

# 2SC2735

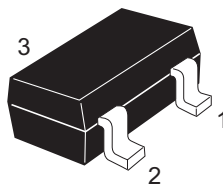
Silicon NPN Epitaxial

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

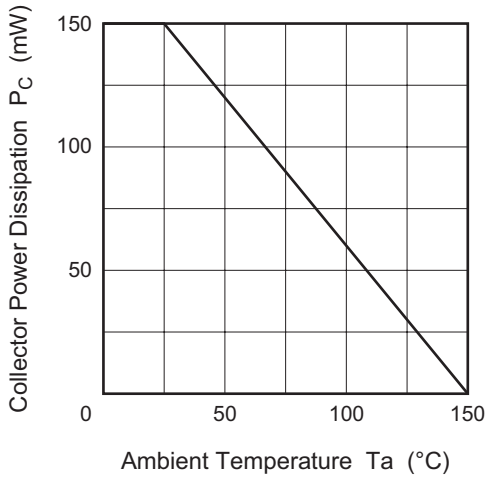
## Electrical Characteristics

(Ta = 25°C)

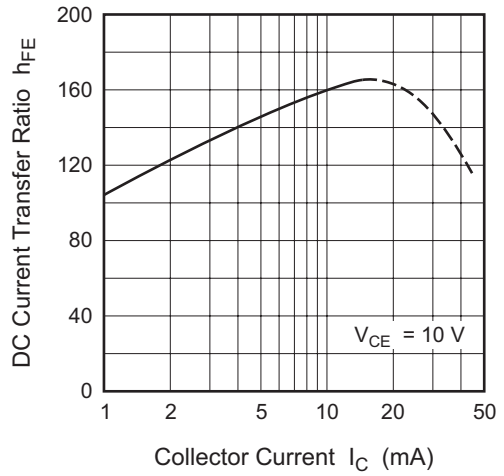
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	30	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	20	—	—	V	$I_C = 1 \text{ mA}, R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	3	—	—	V	$I_E = 10 \mu A, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	0.5	$\mu A$	$V_{CB} = 10 \text{ V}, I_C = 0$
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

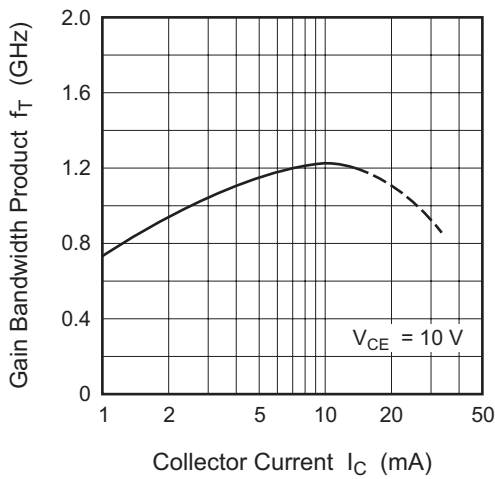
Maximum Collector Dissipation Curve



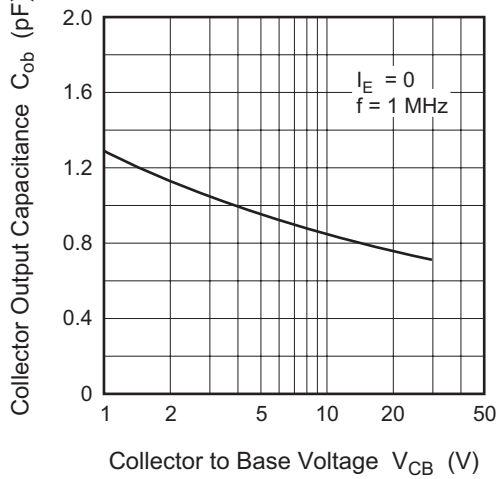
DC Current Transfer Ratio vs. Collector Current



