# 2SC4463

Silicon NPN Epitaxial

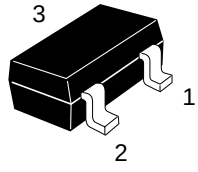
HITACHI

## Application

UHF frequency converter

## Outline

CMPAK




1. Emitter
2. Base
3. Collector

Hitachi semiconductor

## Absolute Maximum Ratings (Ta = 25°C)

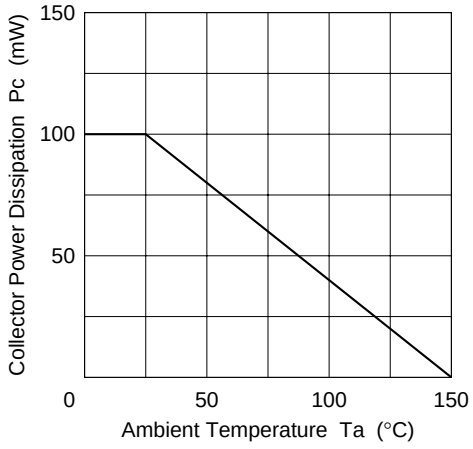
| Item | Symbol | Ratings | Unit |
|---|---|---|---|
| Collector to base voltage | $V_{CBO}$ | 30 | V |
| Collector to emitter voltage | $V_{CEO}$ | 20 | V |
| Emitter to base voltage | $V_{EBO}$ | 3 | V |
| Collector current | $I_C$ | 50 | mA |
| Collector power dissipation | $P_C$ | 100 | mW |
| Junction temperature | Tj | 150 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |

## Electrical Characteristics (Ta = 25°C)

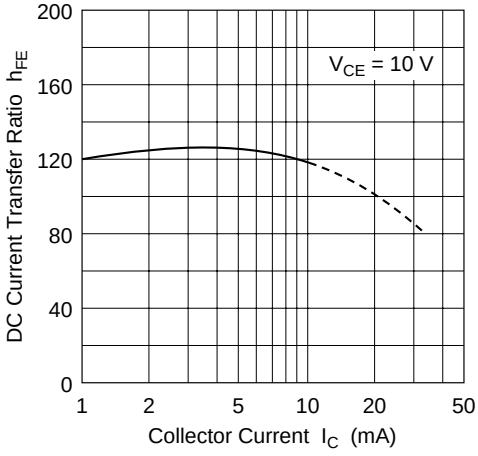
| Item | Symbol | Min | Typ | Max | Unit | Test conditions |
|---|---|---|---|---|---|---|
| Collector to base breakdown voltage | $V_{(BR)CBO}$ | 30 | — | — | V | $I_C$ = 10 µA, $I_E$ = 0 |
| Collector to emitter breakdown voltage | $V_{(BR)CEO}$ | 20 | — | — | V | $I_C$ = 1 mA, $R_{BE}$ = ∞ |
| Emitter to base breakdown voltage | $V_{(BR)EBO}$ | 3 | — | — | V | $I_E$ = 10 µA, $I_C$ = 0 |
| Collector cutoff current | $I_{CBO}$ | — | — | 0.5 | µA | $V_{CB}$ = 10 V, $I_E$ = 0 |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | — | — | 1.0 | V | $I_C$ = 20 mA, $I_B$ = 4 mA |
| DC current transfer ratio | $h_{FE}$ | 60 | 120 | — | | $V_{CE}$ = 10 V, $I_C$ = 10 mA |
| Gain bandwidth product | $f_T$ | 600 | 1000 | — | MHz | $V_{CE}$ = 10 V, $I_C$ = 10 mA |
| Reverse transfer capacitance | Cre | — | 0.35 | 0.65 | pF | $V_{CB}$ = 10 V, $I_E$ = 0, emitter common, f = 1 MHz |
| Conversion gain | CG | — | 21 | — | dB | $V_{CC}$ = 12 V, $I_C$ = 2 mA, f = 200 MHz |
| Noise figure | NF | — | 4.0 | — | dB | $f_{OSC}$ = 230 Mhz (0 dBm), $f_{out}$ = 30 MHz |

Note: Marking is “HC”.

