

**2SC4405**

UHF, Low-Noise, Wide-Band Amplifier Applications

Applications

- UHF, low-noise amplifiers, wide-band amplifiers.

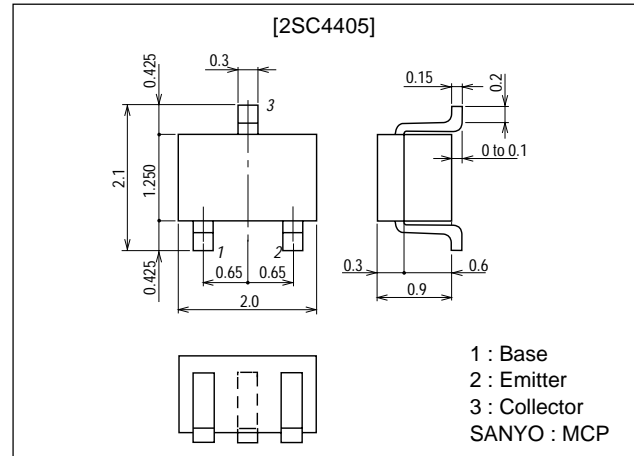
Features

- High cutoff frequency : $f_T=5.0\text{GHz}$ typ
- High power gain : $\text{MAG}=14\text{dB}$ typ ($f=0.9\text{GHz}$)
- Small noise figure : $\text{NF}=1.5\text{dB}$ typ ($f=0.9\text{GHz}$)
- Ultrasmall-sized package permitting 2SC4405-applied sets to be made smaller and slimmer.

Package Dimensions

unit:mm

2059B



Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		20	V
Collector-to-Emitter Voltage	V_{CEO}		12	V
Emitter-to-Base Voltage	V_{EBO}		3	V
Collector Current	I_C		100	mA
Collector Dissipation	P_C		150	mW
Junction Temperature	T_J		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=12\text{V}, I_E=0$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=2\text{V}, I_C=0$			10	μA
DC Current Gain	h_{FE}	$V_{CE}=10\text{V}, I_C=20\text{mA}$	40*		200*	
Gain-Bandwidth Product	f_T	$V_{CE}=10\text{V}, I_C=20\text{mA}$		5.0		GHz
Output Capacitance	C_{ob}	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.9	1.5	pF
Reverse Transfer Capacitance	C_{re}	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.6		pF

* : The 2SC4405 is classified by 20mA h_{FE} as follows :

(Note) Marking : OY

 h_{FE} rank : 2, 3, 4

• For CP package version, use the 2SC3775.

