DATA SHEET

NEC

BIPOLAR ANALOG INTEGRATED CIRCUITS

μPC8103T, μPC8108T

MIXER + OSCILLATOR IC FOR PAGER SYSTEM

DESCRIPTION

μPC8103T and μPC8108T are silicon monolithic integrated circuits designed as mixer-oscillator series for pager system. Due to 1 V supply voltage, these ICs are suitable for low voltage pager system. These ICs are packaged in 6 pin mini mold suitable for high-density surface mounting.

These ICs are manufactured using NEC's 20 GHz f_T NESAT™ III silicon bipolar process. This process uses silicon nitride passivation film and gold electrodes. These materials contributes excellent DC, AC perform-ance. Thus, these ICs are utilized as 1 V voltage ICs.

FEATURES

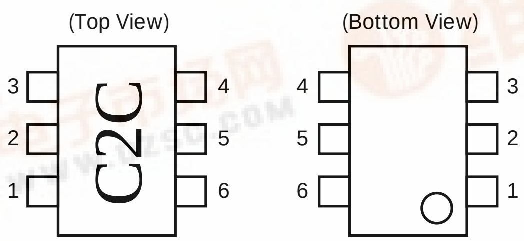
- 1 V supply voltage: V_{CC} = 1.0 V to 2.0 V
- Low current consumption μPC8103T: I_{CC} = 1.0 mA TYP. @ V_{CC} = 1.0 V
  μPC8108T: I_{CC} = 1.5 mA TYP. @ V_{CC} = 1.0 V
- Wide band operation μPC8103T: f_{RF} = 150 MHz to 330 MHz
  μPC8108T: f_{RF} = 150 MHz to 930 MHz
- High-density surface mounting: 6 pin mini mold

ORDERING INFORMATION

PART NUMBER	PACKAGE	SUPPLYING FORM
μPC8103T-E3 μPC8108T-E3	6pin mini mold	Embossed tape 8 mm wide, Pin 1, 2, 3 face to perforation side of tape. QTY 3 kp/Reel

Note To order evaluation samples, please contact your local NEC sales office. (Order number: μPC8103T, μPC8108T)

PIN CONNECTION

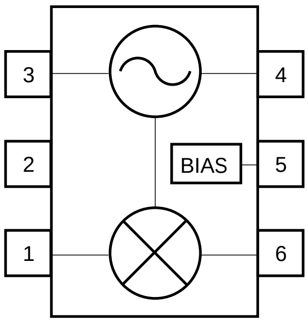


1 : RF INPUT
2 : GND
3 : OSC EMITTER
4 : OSC BASE
5 : V_{CC}
6 : IF OUTPUT

Markings μPC8103T: C2C
μPC8108T: C2F

Caution Electro-static sensitive devices

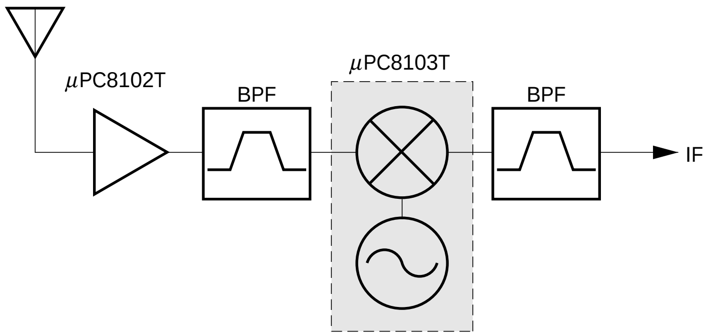
INTERNAL BOLOCK DIAGRAM (IN COMMON)



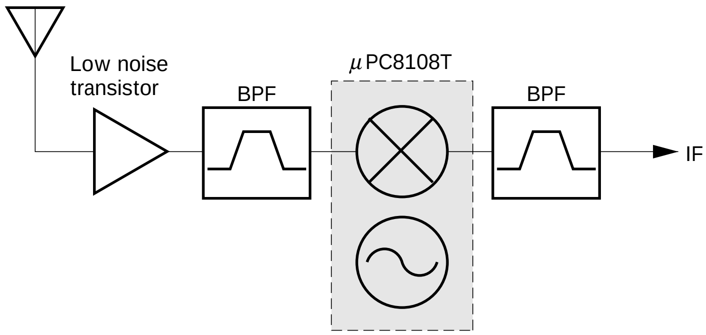
Note Resonator must be externally equipped with 3 and 4 pins. (Refer to pin explanations)

SYSTEM APPLICATION EXAMPLE AS PAGER

150 MHz to 330 MHz



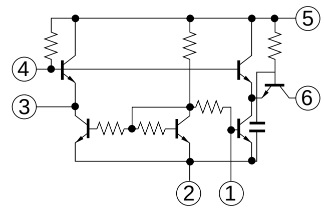
450 MHz to 930 MHz



This system application example schematically presents the chip set product line-up only, and does not imply a detail application circuit (In the case of application circuit example for μPC8103T and μPC8108T, please refer to page 21).

For details on the related devices, refer to the latest data sheet of each device.

PIN EXPLANATION (μPC8103T, μPC8108T IN COMMON)

PIN NO.	PIN NAME	SUPPLY VOLTAGE (V)	PIN VOLTAGE (V)	FUNCTION AND APPLICATION	EQUIVALENT CIRCUIT
1	RF input	—	0.77	RF input for mixer. This port is low impedance.	
2	GND	0	—	This ground pin must be connected to the system ground with minimum inductance. Ground pattern on the board should be formed as wide as possible. Track length should be kept as short as possible.	
3	OSC Emitter	—	0.19	Emitter, base pins of internal transistor for oscillator. These pins should be externally equipped with resonator circuit of X'tal or LC.	
4	OSC Base	—	0.95		
5	V_{CC}	1.0 to 2.0	—	Supply voltage pin. Connect bypass capacitor (eg 1 000 pF) to minimize ground impedance.	
6	IF Output	Same bias as V_{CC} through external inductor (L)	—	IF output pin from mixer. This pin is designed as open collector and should be equipped with inductor (L) because of high impedance port.	

Note Each PIN VOLTAGE is measured with V_{CC} = 1.0 V.

Unless otherwise specified, both product in common.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING	UNIT	CONDITIONS
Supply Voltage	V_{CC}	4.0	V	T_A = +25 °C, Pin 5 and 6
Power Dissipation	P_D	280	mW	Mounted on 50 × 50 × 1.6 mm double copper clad epoxy glass PWB at T_A = +85 °C
Operating Temperature	T_A	–40 to +85	°C	
Storage Temperature	T_{stg}	–55 to +150	°C	
IF Output Voltage Peak Level	$V_{IFout\ MAX.}$	5	V	T_A = +25 °C

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	NOTE
Supply Voltage	V_{CC}	1.0	1.05	2.0	V	Pin 5 and 6
Operating Temperature	T_A	–25	+25	+75	°C	Possible to oscillate
RF Frequency	f_{RF}	150		330	MHz	μPD8103T
RF Frequency	f_{RF}	150		930	MHz	μPD8108T

ELECTRICAL CHARACTERISTICS (T_A = +25 °C, V_{CC} = 1.0 V, Z_S = 50 Ω, Z_L = 2 kΩ, f_{IF} = 20 MHz, P_{Loin} = –21 dBm externally, Upper local Note)

PARAMETER	SYMBOL	μPC8103T			μPC8108T			UNIT	CONDITIONS
		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.		
Circuit Current	I_{CC}	0.55	1	1.4	1.0	1.5	2.1	mA	No input signals
Conversion Gain 1	CG1	13	16	19	17.5	20.5	23.5	dB	f_{RFin} = 150 MHz, TEST CIRCUIT 1
Conversion Gain 2	CG2	12.5	15.5	18.5	17	20	23	dB	f_{RFin} = 280 MHz, TEST CIRCUIT 1
Conversion Gain 3	CG3	12.5	15.5	18.5	17	20	23	dB	f_{RFin} = 330 MHz, TEST CIRCUIT 1
Conversion Gain 4	CG4	–	–	–	16	19	22	dB	f_{RFin} = 450 MHz, TEST CIRCUIT 1
Conversion Gain 5	CG5	–	–	–	12	15	18	dB	f_{RFin} = 930 MHz, TEST CIRCUIT 1

Note Upper local means '$f_{IF} = f_{Loin} - f_{RFin}$'.

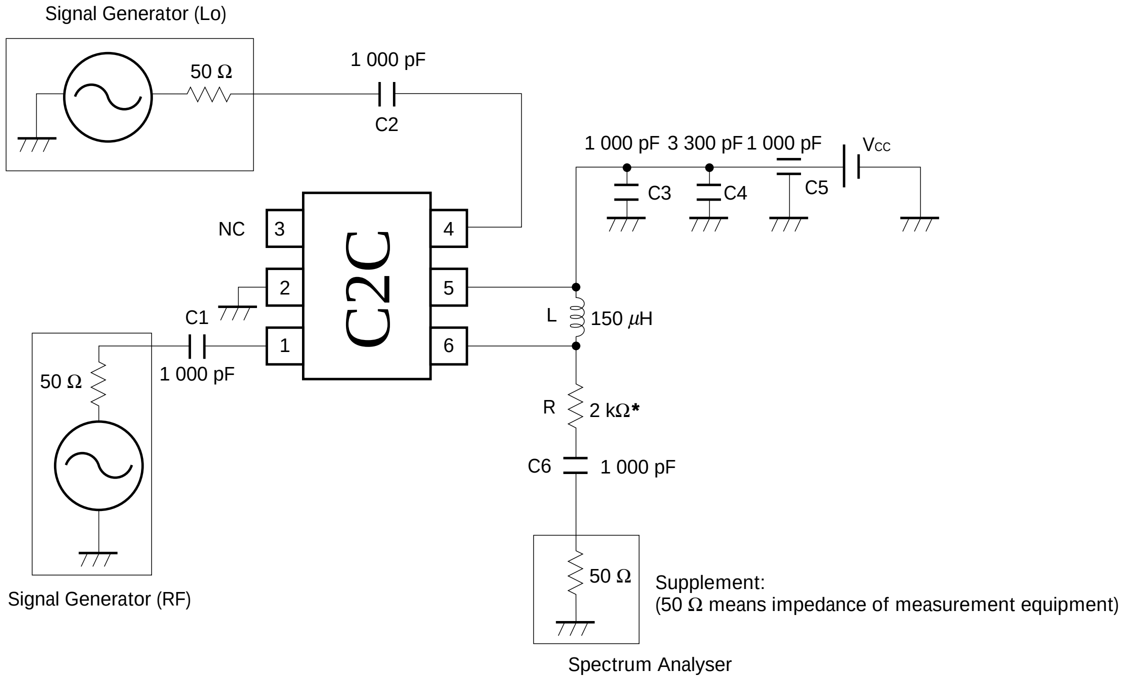
STANDARD CHARACTERISTICS FOR REFERENCE (T_A = +25 °C, V_{CC} = 1.0 V, Z_S = Z_L = 50 Ω, f_{IF} = 20 MHz, P_{Loin} externally, Upper local)

PARAMETER	SYMBOL	μPC8103T		μPC8108T		UNIT	CONDITIONS
		P_{Loin} = –21 dBm	P_{Loin} = –10 dBm	P_{Loin} = –21 dBm	P_{Loin} = –10 dBm		
Noise Figure 1	NF1	13	9	13	8.5	dB	f_{RFin} = 150 MHz, TEST CIRCUIT 2
Noise Figure 2	NF2	11.5	8	12	7	dB	f_{RFin} = 280 MHz, TEST CIRCUIT 2
Noise Figure 3	NF3	12	9	13	8	dB	f_{RFin} = 330 MHz, TEST CIRCUIT 2
Noise Figure 4	NF4	–	–	13.5	8	dB	f_{RFin} = 450 MHz, TEST CIRCUIT 2
Noise Figure 5	NF5	–	–	18	11.5	dB	f_{RFin} = 930 MHz, TEST CIRCUIT 2

Note Upper local means 'f_{IF} = f_{Loin} – f_{RFin}'.

