

2SC2735

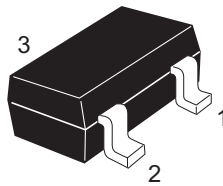
Silicon NPN Epitaxial

REJ03G0706-0200
(Previous ADE-208-1075)
Rev.2.00
Aug.10.2005

Application

UHF/VHF Local oscillator, frequency converter

Outline

RENESAS Package code: PLSP0003ZB-A
(Package name: MPAK)

1. Emitter
2. Base
3. Collector

Note: Marking is "JC".

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

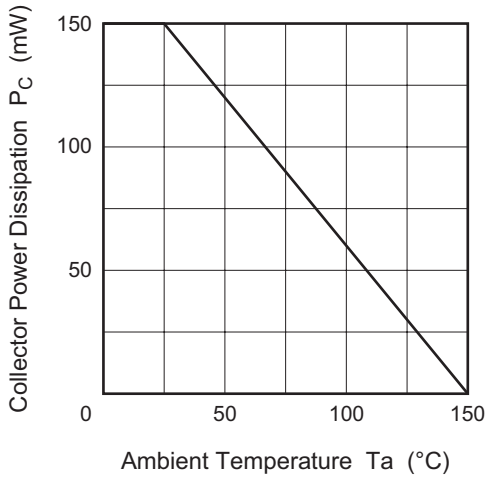
Electrical Characteristics

(Ta = 25°C)

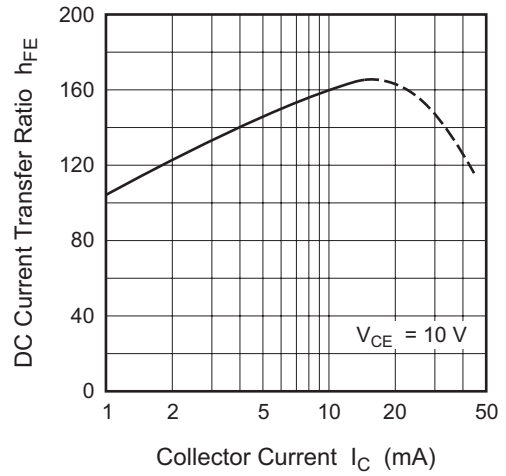
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	30	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	20	—	—	V	$I_C = 1 \text{ mA}, R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	3	—	—	V	$I_E = 10 \mu A, I_C = 0$
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	$V_{CC} = 12 \text{ V}, I_C = 2 \text{ mA},$ $f = 200 \text{ MHz},$ $f_{OSC} = 230 \text{ MHz (0dBm)}$

Main Characteristics

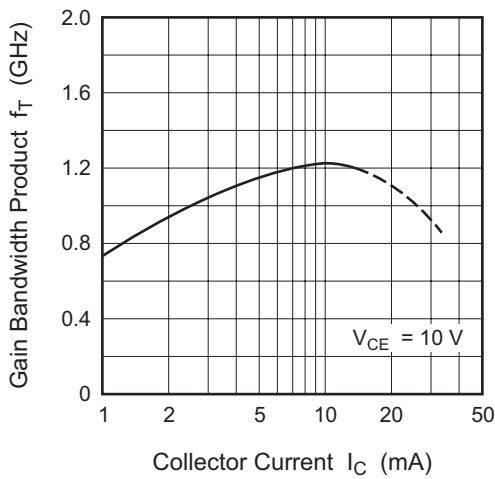
Maximum Collector Dissipation Curve



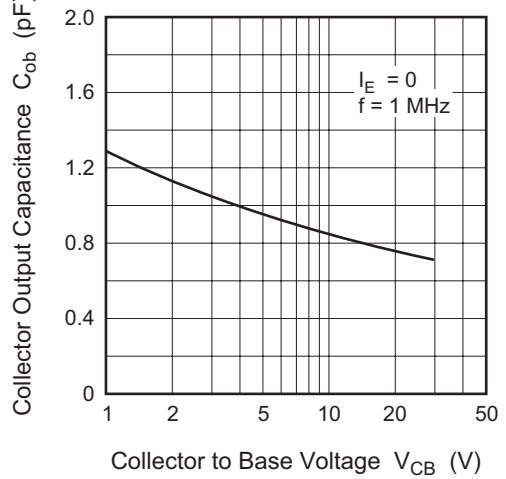
DC Current Transfer Ratio vs. Collector Current



