

SANYO	No.1951B	2SC3778
		NPN Epitaxial Planar Silicon Transistor UHF Low-Noise Amp, Wide-Band Amp Applications

Applications

- UHF low-noise amplifiers, wide-band amplifiers

Features

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

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

			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	70	mA
Base Current	I_B	30	mA
Collector Dissipation	P_C	500	mW
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

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

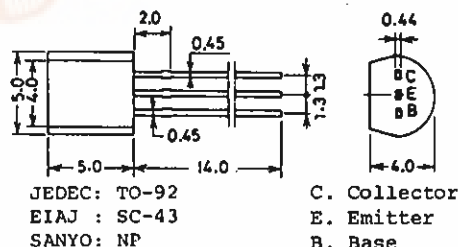
			min	typ	max	unit
Collector Cutoff Current	I_{CBO}	$V_{CB}=12\text{V}, I_E=0$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=2\text{V}, I_C=0$			10	μA
DC Current Gain	h_{FE}	$V_{CE}=10\text{V}, I_C=20\text{mA}$	40*		200*	
Gain-Bandwidth Product	f_T	$V_{CE}=10\text{V}, I_C=20\text{mA}$		5.0		GHz
Output Capacitance	c_{ob}	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.8	1.1	pF
Reverse Transfer Capacitance	c_{re}	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.5		pF
Forward Transfer Gain	$ S_{21e} $	$V_{CE}=10\text{V}, I_C=20\text{mA}, f=0.9\text{GHz}$	8	10		dB
Maximum Available Power Gain	MAG	$V_{CE}=10\text{V}, I_C=20\text{mA}, f=0.9\text{GHz}$		14		dB
Noise Figure	NF	$V_{CE}=10\text{V}, I_C=5\text{mA}, f=0.9\text{GHz}$	2.2	4.5		dB

See specified Test Circuit.

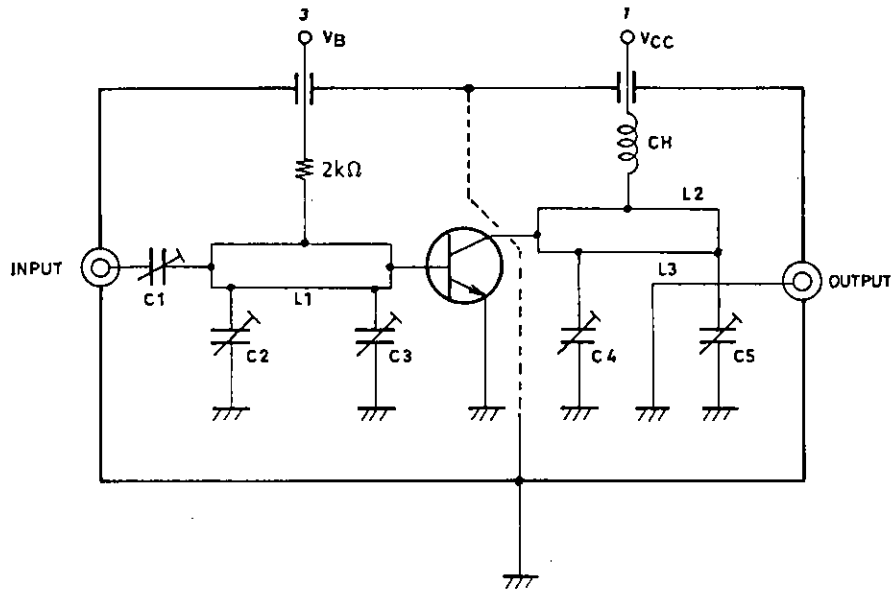
*: The 2SC3778 is classified by 20mA h_{FE} as follows:

