ADL5801 Low Frequency Operation

1. RX 900M/1900M Board Configuration used. Input Series caps on RF & LO Baluns changed to 1nF to reduce highpass effect and allow low frequency operation.
2. Noise Figure measurement issue for Low side LO where LOF close to IF frequency causes front end interference.
3. LSLO = Low Side LO, HSLO = High Side LO

ADL5801 Characterization Details

RX operation

Input Freq Range (MHz)	RF Balun	LO Balun	IF Balun	RF Caps (pF)	LO Caps (pF)	Output Freq (MHz)	VSET (V)	Loss Out?
500-3000	TC1-1-13M+_	TC1-1-13M+_	TC4-1W+	5.6	100	153	3.8	Yes
1900-3100	TC1-1-43M+	TC1-1-43M+	TC4-1W+	2	8	211	3.8	No
3000-4000	3600BL14M050	3600BL14M050	TC4-1W+	1.5	1.5	153	3.6	No
5000-6000	5400BL14B050	5400BL14B050	TC4-1W+	3	3	153	3.6	No

TX Operation

Input Freq Range (MHz)	RF Balun	LO Balun	IF Balun	RF Caps (pF)	LO Caps (pF)	Output Freq (MHz)	VSET (V)	Balun Loss Out?
153	TC1-1-13M+_	TC1-1-13M+_	TC4-14	470	100	300-1300	3.6	No
170	TC1-1-13M+_	TC1-1-13M+_	1850BL15B200	470	100	1500-2700	4	No

Low Frequency Operation

Input Freq Range (MHz)	RF Balun	LO Balun	IF Balun	RF Caps (pF)	LO Caps (pF)	Output Freq (MHz)	VSET (V)	Balun Loss Out?
50M - 500M	TC1-1-13M+_	TC1-1-13M+_	TC4-1W+	1000	1000	10M/70M	3.6	No

ADL5801 Characterization Details

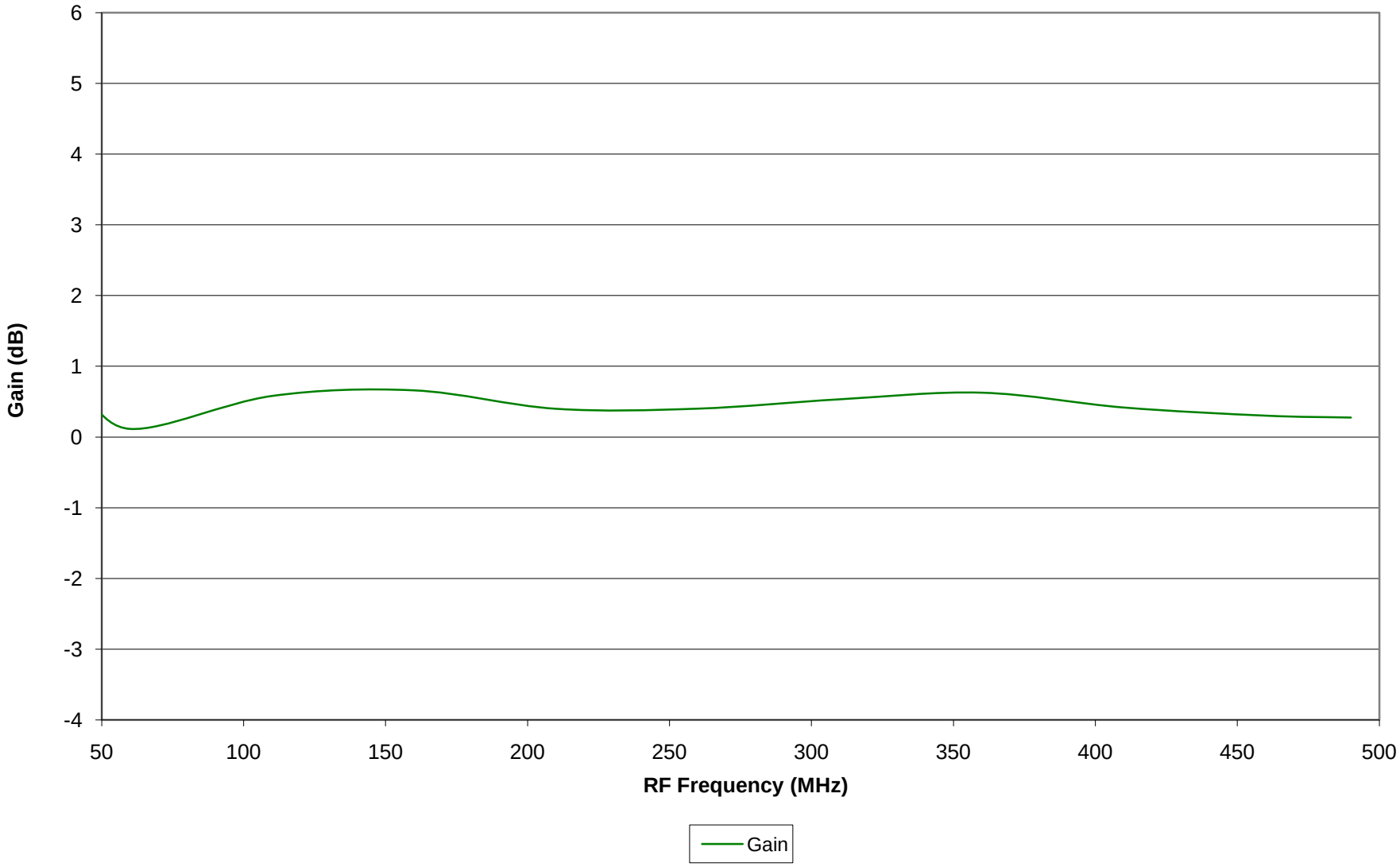
RX operation

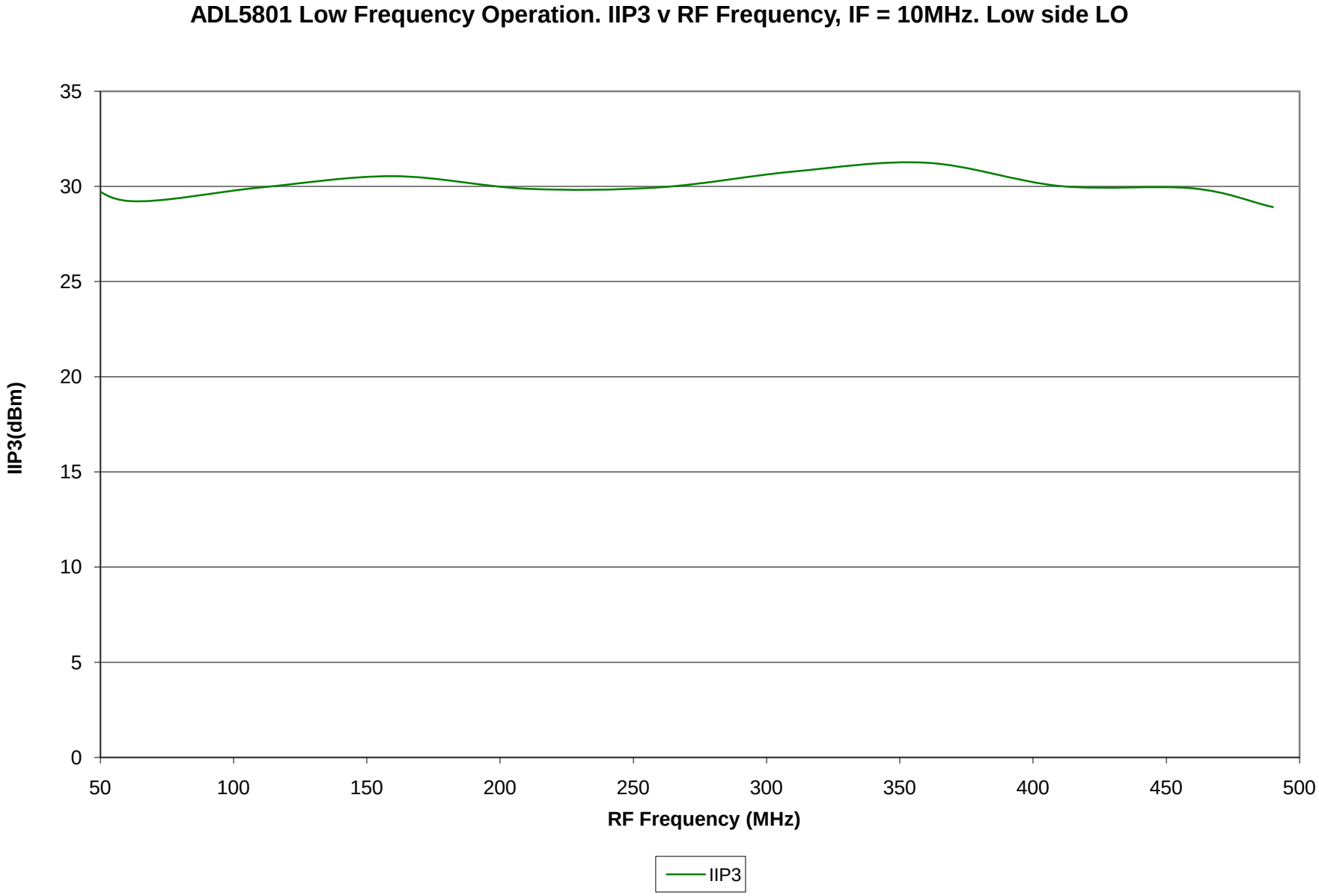
Input Freq Range (MHz)	RF Balun	LO Balun	IF Balun	RF Caps (pF)	LO Caps (pF)	Output Freq (MHz)	VSET (V)	Balun Loss Out?
500-3000	TC1-1-13M+_	TC1-1-13M+_	TC4-1W+	5.6	100	153	3.8	Yes
1900-3100	TC1-1-43M+	TC1-1-43M+	TC4-1W+	2	8	211	3.8	No
3000-4000	3600BL14M050	3600BL14M050	TC4-1W+	1.5	1.5	153	3.6	No
5000-6000	5400BL14B050	5400BL14B050	TC4-1W+	3	3	153	3.6	No