TEST CIRCUIT 1

R_S = 50 Ω, R_L = 2 kΩ (CG MEASUREMENT)



*** Note** On 50 Ω measurement, this high inpedance IFout needs the calculatiuon as follows

$$CG\ (dB) = \text{Measured value} + 20 \log_{10} \frac{2\ k\Omega}{50\ \Omega}$$

TEST CIRCUIT 2

R_S = R_L = 50 Ω (NF MEASUREMENT)

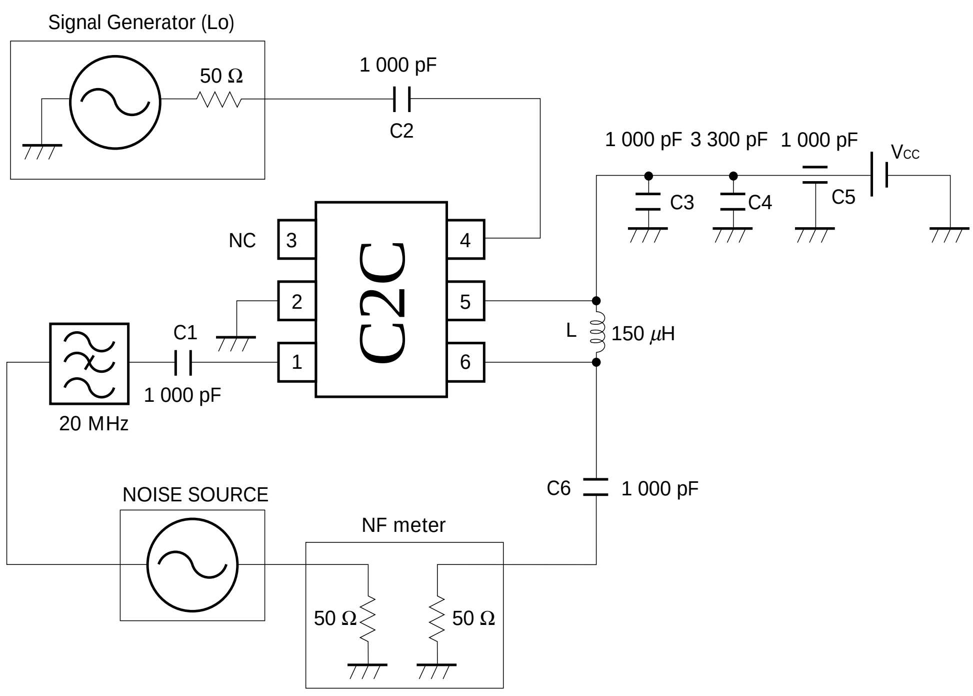
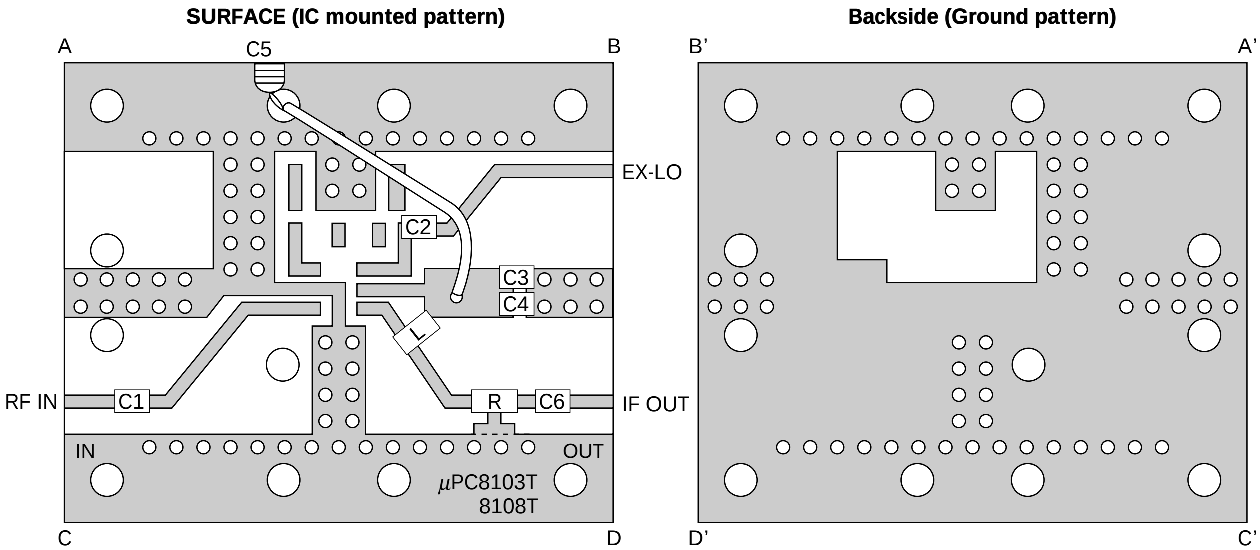


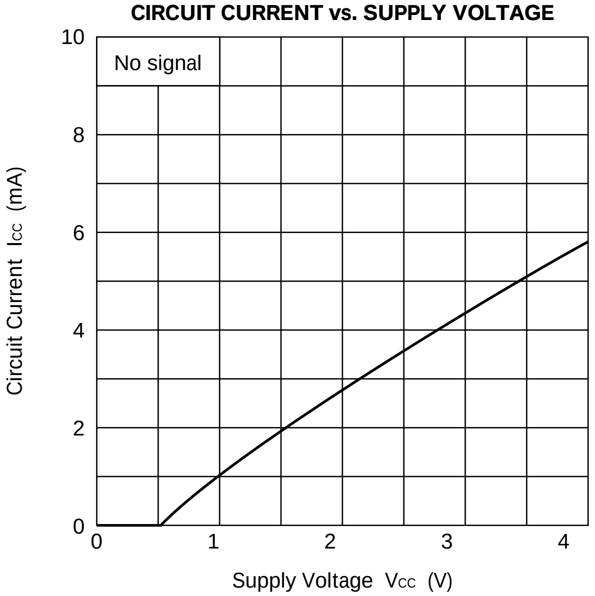
ILLUSTRATION OF TEST CIRCUITS ASSEMBLED ON EVALUATION BOARD

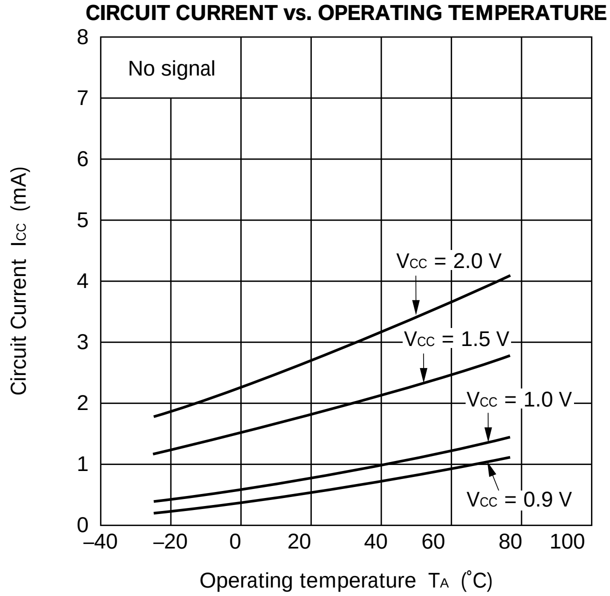


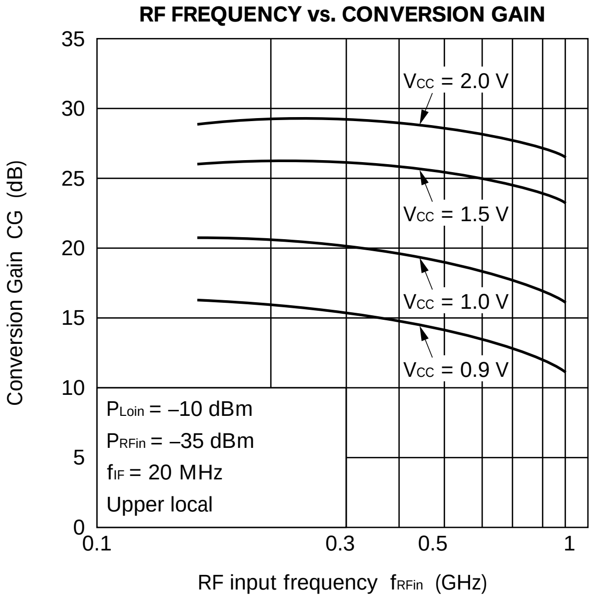
Note **(*1)** 35 × 42 × 0.4 mm double sided copper clad polyimide board
(*2) Solder plated pattern
(*3) Surface vs. backside : A - A', B - B', C - C', D - D'
(*4) ⬚ should be removed.
(*5) In the care of NF measurement, remove R and short.
(*6) ○ ◯ : Through holes

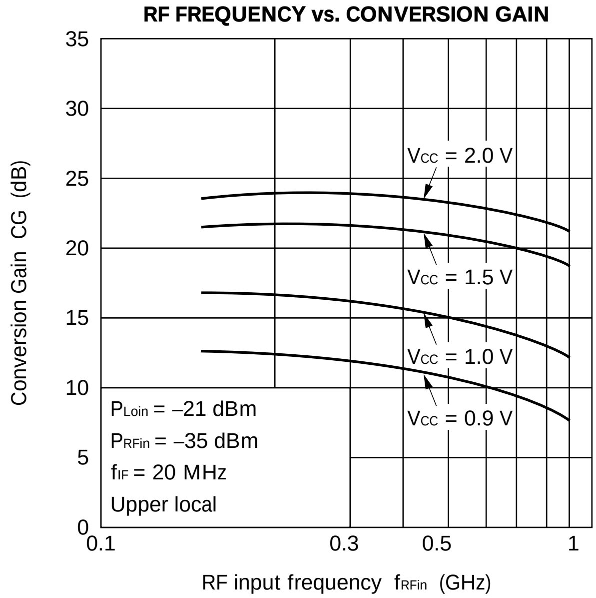
CHARACTERISTIC CURVES (Unless otherwise specified with TEST CIRCUIT 1 or 2)

