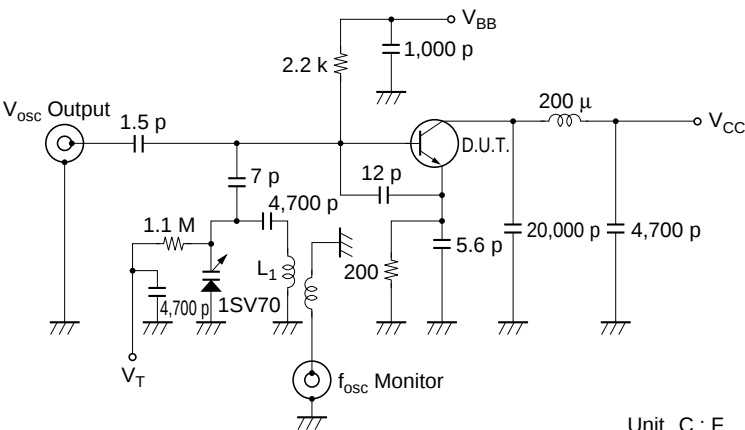


VHF Conversion Gain (CG₁) : Noise Figure Test Circuit





VHF Oscillating Output Voltage (V_{osc1}) Test Circuit

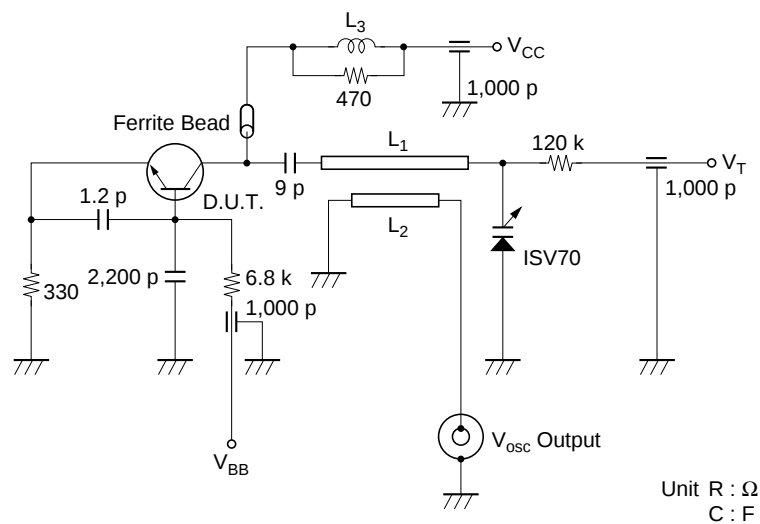


L_1 : $\phi 0.3\text{ mm}$ Enameled Copper Wire
3 Turns inside dia $\phi 3\text{ mm}$

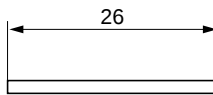
Test Frequency
 $f_{osc} = 300\text{ MHz}$

Unit C : F
R : Ω
L : H

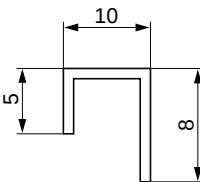
UHF Oscillating Output Voltage (V_{osc2}) Test Circuit



L_1 : Polyurethane Coated
Copper Wire



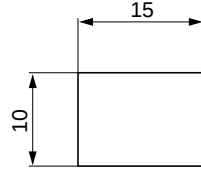
L_2 : Polyurethane Coated
Copper Wire



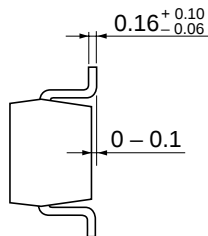
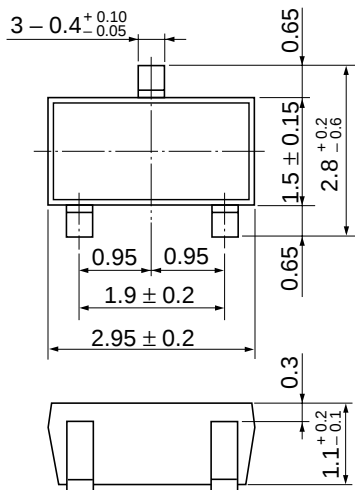
(Unit : mm)

L_3 : $\phi 0.3$ mm Enameled Copper
wire, 10 Turns with
470 Ω (1/4W) Resistor.

Dimensions of Cavity



Test Frequency
 $f_{osc} = 930$ MHz



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

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