Low Frequency Operation

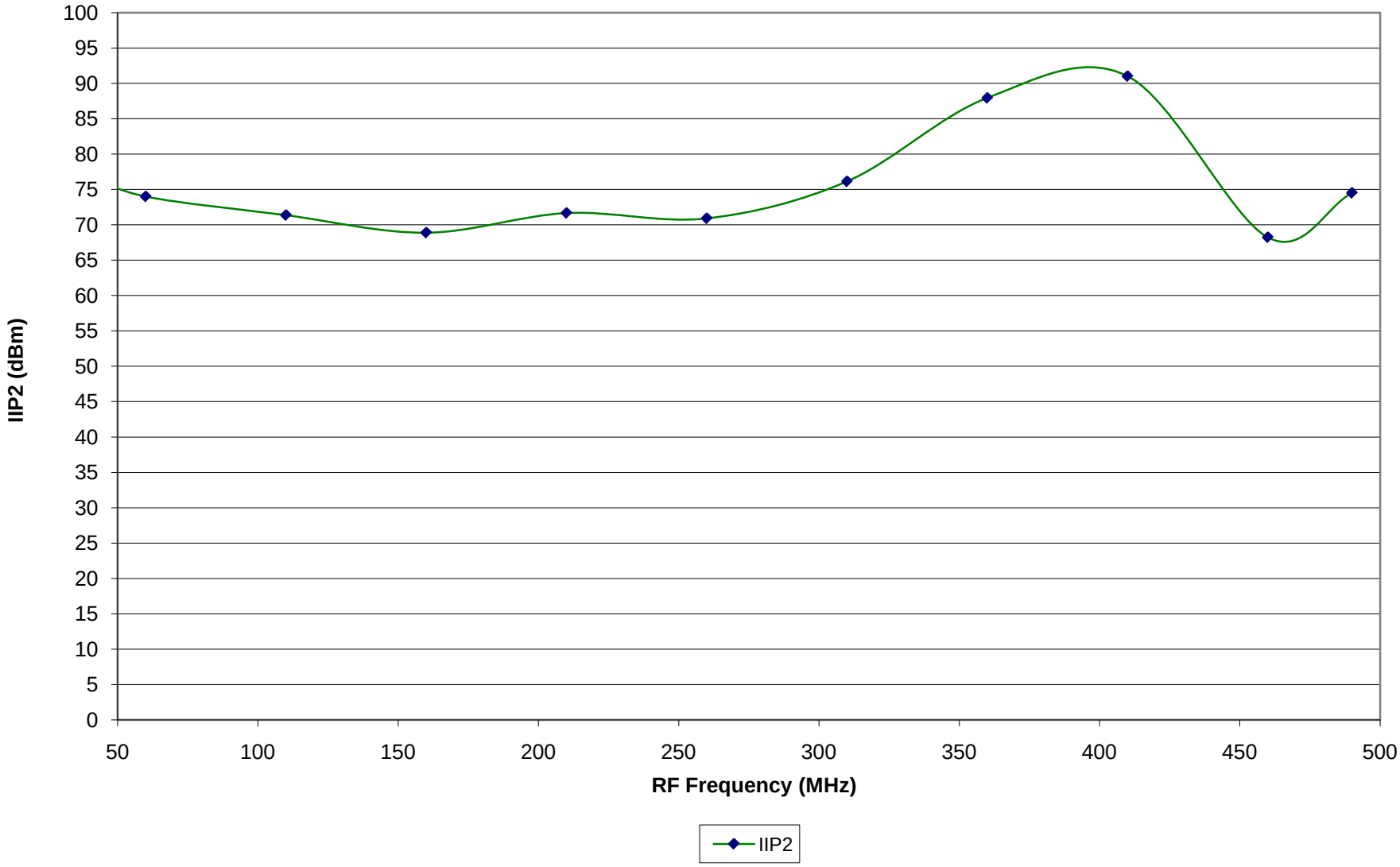
Input Freq Range (MHz)	RF Balun	LO Balun	IF Balun	RF Caps (pF)	LO Caps (pF)	Output Freq (MHz)	VSET (V)	Balun Loss Out?
50M - 500M	TC1-1-13M+_	TC1-1-13M+_	TC4-1W+	1000	1000	10M/70M	3.6	No

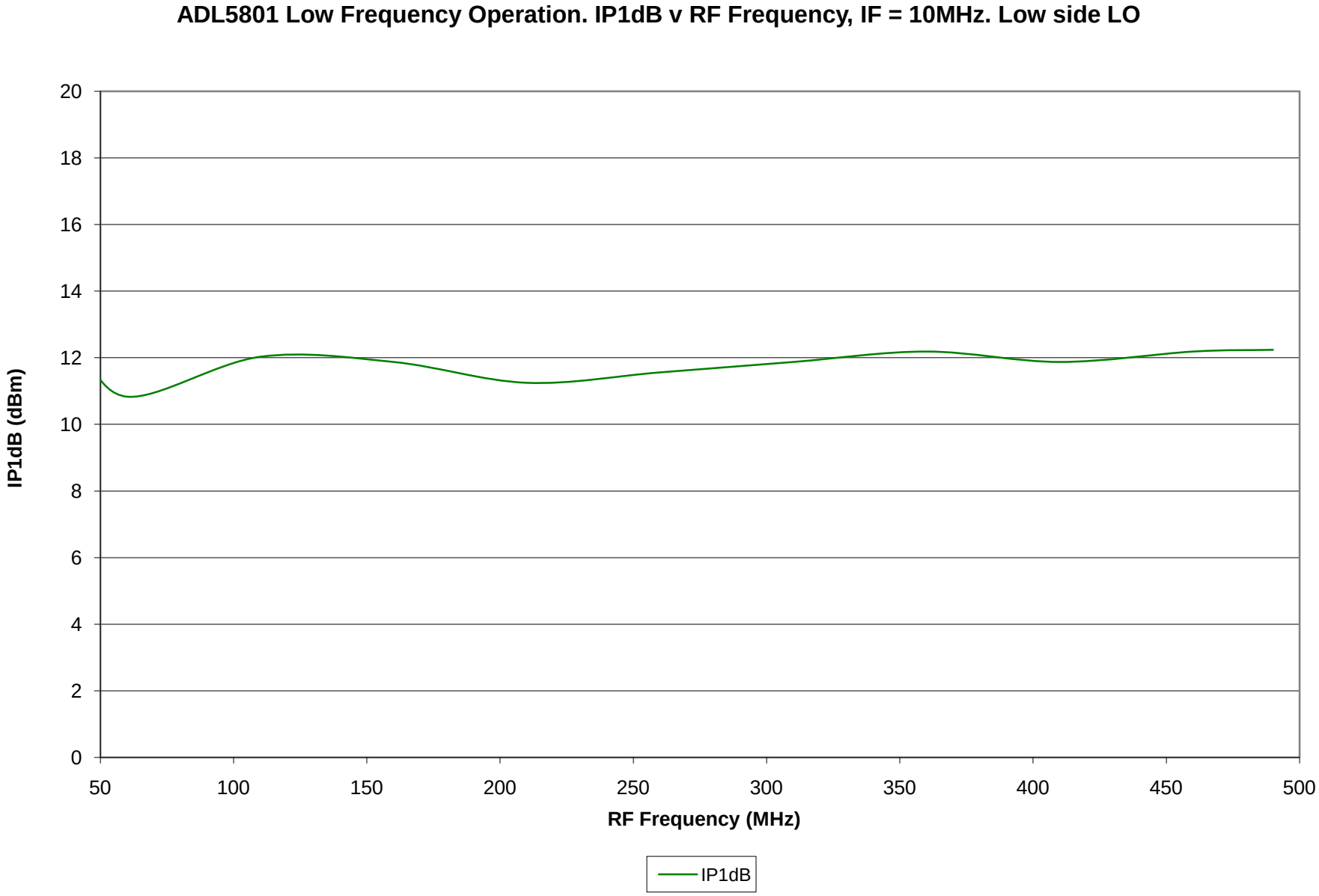
ADL5801 Low Frequency Operation. Gain v RF Frequency, IF = 10MHz. Low side LO



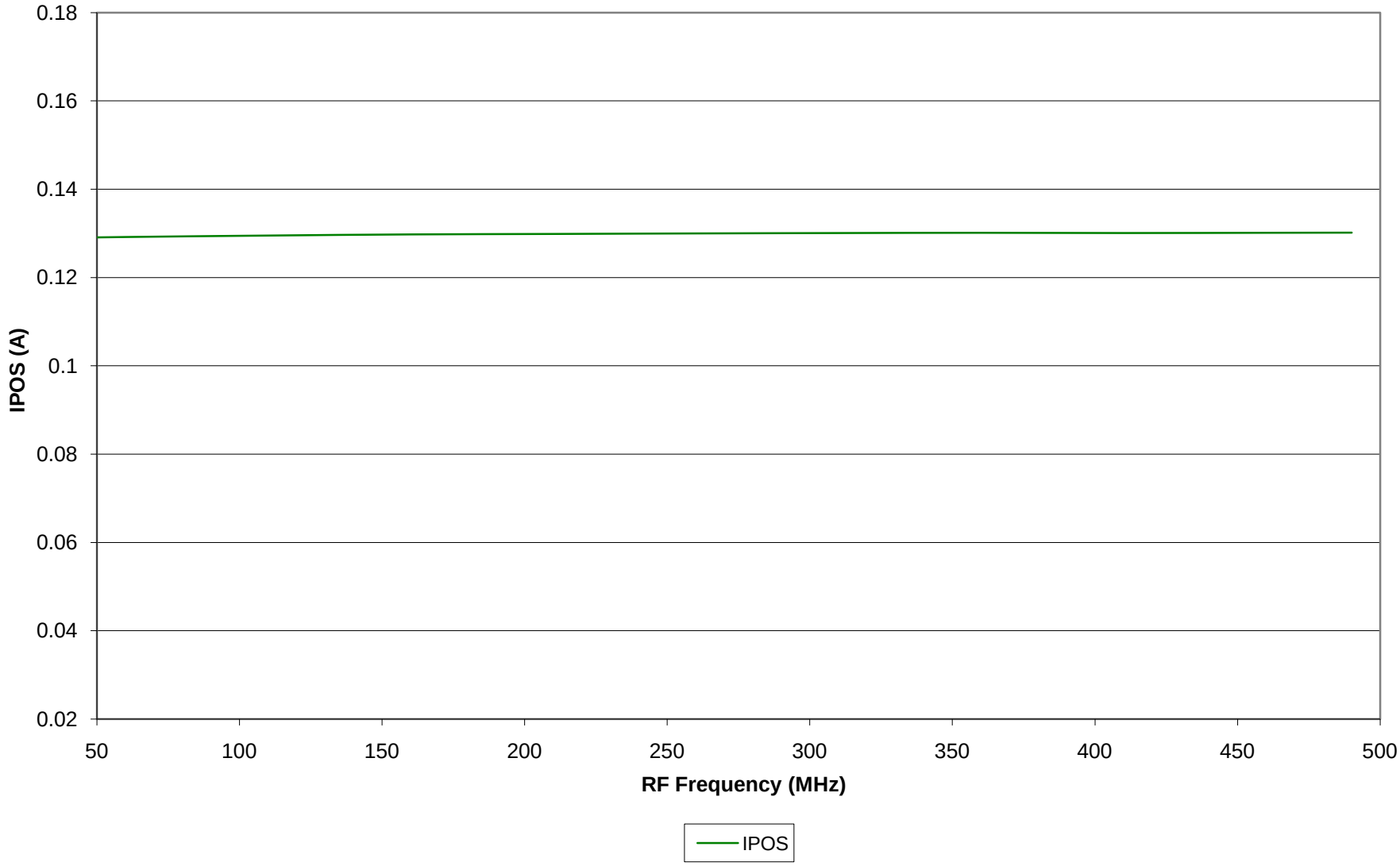

ADL5801 Low Frequency Operation. IIP3 v RF Frequency, IF = 10MHz. Low side LO
IIP3(dBm)
35
30
25
20
15
10
5
0
50
100
150
200
250
300
350
400
450
500
RF Frequency (MHz)
IIP3