— μPC8103T —

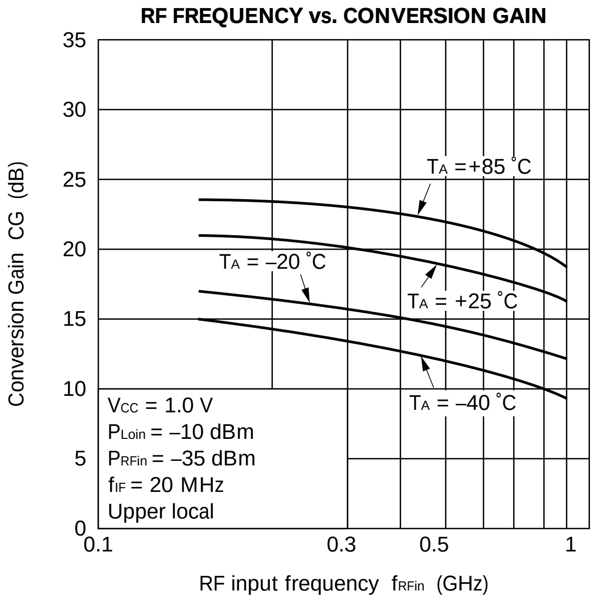


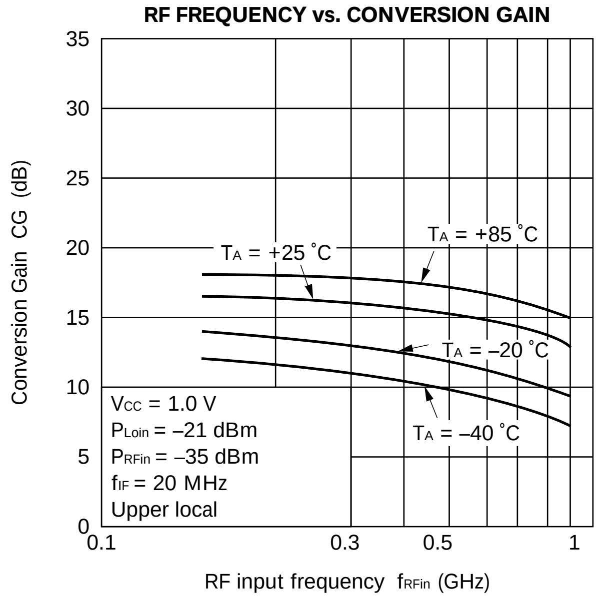


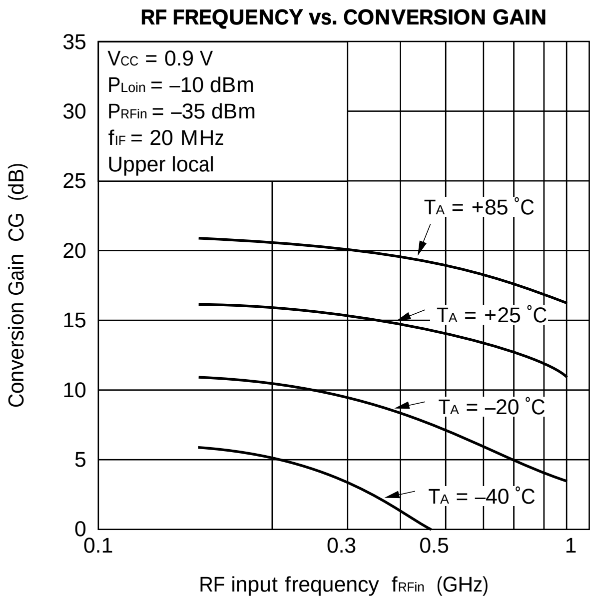


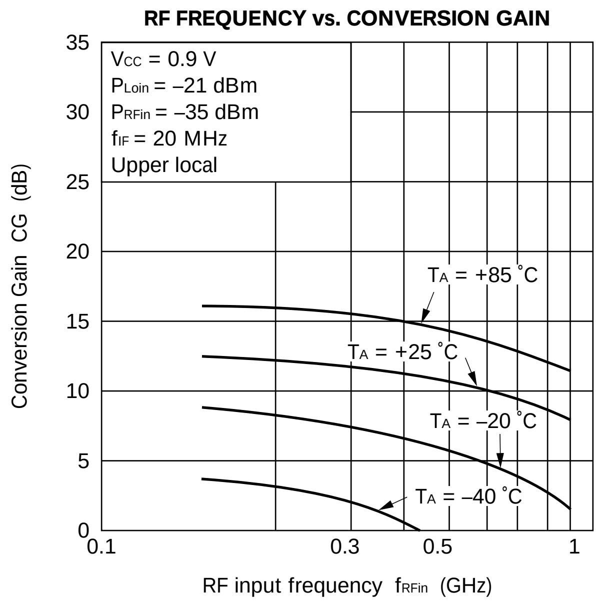


— μPC8103T —

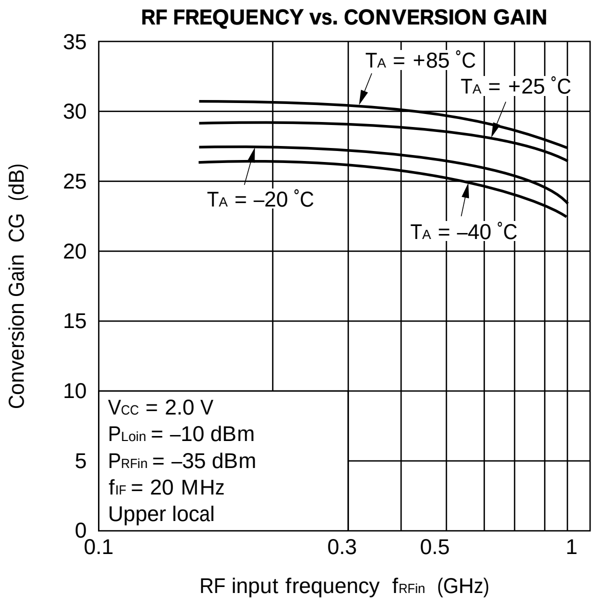

RF FREQUENCY vs. CONVERSION GAIN
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)
TA =+85 °C
TA = –20 °C
TA = +25 °C
TA = –40 °C
VCC = 1.0 V
PLoin = –10 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local

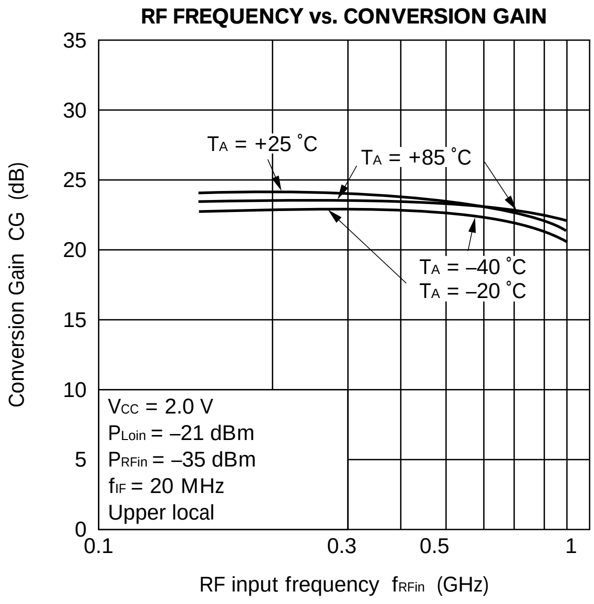

RF FREQUENCY vs. CONVERSION GAIN
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)
TA = +25 °C
TA = +85 °C
TA = –20 °C
TA = –40 °C
VCC = 1.0 V
PLoin = –21 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local

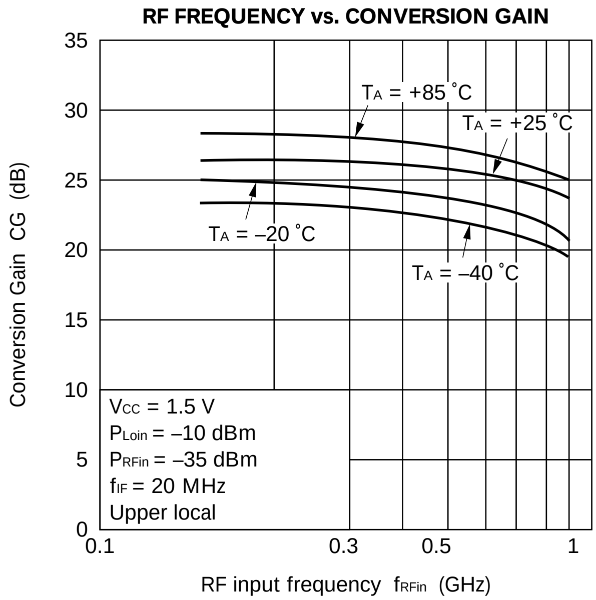

RF FREQUENCY vs. CONVERSION GAIN
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)
VCC = 0.9 V
PLoin = –10 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C

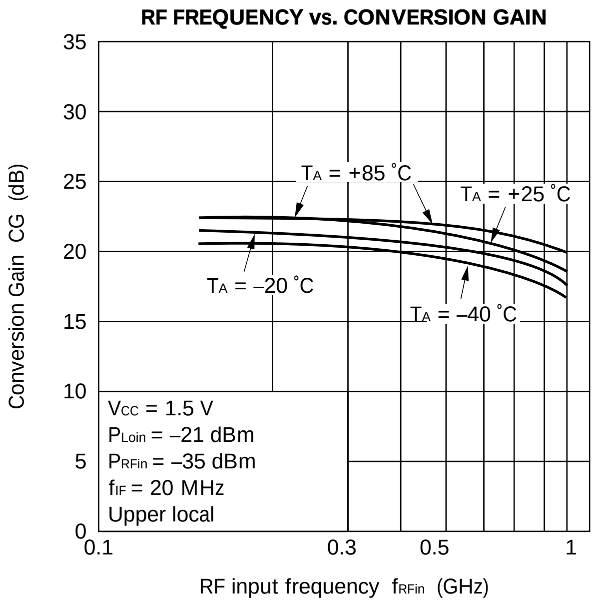

RF FREQUENCY vs. CONVERSION GAIN
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)
VCC = 0.9 V
PLoin = –21 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C

— μPC8103T —


RF FREQUENCY vs. CONVERSION GAIN
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C
VCC = 2.0 V
PLoin = –10 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)

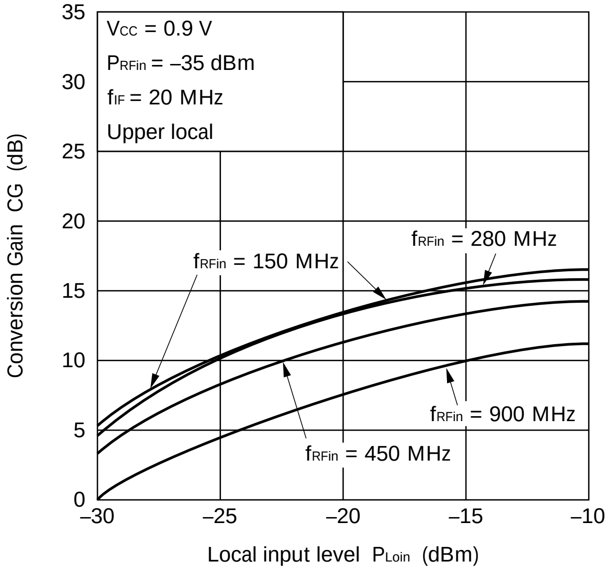

RF FREQUENCY vs. CONVERSION GAIN
TA = +25 °C
TA = +85 °C
TA = –40 °C
TA = –20 °C
VCC = 2.0 V
PLoin = –21 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)


RF FREQUENCY vs. CONVERSION GAIN
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C
VCC = 1.5 V
PLoin = –10 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)

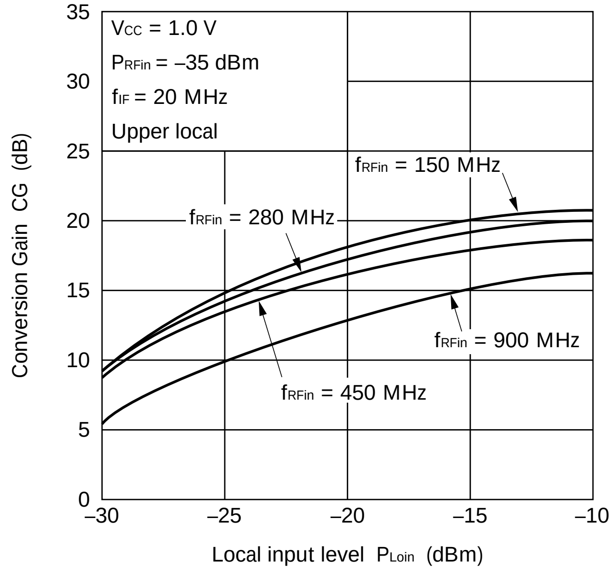

RF FREQUENCY vs. CONVERSION GAIN
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C
VCC = 1.5 V
PLoin = –21 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)

