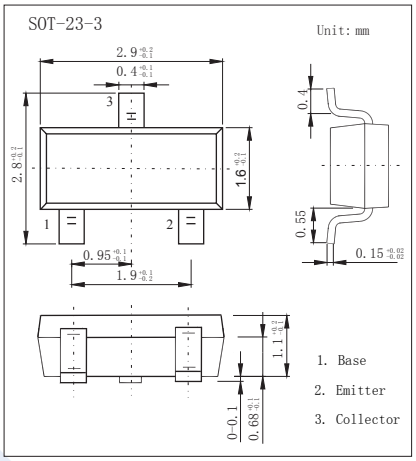
# NPN Transistors

# 2SC3142




## ■ Features

- Collector Current Capability $I_C$=30mA
- Collector Emitter Voltage $V_{CEO}$=20V

## ■ Absolute Maximum Ratings Ta = 25℃

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Collector - Base Voltage | $V_{CBO}$ | 25 | V |
| Collector - Emitter Voltage | $V_{CEO}$ | 20 | |
| Emitter - Base Voltage | $V_{EBO}$ | 3 | |
| Collector Current - Continuous | $I_C$ | 30 | mA |
| Collector Power Dissipation | $P_C$ | 150 | mW |
| Junction Temperature | $T_J$ | 125 | ℃ |
| Storage Temperature Range | $T_{stg}$ | -40 to 125 | |

## ■ Electrical Characteristics Ta = 25℃

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Collector- base breakdown voltage | $V_{CBO}$ | $I_C$= 100 μA， $I_E$= 0 | 25 | | | V |
| Collector- emitter breakdown voltage | $V_{CEO}$ | $I_C$= 1 mA， $I_B$= 0 | 20 | | | |
| Emitter - base breakdown voltage | $V_{EBO}$ | $I_E$= 100 μ A， $I_C$= 0 | 3 | | | |
| Collector-base cut-off current | $I_{CBO}$ | $V_{CB}$= 10V , $I_E$= 0 | | | 0.1 | uA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$= 3V , $I_C$=0 | | | 0.1 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$=30 mA, $I_B$=3mA | | | 0.5 | V |
| Base - emitter saturation voltage | $V_{BE(sat)}$ | $I_C$=30 mA, $I_B$=3mA | | | 1.2 | |
| DC current gain | $h_{FE}$ | $V_{CE}$= 6V, $I_C$= 1mA | 40 | | 180 | |
| Base time constant | $r_{bb'}C_c$ | $V_{CB}$= 6V, $I_C$=1mA,f=31.9MHz | | | 19 | ps |
| Noise figure | NF | $V_{CE}$= 6V, $I_C$=1mA,f=100MHz | | 2.2 | | dB |
| Power gain | PG | $V_{CE}$= 6V, $I_C$=1mA,f=100MHz | | 28 | | |
| Reverse transfer capacitance | $C_{re}$ | $V_{CB}$= 6V, f=1MHz | | | 0.9 | pF |
| Transition frequency | $f_T$ | $V_{CE}$= 6V, $I_C$=4mA | 450 | | | MHz |

## ■ Classification of $h_{fe}$

| Type | 2SC3142-J2 | 2SC3142-J3 | 2SC3142-J4 |
|---|---|---|---|
| Range | 40-80 | 60-120 | 90-180 |
| Marking | J2 | J3 | J4 |

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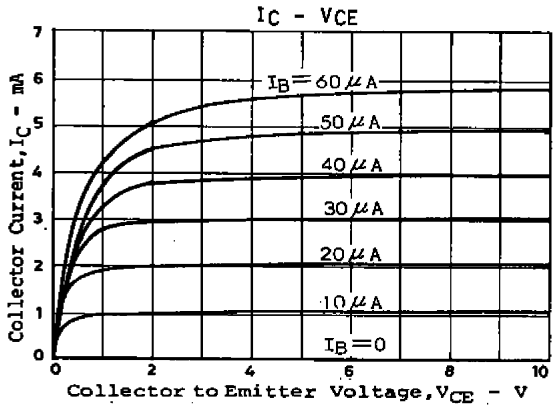