ADL5801 Low Frequency Operation. IIP2 v RF Frequency, IF = 10MHz. Low side LO

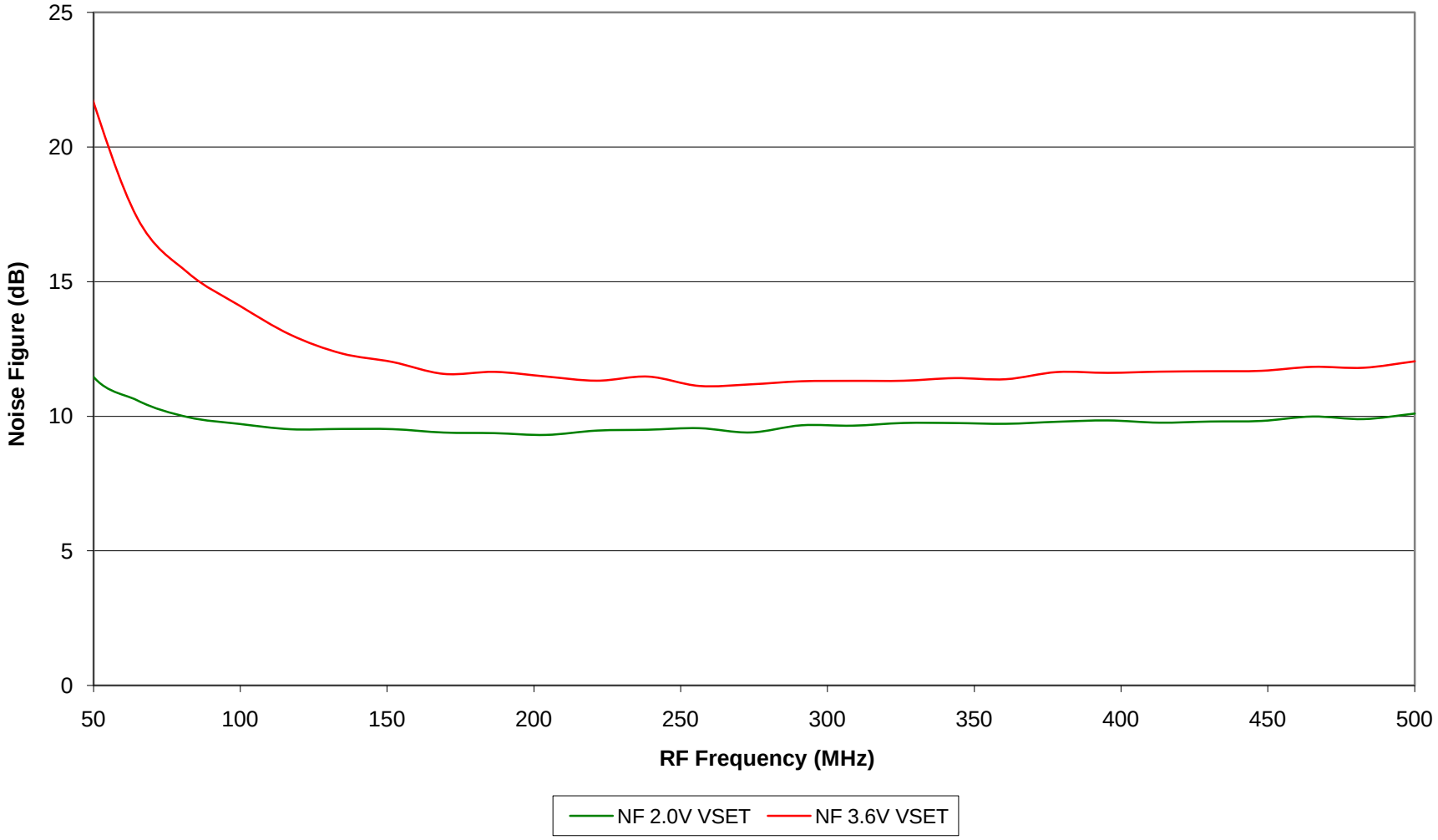


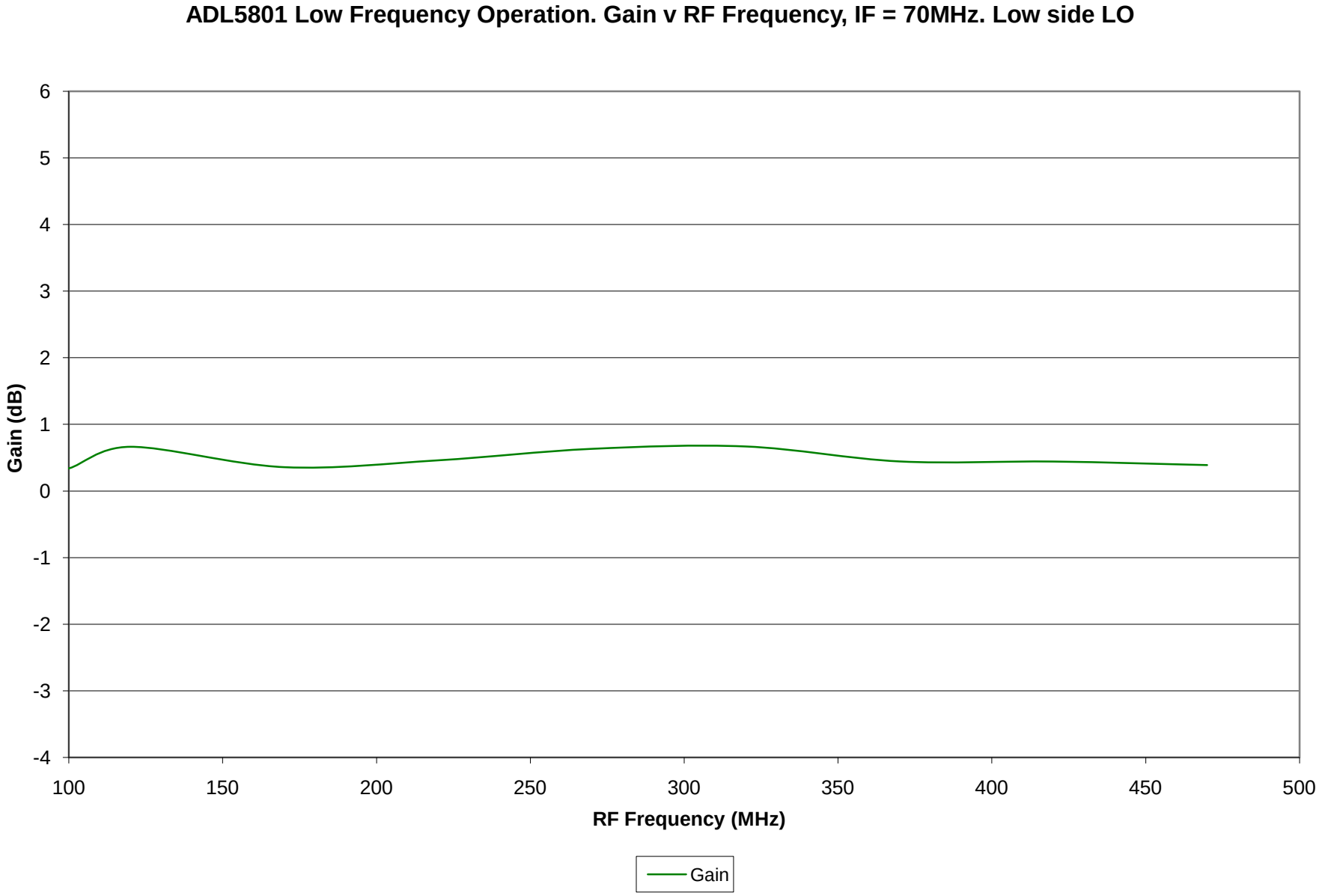

ADL5801 Low Frequency Operation. IP1dB v RF Frequency, IF = 10MHz. Low side LO
IP1dB (dBm)
20
18
16
14
12
10
8
6
4
2
0
50
100
150
200
250
300
350
400
450
500
RF Frequency (MHz)
IP1dB

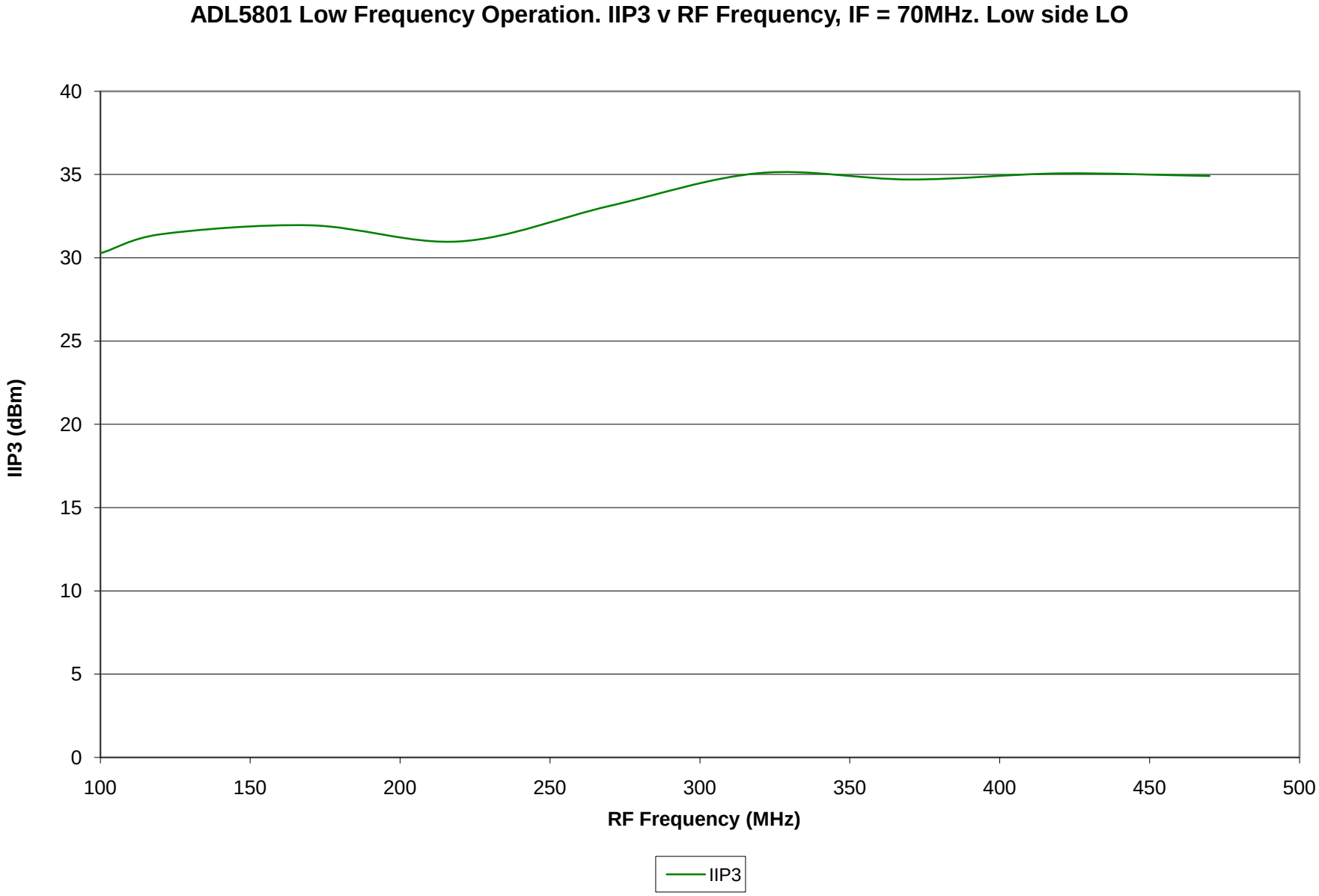
ADL5801 Low Frequency Operation. Supply Current v RF Frequency, IF = 10MHz. Low side LO



