
2SC2735

Silicon NPN Epitaxial

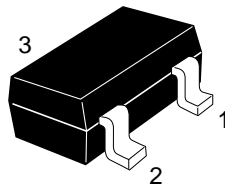
HITACHI

Application

UHF/VHF Local oscillator, frequency converter

Outline

MPAK



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

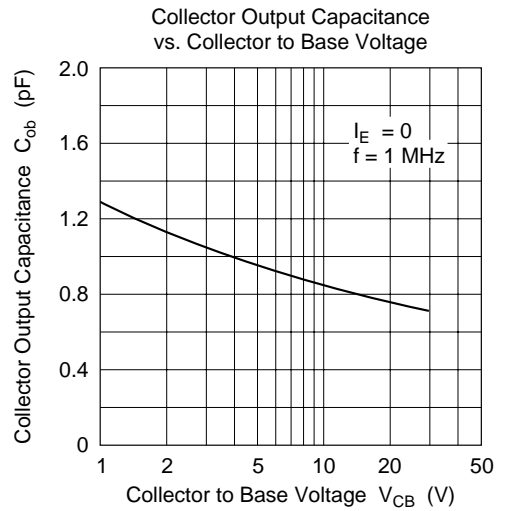
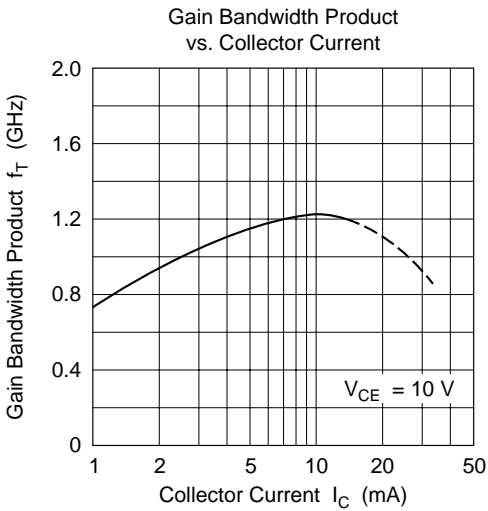
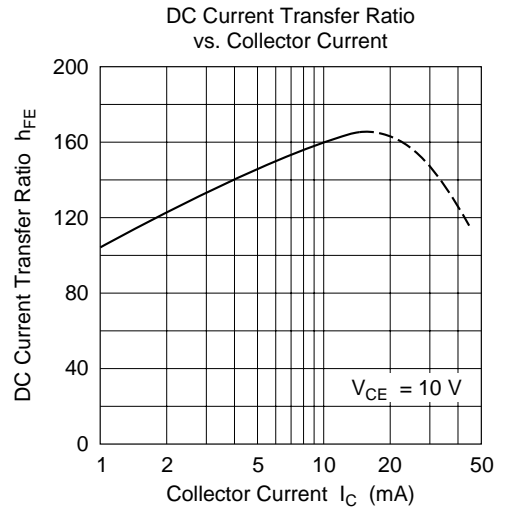
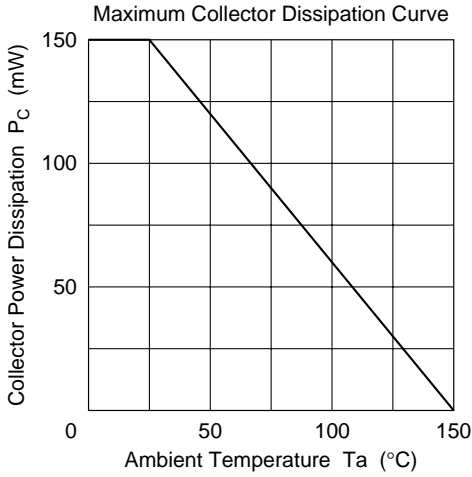
Absolute Maximum Ratings (Ta = 25°C)

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

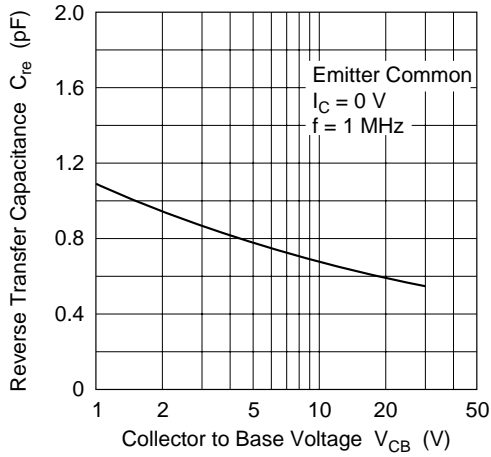
Electrical Characteristics (Ta = 25°C)