Rank	2	3	4
h_{FE}	40 to 80	60 to 120	100 to 200

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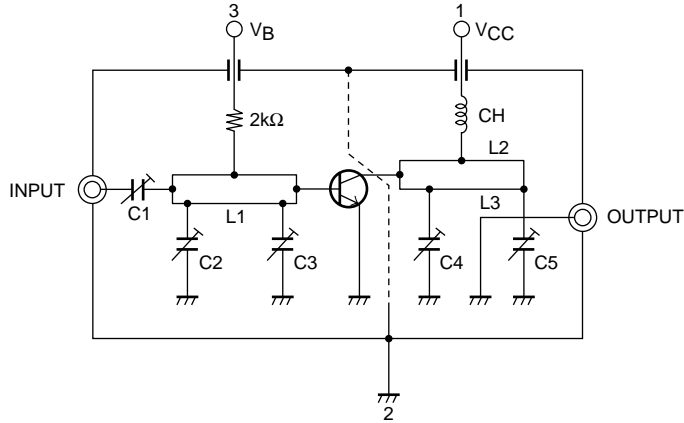
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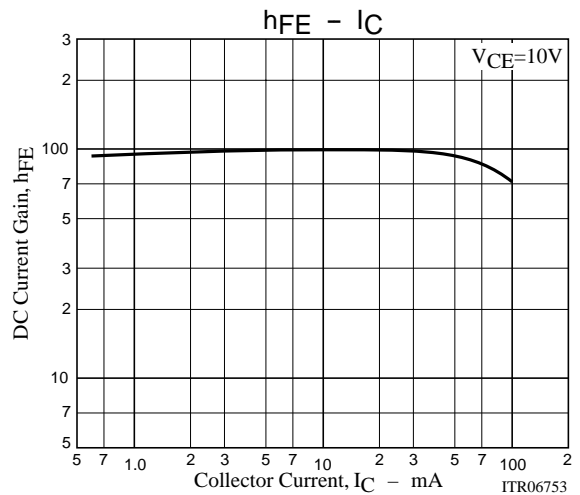
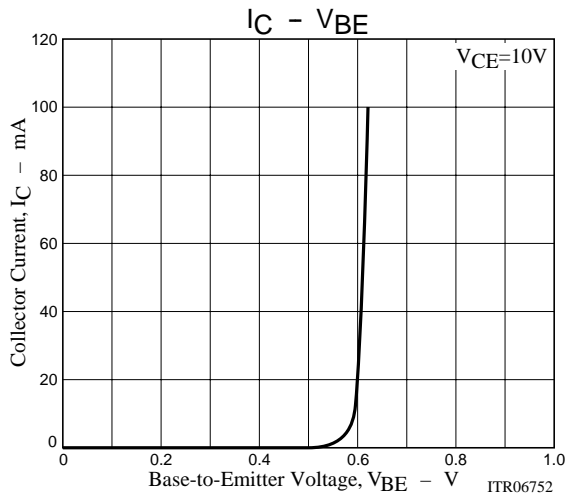
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE}=10V, I_C=20mA, f=0.9GHz$	8.5	10		dB
Maximum Available Power Gain	MAG	$V_{CE}=10V, I_C=20mA, f=0.9GHz$		14		dB
Noise Figure	NF	$V_{CE}=10V, I_C=5mA, f=0.9GHz$ See specified Test Circuit.		1.5		dB