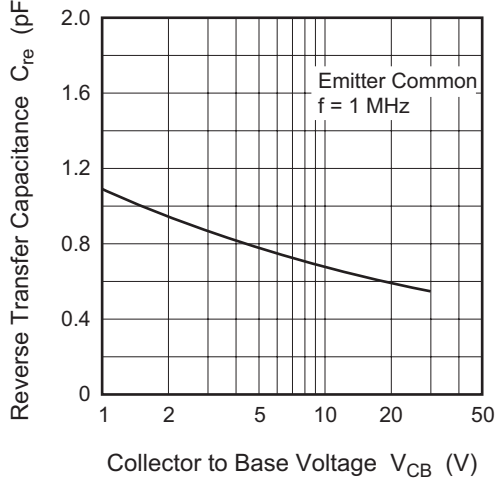
Gain Bandwidth Product vs. Collector Current



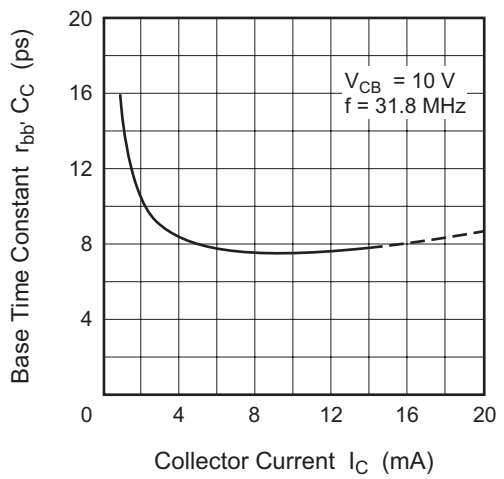
Collector Output Capacitance vs. Collector to Base Voltage



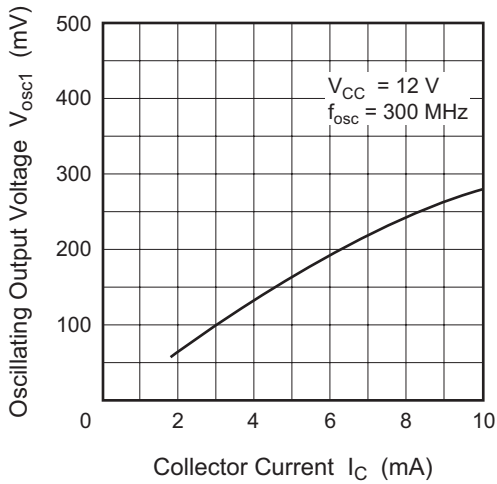
Reverse Transfer Capacitance vs. Collector to Base Voltage



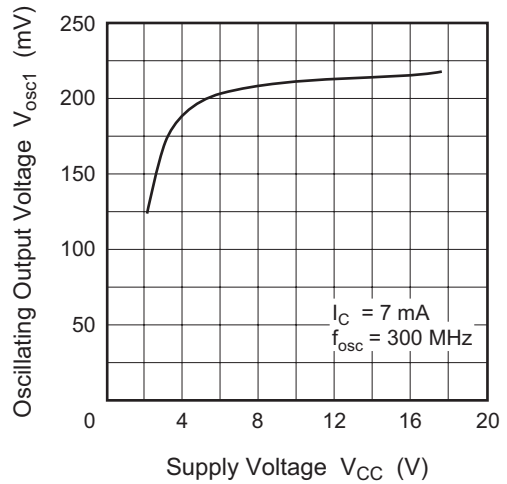
Base Time Constant vs. Collector Current



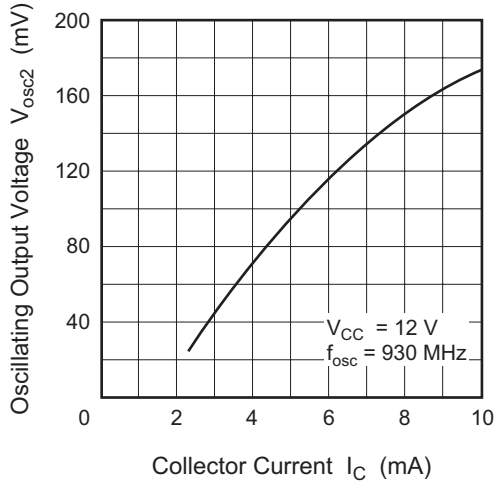
Oscillating Output Voltage vs. Collector Current