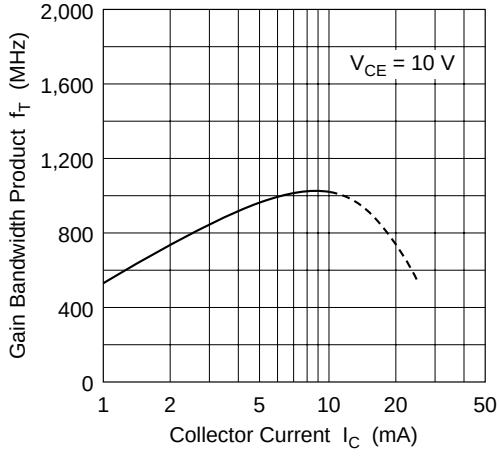
Maximum Collector Dissipation Curve



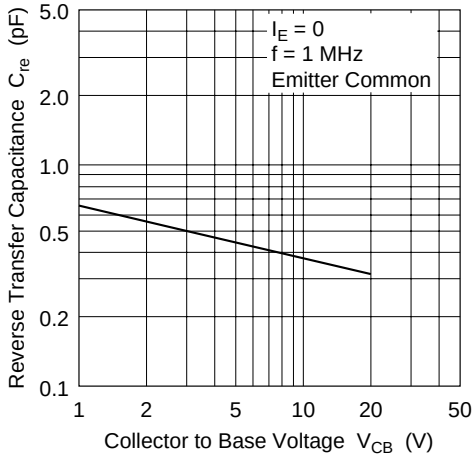

DC Current Transfer Ratio vs. Collector Current



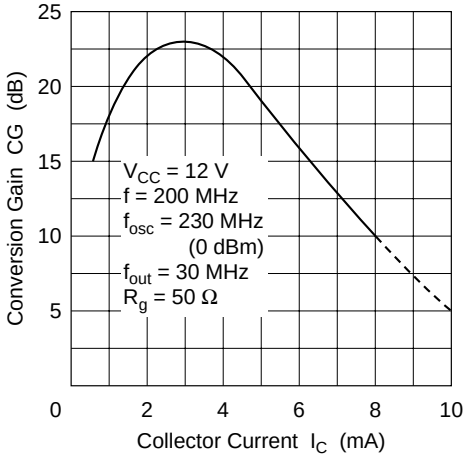

Gain Bandwidth Product vs. Collector Current



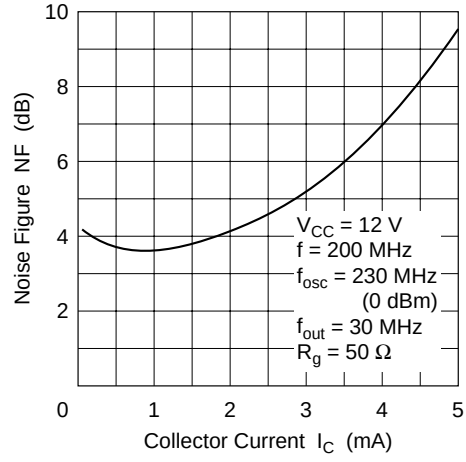

Reverse Transfer Capacitance vs. Collector to Base Voltage



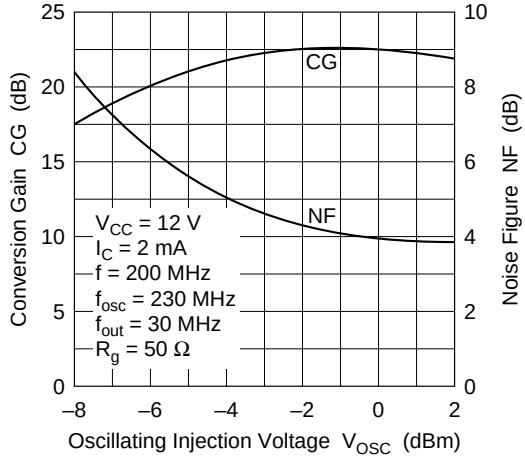
Conversion Gain vs. Collector Current



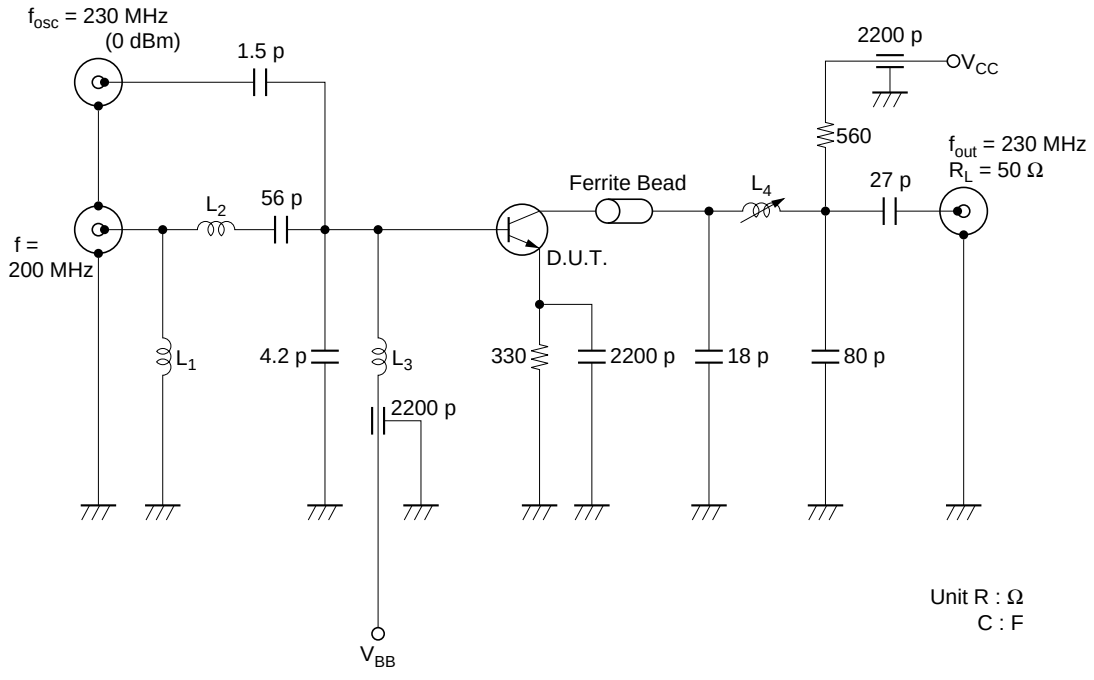

Noise Figure vs. Collector Current