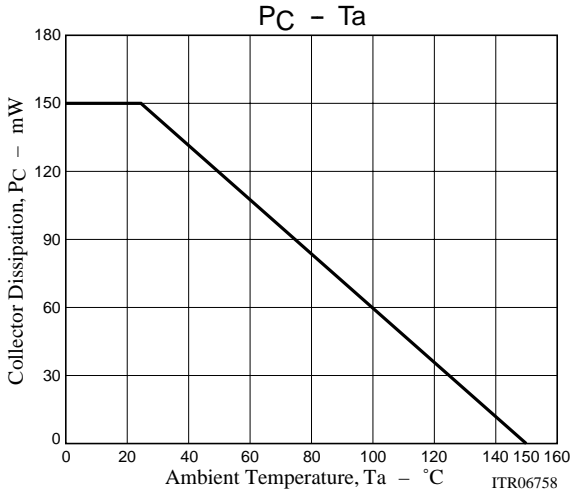
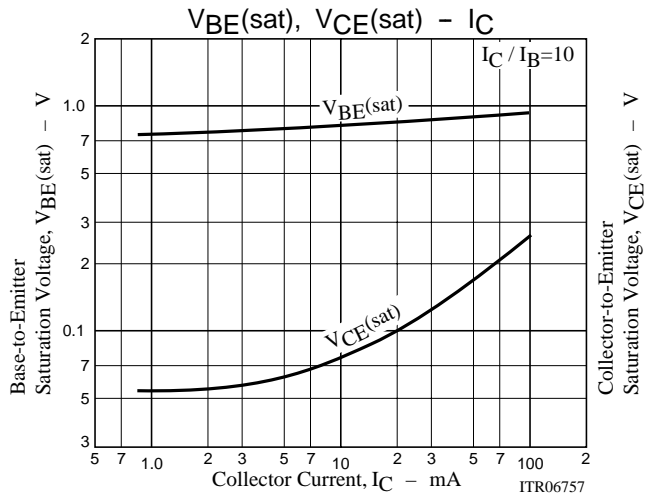
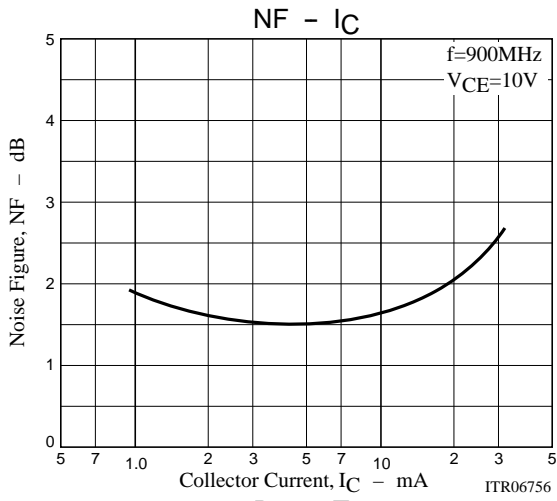
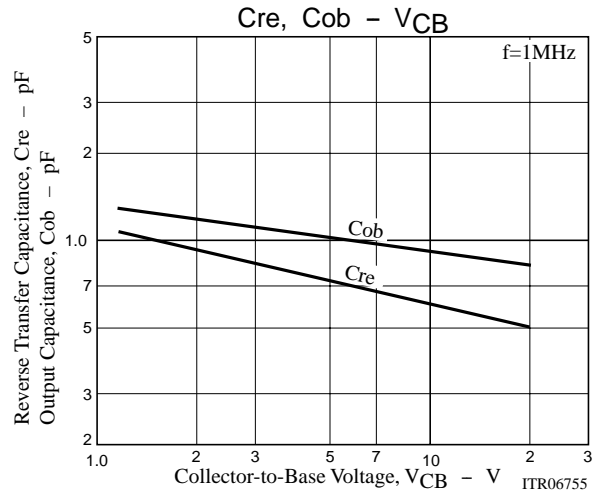
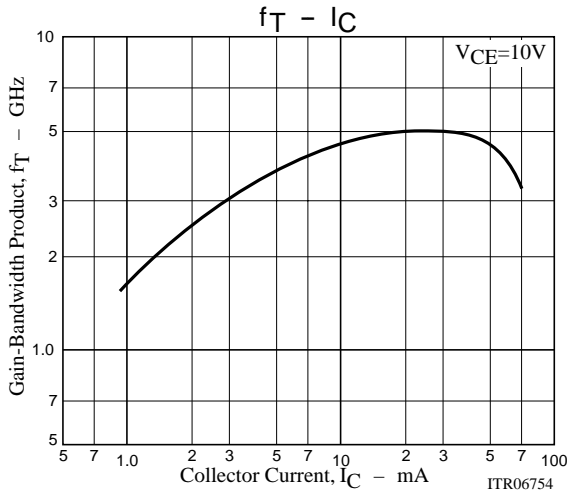
NF Test Circuit



900MHz	
C1	to 5pF
C2	to 10pF
C3	to 10pF
C4	to 10pF
C5	to 10pF
L1	W ≈ 1.5mm, l ≈ 25mm Strip line
L2	W ≈ 4mm, l ≈ 25mm Strip line
L3	0.5φ, l ≈ 40mm
CH	2t+bead core



