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# 2SC3127, 2SC3128, 2SC3510

Silicon NPN Epitaxial

# HITACHI

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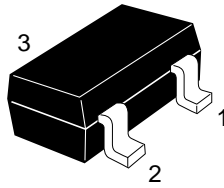
## Application

UHF/VHF wide band amplifier

## Outline

MPAK

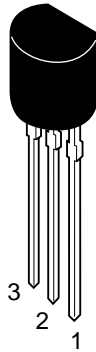
2SC3127



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

TO-92 (2)

2SC3128, 2SC3510



1. Base
2. Emitter
3. Collector

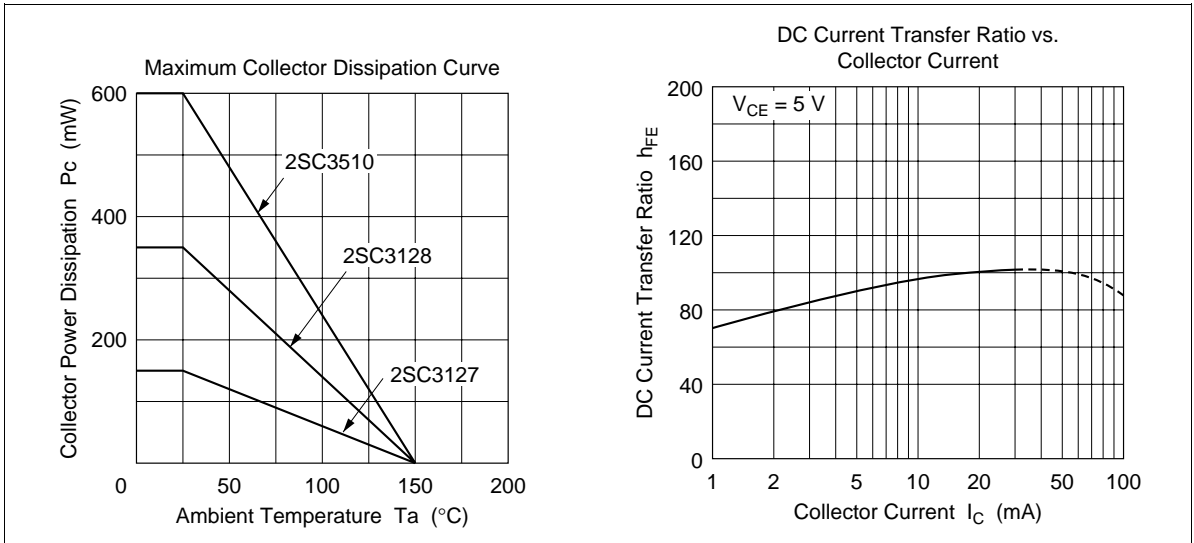
**Absolute Maximum Ratings** ( $T_a = 25^\circ\text{C}$ )

