W-CDMA Triple LNA GaAs MMIC

■GENERAL DESCRIPTION

NJG1123PB5 is a Triple band LNA IC designed for W-CDMA / UMTS cellular phone of 2.1GHz, 1.7GHz and 800MHz band.

This IC has the function which bypasses LNA, and high gain mode or low gain mode can be chosen.

High IIP3 and a low noise are achieved at the High gain mode.

And low current consumption can be achieved at the low gain mode because LNA enters the state of the standby.

An ultra small and ultra thin package of FFP16–B5 is adopted.

■PACKAGE OUTLINE

NJG1123PB5

■FEATURES

●Low voltage operation	+2.7V
●Low CTL voltage operation	+1.85V
●Low current consumption	2.2mA typ. @High Gain Mode 0uA typ. @Low Gain Mode
●Small package	FFP16-B5 (Package size: 2.0 x 2.0 x 0.65mm typ)

[High gain mode]

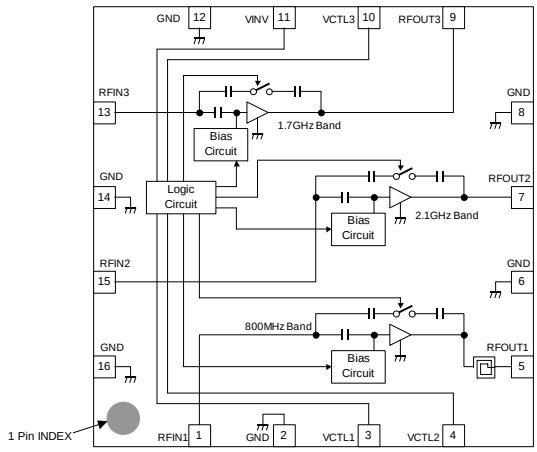
●High gain	17.0dB typ. @fRF =2140MHz, 1860MHz16.0dB typ. @fRF =885MHz
●Low noise figure	1.65dB typ. @fRF=2140MHz 1.5dB typ. @fRF =885MHz, 1860MHz
●High Input IP3	0dBm typ. @ f_{RF}=2140.0+2140.1MHz, Pin=-30dBm -1dBm typ. @f_{RF}=885.0+885.1MHz, Pin=-30dBm +1dBm typ. @f_{RF}=1860.0+1860.1MHz, Pin=-30dBm

[Low gain mode]

●Gain	-8.0dB typ. @f_{RF}=2140MHz -6.5dB typ. @f_{RF}=885MHz -9.0dB typ. @ f_{RF}=1860MHz
●High Input IP3	+18dBm typ. @ f_{RF}=2140.0+2140.1MHz, Pin=--16dBm +13dBm typ. @f_{RF}=885.0+885.1MHz, Pin=--20dBm +18.5dBm typ. @f_{RF}=1860.0+1860.1MHz, Pin=-16dBm

■PIN CONFIGURATION

(Top View)



Pin Connection

1. RFIN1 (800MHz)	9. RFOUT3 (1.7GHz)
2. GND	10. VCTL3 (Gain Sel)
3. VCTL1 (Band Sel)	11. VINV
4. VCTL2 (Band Sel)	12. GND
5. RFOUT1 (800MHz)	13. RFIN3 (1.7GHz)
6. GND	14. GND
7. RFOUT2 (2.1GHz)	15. RFIN2 (2.1GHz)
8. GND	16. GND

Note: Specifications and description listed in this catalog are subject to change without prior notice.

■ABSOLUTE MAXIMUM RATINGS

(T_a=+25°C, Z_S=Z_l=50Ω)

PARAMETERS	SYMBOL	CONDITIONS	RATINGS	UNITS
Operating voltage	V_{DD}		5.0	V
Inverter supply voltage	V_{INV}		5.0	V
Control voltage	V_{CTL}	V_{CTL}1, 2, 3	5.0	V
Input power	Pin	V_{DD}=2.7V	+15	dBm
Power dissipation	P_D	At on PCB Board	300	mW
Operating temperature	T_{opr}		-40~+85	°C
Storage temperature	T_{stg}		-55~+125	°C

■ELECTRICAL CHARACTERISTICS 1 (DC)

(V_{DD}=V_{INV}=2.7V, T_a=+25°C, Z_S=Z_l=50Ω)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Operating voltage	V_{DD}		2.5	2.85	3.6	V
Inverter supply voltage	V_{INV}		2.5	2.85	3.6	V
Control voltage1 (High)	$V_{CTL1(H)}$		1.52	1.85	V_{INV}+0.3	V
Control voltage1 (Low)	$V_{CTL1(L)}$		0	0	0.3	V
Control voltage 2 (High)	$V_{CTL2(H)}$		1.52	1.85	V_{INV}+0.3	V
Control voltage 2 (Low)	$V_{CTL2(L)}$		0	0	0.3	V
Control voltage 3 (High)	$V_{CTL3(H)}$		1.52	1.85	V_{INV}+0.3	V
Control voltage 3 (Low)	$V_{CTL3(L)}$		0	0	0.3	V
Operating current2 2.1GHz[High gain mode]	I_{DD1}	V_{CTL1}=0V, V_{CTL2}=0V, V_{CTL3}=1.85V, RF OFF	-	2.2	2.95	mA
Operating current1 800MHz[High gain mode]	I_{DD2}	V_{CTL1}=1.85V, V_{CTL2}=0V, V_{CTL3}=1.85V, RF OFF	-	2.2	2.95	mA
Operating current1 1.7GHz[High gain mode]	I_{DD3}	V_{CTL1}=0V, V_{CTL2}=1.85V, V_{CTL3}=1.85V, RF OFF	-	2.2	2.95	mA
Operating current 3 800M/2.1GHz[Low gain mode]	I_{DD4}	V_{CTL3}=0V, RF OFF	-	0	5	uA
Inverter current1	I_{INV1}	V_{CTL3}=1.85V	-	80	130	uA
Inverter current2	I_{INV2}	V_{CTL3}=0V	-	45	80	uA
Control current 1	I_{CTL1}	V_{CTL1}=1.85V	-	3	10	uA
Control current 2	I_{CTL2}	V_{CTL2}=1.85V	-	3	10	uA
Control current 3	I_{CTL3}	V_{CTL3}=1.85V	-	3	10	uA

■**ELECTRICAL CHARACTERISTICS 2 (2.1GHz band High Gain mode)**

(V_{DD}=V_{INV}=2.7V, V_{CTL1}=0V, V_{CTL2}=0V, V_{CTL3}=1.85V, fRF=2140MHz, T_a=+25°C, Z_S=Z_l=50Ω, TEST CIRCUIT)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Small signal gain1	Gain1	Exclude PCB & connector losses (IN: 0.09dB, OUT: 0.36dB)	15.5	17.0	19.0	dB
Noise figure1	NF1	Exclude PCB & connector losses (IN: 0.09dB)	-	1.65	1.85	dB
Pin at 1dB gain compression point1	P-1dB(1)		-16.0	-12.5	-	dBm
Input 3rd order intercept point	IIP3_1	f1=fRF, f2=fRF+100kHz, Pin=-30dBm	-5.0	0	-	dBm
RF Input VSWR1	VSWRi1		-	1.7	2.2	
RF Output VSWR1	VSWRo1		-	1.8	2.5	

■**ELECTRICAL CHARACTERISTICS 3 (2.1GHz band Low Gain mode)**

(V_{DD}=V_{INV}=2.7V, V_{CTL1}=0V, V_{CTL2}=0V, V_{CTL3}=0V, fRF=2140MHz, T_a=+25°C, Z_S=Z_l=50Ω, TEST CIRCUIT)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Small signal gain2	Gain2	Exclude PCB & connector losses (IN: 0.09dB, OUT: 0.36dB)	-11.0	-8.0	-6.0	dB
Noise figure2	NF2	Exclude PCB & connector losses (IN: 0.09dB)	-	8.5	11.5	dB
Pin at 1dB gain compression point2	P-1dB(2)		+5.0	+12.5	-	dBm
Input 3rd order intercept point2	IIP3_2	f1=fRF, f2=fRF+100kHz, Pin=-16dBm	0.0	+18.0	-	dBm
RF Input VSWR2	VSWRi2		-	2.0	2.4	
RF Output VSWR2	VSWRo2		-	1.5	2.1	

■**ELECTRICAL CHARACTERISTICS 4 (800MHz band High Gain mode)**

(V_{DD}=V_{INV}=2.7V, V_{CTL1}=1.85V, V_{CTL2}=0V,V_{CTL3}=1.85V, fRF=885MHz, T_a=+25°C, Z_S=Z_l=50Ω, TEST CIRCUIT)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Small signal gain1	Gain3	Exclude PCB & connector losses (IN: 0.06dB, OUT: 0.16dB)	15.0	16.0	18.5	dB
Noise figure1	NF3	Exclude PCB & connector losses (IN: 0.06dB,)	-	1.5	1.7	dB
Pin at 1dB gain compression point1	P-1dB(3)		-16.0	-9.0	-	dBm
Input 3rd order intercept point	IIP3_3	f1=fRF, f2=fRF+100kHz, Pin=30dBm	-8.0	-1.0	-	dBm
RF Input VSWR1	VSWRi3		-	1.5	2.0	
RF Output VSWR1	VSWRo3		-	1.5	2.1	

■**ELECTRICAL CHARACTERISTICS 5 (800MHz band Low Gain mode)**

(V_{DD}=V_{INV}=2.7V, V_{CTL1}=1.85V, V_{CTL2}=0V,V_{CTL3}=0V, fRF=885MHz, T_a=+25°C, Z_S=Z_l=50Ω, TEST CIRCUIT)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Small signal gain2	Gain4	Exclude PCB & connector losses (IN: 0.06dB, OUT: 0.16dB)	-6.0	-4.0	-3.0	dB
Noise figure2	NF4	Exclude PCB & connector losses (IN: 0.06dB,)	-	4.5	6.5	dB
Pin at 1dB gain compression point2	P_{-1dB}(4)		+4.0	+9.0	-	dBm
Input 3rd order intercept point2	IIP3_4	F1=fRF, f2=fRF+100kHz, Pin=-36dBm	1.5	+2.0	-	dBm
RF Input VSWR2	$VSWR_I$4		-	1.7	2.3	
RF Output VSWR2	$VSWR_O$4		-	1.6	2.1	

■**ELECTRICAL CHARACTERISTICS 4 (1.7GHz band High Gain mode)**

(V_{DD}=V_{INV}=2.7V, V_{CTL1}=0V, V_{CTL2}=1.85V, V_{CTL3}=1.85V, fRF=1860MHz, T_a=+25°C, Z_S=Z_l=50Ω, TEST CIRCUIT)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Small signal gain1	Gain5	Exclude PCB & connector losses (IN: 0.10dB, OUT: 0.31dB)	15.6	17.0	19.0	dB
Noise figure1	NF5	Exclude PCB & connector losses (IN: 0.10dB,)	-	1.5	1.75	dB
Pin at 1dB gain compression point1	P_{-1dB}(5)		-16.0	-11.5	-	dBm
Input 3rd order intercept point	IIP3_5	f1=fRF, f2=fRF+100kHz, Pin=-30dBm	-5.0	+1.0	-	dBm
RF Input VSWR1	$VSWR_I$5		-	1.9	2.4	
RF Output VSWR1	$VSWR_o$5		-	1.9	2.3	

■**ELECTRICAL CHARACTERISTICS 5 (1.7GHz band Low Gain mode)**

(V_{DD}=V_{INV}=2.7V, V_{CTL1}=0V, V_{CTL2}=1.85V, V_{CTL3}=0V, fRF=1860MHz, T_a=+25°C, Z_S=Z_l=50Ω, TEST CIRCUIT)

PARAMETERS	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Small signal gain2	Gain6	Exclude PCB & connector losses (IN: 0.10dB, OUT: 0.31dB)	-11.5	-9.0	-7.0	dB
Noise figure2	NF6	Exclude PCB & connector losses (IN: 0.10dB,)	-	9.0	12.0	dB
Pin at 1dB gain compression point2	P_{-1dB}(6)		+4.0	+12.5	-	dBm
Input 3rd order intercept point2	IIP3_6	f1=fRF, f2=fRF+100kHz, Pin=-16dBm	0	+18.5	-	dBm
RF Input VSWR2	$VSWR_I$6		-	1.7	2.3	
RF Output VSWR2	$VSWR_o$6		-	1.6	2.3	

■TERMINAL INFORMATION

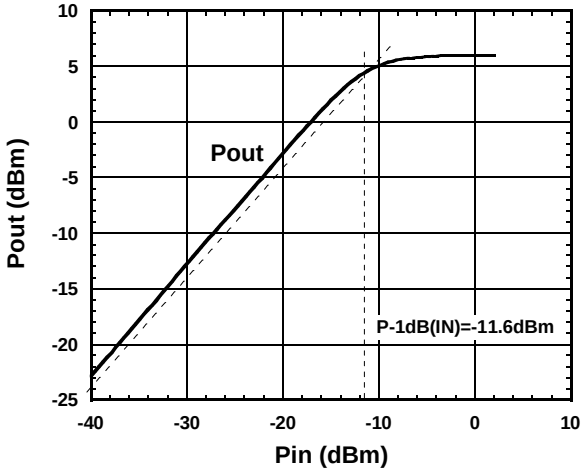
No.	SYMBOL	DESCRIPTION
1	RFIN1	RF input terminal of 800MHz band. The RF signal is input through external matching circuit connected to this terminal. The DC blocking capacitor is not required.
2	GND	Ground terminal. (0V)
3	VCTL1	Control voltage supply terminal. The frequency band (2Ghz / 800MHz / 1.7GHz) selects by 2bit control signal. (Please refer to truth table.)
4	VCTL2	
5	RFOUT1	Output terminal of 800MHz band. This terminal is also the power supply terminal of the LNA, please use inductor (L3) to connect power supply.
6	GND	Ground terminal. (0V)
7	RFOUT2	Output terminal of 2.1GHz band. This terminal is also the power supply terminal of the LNA, please use inductor (L6) to connect power supply.
8	GND	Ground terminal. (0V)
9	RFOUT3	Output terminal of 1.7GHz band. This terminal is also the power supply terminal of the LNA, please use inductor (L10) to connect power supply.
10	VCTL3	Control voltage supply terminal. The high level voltage of this terminal selects High Gain Mode. The low level voltage of this terminal selects Low Gain Mode.
11	VINV	Inverter voltage supplies terminal.
12	GND	Ground terminal. (0V)
13	RFIN3	RF input terminal of 1.7GHz band. The RF signal is input through external matching circuit connected to this terminal. The DC blocking capacitor is not required.
14	GND	Ground terminal. (0V)
15	RFIN2	RF input terminal of 2.1GHz band. The RF signal is input through external matching circuit connected to this terminal. The DC blocking capacitor is not required.
16	GND	Ground terminal. (0V)

CAUTION

1) Ground terminal (No.2, 6, 8, 12, 14, 16) should be connected to the ground plane as low inductance as possible.

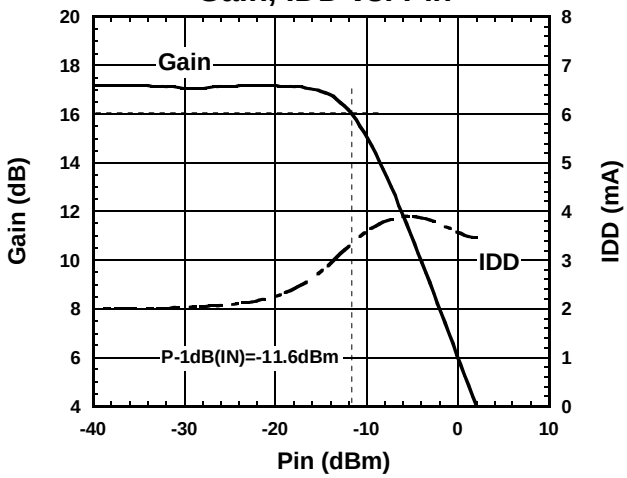
■ ELECTRICAL CHARACTERISTICS (2.1GHz band High Gain Mode)

NJG1123PB5 (2.1GHz) @High Gain
Pout vs. Pin



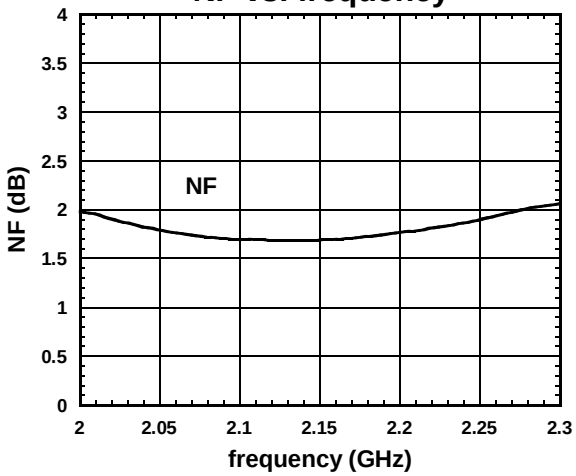
Condition
Ta=+25°C,
f=2140MHz,
V_{DD}=V_{INV}=2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (2.1GHz) @High Gain
Gain, IDD vs. Pin



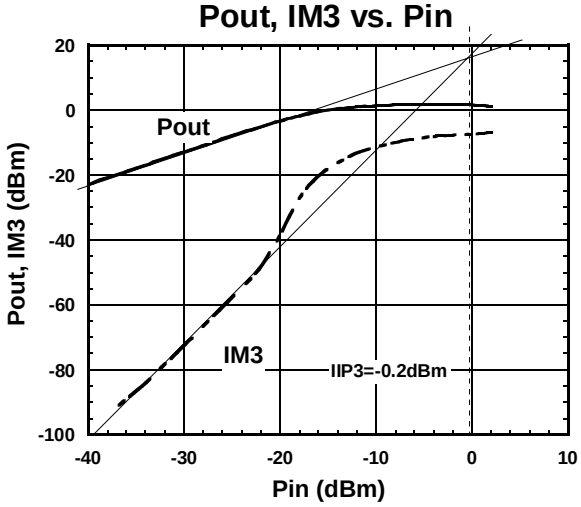
Condition
Ta=+25°C,
f=2140MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (2.1GHz) @High Gain
NF vs. frequency



Condition
Ta=+25°C,
f=2~2.3GHz,
V_{DD}=V_{INV}=2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

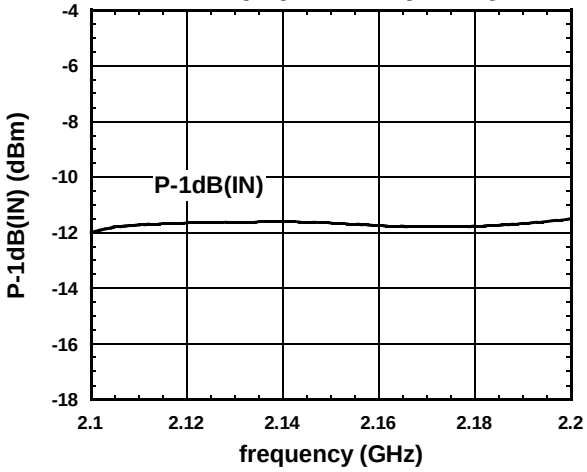
NJG1123PB5 (2.1GHz) @High Gain
Pout, IM3 vs. Pin



Condition
Ta=+25°C,
f1=2140MHz, f2=f1+100kHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

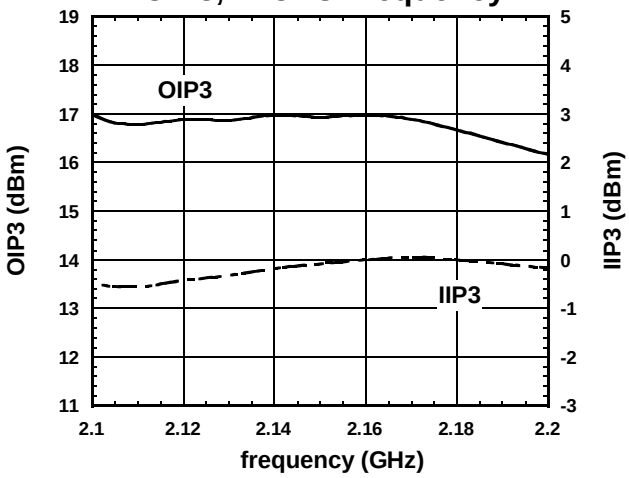
■ ELECTRICAL CHARACTERISTICS (2.1GHz band High Gain Mode)

NJG1123PB5 (2.1GHz) @High Gain
P-1dB(IN) vs. frequency



Condition
Ta=+25°C,
f=2.1~2.2GHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

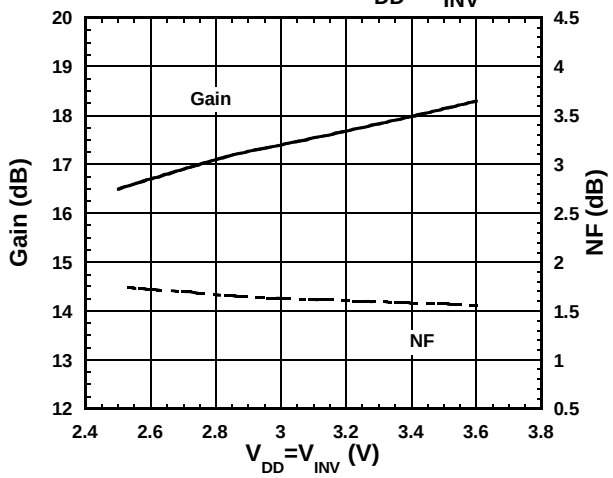
NJG1123PB5 (2.1GHz) @High Gain
OIP3, IIP3 vs. frequency



Condition
Ta=+25°C,
f1=2.1~2.2GHz, f2=f1+100kHz,
Pin=-30dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

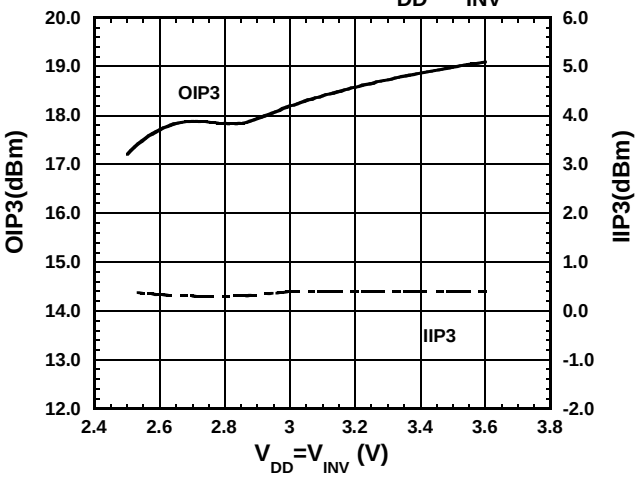
■ ELECTRICAL CHARACTERISTICS (2.1GHz band High Gain Mode)

NJG1123PB5 (2.1GHz) @High Gain
Gain, NF vs. V_{DD}, V_{INV}



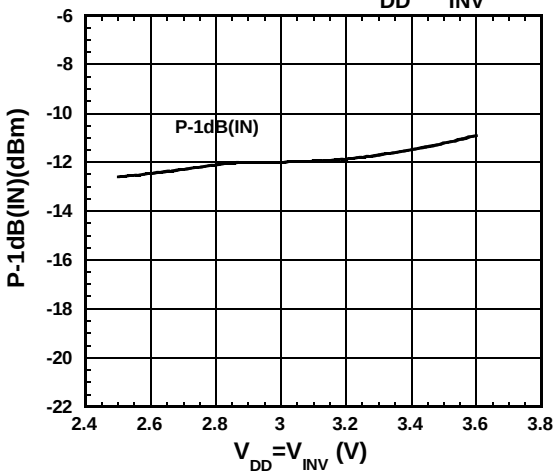
Condition
Ta=+25°C,
f=2140MHz,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (2.1GHz) @High Gain
OIP3, IIP3 vs. V_{DD}, V_{INV}



