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NPN Epitaxial Planar Silicon Transistors

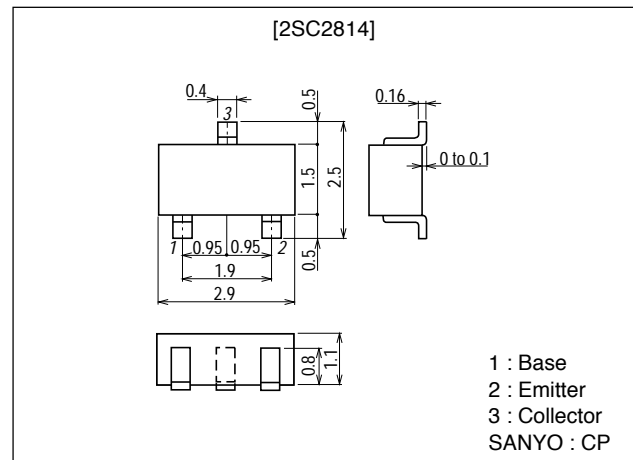
## 2SC2814 — High-Frequency General-Purpose Amplifier Applications

### Features

- Ultrasmall package enabling compactness and slimness of sets.
- High  $f_T$  and small  $c_{re}$  ( $f_T=320\text{MHz}$  typ,  $c_{re}=0.95\text{pF}$  typ).

### Package Dimensions

unit:mm  
2018B



### Specifications

Absolute Maximum Ratings at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		30	V
Collector-to-Emitter Voltage	$V_{CEO}$		20	V
Emitter-to-Base Voltage	$V_{EBO}$		5	V
Collector Current	$I_C$		30	mA
Collector Dissipation	$P_C$		150	mW
Junction Temperature	$T_j$		125	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +125	$^\circ\text{C}$

Electrical Characteristics at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CB0}$	$V_{CB}=10\text{V}, I_E=0$			0.1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=4\text{V}, I_C=0$			0.1	$\mu\text{A}$
DC Current Gain	$h_{FE}$	$V_{CE}=6\text{V}, I_C=1\text{mA}$	40*		270*	
Gain-Bandwidth Product	$f_T$	$V_{CE}=6\text{V}, I_C=1\text{mA}$	200	320		MHz
Reverse Transfer Capacitance	$C_{re}$	$V_{CB}=6\text{V}, f=1\text{MHz}$	0.7	0.95	1.2	pF
Base-to-Collector Time Constant	$r_{bb}'C_C$	$V_{CE}=6\text{V}, I_C=1\text{mA}, f=31.9\text{MHz}$		12	20	ps
Noise Figure	NF	$V_{CE}=6\text{V}, I_C=1\text{mA}, f=100\text{MHz}$		3.0		dB
Power Gain	PG	$V_{CE}=6\text{V}, I_C=1\text{mA}, f=100\text{MHz}$		25		dB

\* : The 2SC2814 are classified as follows by  $h_{FE}$  at 1mA :

