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# 2SC3127, 2SC3128, 2SC3510

Silicon NPN Epitaxial

# HITACHI

ADE-208-1080A (Z)  
2nd. Edition  
Mar. 2001

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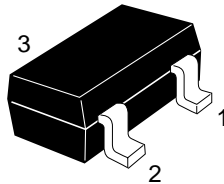
## Application

UHF/VHF wide band amplifier

## Outline

MPAK

2SC3127

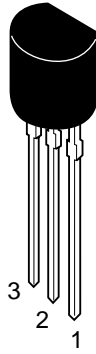


1. Emitter
2. Base
3. Collector

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

TO-92 (2)

2SC3128, 2SC3510



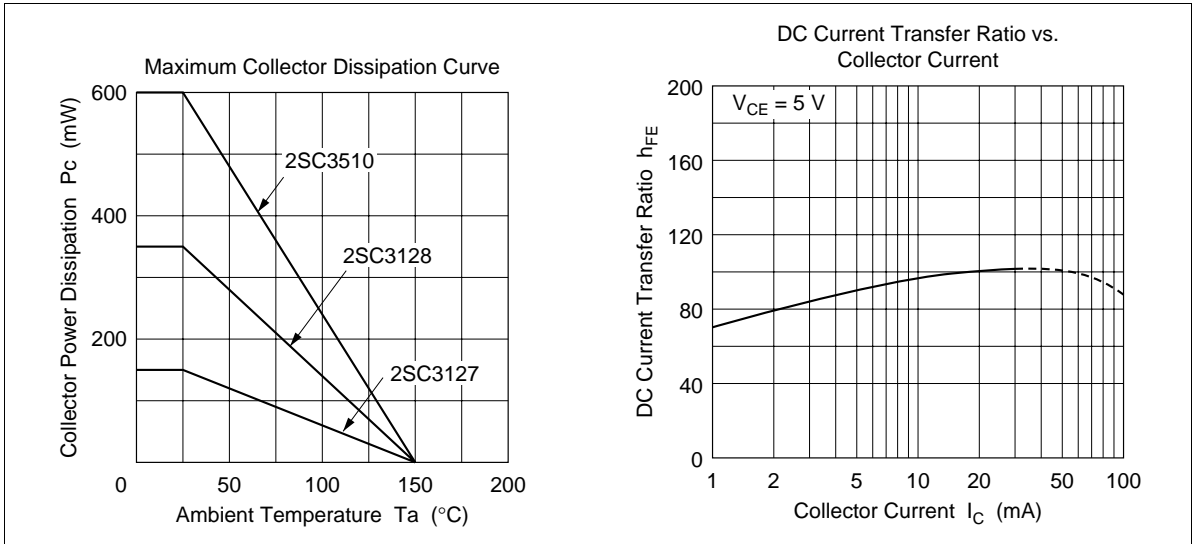
1. Base
2. Emitter
3. Collector

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

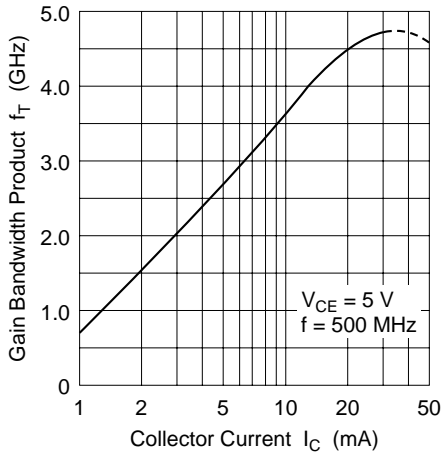
Item	Symbol	2SC3127*1	2SC3128	2SC3510	Unit
Collector to base voltage	$V_{\text{CBO}}$	20	20	20	V
Collector to emitter voltage	$V_{\text{CEO}}$	12	12	12	V
Emitter to base voltage	$V_{\text{EBO}}$	3	3	3	V
Collector current	$I_{\text{C}}$	50	50	50	mA
Collector power dissipation	$P_{\text{C}}$	150	350	600	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	$^\circ\text{C}$