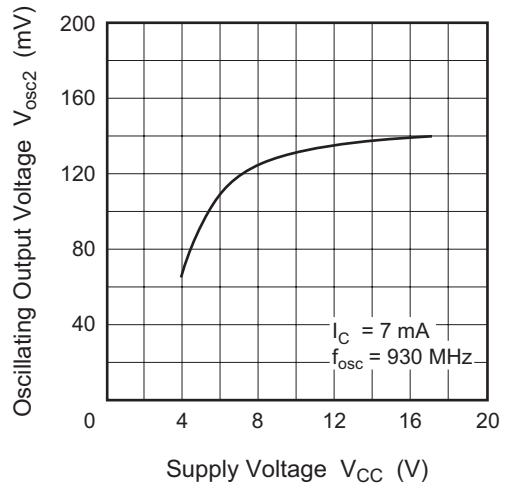
Oscillating Output Voltage vs. Supply Voltage



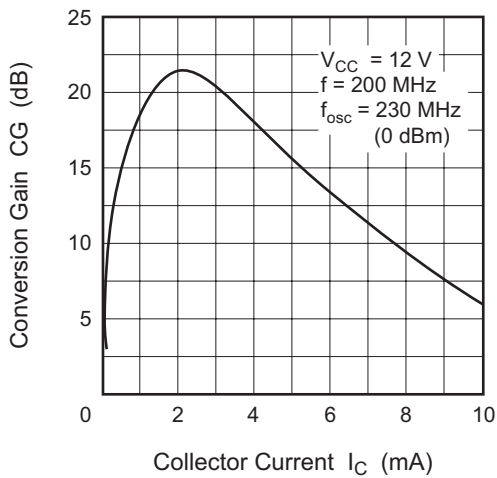
Oscillating Output Voltage vs. Collector Current



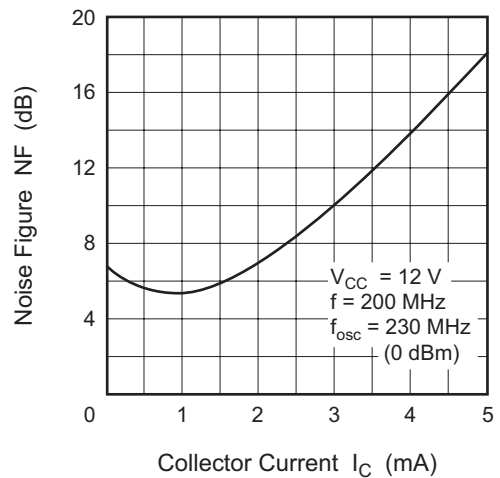
Oscillating Output Voltage vs. Supply Voltage



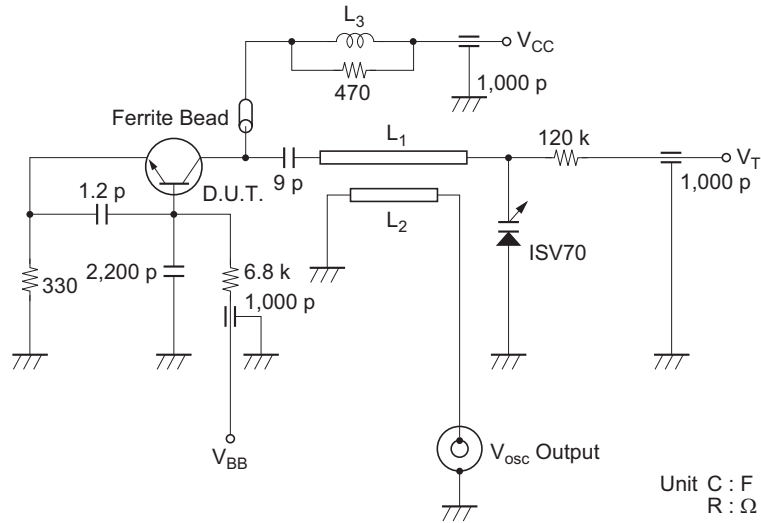
Conversion Gain vs. Collector Current



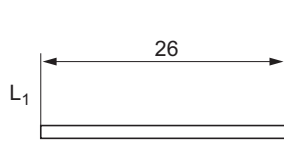
Noise Figure vs. Collector Current



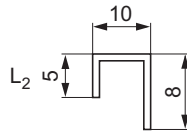
V<sub>OSC2</sub> UHF Oscillating Output Voltage Test Circuit