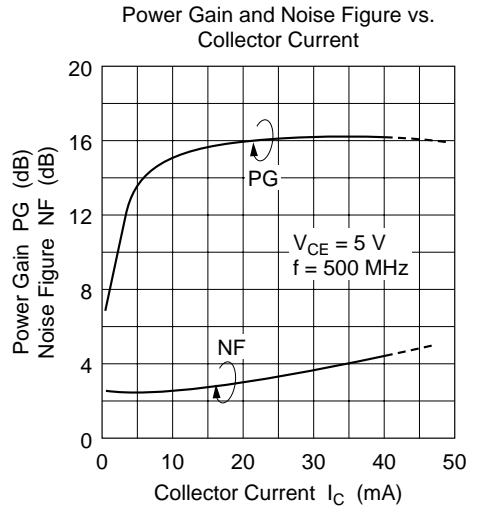
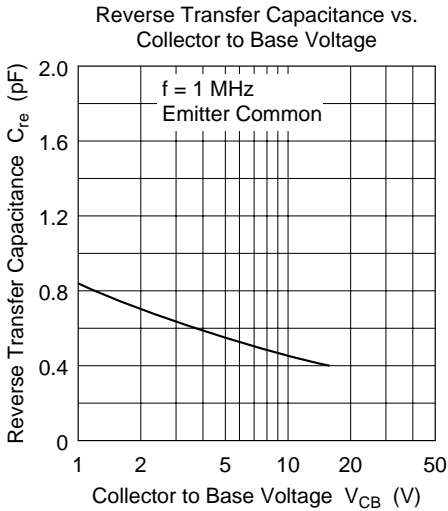
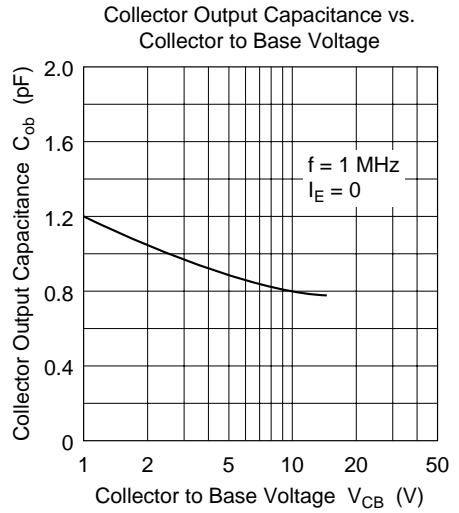
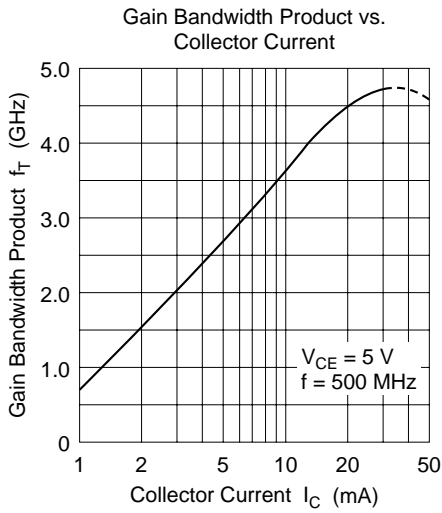
Item	Symbol	2SC3127* <sup>1</sup>	2SC3128	2SC3510	Unit
Collector to base voltage	$V_{\text{CBO}}$	20	20	20	V
Collector to emitter voltage	$V_{\text{CEO}}$	12	12	12	V
Emitter to base voltage	$V_{\text{EBO}}$	3	3	3	V
Collector current	$I_{\text{C}}$	50	50	50	mA
Collector power dissipation	$P_{\text{C}}$	150	350	600	mW
Junction temperature	$T_{\text{j}}$	150	150	150	$^\circ\text{C}$
Storage temperature	$T_{\text{stg}}$	-55 to +150	-55 to +150	-55 to +150	$^\circ\text{C}$

Note: 1. Marking for 2SC3127 is "ID-".

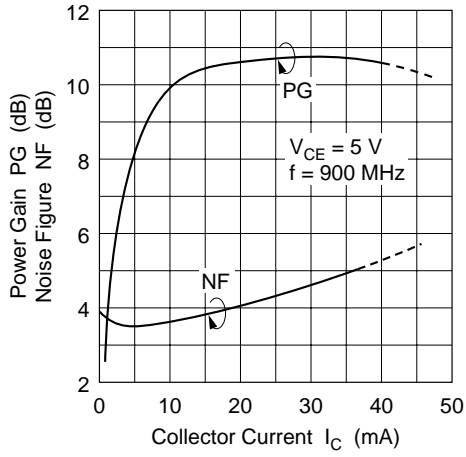
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	20	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	12	—	—	V	$I_C = 1 \text{ mA}, R_{BE} = \infty$
Emitter cutoff current	$I_{EBO}$	—	—	10	$\mu A$	$V_{EB} = 3 \text{ V}, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	0.5	$\mu A$	$V_{CB} = 12 \text{ V}, I_E = 0$
DC current transfer ratio	$h_{FE}$	30	90	200		$V_{CE} = 5 \text{ V}, I_C = 20 \text{ mA}$
Collector output capacitance	Cob	—	0.9	1.5	pF	$V_{CB} = 5 \text{ V}, I_E = 0, f = 1 \text{ MHz}$
Gain bandwidth product	$f_T$	3.5	4.5	—	GHz	$V_{CE} = 5 \text{ V}, I_C = 20 \text{ mA}$
Power gain	PG	—	10.5	—	dB	$V_{CE} = 5 \text{ V}, I_C = 20 \text{ mA}, f = 900 \text{ MHz}$
Noise figure	NF	—	2.2	—	dB	$V_{CE} = 5 \text{ V}, I_C = 5 \text{ mA}, f = 900 \text{ MHz}$