**Electrical Characteristics** (Ta = 25°C)

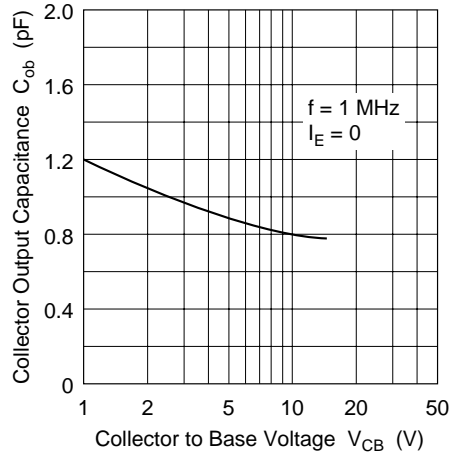
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	20	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	12	—	—	V	$I_C = 1 \text{ mA}, R_{BE} = \infty$
Emitter cutoff current	$I_{EBO}$	—	—	10	$\mu A$	$V_{EB} = 3 \text{ V}, I_C = 0$
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	$V_{CE} = 5 \text{ V}, I_C = 5 \text{ mA}, f = 900 \text{ MHz}$



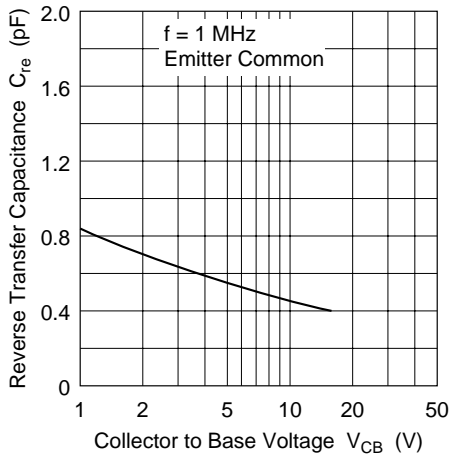
Gain Bandwidth Product vs. Collector Current



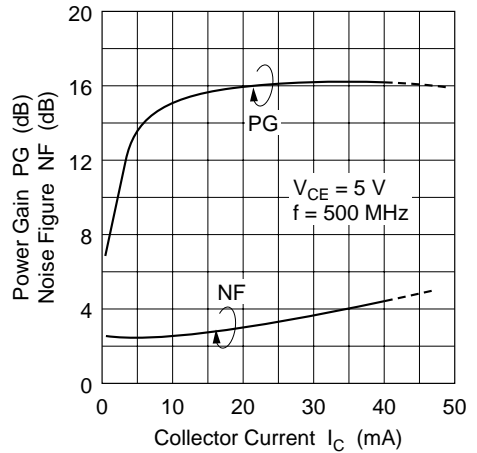
Collector Output Capacitance vs. Collector to Base Voltage



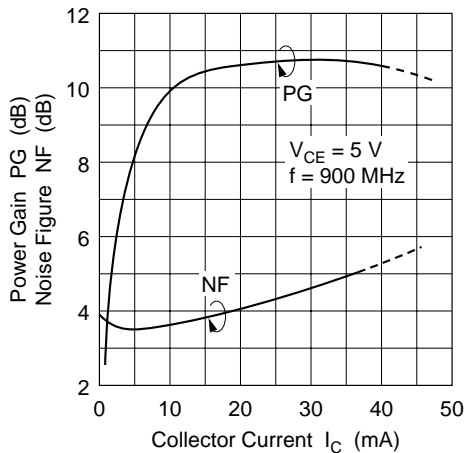
Reverse Transfer Capacitance vs. Collector to Base Voltage



