

TA4032FT

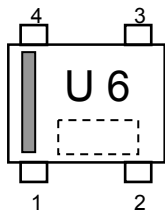
○ UHF Band Low Noise Amplifier Applications

- Thin Extreme Super mini Quad Package (4pin) : TESQ

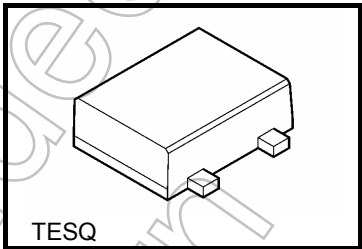
FEATURES

- Low Noise Figure: NF = 1dB (typ.) (@ f=1.575GHz)
- High Gain: $|S_{21e}|^2 = 14.8\text{dB}$ (typ.) (@ f=1.575GHz)
- ESD immunity level improvement of TA4020FT.

Marking



No.	Pin Name
1	INPUT
2	GND
3	OUTPUT
4	V _{CC}



Weight: 1.5mg (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Voltage at pin V _{CC}	V _{CC}	5	V
Output Voltage	V _{OUT}	3	V
Current into pin V _{CC}	I _{CC}	15	mA
Total Power dissipation	P _D	100	mW
Junction temperature	T _j	150	°C
Operate temperature Range	T _{opr}	−40 to 85	°C
Storage temperature Range	T _{stg}	−55 to 150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Operation range

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Voltage supply	V _{CC}	—	2.5	3	5	V

Start of commercial production
2008-12

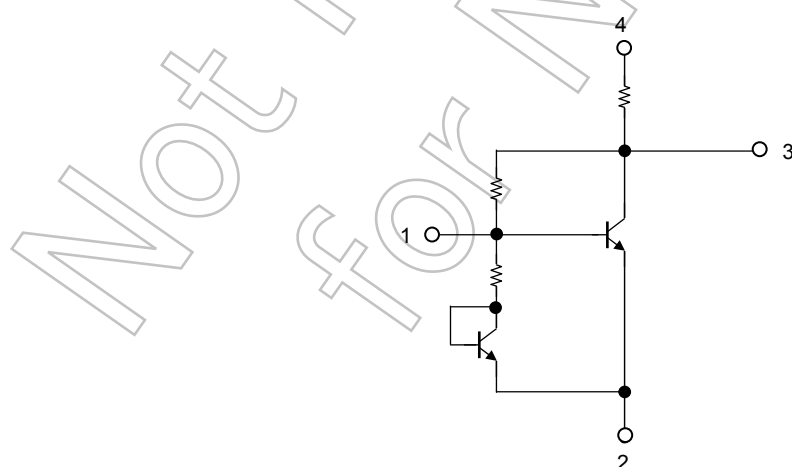
Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Circuit Current	I _{CC}	V _{CC} = 3V	3.8	5	6.5	mA
Insertion Gain	S ₂₁ e ² (1)	V _{CC} = 3V, f = 1.575GHz Z _S =Z _L =50Ω	13	14.8	—	dB
	S ₂₁ e ² (2)	V _{CC} = 3V, f = 2GHz Z _S =Z _L =50Ω	11	13	—	dB
	S ₂₁ e ² (3)	V _{CC} = 3V, f = 2.4GHz Z _S =Z _L =50Ω	10	11.7	—	dB
Noise Figure	NF(1)	V _{CC} = 3V, f = 1.575GHz Z _S =Z _L =50Ω	—	1	1.2	dB
	NF(2)	V _{CC} = 3V, f = 2GHz Z _S =Z _L =50Ω	—	1.05	1.25	dB
	NF(3)	V _{CC} = 3V, f = 2.4GHz Z _S =Z _L =50Ω	—	1.15	1.4	dB
3 rd order intermodulation distortion input intercept point	IIP3	V _{CC} = 3V, f = 1.575GHz, Δf = 1MHz Z _S =Z _L =50Ω	-11	-8.2	—	dBmW
3 rd order intermodulation distortion output intercept point	OIP3	V _{CC} = 3V, f = 1.575GHz, Δf = 1MHz Z _S =Z _L =50Ω	2	5.9	—	dBmW
Input return loss	RL _{in}	V _{CC} = 3V, f = 1.575GHz Z _S =Z _L =50Ω	—	5.6	—	dB
Output return loss	RL _{out}	V _{CC} = 3V, f = 1.575GHz Z _S =Z _L =50Ω	—	7.8	—	dB
Isolation	ISL	V _{CC} = 3V, f = 1.575GHz Z _S =Z _L =50Ω	—	24.3	—	dB

Caution:

This device is sensitive to electrostatic discharge due to the high frequency transistor process of f_T=60GHz class is used for this product.