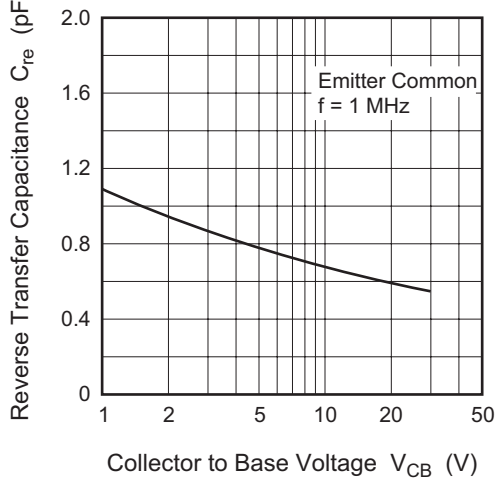
Gain Bandwidth Product vs. Collector Current



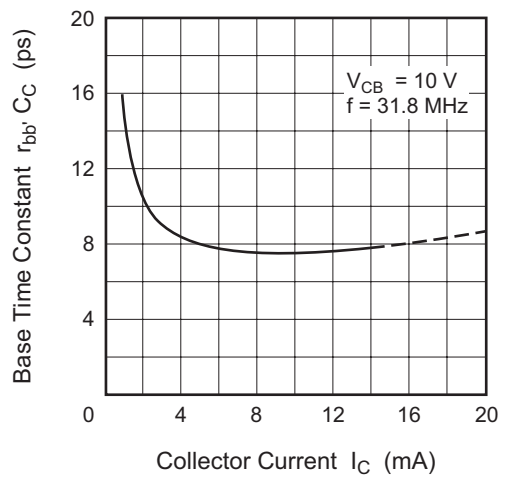
Collector Output Capacitance vs. Collector to Base Voltage



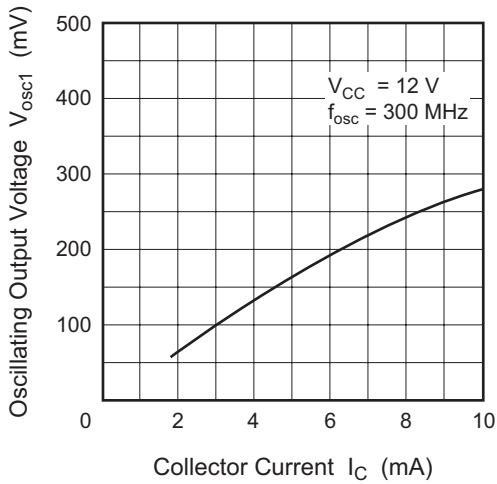
Reverse Transfer Capacitance vs. Collector to Base Voltage



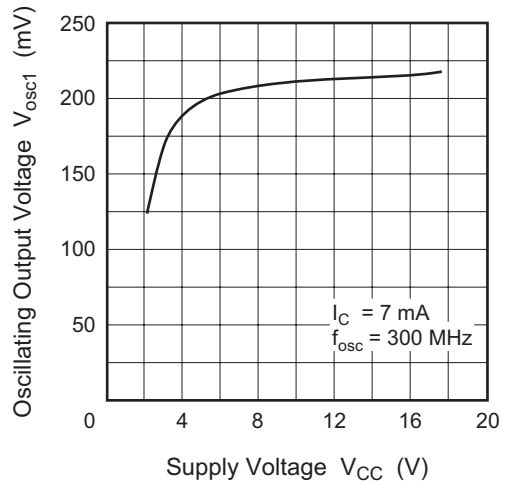
Base Time Constant vs. Collector Current



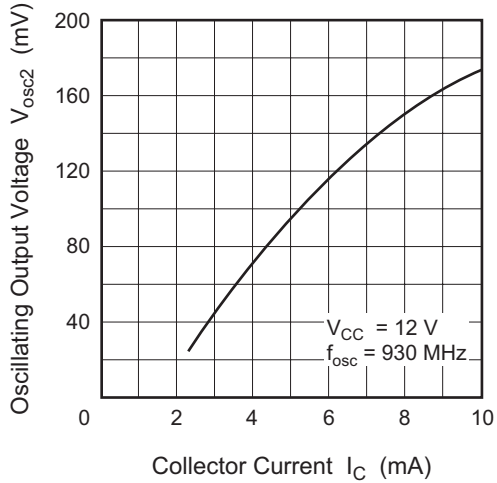
Oscillating Output Voltage vs. Collector Current