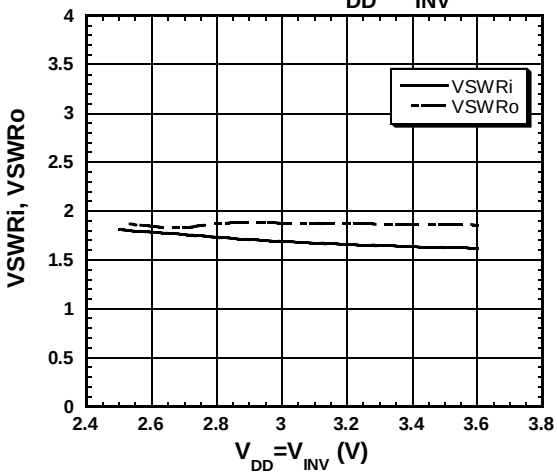
Condition
Ta=+25°C,
f1=2140MHz, f2=f1+2140.1Hz,
Pin=-30dBm,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (2.1GHz) @High Gain
P-1dB(IN) vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
f=2140MHz,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (2.1GHz) @High Gain
VSWR vs. V_{DD}, V_{INV}

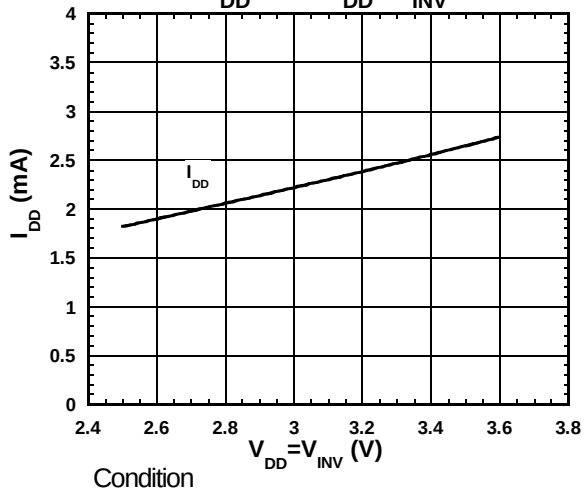


Condition
Ta=+25°C,
f=2140MHz,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

■ **ELECTRICAL CHARACTERISTICS (2.1GHz band High Gain Mode)**

NJG1123PB5 (2.1GHz) @High Gain

I_{DD} vs. V_{DD}, V_{INV}



Condition

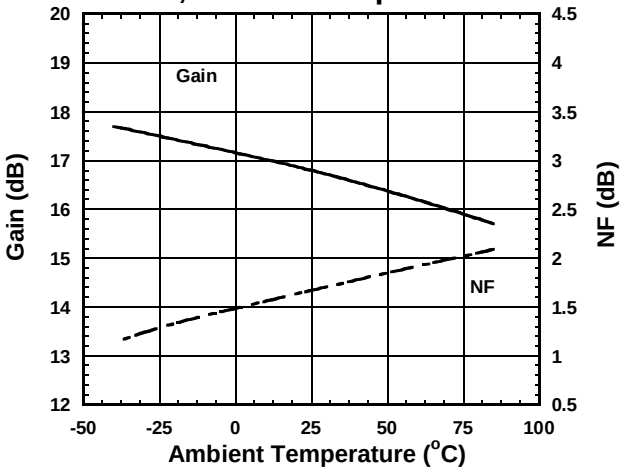
Ta=+25°C,

RF=OFF,

$V_{CTL}1$=0V, $V_{CTL}2$=0V, $V_{CTL}3$=1.85V

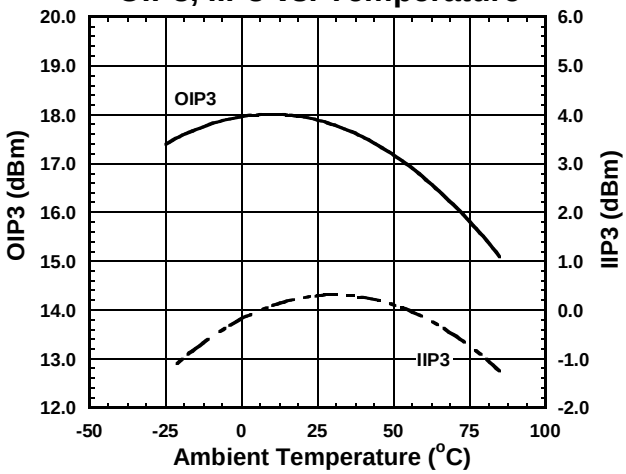
■ ELECTRICAL CHARACTERISTICS (2.1GHz band High Gain Mode)

NJG1123PB5 (2.1GHz) @High Gain
Gain, NF vs. Temperature



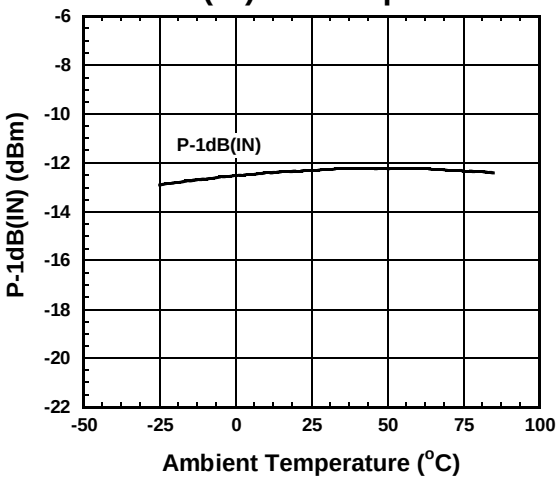
Condition
f=2140MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (2.1GHz) @High Gain
OIP3, IIP3 vs. Temperature



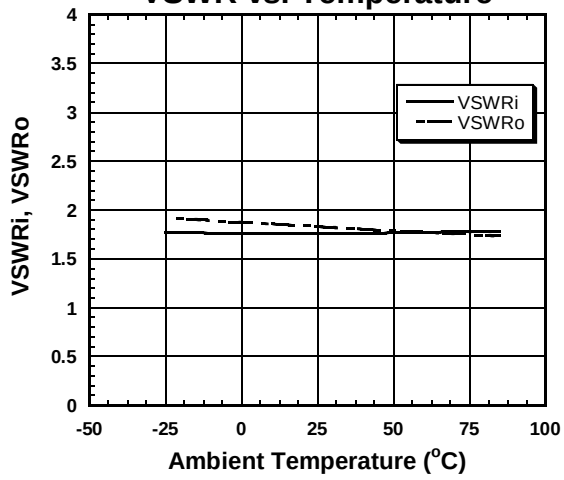
Condition
f1=2140MHz, f2=f1+2140.1Hz,
Pin=-30dBm,
V_{DD}= V_{INV} =2.7V
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (2.1GHz) @High Gain
P-1dB(IN) vs. Temperature



Condition
f=2140MHz,
V_{DD}= V_{INV} =2.7V
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

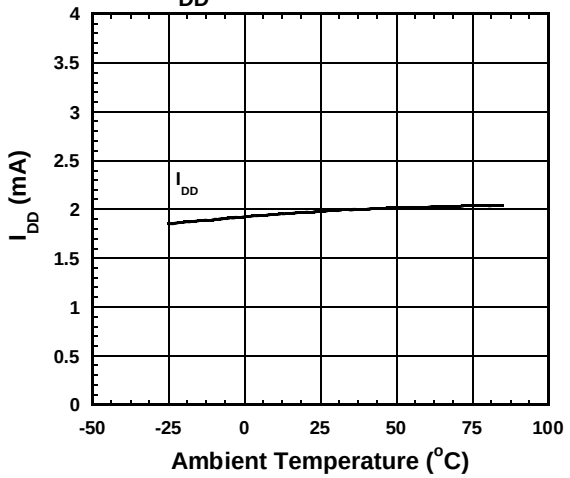
NJG1123PB5 (2.1GHz) @High Gain
VSWR vs. Temperature



Condition
f=2140MHz,
V_{DD}= V_{INV} =2.7V
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

■ **ELECTRICAL CHARACTERISTICS (2.1GHz band High Gain Mode)**

NJG1123PB5 (2.1GHz) @High Gain
I_{DD} vs. Temperature



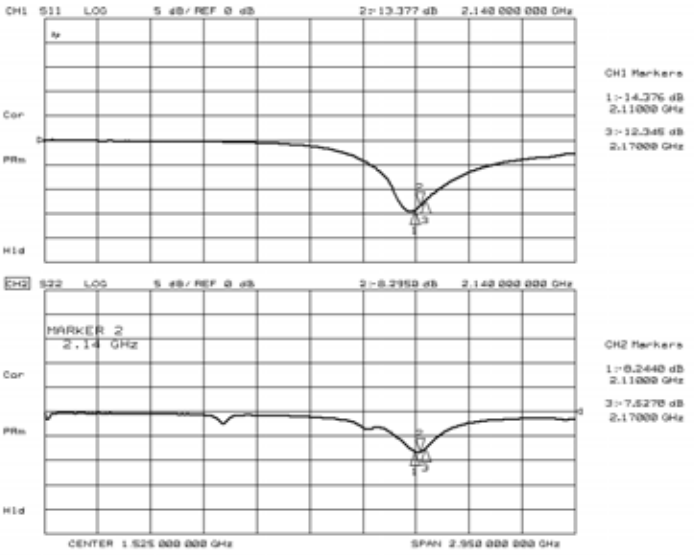
Condition

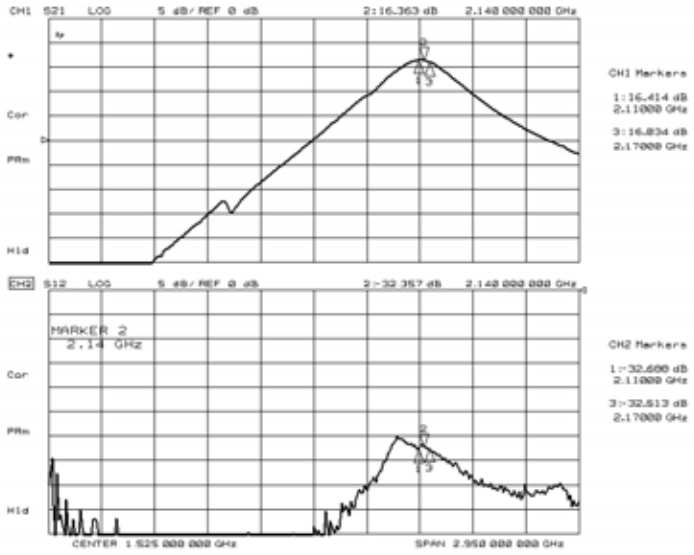
RF=OFF,

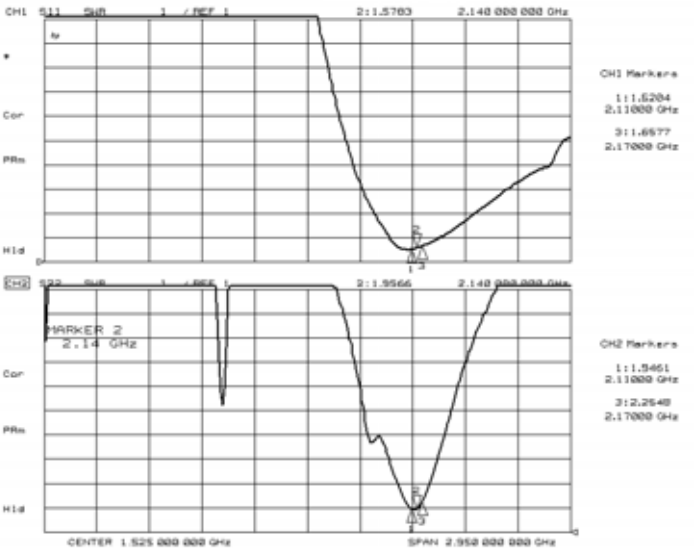
V_{DD}= V_{INV} =2.7V

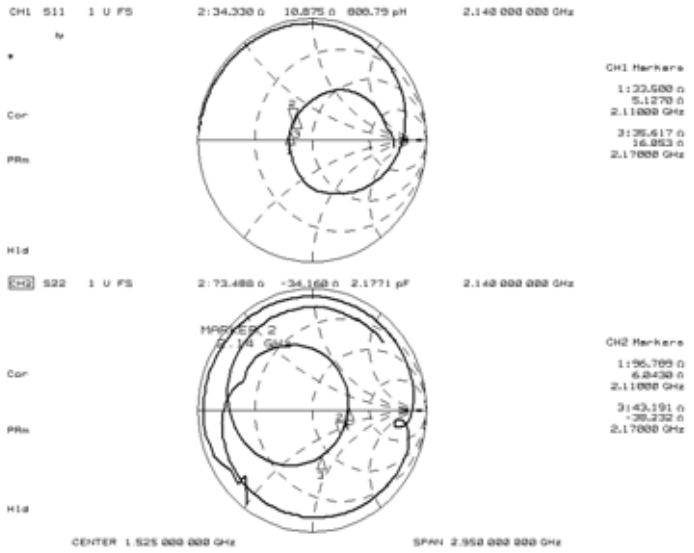
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=1.85V

■ ELECTRICAL CHARACTERISTICS (2.1GHz band High Gain Mode)

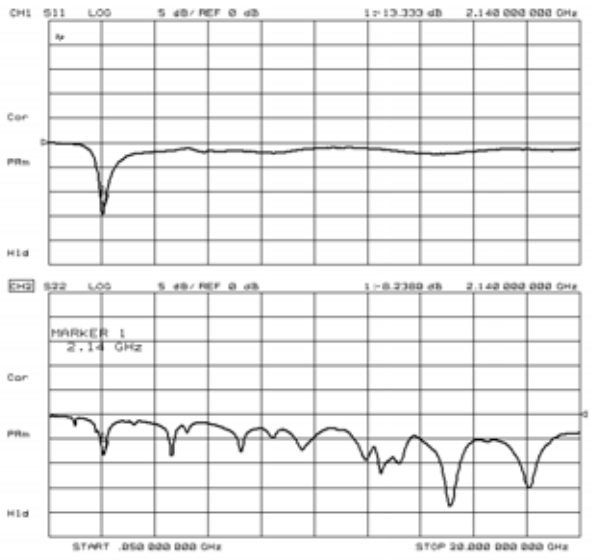


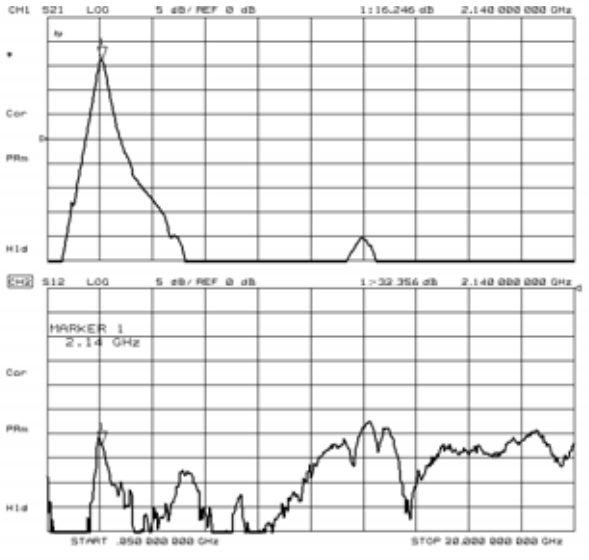




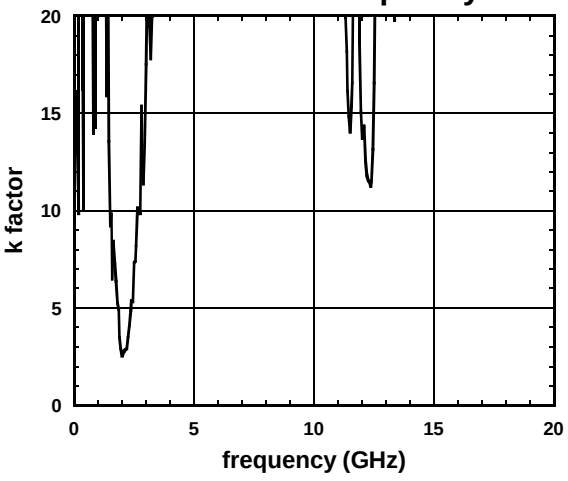


■ **ELECTRICAL CHARACTERISTICS (2.1GHz band High Gain Mode)**



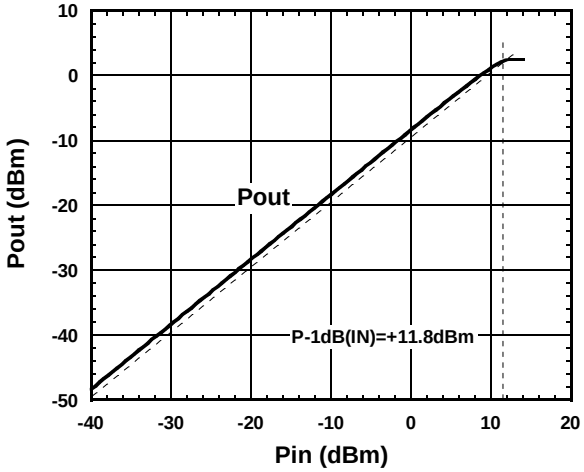


NJG1123PB5 (2.1GHz) @High Gain
k factor vs. frequency



■ ELECTRICAL CHARACTERISTICS (2.1GHz band Low Gain Mode)

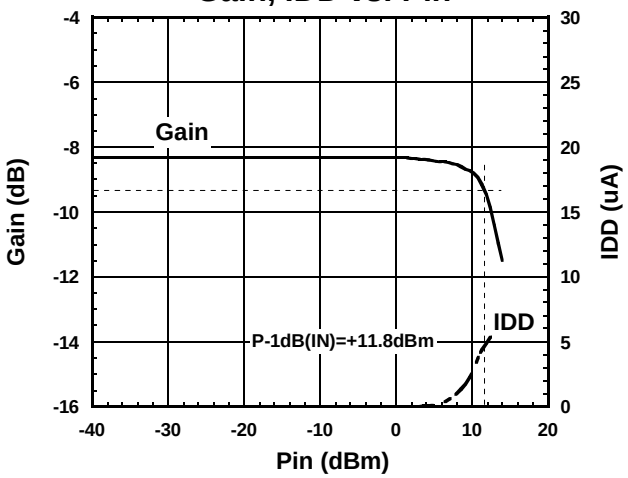
NJG1123PB5 (2.1GHz) @Low Gain
Pout vs. Pin



Condition

Ta=+25°C,
f=2140MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

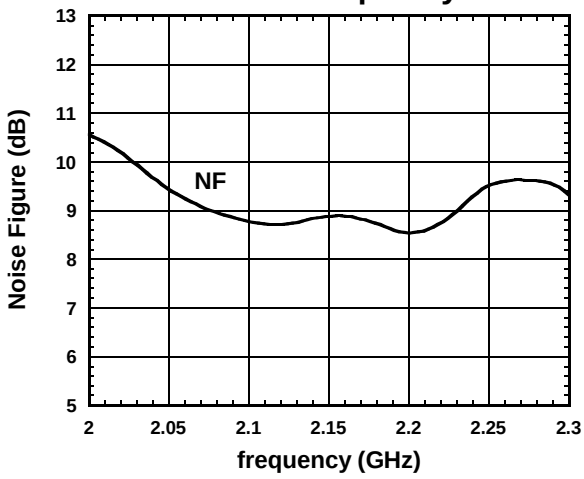
NJG1123PB5 (2.1GHz) @Low Gain
Gain, IDD vs. Pin



Condition

Ta=+25°C,
f=2140MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

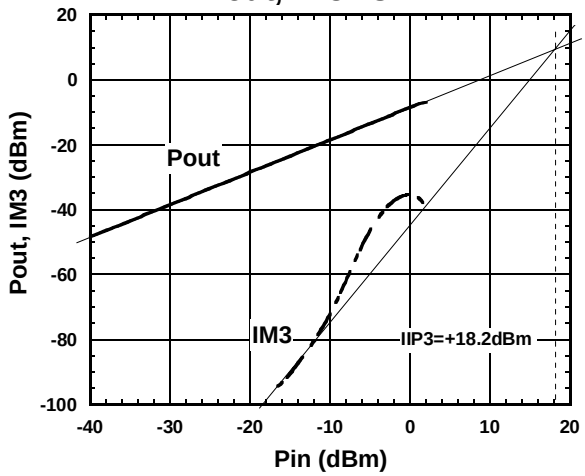
NJG1123PB5 (2.1GHz) @Low Gain
NF vs. frequency



Condition

Ta=+25°C,,
f=2~2.3GHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

NJG1123PB5 (2.1GHz) @Low Gain
Pout, IM3 vs. Pin

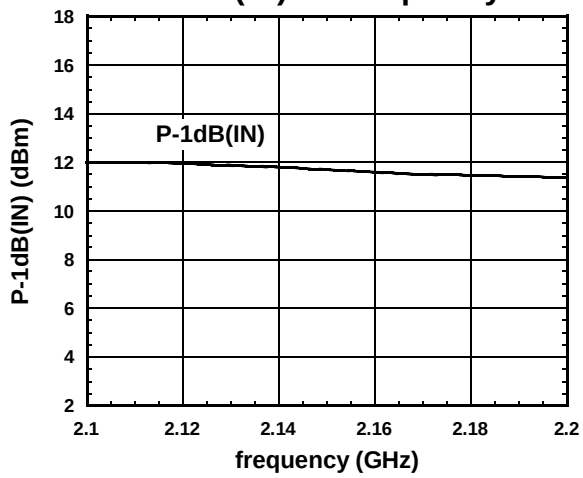


Condition

Ta=+25°C,
f=2~2.3GHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

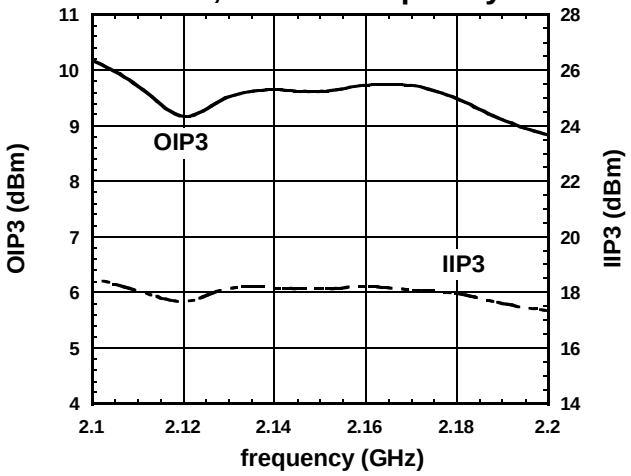
■ **ELECTRICAL CHARACTERISTICS (2.1GHz band Low Gain Mode)**

NJG1123PB5 (2.1GHz) @Low Gain
P-1dB(IN) vs. frequency



Condition
Ta=+25°C,
f=2.1~2.2GHz,
V_{DD}=V_{INV}=2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

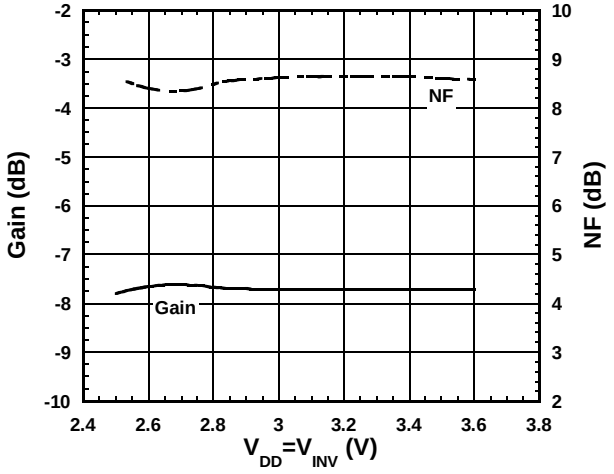
NJG1123PB5 (2.1GHz) @Low Gain
OIP3, IIP3 vs. frequency



Condition
Ta=+25°C,
f1=2.1~2.2GHz, f2=f1+100kHz,
Pin=-16dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

