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# 2SC4462

Silicon NPN Epitaxial

# HITACHI

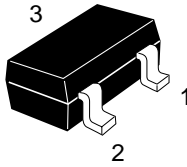
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## Application

UHF frequency converter

## Outline

CMPAK



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

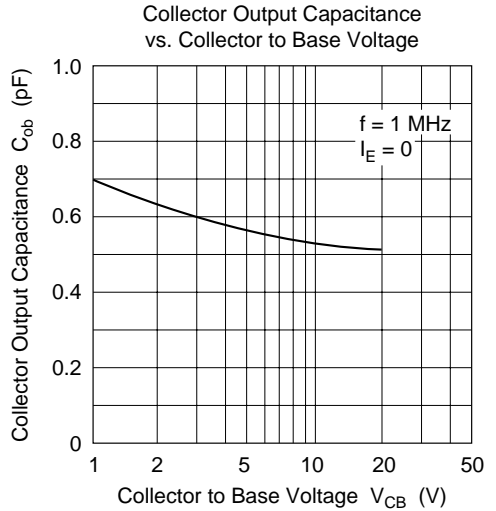
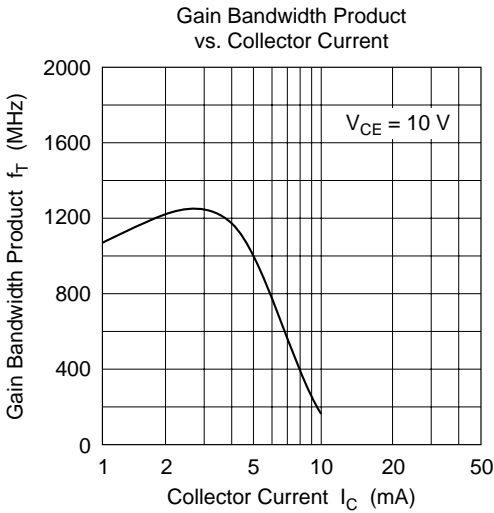
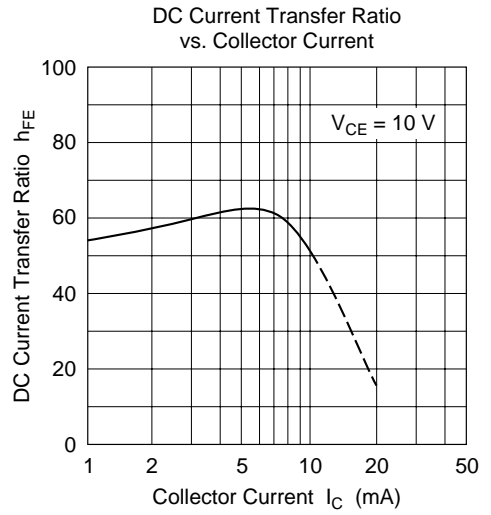
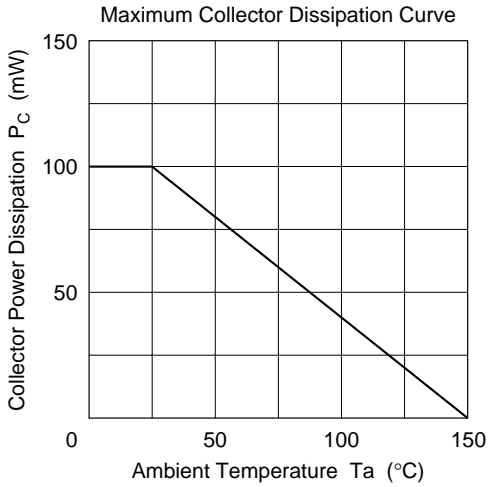
**Absolute Maximum Ratings** ( $T_a = 25^\circ\text{C}$ )

Item	Symbol	Rated	Unit
Collector to base voltage	$V_{\text{CBO}}$	30	V
Collector to emitter voltage	$V_{\text{CEO}}$	25	V
Emitter to base voltage	$V_{\text{EBO}}$	4	V
Collector current	$I_{\text{C}}$	20	mA
Collector power dissipation	$P_{\text{C}}$	100	mW
Junction temperature	$T_{\text{j}}$	150	$^\circ\text{C}$
Storage temperature	$T_{\text{stg}}$	-55 to +150	$^\circ\text{C}$

