

2SC3774

# UHF Low-Noise Amplifier, Wide-Band Amplifier Applications

### **Applications**

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

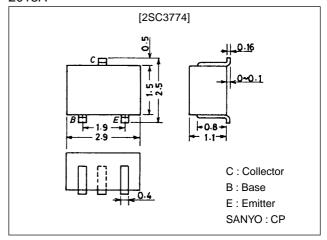
#### **Features**

- Small noise figure: NF=2.2dB typ (f=0.9GHz).
  High power gain: MAG=14dB typ (f=0.9GHz).
- · High cutoff frequency :  $f_T$ =5.0GHz typ.

### **Package Dimensions**

unit:mm

#### 2018A



## **Specifications**

#### Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CBO</sub>		20	V
Collector-to-Emitter Voltage	VCEO		12	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		3	V
Collector Current	I <sub>C</sub>		70	mA
Base Current	Ι <sub>Β</sub>		20	mA
Collector Dissipation	PC		250	mW
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		-55 to +150	°C

#### Electrical Characteristics at Ta = 25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	Oille
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =12V, I <sub>E</sub> =0			1.0	μΑ
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =2V, I <sub>C</sub> =0			10	μΑ
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =20mA	40*		200*	
Gain-Bandwidth Product	fΤ	V <sub>CE</sub> =10V, I <sub>C</sub> =20mA		5.0		GHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, f=1MHz		0.75	1.0	pF
Reverse Transfer Capacitance	C <sub>re</sub>	V <sub>CB</sub> =10V, f=1MHz		0.5		pF

\* : The 2SC3774 is classified by 20mA  $h_{FE}$  as follows :

40 2 80 60 3 120 100 4 200

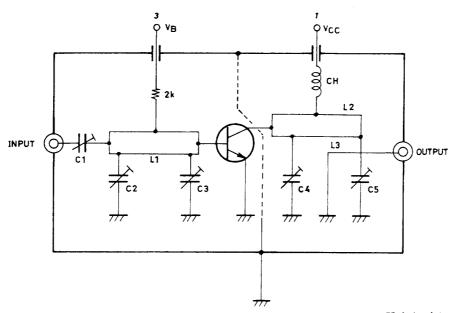
(Note) Marking: NY h<sub>FE</sub> rank: 2, 3, 4

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## 2SC3774

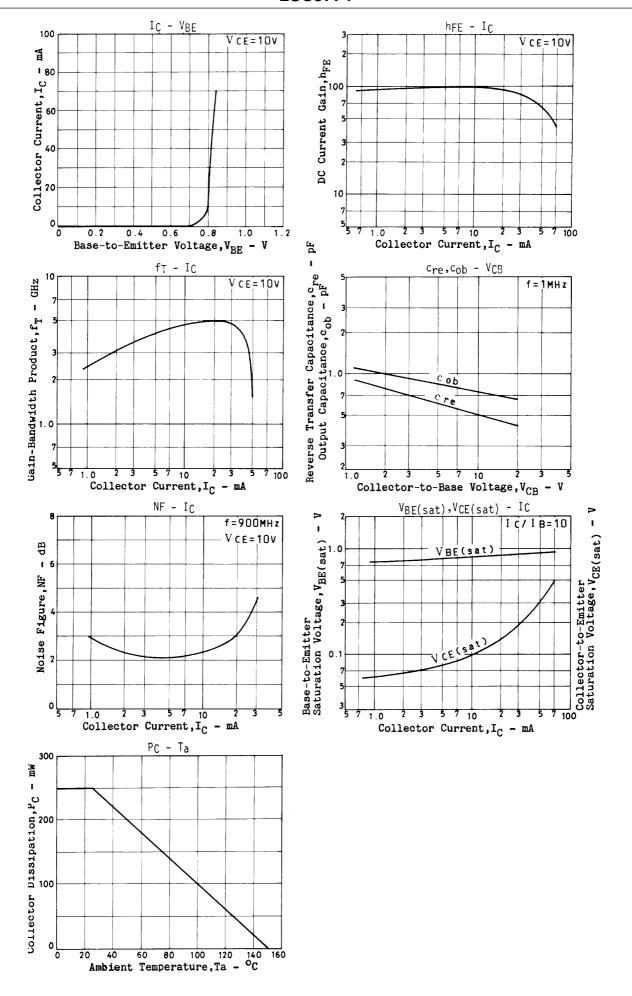
Parameter	Symbol Conditions	Conditions	Ratings			Unit
		min	typ	max	Offic	
Forward Transfer Gain	S21e   <sup>2</sup>	V <sub>CE</sub> =10V, I <sub>C</sub> =20mA, f=0.9GHz	8	10		dB
Maximum Available Power Gain	MAG	V <sub>CE</sub> =10V, I <sub>C</sub> =20mA, f=0.9GHz		14		dB
Noise Figure	NF	V <sub>CE</sub> =10V, I <sub>C</sub> =5mA, f=0.9GHz, See specified Test Circuit.		2.2	4.5	dB

## **NF Test Circuit**

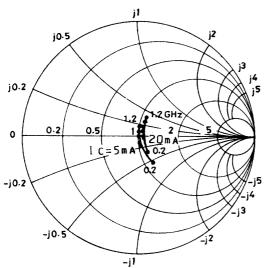


Unit (resistance :  $\Omega$ )

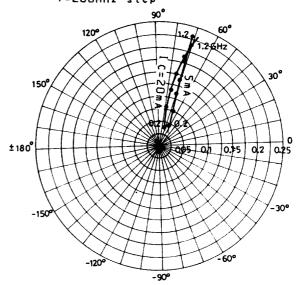
	900MHz
C1	~5pF
C2	~10pF
C3	~10pF
C4	~10pF
C5	~10pF
L1	W ≈ 1.5mm, I ≈ 25mm
	Strip line
L2	W ≈ 4mm, I ≈ 25mm
	Strip line
L3	0.5φ, I ≈ 40mm
CH	2t+bead core



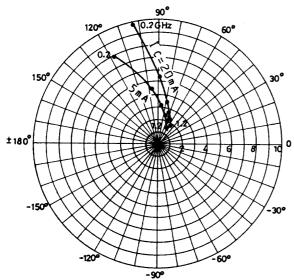
S11e: VCE=10V f=200MHz.step



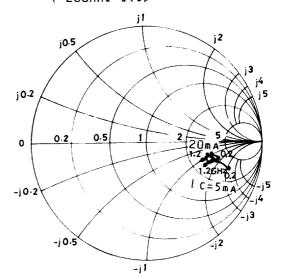
S12e: VCE=10V f=200MHz step



S21e: VCE=10Vf=200MHz step



S22e: VCE=10V f=200MHz step



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