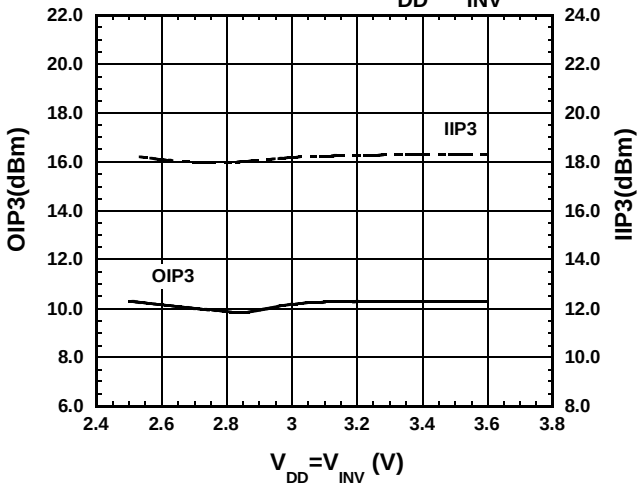
■ ELECTRICAL CHARACTERISTICS (2.1GHz band Low Gain Mode)

NJG1123PB5 (2.1GHz) @Low Gain
Gain, NF vs. V_{DD}, V_{INV}



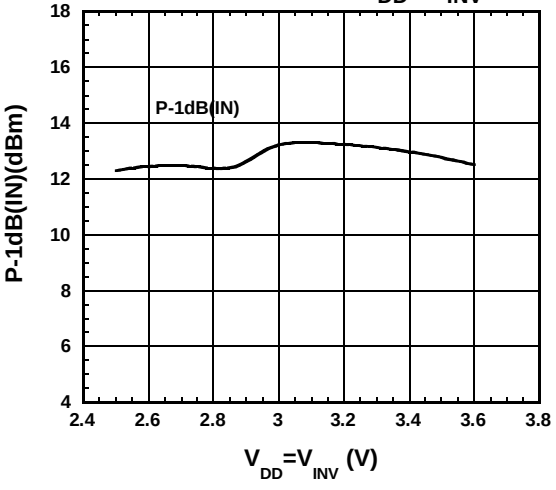
Condition
Ta=+25°C,
f=2140MHz,
$V_{CTL}1$=0V, $V_{CTL}2$=0V, $V_{CTL}3$=0V

NJG1123PB5 (2.1GHz) @Low Gain
OIP3, IIP3 vs. V_{DD}, V_{INV}



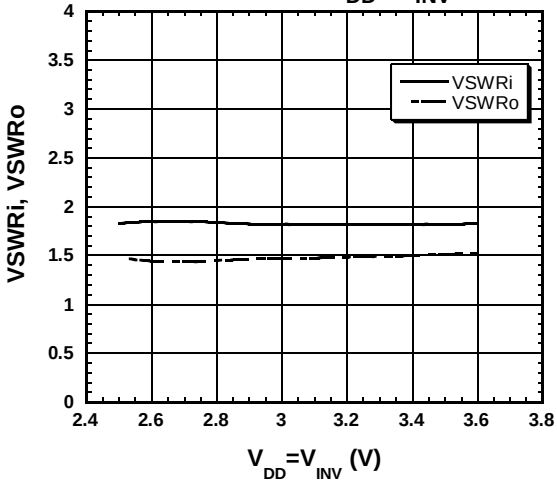
Condition
Ta=+25°C,
f1=2140MHz, f2=f1+2140.1MHz,
Pin=-16dBm,
$V_{CTL}1$=0V, $V_{CTL}2$=0V, $V_{CTL}3$=0V

NJG1123PB5 (2.1GHz) @Low Gain
P-1dB(IN) vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
f=2140MHz,
$V_{CTL}1$=0V, $V_{CTL}2$=0V, $V_{CTL}3$=0V

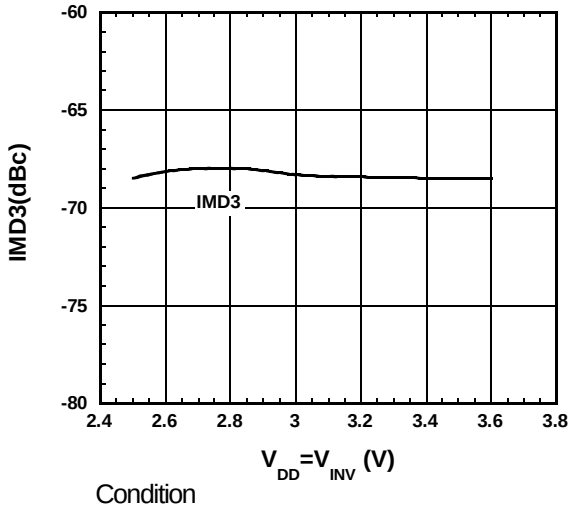
NJG1123PB5 (2.1GHz) @Low Gain
VSWR vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
f=2140MHz,
$V_{CTL}1$=0V, $V_{CTL}2$=0V, $V_{CTL}3$=0V

■ ELECTRICAL CHARACTERISTICS (2.1GHz band Low Gain Mode)

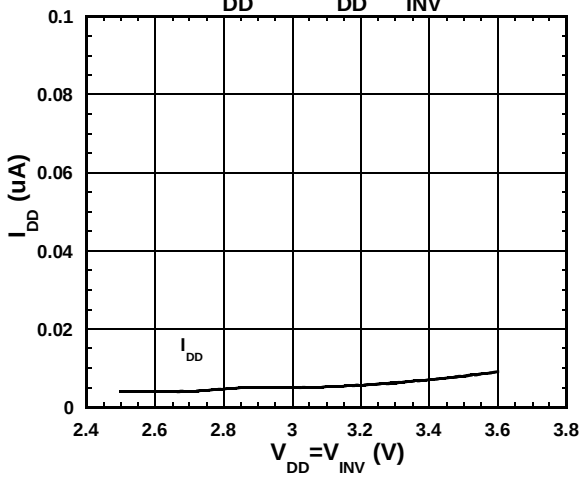
NJG1123PB5 (2.1GHz) @Low Gain
IMD3 vs. V_{DD}, V_{INV}



Condition

Ta=+25°C,
f1=2140MHz, f2=f1+2140.1MHz,
Pin=-16dBm,
$V_{CTL}1$=0V, $V_{CTL}2$=0V, $V_{CTL}3$=0V

NJG1123PB5 (2.1GHz) @Low Gain
I_{DD} vs. V_{DD}, V_{INV}

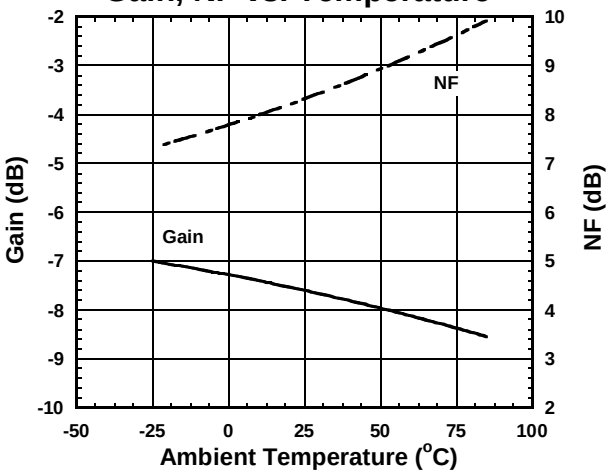


Condition

Ta=+25°C,
RF=OFF,
$V_{CTL}1$=0V, $V_{CTL}2$=0V, $V_{CTL}3$=0V

■ ELECTRICAL CHARACTERISTICS (2.1GHz band Low Gain Mode)

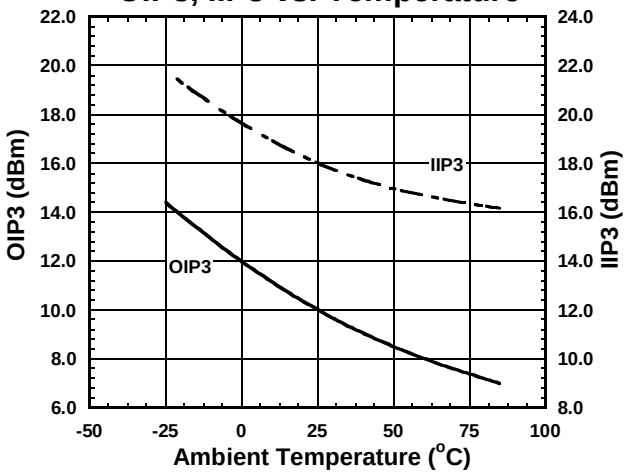
NJG1123PB5 (2.1GHz) @Low Gain
Gain, NF vs. Temperature



Condition

f=2140MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

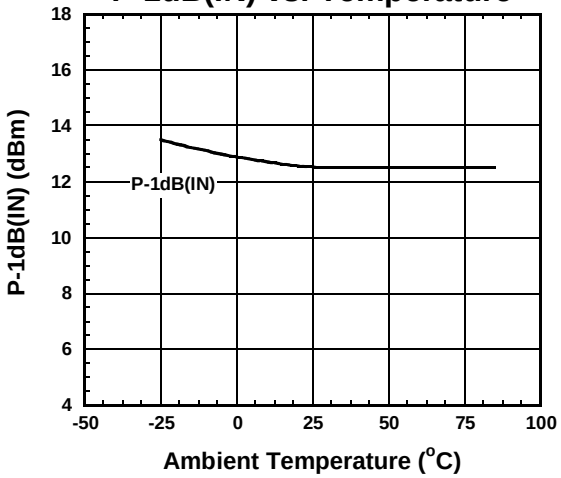
NJG1123PB5 (2.1GHz) @Low Gain
OIP3, IIP3 vs. Temperature



Condition

f1=2140MHz, f2=f1+2140.1Hz,
Pin=-16dBm,
V_{DD}= V_{INV} =2.7V
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

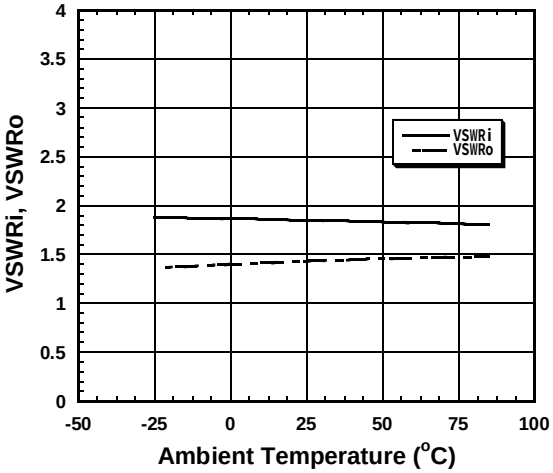
NJG1123PB5 (2.1GHz) @Low Gain
P-1dB(IN) vs. Temperature



Condition

f=2140MHz,
V_{DD}= V_{INV} =2.7V
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

NJG1123PB5 (2.1GHz) @Low Gain
VSWR vs. Temperature

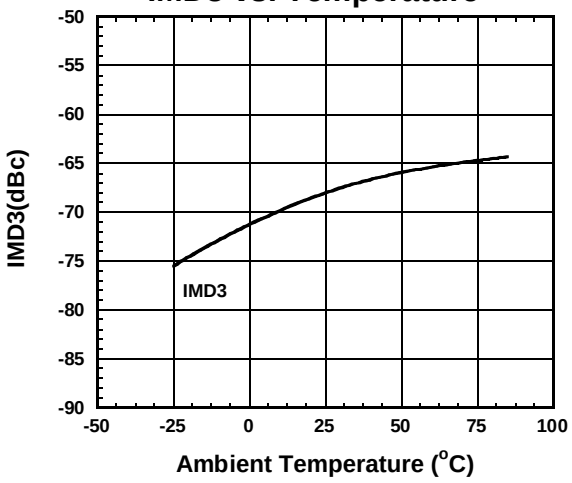


Condition

f=2140MHz,
V_{DD}= V_{INV} =2.7V
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

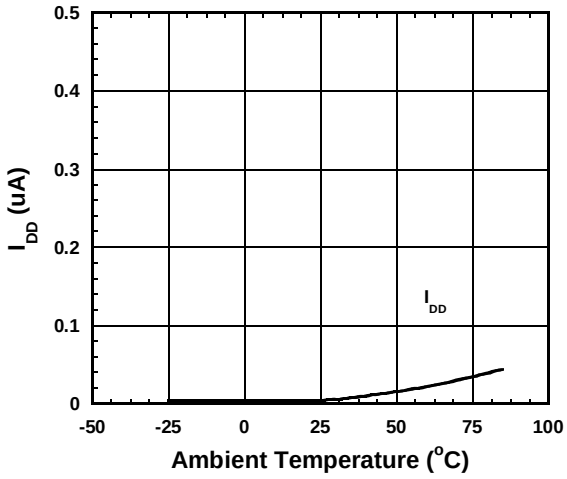
■ **ELECTRICAL CHARACTERISTICS (2.1GHz band Low Gain Mode)**

NJG1123PB5 (2.1GHz) @Low Gain
IMD3 vs. Temperature



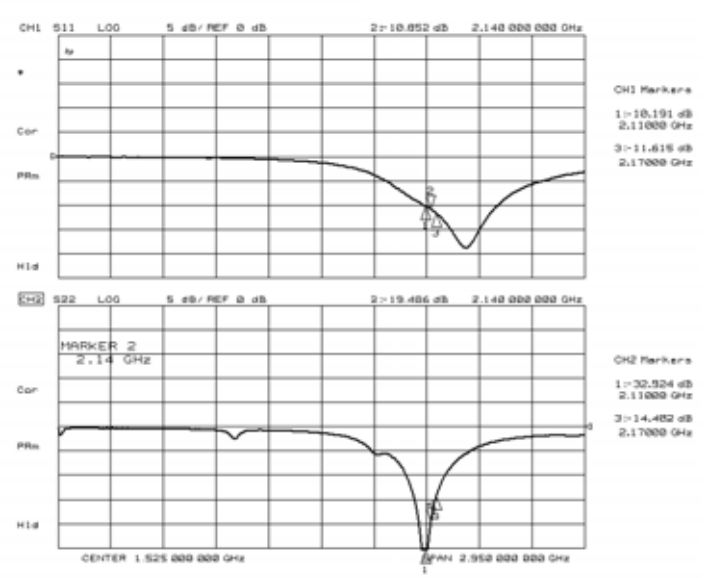
Condition
f1=2140MHz, f2=f1+2140.1Hz,
Pin=-16dBm,
V_{DD}= V_{INV} =2.7V
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

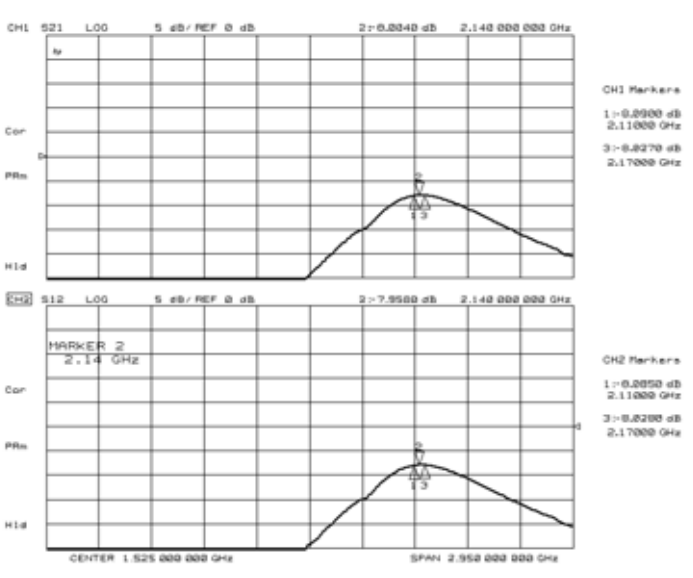
NJG1123PB5 (2.1GHz) @Low Gain
I_{DD} vs. Temperature

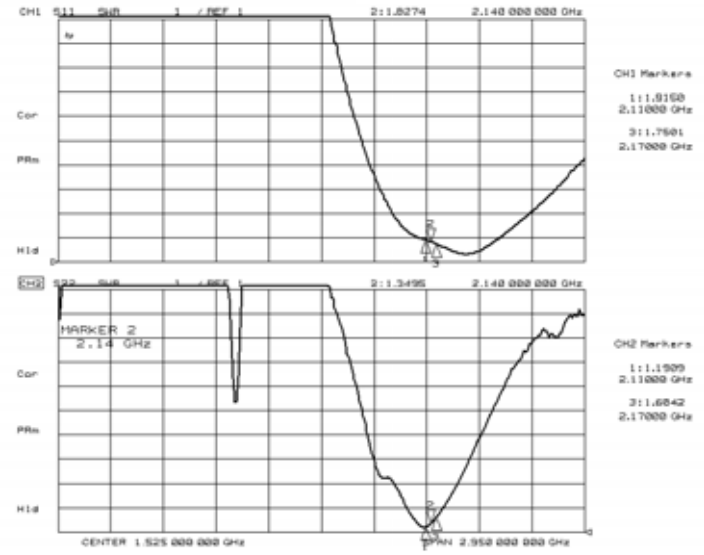


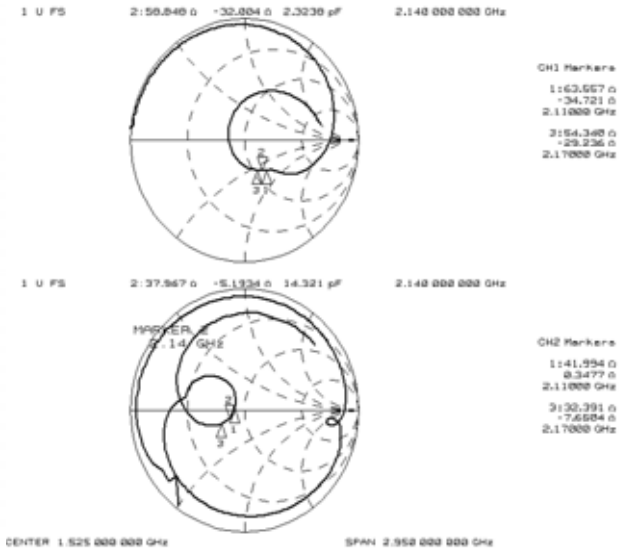
Condition
RF=OFF,
V_{DD}= V_{INV} =2.7V
V_{CTL}1=0V, V_{CTL}2=0V, V_{CTL}3=0V

■ **ELECTRICAL CHARACTERISTICS (2.1GHz band Low Gain Mode)**

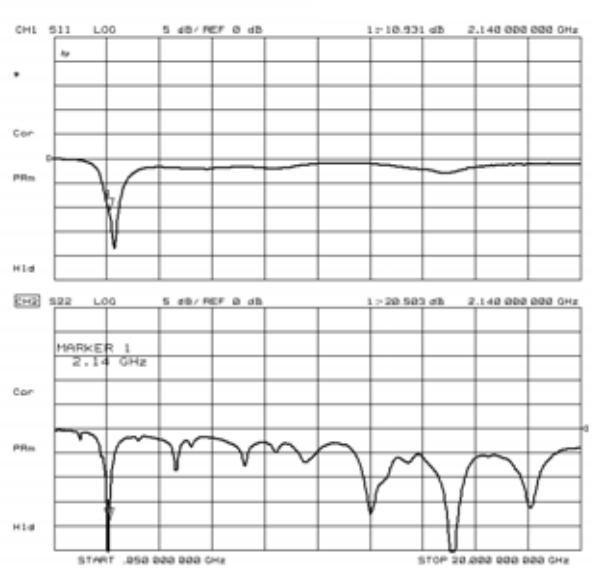


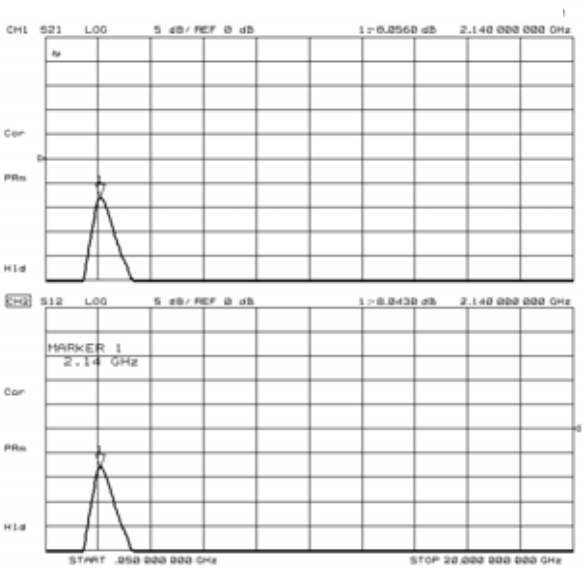






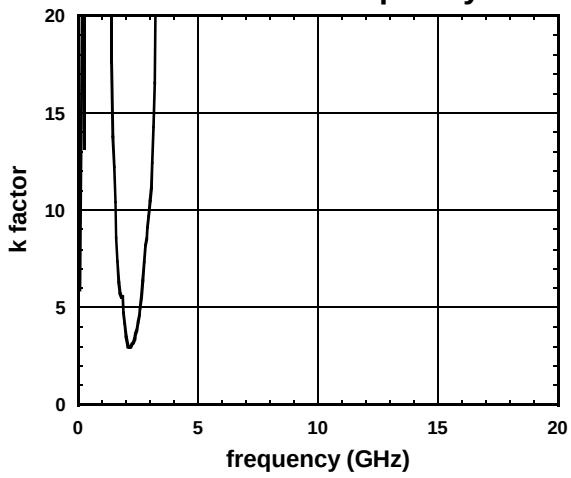
■ **ELECTRICAL CHARACTERISTICS (2.1GHz band Low Gain Mode)**





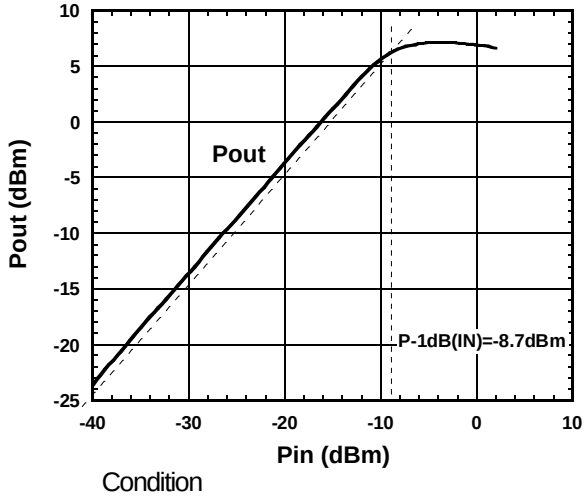
NJG1123PB5 (2.1GHz) @Low Gain

k factor vs. frequency



■ ELECTRICAL CHARACTERISTICS (800MHz band High Gain Mode)

NJG1123PB5 (800MHz) @High Gain Pout vs. Pin



Condition

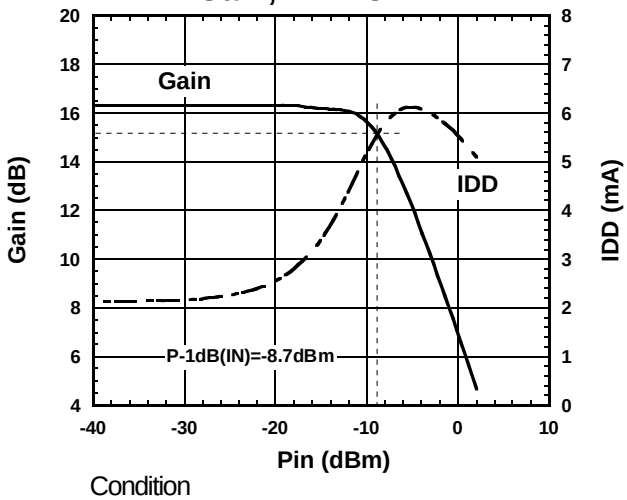
Ta=+25°C,

f=885MHz,

V_{DD}=V_{INV}=2.7V,

V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (800MHz) @High Gain Gain, IDD vs. Pin



Condition

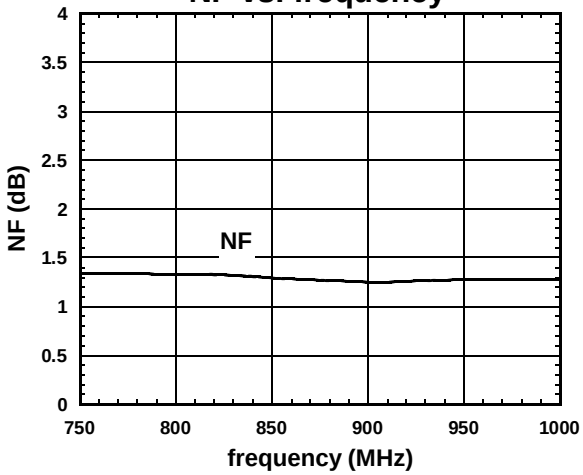
Ta=+25°C,

f=885MHz,

V_{DD}= V_{INV} =2.7V,

V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (800MHz) @High Gain NF vs. frequency



