# F1200 Temperature Performance

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- AT0089

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The Analog and Digital Company™

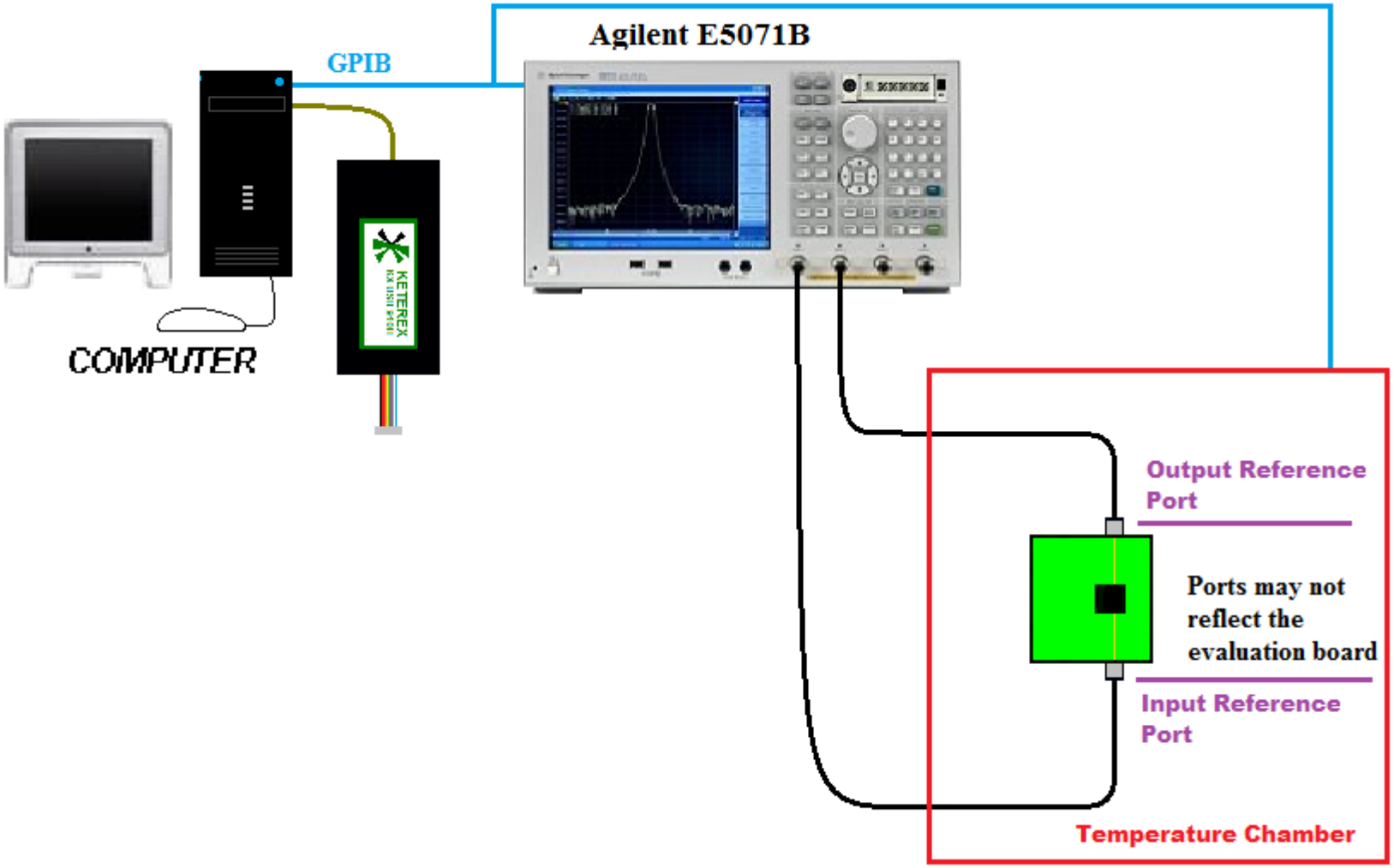
# Agenda

- Introduction
- Testing
- Results

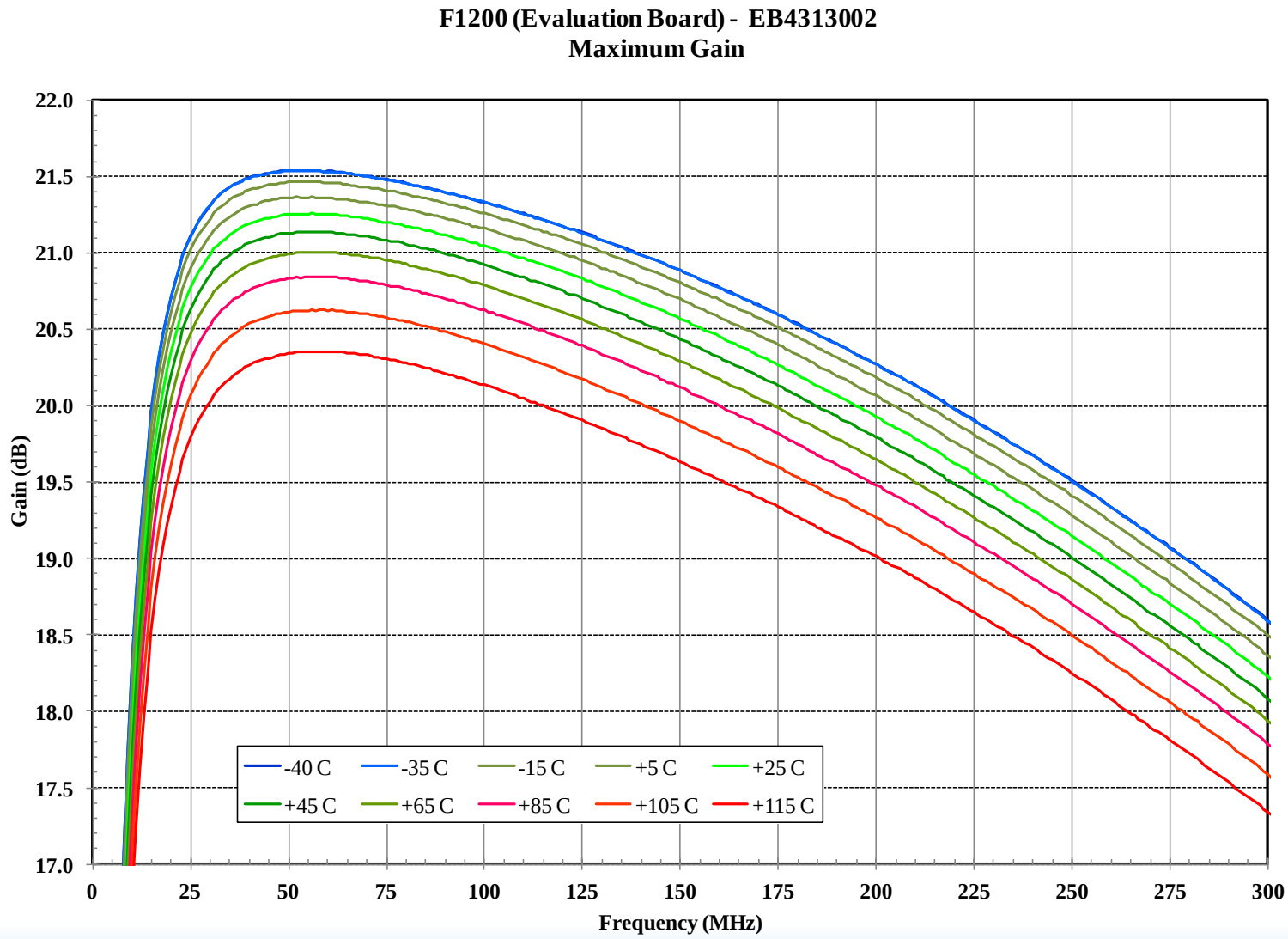
# Introduction

- Customer is interested in the F1200, Intermediate Frequency Digital Variable Gain Amplifier, and has a concern with temperature variation.
- The temperature specification say the product can be used to +85 °C.  Customer's environment can go to +105 °C.
- Customer is interested in the parameter variations with the temperature.