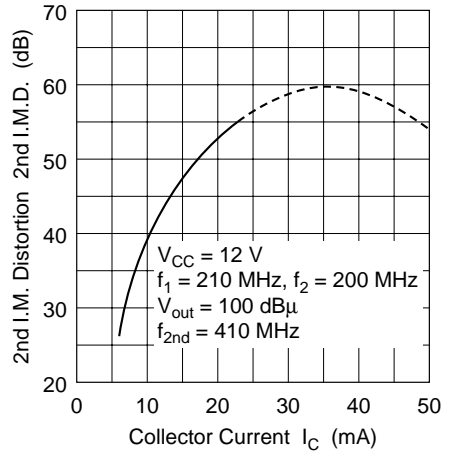




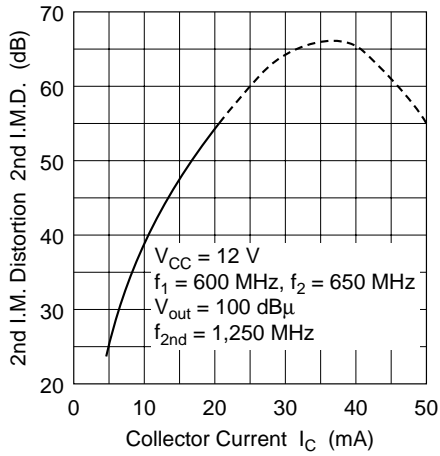
Power Gain and Noise Figure vs. Collector Current



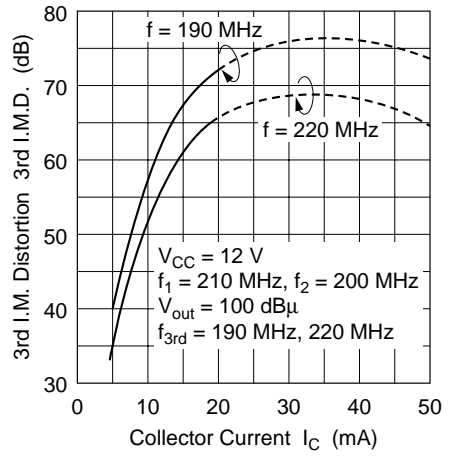
2nd I.M. Distortion vs. Collector Current

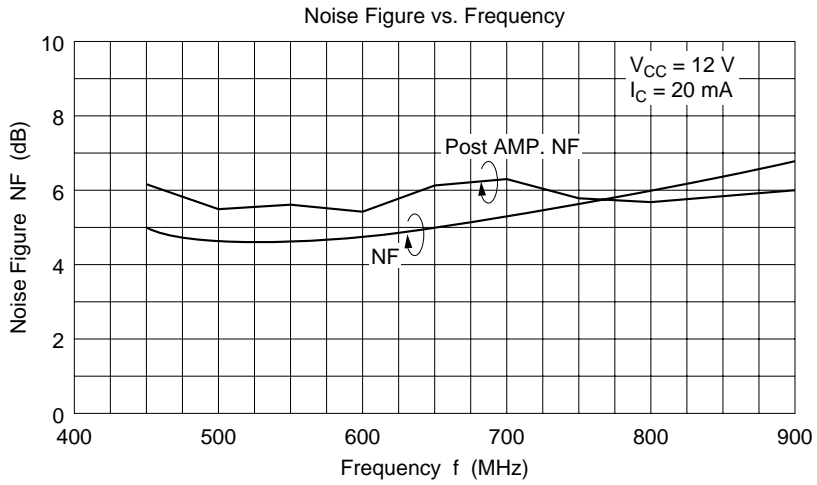
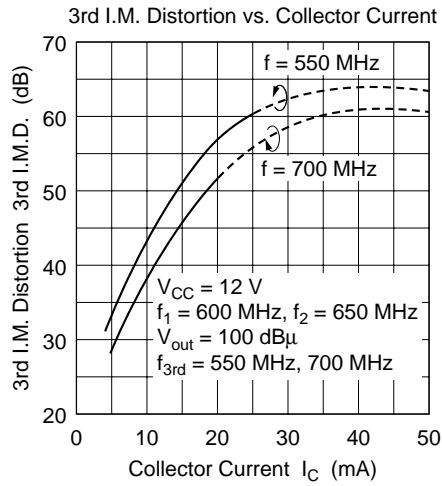