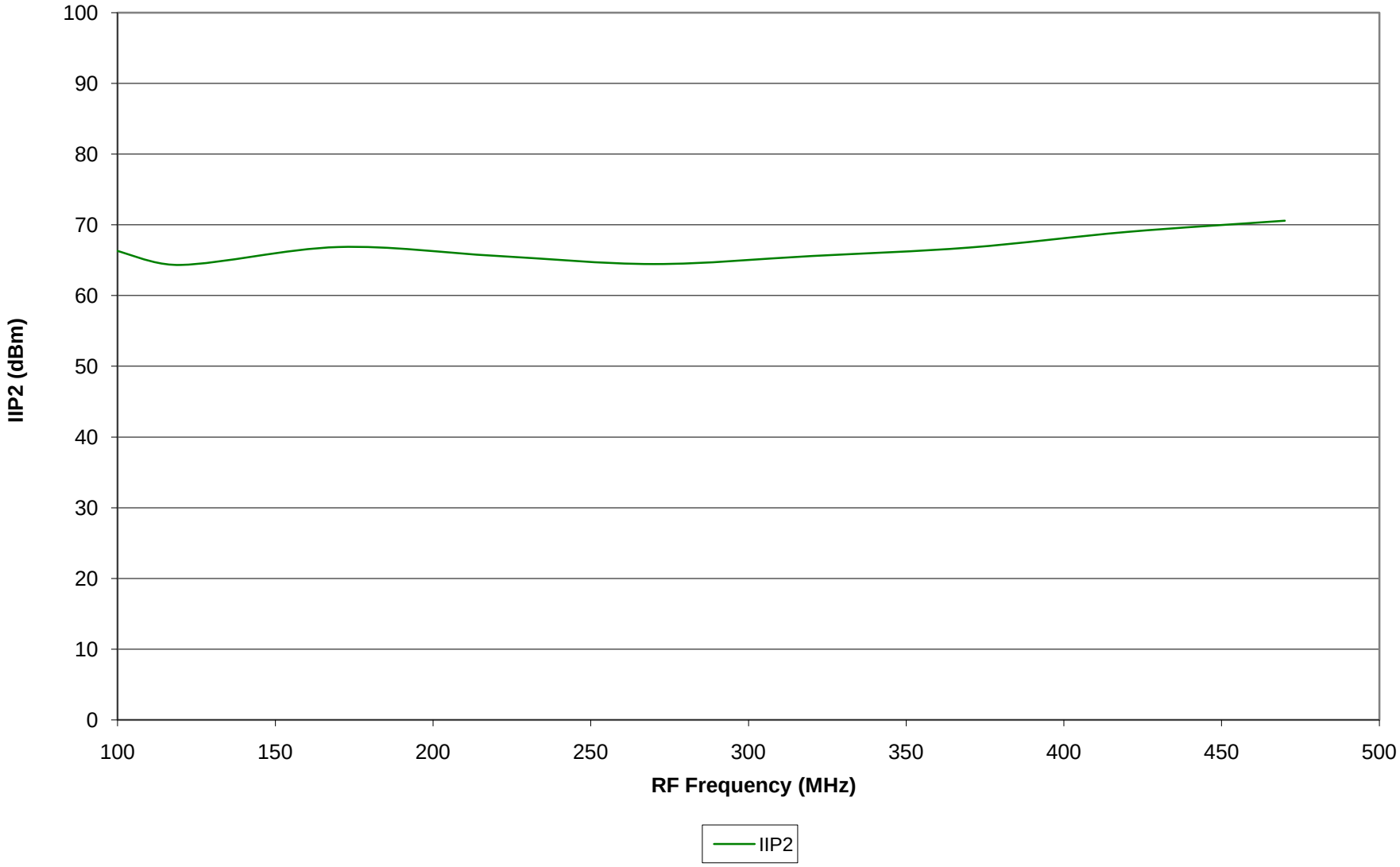
ADL5801 Low Frequency Operation, Low side LO, 10MHz IF. Noise Figure v RF Frequency, VSET = 2.0V & 3.6V. Rise in NF near 50MHz artifact of measurement as LOF & RFF approach IFF

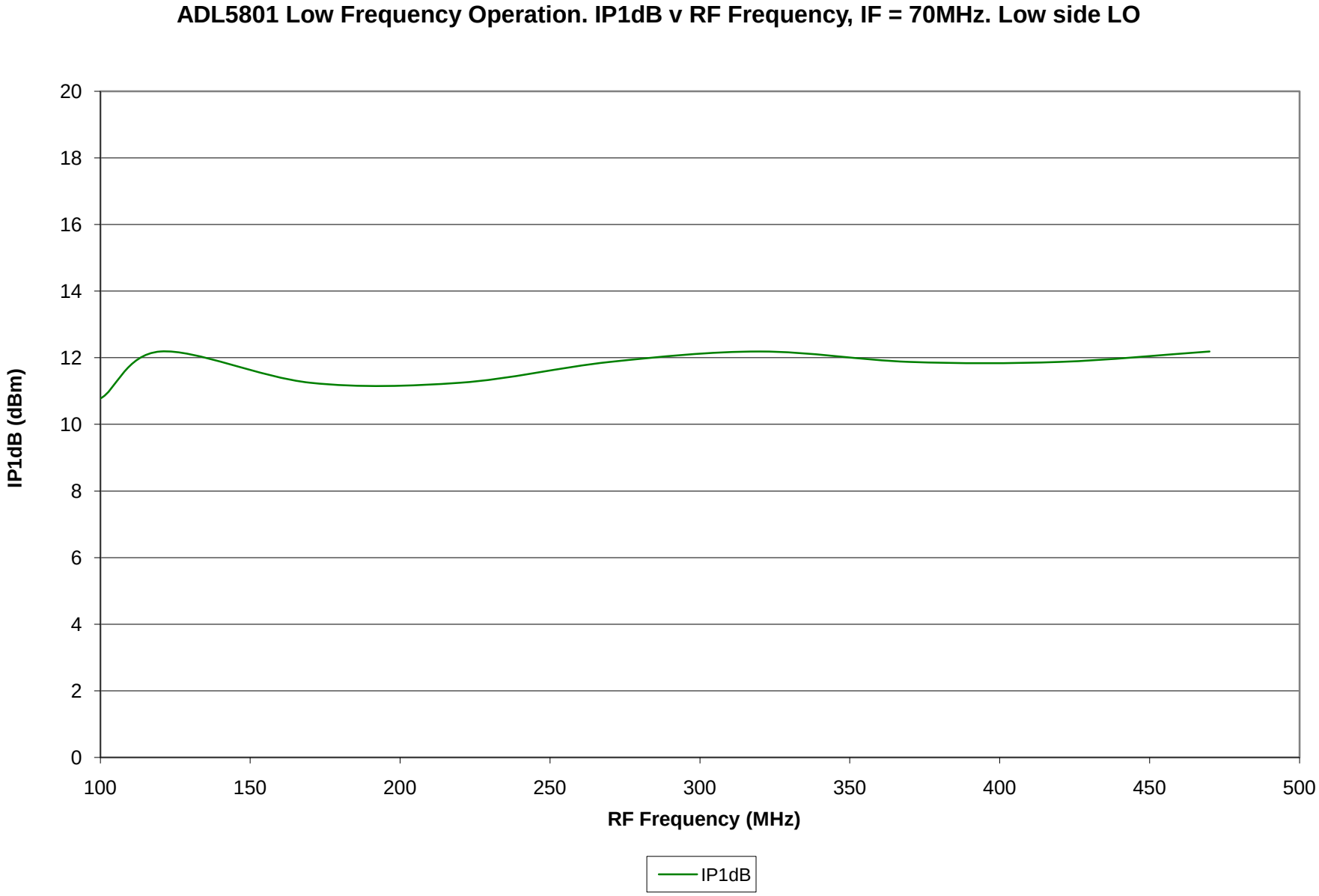



ADL5801 Low Frequency Operation. Gain v RF Frequency, IF = 70MHz. Low side LO
Gain (dB)
6
5
4
3
2
1
0
-1
-2
-3
-4
100
150
200
250
300
350
400
450
500
RF Frequency (MHz)
Gain

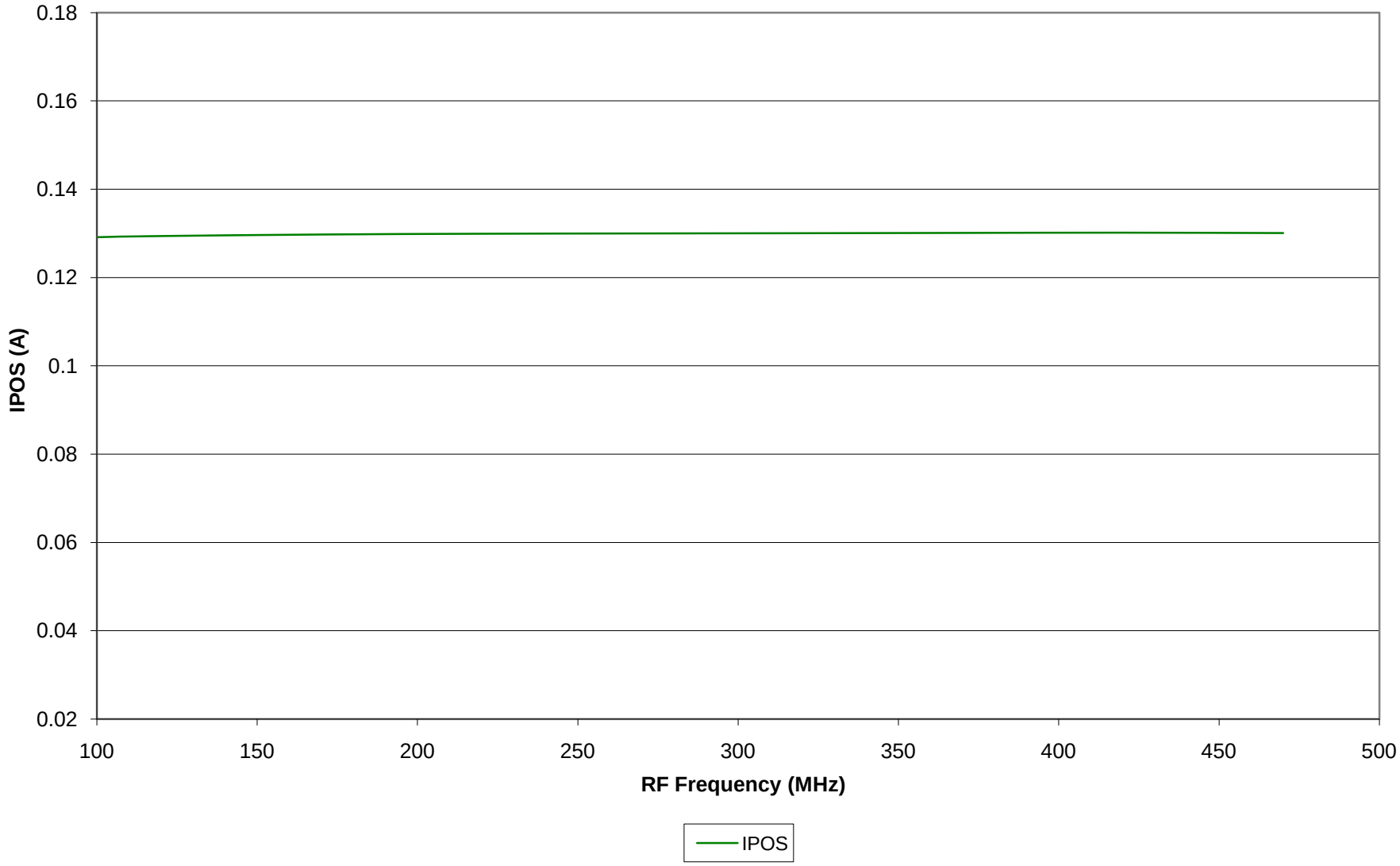

ADL5801 Low Frequency Operation. IIP3 v RF Frequency, IF = 70MHz. Low side LO
IIP3 (dBm)
40
35
30
25
20
15
10
5
0
100
150
200
250
300
350
400
450
500
RF Frequency (MHz)
IIP3

