



2SC3776

UHF Oscillator, Mixer, Low-Noise Amplifier, Wide-Band Amplifier Applications

Applications

- UHF frequency converters, local oscillators, low-noise amplifiers, wide-band amplifiers.

Features

- Small noise figure : NF=2.5dB typ (f=0.9GHz).
- High power gain : MAG=12dB typ (f=0.9GHz).
- High cutoff frequency : $f_T=3.0$ GHz typ.

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CB0}		25	V
Collector-to-Emitter Voltage	V_{CE0}		16	V
Emitter-to-Base Voltage	V_{EB0}		3	V
Collector Current	I_C		70	mA
Base Current	I_B		20	mA
Collector Dissipation	P_C		400	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}	$V_{CB}=16\text{V}, I_E=0$			1.0	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=2\text{V}, I_C=0$			10	μA
DC Current Gain	h_{FE}	$V_{CE}=10\text{V}, I_C=10\text{mA}$	40*		200*	
Gain-Bandwidth Product	f_T	$V_{CE}=10\text{V}, I_C=10\text{mA}$	1.5	3.0		GHz
Output Capacitance	C_{ob}	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.7	1.0	pF
Reverse Transfer Capacitance	C_{re}	$V_{CB}=10\text{V}, f=1\text{MHz}$		0.45		pF

* : The 2SC3776 is classified by 10mA h_{FE} as follows :

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Rank	C	D	E
h_{FE}	40 to 80	60 to 120	100 to 200

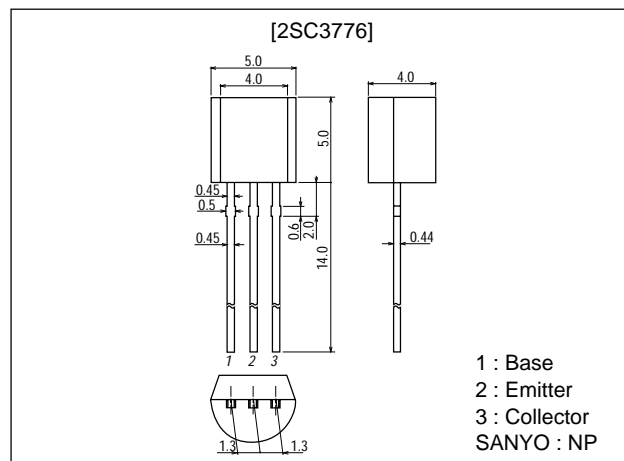
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Package Dimensions