Condition

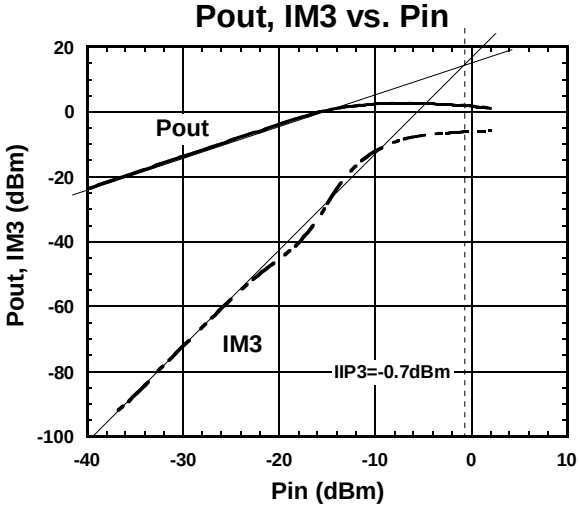
Ta=+25°C,

f=750M~1GHz,

V_{DD}=V_{INV} =2.7V,

V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (800MHz) @High Gain Pout, IM3 vs. Pin



Condition

Ta=+25°C,

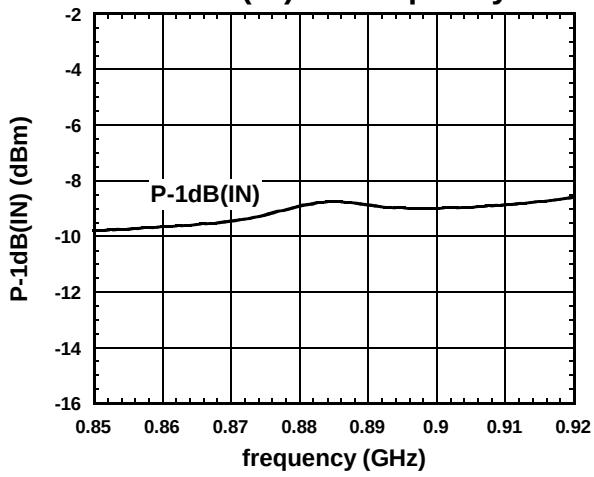
f1=885MHz, f2=f1+100kHz,

V_{DD}= V_{INV} =2.7V,

V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=1.85V

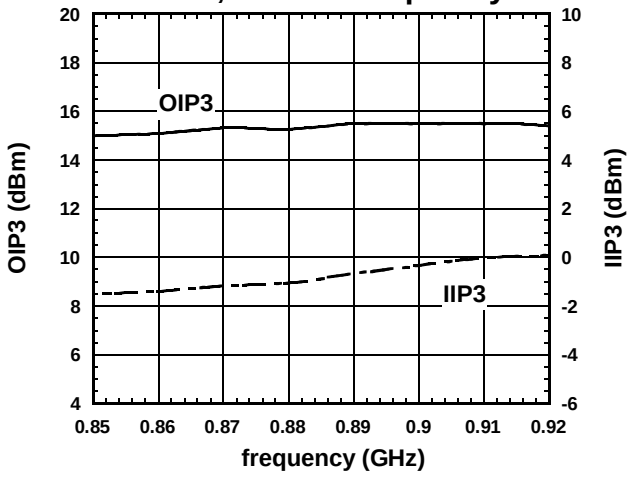
■ **ELECTRICAL CHARACTERISTICS (800MHz band High Gain Mode)**

NJG1123PB5 (800MHz) @High Gain
P-1dB(IN) vs. frequency



Condition
Ta=+25°C,
f=850~920MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=1.85V

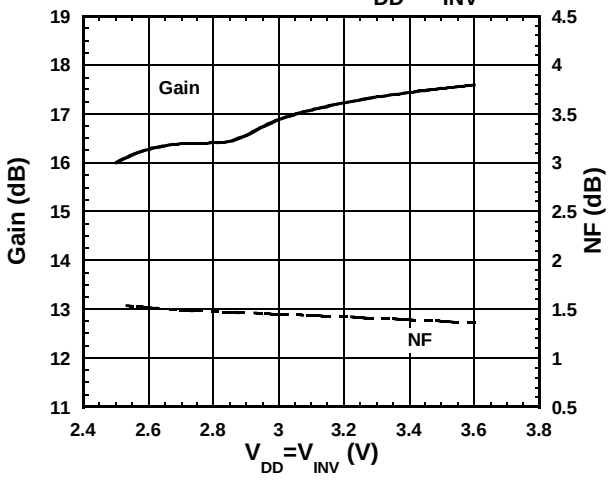
NJG1123PB5 (800MHz) @High Gain
OIP3, IIP3 vs. frequency



Condition
Ta=+25°C,
f1=850~920MHz, f2=f1+100kHz,
Pin=-30dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=1.85V

■ ELECTRICAL CHARACTERISTICS (800MHz band High Gain Mode)

NJG1123PB5 (800MHz) @High Gain
Gain, NF vs. V_{DD}, V_{INV}



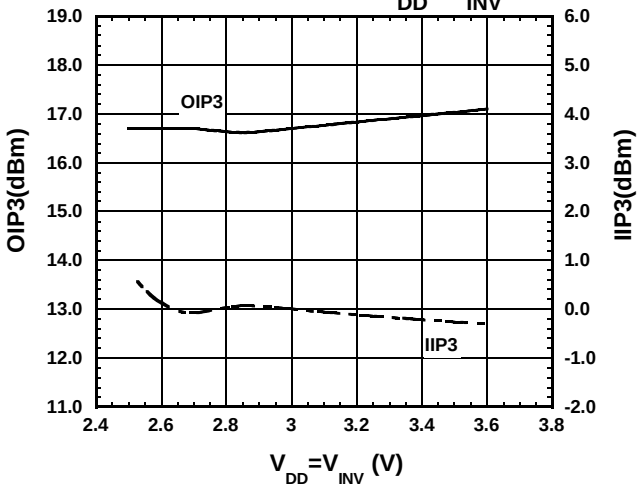
Condition

Ta=+25°C,

f=885MHz,

$V_{CTL}1$=1.85V, $V_{CTL}2$=0V, $V_{CTL}3$=1.85V

NJG1123PB5 (800MHz) @High Gain
OIP3, IIP3 vs. V_{DD}, V_{INV}



Condition

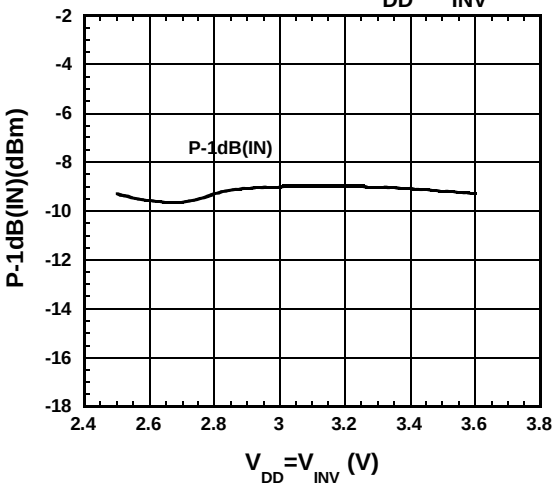
Ta=+25°C,

f1=885MHz, f2=f1+100kHz,

Pin=-30dBm,

$V_{CTL}1$=1.85V, $V_{CTL}2$=0V, $V_{CTL}3$=1.85V

NJG1123PB5 (800MHz) @High Gain
P-1dB(IN) vs. V_{DD}, V_{INV}



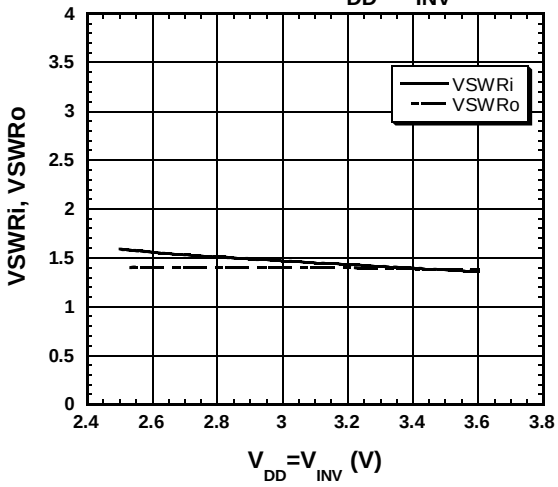
Condition

Ta=+25°C,

f=885MHz,

$V_{CTL}1$=1.85V, $V_{CTL}2$=0V, $V_{CTL}3$=1.85V

NJG1123PB5 (800MHz) @High Gain
VSWR vs. V_{DD}, V_{INV}



Condition

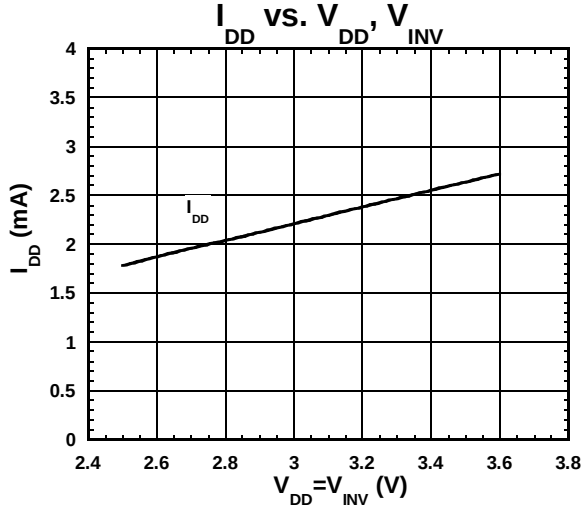
Ta=+25°C,

f=885MHz,

$V_{CTL}1$=1.85V, $V_{CTL}2$=0V, $V_{CTL}3$=1.85V

■ **ELECTRICAL CHARACTERISTICS (800MHz band High Gain Mode)**

NJG1123PB5 (800MHz) @High Gain



Condition

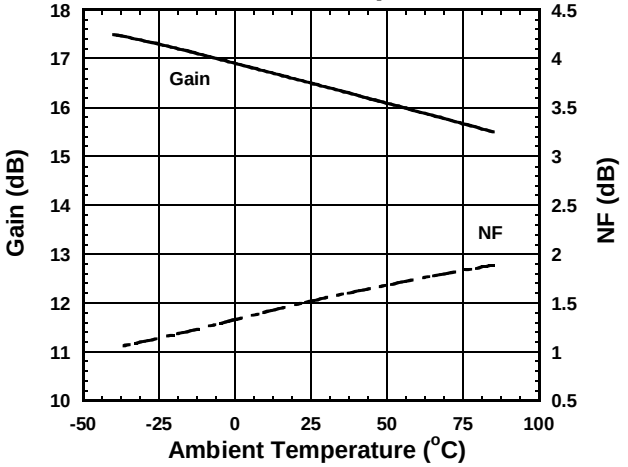
Ta=+25°C,

RF=OFF

$V_{CTL}1$=1.85V, $V_{CTL}2$=0V, $V_{CTL}3$=1.85V

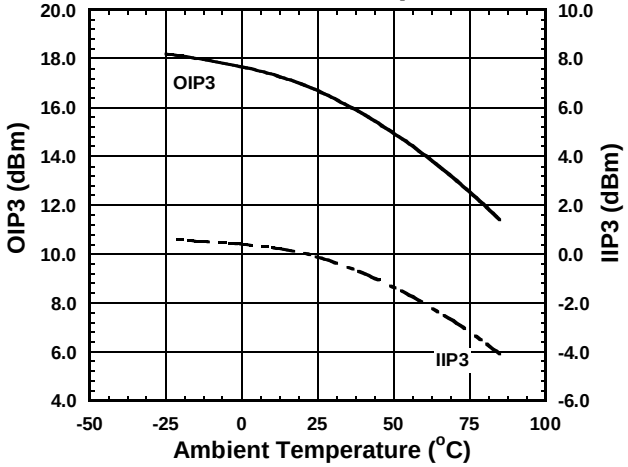
■ ELECTRICAL CHARACTERISTICS (800MHz band High Gain Mode)

NJG1123PB5 (800MHz) @High Gain
Gain, NF vs. Temperature



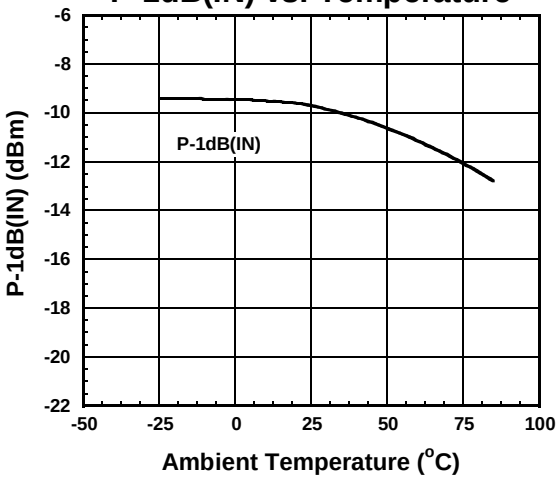
Condition
f=885MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (800MHz) @High Gain
OIP3, IIP3 vs. Temperature



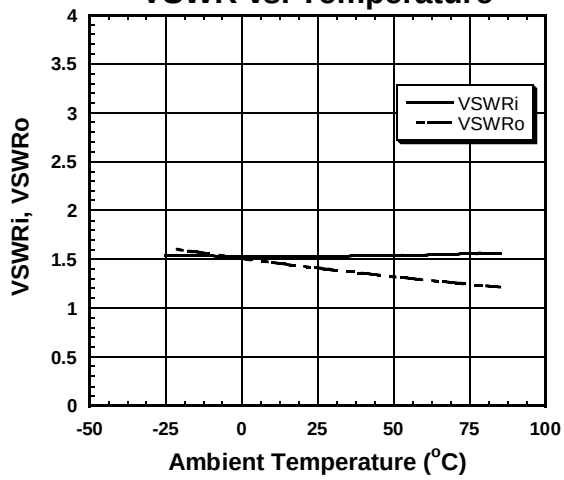
Condition
f1=885MHz, f2=f1+100kHz,
Pin=-30dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=1.85V

NJG1123PB5 (800MHz) @High Gain
P-1dB(IN) vs. Temperature



Condition
f=885MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=1.85V

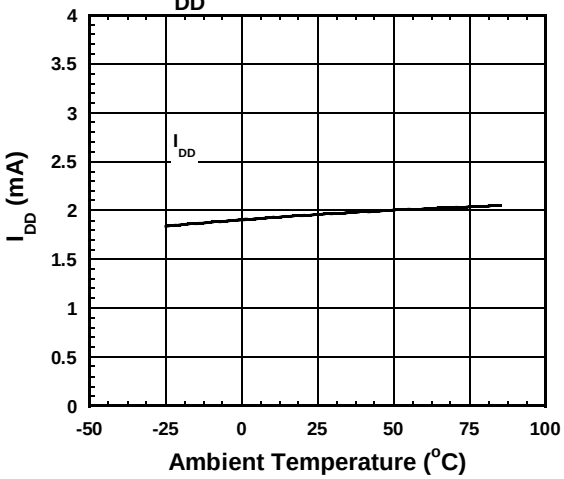
NJG1123PB5 (800MHz) @High Gain
VSWR vs. Temperature



Condition
f=885MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=1.85V

■ **ELECTRICAL CHARACTERISTICS (800MHz band High Gain Mode)**

NJG1123PB5 (800MHz) @High Gain
I_{DD} vs. Temperature



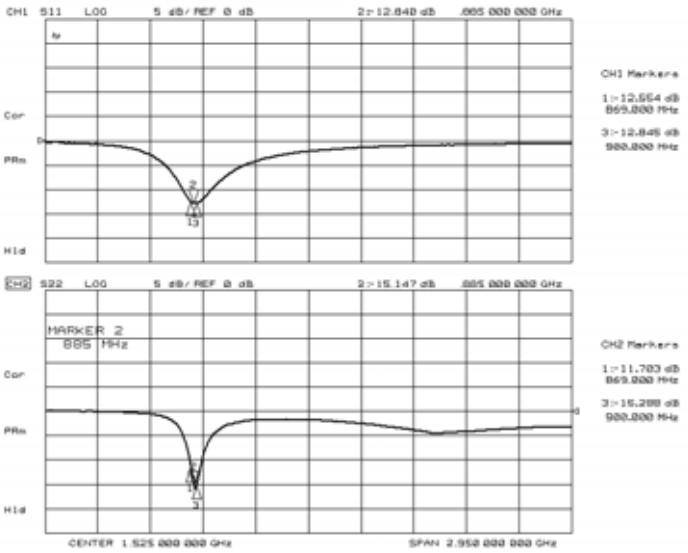
Condition

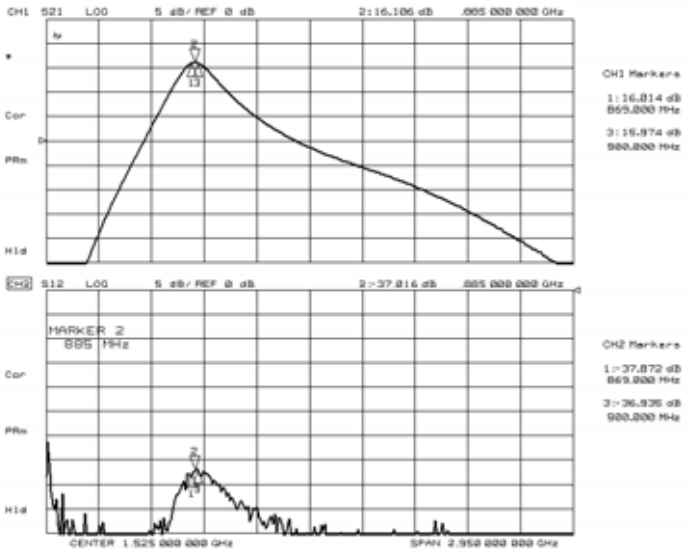
RF=OFF

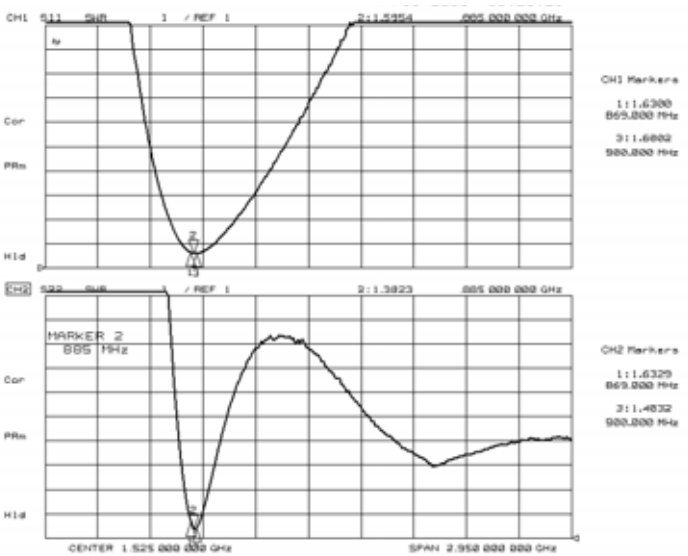
V_{DD}= V_{INV} =2.7V,

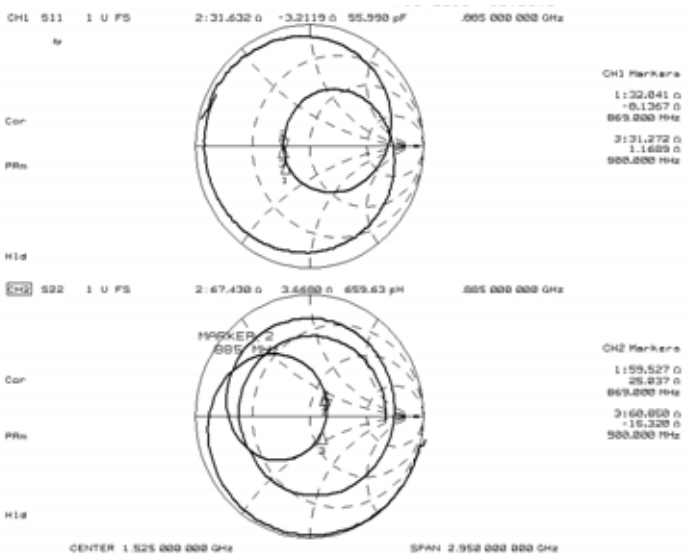
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=1.85V

■ ELECTRICAL CHARACTERISTICS (800MHz band High Gain Mode)

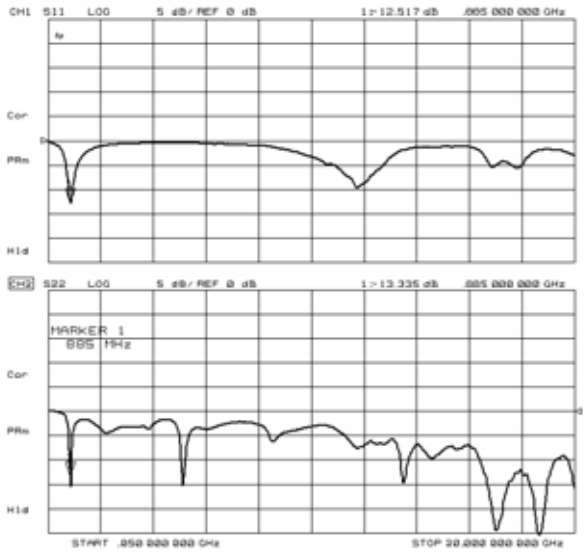


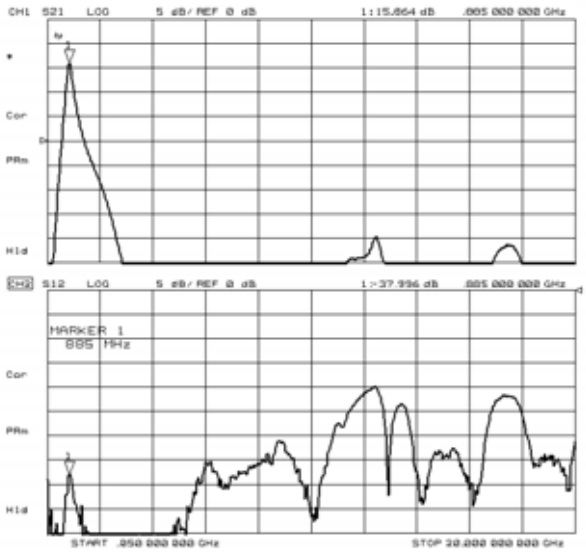




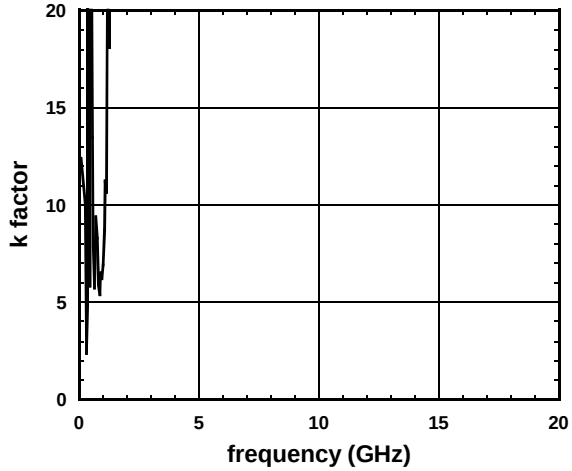


■ **ELECTRICAL CHARACTERISTICS (800MHz band High Gain Mode)**



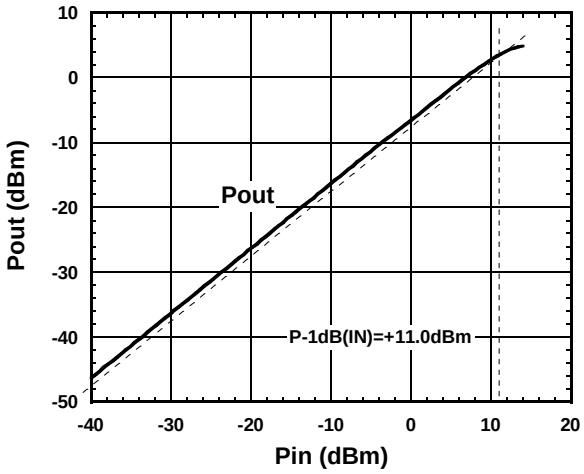


NJG1123PB5 (800MHz) @High Gain
k factor vs. frequency



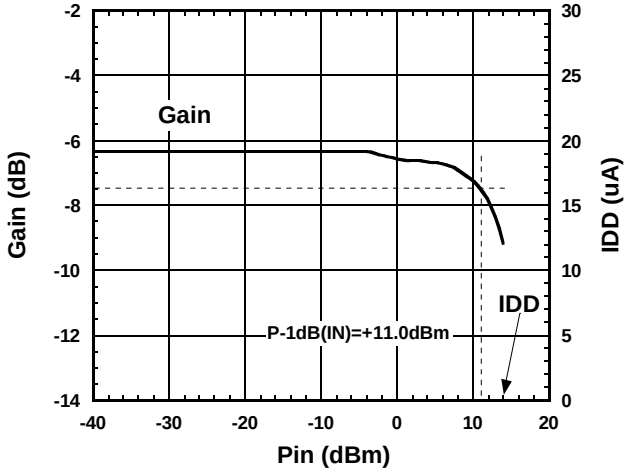
■ ELECTRICAL CHARACTERISTICS (800MHz band Low Gain Mode)