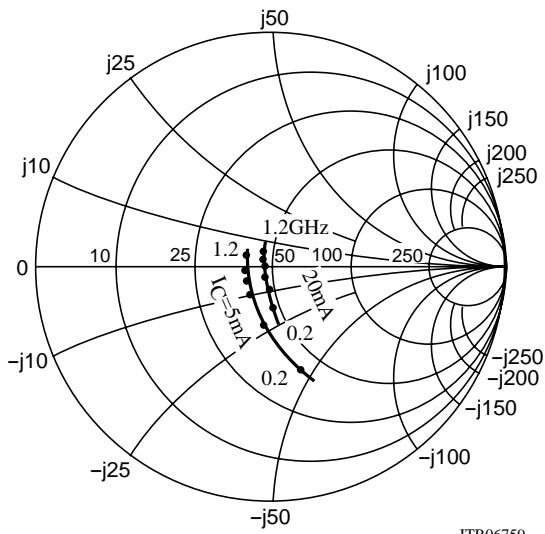
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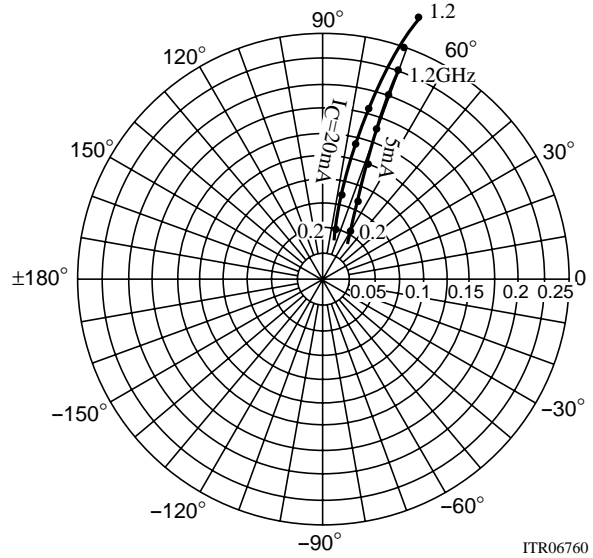
S parameter

S11e : $V_{CE}=10V$
f=200MHz step



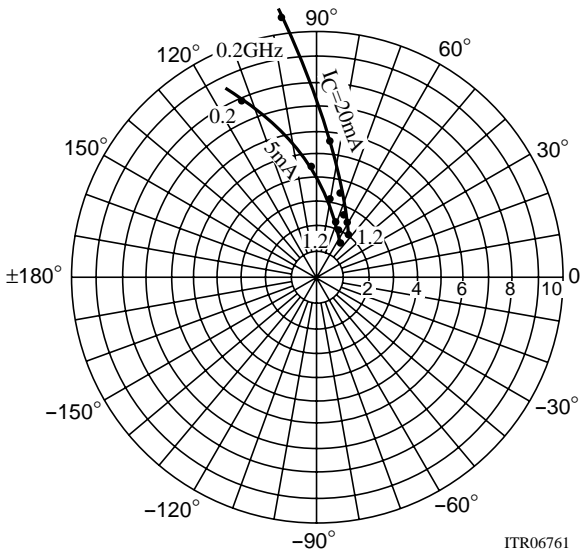
ITR06759

S12e : $V_{CE}=10V$
f=200MHz step



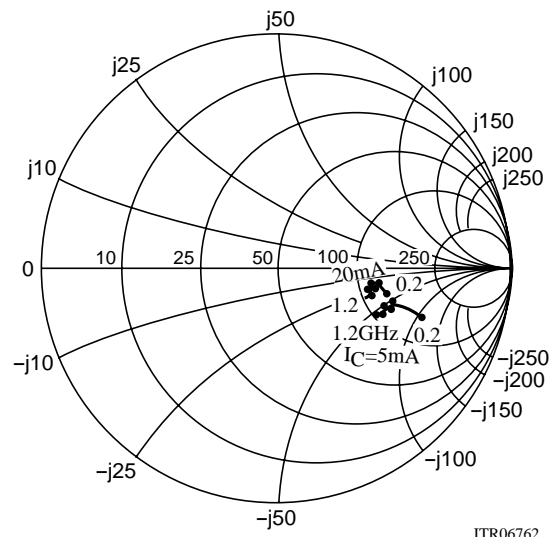
ITR06760

S21e : $V_{CE}=10V$
f=200MHz step



ITR06761

S22e : $V_{CE}=10V$
f=200MHz step



ITR06762

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