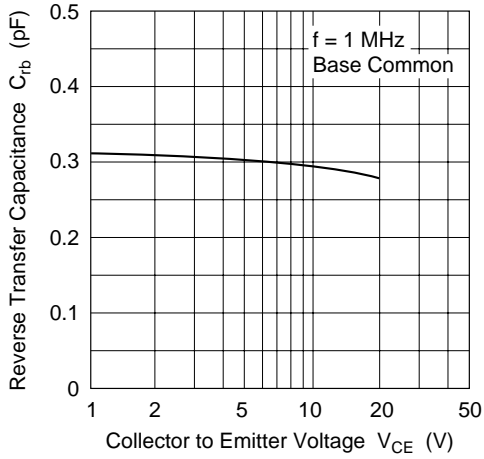
**Electrical Characteristics** ( $T_a = 25^\circ\text{C}$ )

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(\text{BR})\text{CBO}}$	30	—	—	V	$I_{\text{C}} = 10 \mu\text{A}$ , $I_{\text{E}} = 0$
Collector to emitter breakdown voltage	$V_{(\text{BR})\text{CEO}}$	25	—	—	V	$I_{\text{C}} = 1 \text{ mA}$ , $R_{\text{BE}} = \infty$
Emitter to base breakdown voltage	$V_{(\text{BR})\text{EBO}}$	4	—	—	V	$I_{\text{E}} = 10 \mu\text{A}$ , $I_{\text{C}} = 0$
Collector cutoff current	$I_{\text{CBO}}$	—	—	0.5	$\mu\text{A}$	$V_{\text{CB}} = 10 \text{ V}$ , $I_{\text{E}} = 0$
Collector to emitter saturation voltage	$V_{\text{CE}(\text{sat})}$	—	—	5	V	$I_{\text{C}} = 10 \text{ mA}$ , $I_{\text{B}} = 1 \text{ mA}$
DC current transfer ratio	$h_{\text{FE}}$	30	—	—		$V_{\text{CE}} = 10 \text{ V}$ , $I_{\text{C}} = 3 \text{ mA}$
Gain bandwidth product	$f_{\text{T}}$	700	1000	—	MHz	$V_{\text{CE}} = 10 \text{ V}$ , $I_{\text{C}} = 5 \text{ mA}$
Collector output capacitance	$C_{\text{ob}}$	—	—	0.8	pF	$V_{\text{CB}} = 10 \text{ V}$ , $I_{\text{C}} = 5 \text{ mA}$ , $f = 1 \text{ MHz}$
Conversion gain	CG	—	7.0	—	dB	$V_{\text{CC}} = 12 \text{ V}$ , $I_{\text{E}} = 0$ , $f = 900 \text{ MHz}$
Noise figure	NF	—	10.0	—	dB	$f_{\text{osc}} = 930 \text{ MHz}$ (0 dBm), $f_{\text{out}} = 30 \text{ MHz}$

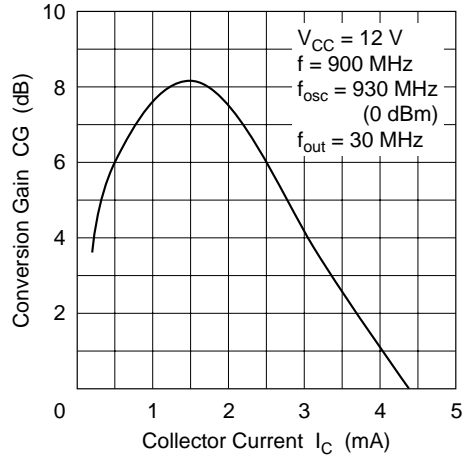
Note: Marking is "EC".



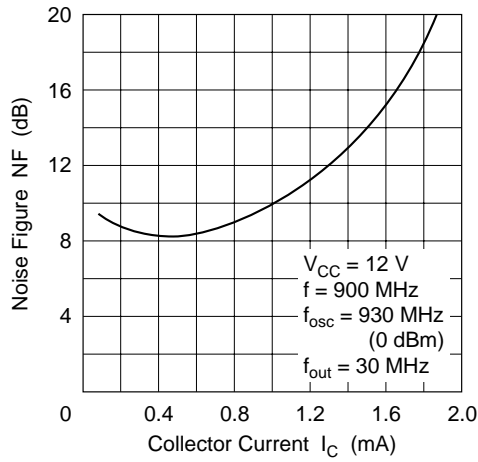
Reverse Transfer Capacitance vs. Collector to Emitter Voltage



