2SC2735

Silicon NPN Epitaxial

HITACHI

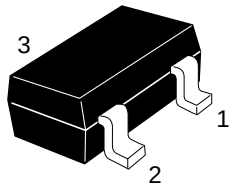
ADE-208-1075 (Z)
1st. Edition
Mar. 2001

Application

UHF/VHF Local oscillator, frequency converter

Outline

MPAK



1. Emitter
2. Base
3. Collector

Note: Marking is “JC”.

Hitachi semiconductor

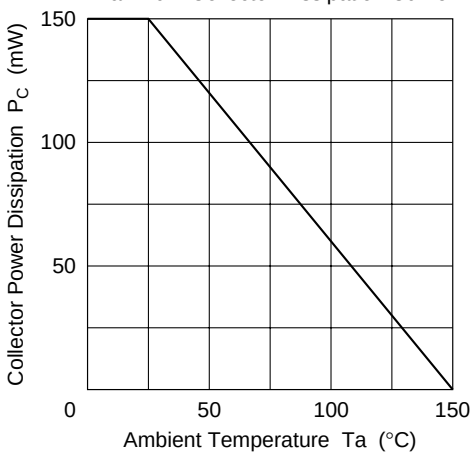
Absolute Maximum Ratings (Ta = 25°C)

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	Tj	150	°C
Storage temperature	Tstg	–55 to +150	°C

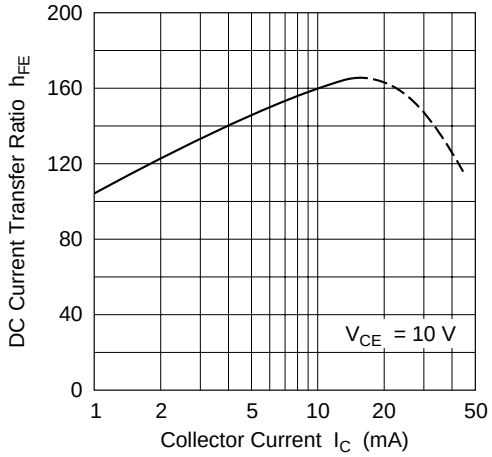
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	30	—	—	V	I_C = 10 µA, I_E = 0
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	20	—	—	V	I_C = 1 mA, R_{BE} = ∞
Emitter to base breakdown voltage	$V_{(BR)EBO}$	3	—	—	V	I_E = 10 µA, I_C = 0
Collector cutoff current	I_{CBO}	—	—	0.5	µA	V_{CB} = 10 V, I_C = 0
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	1.0	V	I_C = 20 mA, I_B = 4 mA
DC current transfer ratio	h_{FE}	40	—	—		V_{CE} = 10 V, I_C = 10 mA
Collector output capacitance	Cob	—	0.85	1.5	pF	V_{CB} = 10 V, I_E = 0, f = 1 MHz
Gain bandwidth product	f_T	600	1200	—	MHz	V_{CE} = 10 V, I_C = 10 mA
Oscillating output voltage	V_{OSC1}	—	210	—	mV	V_{CC} = 12 V, I_C = 7 mA, f_{OSC} = 300 MHz
	V_{OSC2}	—	130	—	mV	V_{CC} = 12 V, I_C = 7 mA, f_{OSC} = 930 MHz
Conversion gain	CG	—	21	—	dB	V_{CC} = 12 V, I_C = 2 mA, f = 200 MHz, f_{OSC} = 230 MHz (0dBm)
Noise figure	NF	—	6.5	—	dB	V_{CC} = 12 V, I_C = 2 mA, f = 200 MHz, f_{OSC} = 230 MHz (0dBm)