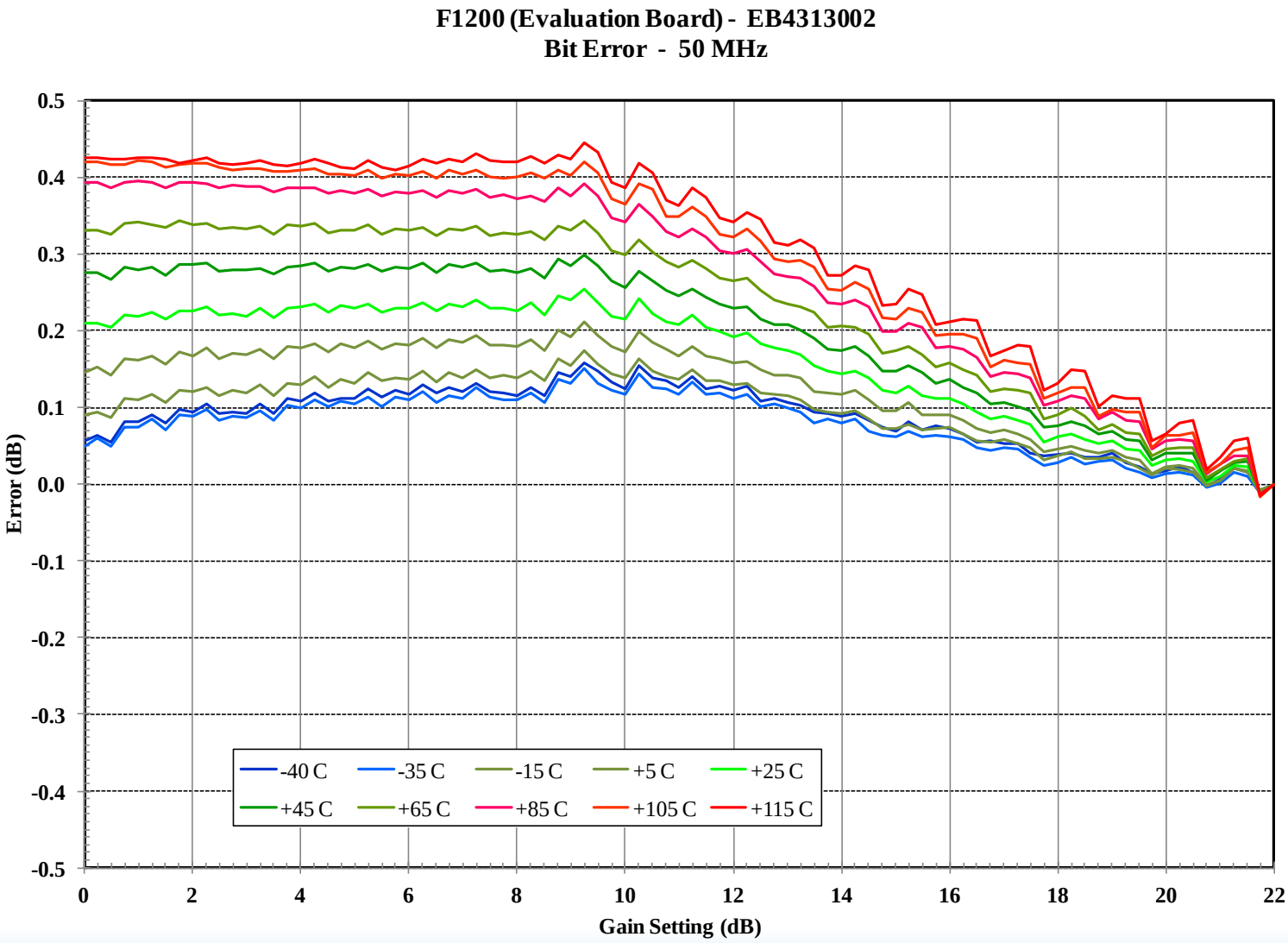
# S-Parameter Test Setup



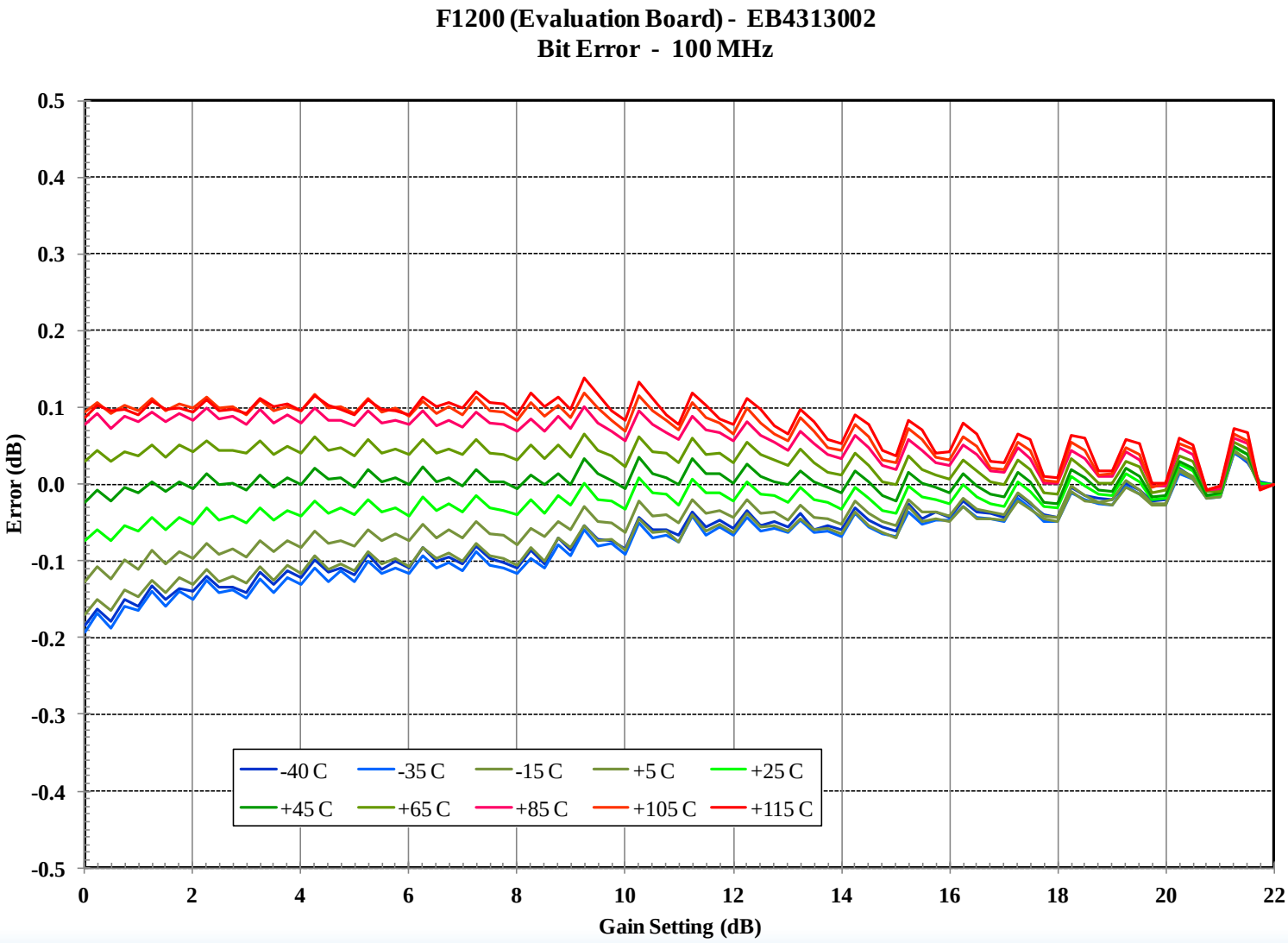
# Maximum Gain Variation



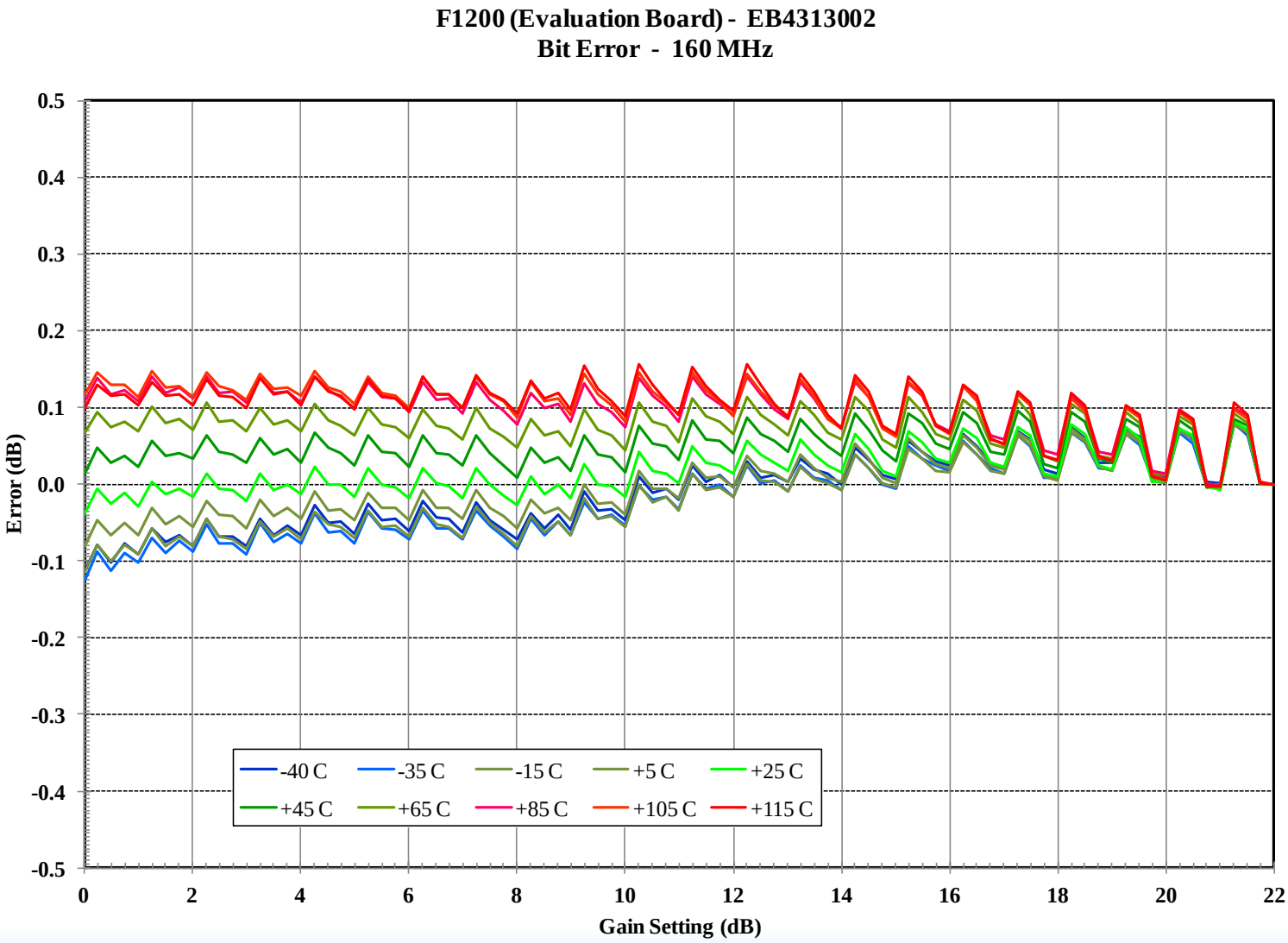
# Attenuator Accuracy at 50 MHz



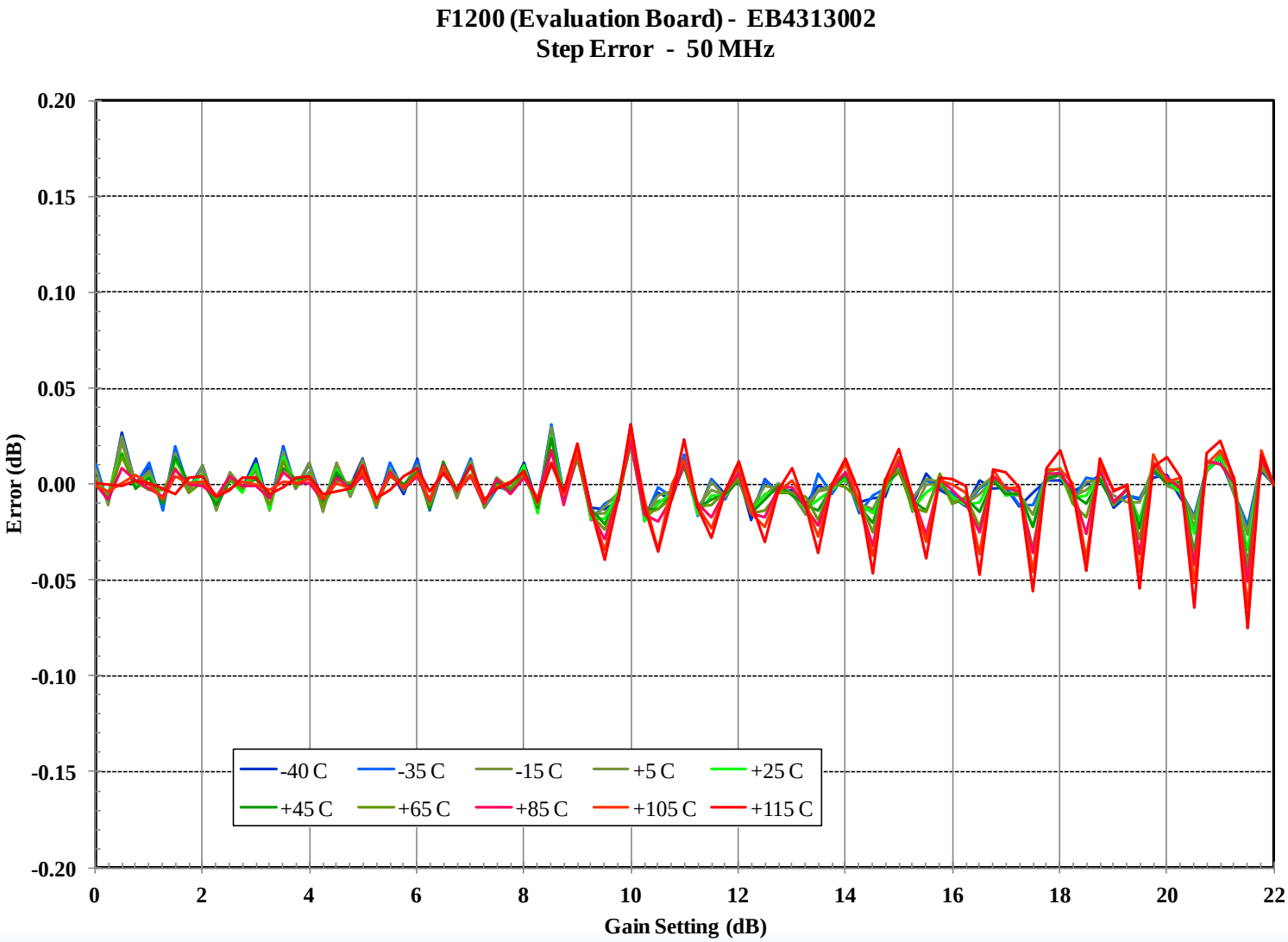
# Attenuator Accuracy at 100 MHz



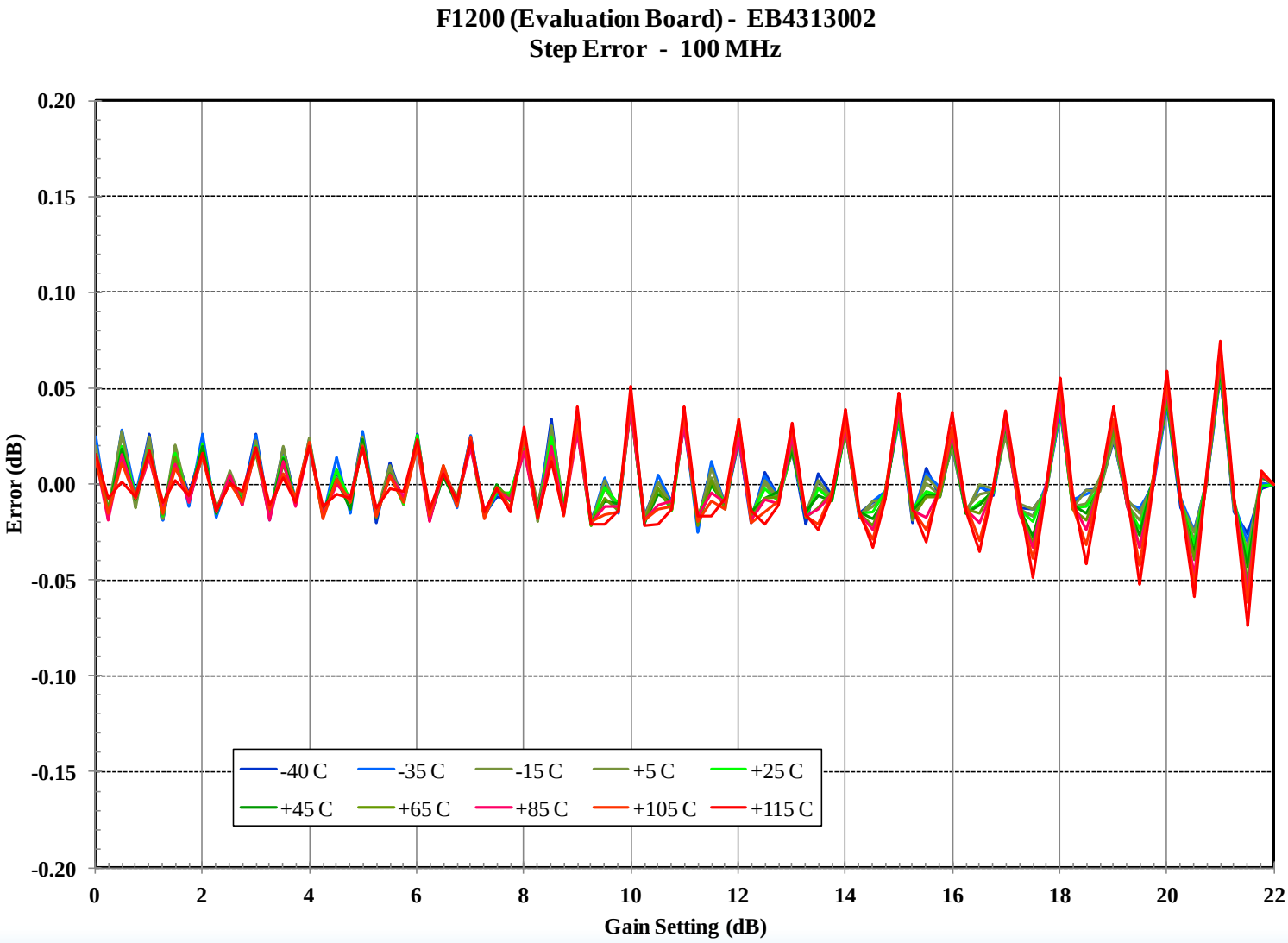
# Attenuator Accuracy at 160 MHz



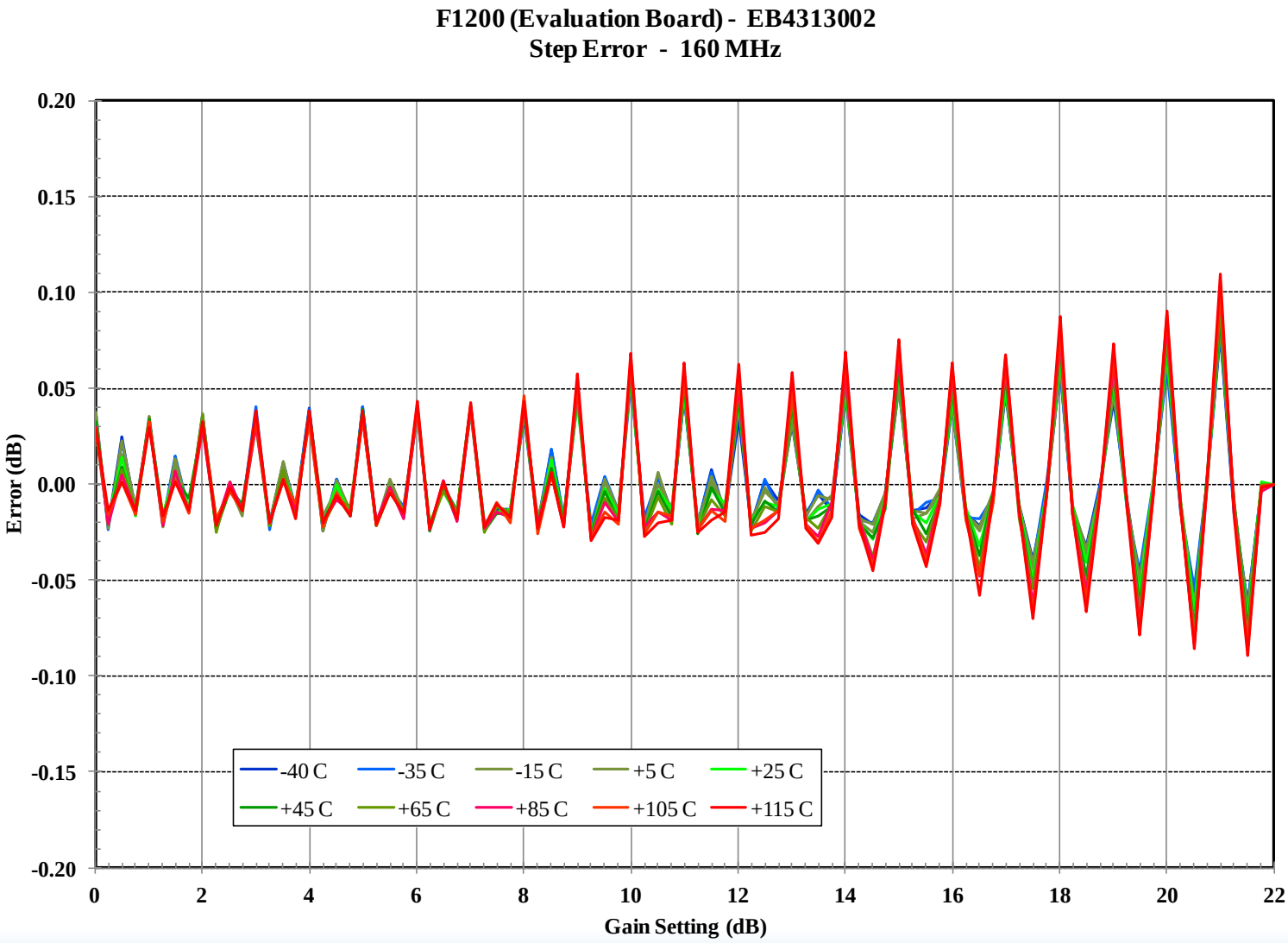