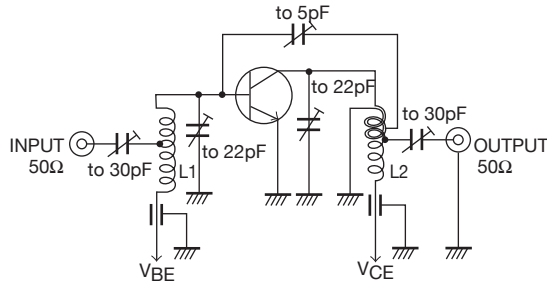
(Note) Marking : F

$h_{FE}$  rank : 2, 3, 4, 5

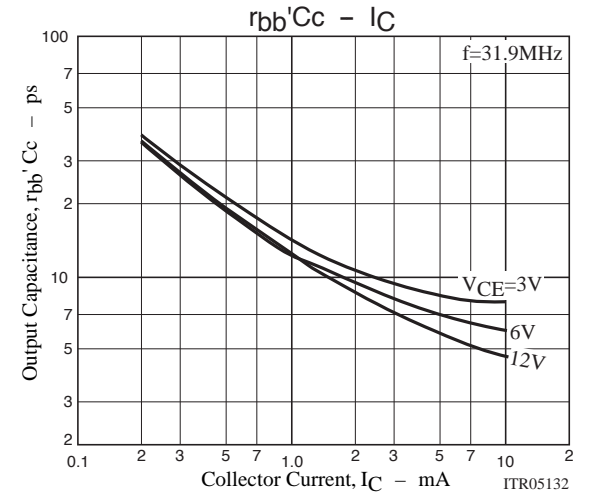
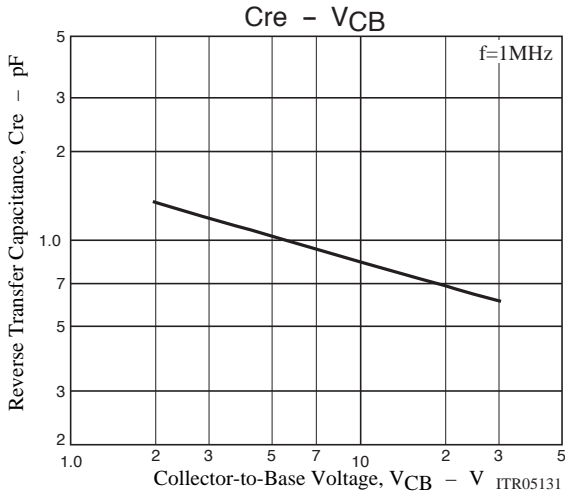
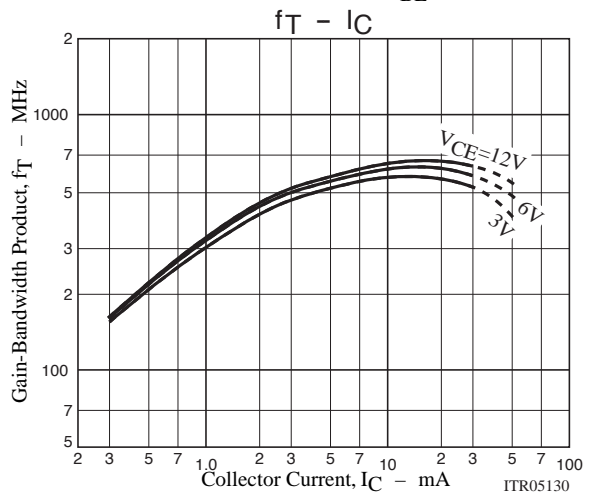
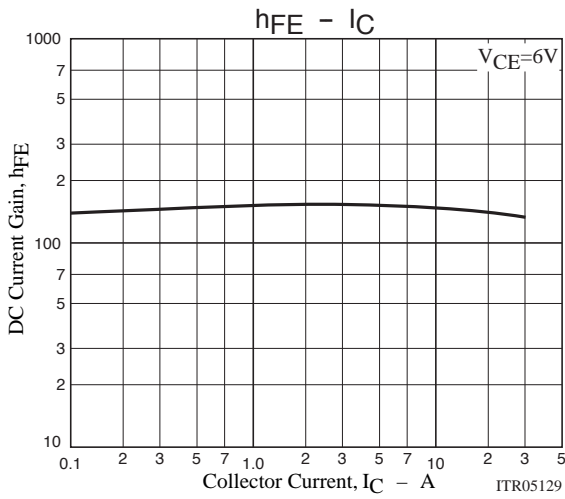
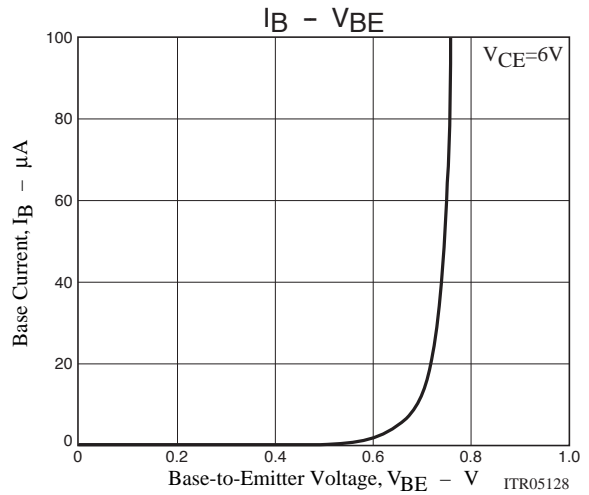
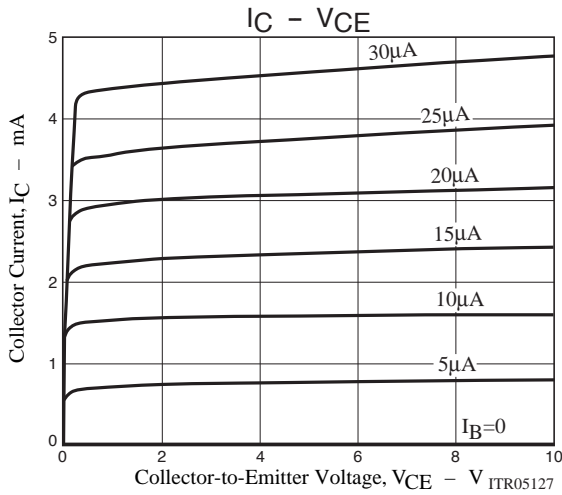
Rank	2	3	4	5
$h_{FE}$	40 to 80	60 to 120	90 to 180	135 to 270