Please make enough tool and equipment earthed when you handle.



Equivalent Circuit

RF Test Circuit (Top View)

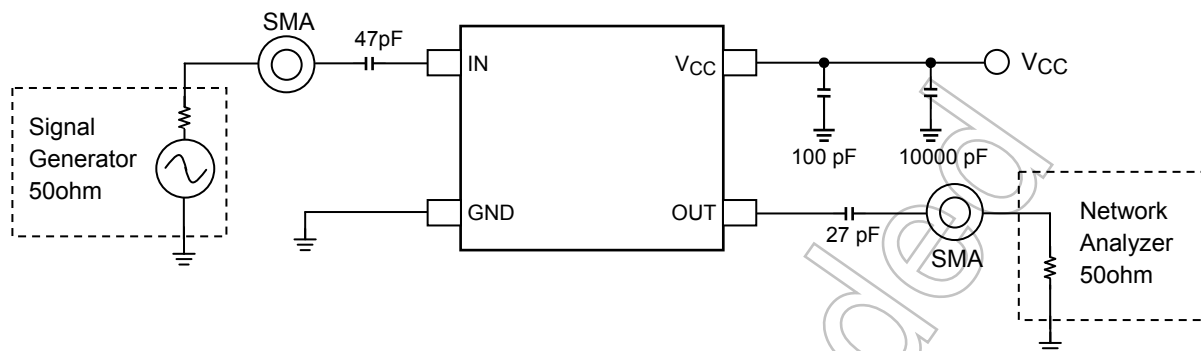
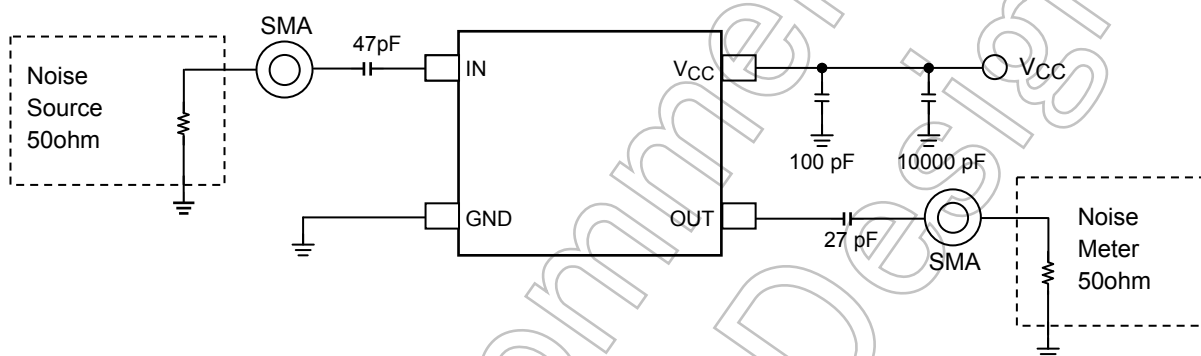
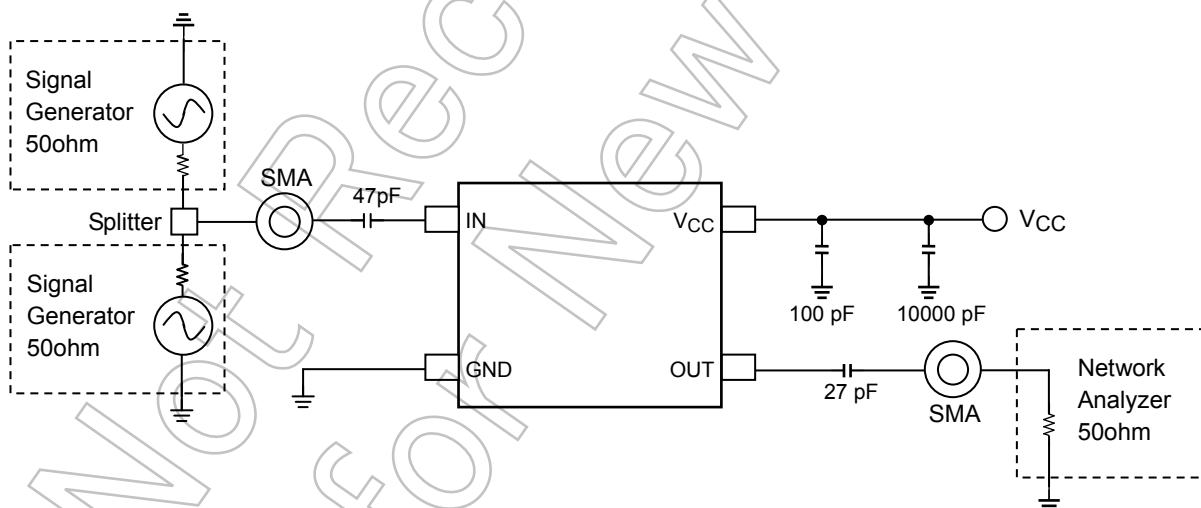
Fig.1 S21, RL_{in} , RL_{out} , ISL Test Circuit