ADL5801 Low Frequency Operation. IIP2 v RF Frequency, IF = 70MHz. Low side LO

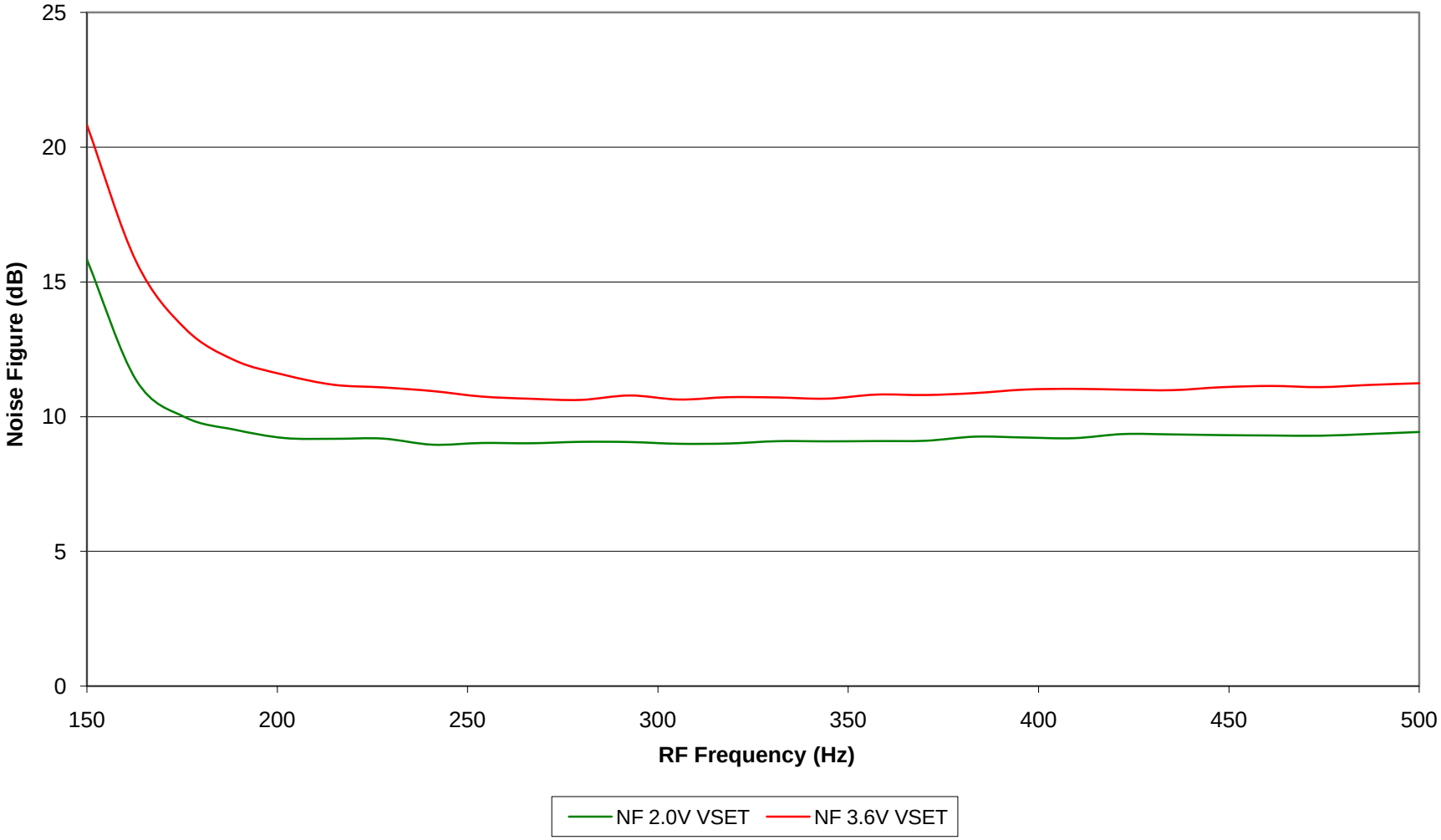



ADL5801 Low Frequency Operation. IP1dB v RF Frequency, IF = 70MHz. Low side LO
IP1dB (dBm)
20
18
16
14
12
10
8
6
4
2
0
100
150
200
250
300
350
400
450
500
RF Frequency (MHz)
IP1dB

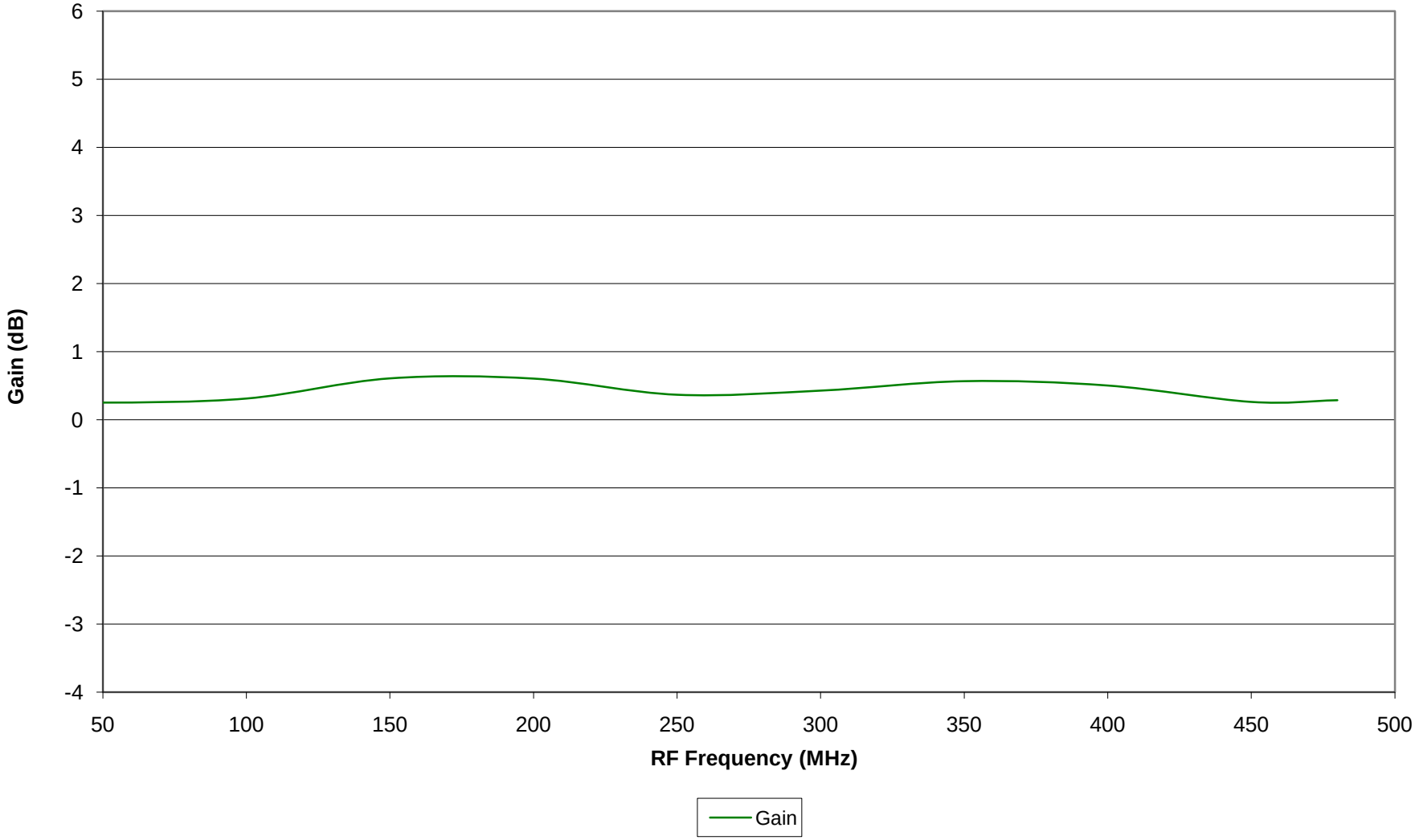
ADL5801 Low Frequency Operation. Supply Current v RF Frequency, IF = 70MHz. Low side LO