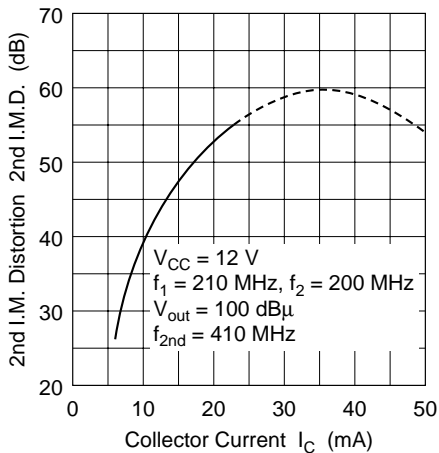
Power Gain and Noise Figure vs. Collector Current



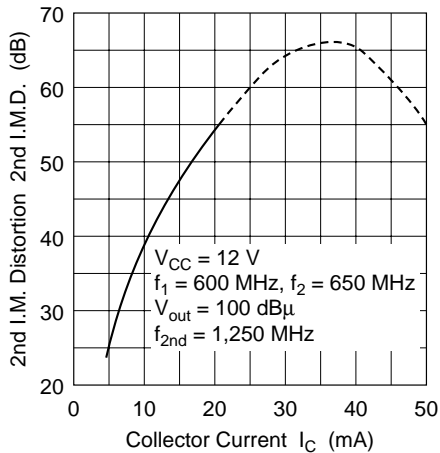
Power Gain and Noise Figure vs. Collector Current



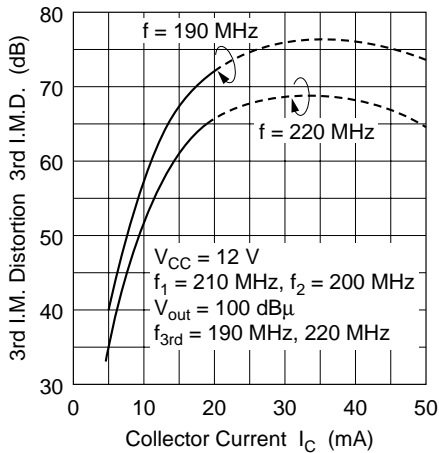
2nd I.M. Distortion vs. Collector Current

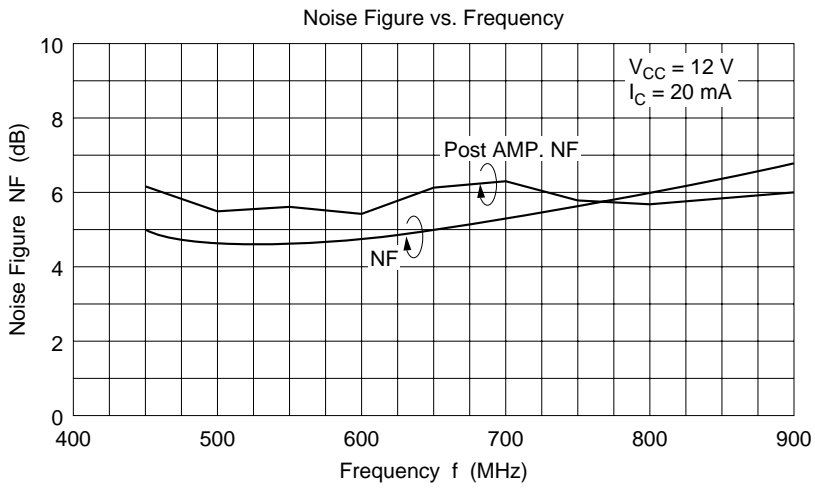
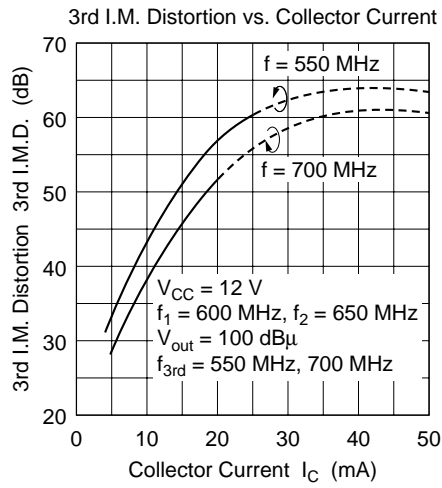