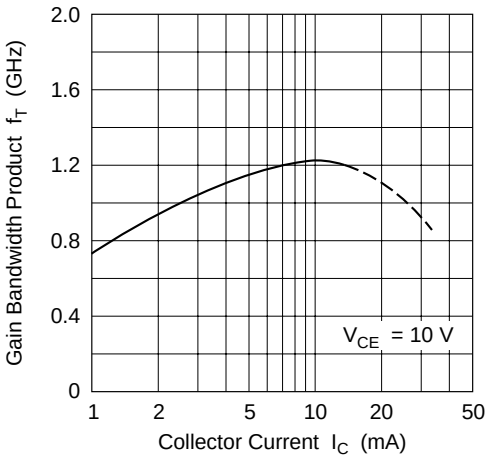
Maximum Collector Dissipation Curve



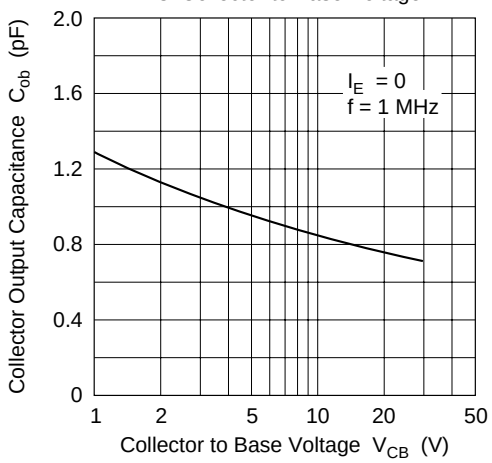
DC Current Transfer Ratio vs. Collector Current



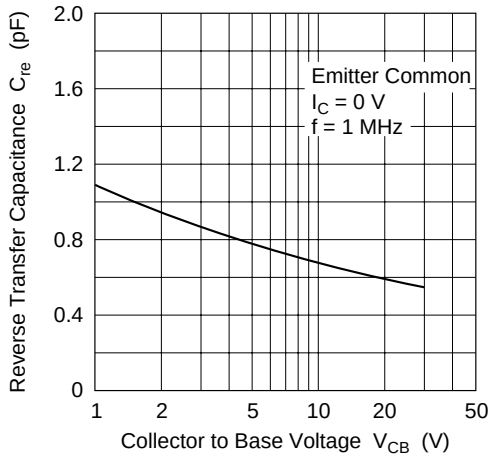
Gain Bandwidth Product vs. Collector Current



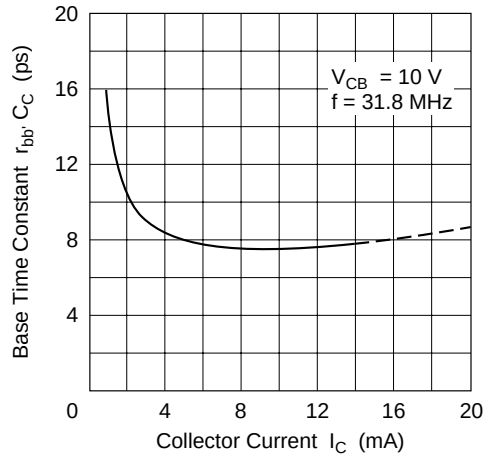
Collector Output Capacitance vs. Collector to Base Voltage



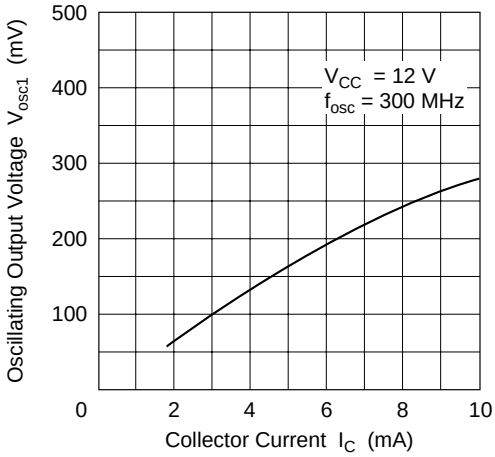
Reverse Transfer Capacitance
vs. Collector to Base Voltage