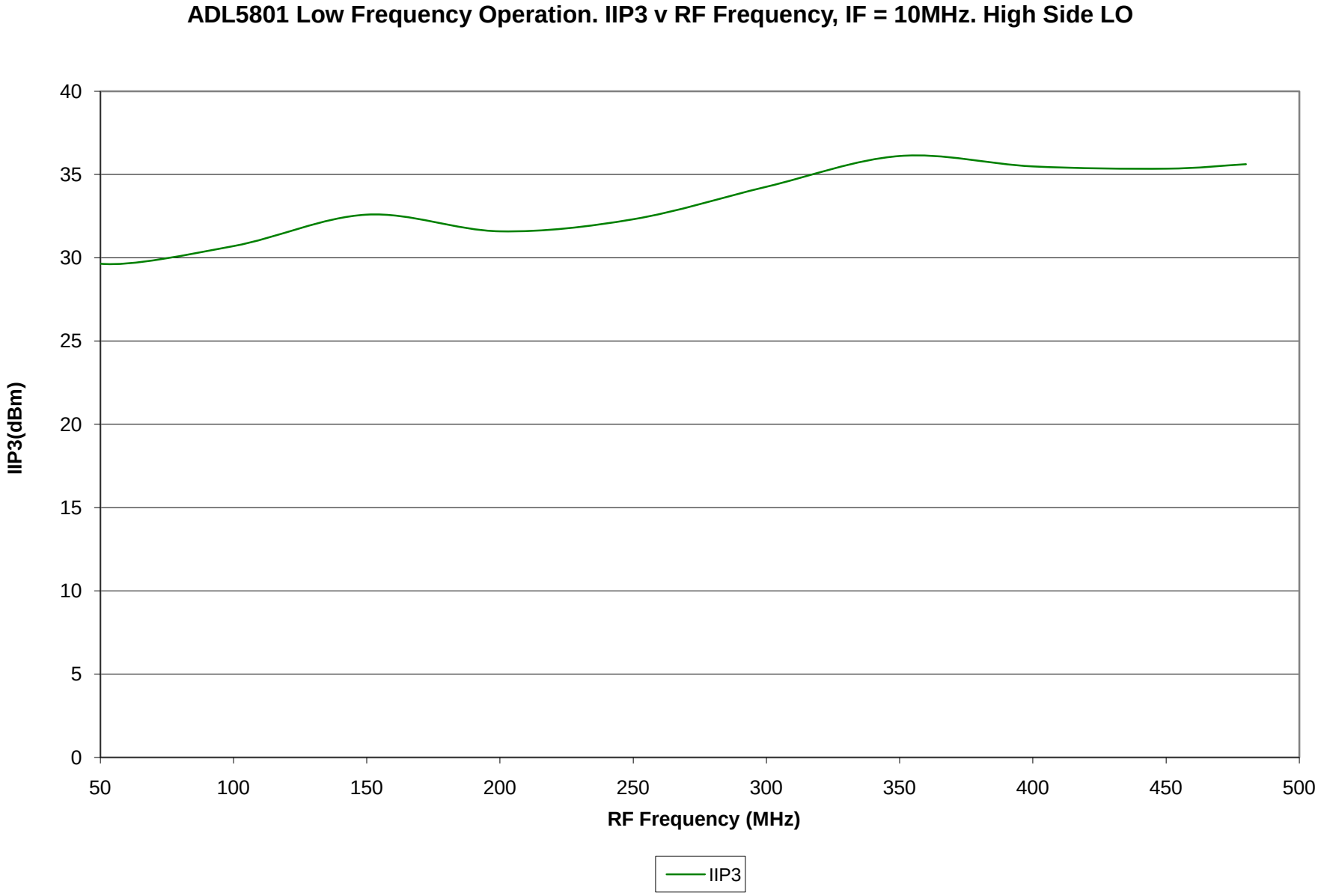


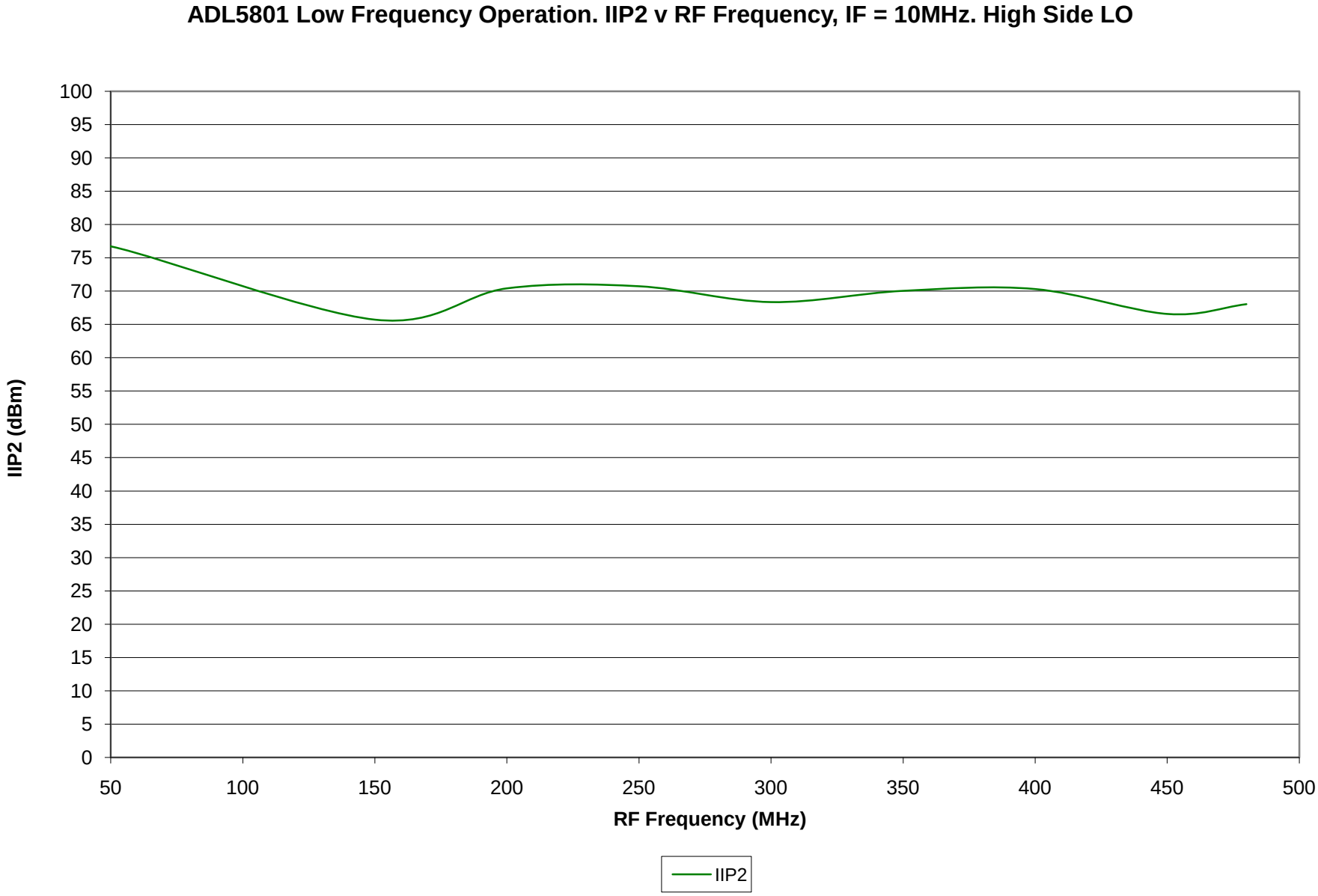
ADL5801 Low Frequency Operation, Low side LO, 70MHz IF. Noise Figure v RF Frequency, VSET = 2.0V & 3.6V.. Rise in NF near 50MHz artifact of measurement as LOF & RFF approach IFF



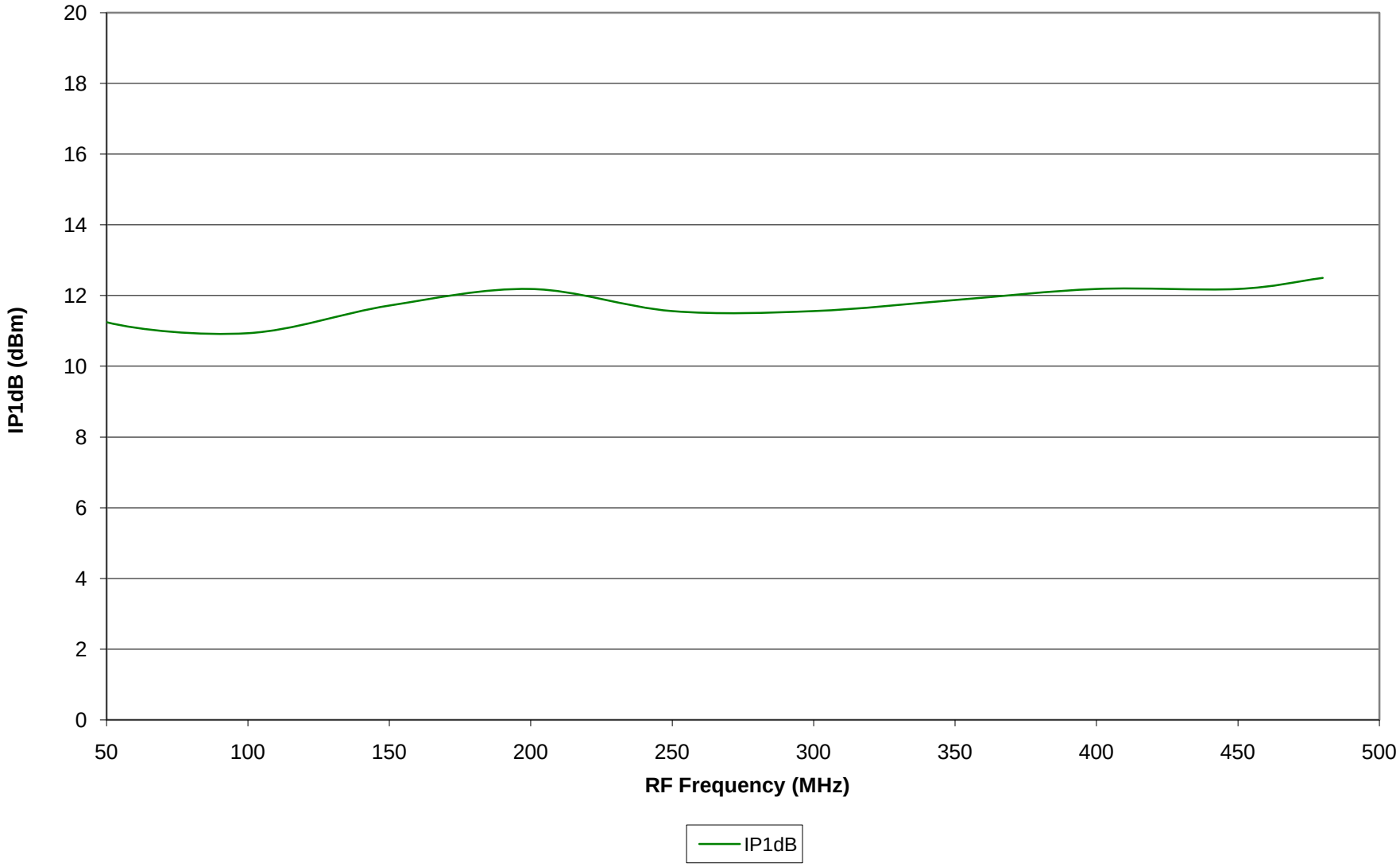
ADL5801 Low Frequency Operation. Gain v RF Frequency, IF = 10MHz. High Side LO



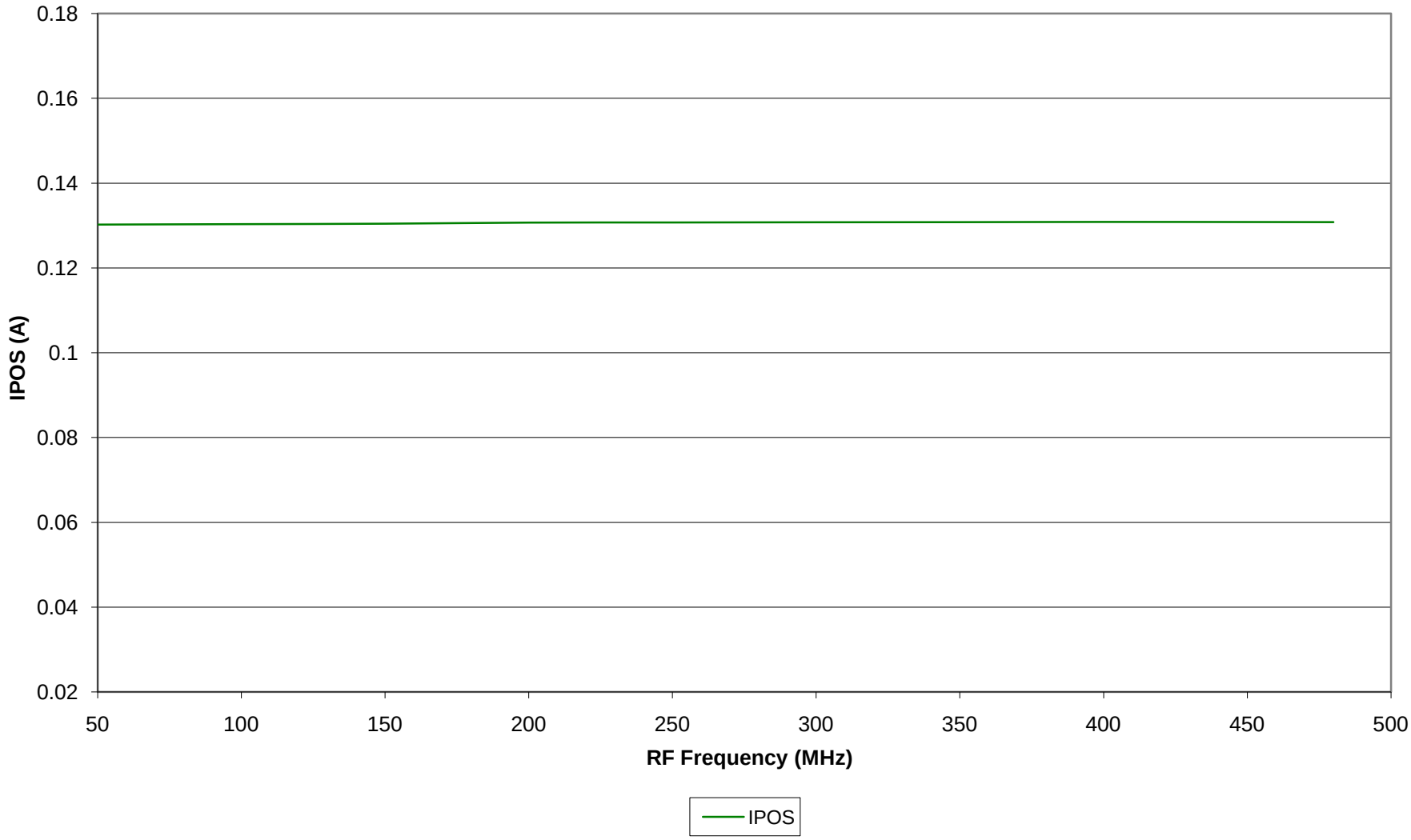

ADL5801 Low Frequency Operation. IIP3 v RF Frequency, IF = 10MHz. High Side LO
IIP3(dBm)
40
35
30
25
20
15
10
5
0
50
100
150
200
250
300
350
400
450
500
RF Frequency (MHz)
IIP3


ADL5801 Low Frequency Operation. IIP2 v RF Frequency, IF = 10MHz. High Side LO
IIP2 (dBm)
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
50
100
150
200
250
300
350
400
450
500
RF Frequency (MHz)
IIP2