— μPC8103T —

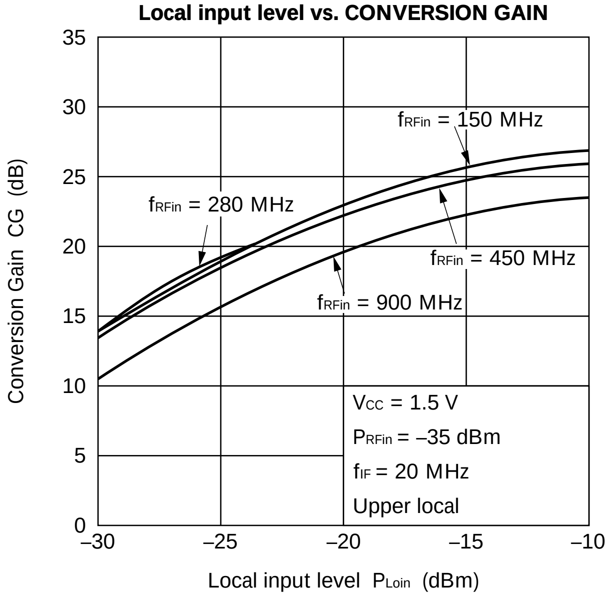
Local input level vs. CONVERSION GAIN



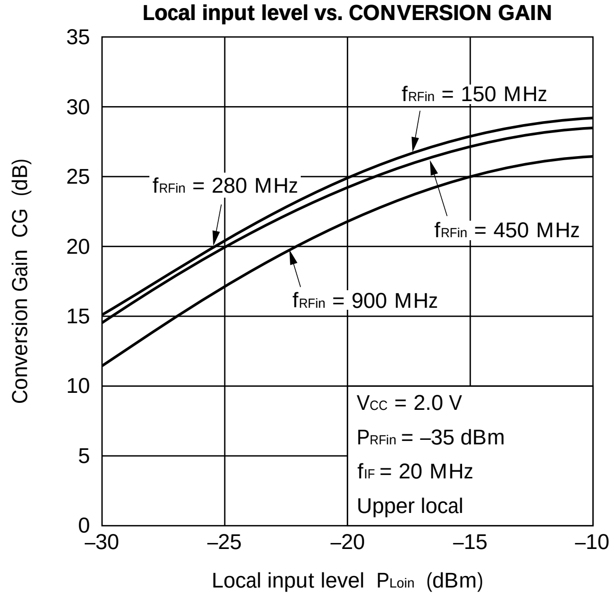
Local input level vs. CONVERSION GAIN



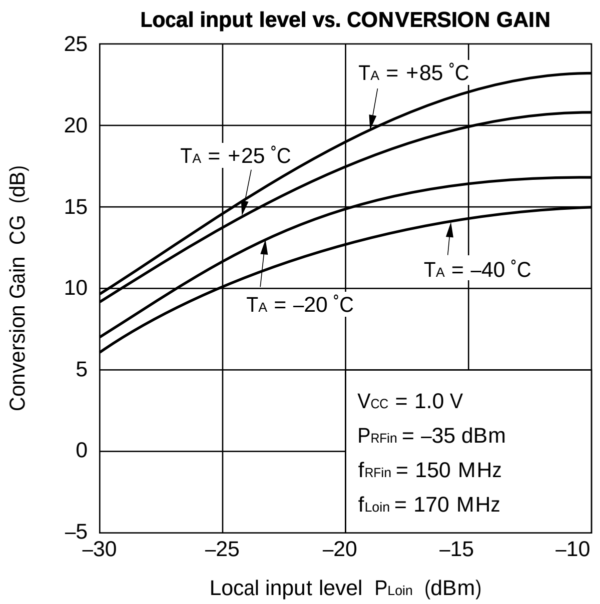
Local input level vs. CONVERSION GAIN

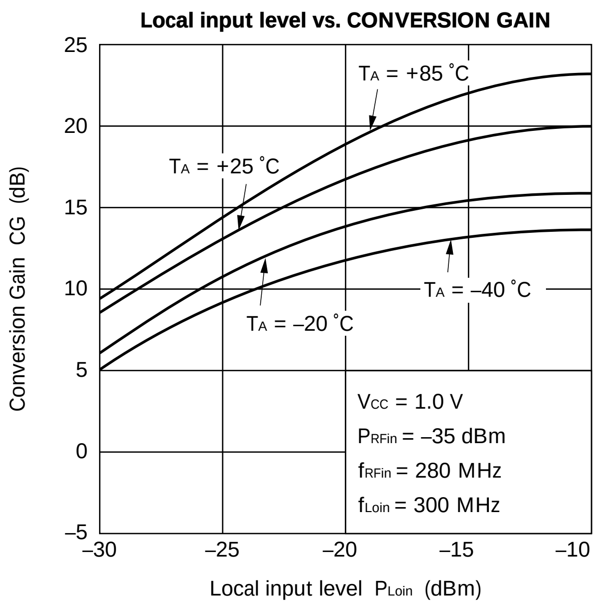


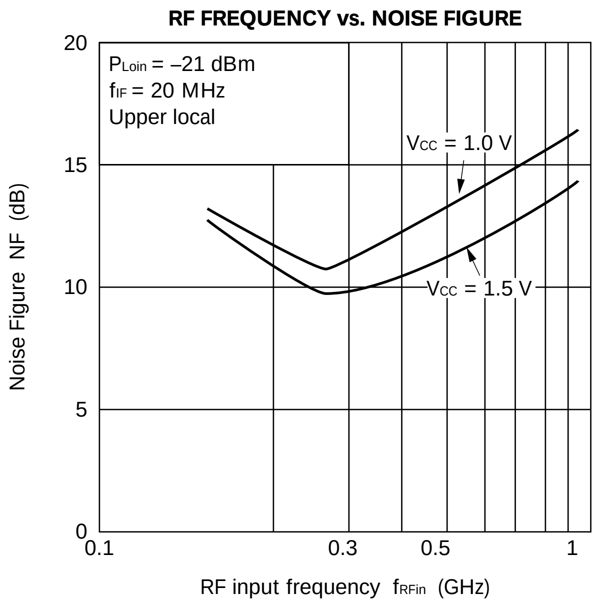
Local input level vs. CONVERSION GAIN

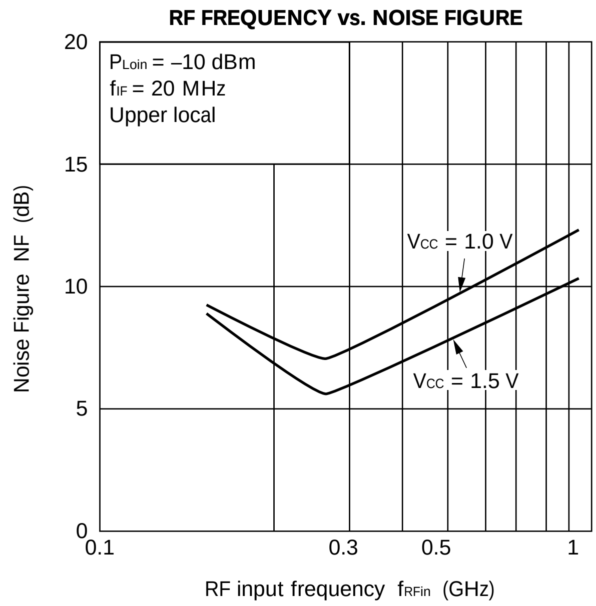


— μPC8103T —

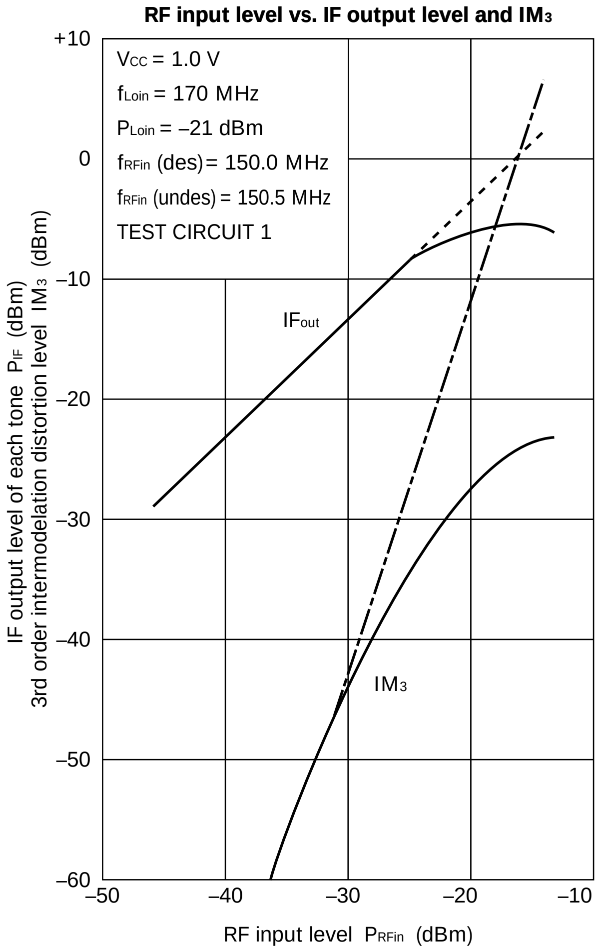

Local input level vs. CONVERSION GAIN
Conversion Gain CG (dB)
Local input level PLoin (dBm)
TA = +85 ˚C
TA = +25 ˚C
TA = –20 ˚C
TA = –40 ˚C
VCC = 1.0 V
PRFin = –35 dBm
fRFin = 150 MHz
fLoin = 170 MHz

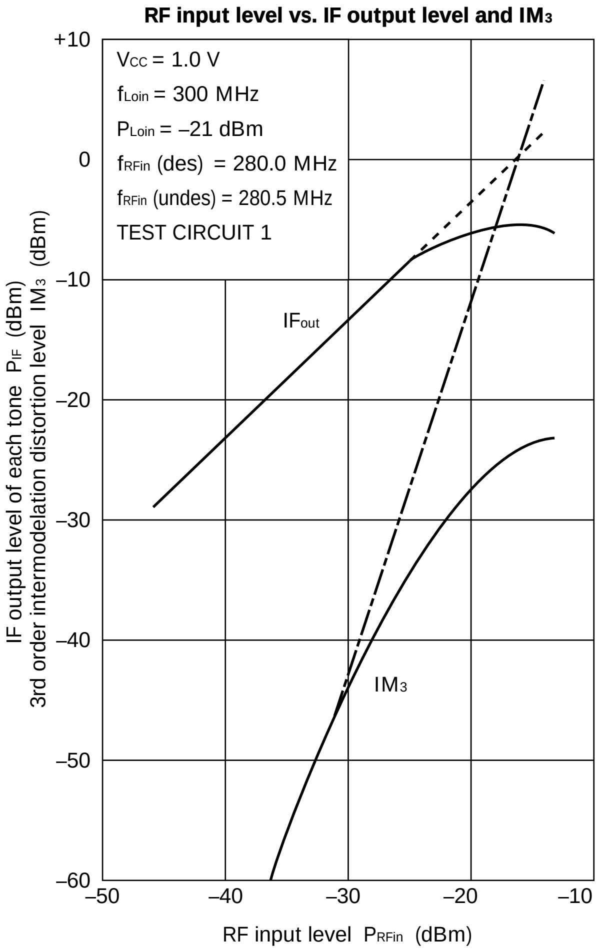

Local input level vs. CONVERSION GAIN
Conversion Gain CG (dB)
Local input level PLoin (dBm)
TA = +85 ˚C
TA = +25 ˚C
TA = –20 ˚C
TA = –40 ˚C
VCC = 1.0 V
PRFin = –35 dBm
fRFin = 280 MHz
fLoin = 300 MHz


RF FREQUENCY vs. NOISE FIGURE
Noise Figure NF (dB)
RF input frequency fRFin (GHz)
PLoin = –21 dBm
fIF = 20 MHz
Upper local
VCC = 1.0 V
VCC = 1.5 V

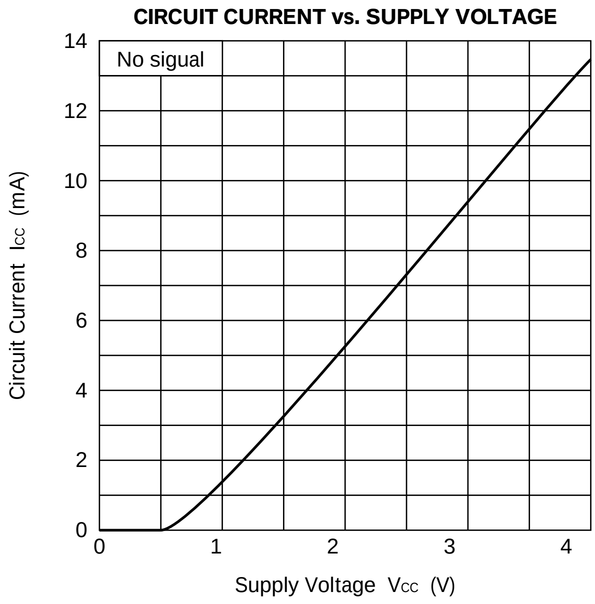

RF FREQUENCY vs. NOISE FIGURE
Noise Figure NF (dB)
RF input frequency fRFin (GHz)
PLoin = –10 dBm
fIF = 20 MHz
Upper local
VCC = 1.0 V
VCC = 1.5 V

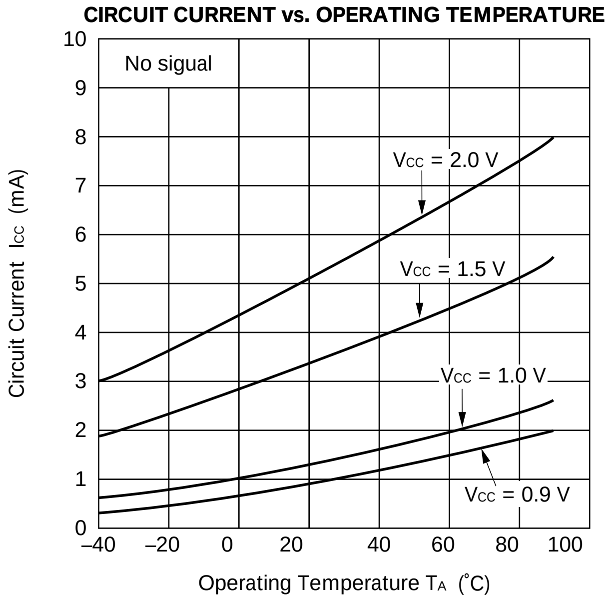
— μPC8103T —

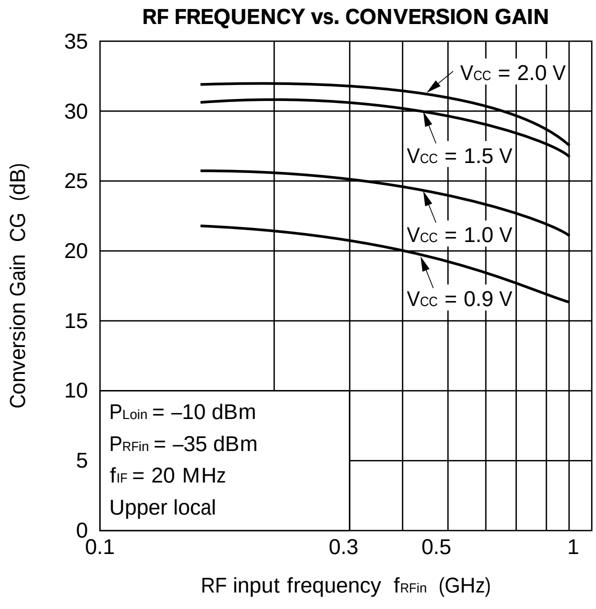

RF input level vs. IF output level and IM3
+10
0
–10
–20
–30
–40
–50
–60
–50
–40
–30
–20
–10
VCC = 1.0 V
fLoin = 170 MHz
PLoin = –21 dBm
fRFin (des) = 150.0 MHz
fRFin (undes) = 150.5 MHz
TEST CIRCUIT 1
IFout
IM3
IF output level of each tone PIF (dBm)
3rd order intermodelation distortion level IM3 (dBm)
RF input level PRFin (dBm)