Conversion Gain, noise figure vs.
Oscillating Injection Voltage

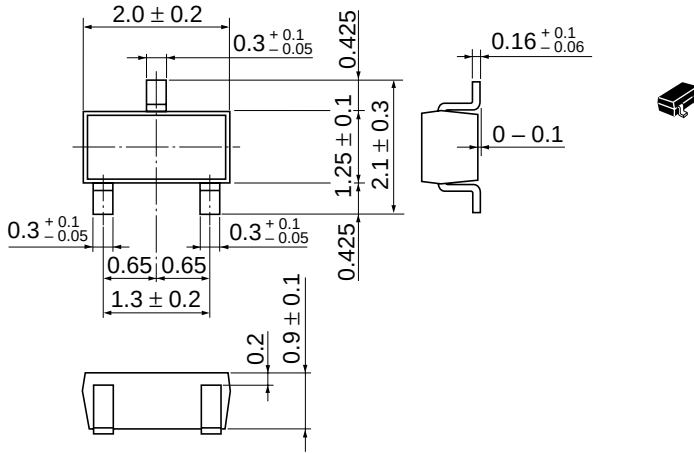


## Conversion Gain, Noise Figure Test Circuit




$L_1$ : ϕ0.5 mm Enameled Copper Wire 4 Turns Inside Dia ϕ5 mm
$L_2$ : ϕ0.5 mm Enameled Copper Wire 4 Turns Inside Dia ϕ4 mm
$L_3$ : ϕ0.2 mm Enameled Copper Wire 6 Turns Inside Dia ϕ3 mm
$L_4$ : ϕ0.2 mm Enameled Copper Wire 16 Turns, Inside Dia ϕ0.5 mm, Using Ferrite Bead

Unit: mm




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

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