Fig.2 NF Test Circuit

Fig.3 OIP₃, IIP₃ Test Circuit

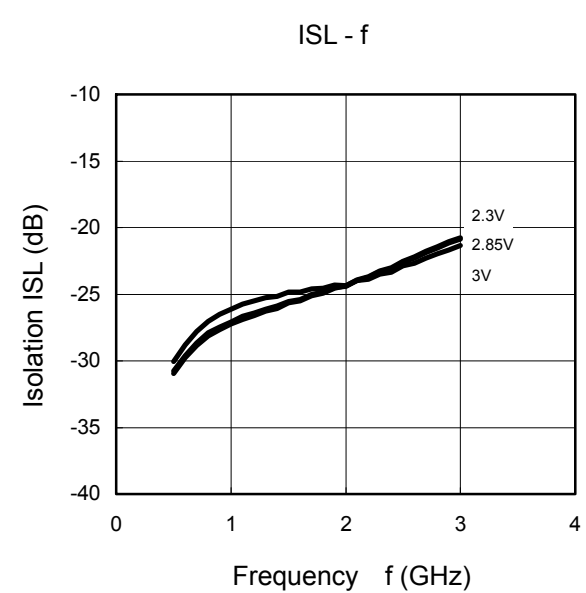
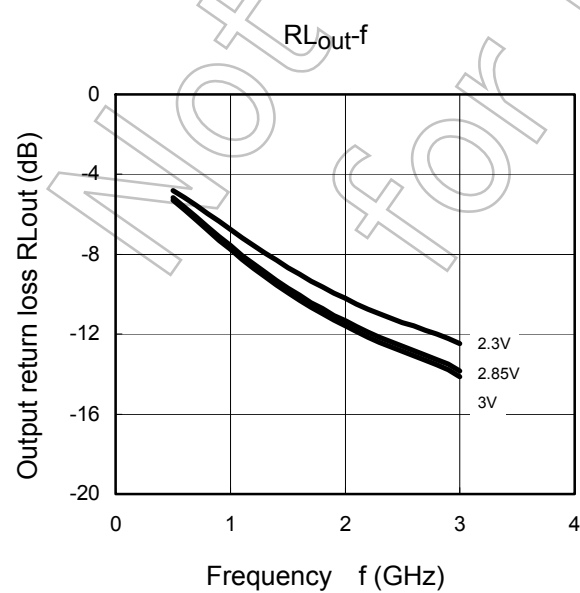
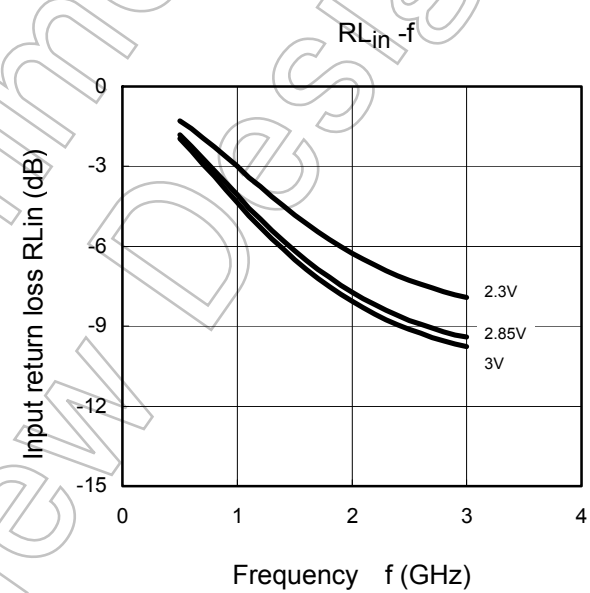
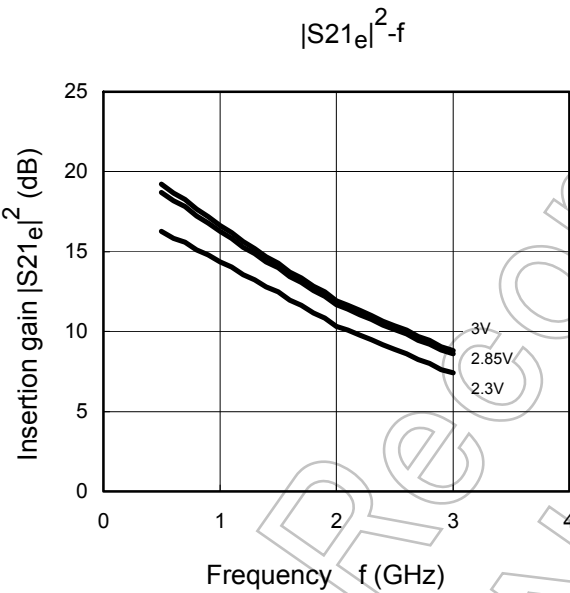