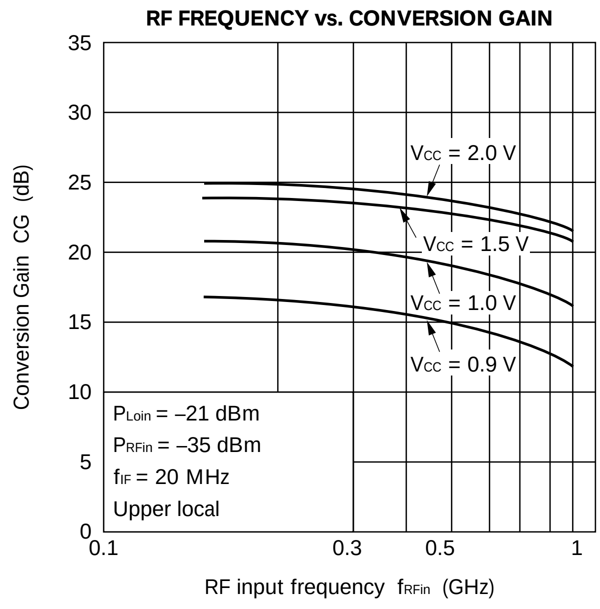

RF input level vs. IF output level and IM3
+10
0
–10
–20
–30
–40
–50
–60
–50
–40
–30
–20
–10
VCC = 1.0 V
fLoin = 300 MHz
PLoin = –21 dBm
fRFin (des) = 280.0 MHz
fRFin (undes) = 280.5 MHz
TEST CIRCUIT 1
IFout
IM3
IF output level of each tone PIF (dBm)
3rd order intermodelation distortion level IM3 (dBm)
RF input level PRFin (dBm)

— μPC8108T —

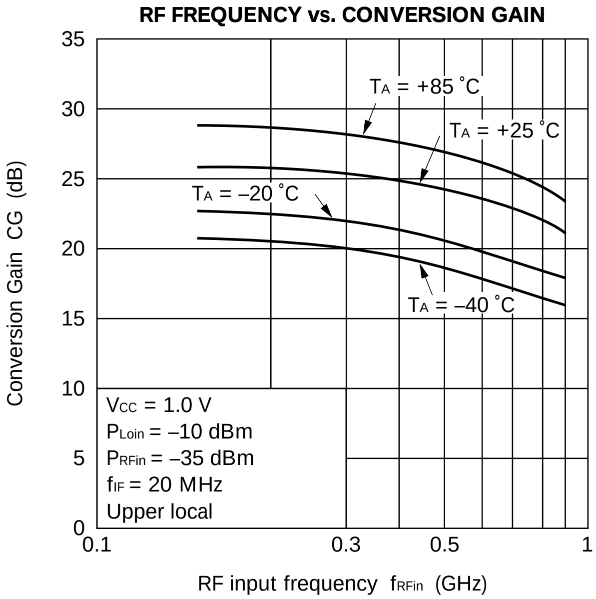

CIRCUIT CURRENT vs. SUPPLY VOLTAGE
No sigual
Circuit Current ICC (mA)
Supply Voltage VCC (V)
0
2
4
6
8
10
12
14
0
1
2
3
4

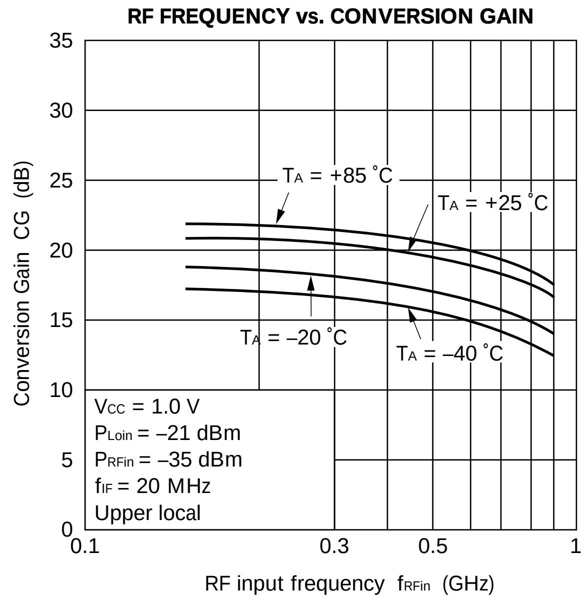

CIRCUIT CURRENT vs. OPERATING TEMPERATURE
No sigual
VCC = 2.0 V
VCC = 1.5 V
VCC = 1.0 V
VCC = 0.9 V
Circuit Current ICC (mA)
Operating Temperature TA (˚C)
0
1
2
3
4
5
6
7
8
9
10
–40
–20
0
20
40
60
80
100

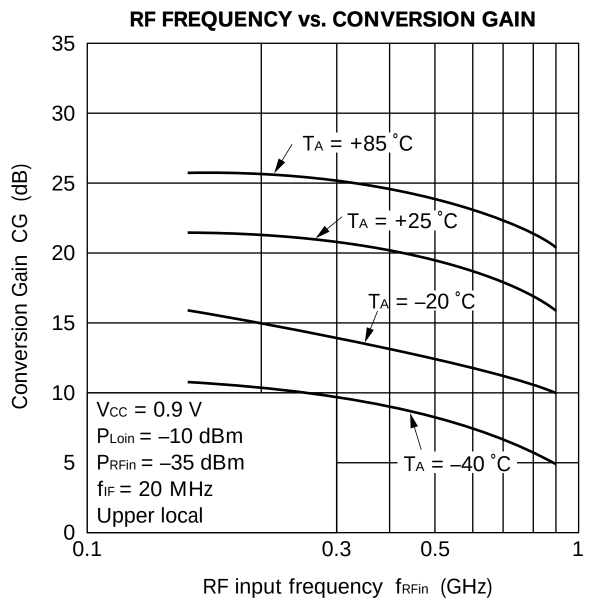

RF FREQUENCY vs. CONVERSION GAIN
VCC = 2.0 V
VCC = 1.5 V
VCC = 1.0 V
VCC = 0.9 V
PLoin = –10 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)
0
5
10
15
20
25
30
35
0.1
0.3
0.5
1

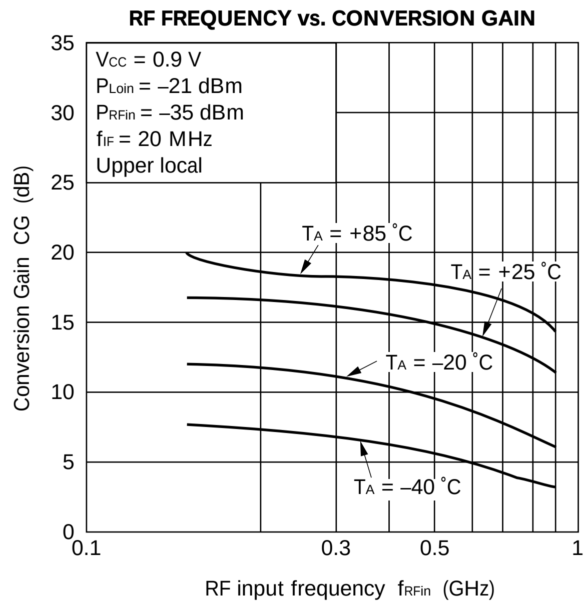

RF FREQUENCY vs. CONVERSION GAIN
VCC = 2.0 V
VCC = 1.5 V
VCC = 1.0 V
VCC = 0.9 V
PLoin = –21 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)
0
5
10
15
20
25
30
35
0.1
0.3
0.5
1

— μPC8108T —


RF FREQUENCY vs. CONVERSION GAIN
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C
VCC = 1.0 V
PLoin = –10 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)


RF FREQUENCY vs. CONVERSION GAIN
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C
VCC = 1.0 V
PLoin = –21 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)


RF FREQUENCY vs. CONVERSION GAIN
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C
VCC = 0.9 V
PLoin = –10 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)


RF FREQUENCY vs. CONVERSION GAIN
VCC = 0.9 V
PLoin = –21 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)

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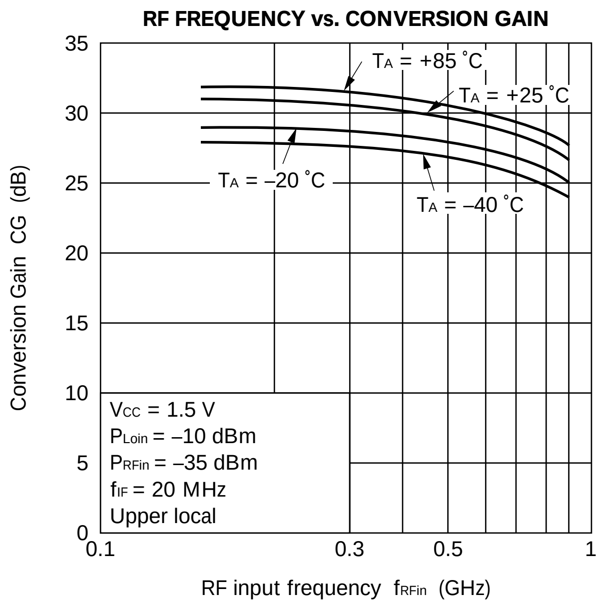
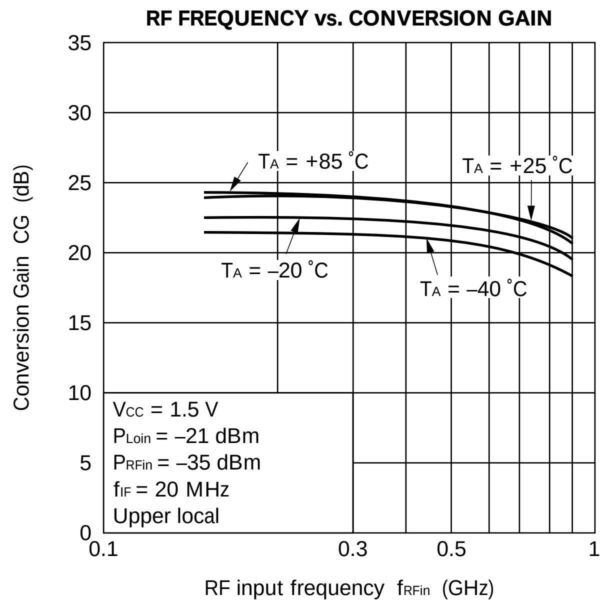
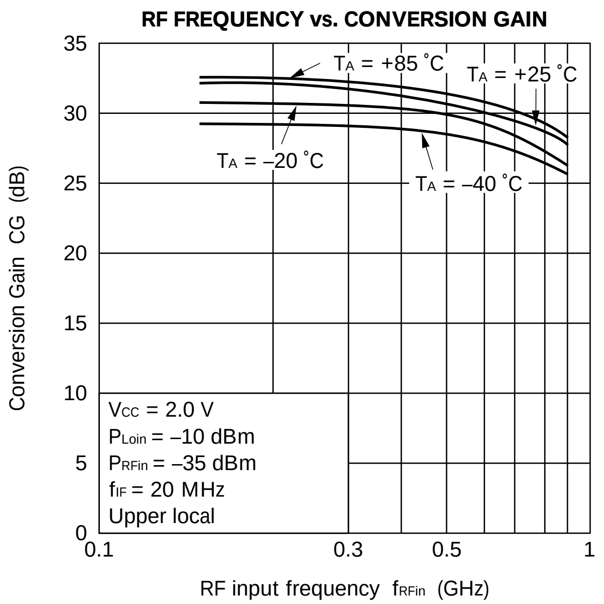
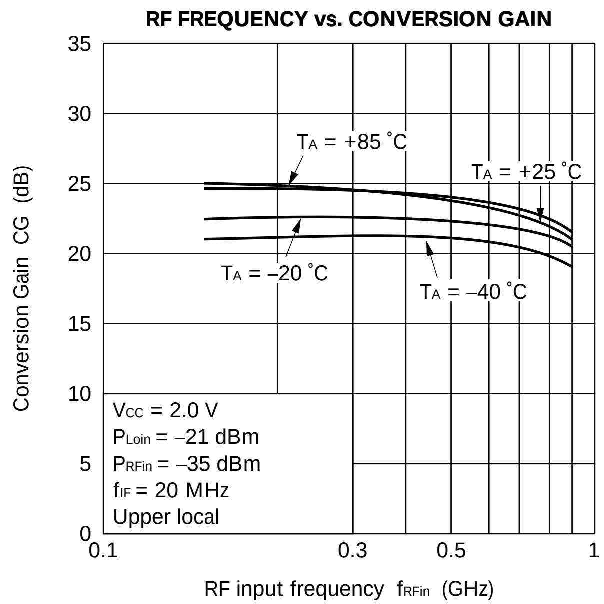
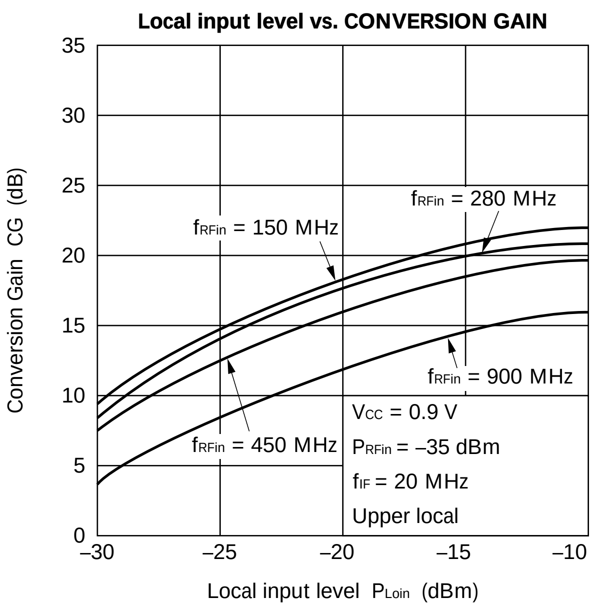