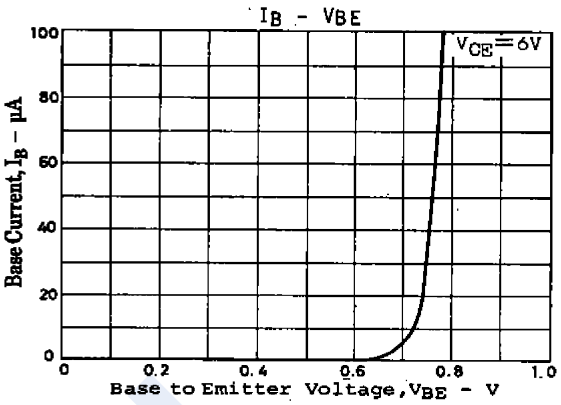


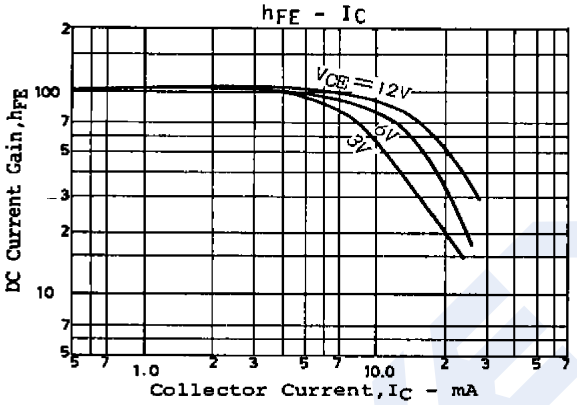


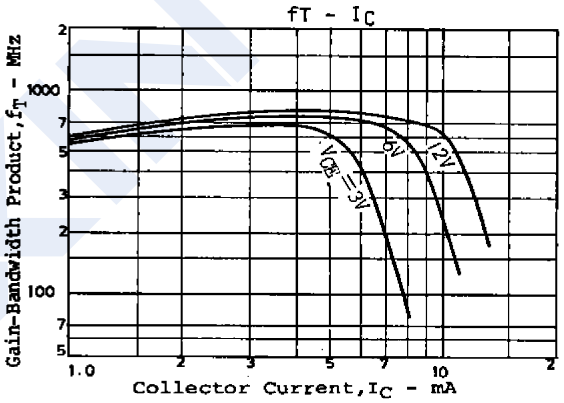


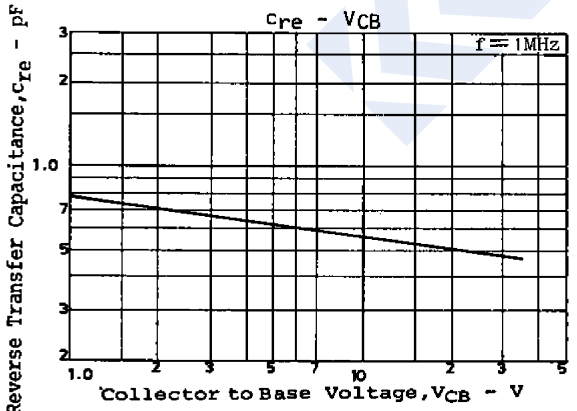


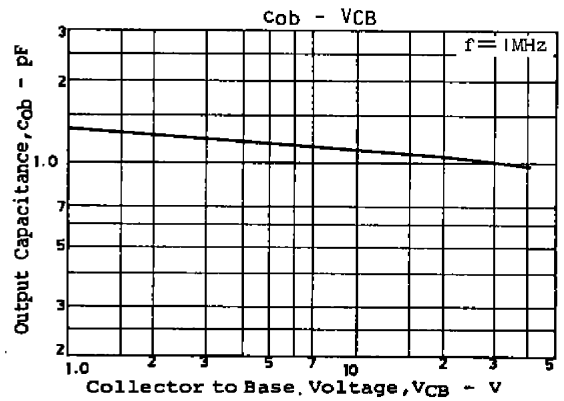