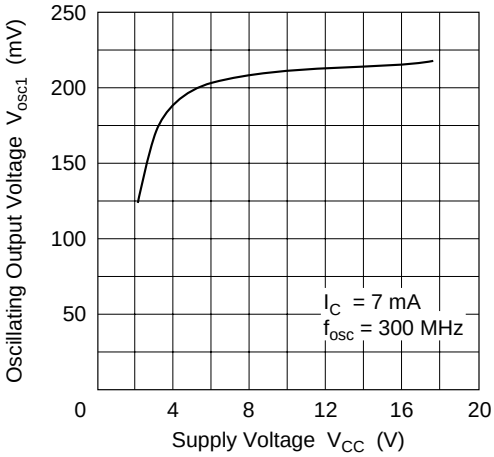
Base Time Constant
vs. Collector Current



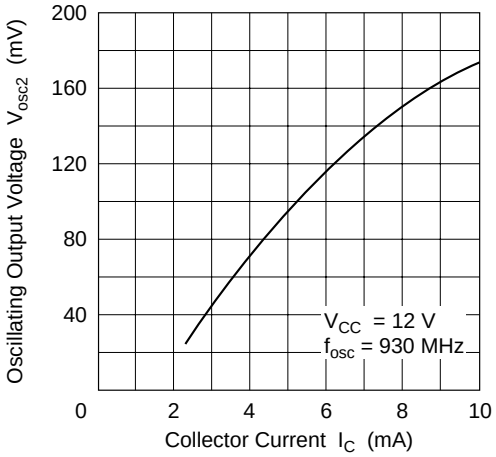
Oscillating Output Voltage
vs. Collector Current



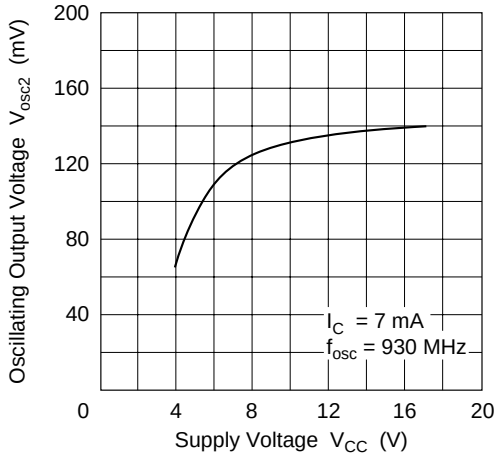
Oscillating Output Voltage
vs. Supply Voltage



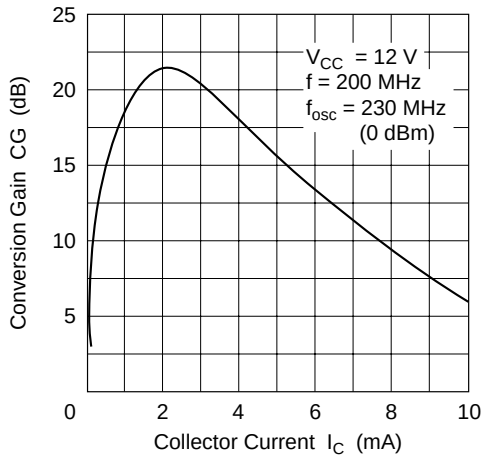
Oscillating Output Voltage vs. Collector Current



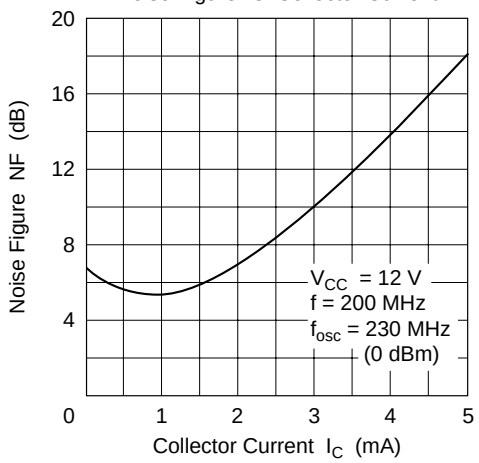
Oscillating Output Voltage vs. Supply Voltage