RF FREQUENCY vs. CONVERSION GAIN
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C
VCC = 1.5 V
PLoin = –10 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local

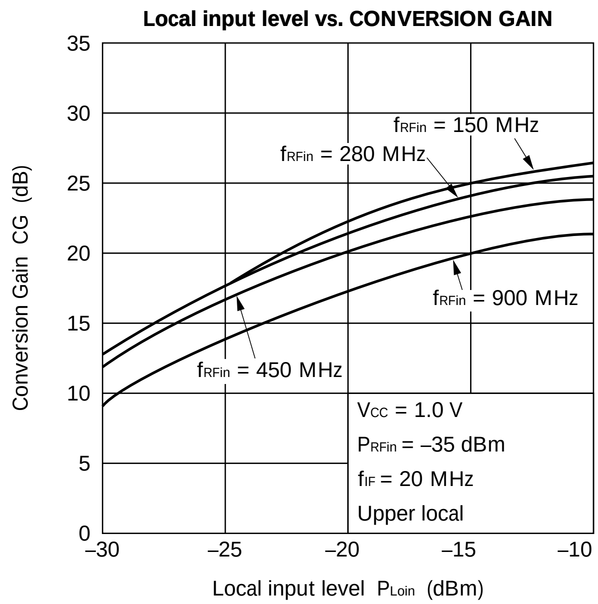

RF FREQUENCY vs. CONVERSION GAIN
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C
VCC = 1.5 V
PLoin = –21 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local

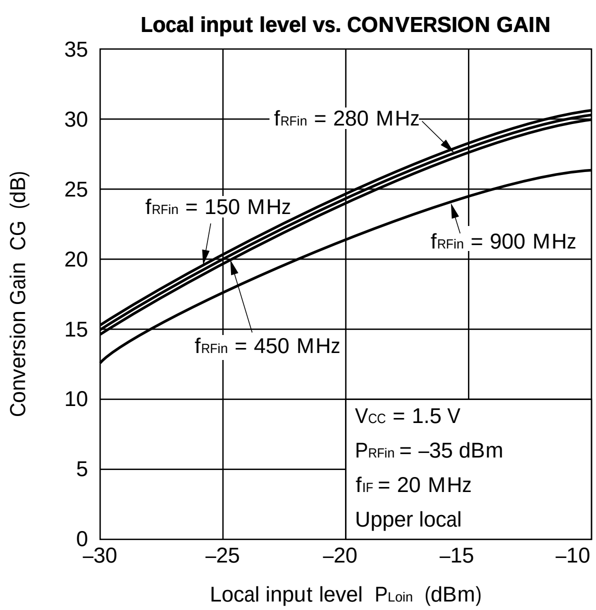

RF FREQUENCY vs. CONVERSION GAIN
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C
VCC = 2.0 V
PLoin = –10 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local

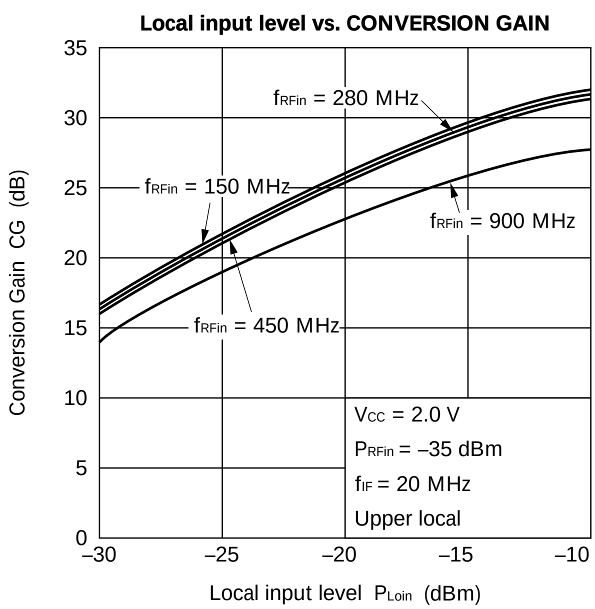

RF FREQUENCY vs. CONVERSION GAIN
Conversion Gain CG (dB)
RF input frequency fRFin (GHz)
TA = +85 °C
TA = +25 °C
TA = –20 °C
TA = –40 °C
VCC = 2.0 V
PLoin = –21 dBm
PRFin = –35 dBm
fIF = 20 MHz
Upper local

— μPC8108T —


Local input level vs. CONVERSION GAIN
Conversion Gain CG (dB)
Local input level PLoin (dBm)
fRFin = 150 MHz
fRFin = 280 MHz
fRFin = 450 MHz
fRFin = 900 MHz
VCC = 0.9 V
PRFin = –35 dBm
fIF = 20 MHz
Upper local


Local input level vs. CONVERSION GAIN
Conversion Gain CG (dB)
Local input level PLoin (dBm)
fRFin = 150 MHz
fRFin = 280 MHz
fRFin = 450 MHz
fRFin = 900 MHz
VCC = 1.0 V
PRFin = –35 dBm
fIF = 20 MHz
Upper local


Local input level vs. CONVERSION GAIN
Conversion Gain CG (dB)
Local input level PLoin (dBm)
fRFin = 280 MHz
fRFin = 150 MHz
fRFin = 900 MHz
fRFin = 450 MHz
VCC = 1.5 V
PRFin = –35 dBm
fIF = 20 MHz
Upper local


Local input level vs. CONVERSION GAIN
Conversion Gain CG (dB)
Local input level PLoin (dBm)
fRFin = 280 MHz
fRFin = 150 MHz
fRFin = 900 MHz
fRFin = 450 MHz
VCC = 2.0 V
PRFin = –35 dBm
fIF = 20 MHz
Upper local

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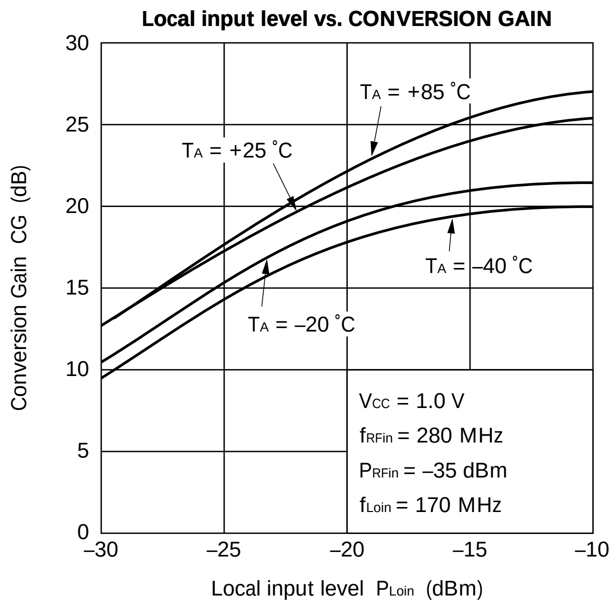
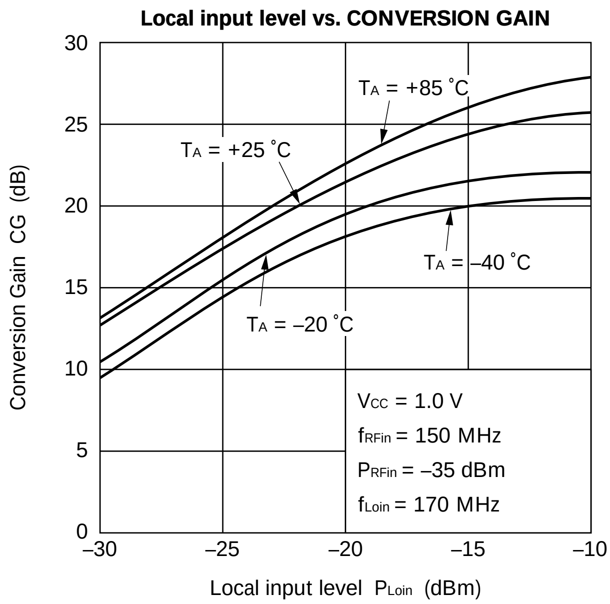
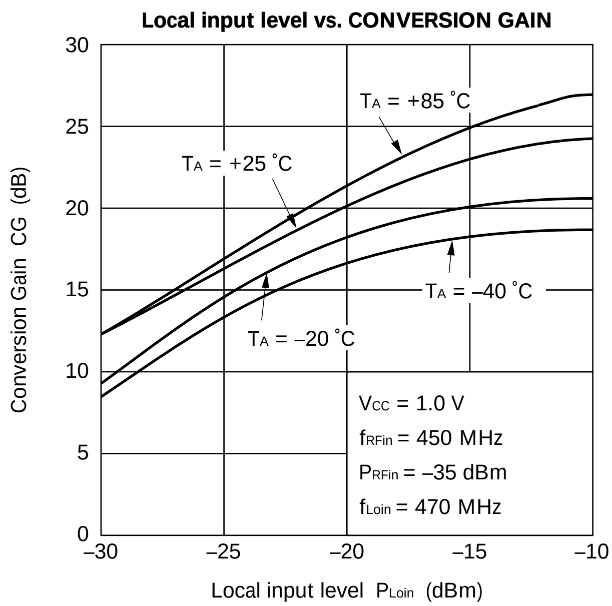
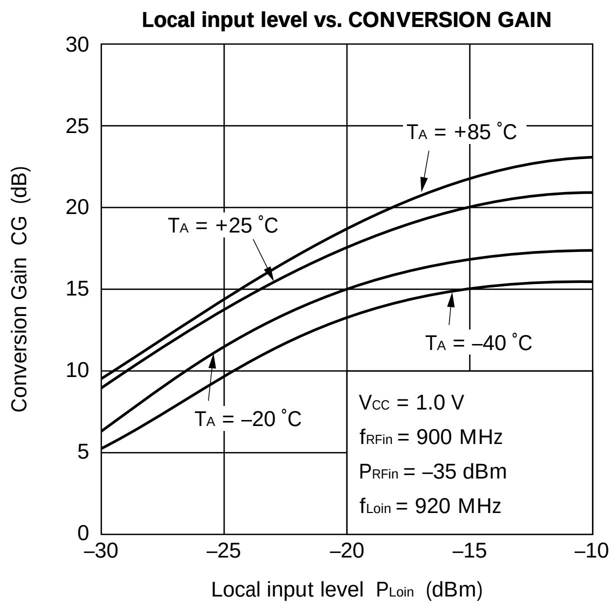