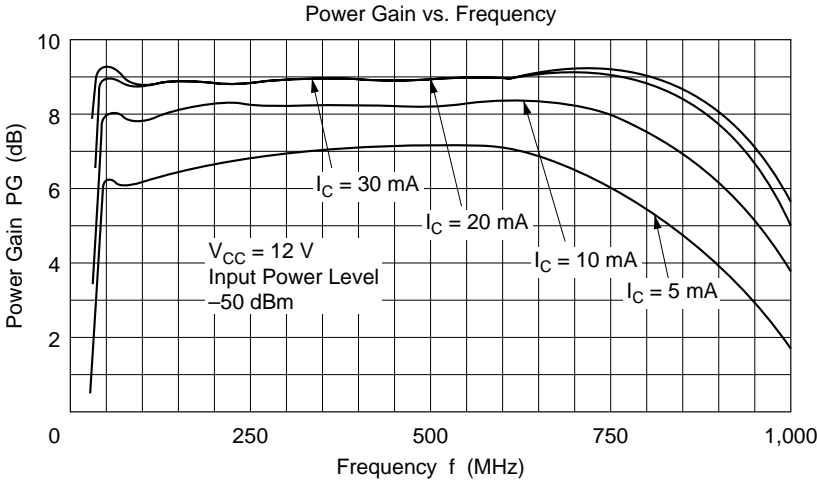
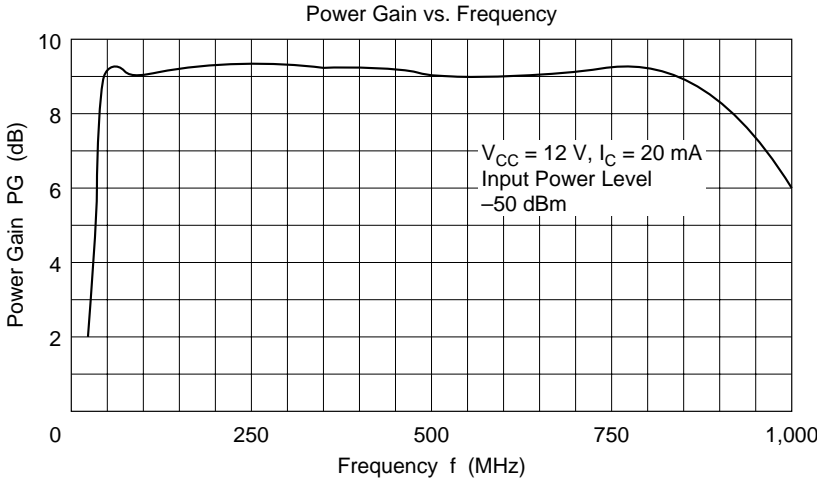
2nd I.M. Distortion vs. Collector Current