# Step Accuracy (DNL) at 50 MHz



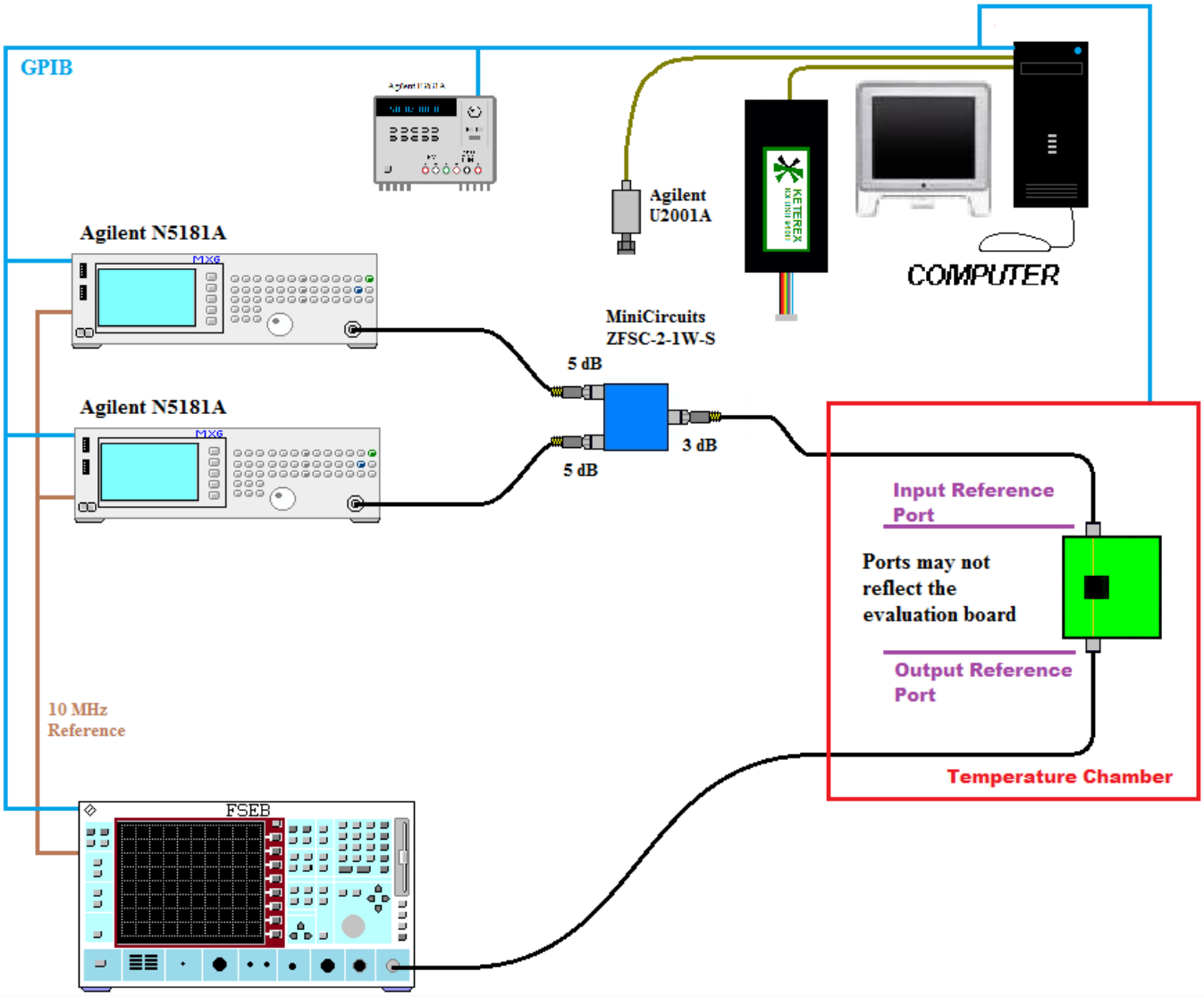
# Step Accuracy (DNL) at 100 MHz



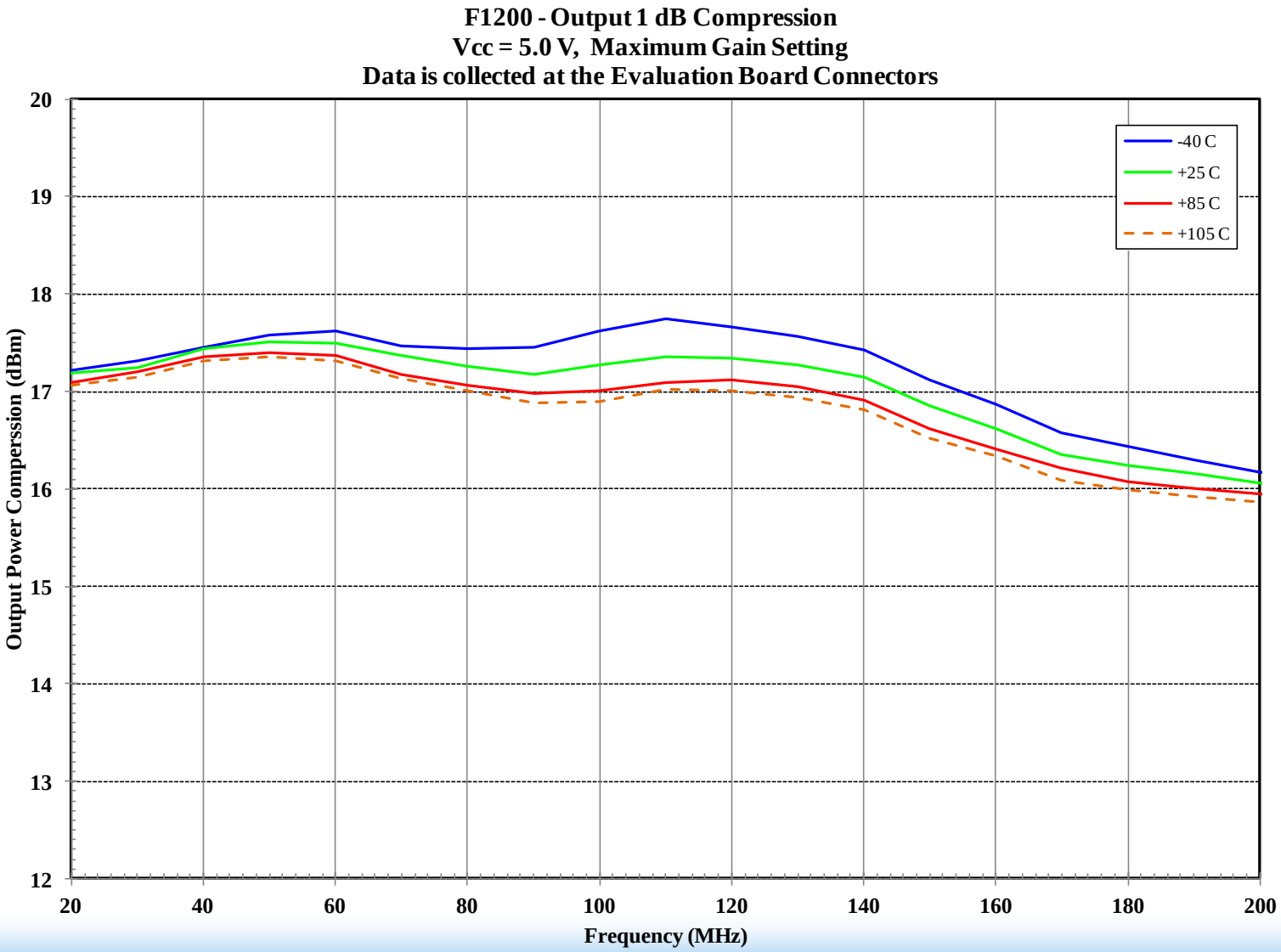
# Step Accuracy (DNL) at 160 MHz



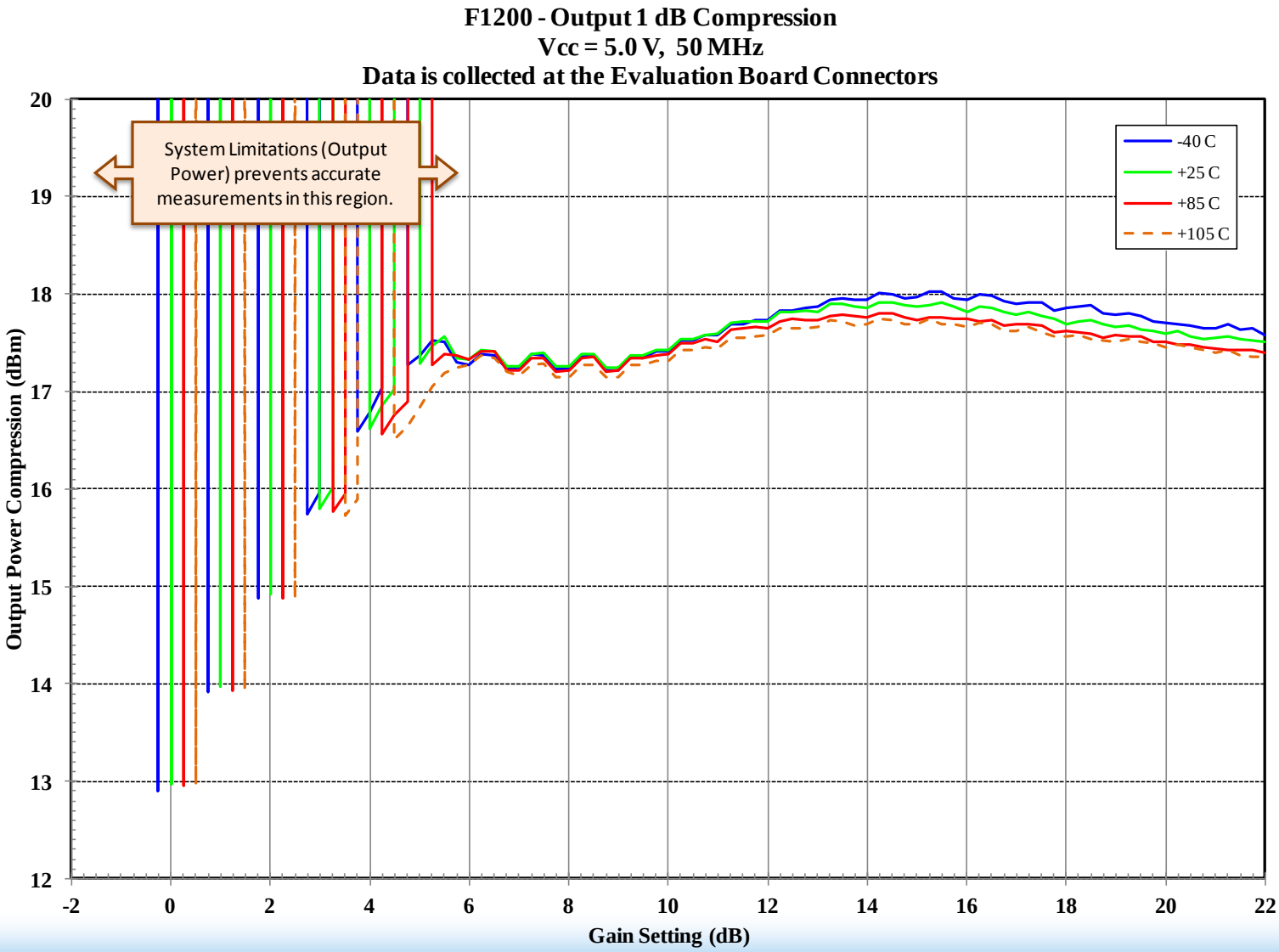
# P1dB, IP3, Harmonic Test Setup



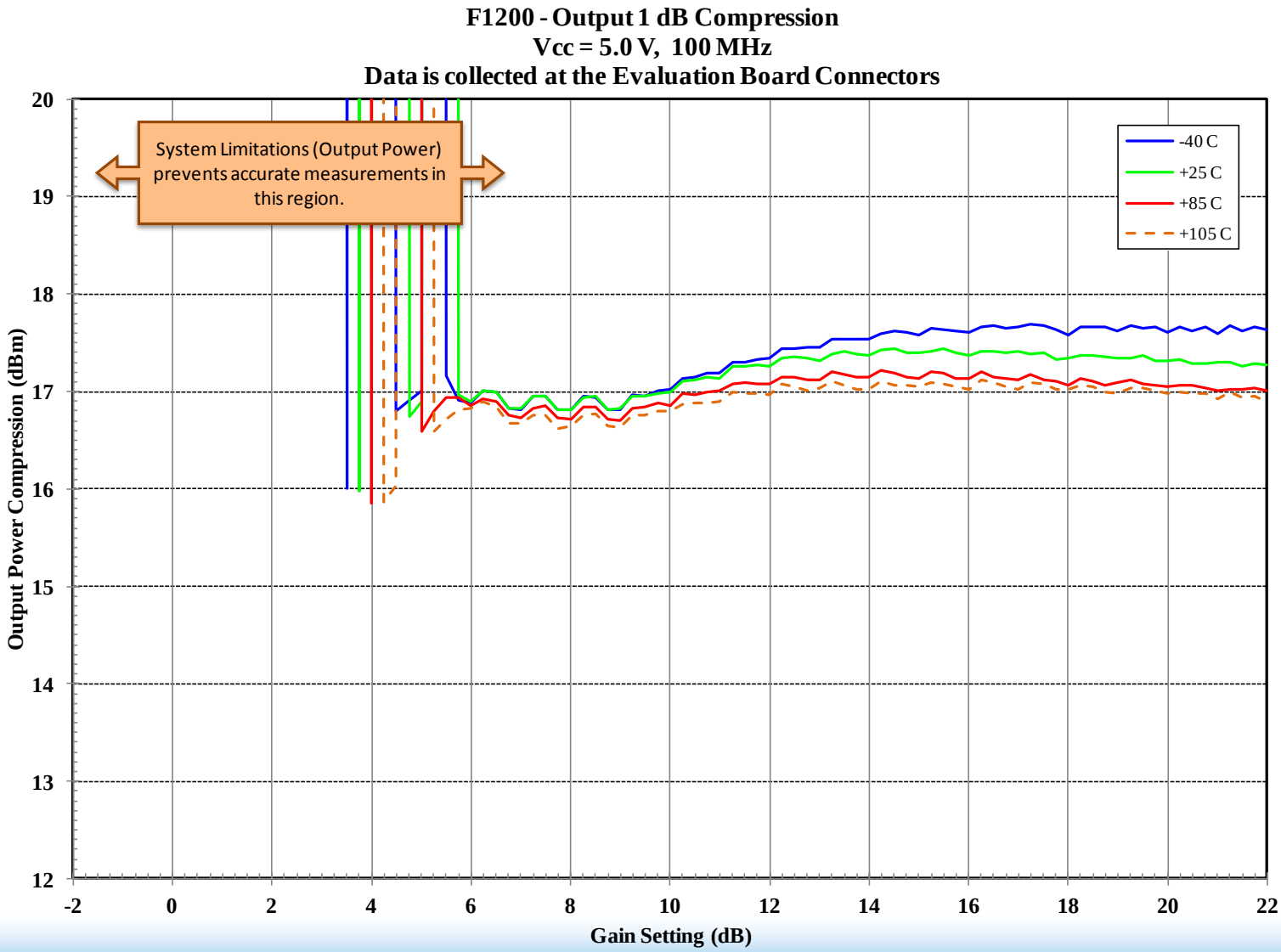