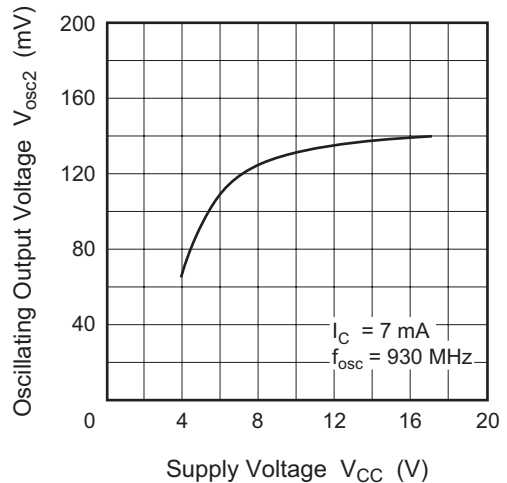
Oscillating Output Voltage vs. Supply Voltage



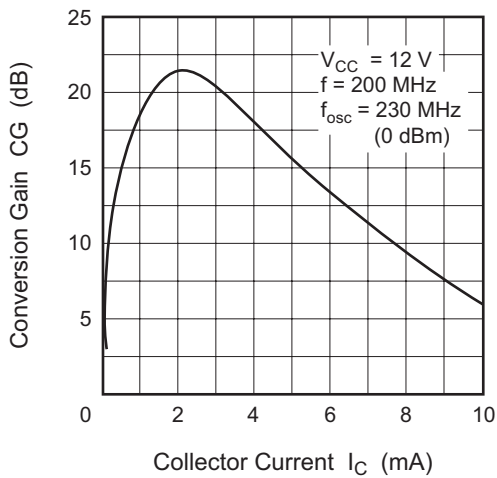
Oscillating Output Voltage vs. Collector Current



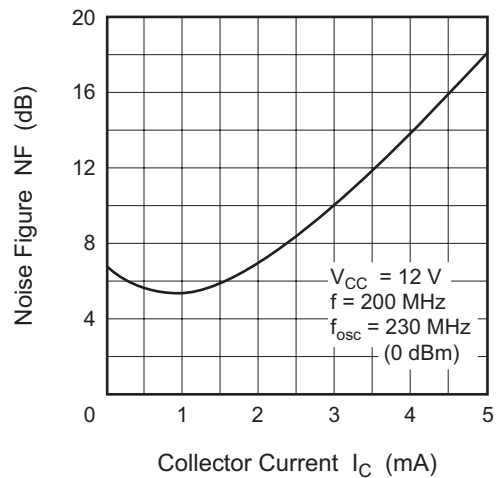
Oscillating Output Voltage vs. Supply Voltage



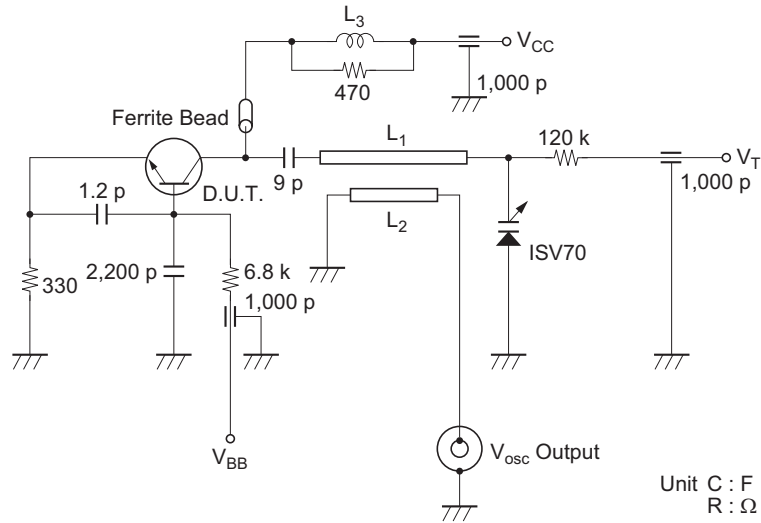
Conversion Gain vs. Collector Current



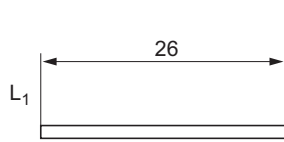
Noise Figure vs. Collector Current



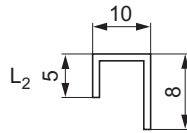
V_{OSC2} UHF Oscillating Output Voltage Test Circuit