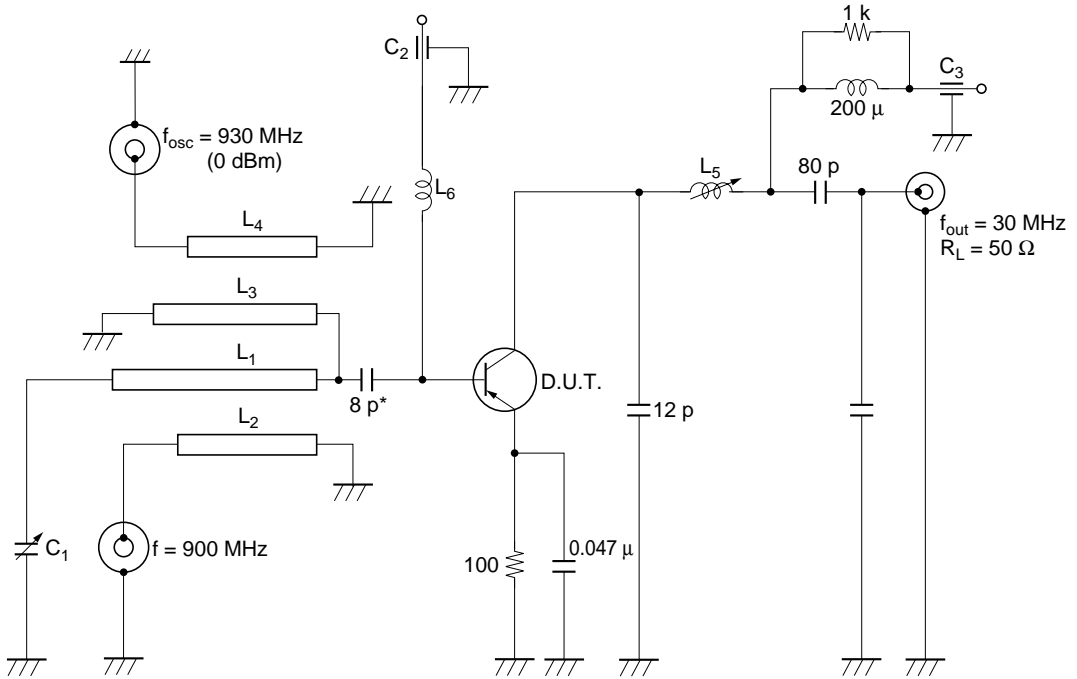
Conversion Gain vs. Collector Current



Noise Figure vs. Collector Current



Conversion Gain and Noise Figure Test Circuit



\* Disk Capacitor

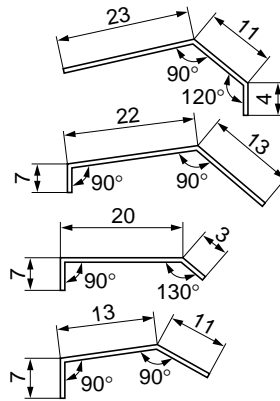
Unit R :  $\Omega$   
 C : F  
 L : H

L<sub>1</sub> :  $\phi$ 1 mm Enameled Copper Wire

L<sub>2</sub> :  $\phi$ 1 mm Enameled Copper Wire

L<sub>3</sub> :  $\phi$ 1 mm Enameled Copper Wire

L<sub>4</sub> :  $\phi$ 1 mm Enameled Copper Wire



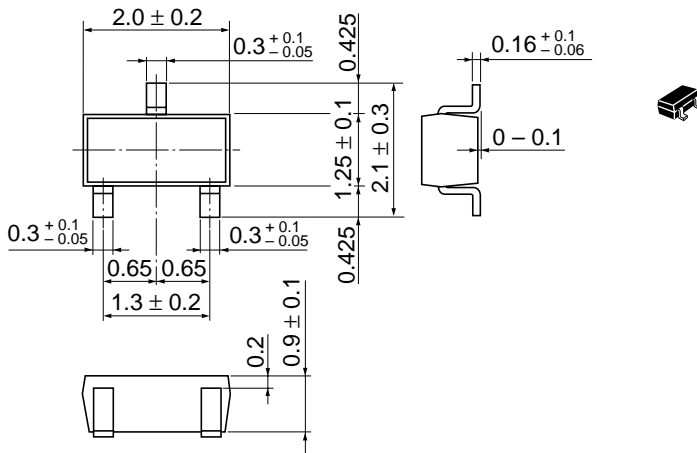
(Dimensions in mm)

L<sub>5</sub> : Bobbin  $\phi$ 5 mm inside dia,  $\phi$ 0.2 mm Enameled Copper Wire 20 Turns

L<sub>6</sub> :  $\phi$ 0.5 mm Enameled Copper Wire 1 Turn inside dia  $\phi$ 6 mm

C<sub>1</sub> : 20 pF max. Air Trimmer Condenser

C<sub>2</sub>, C<sub>3</sub> : 1000 pF Air Core Capacitor



Hitachi Code	CMPAK
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.006 g

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