# OP1dB: Maximum Gain



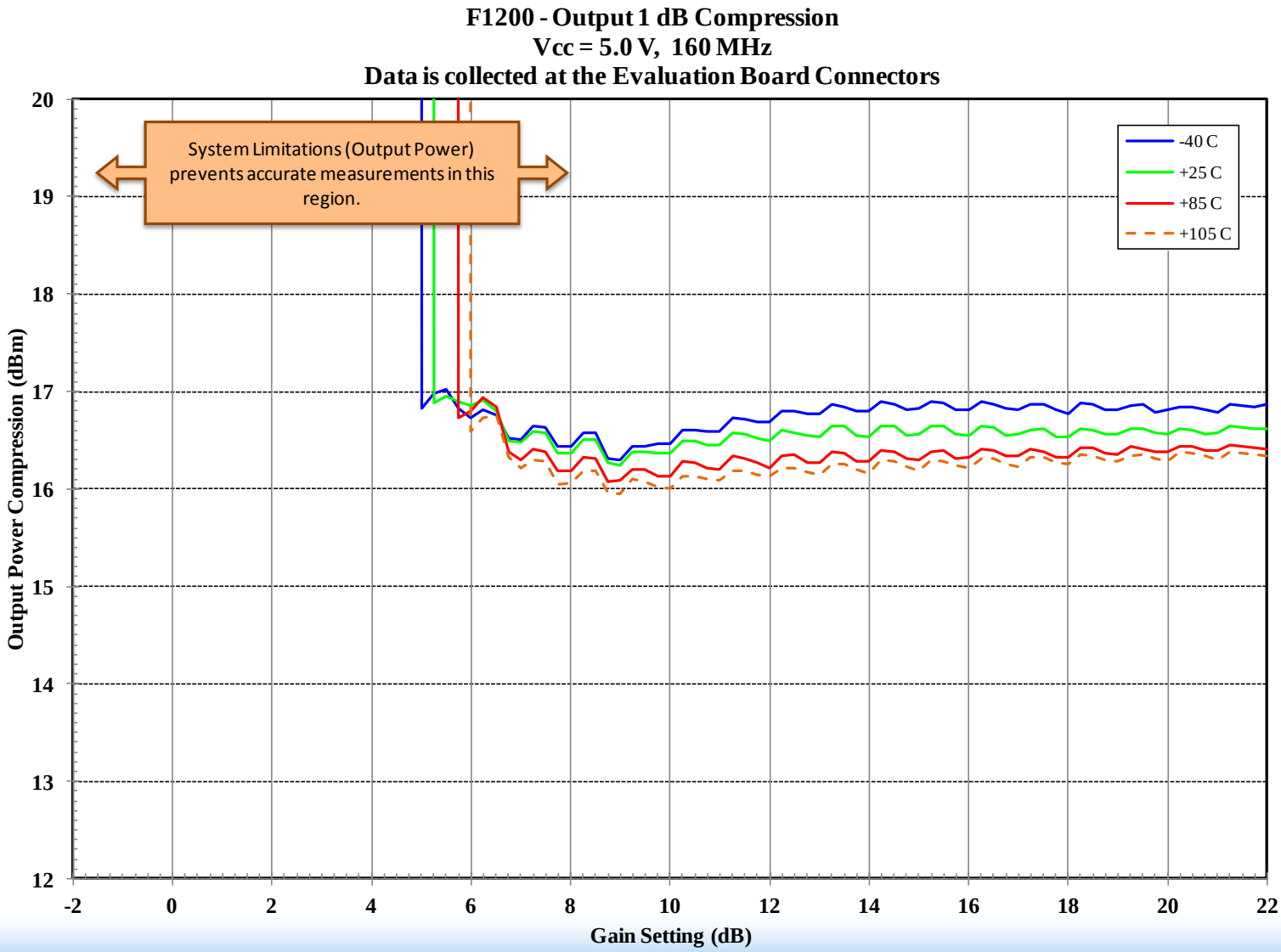
# OP1dB: 50 MHz


F1200 - Output 1 dB Compression
Vcc = 5.0 V, 50 MHz
Data is collected at the Evaluation Board Connectors
System Limitations (Output Power) prevents accurate measurements in this region.
-40 C
+25 C
+85 C
+105 C
Output Power Compression (dBm)
Gain Setting (dB)
20
19
18
17
16
15
14
13
12
-2
0
2
4
6
8
10
12
14
16
18
20
22