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

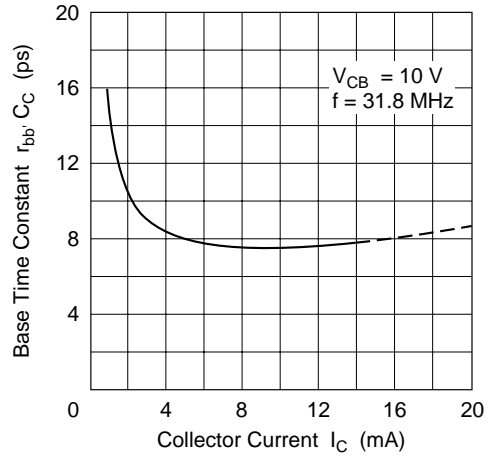
Note: Marking is "JC".



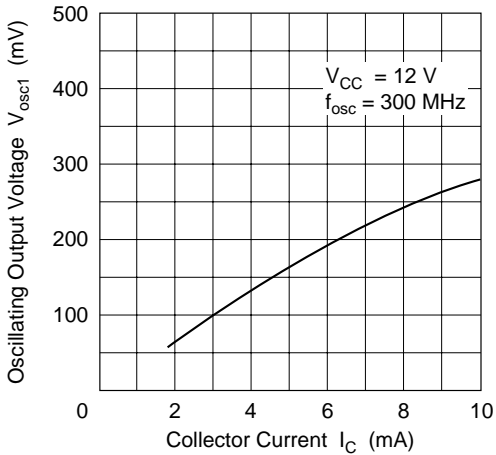
Reverse Transfer Capacitance vs. Collector to Base Voltage



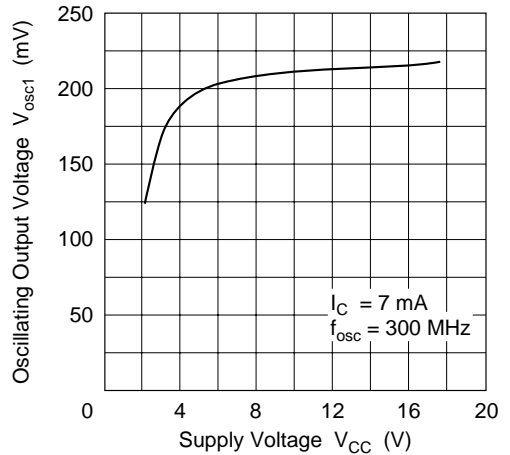
Base Time Constant vs. Collector Current



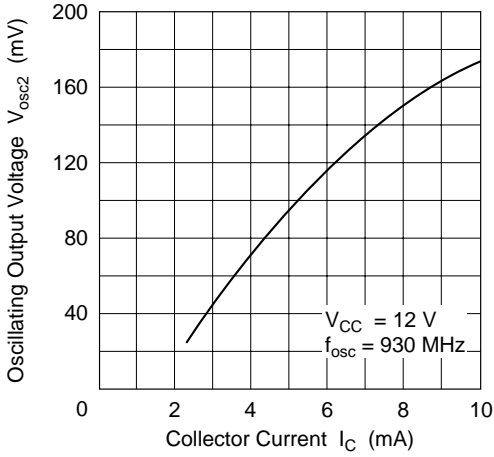
Oscillating Output Voltage vs. Collector Current



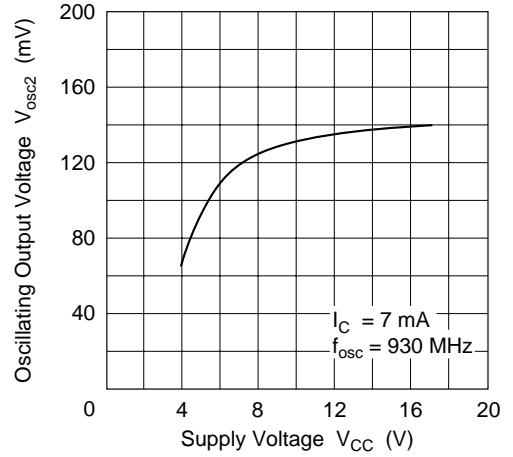
Oscillating Output Voltage vs. Supply Voltage