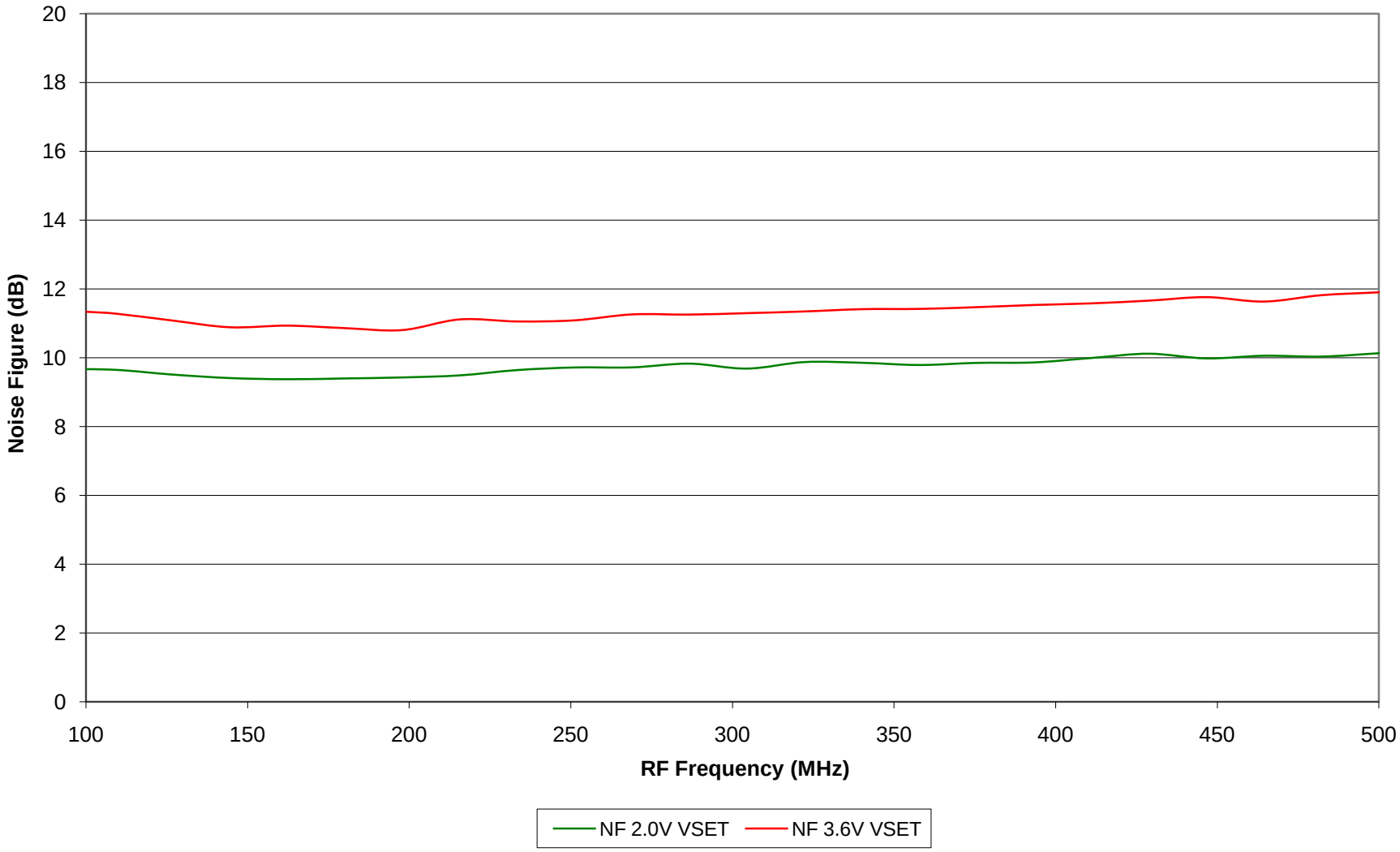
ADL5801 Low Frequency Operation. IP1dB v RF Frequency, IF = 10MHz. High Side LO



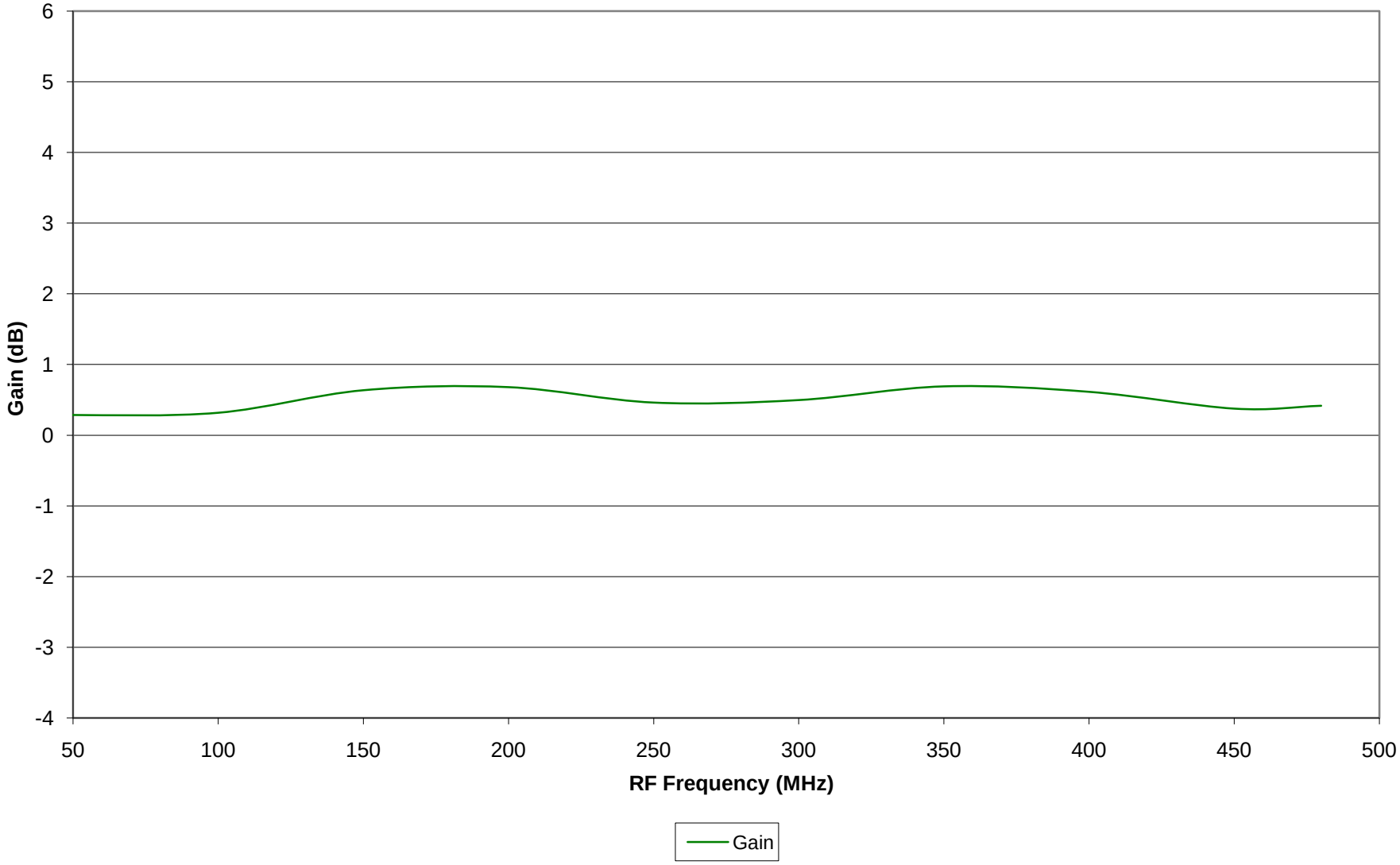
ADL5801 Low Frequency Operation. Supply Current v RF Frequency, IF = 10MHz. High Side LO