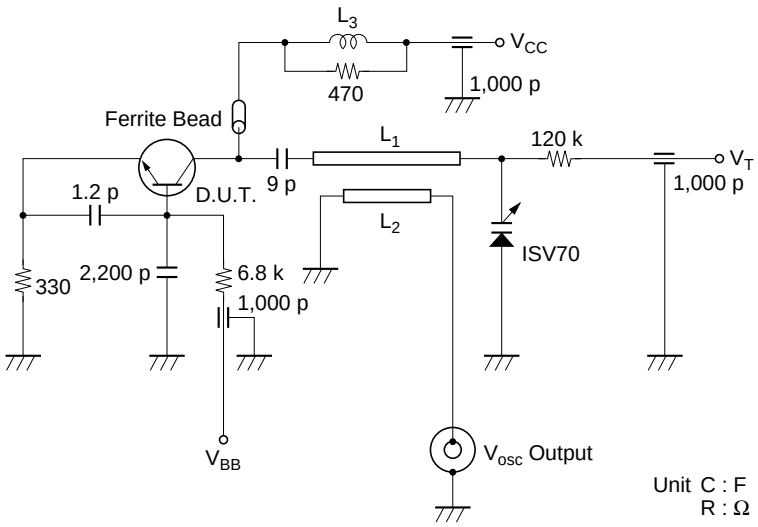
Conversion Gain vs. Collector Current

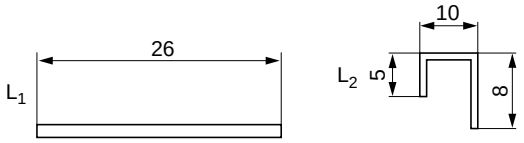


Noise Figure vs. Collector Current



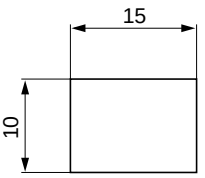
V_{OSC2} UHF Oscillating Output Voltage Test Circuit





(Dimensions in mm)

Dimensions of Cavity



(Dimensions in mm)

L_1 : Polyurethane Coated Copper Wire ϕ1.0 mm

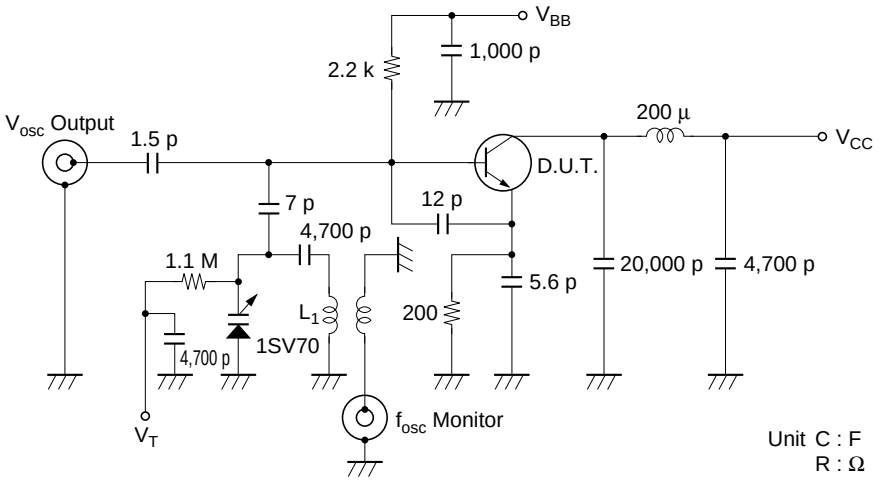
L_2 : Polyurethane Coated Copper Wire ϕ0.8 mm

L_3 : ϕ0.3 mm Enameled Copper wire, 10 Turns with 470 Ω (1/4W)Resistor.