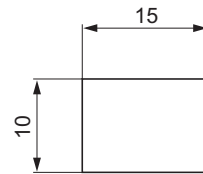
Unit C : F  
R : Ω



(Dimensions in mm)



Dimensions of Cavity



(Dimensions in mm)

L<sub>1</sub> : Polyurethane Coated Copper Wire φ1.0 mm

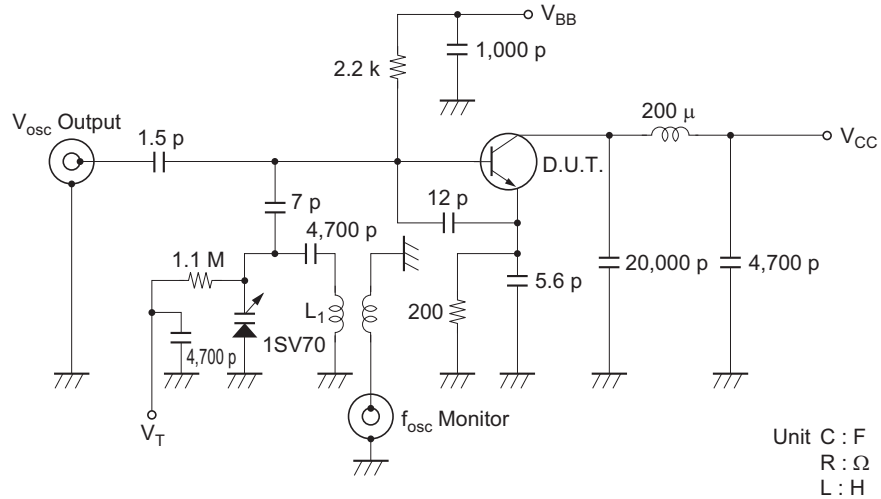
L<sub>2</sub> : Polyurethane Coated Copper Wire φ0.8 mm

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

Test Frequency : f<sub>osc</sub> = 930 MHz

Test Equipment : YHP 4271A Vector Voltmeter

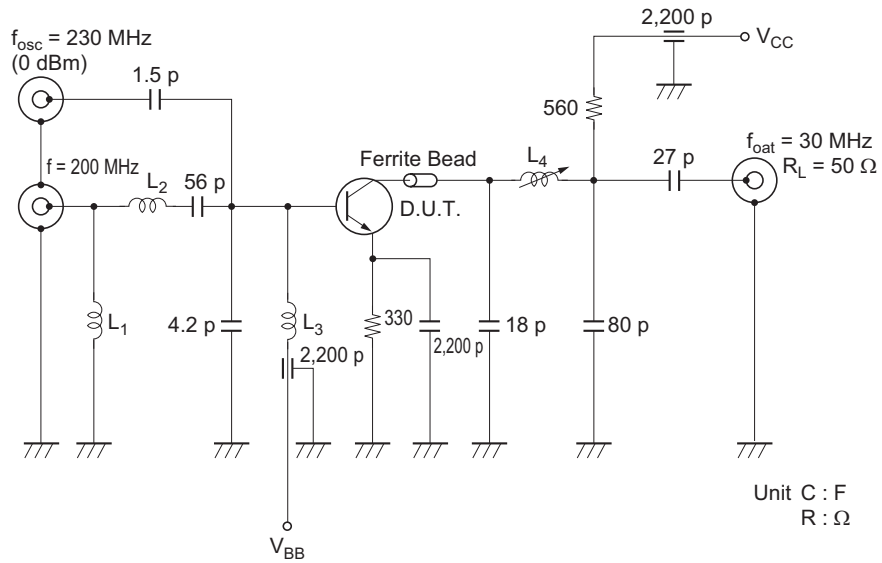
V<sub>OSC1</sub> VHF Oscillating Output Voltage Test Circuit