Local input level vs. CONVERSION GAIN
Conversion Gain CG (dB)
Local input level PLoin (dBm)
TA = +85 °C
TA = +25 °C
TA = –40 °C
TA = –20 °C
VCC = 1.0 V
fRFin = 280 MHz
PRFin = –35 dBm
fLoin = 170 MHz


Local input level vs. CONVERSION GAIN
Conversion Gain CG (dB)
Local input level PLoin (dBm)
TA = +85 °C
TA = +25 °C
TA = –40 °C
TA = –20 °C
VCC = 1.0 V
fRFin = 150 MHz
PRFin = –35 dBm
fLoin = 170 MHz


Local input level vs. CONVERSION GAIN
Conversion Gain CG (dB)
Local input level PLoin (dBm)
TA = +85 °C
TA = +25 °C
TA = –40 °C
TA = –20 °C
VCC = 1.0 V
fRFin = 450 MHz
PRFin = –35 dBm
fLoin = 470 MHz


Local input level vs. CONVERSION GAIN
Conversion Gain CG (dB)
Local input level PLoin (dBm)
TA = +85 °C
TA = +25 °C
TA = –40 °C
TA = –20 °C
VCC = 1.0 V
fRFin = 900 MHz
PRFin = –35 dBm
fLoin = 920 MHz

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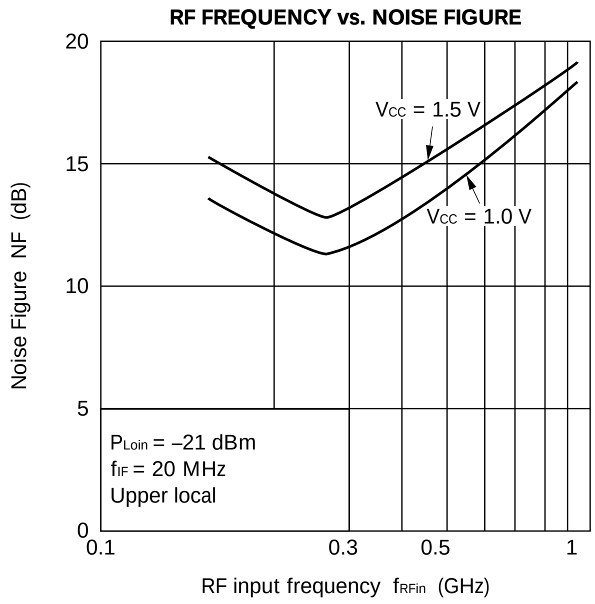
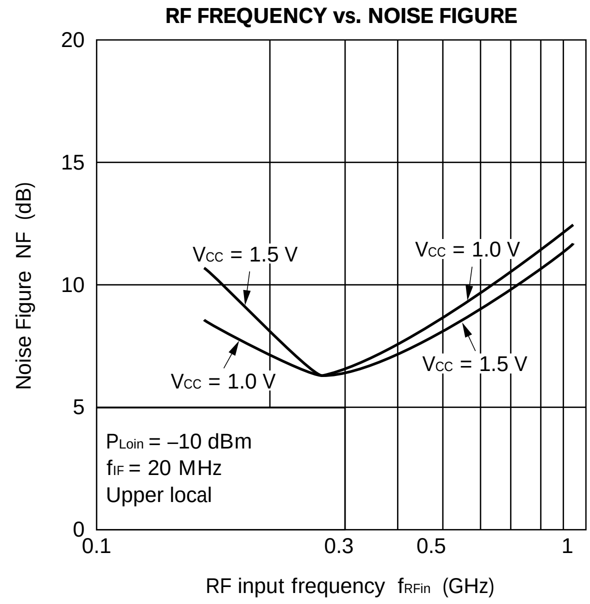
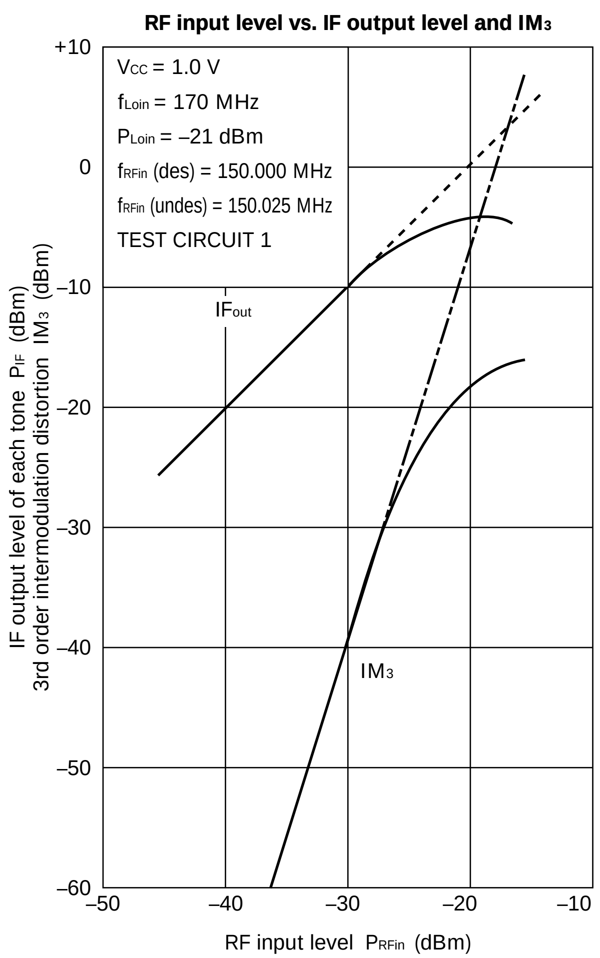
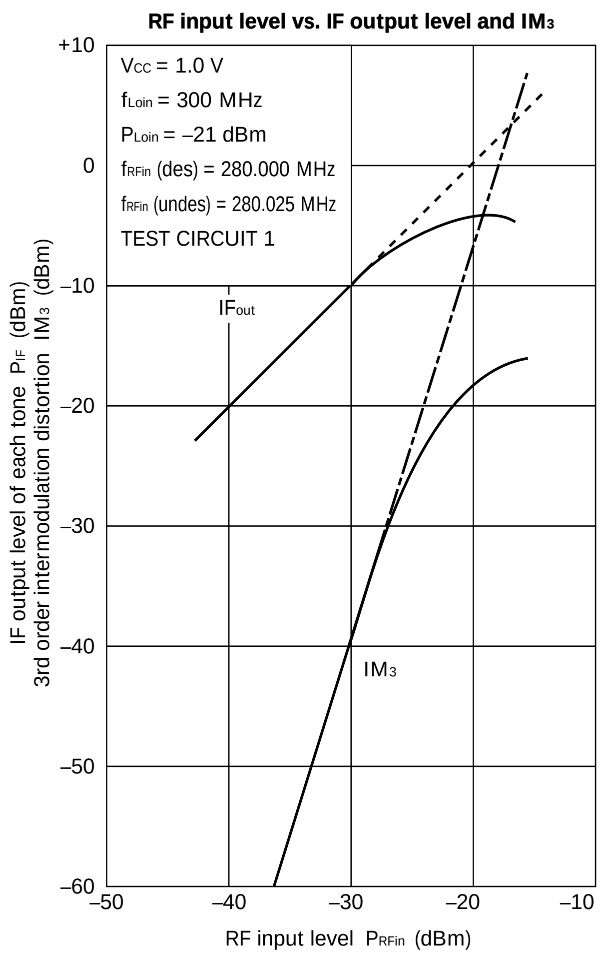
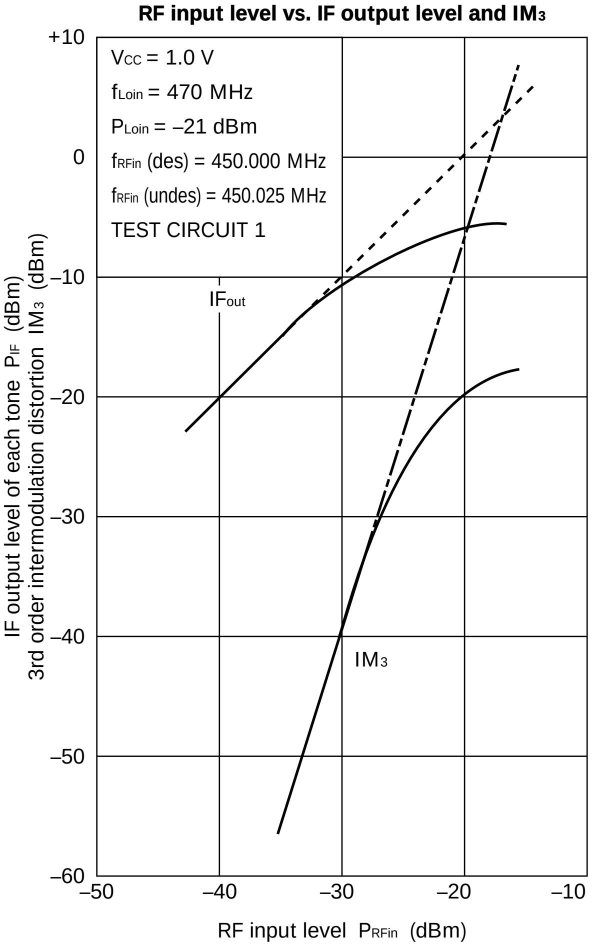

RF FREQUENCY vs. NOISE FIGURE
VCC = 1.5 V
VCC = 1.0 V
PLoin = –21 dBm
fIF = 20 MHz
Upper local
Noise Figure NF (dB)
RF input frequency fRFin (GHz)
0.1
0.3
0.5
1
0
5
10
15
20

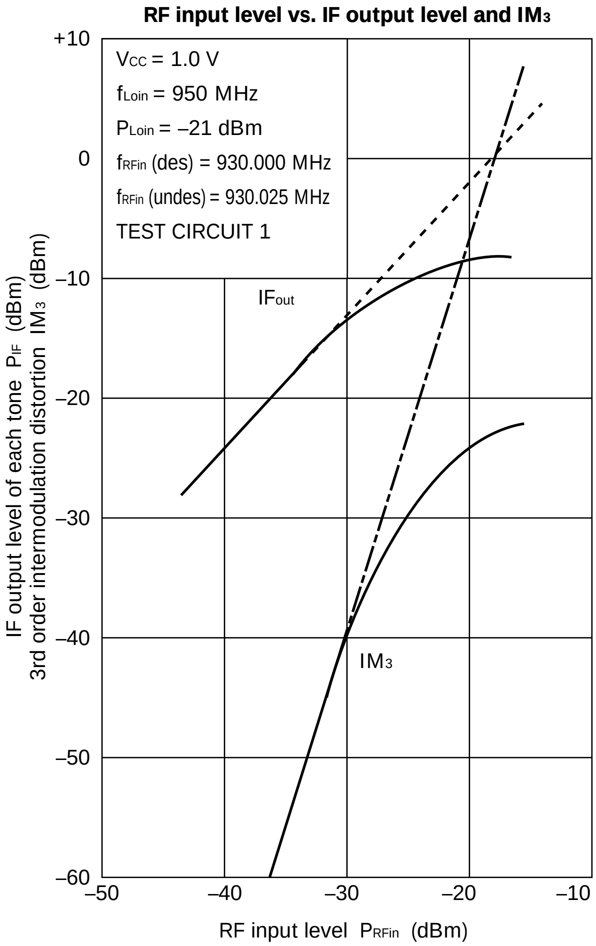

RF FREQUENCY vs. NOISE FIGURE
VCC = 1.5 V
VCC = 1.0 V
VCC = 1.0 V
VCC = 1.5 V
PLoin = –10 dBm
fIF = 20 MHz
Upper local
Noise Figure NF (dB)
RF input frequency fRFin (GHz)
0.1
0.3
0.5
1
0
5
10
15
20


RF input level vs. IF output level and IM3
VCC = 1.0 V
fLoin = 170 MHz
PLoin = –21 dBm
fRFin (des) = 150.000 MHz
fRFin (undes) = 150.025 MHz
TEST CIRCUIT 1
IFout
IM3
IF output level of each tone PIF (dBm)
3rd order intermodulation distortion IM3 (dBm)
RF input level PRFin (dBm)
+10
0
–10
–20
–30
–40
–50
–60
–50
–40
–30
–20
–10