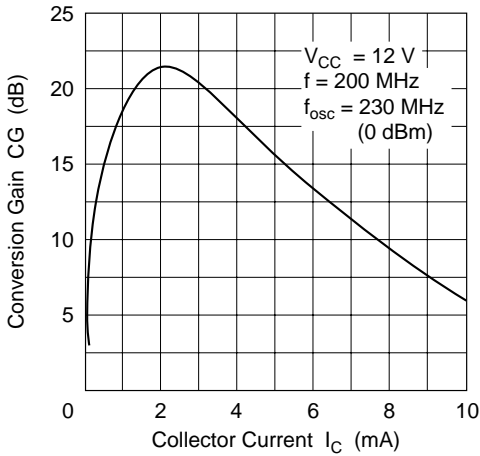
Oscillating Output Voltage vs. Collector Current



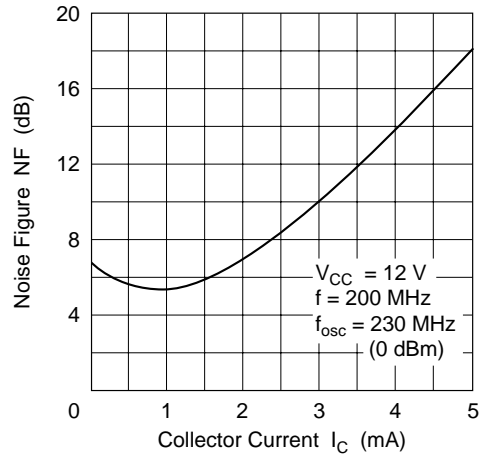
Oscillating Output Voltage vs. Supply Voltage



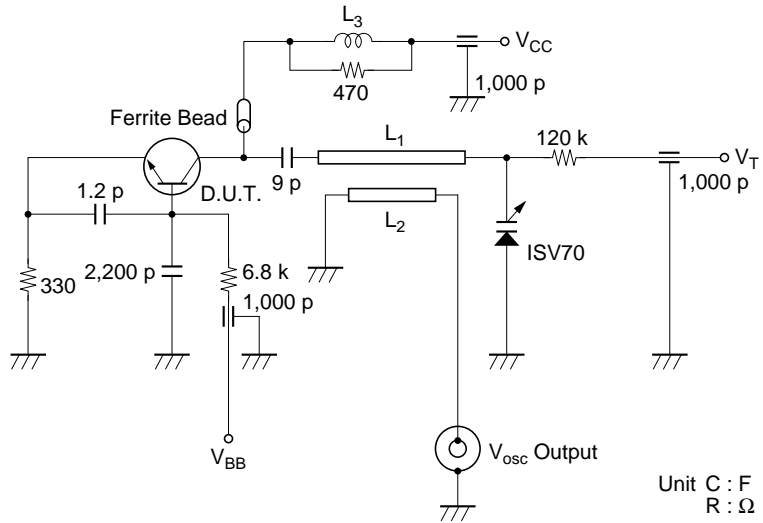
Conversion Gain vs. Collector Current



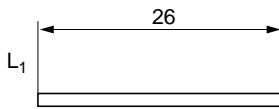
Noise Figure vs. Collector Current



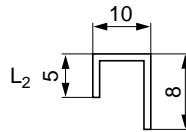
V_{osc2} UHF Oscillating Output Voltage Test Circuit



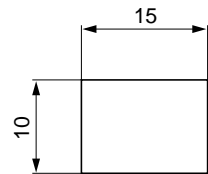
Unit C : F
R : Ω



(Dimensions in mm)



Dimensions of Cavity



(Dimensions in mm)