L<sub>1</sub> : Inside dia φ3 mm, φ3 mm Enameled Copper Wire 12 Turns

Test Frequency : f<sub>osc</sub> = 300 MHz

VHF Conversion Gain : Noise Figure Test Circuit



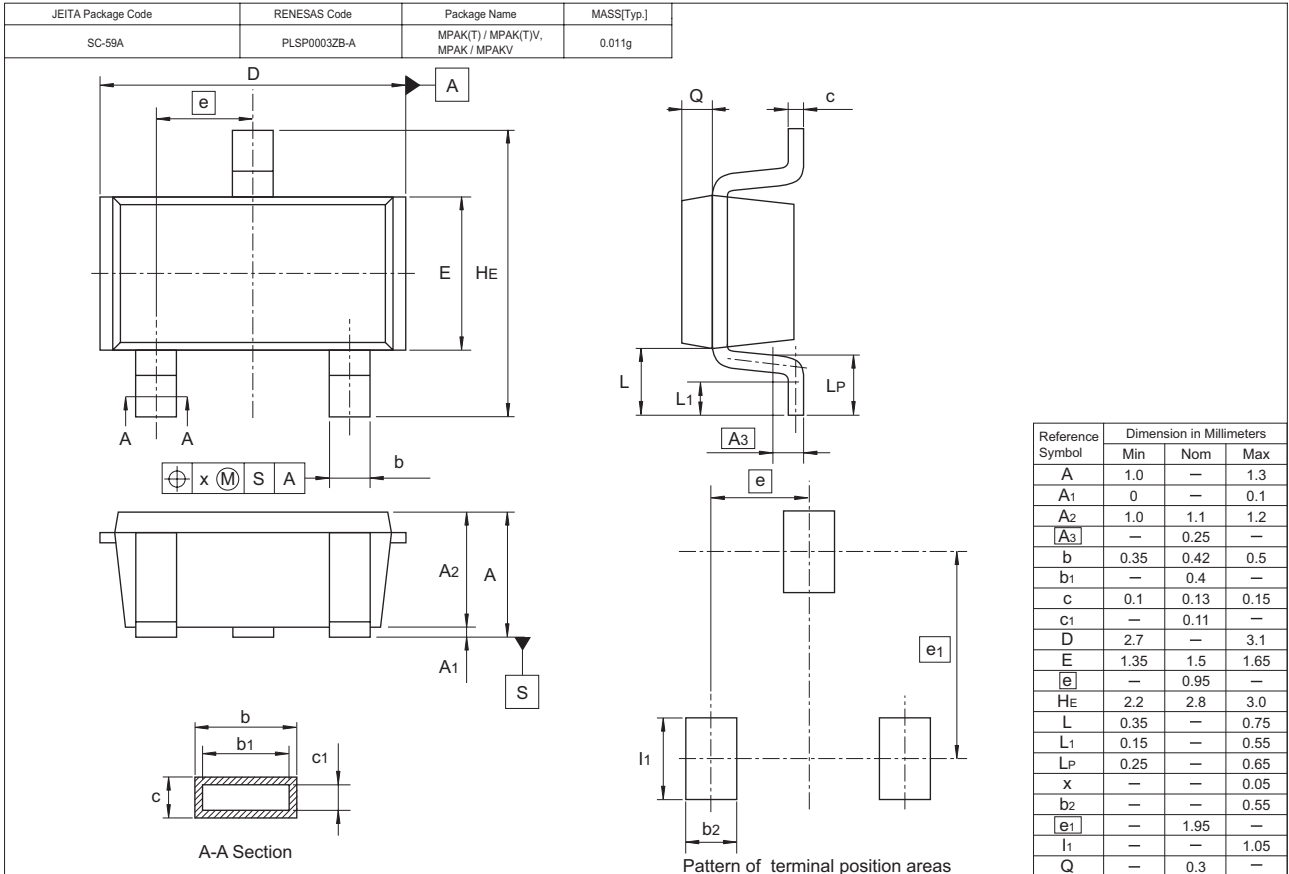
L<sub>1</sub> : Inside dia φ5 mm, φ0.5 mm Enameled Copper Wire 4 Turns

L<sub>2</sub> : Inside dia φ4 mm, φ0.5 mm Enameled Copper Wire 4 Turns

L<sub>3</sub> : Inside dia φ3 mm, φ0.2 mm Enameled Copper Wire 6 Turns

L<sub>4</sub> : 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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