# 2SC2471

Silicon NPN Epitaxial

HITACHI

## Application

- UHF Amplifier
- UHF TV Tuner, Local oscillator

## Outline

TO-92 (2)


1. Base
2. Emitter
3. Collector

Hitachi semiconductor

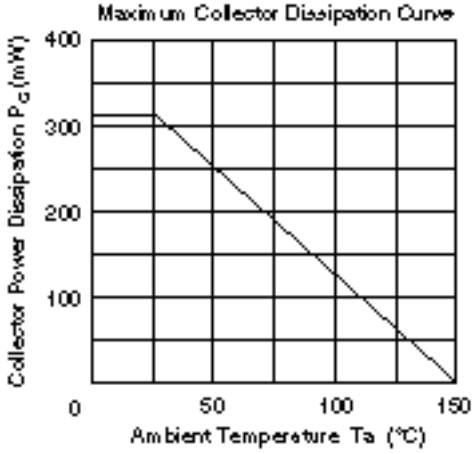
## Absolute Maximum Ratings (Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|---|---|---|---|
| Collector to base voltage | $V_{CBO}$ | 30 | V |
| Collector to emitter voltage | $V_{CEO}$ | 30 | V |
| Emitter to base voltage | $V_{EBO}$ | 3 | V |
| Collector current | $I_C$ | 50 | mA |
| Collector power dissipation | $P_C$ | 310 | mW |
| Junction temperature | Tj | 150 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |

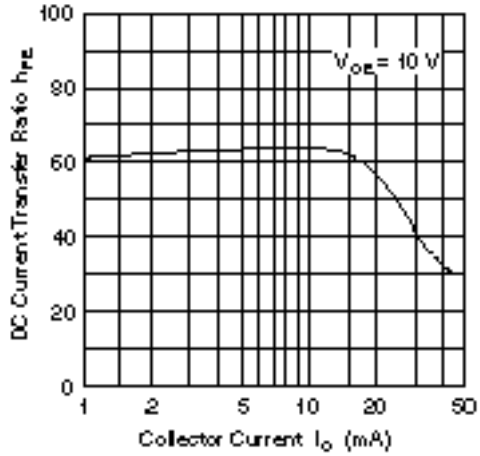
## Electrical Characteristics (Ta = 25°C)

| 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 | $V_{(BR)CEO}$ | 30 | — | — | 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 | $I_{CBO}$ | — | — | 100 | nA | $V_{CB}$ = 24 V, $I_E$ = 0 |
| Emitter cutoff current | $I_{EBO}$ | — | — | 100 | nA | $V_{EB}$ = 2 V, $I_C$ = 0 |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | — | — | 300 | mV | $I_C$ = 10 mA, $I_B$ = 5 mA |
| Base to emitter voltage | $V_{BE}$ | — | — | 0.95 | V | $V_{CE}$ = 10 V, $I_C$ = 5 mA |
| DC current transfer ratio | $h_{FE}$ | 20 | — | — | | $V_{CE}$ = 10 V, $I_C$ = 5 mA |
| Gain bandwidth product | $f_T$ | 1000 | 2000 | — | MHz | $V_{CE}$ = 10 V, $I_C$ = 5 mA |
| Collector output capacitance | Cob | — | 0.9 | 1.5 | pF | $V_{CB}$ = 10 V, $I_E$ = 0, f = 1 MHz |
| Base time constant | $r_{bb'} \cdot C_C$ | — | 12 | 20 | ps | $V_{CB}$ = 10 V, $I_C$ = 5 mA, f = 31.8 MHz |