unit:mm

2004B

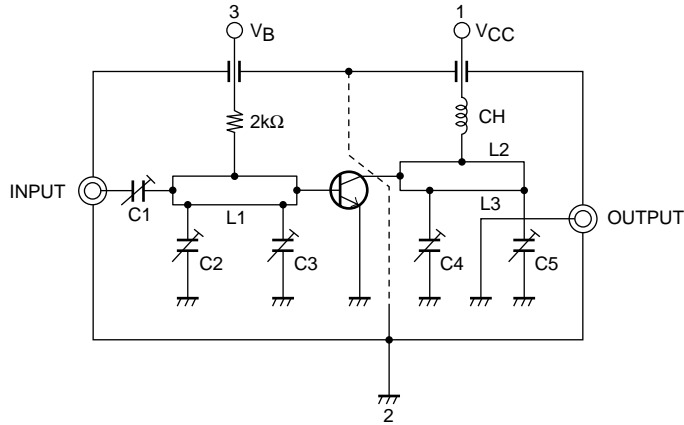


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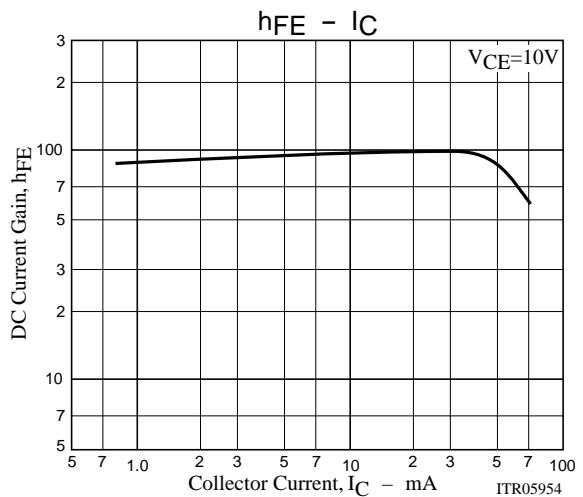
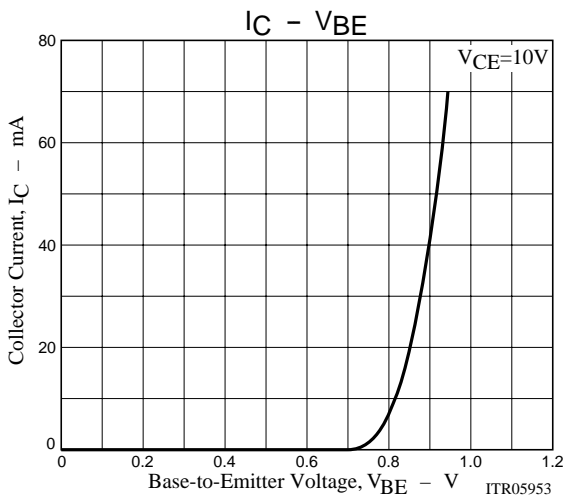
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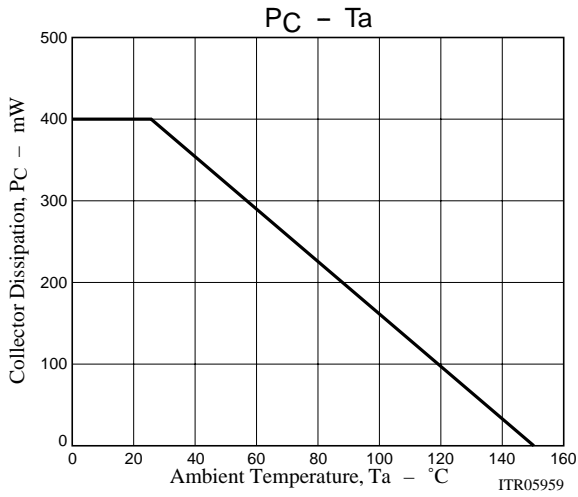
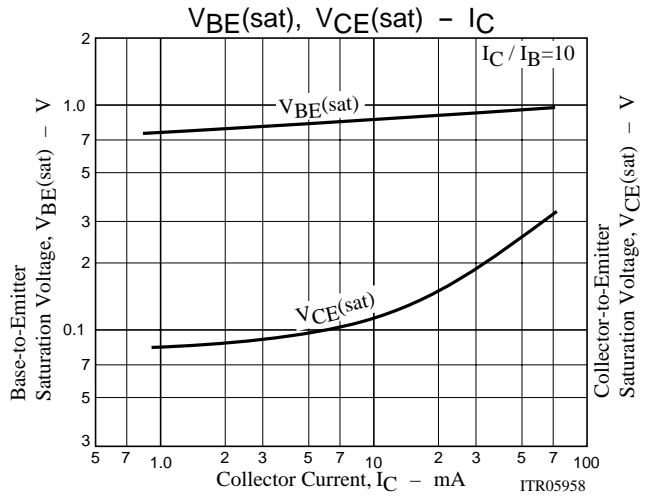
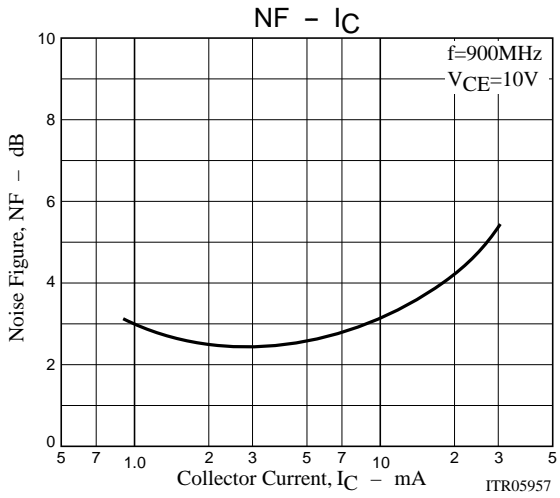
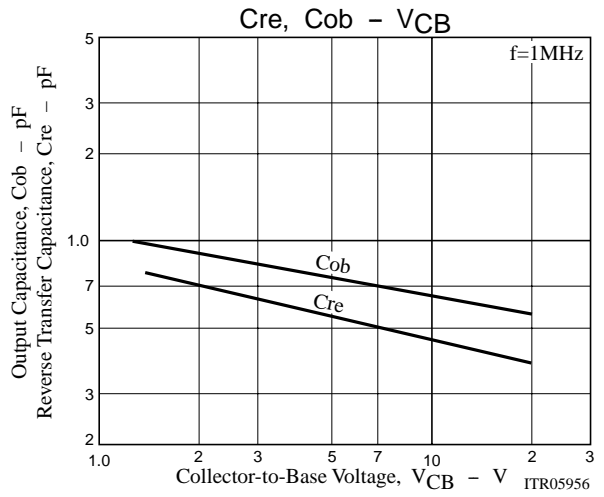
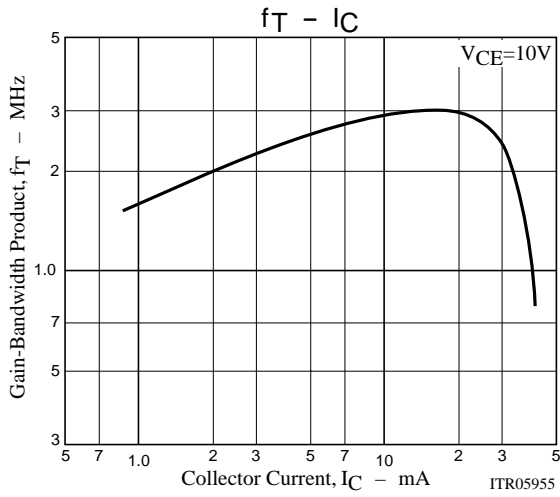
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Gain	$ S_{21e} ^2$	$V_{CE}=10V, I_C=10mA, f=0.9GHz$	7	9		dB
Maximum Available Power Gain	MAG	$V_{CE}=10V, I_C=10mA, f=0.9GHz$		12		dB
Noise Figure	NF	$V_{CE}=10V, I_C=3mA, f=0.9GHz,$ See specified Test Circuit.		2.5		dB