Test Frequency : f_{osc} = 930 MHz

Test Equipment : YHP 4271A Vector Voltmeter

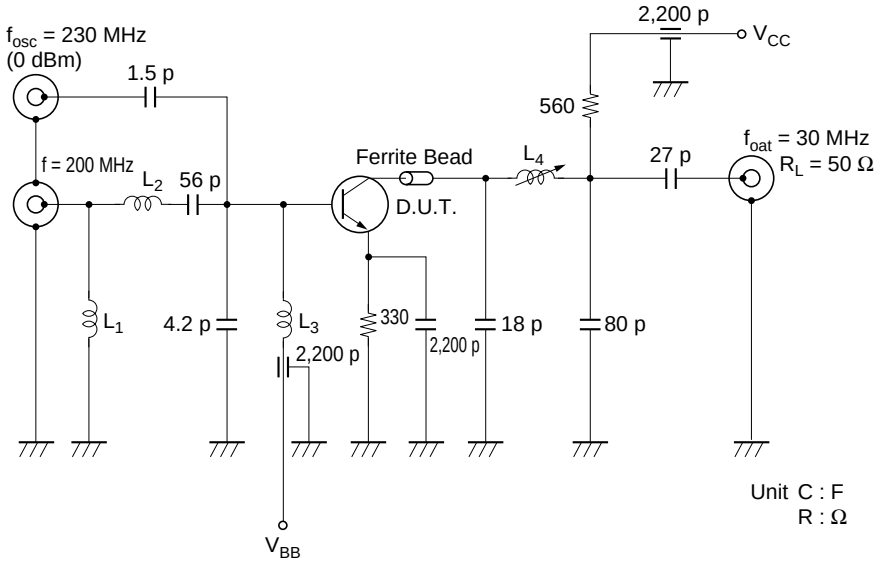
V_{OSC1} VHF Oscillating Output Voltage Test Circuit



L_1 : Inside dia ϕ3 mm, ϕ3 mm Enameled Copper Wire 12 Turns

Test Frequency : f_{osc} = 300 MHz

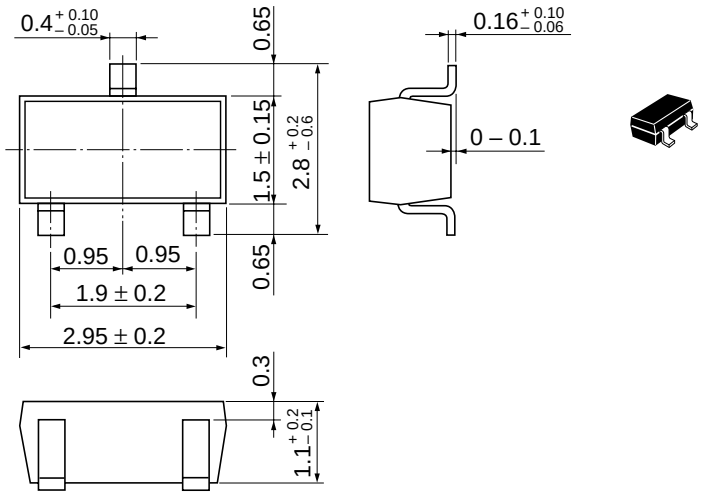
VHF Conversion Gain : Noise Figure Test Circuit



L_1 : Inside dia ϕ5 mm, ϕ0.5 mm Enameled Copper Wire 4 Turns
L_2 : Inside dia ϕ4 mm, ϕ0.5 mm Enameled Copper Wire 4 Turns
L_3 : Inside dia ϕ3 mm, ϕ0.2 mm Enameled Copper Wire 6 Turns
L_4 : Outside dia ϕ5 mm Bobbin, ϕ0.2 mm Enameled Copper Wire 16 Turns, using Ferrite bead.

Package Dimensions

As of January, 2001
Unit: mm



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

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