40	C	80	60	D	120	100	E	200
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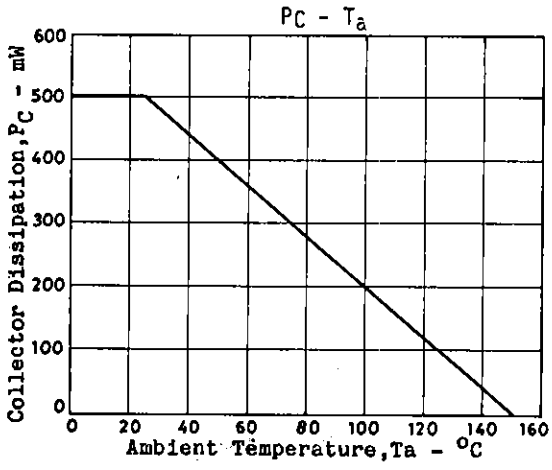
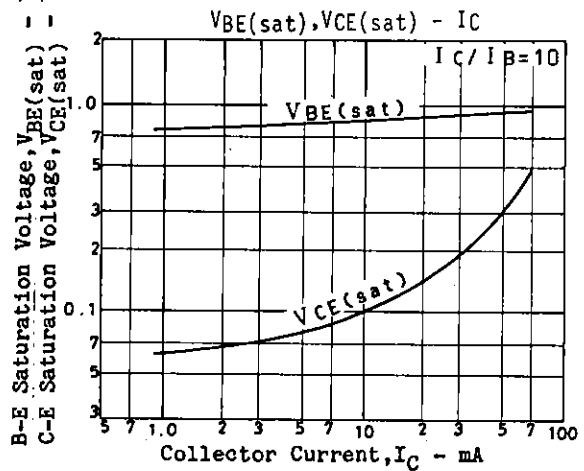
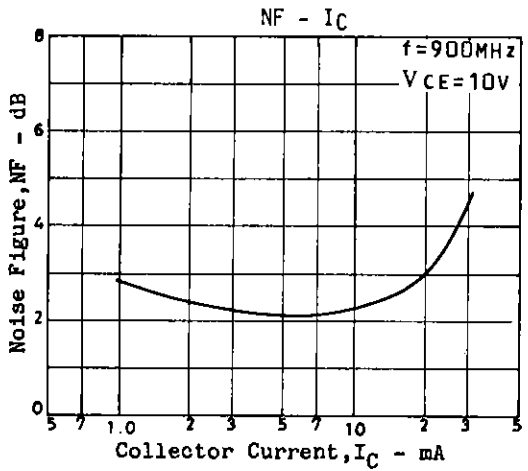
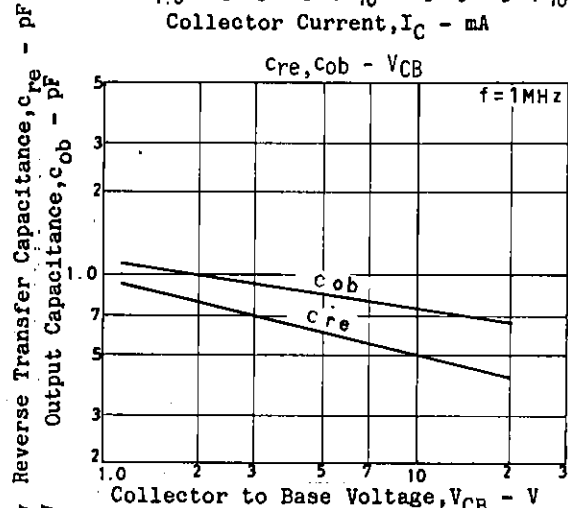
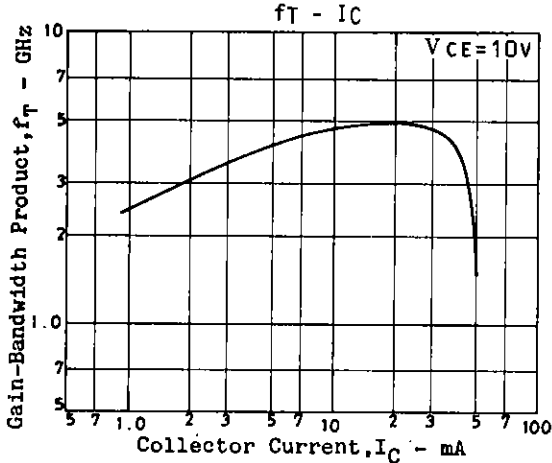
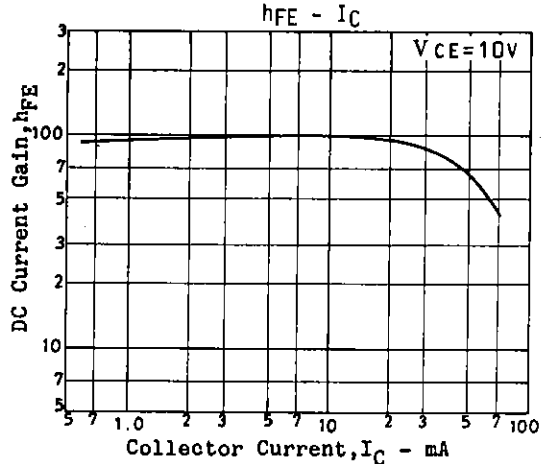
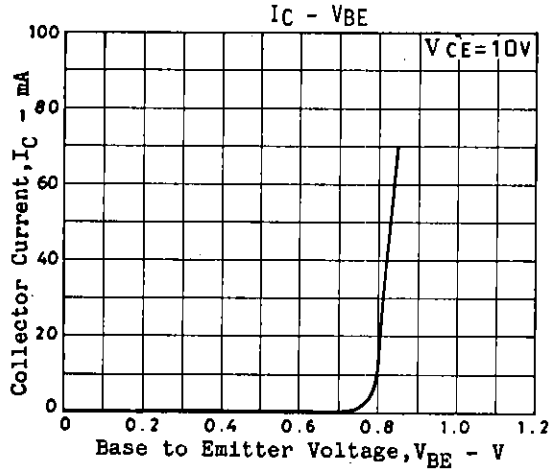
Package Dimensions 2004A
(unit: mm)