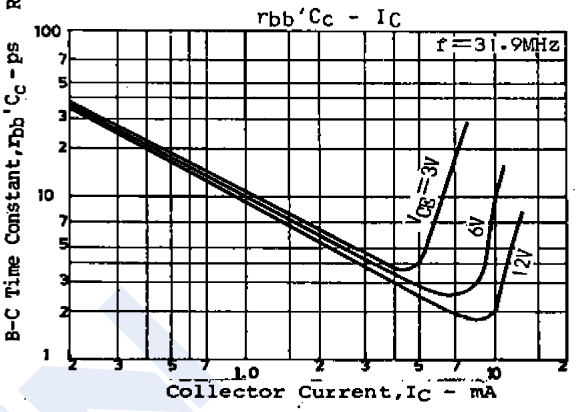


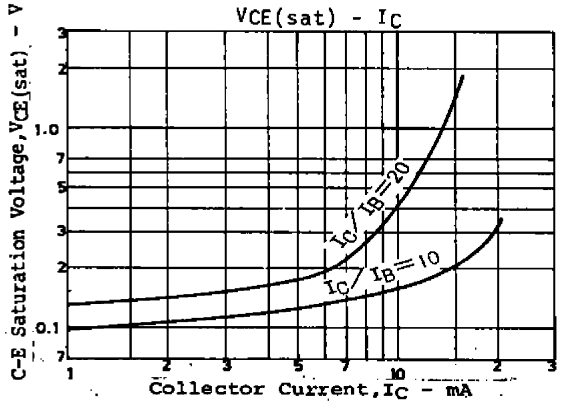

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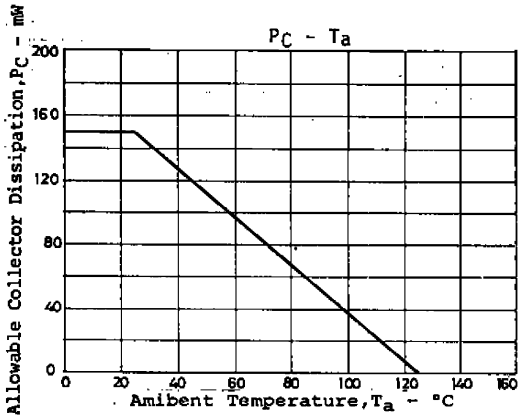