NJG1123PB5 (800MHz) @Low Gain
Pout vs. Pin



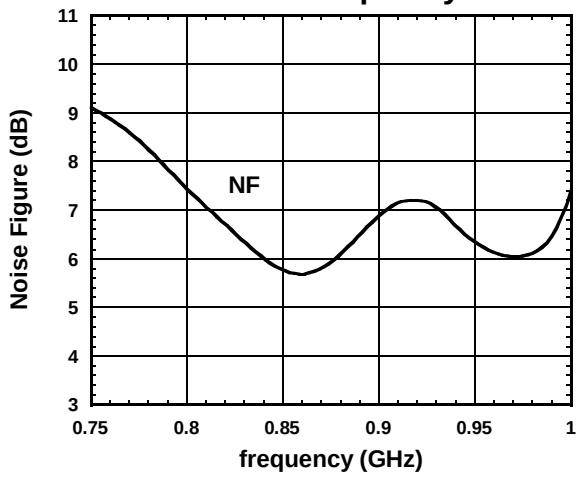
Condition
Ta=+25°C,
f=885MHz,
V_{DD}=V_{INV}=2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

NJG1123PB5 (800MHz) @Low Gain
Gain, IDD vs. Pin



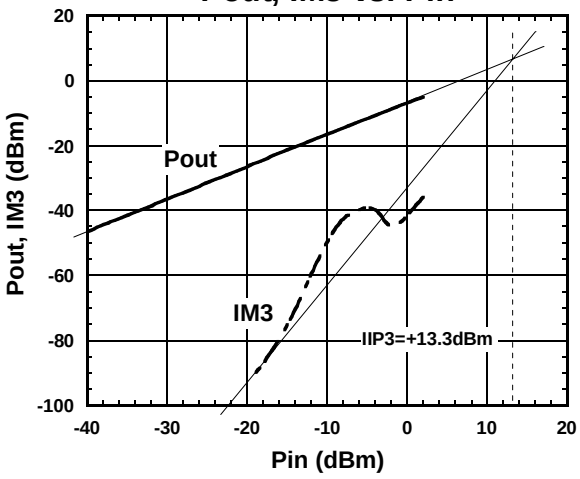
Condition
Ta=+25°C,
f=885MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

NJG1123PB5 (800MHz) @Low Gain
NF vs. frequency



Condition
Ta=+25°C,
f=750~1GHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

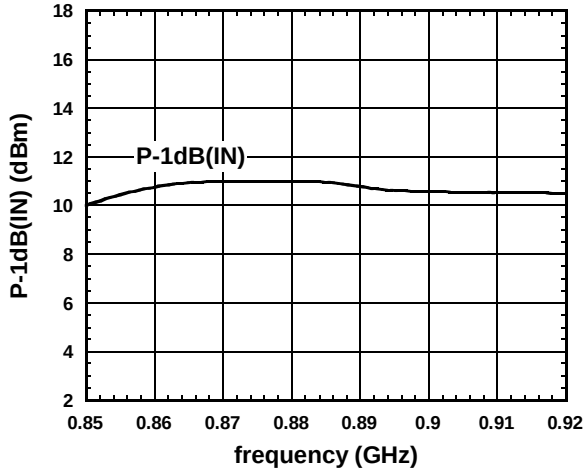
NJG1123PB5 (800MHz) @Low Gain
Pout, IM3 vs. Pin



Condition
Ta=+25°C,
f1=885MHz, f2=f1+100kHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

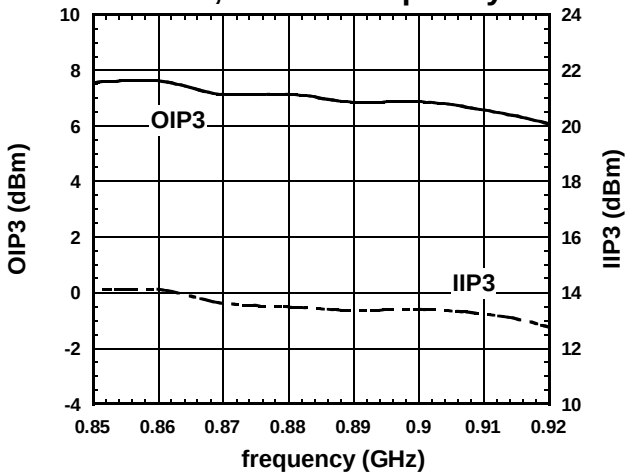
■ ELECTRICAL CHARACTERISTICS (800MHz band Low Gain Mode)

NJG1123PB5 (800MHz) @Low Gain
P-1dB(IN) vs. frequency



Condition
Ta=+25°C,
f=850~920MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

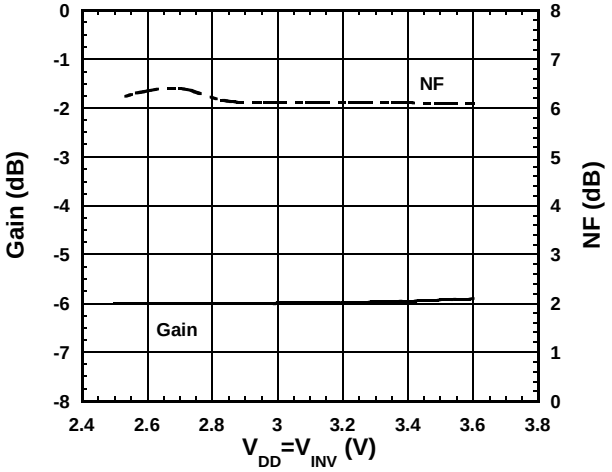
NJG1123PB5 (800MHz) @Low Gain
OIP3, IIP3 vs. frequency



Condition
Ta=+25°C
f1=850~920MHz, f2=f1+100kHz,
Pin=-20dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

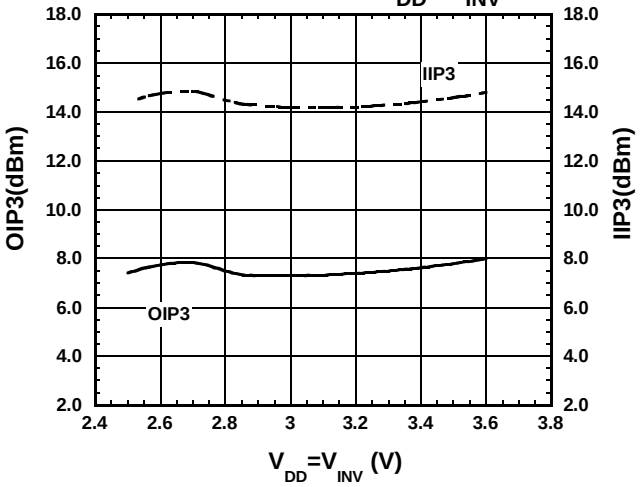
■ ELECTRICAL CHARACTERISTICS (800MHz band Low Gain Mode)

NJG1123PB5 (800MHz) @Low Gain
Gain, NF vs. V_{DD}, V_{INV}



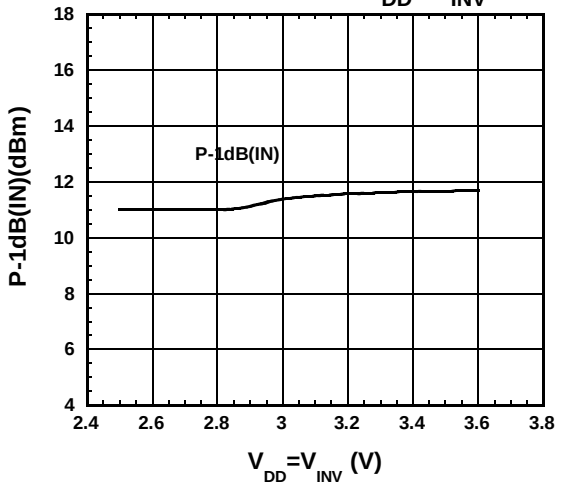
Condition
Ta=+25°C,
f=885MHz,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

NJG1123PB5 (800MHz) @Low Gain
OIP3, IIP3 vs. V_{DD}, V_{INV}



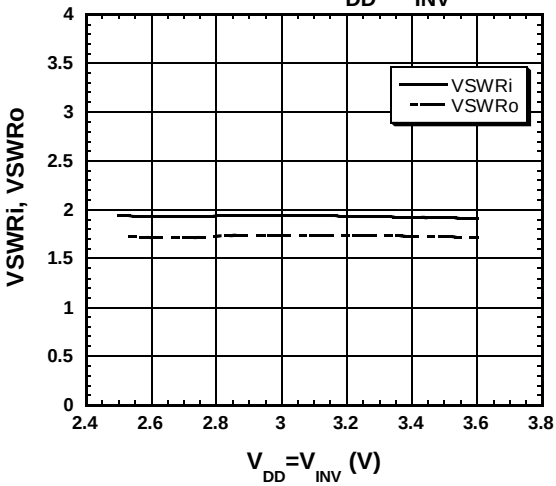
Condition
Ta=+25°C,
f1=885MHz, f2=f1+100kHz,
Pin=-20dBm,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

NJG1123PB5 (800MHz) @Low Gain
P-1dB(IN) vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
f=885MHz,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

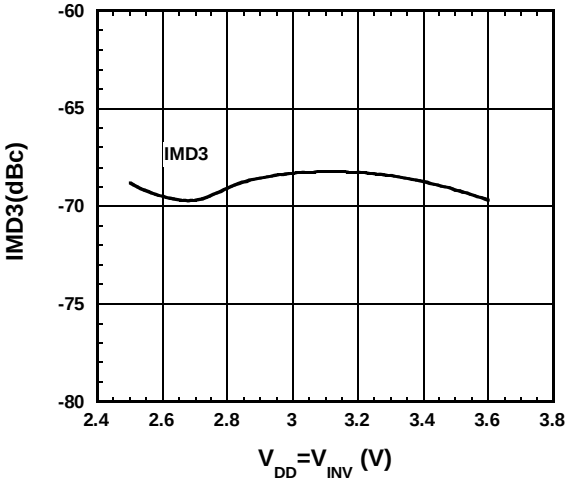
NJG1123PB5 (800MHz) @Low Gain
VSWR vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
f=885MHz,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

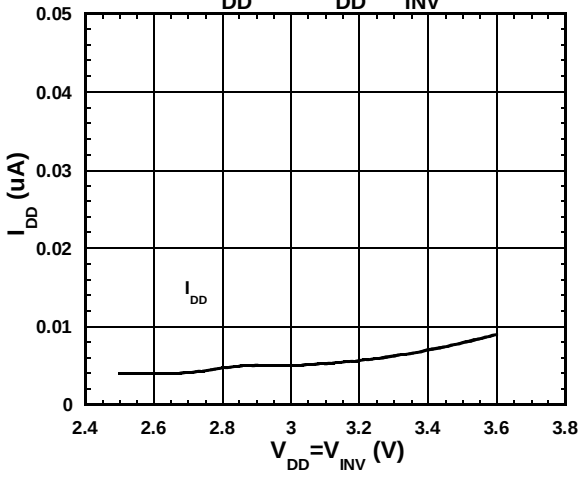
■ **ELECTRICAL CHARACTERISTICS (800MHz band Low Gain Mode)**

NJG1123PB5 (800MHz) @Low Gain
IMD3 vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
f1=885MHz, f2=f1+100kHz,
Pin=-20dBm,
$V_{CTL}1$=1.85V, $V_{CTL}2$=0V, $V_{CTL}3$=0V

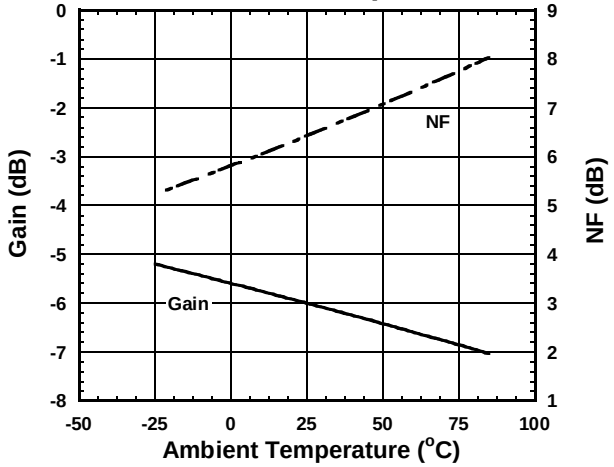
NJG1123PB5 (800MHz) @Low Gain
I_{DD} vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
RF=OFF
$V_{CTL}1$=1.85V, $V_{CTL}2$=0V, $V_{CTL}3$=0V

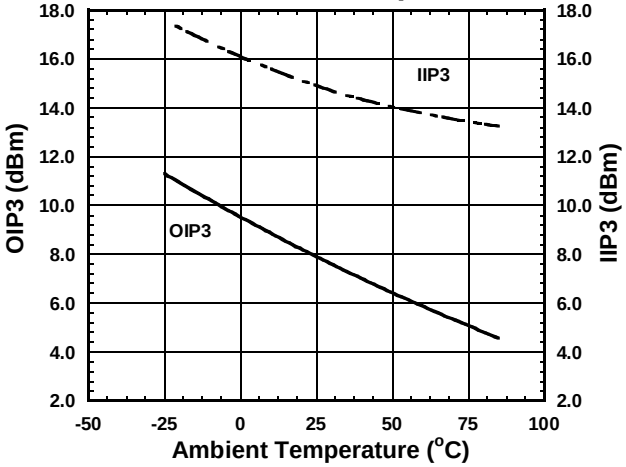
■ ELECTRICAL CHARACTERISTICS (800MHz band Low Gain Mode)

NJG1123PB5 (800MHz) @Low Gain
Gain, NF vs. Temperature



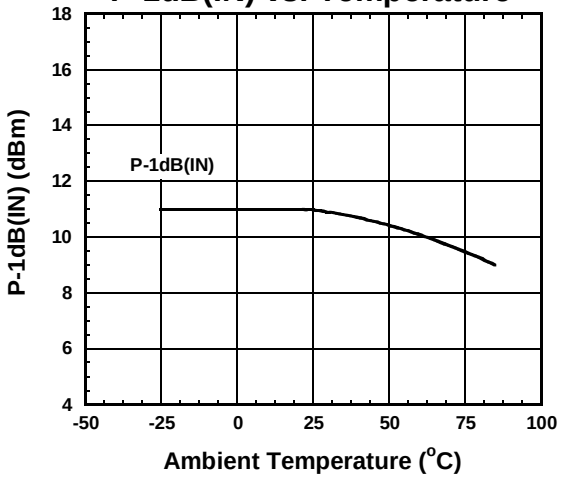
Condition
f=885MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

NJG1123PB5 (800MHz) @Low Gain
OIP3, IIP3 vs. Temperature



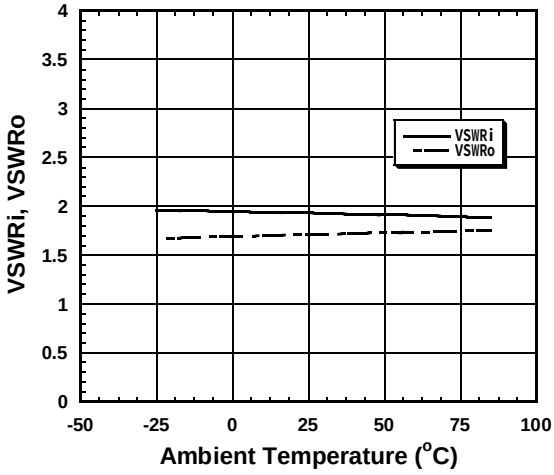
Condition
f1=885MHz, f2=f1+100kHz,
Pin=-20dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

NJG1123PB5 (800MHz) @Low Gain
P-1dB(IN) vs. Temperature



Condition
f=885MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

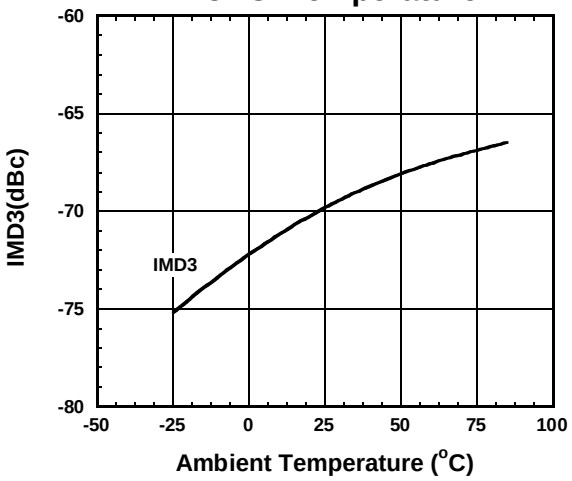
NJG1123PB5 (800MHz) @Low Gain
VSWR vs. Temperature



Condition
f=885MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

■ ELECTRICAL CHARACTERISTICS (800MHz band Low Gain Mode)

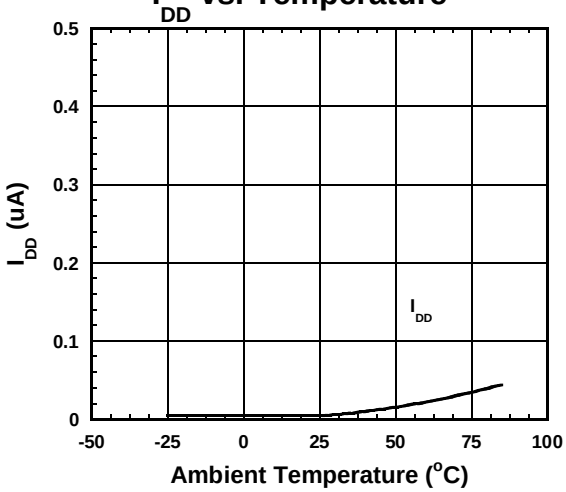
NJG1123PB5 (800MHz) @Low Gain
IMD3 vs. Temperature



Condition

f1=885MHz, f2=f1+100kHz,
Pin=-20dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

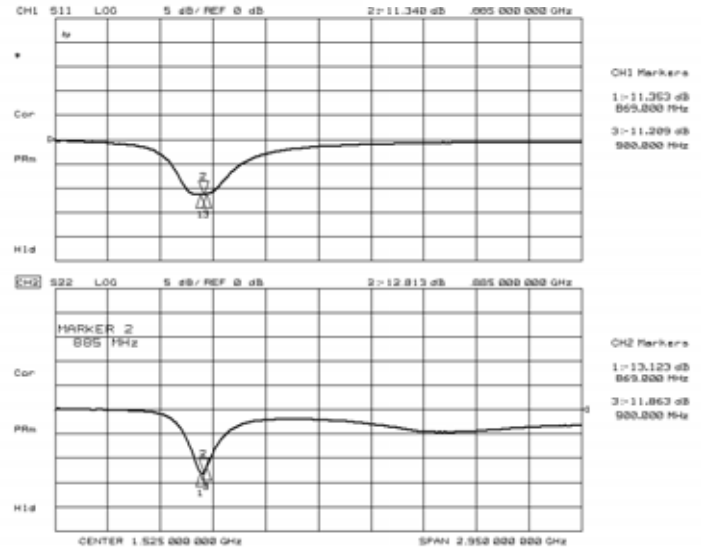
NJG1123PB5 (800MHz) @Low Gain
I_{DD} vs. Temperature

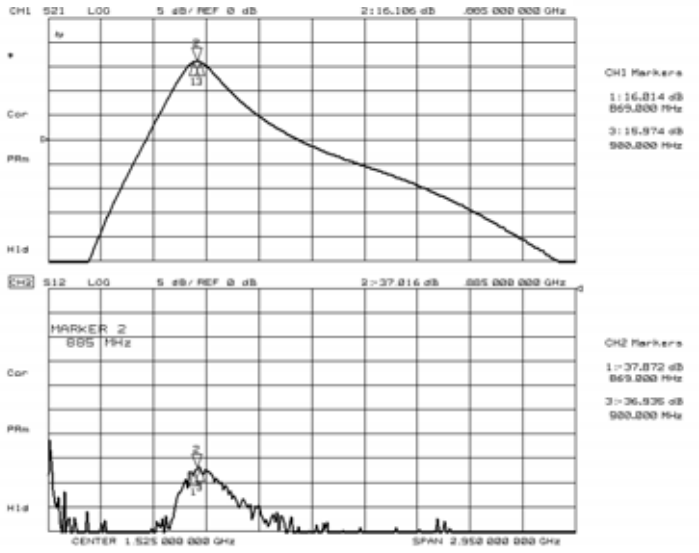


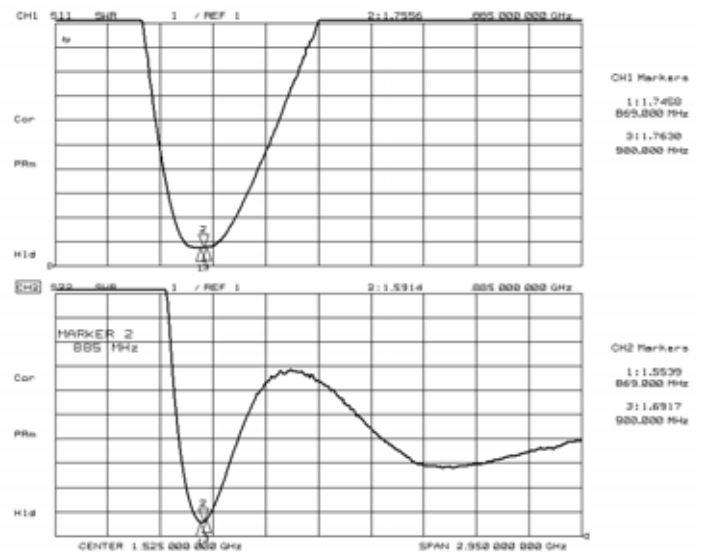
Condition

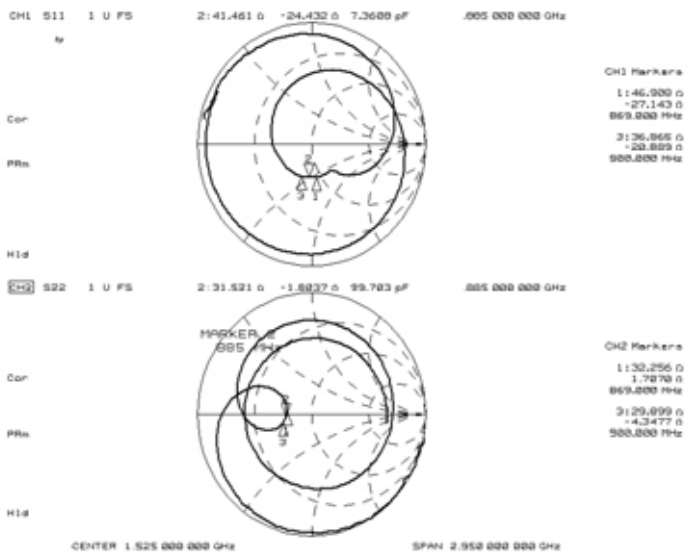
RF=OFF
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=1.85V, V_{CTL}2=0V, V_{CTL}3=0V