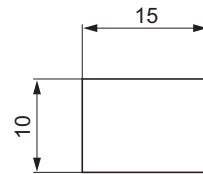
Unit C : F
R : Ω



(Dimensions in mm)



Dimensions of Cavity



(Dimensions in mm)

L₁ : Polyurethane Coated Copper Wire φ1.0 mm

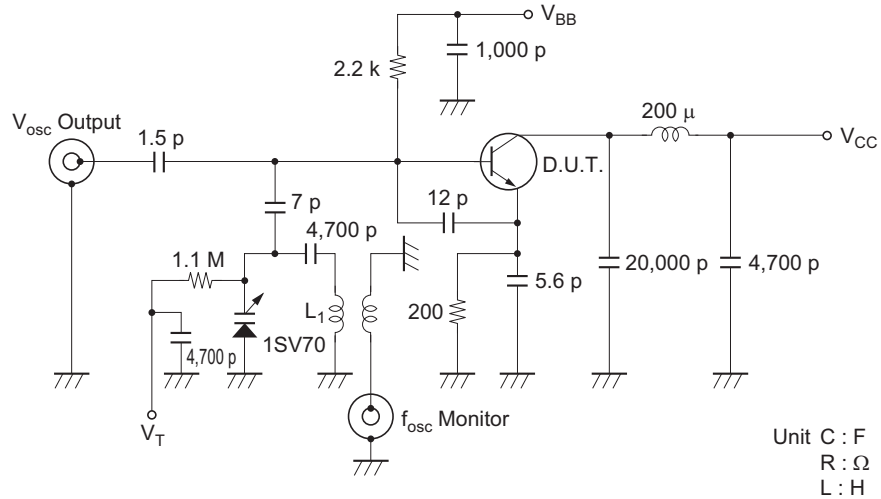
L₂ : Polyurethane Coated Copper Wire φ0.8 mm

L₃ : 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

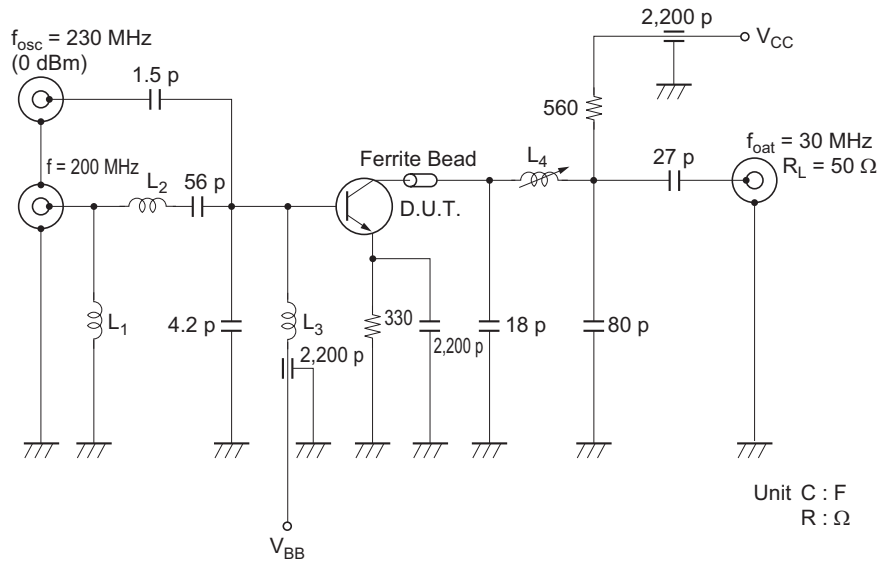
V_{OSC1} VHF Oscillating Output Voltage Test Circuit