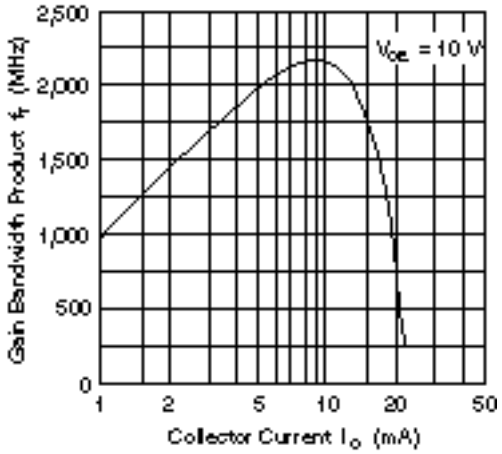
Maximum Collector Dissipation Curve



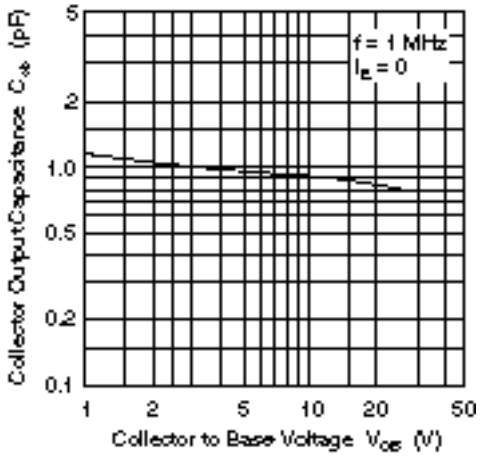

DC Current Transfer Ratio vs. Collector Current

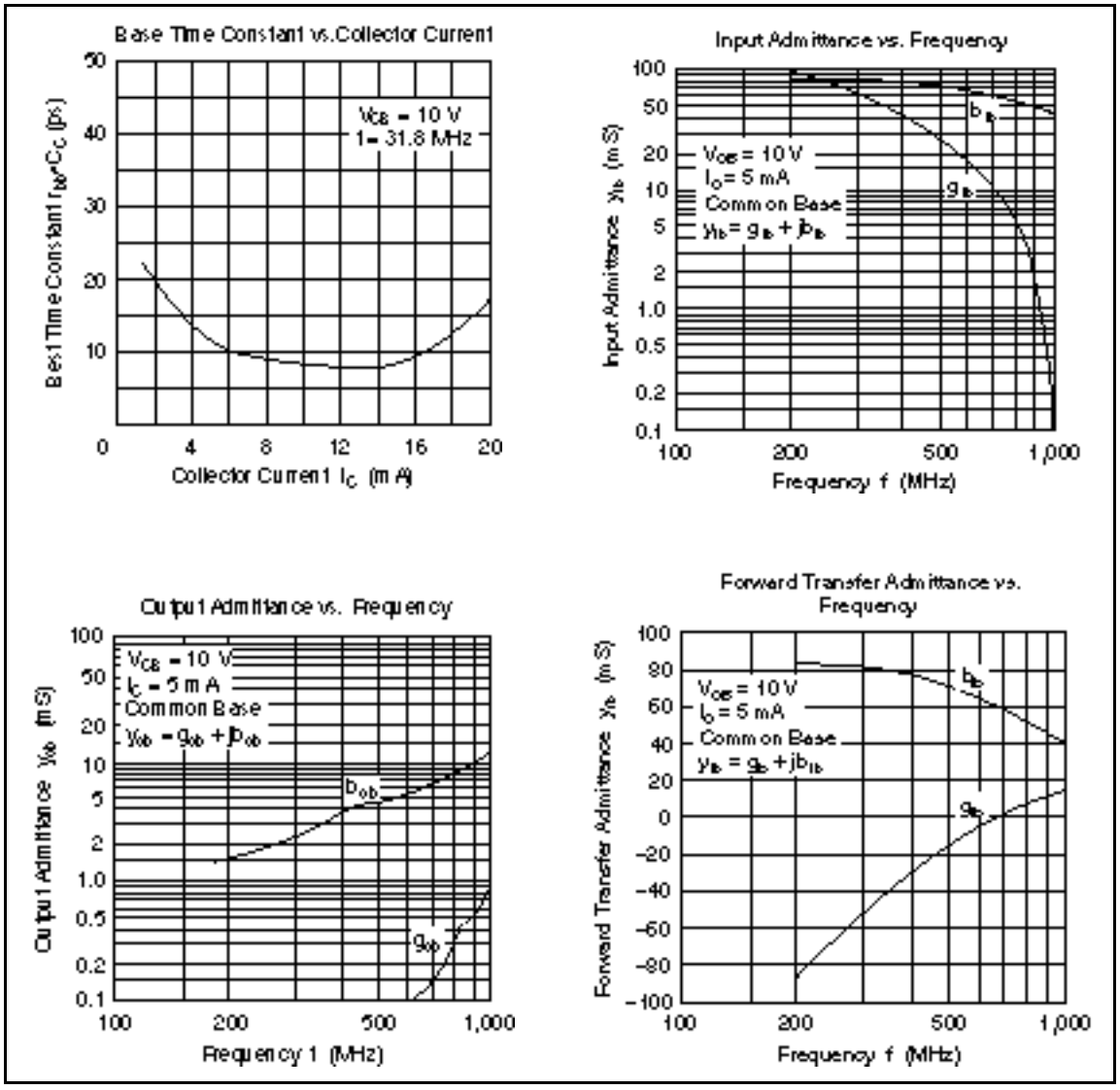


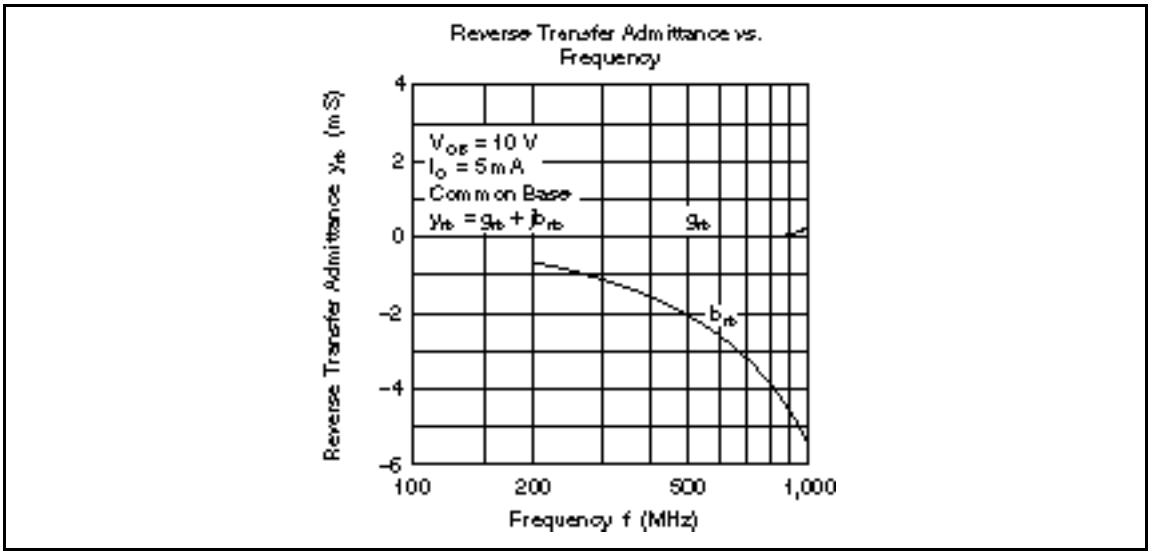

Gain Bandwidth Product vs. Collector Current




Collector Output Capacitance vs. Collector to Base Voltage




Base Time Constant vs. Collector Current
Base Time Constant $r_{bb'}C_c$ (ps)
$V_{CB}$ = 10 V
f = 31.8 MHz
Collector Current $I_C$ (mA)
Input Admittance vs. Frequency
Input Admittance $y_{ib}$ (mS)
$V_{CB}$ = 10 V
$I_C$ = 5 mA
Common Base
$y_{ib} = g_{ib} + jb_{ib}$
Frequency f (MHz)
Output Admittance vs. Frequency
Output Admittance $y_{ob}$ (mS)
$V_{CB}$ = 10 V
$I_C$ = 5 mA
Common Base
$y_{ob} = g_{ob} + jb_{ob}$
Frequency f (MHz)
Forward Transfer Admittance vs. Frequency
Forward Transfer Admittance $y_{fb}$ (mS)
$V_{CB}$ = 10 V
$I_C$ = 5 mA
Common Base
$y_{fb} = g_{fb} + jb_{fb}$
Frequency f (MHz)


Reverse Transfer Admittance vs. Frequency
Reverse Transfer Admittance $y_{re}$ (mS)
4
2
0
-2
-4
-6
$V_{CB}$ = 10 V
$I_E$ = 5 mA
Common Base
$y_{re} = g_{re} + jb_{re}$
$g_{re}$
$b_{re}$
100
200
500
1,000
Frequency f (MHz)

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