RF input level vs. IF output level and IM3
VCC = 1.0 V
fLoin = 300 MHz
PLoin = –21 dBm
fRFin (des) = 280.000 MHz
fRFin (undes) = 280.025 MHz
TEST CIRCUIT 1
IFout
IM3
IF output level of each tone PIF (dBm)
3rd order intermodulation distortion IM3 (dBm)
RF input level PRFin (dBm)
+10
0
–10
–20
–30
–40
–50
–60
–50
–40
–30
–20
–10

— μPC8108T —


RF input level vs. IF output level and IM3
VCC = 1.0 V
fLoin = 470 MHz
PLoin = –21 dBm
fRFin (des) = 450.000 MHz
fRFin (undes) = 450.025 MHz
TEST CIRCUIT 1
IFout
IM3
IF output level of each tone PIF (dBm)
3rd order intermodulation distortion IM3 (dBm)
+10
0
–10
–20
–30
–40
–50
–60
–50
–40
–30
–20
–10
RF input level PRFin (dBm)


RF input level vs. IF output level and IM3
VCC = 1.0 V
fLoin = 950 MHz
PLoin = –21 dBm
fRFin (des) = 930.000 MHz
fRFin (undes) = 930.025 MHz
TEST CIRCUIT 1
IFout
IM3
IF output level of each tone PIF (dBm)
3rd order intermodulation distortion IM3 (dBm)
+10
0
–10
–20
–30
–40
–50
–60
–50
–40
–30
–20
–10
RF input level PRFin (dBm)

Application circuit example (In the case of μPC8103T)

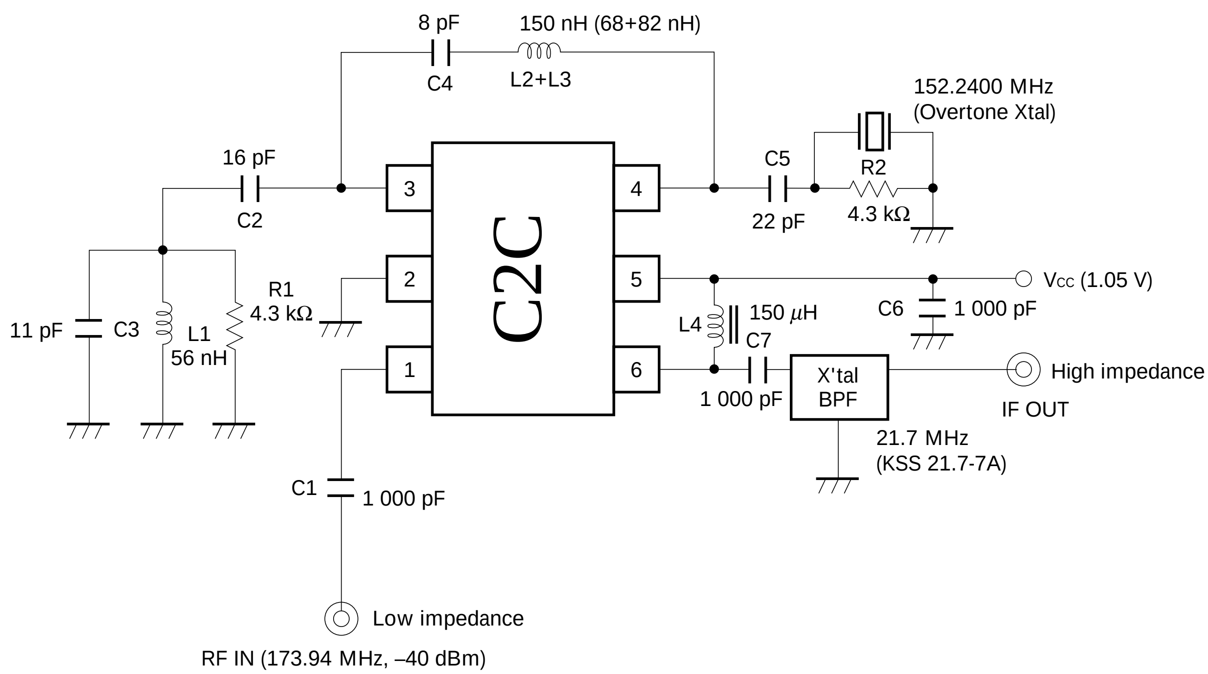
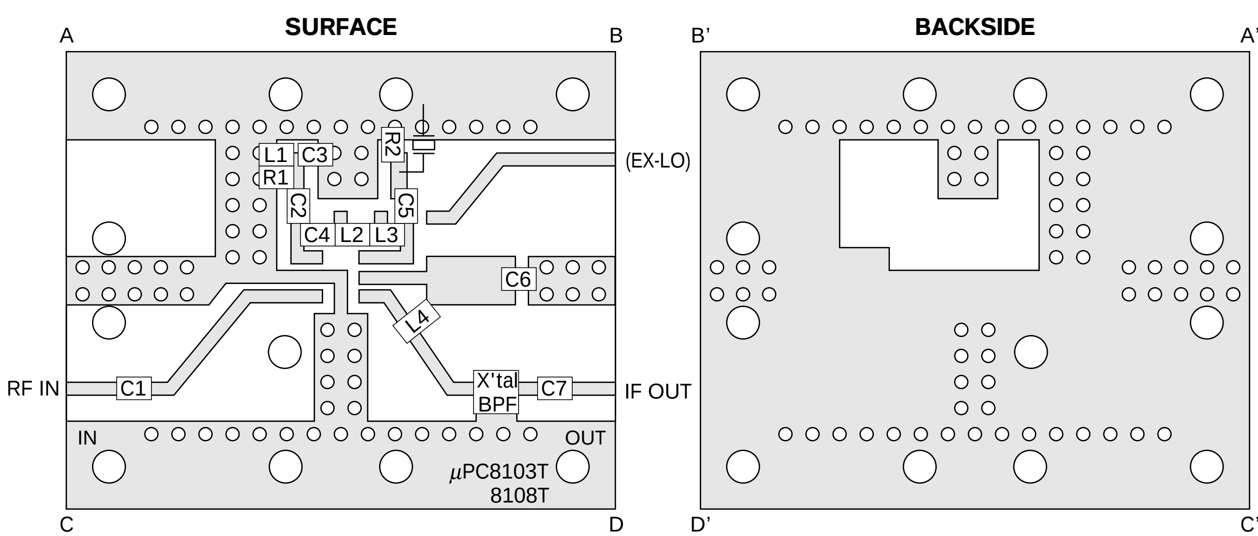


ILLUSTRATION OF APPLICATION CIRCUIT ASSEMBLED ON EVALUATION BOARD



Note **(*1)** 35 × 42 × 0.4 mm double copper clad polyimide board

(*2) Solder plated pattern

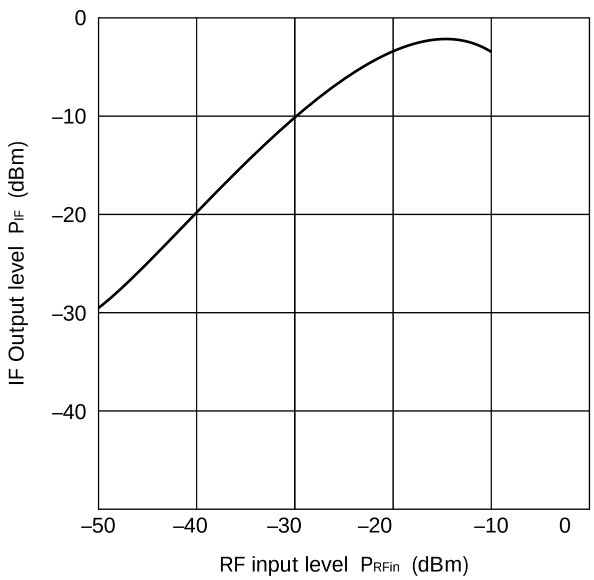
(*3) Surface vs. Backside : A - A', B - B', C - C', D - D'

(*4) ○ ◯ : Through holes

The application circuits and their parameters are for references only and are not intended for use in actual design-in's.

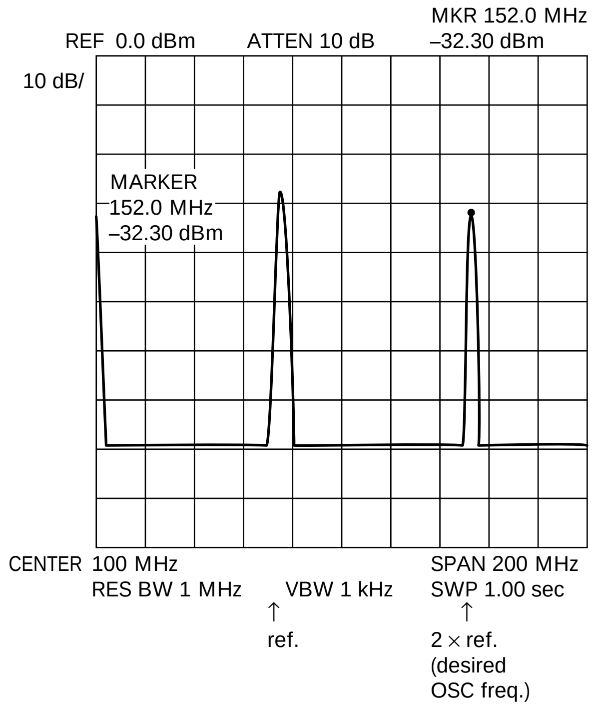
— With application circuit (μPC8103T) —

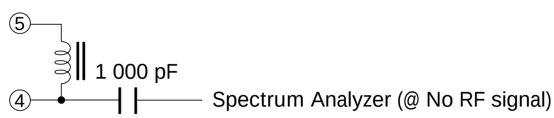
RF input level vs. IF output level



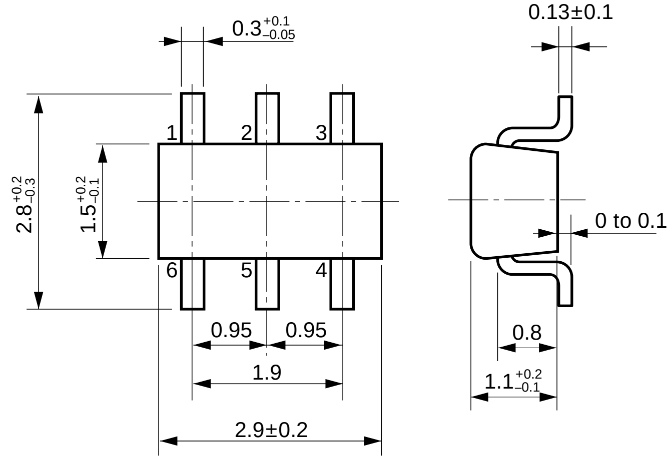
(This measurement needs the calculation as same as TEST CIRCUIT 1.)

Spectrum of Overtone Oscillation (without RF signal)





6 PIN MINI MOLD PACKAGE DIMENSIONS (Unit : mm)



NOTES ON CORRECT USE

(1) Observe precautions for handling because of electro-static sensitive devices.
(2) Form a ground pattern as wide as possible to maintain the minimum ground impedance (to prevent undesired oscillation).
(3) Keep the wiring length of the ground pins as short as possible.
(4) Connect a bypass capacitor (eg 1 000 pF) to the Vcc pin.
(5) Insert the inductor (eg L = 150 μH) between 5 and 6 pins.

RECOMMENDED SOLDERING CONDITIONS

This product should be soldered in the following recommended conditions. Other soldering methods and conditions than the recommended conditions are to be consulted with our sales representatives.

μPC8103T, μPC8108T

Soldering process	Soldering conditions	Recommended condition symbol
Infrared ray reflow	Package peak temperature: 235 ˚C, Hour: within 30 s. (more than 210 ˚C), Time: 2 time, Limited days: no.Note	IR35-00-2
VPS	Package peak temperature: 215 ˚C, Hour: within 40 s. (more than 200 ˚C), Time: 2 time, Limited days: no.Note	VP15-00-2
Wave soldering	Soldering tub temperature: less than 260 ˚C, Hour: within 10 s. Time: 1 time, Limited days: no.Note	WS60-00-1
Pin part heating	Pin area temperature: less than 300 ˚C, Hour: within 10 s. Limited days: no.Note	

Note It is the storage days after opening a dry pack, the storage conditions are 25 ˚C, less than 65 % RH.

Caution The combined use of soldering method is to be avoided (However, except the pin area heating method).

For details of recommended soldering conditions for surface mounting, refer to information document SEMICONDUCTOR DEVICE MOUNTING TECHNOLOGY MANUAL (IEI-1207)

[MEMO]

[MEMO]