■ ELECTRICAL CHARACTERISTICS (800MHz band Low Gain Mode)

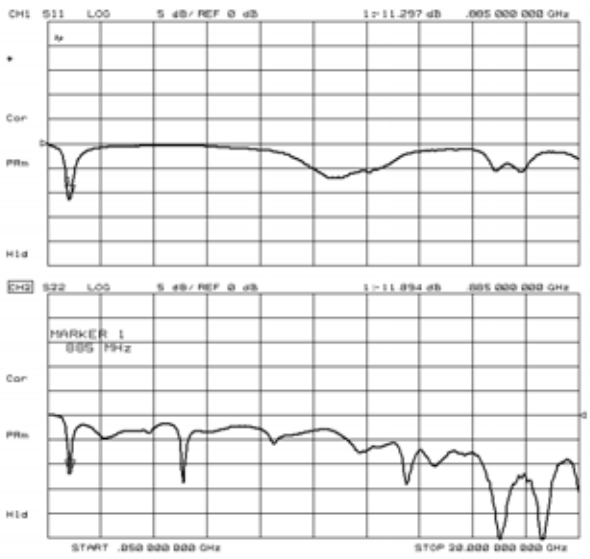


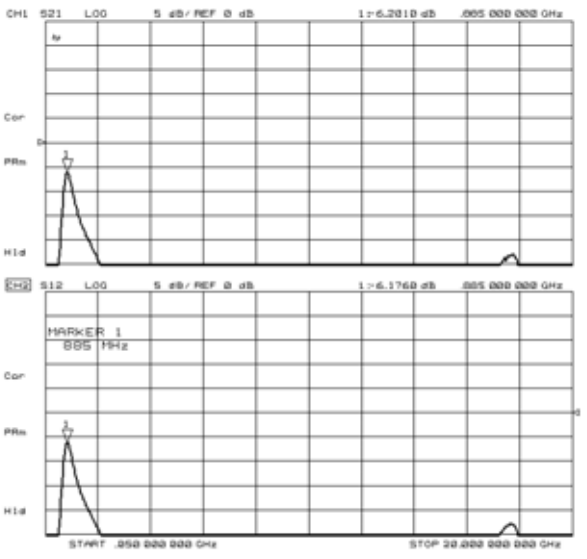




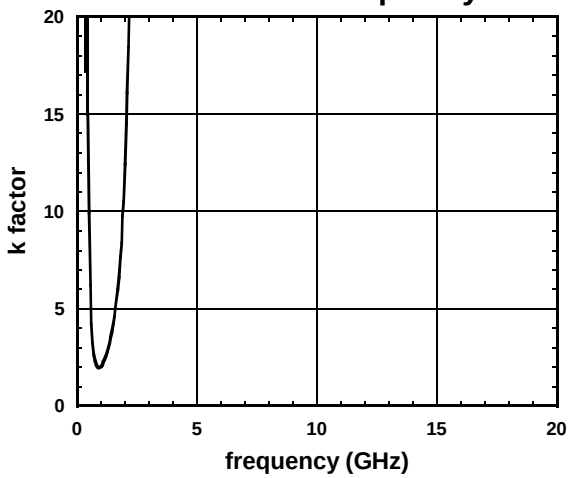


■ **ELECTRICAL CHARACTERISTICS (800MHz band Low Gain Mode)**



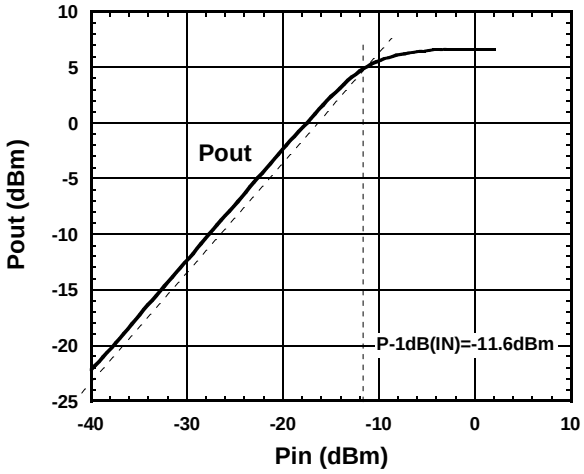


NJG1123PB5 (800MHz) @Low Gain
k factor vs. frequency



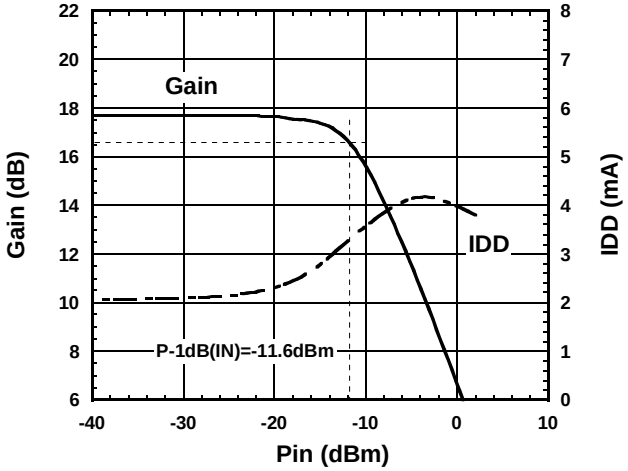
■ ELECTRICAL CHARACTERISTICS (1.7GHz band High Gain Mode)

NJG1123PB5 (1.7GHz) @High Gain
Pout vs. Pin



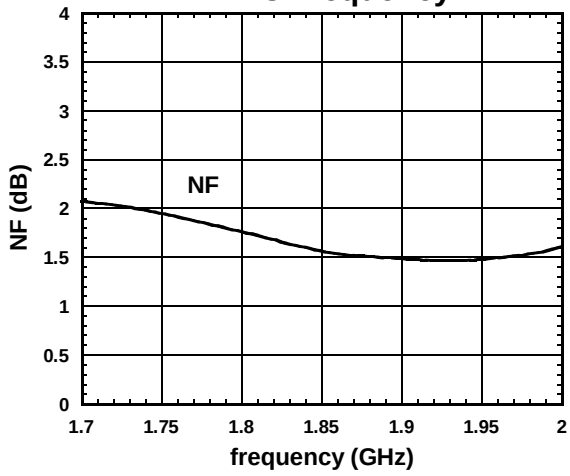
Condition
Ta=+25°C,
f=1860MHz,
V_{DD}=V_{INV}=2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

NJG1123PB5 (1.7GHz) @High Gain
Gain, IDD vs. Pin



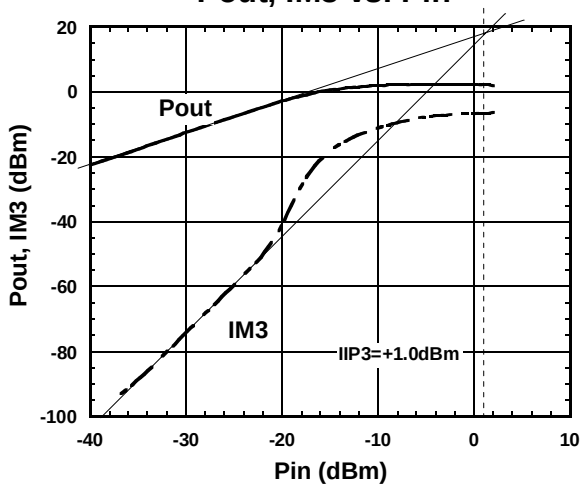
Condition
Ta=+25°C,
f=1860MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

NJG1123PB5 (1.7GHz) @High Gain
NF vs. frequency



Condition
Ta=+25°C,
f=1.7~2GHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

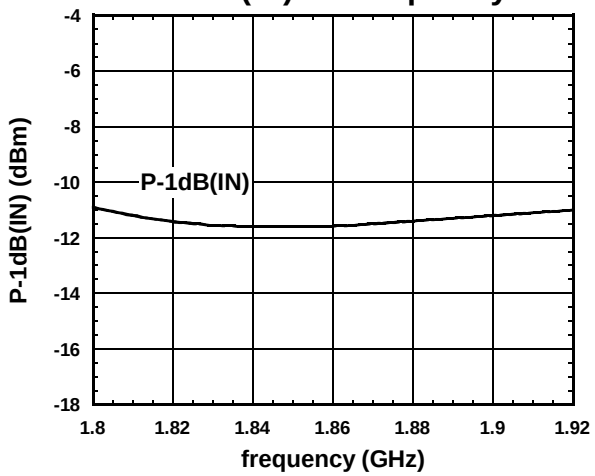
NJG1123PB5 (1.7GHz) @High Gain
Pout, IM3 vs. Pin



Condition
Ta=+25°C,
f1=1860MHz, f2=f1+100kHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

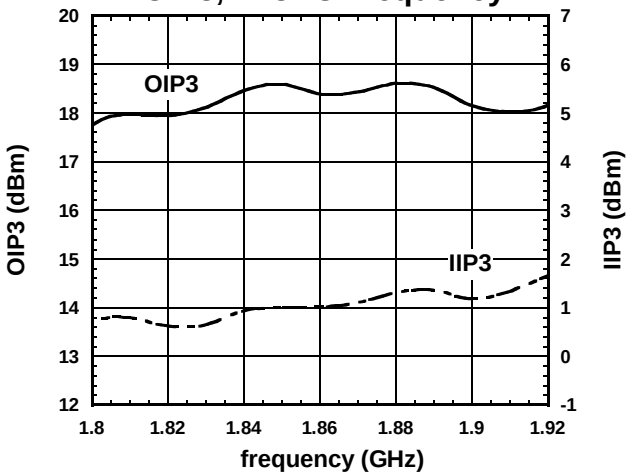
■ ELECTRICAL CHARACTERISTICS (1.7GHz band High Gain Mode)

NJG1123PB5 (1.7GHz) @High Gain
P-1dB(IN) vs. frequency



Condition
Ta=+25°C,
f=1.8~1.92GHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

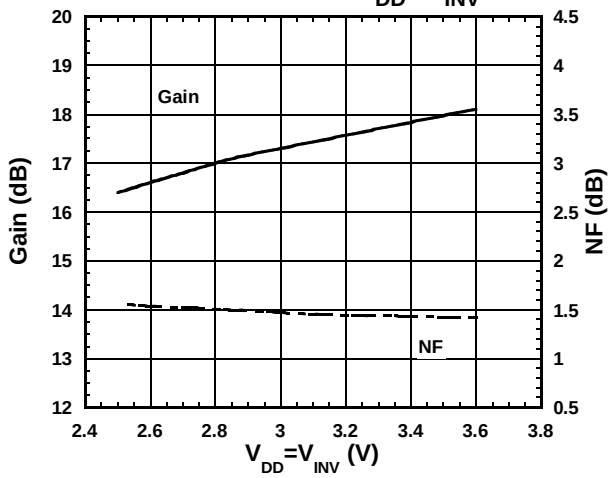
NJG1123PB5 (1.7GHz) @High Gain
OIP3, IIP3 vs. frequency



Condition
Ta=+25°C,
f1=1.8~1.92GHz, f2=f1+100kHz,
Pin=-30dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

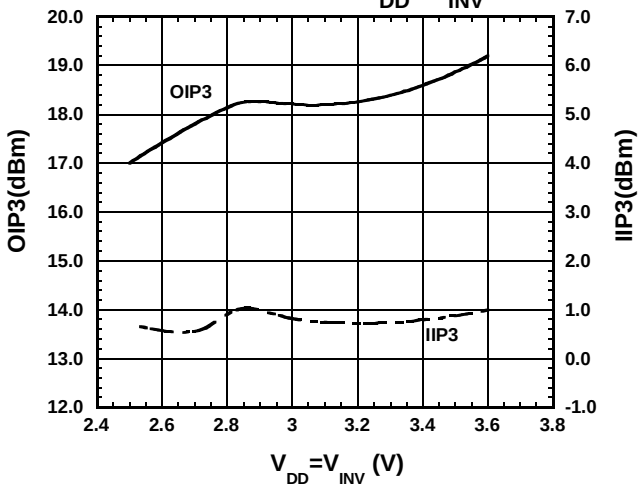
■ ELECTRICAL CHARACTERISTICS (1.7GHz band High Gain Mode)

NJG1123PB5 (1.7GHz) @High Gain
Gain, NF vs. V_{DD}, V_{INV}



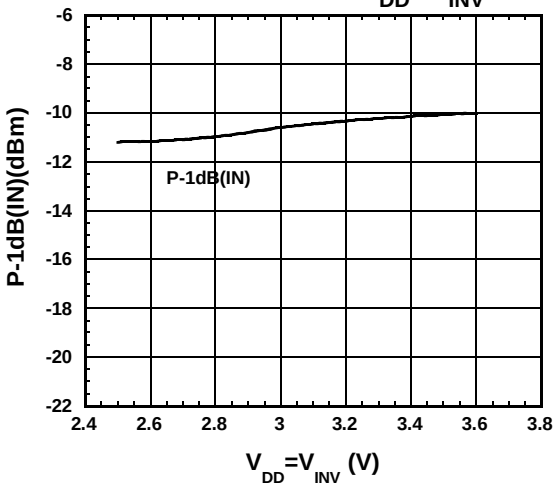
Condition
Ta=+25°C,
f=1860MHz,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

NJG1123PB5 (1.7GHz) @High Gain
OIP3, IIP3 vs. V_{DD}, V_{INV}



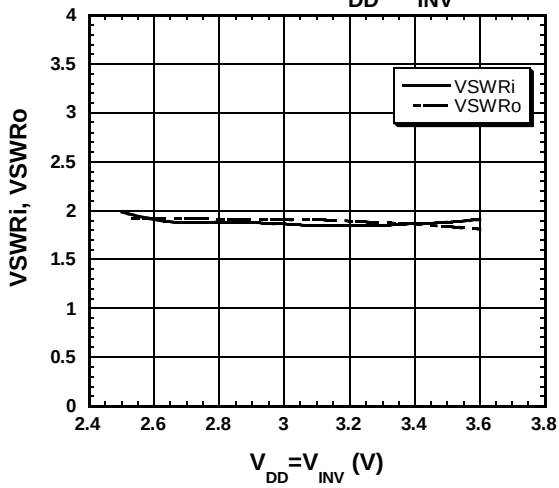
Condition
Ta=+25°C,
f1=1860MHz, f2=f1+100kHz,
Pin=-30dBm,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

NJG1123PB5 (1.7GHz) @High Gain
P-1dB(IN) vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
f=1860MHz,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

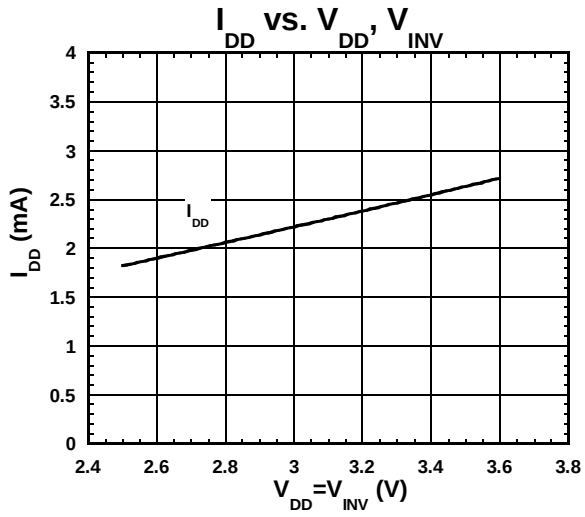
NJG1123PB5 (1.7GHz) @High Gain
VSWR vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
f=1860MHz,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

■ ELECTRICAL CHARACTERISTICS (1.7GHz band High Gain Mode)

NJG1123PB5 (1.7GHz) @High Gain



Condition

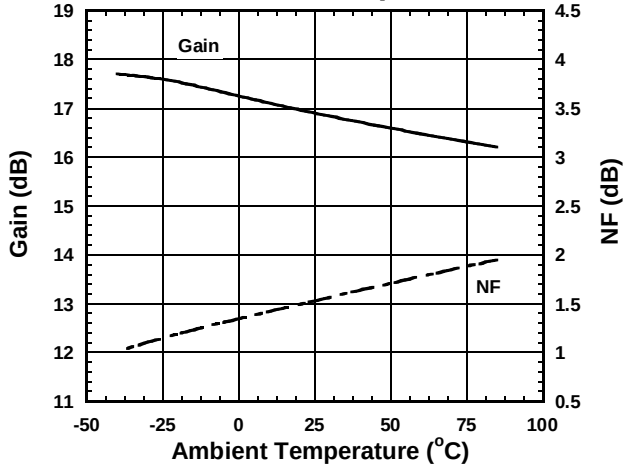
Ta=+25°C,

RF=OFF

$V_{CTL}1$=0V, $V_{CTL}2$=1.85V, $V_{CTL}3$=1.85V

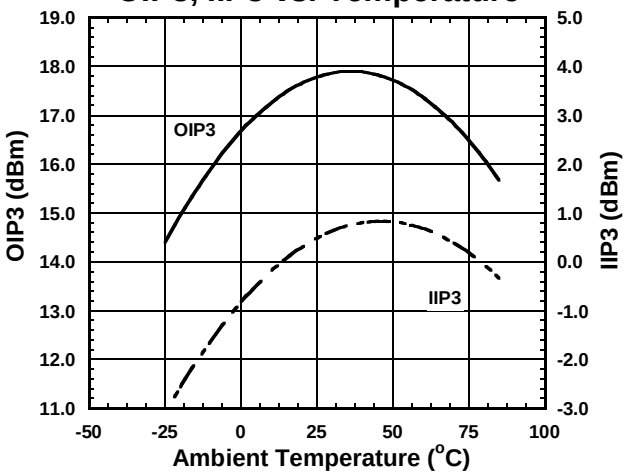
■ ELECTRICAL CHARACTERISTICS (1.7GHz band High Gain Mode)

NJG1123PB5 (1.7GHz) @High Gain
Gain, NF vs. Temperature



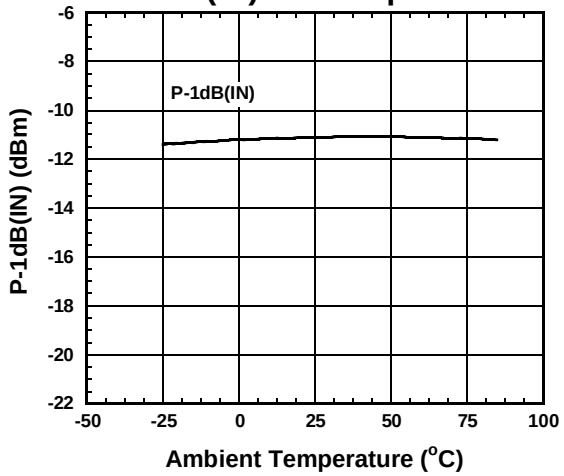
Condition
f=1860MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

NJG1123PB5 (1.7GHz) @High Gain
OIP3, IIP3 vs. Temperature



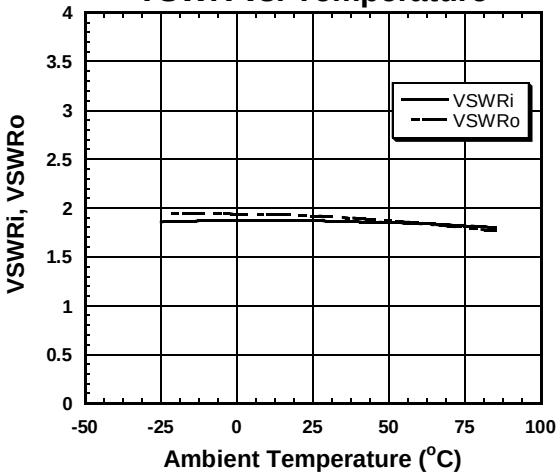
Condition
f1=1860MHz, f2=f1+100kHz,
Pin=-30dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

NJG1123PB5 (1.7GHz) @High Gain
P-1dB(IN) vs. Temperature



Condition
f=1860MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

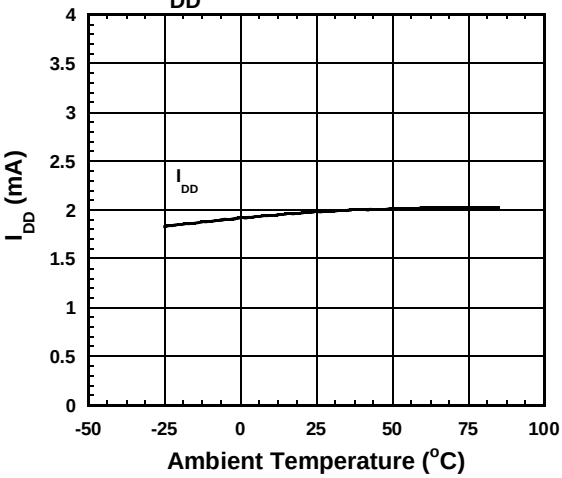
NJG1123PB5 (1.7GHz) @High Gain
VSWR vs. Temperature



Condition
f=1860MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

■ ELECTRICAL CHARACTERISTICS (1.7GHz band High Gain Mode)

NJG1123PB5 (1.7GHz) @High Gain
I_{DD} vs. Temperature



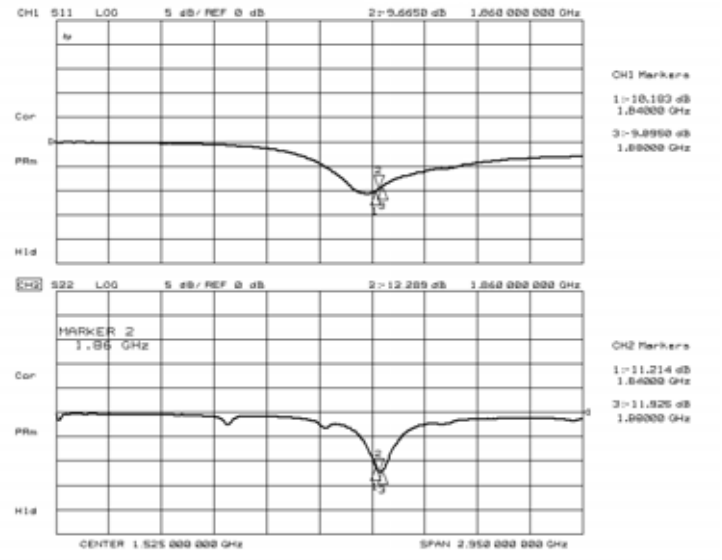
Condition

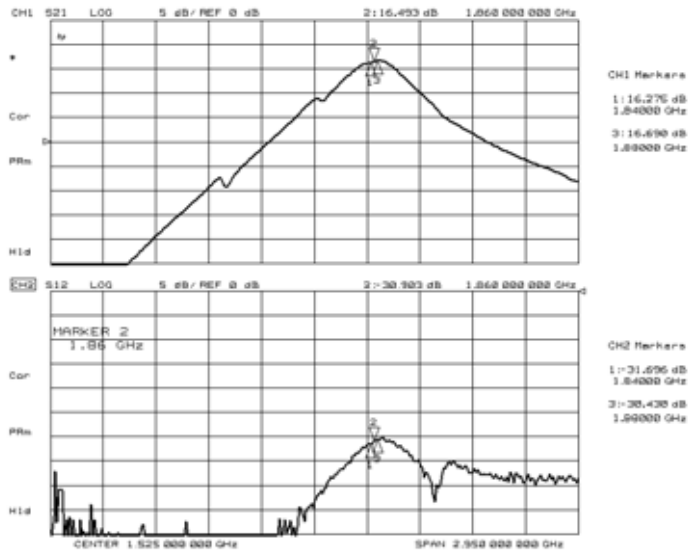
RF=OFF

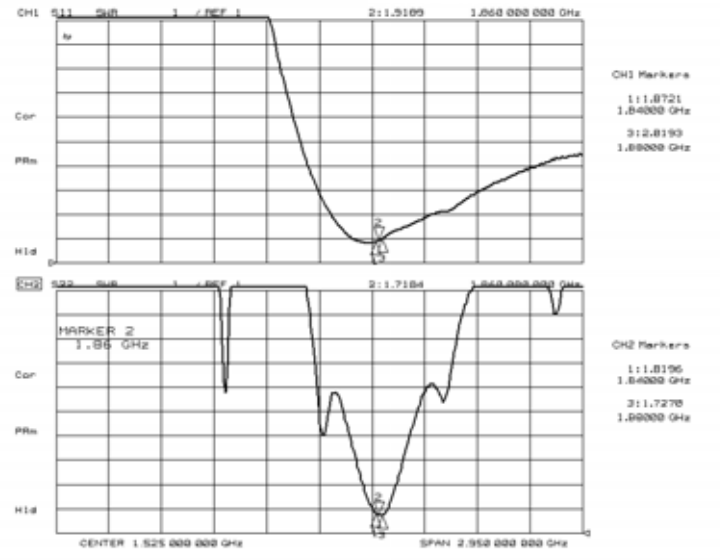
V_{DD}= V_{INV} =2.7V,

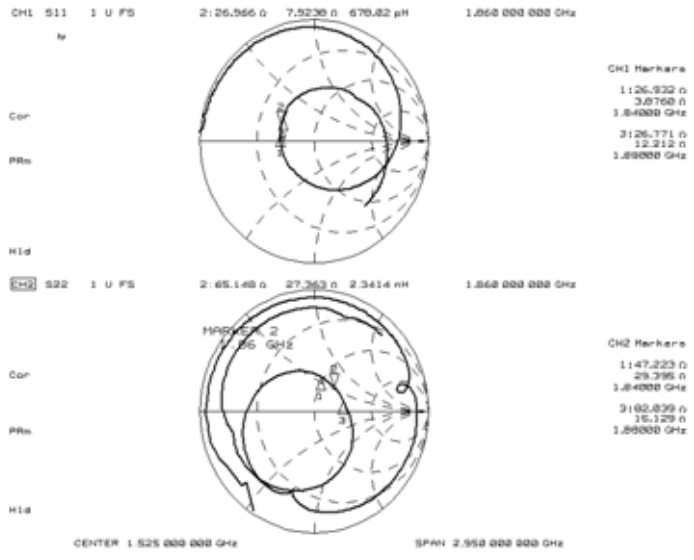
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=1.85V