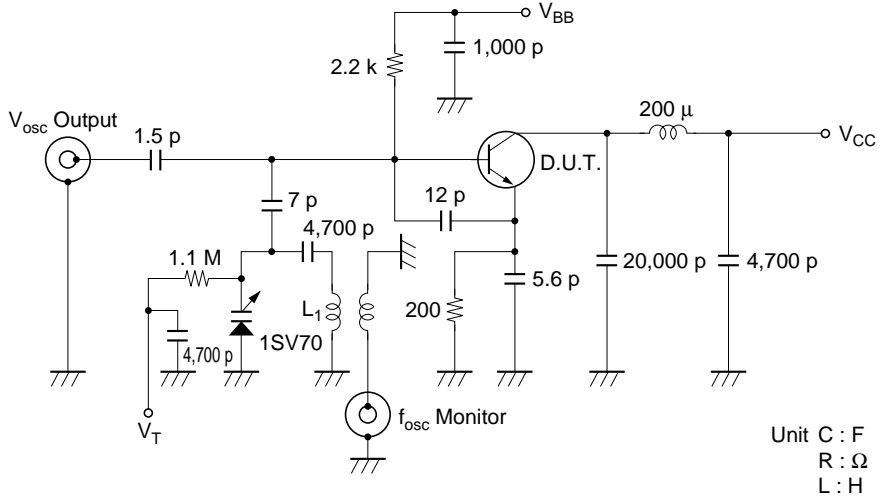
L_1 : Polyurethane Coated Copper Wire ϕ 1.0 mm

L_2 : Polyurethane Coated Copper Wire ϕ 0.8 mm

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

Test Frequency : $f_{osc} = 930$ MHz

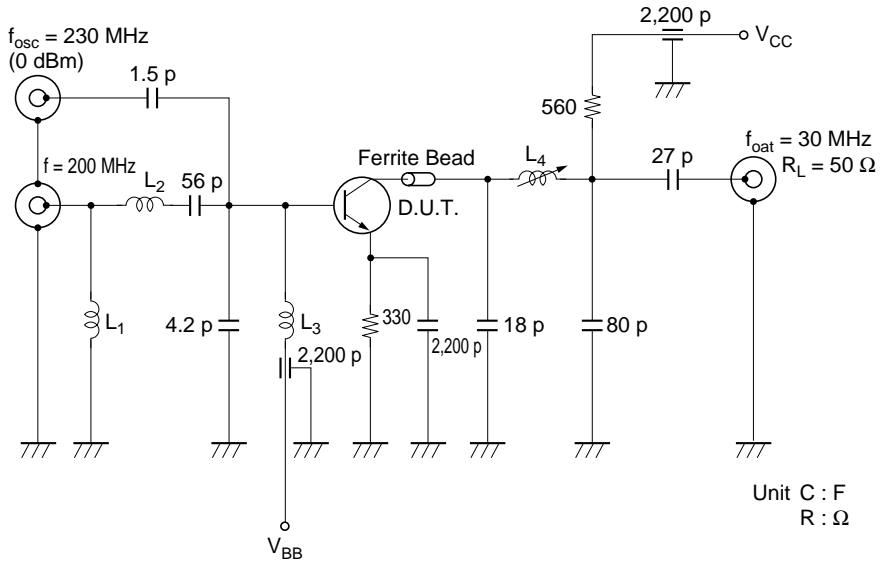
Test Equipment : YHP 4271A Vector Voltmeter

V_{OSC1} VHF Oscillating Output Voltage Test Circuit

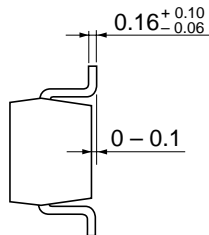
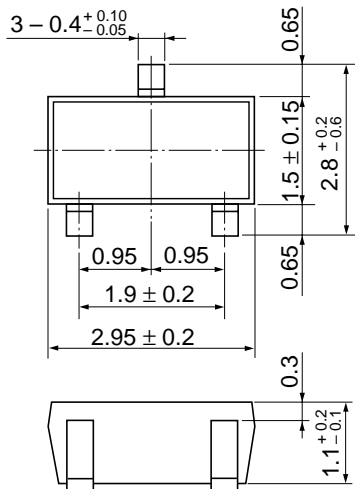
L₁ : Inside dia $\phi 3$ mm, $\phi 3$ mm Enameled Copper Wire 12 Turns

Test Frequency : $f_{osc} = 300$ MHz

VHF Conversion Gain : Noise Figure Test Circuit



- L₁ : Inside dia φ5 mm, φ0.5 mm Enameled Copper Wire 4 Turns
- L₂ : Inside dia φ4 mm, φ0.5 mm Enameled Copper Wire 4 Turns
- L₃ : Inside dia φ3 mm, φ0.2 mm Enameled Copper Wire 6 Turns
- L₄ : Outside dia φ5 mm Bobbin, φ0.2 mm Enameled Copper Wire 16 Turns, using Ferrite bead.



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

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