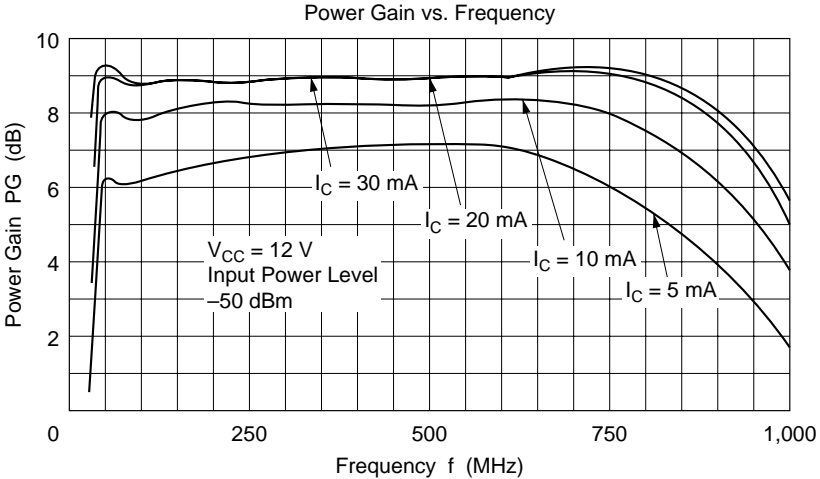
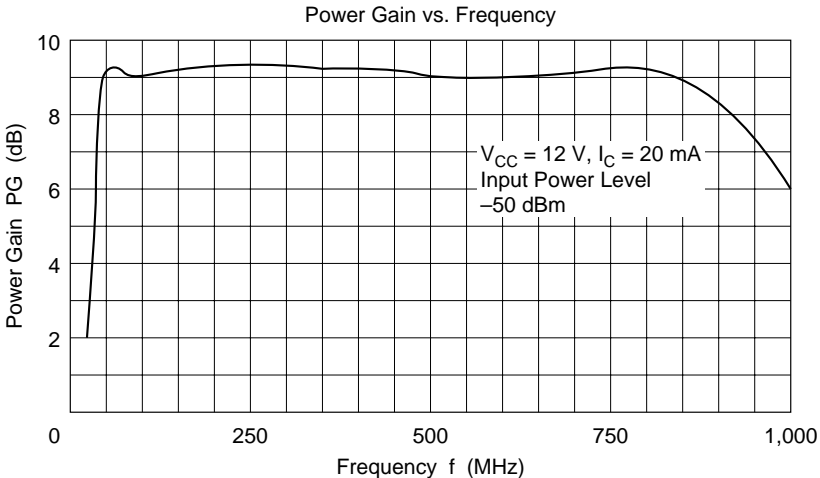
2nd I.M. Distortion vs. Collector Current