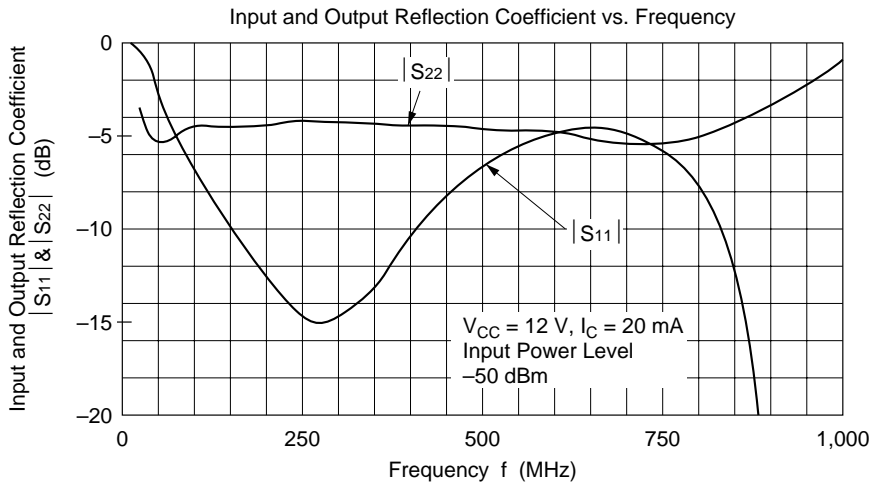


3rd I.M. Distortion vs. Collector Current

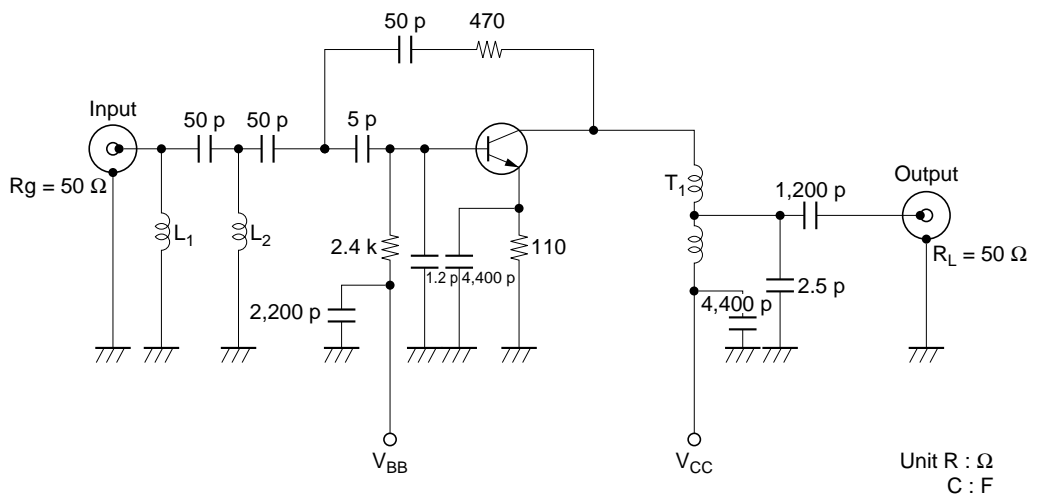








Vhf to Uhf Wide Band Amp. Circuit



**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

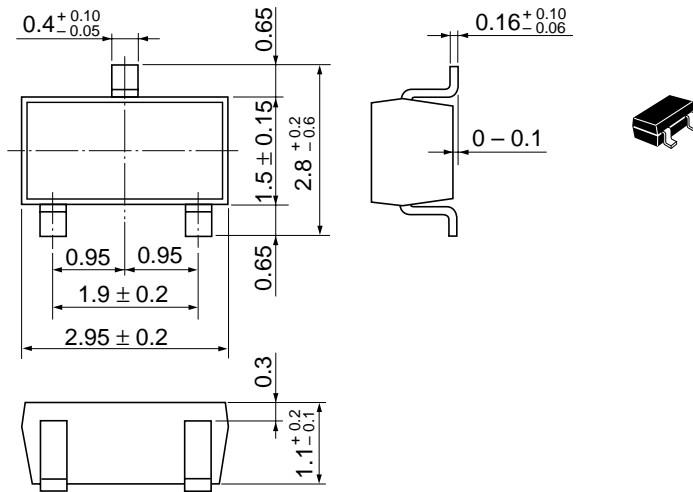
$\phi 0.1$  mm Polyurethane Coated Copper wire 3 Turns.

Ratio Input to Output is 2 : 1



Package Dimensions

As of January, 2001  
Unit: mm



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

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