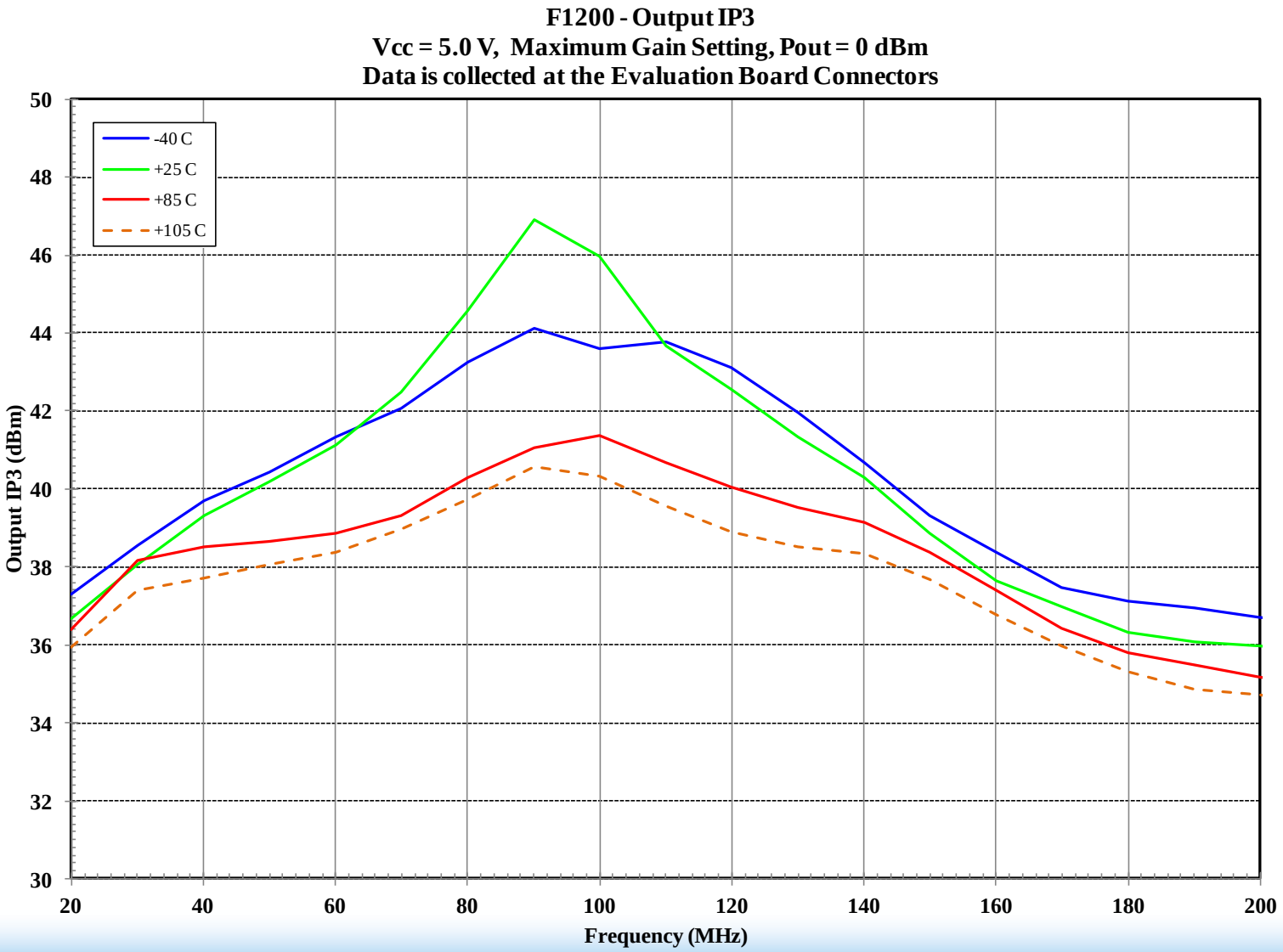
# OP1dB : 100 MHz



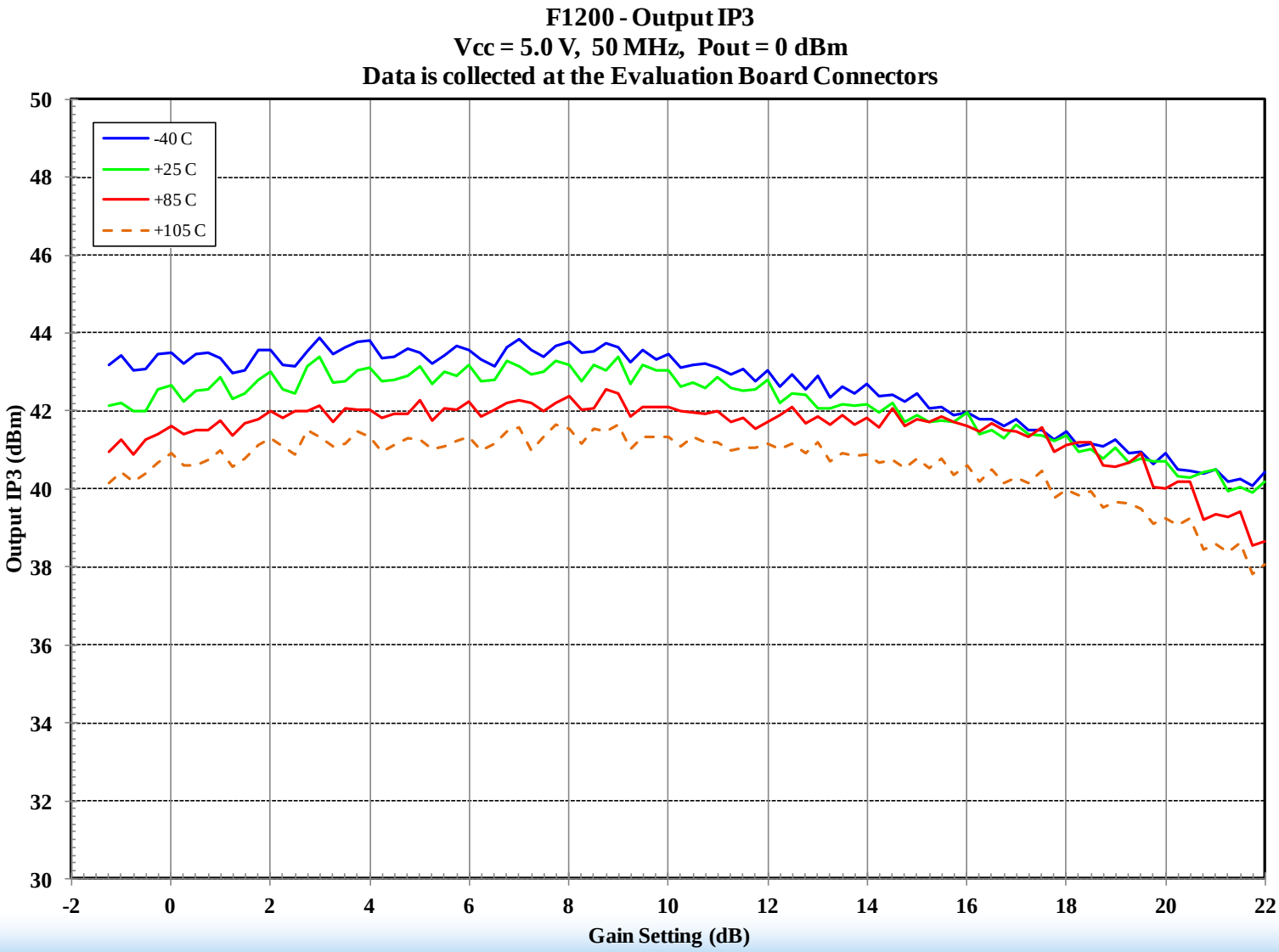
# OP1dB : 160 MHz



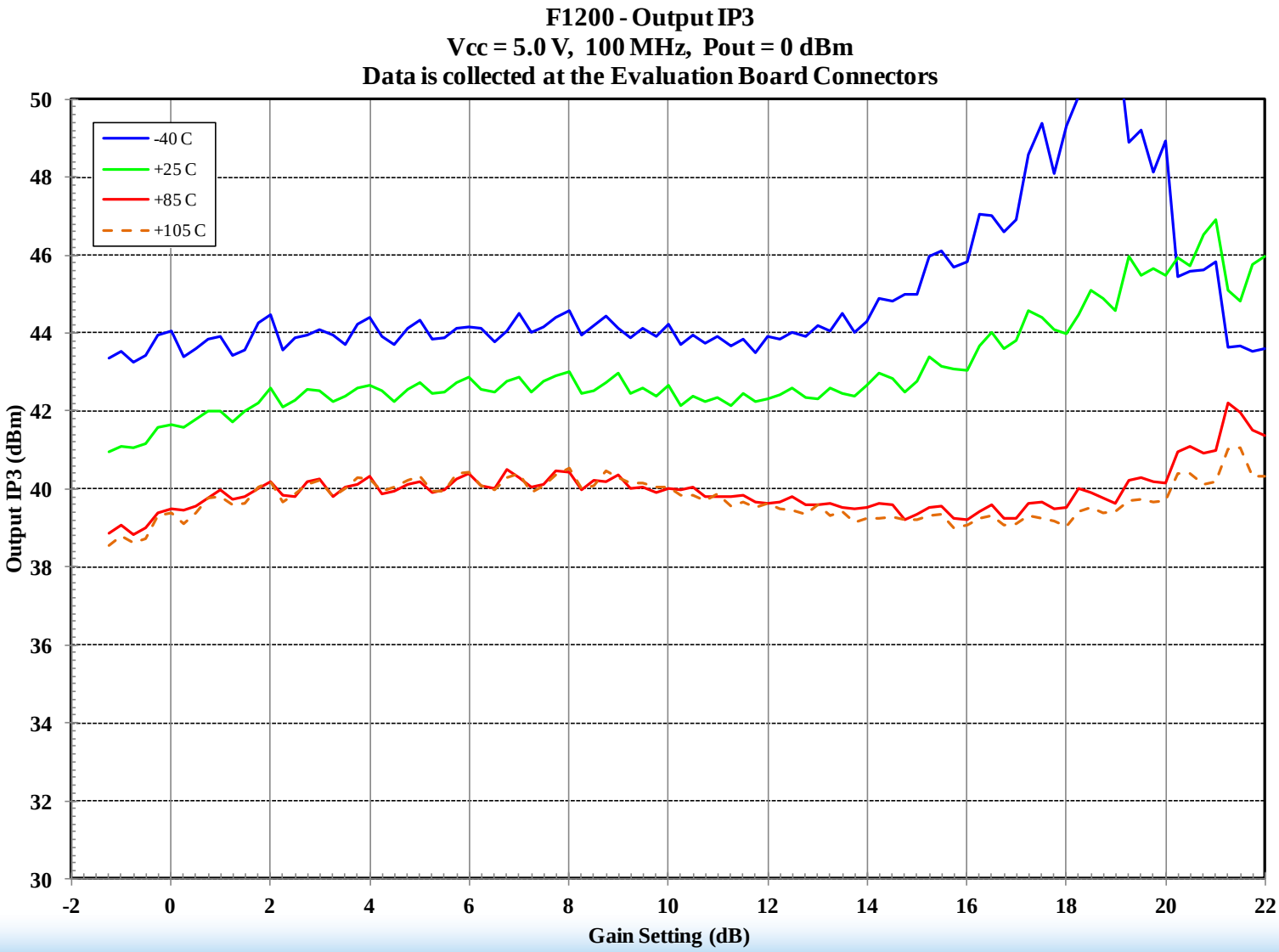
# OIP3: Maximum Gain



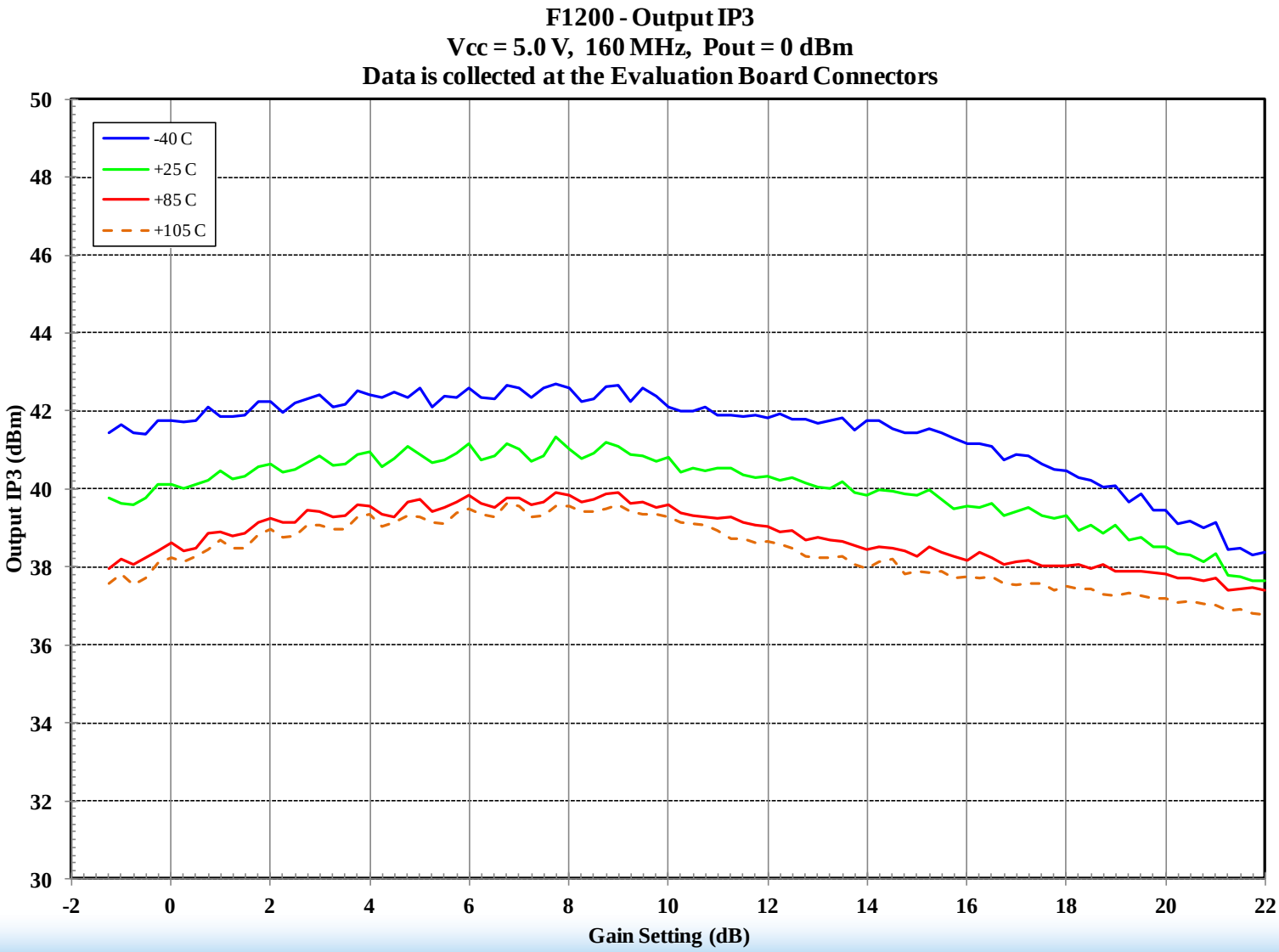
# OIP3: 50 MHz


F1200 - Output IP3
Vcc = 5.0 V, 50 MHz, Pout = 0 dBm
Data is collected at the Evaluation Board Connectors
-40 C
+25 C
+85 C
+105 C
Output IP3 (dBm)
50
48
46
44
42
40
38
36
34
32
30
-2
0
2
4
6
8
10
12
14
16
18
20
22
Gain Setting (dB)

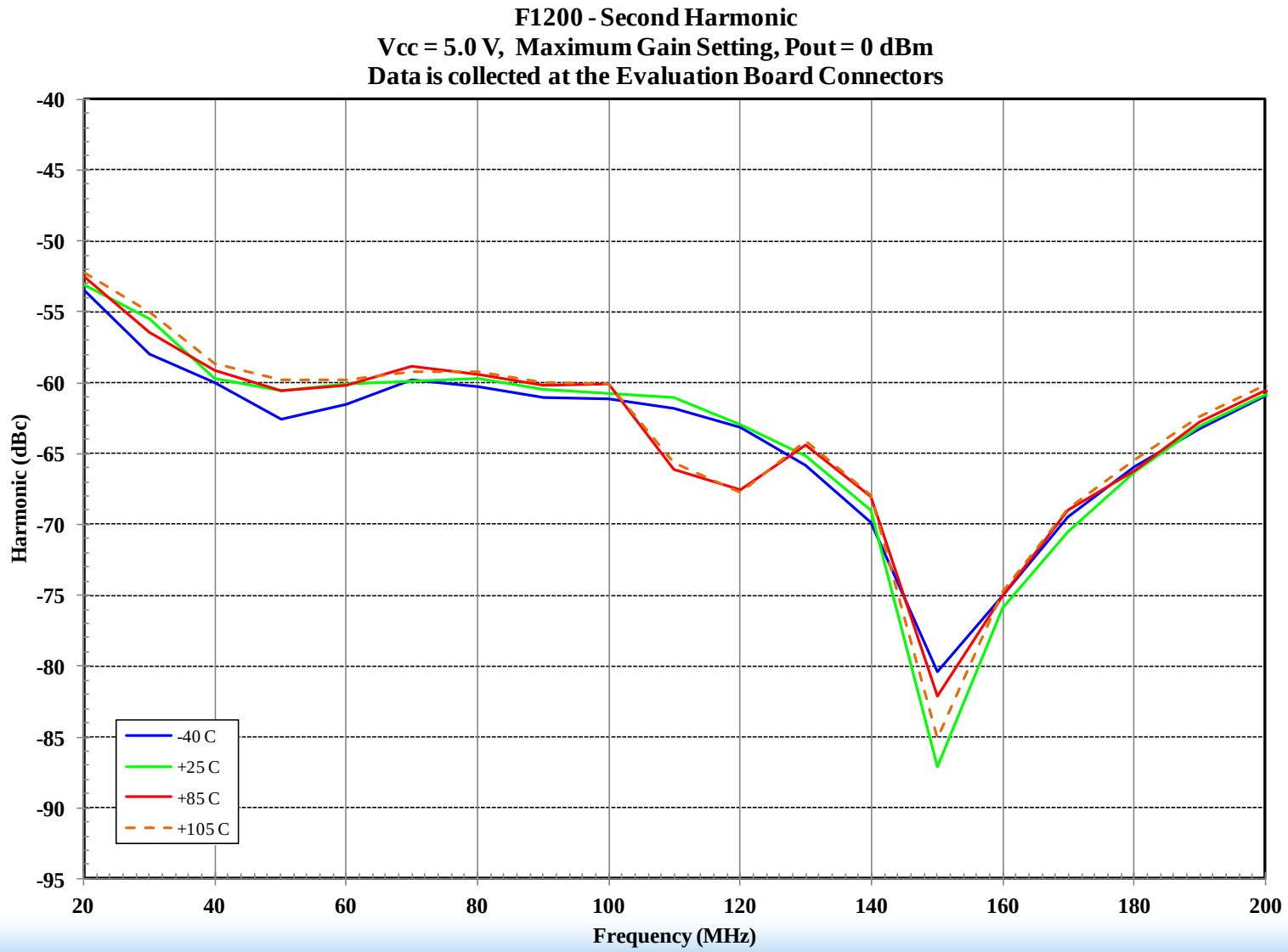