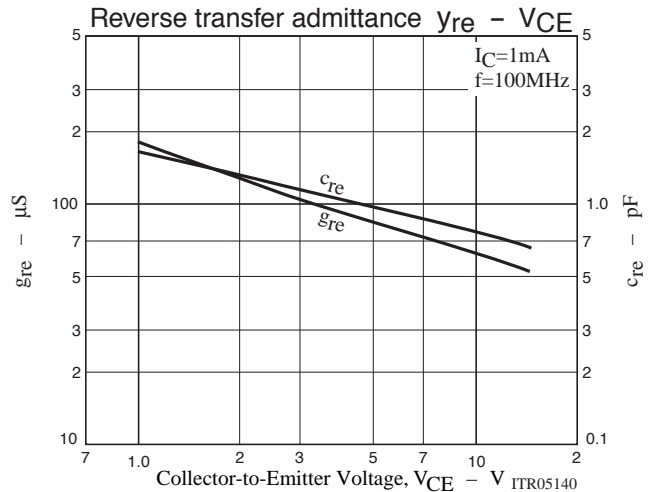
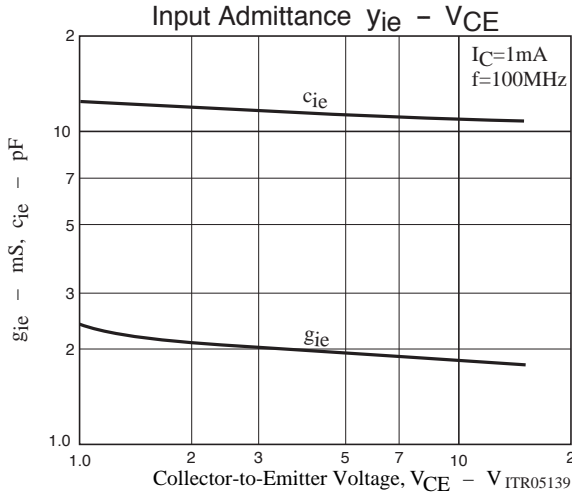
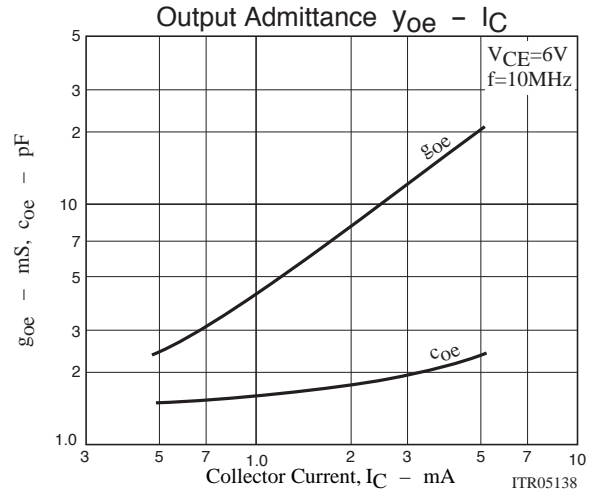
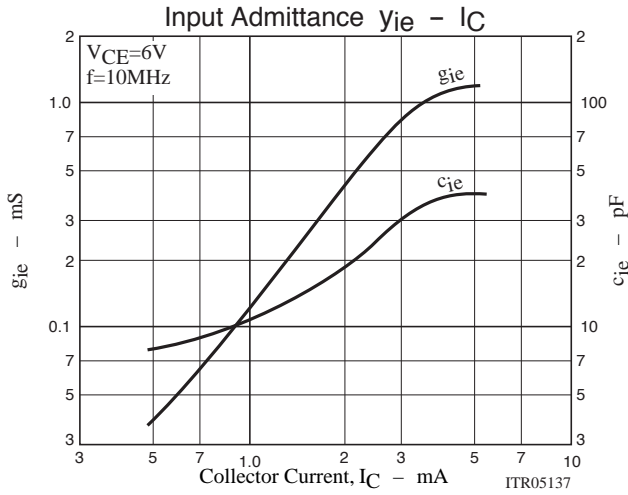
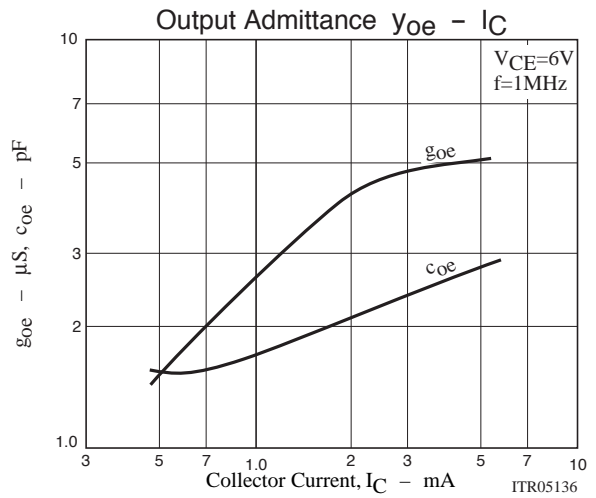
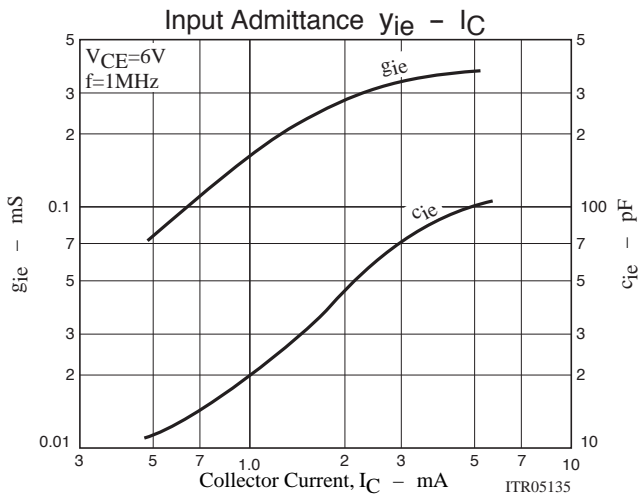