■ ELECTRICAL CHARACTERISTICS (1.7GHz band High Gain Mode)

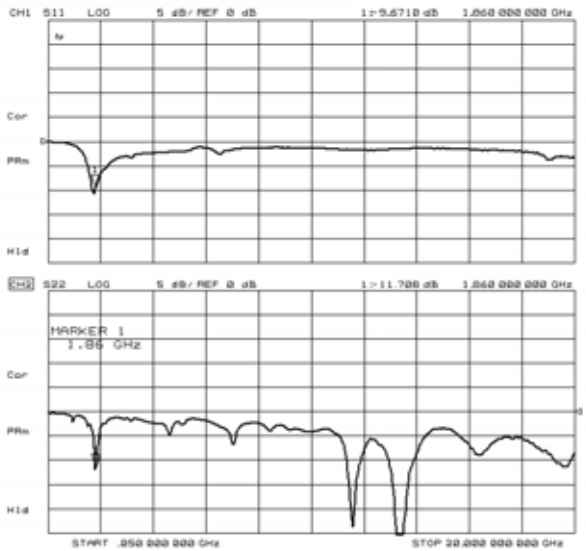


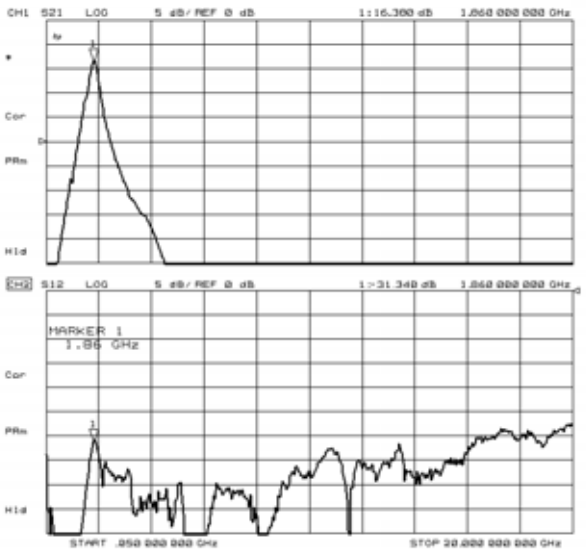




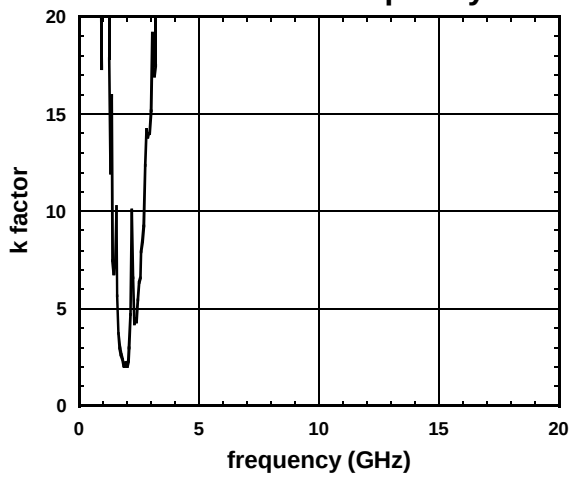


■ ELECTRICAL CHARACTERISTICS (1.7GHz band High Gain Mode)



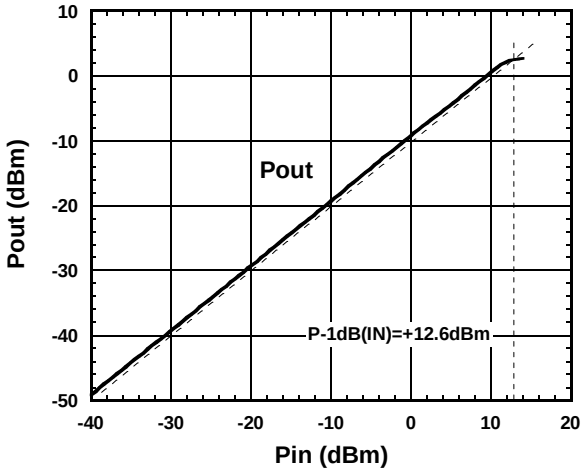


NJG1123PB5 (1.7GHz) @High Gain
k factor vs. frequency



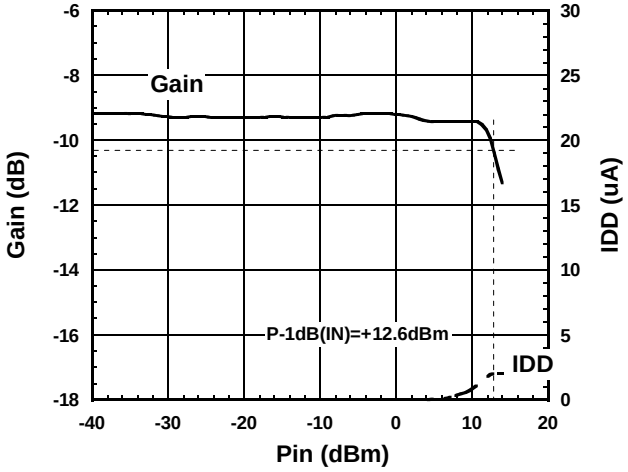
■ ELECTRICAL CHARACTERISTICS (1.7GHz band Low gain Mode)

NJG1123PB5 (1.7GHz) @Low Gain
Pout vs. Pin



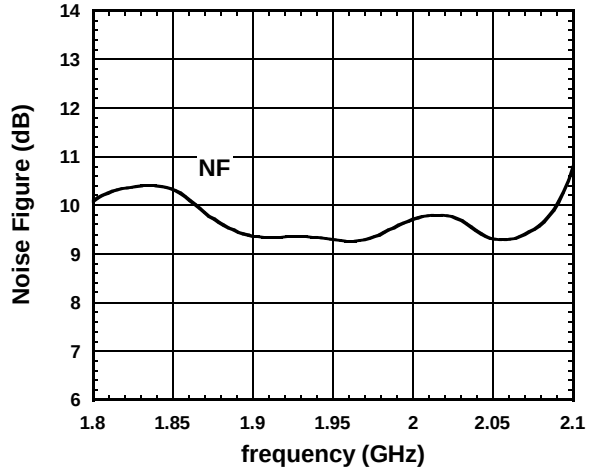
Condition
Ta=+25°C,
f=1860MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

NJG1123PB5 1.7GHz) @Low Gain
Gain, IDD vs. Pin



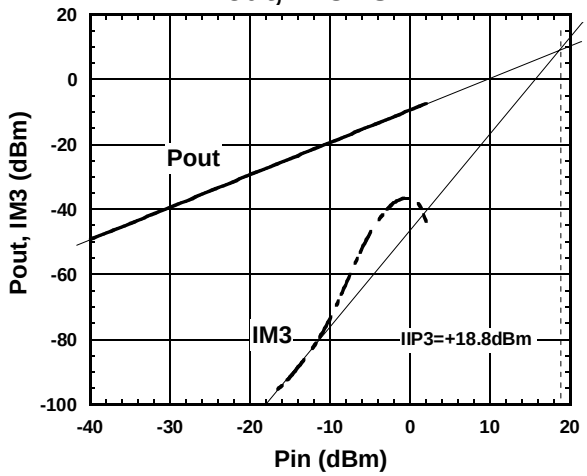
Condition
Ta=+25°C,
f=1860MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

NJG1123PB5 (1.7GHz) @Low Gain
NF vs. frequency



Condition
Ta=+25°C,
f=1.8~2.1GHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

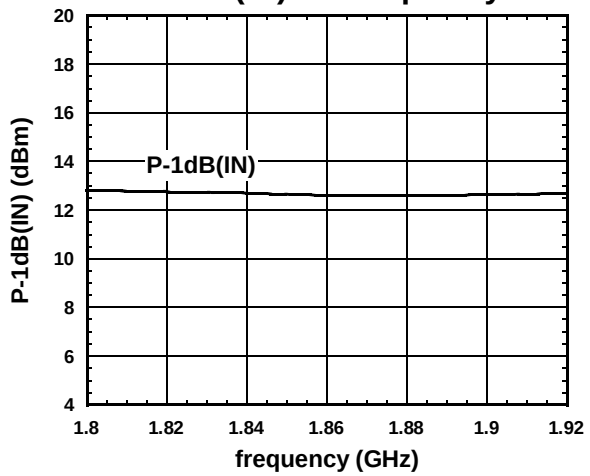
NJG1123PB5 (1.7GHz) @Low Gain
Pout, IM3 vs. Pin



Condition
Ta=+25°C,
f1=1860MHz, f2=f1+100kHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

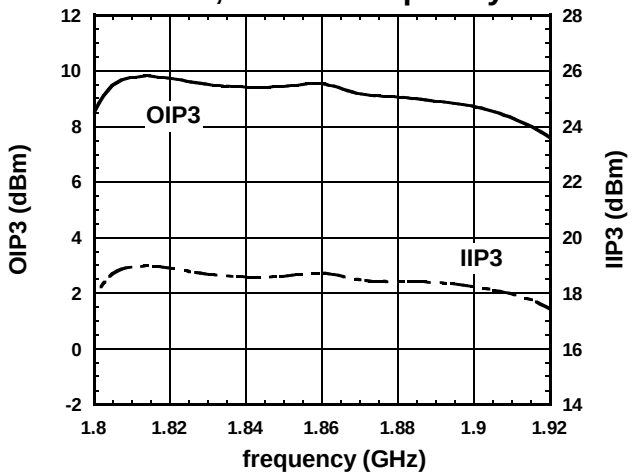
■ ELECTRICAL CHARACTERISTICS (1.7GHz band Low gain Mode)

NJG1123PB5 (1.7GHz) @Low Gain
P-1dB(IN) vs. frequency



Condition
Ta=+25°C,
f=1.8~1.92GHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

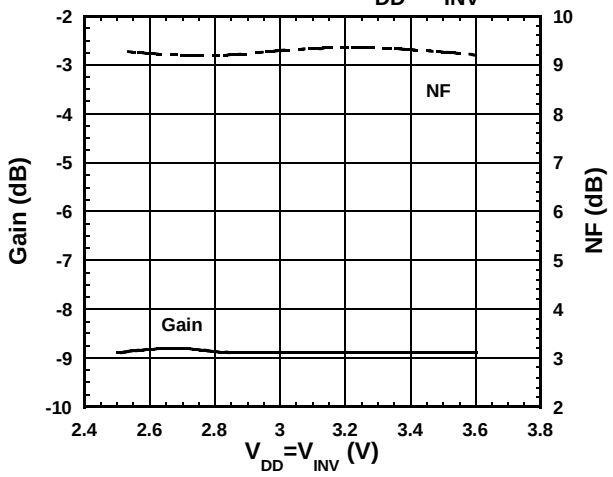
NJG1123PB5 (1.7GHz) @Low Gain
OIP3, IIP3 vs. frequency



Condition
Ta=+25°C,
f1=1.8~1.92GHz, f2=f1+100kHz,
Pin=-16dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

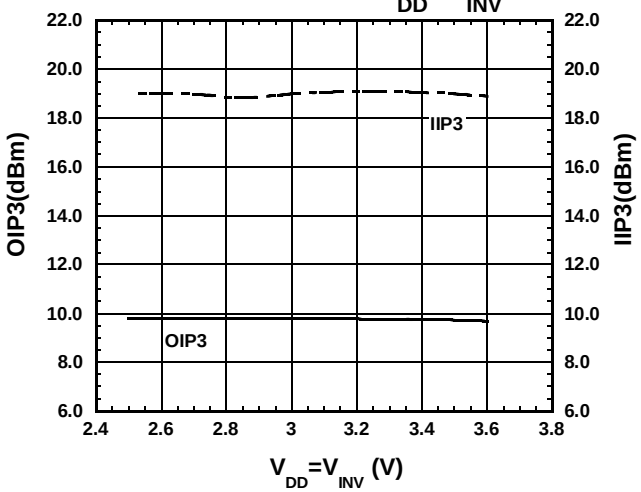
■ ELECTRICAL CHARACTERISTICS (1.7GHz band Low gain Mode)

NJG1123PB5 (1.7GHz) @Low Gain
Gain, NF vs. V_{DD}, V_{INV}



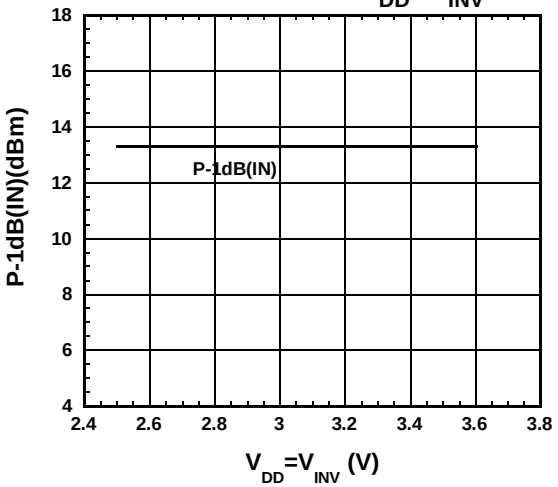
Condition
Ta=+25°C,
f=1860MHz,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

NJG1123PB5 (1.7GHz) @Low Gain
OIP3, IIP3 vs. V_{DD}, V_{INV}



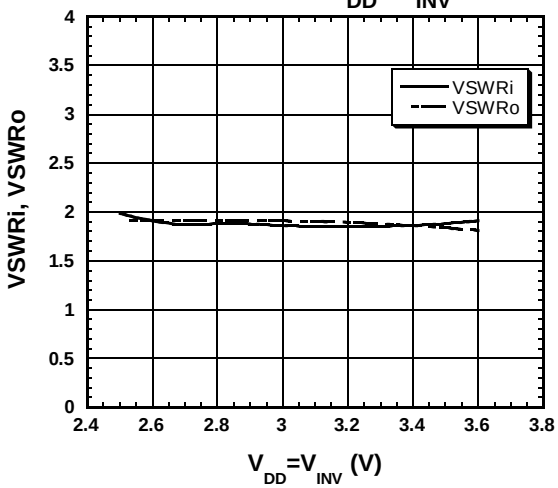
Condition
Ta=+25°C,
f1=1860MHz, f2=f1+100kHz,
Pin=-16dBm,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

NJG1123PB5 (1.7GHz) @Low Gain
P-1dB(IN) vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
f=1860MHz,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

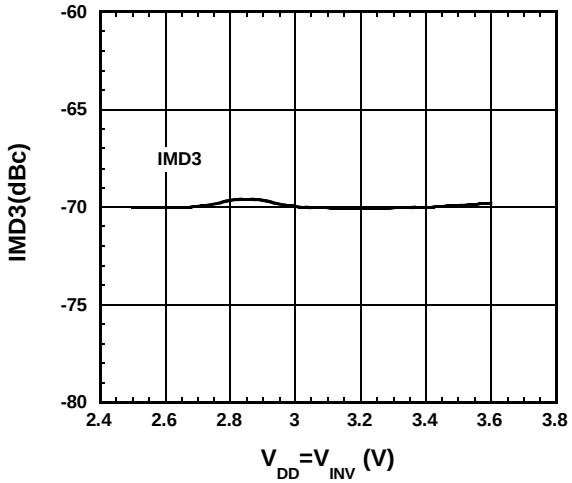
NJG1123PB5 (1.7GHz) @Low Gain
VSWR vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
f=1860MHz,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

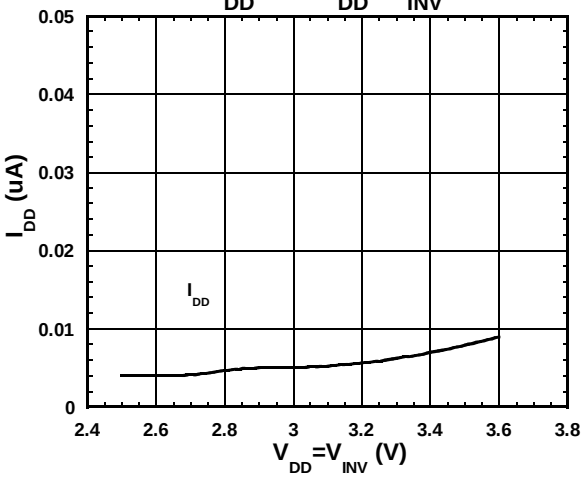
■ ELECTRICAL CHARACTERISTICS (1.7GHz band Low gain Mode)

NJG1123PB5 (1.7GHz) @Low Gain
IMD3 vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
f1=1860MHz, f2=f1+100kHz,
Pin=-16dBm,
$V_{CTL}1$=0V, $V_{CTL}2$=1.85V, $V_{CTL}3$=0V

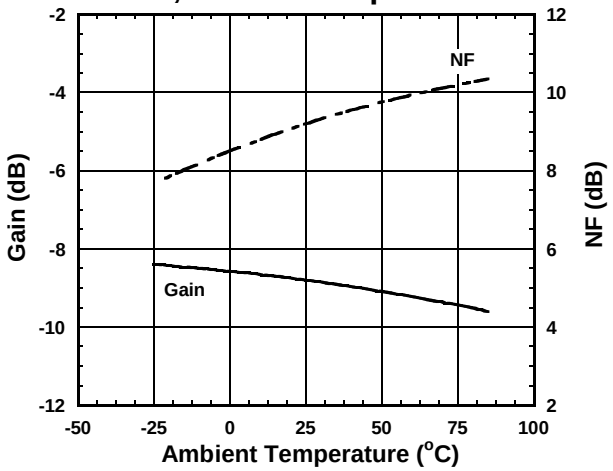
NJG1123PB5 (1.7GHz) @Low Gain
I_{DD} vs. V_{DD}, V_{INV}



Condition
Ta=+25°C,
RF=OFF,
$V_{CTL}1$=0V, $V_{CTL}2$=1.85V, $V_{CTL}3$=0V

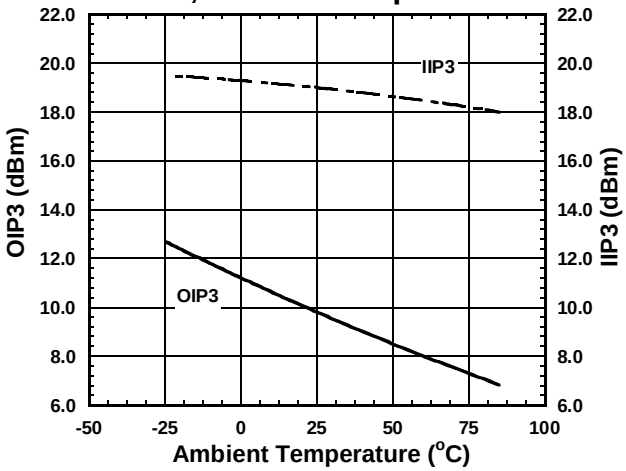
■ ELECTRICAL CHARACTERISTICS (1.7GHz band Low gain Mode)

NJG1123PB5 (1.7GHz) @Low Gain
Gain, NF vs. Temperature



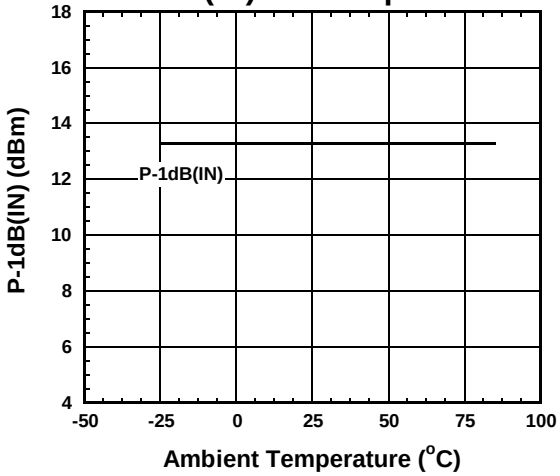
Condition
f=1860MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

NJG1123PB5 (1.7GHz) @Low Gain
OIP3, IIP3 vs. Temperature



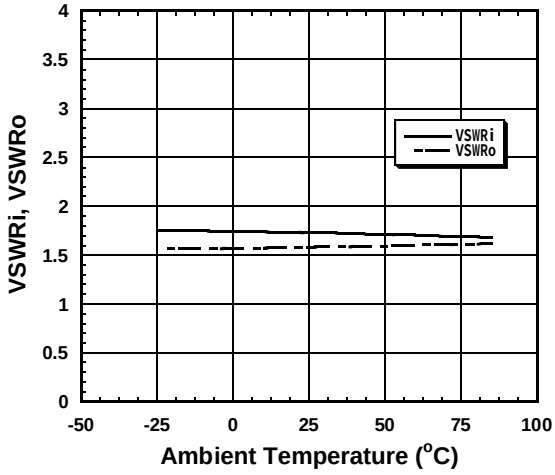
Condition
f1=1860MHz, f2=f1+100kHz,
Pin=-16dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

NJG1123PB5 (1.7GHz) @Low Gain
P-1dB(IN) vs. Temperature



Condition
f=1860MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

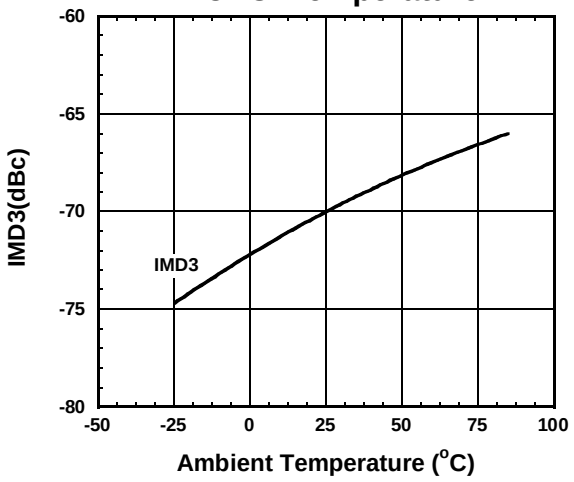
NJG1123PB5 (1.7GHz) @Low Gain
VSWR vs. Temperature