# OIP3: 100 MHz


F1200 - Output IP3
Vcc = 5.0 V, 100 MHz, Pout = 0 dBm
Data is collected at the Evaluation Board Connectors
-40 C
+25 C
+85 C
+105 C
Output IP3 (dBm)
50
48
46
44
42
40
38
36
34
32
30
-2
0
2
4
6
8
10
12
14
16
18
20
22
Gain Setting (dB)

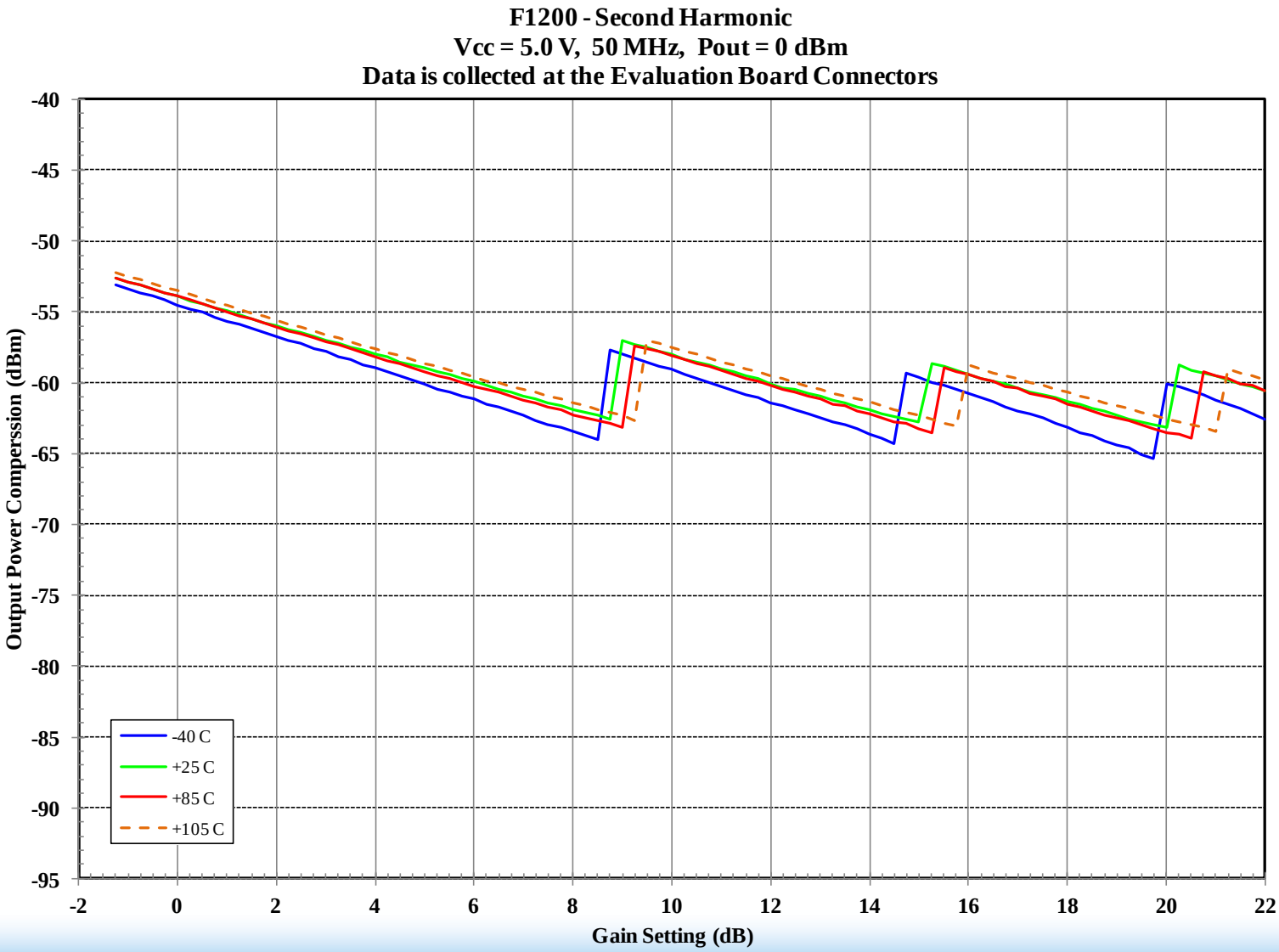
# OIP3: 160 MHz


F1200 - Output IP3
Vcc = 5.0 V, 160 MHz, Pout = 0 dBm
Data is collected at the Evaluation Board Connectors
-40 C
+25 C
+85 C
+105 C
Output IP3 (dBm)
50
48
46
44
42
40
38
36
34
32
30
-2
0
2
4
6
8
10
12
14
16
18
20
22
Gain Setting (dB)