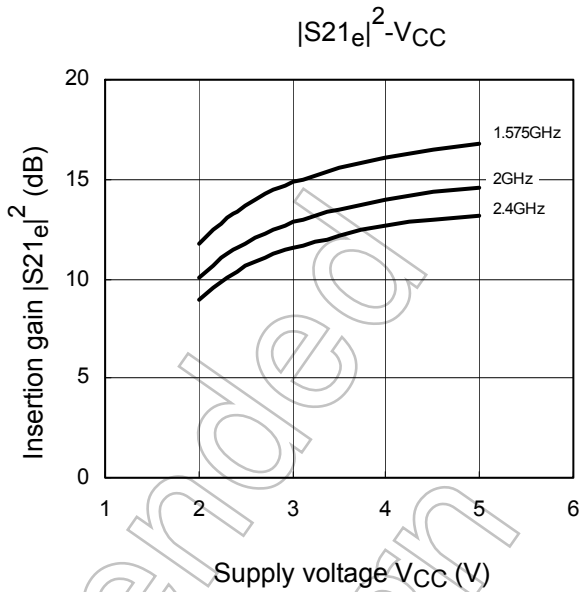
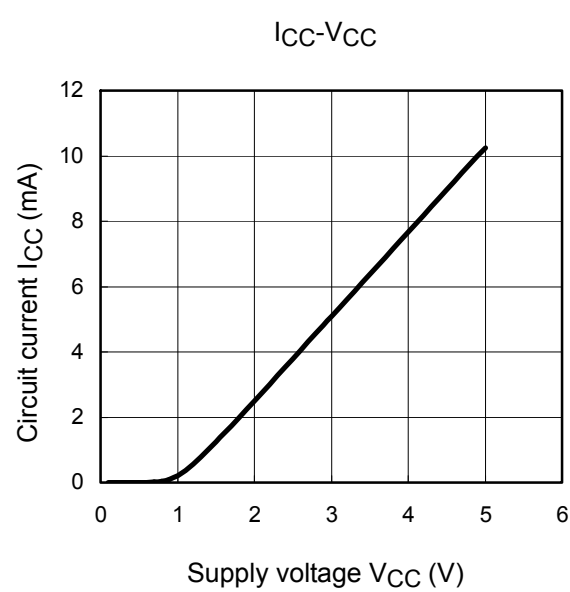
Notice

The circuits and measurements contained in this document are given only in the context of as examples of applications for these products.