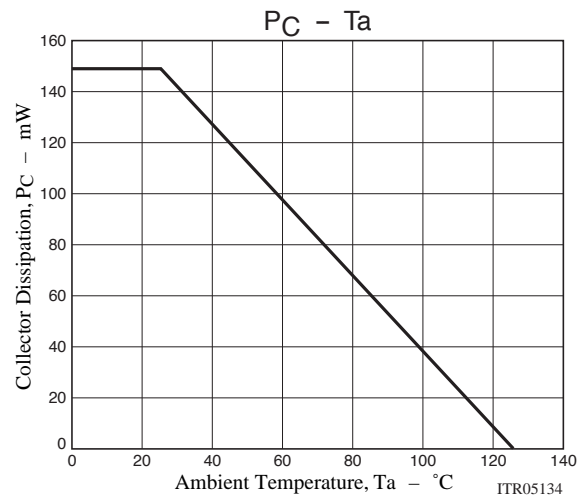
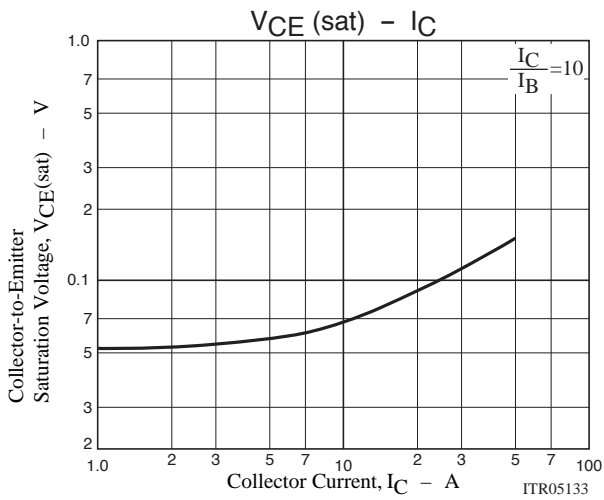
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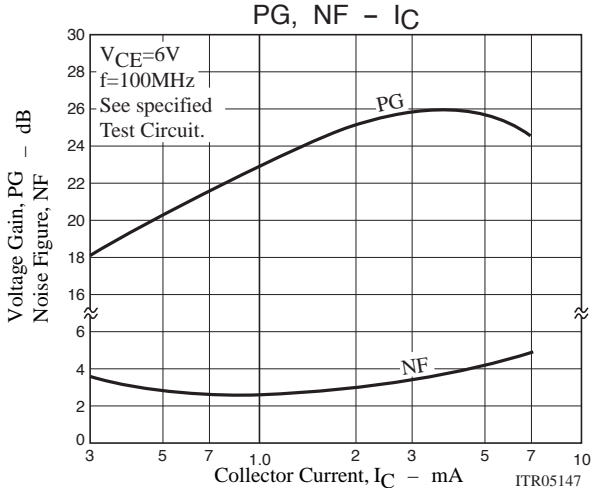
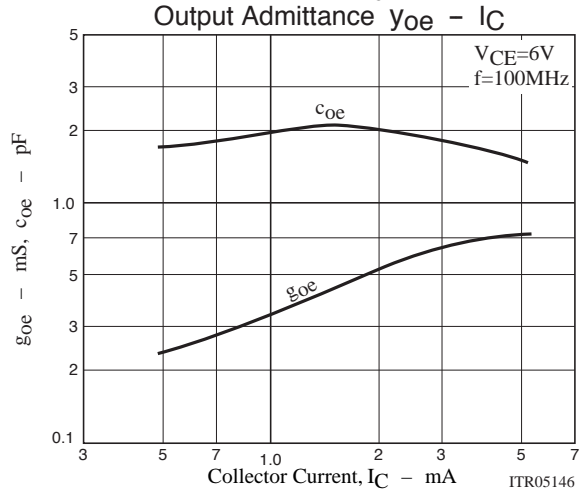