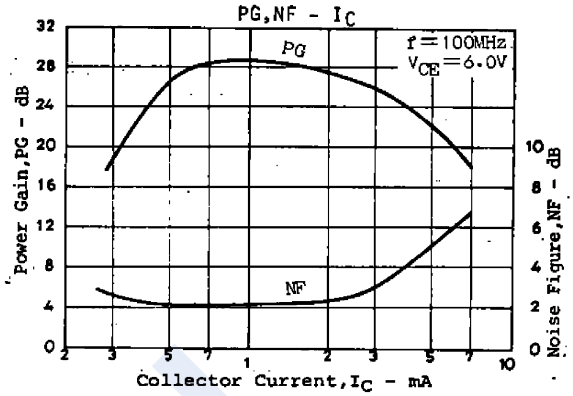


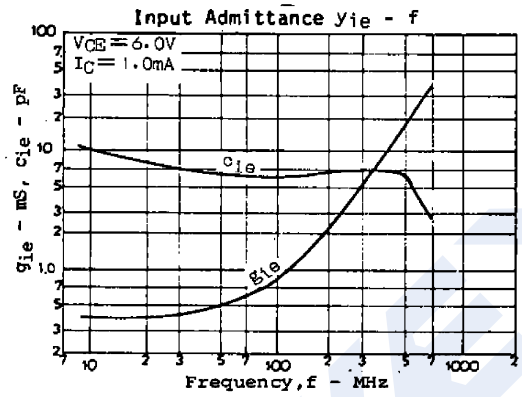


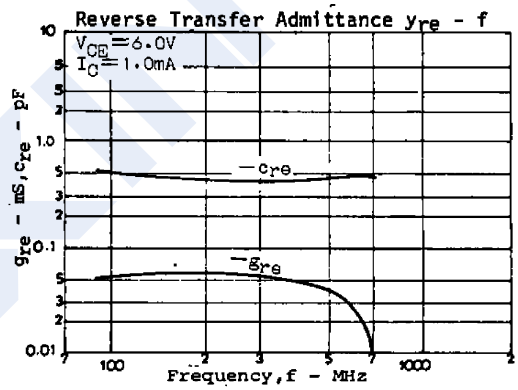


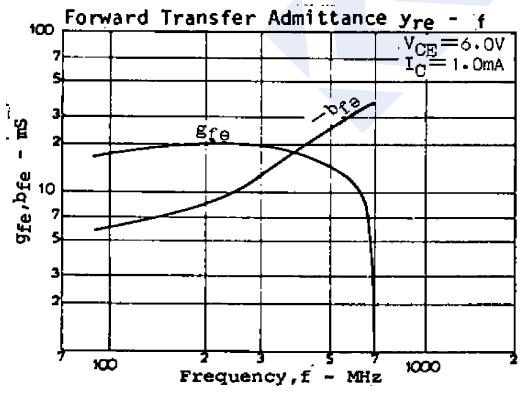


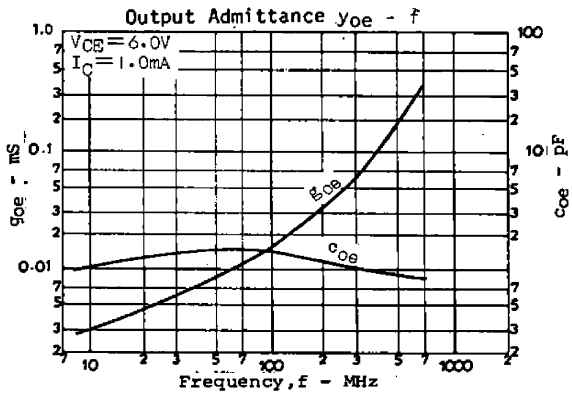


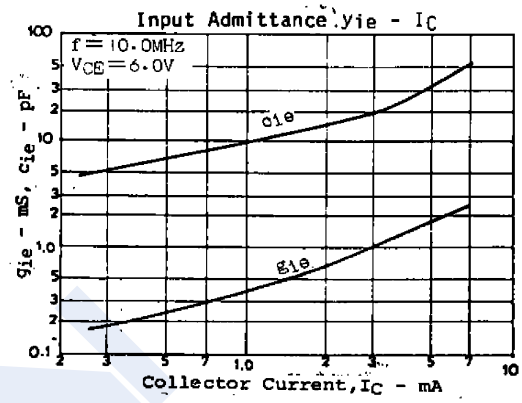


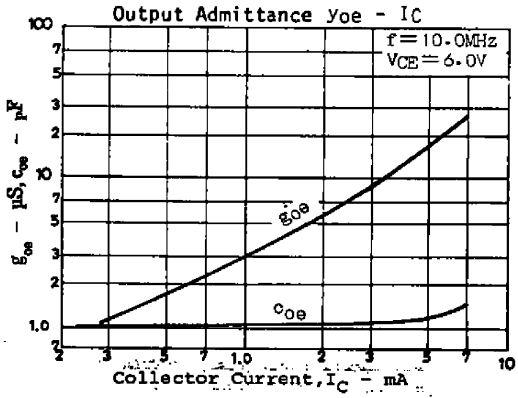

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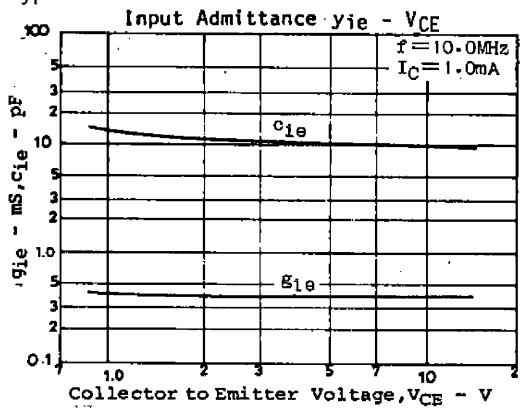