NF Test Circuit



900MHz	
C1	~5pF
C2	~10pF
C3	~10pF
C4	~10pF
C5	~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

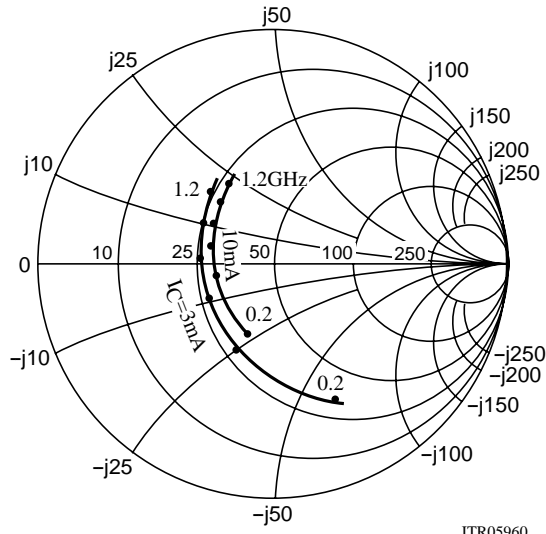




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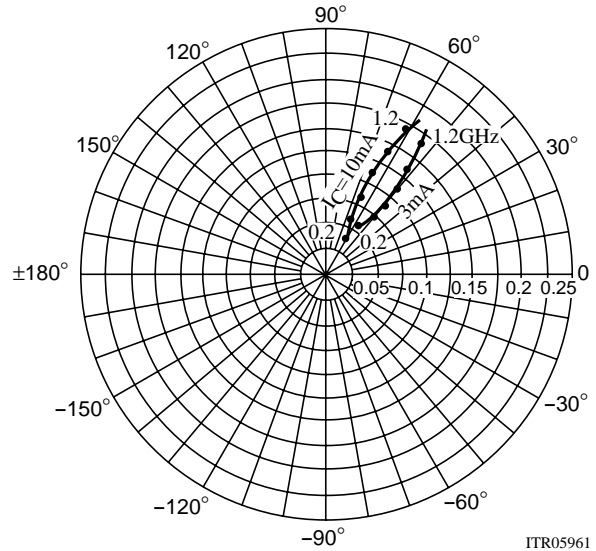
S parameter

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



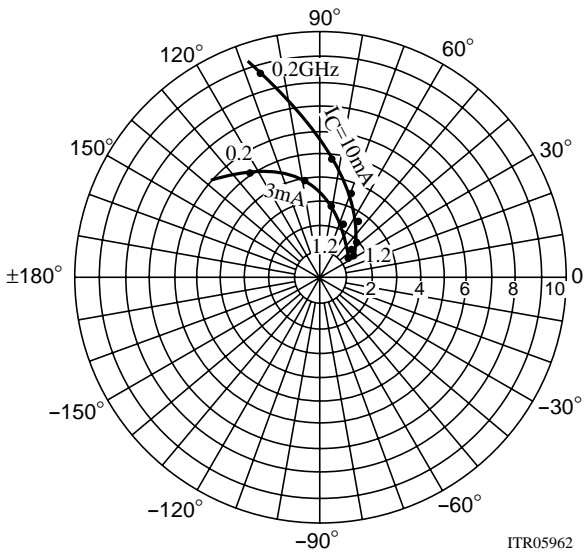
ITR05960

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



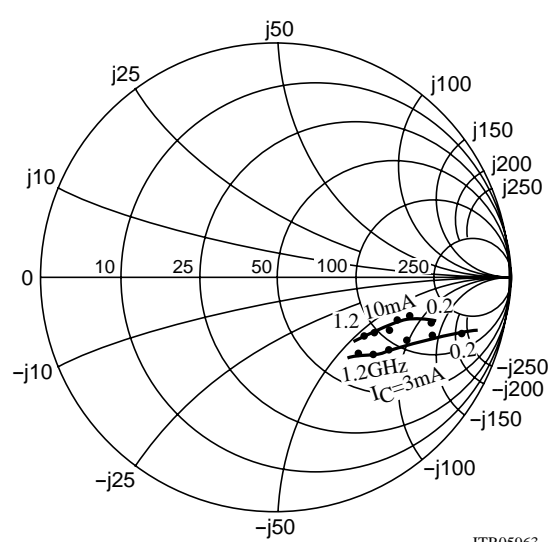
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S21e : $V_{CE}=10V$
f=200MHz step



ITR05962

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



ITR05963

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