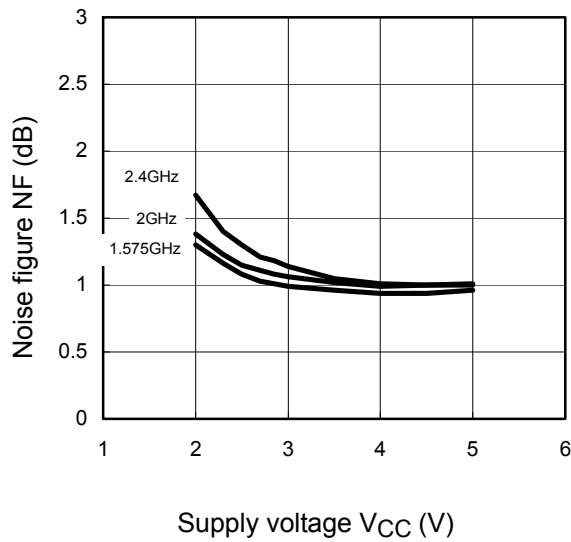
Moreover, these example application circuits are not intended for mass production, since the high-frequency characteristics (the AC characteristics) of these devices will be affected by the external components which the customer uses, by the design of the circuit and by various other conditions.

It is the responsibility of the customer to design external circuits which correctly implement the intended application, and to check the characteristics of the design.

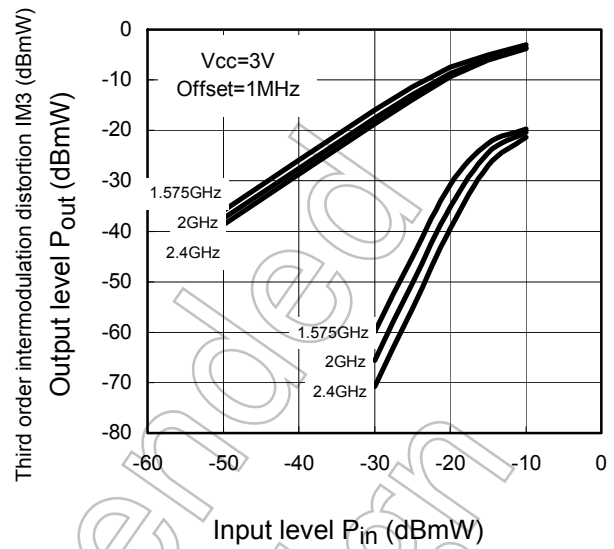
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NF- V_{CC}