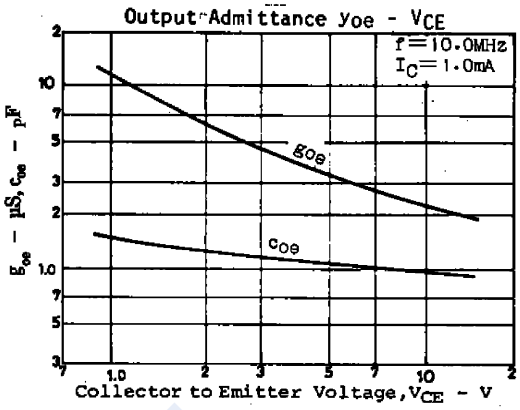


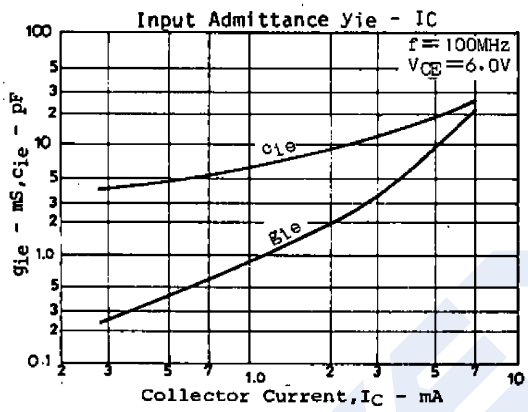


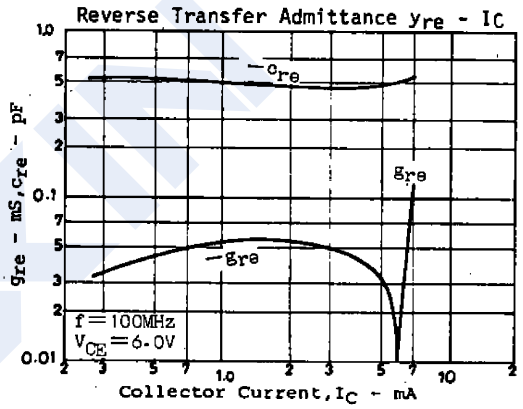


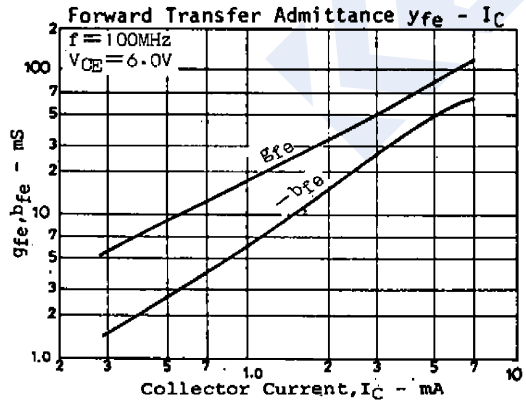


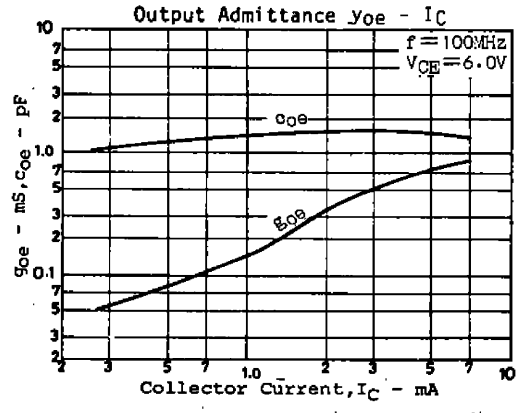


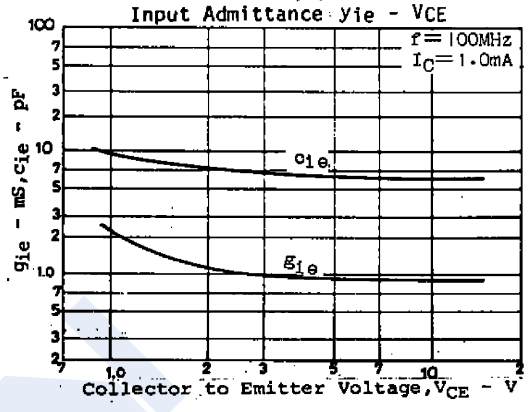


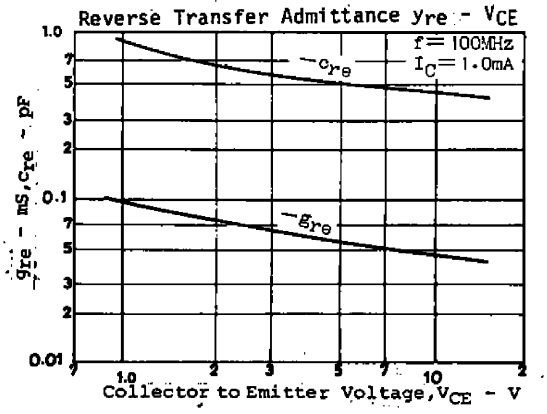

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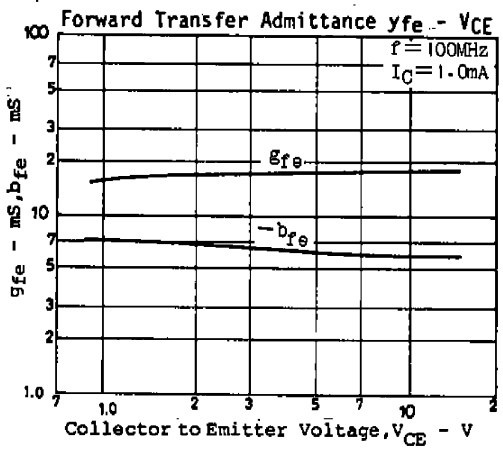