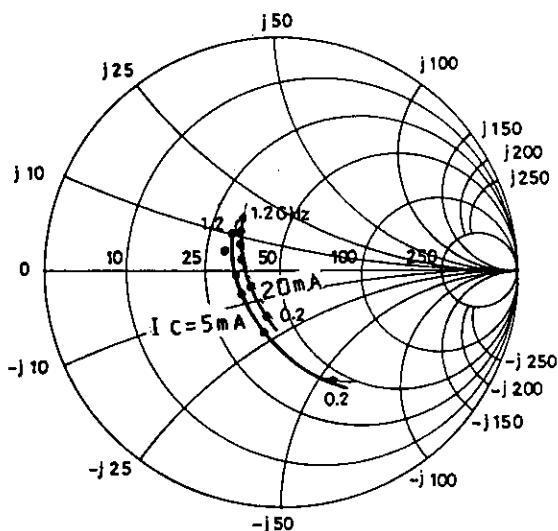
NF Test Circuit



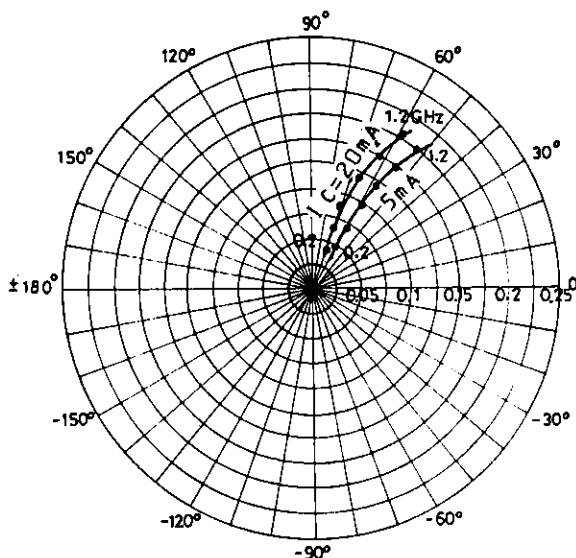
900MHz	
C1	~5 pF
C2	~10 pF
C3	~10 pF
C4	~10 pF
C5	~10 pF
L1	W≐1.5mm, l≐25mm strip line
L2	W≐4mm, l≐25mm strip line
L3	0.5φ, l≐40mm
CH	2t+bead core



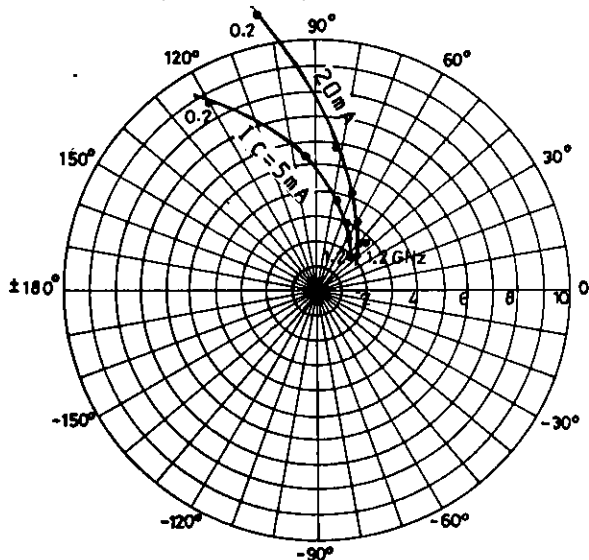
S11e : $V_{CE}=10V$
 $f=200MHz$ step



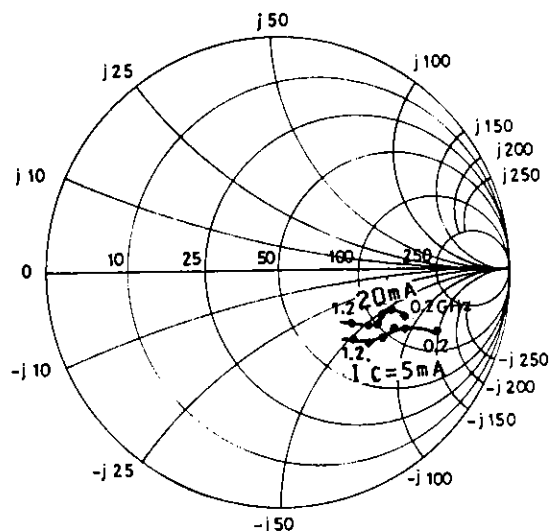
S12e : $V_{CE}=10V$
 $f=200MHz$ step



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



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



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