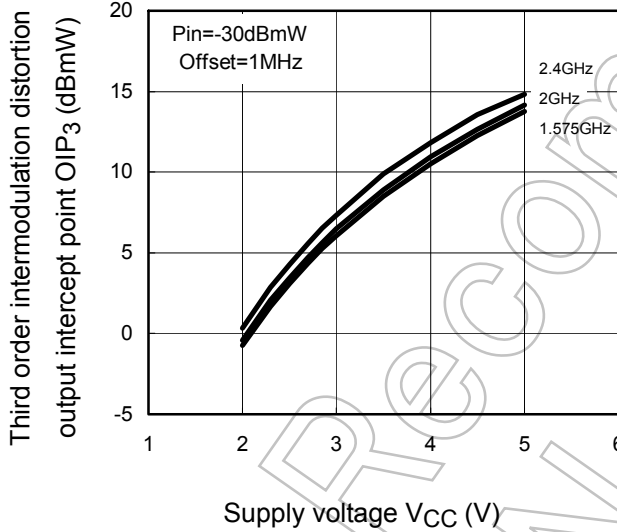
IM3/ P_{out} - P_{in}



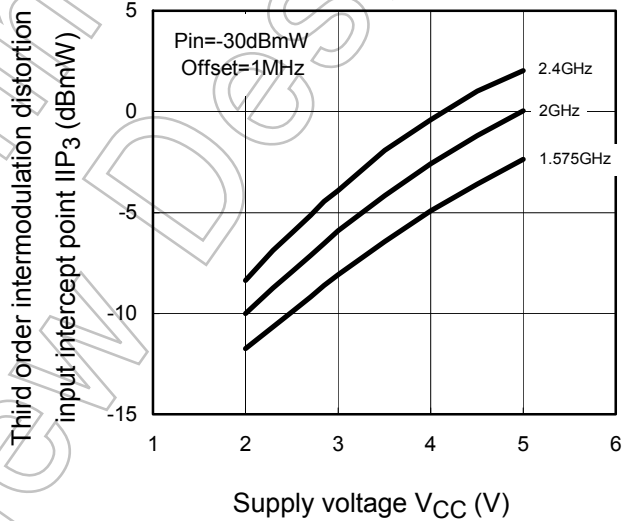
Supply voltage V_{CC} (V)

Input level P_{in} (dBmW)

OIP3- V_{CC}



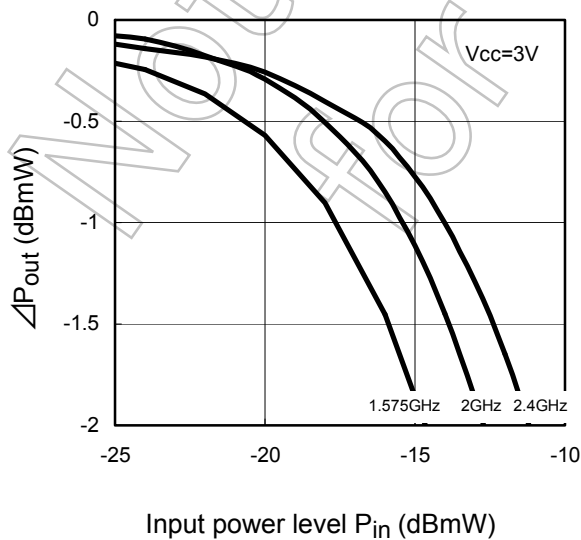
IIP3- V_{CC}



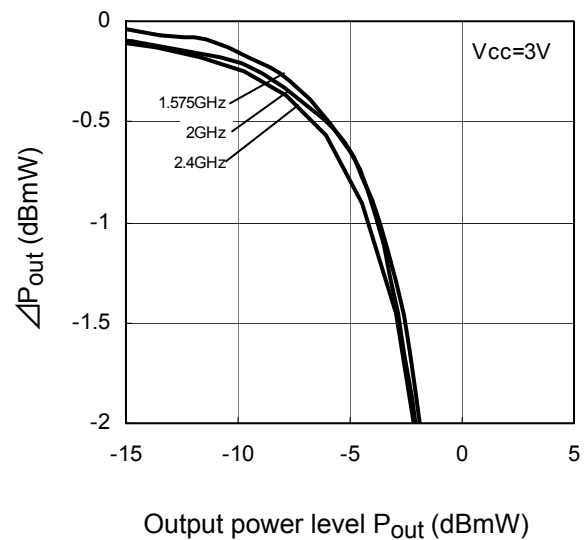
Supply voltage V_{CC} (V)

Supply voltage V_{CC} (V)

ΔP_{out} - P_{in}

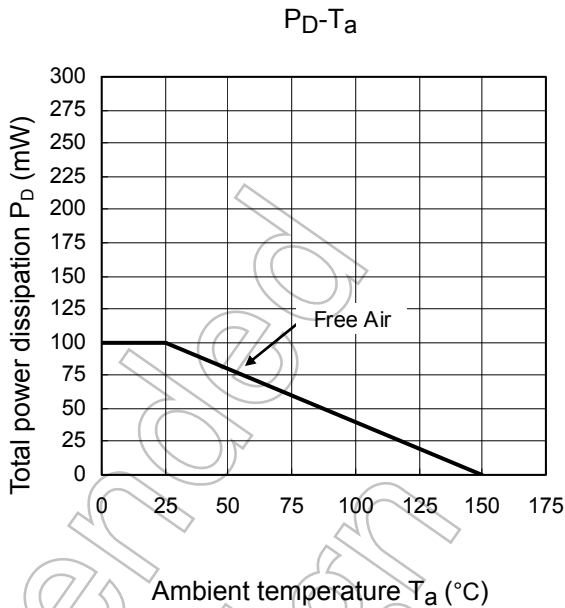
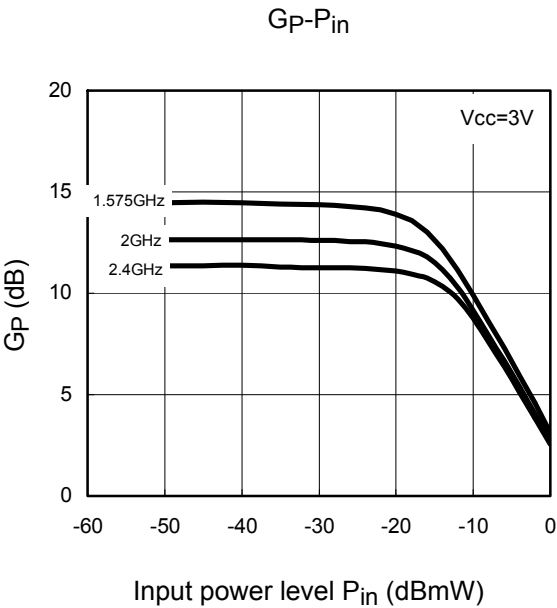