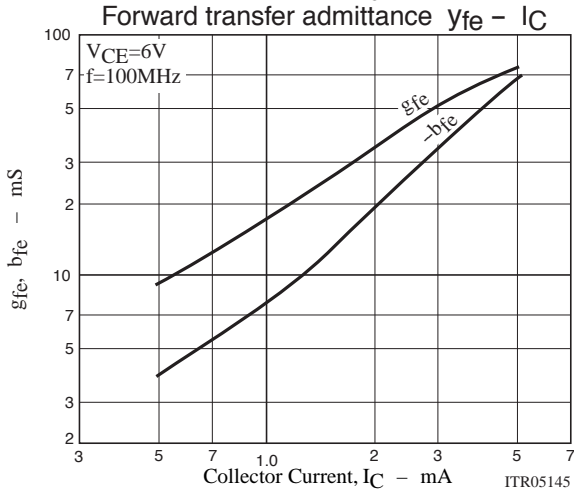
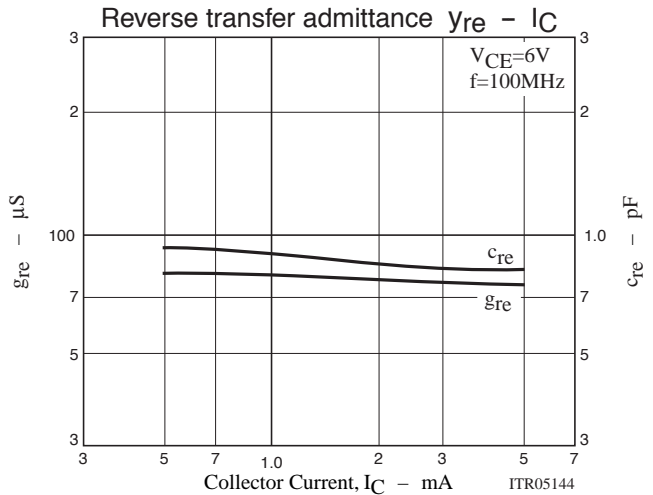
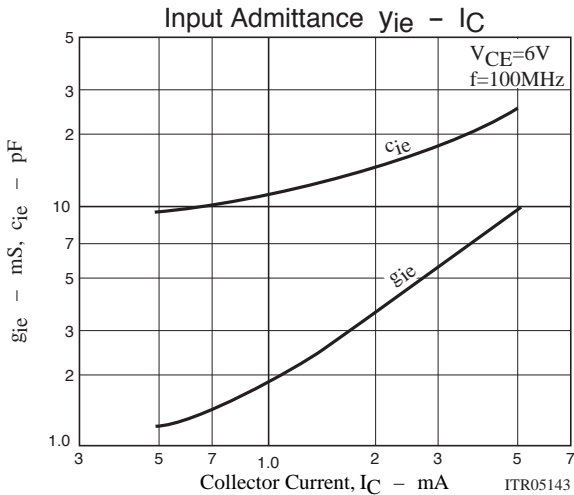
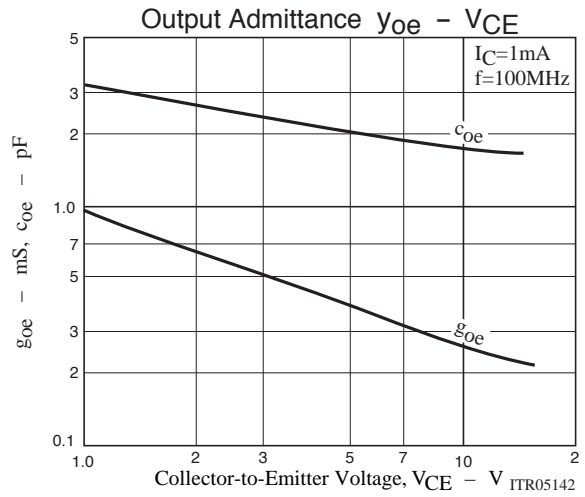
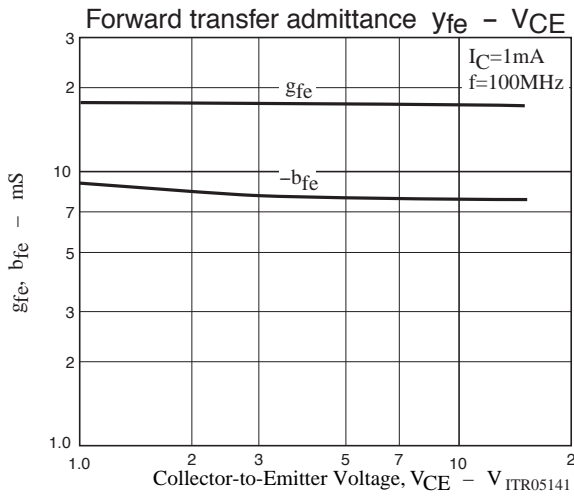
## NF, PG Test Circuit



- L1 : 1mmø plated wire 10mmø 4T, tap : 2T from V<sub>BE</sub> side.
- L2 : 1mmø plated wire 10mmø 7T, tap : 1T from V<sub>CE</sub> side.
- L3 : 1mmø enameled wire 10mmø 3T.







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