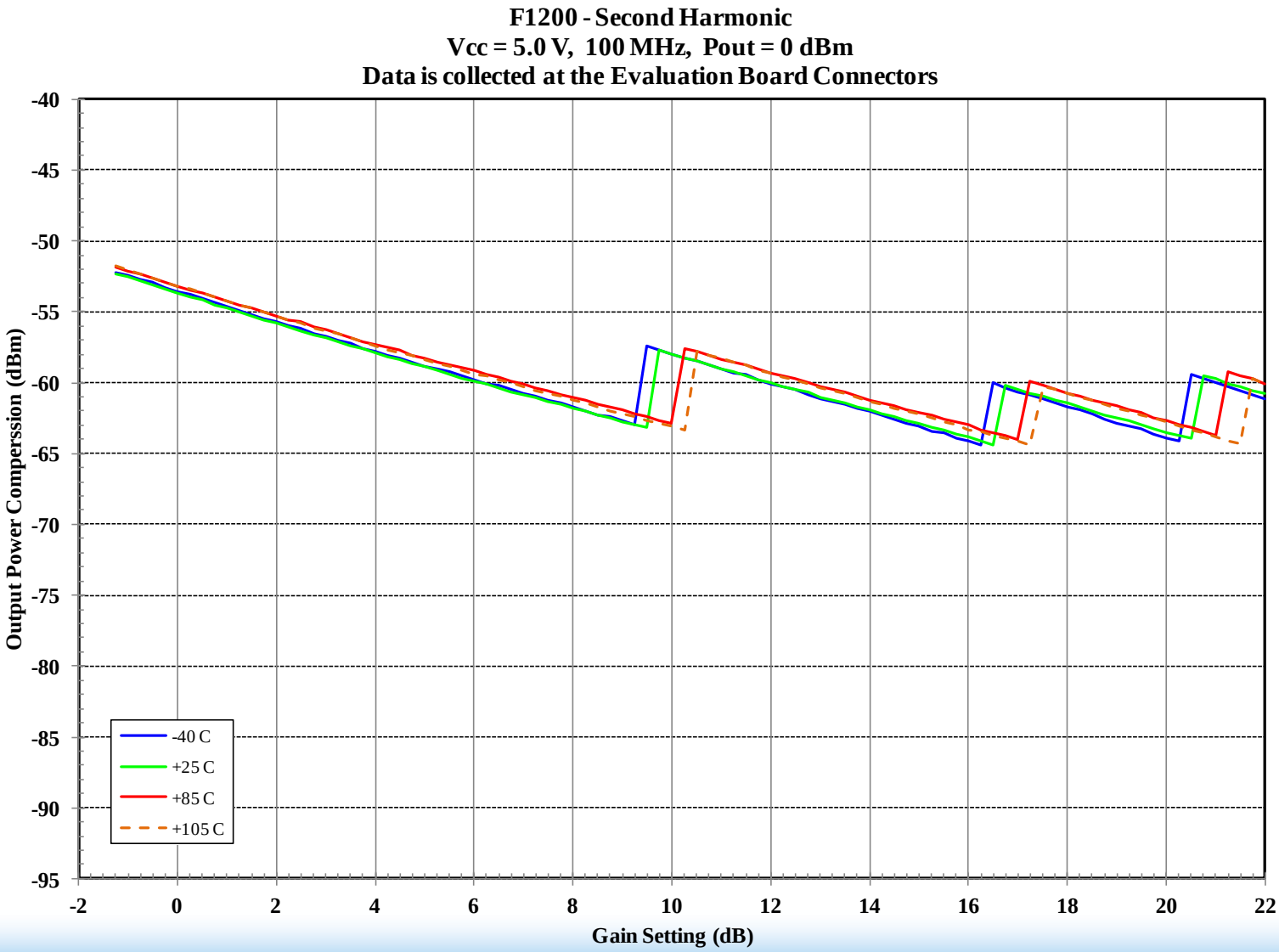
# 2nd Harmonic: Maximum Gain



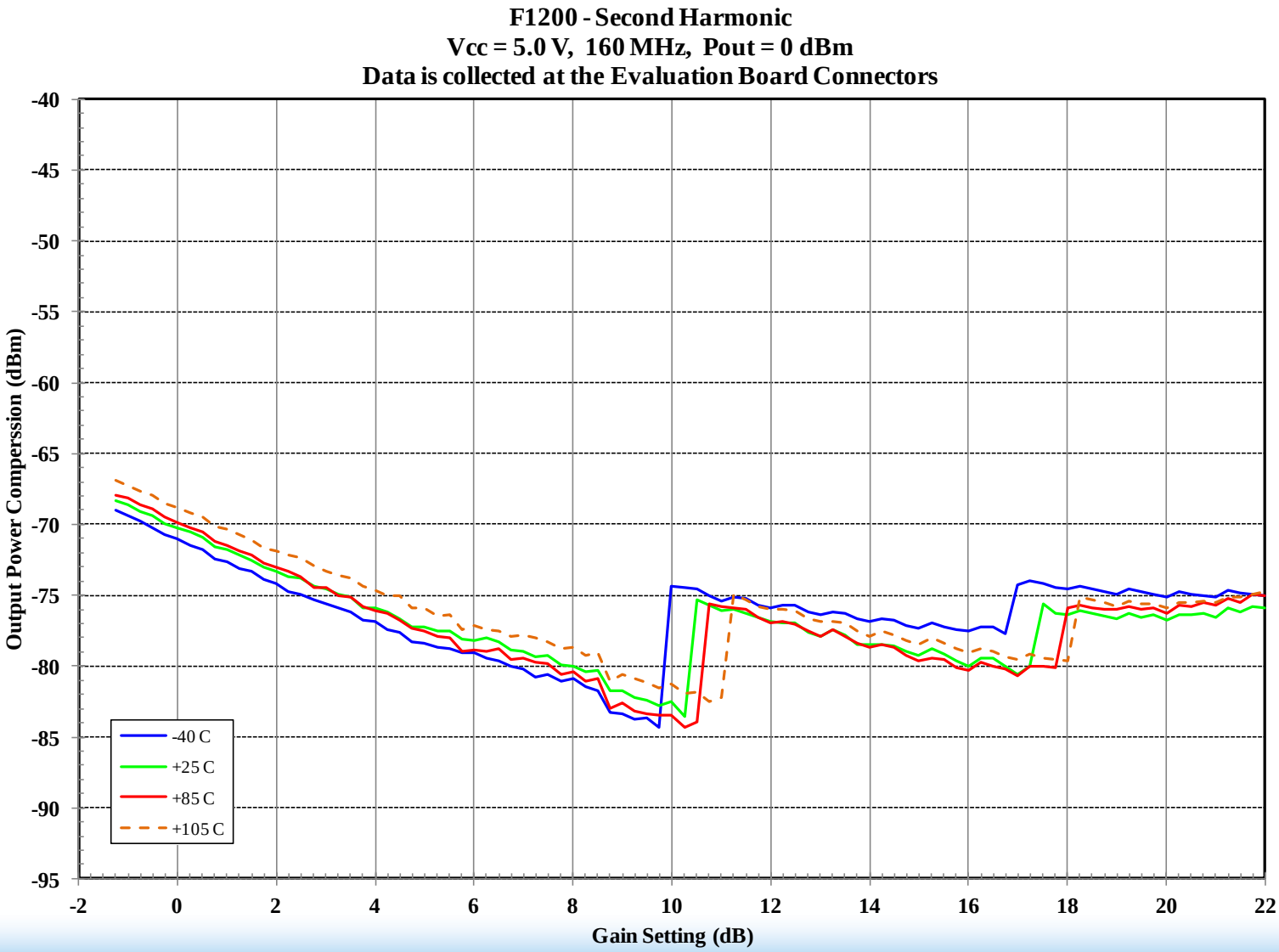
# 2nd Harmonic: 50 MHz



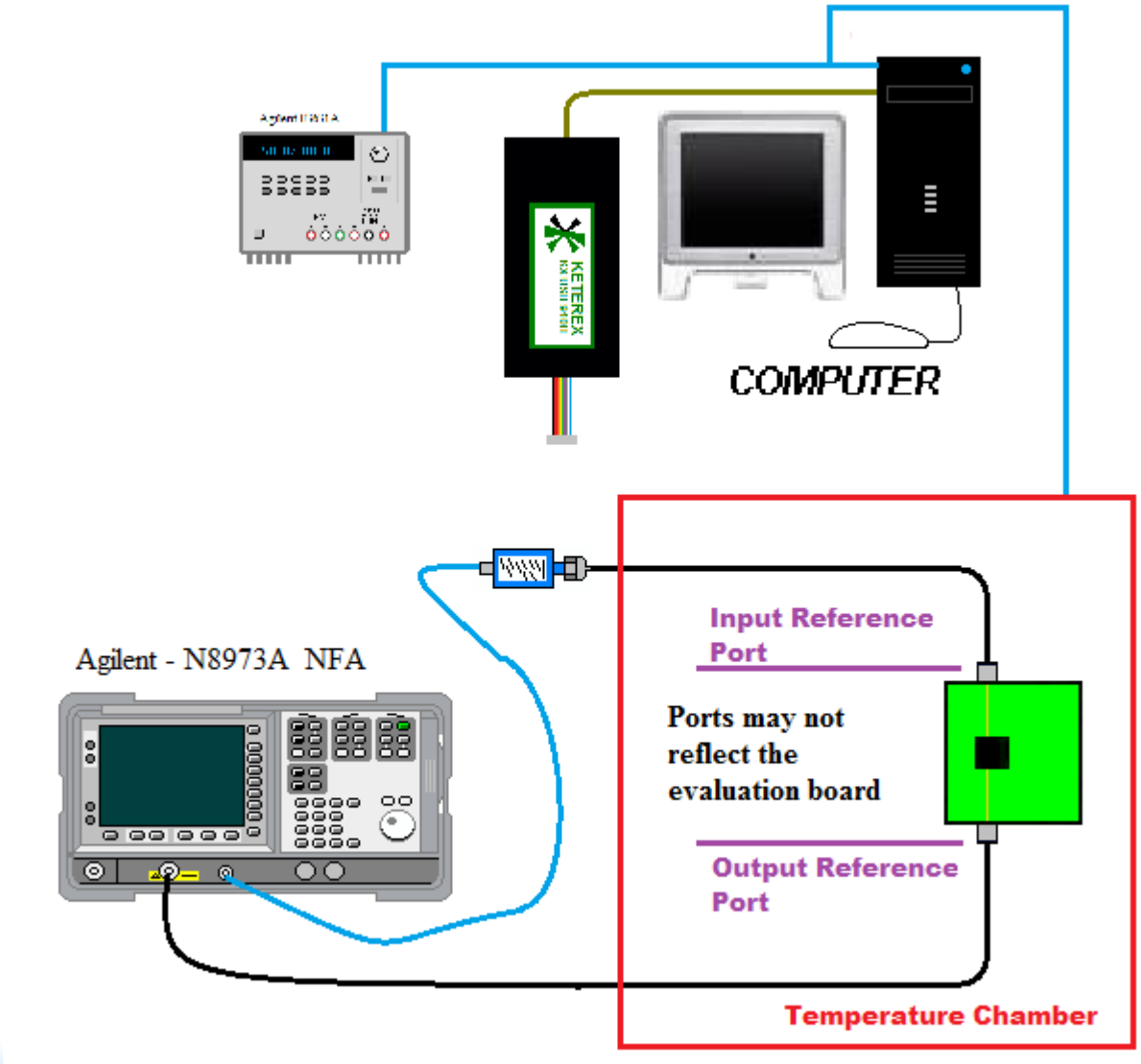