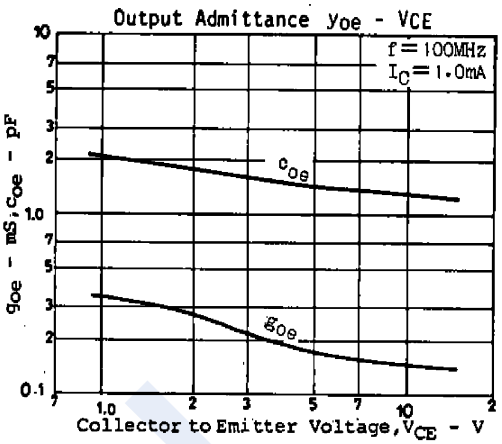
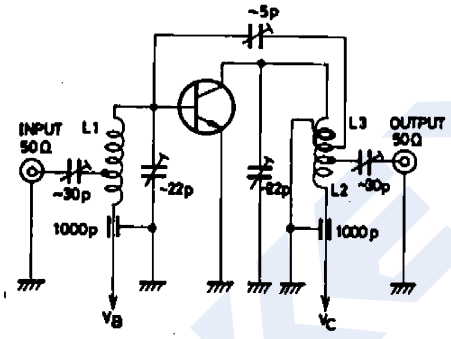



NF, PG Test Circuit




L1 : 1mmø plated wire 10mmø 5T, pitch 15mm, tap : 2T from base.
L2 : 1mmø plated wire 10mmø 7T, pitch 10mm, tap : 2T from $V_C$.
L3 : 1mmø enameled wire 10mmø 3T, pitch 10mm.

Unit (Capacitance : F)