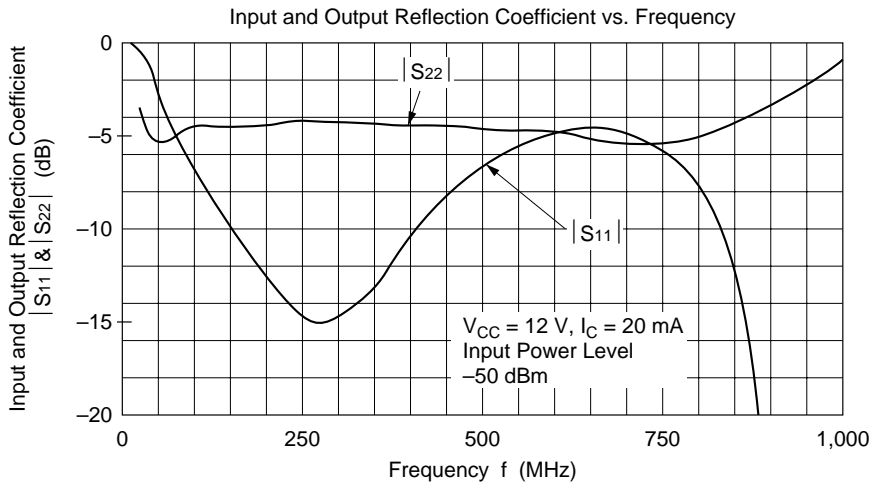


3rd I.M. Distortion vs. Collector Current

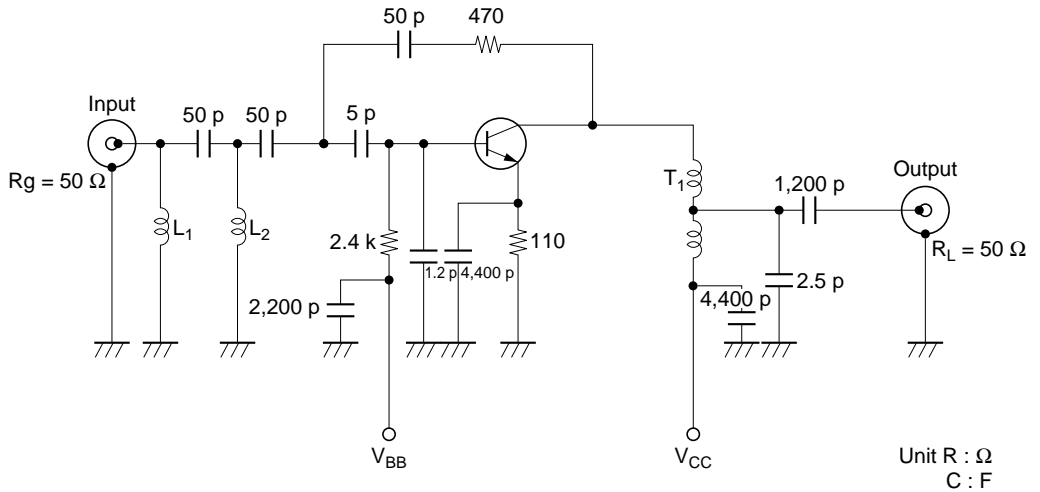








Vhf to Uhf Wide Band Amp. Circuit



Parts Specification

$L_1$  : Inside dia  $\phi 3.0$  mm,  $\phi 0.4$  mm Polyurethane Coated Copper wire 12 Turns.

$L_2$  : Inside dia  $\phi 3.5$  mm,  $\phi 0.5$  mm Polyurethane Coated Copper wire 9 Turns.

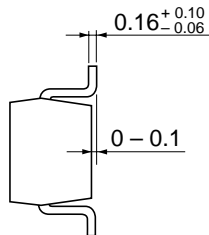
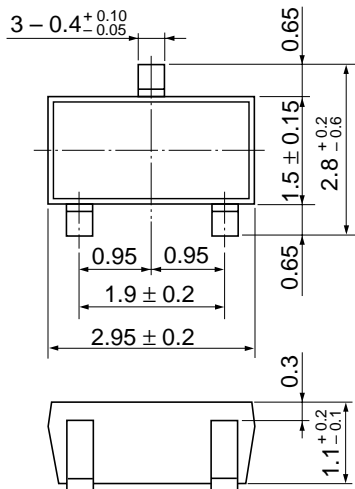
$T_1$  : Balance wind used Ferrite Core

Outside dia  $\phi 4.0$  mm, Inside dia  $\phi 2.0$  mm

$\phi 0.1$  mm Polyurethane Coated Copper wire 3 Turns.

Ratio Input to Output is 2 : 1





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

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