ΔP_{out} - P_{out}

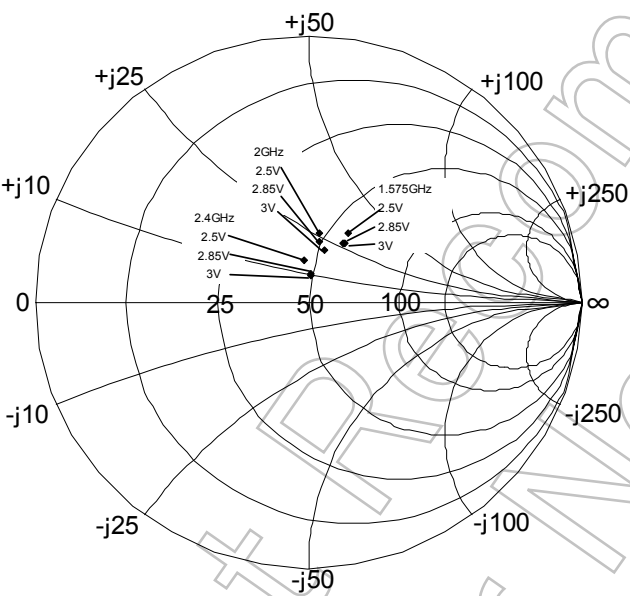


Input power level P_{in} (dBmW)

Output power level P_{out} (dBmW)



NFmin Γ opt

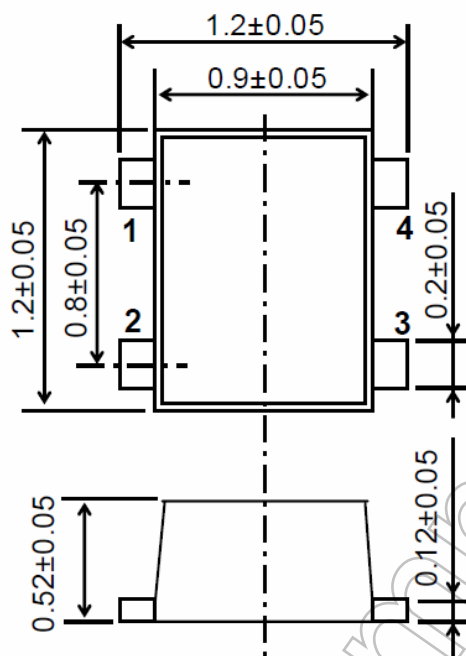


Frequency (GHz)	Vcc(V)	NFmin Γ opt			Rn
		NF(dB)	mag.(-)	ang.(°)	
1.575	3	0.85	0.255	58.3	8.1
	2.85	0.87	0.258	60.2	8.4
	2.5	0.89	0.295	60.6	9.2
2	3	0.95	0.201	73.8	8.3
	2.85	0.96	0.229	80.2	7.3
	2.5	0.97	0.263	81.3	6.8
2.4	3	1.05	0.159	95.3	6.9
	2.85	1.10	0.107	86.2	6.2
	2.5	1.17	0.097	85.8	6.0

Package Dimensions

Unit: mm

SON4-P-0101-0.80



Weight: 1.5 mg (Typ.)

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