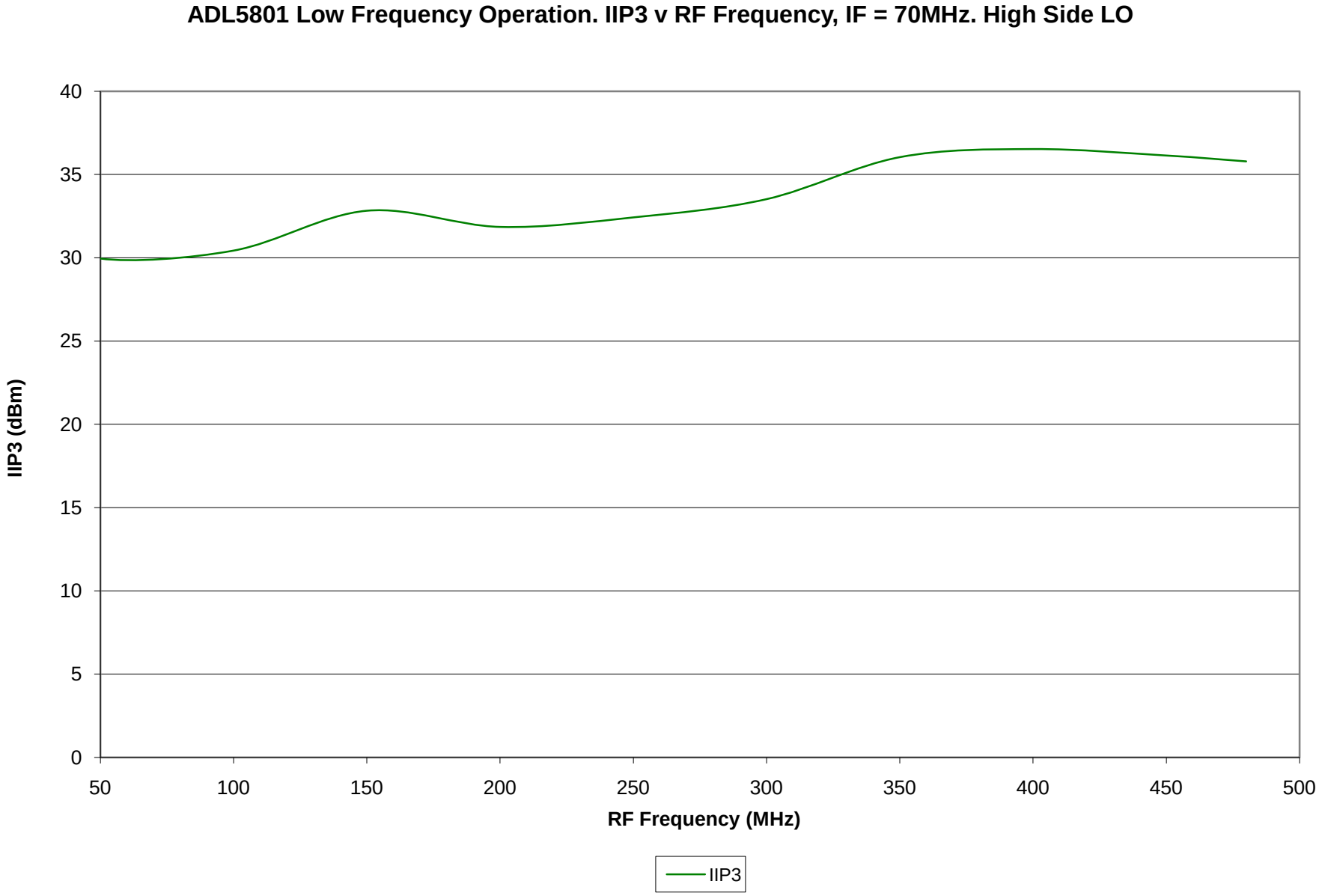


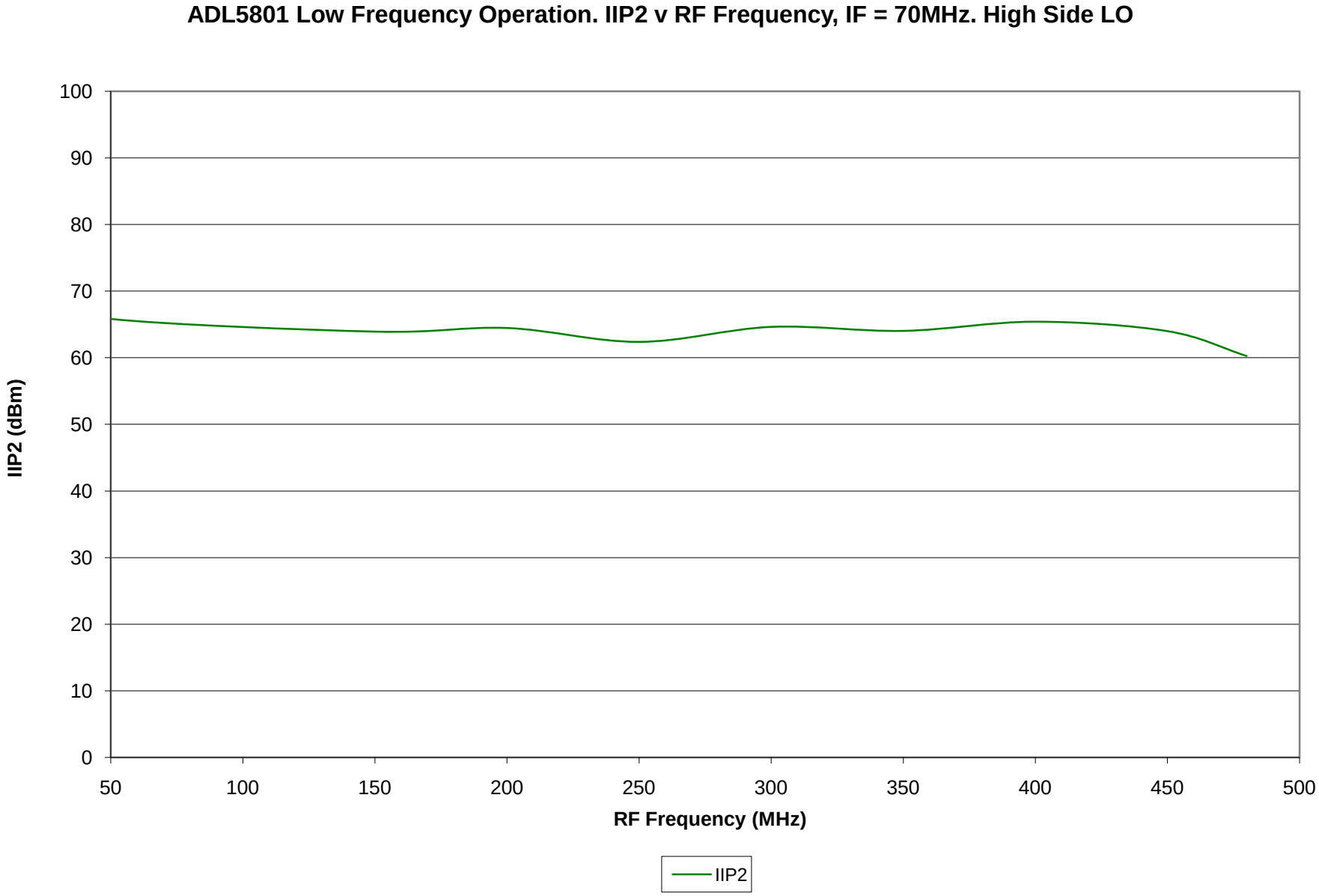
ADL5801 Low Frequency Operation, High side LO, 10MHz IF. Noise Figure v RF Frequency, VSET = 2.0V & 3.6V



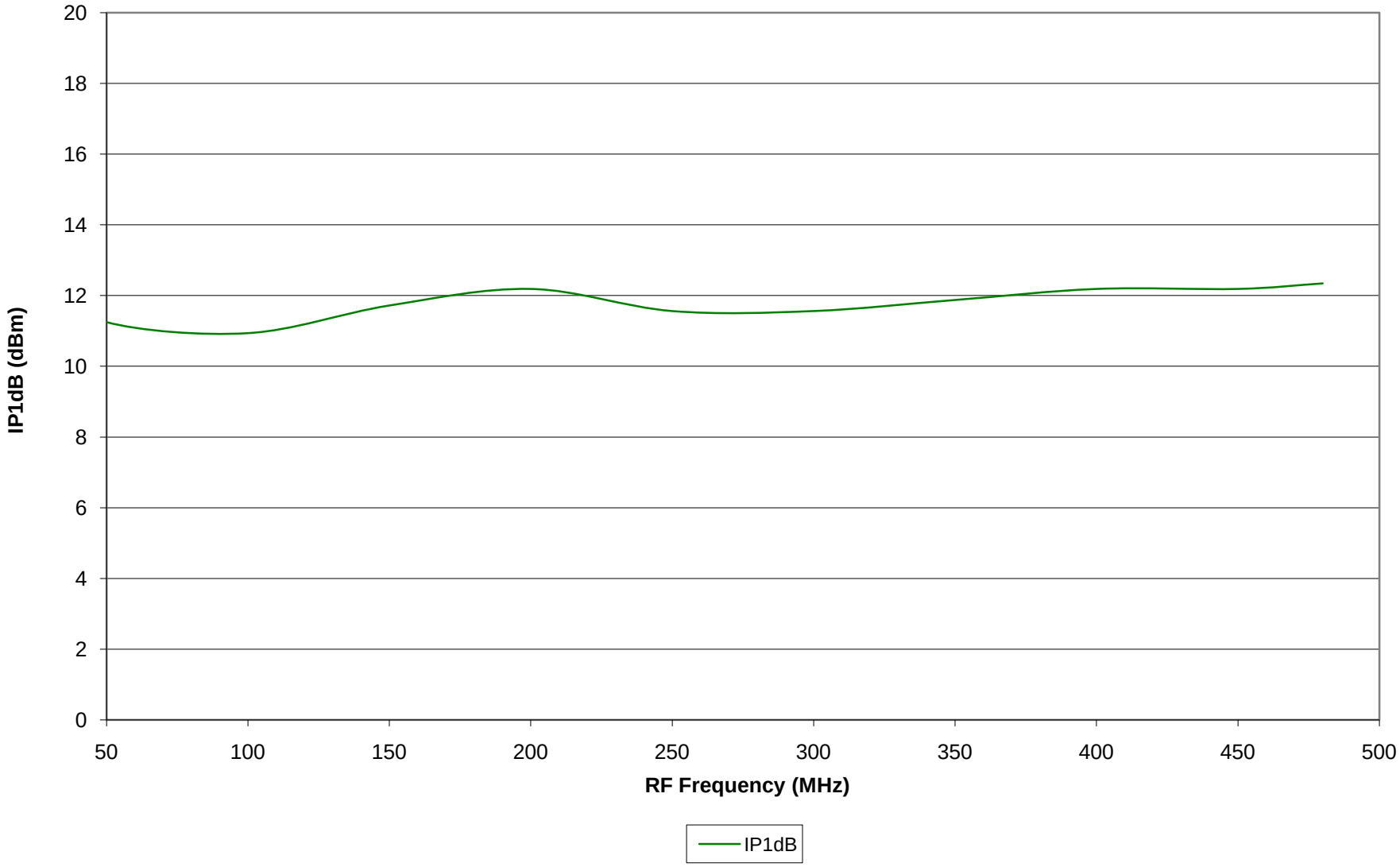
ADL5801 Low Frequency Operation. Gain v RF Frequency, IF = 70MHz. High Side LO



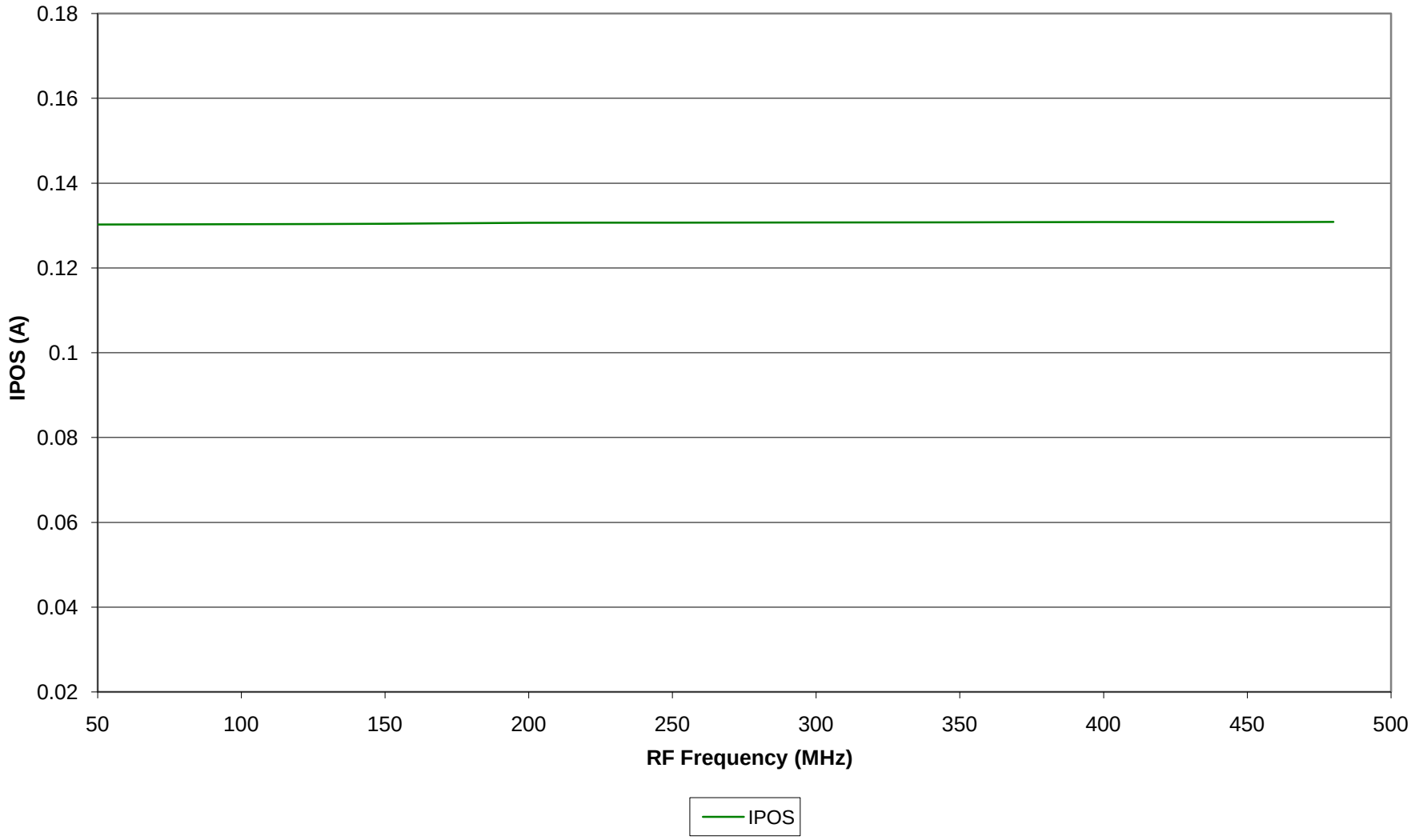

ADL5801 Low Frequency Operation. IIP3 v RF Frequency, IF = 70MHz. High Side LO
IIP3 (dBm)
40
35
30
25
20
15
10
5
0
50
100
150
200
250
300
350
400
450
500
RF Frequency (MHz)
IIP3


ADL5801 Low Frequency Operation. IIP2 v RF Frequency, IF = 70MHz. High Side LO
IIP2 (dBm)
100
90
80
70
60
50
40
30
20
10
0
50
100
150
200
250
300
350
400
450
500
RF Frequency (MHz)
IIP2

ADL5801 Low Frequency Operation. IP1dB v RF Frequency, IF = 70MHz. High Side LO



ADL5801 Low Frequency Operation. Supply Current v RF Frequency, IF = 70MHz. High Side LO



ADL5801 Low Frequency Operation, High side LO, 70MHz IF. Noise Figure v RF Frequency, VSET = 2.0V & 3.6V.