Condition
f=1860MHz,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

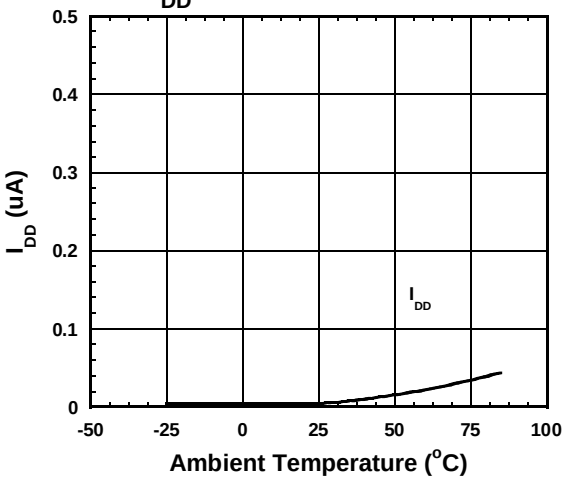
■ ELECTRICAL CHARACTERISTICS (1.7GHz band Low gain Mode)

NJG1123PB5 (1.7GHz) @Low Gain
IMD3 vs. Temperature



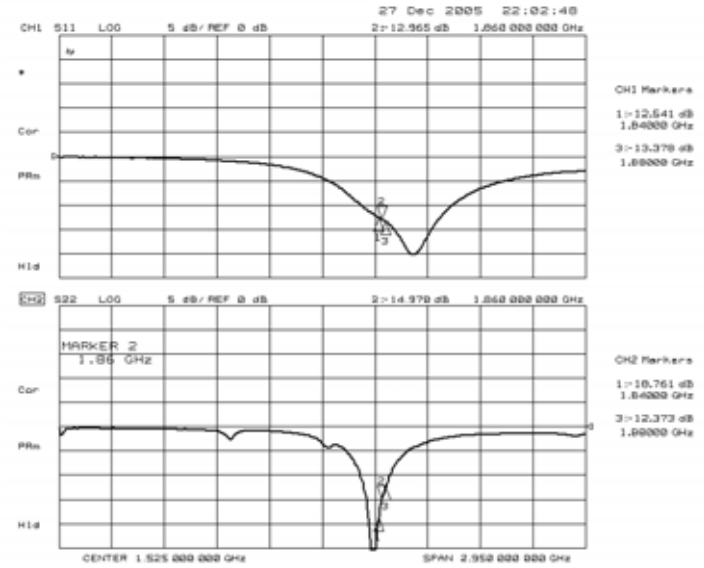
Condition
f1=1860MHz, f2=f1+100kHz,
Pin=-16dBm,
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

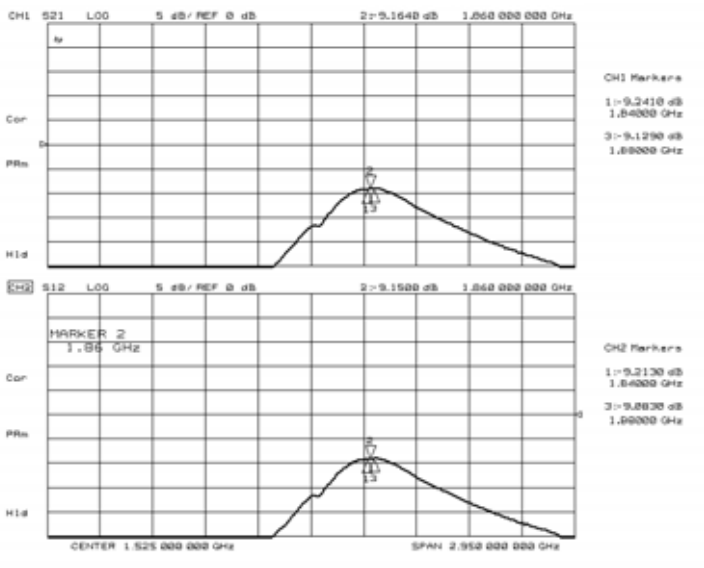
NJG1123PB5 (1.7GHz) @Low Gain
I_{DD} vs. Temperature

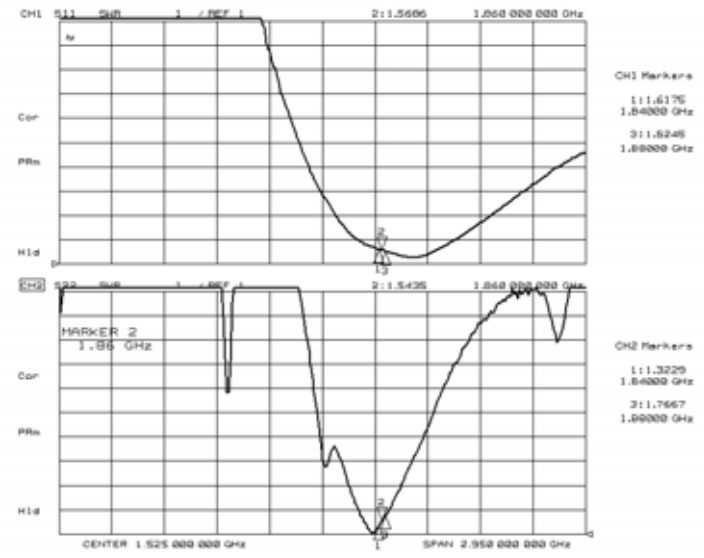


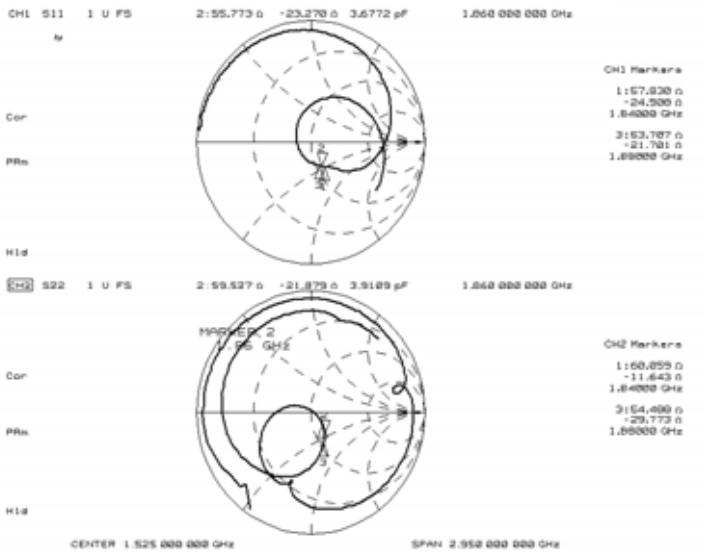
Condition
RF=OFF
V_{DD}= V_{INV} =2.7V,
V_{CTL}1=0V, V_{CTL}2=1.85V, V_{CTL}3=0V

■ ELECTRICAL CHARACTERISTICS (1.7GHz band Low gain Mode)

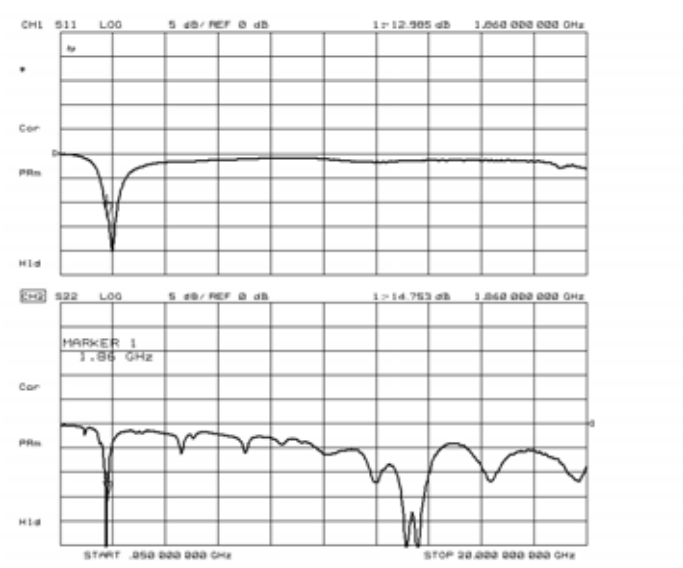


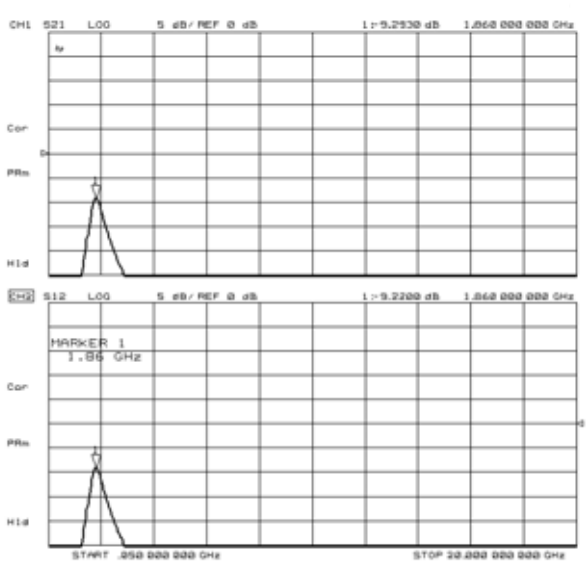




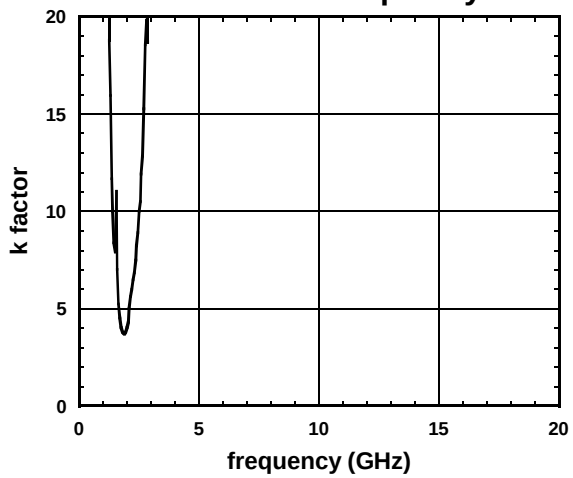


■ **ELECTRICAL CHARACTERISTICS (1.7GHz band Low gain Mode)**





NJG1123PB5 (1.7GHz) @Low Gain
k factor vs. frequency



■ TRUTH TABLE

Control voltage			Operating state					
$V_{CTL}1$ (Band Sel1)	$V_{CTL}2$ (Band Sel2)	$V_{CTL}3$ (Gain Sel1)	2.1GHz Band		800MHz Band		1.7GHz Band	
			LNA	Bypass	LNA	Bypass	LNA	Bypass
L	L	L	OFF	ON	OFF	ON	OFF	ON
L	L	H	ON	OFF	OFF	OFF	OFF	OFF
H	L	L	OFF	ON	OFF	ON	OFF	ON
H	L	H	OFF	OFF	ON	OFF	OFF	OFF
L	H	L	OFF	ON	OFF	ON	OFF	ON
L	H	H	OFF	OFF	OFF	OFF	ON	OFF
H	H	L	Don't Care					
H	H	H						

"L"=0 ~ 0.45V, "H"=1.52 ~ V_{INV}+0.3 V

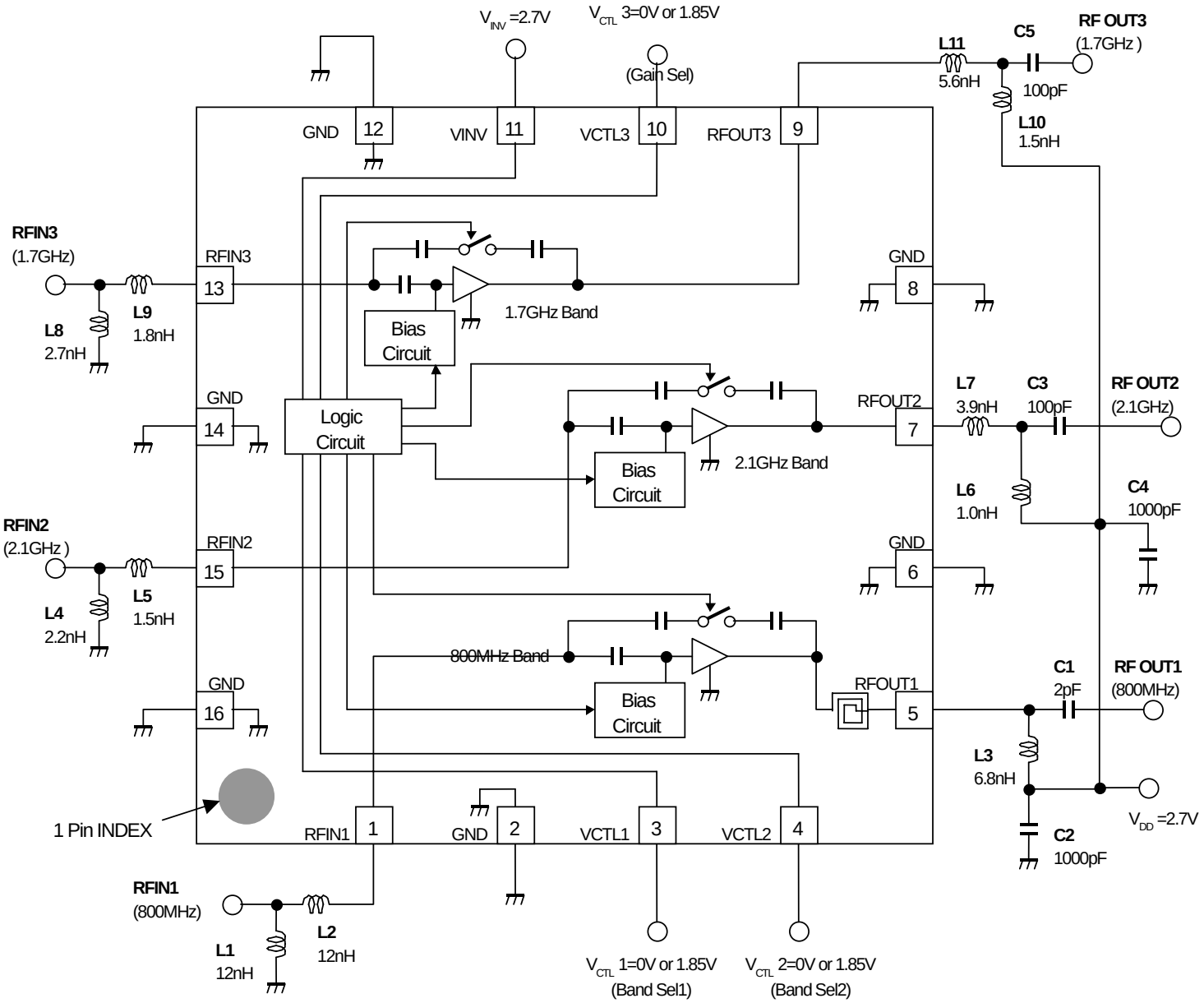
Note:

1) $V_{CTL}3$="L" (All bypass circuits: ON state)

2) $V_{CTL}1=V_{CTL}2=V_{CTL}3$="H" (800MHz and 1.7GHz band LNA: ON state)

■ APPLICATION CIRCUIT

(Top View)



PARTS LIST

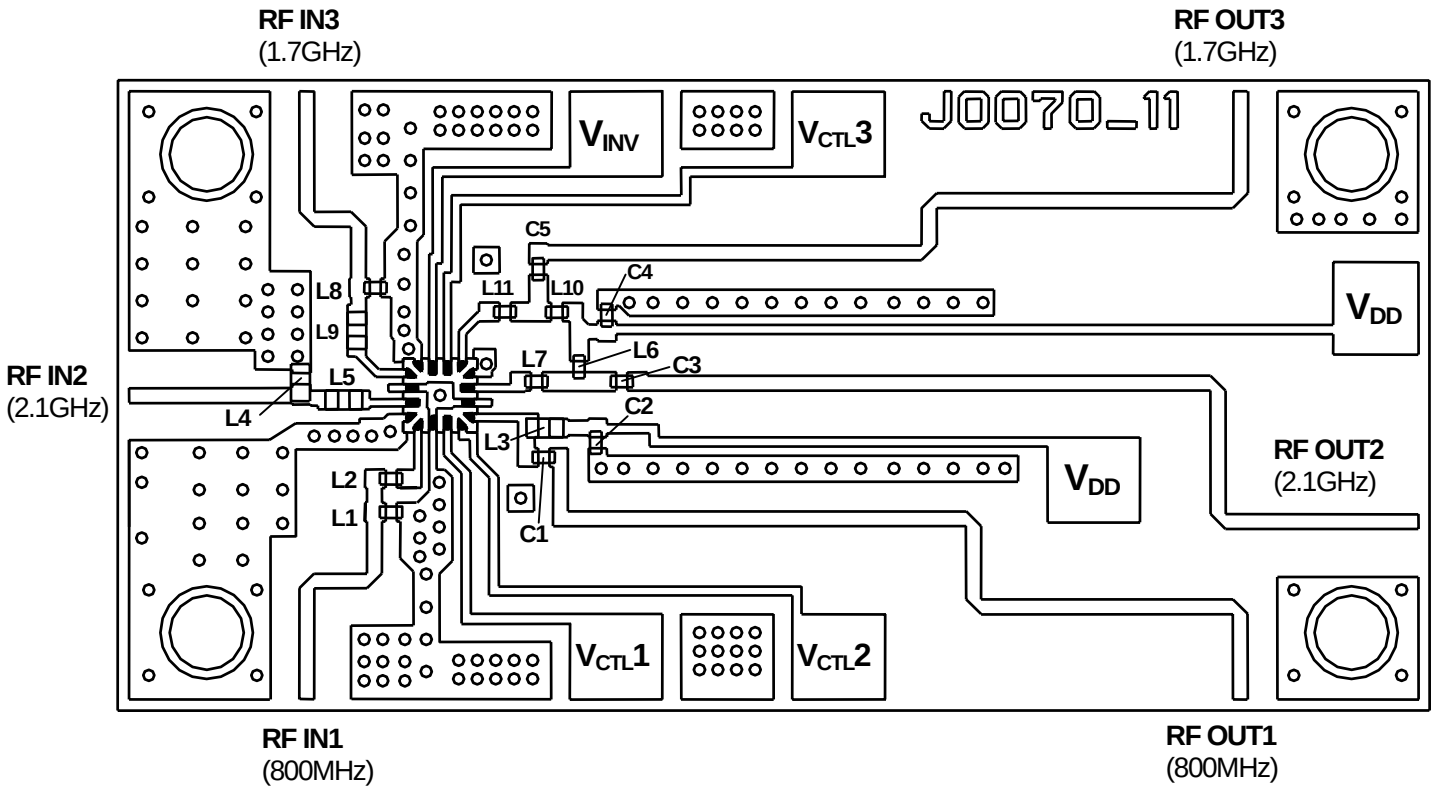
Parts ID	Comment
L1, L2, L6, L7, L8, L10, L11	TDK (MLG0603)
L3, L4, L5, L9	TAIYO-YUDEN (HK1005)
C1 ~ C5	MURATA (GRM03)

PRECAUTIONS

1) Please locate C2 close to L3.
2) Please locate C4 close to L6, L10.
3) Ground terminal should be connected to the ground plane as low inductance as possible.
4) Please use an appropriate inductor for L3, L4, L5, L9 to improve Gain.

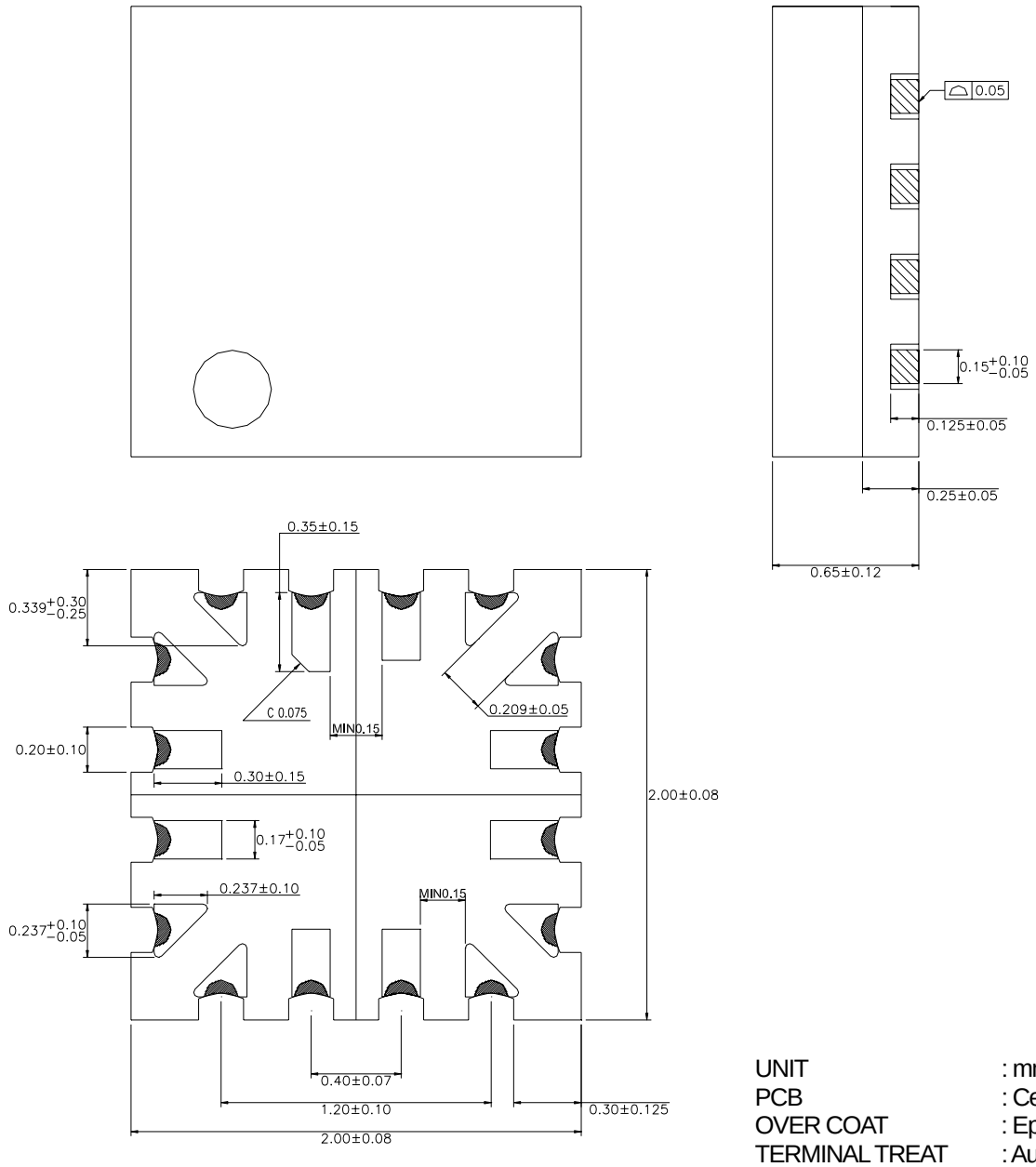
■ TEST PCB LAYOUT

(Top View)



PCB (FR-4):
t=0.2mm
MICROSTRIP LINE WIDTH=0.4mm (Z_0=50Ω)
PCB SIZE=35.4mmx17.0mm

■ PACKAGE OUTLINE (FFP16-B5)



UNIT	: mm
PCB	: Ceramic
OVER COAT	: Epoxy resin
TERMINAL TREAT	: Au
WEIGHT	: 7mg

Cautions on using this product

This product contains Gallium-Arsenide (GaAs) which is a harmful material.

- Do NOT eat or put into mouth.
- Do NOT dispose in fire or break up this product.
- Do NOT chemically make gas or powder with this product.
- To waste this product, please obey the relating law of your country.

This product may be damaged with electric static discharge (ESD) or spike voltage. Please handle with care to avoid these damages.