L₁ : Inside dia φ3 mm, φ3 mm Enameled Copper Wire 12 Turns

Test Frequency : f_{osc} = 300 MHz

VHF Conversion Gain : Noise Figure Test Circuit



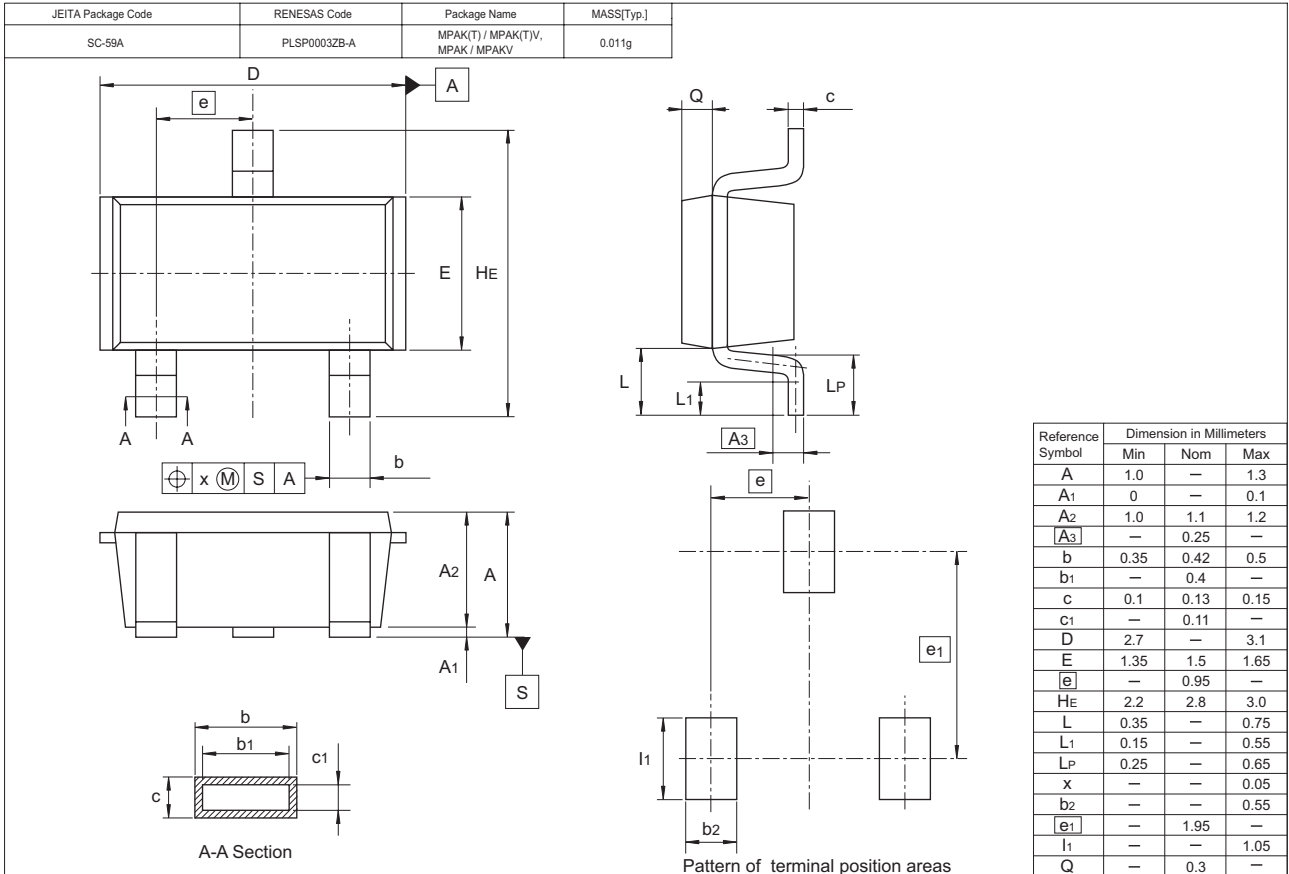
L₁ : Inside dia φ5 mm, φ0.5 mm Enameled Copper Wire 4 Turns

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.

Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
2SC2735JTL-E	3000	φ 178 mm Reel, 8 mm Emboss Taping

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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