# 2nd Harmonic: 100 MHz



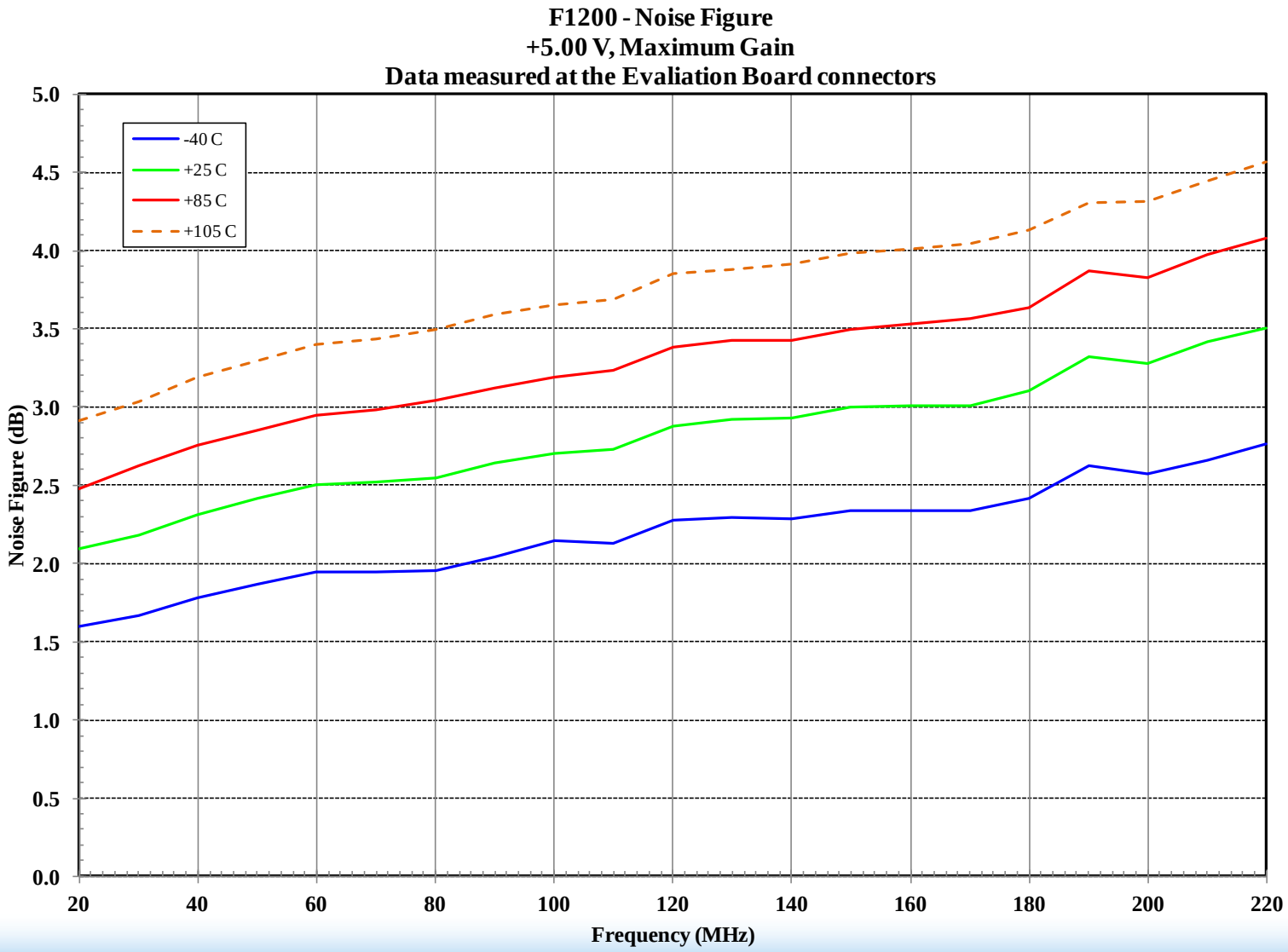
# 2nd Harmonic: 160 MHz



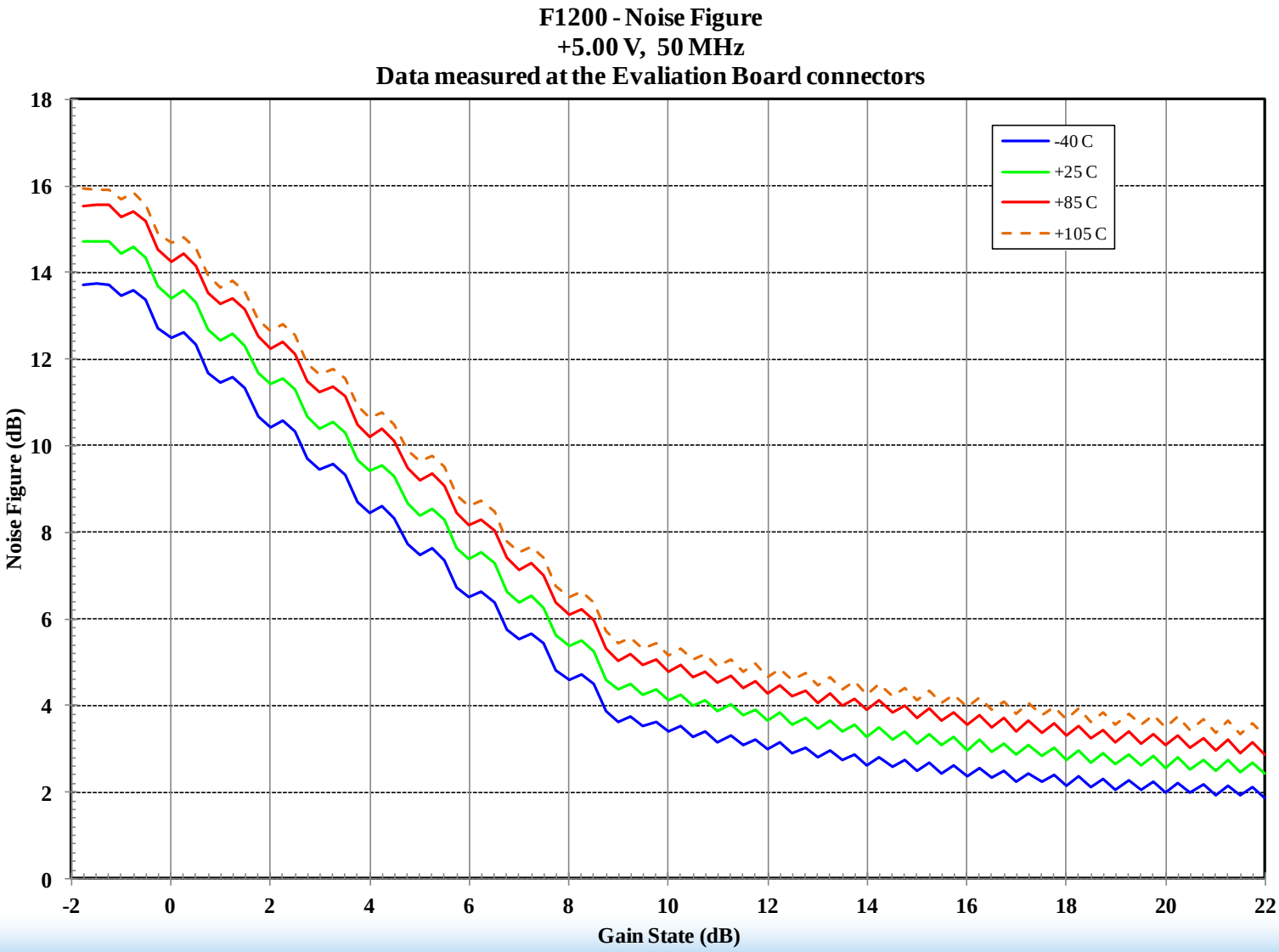
# Noise Figure Test Setup



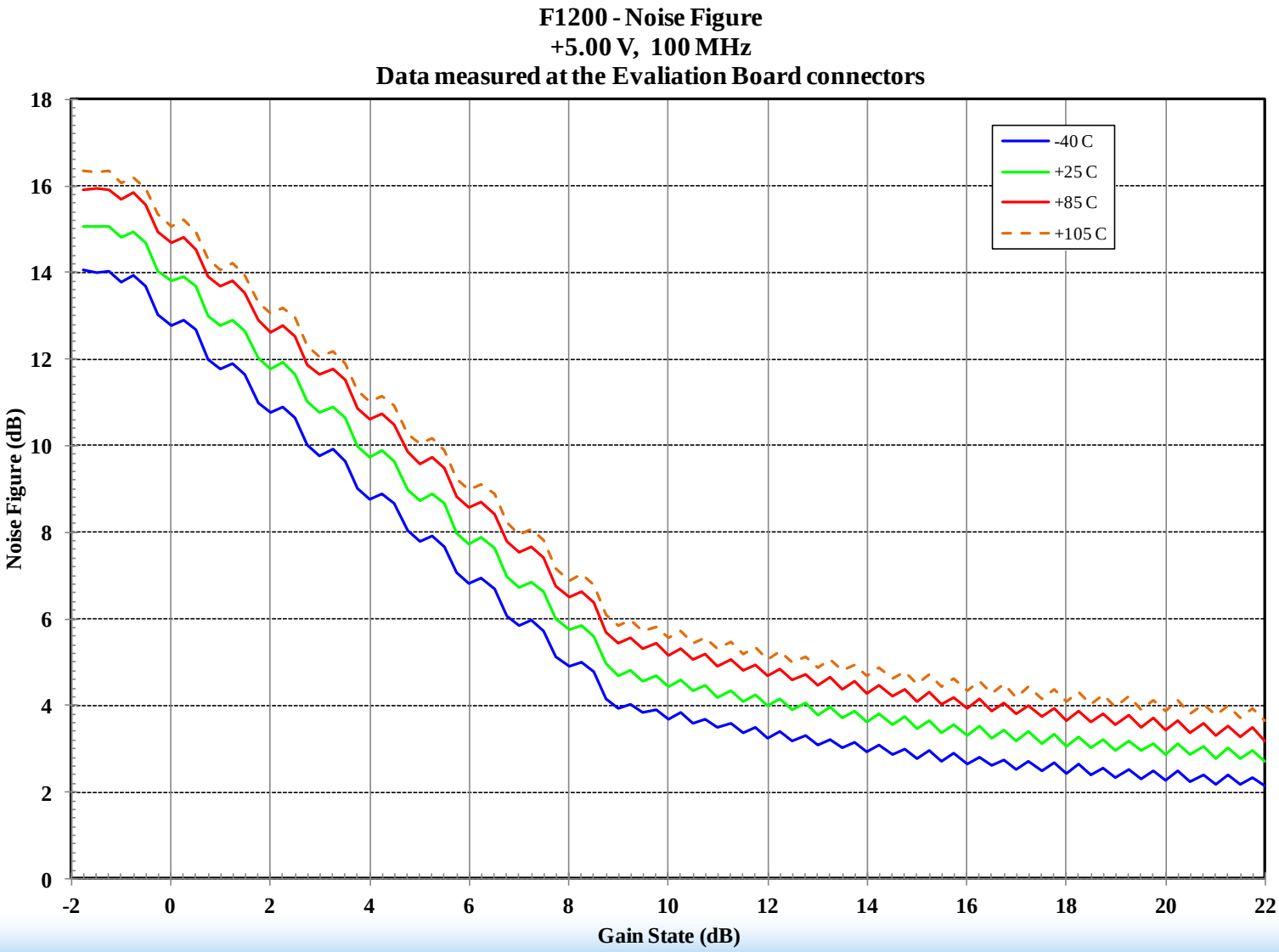
# Noise Figure: Maximum Gain



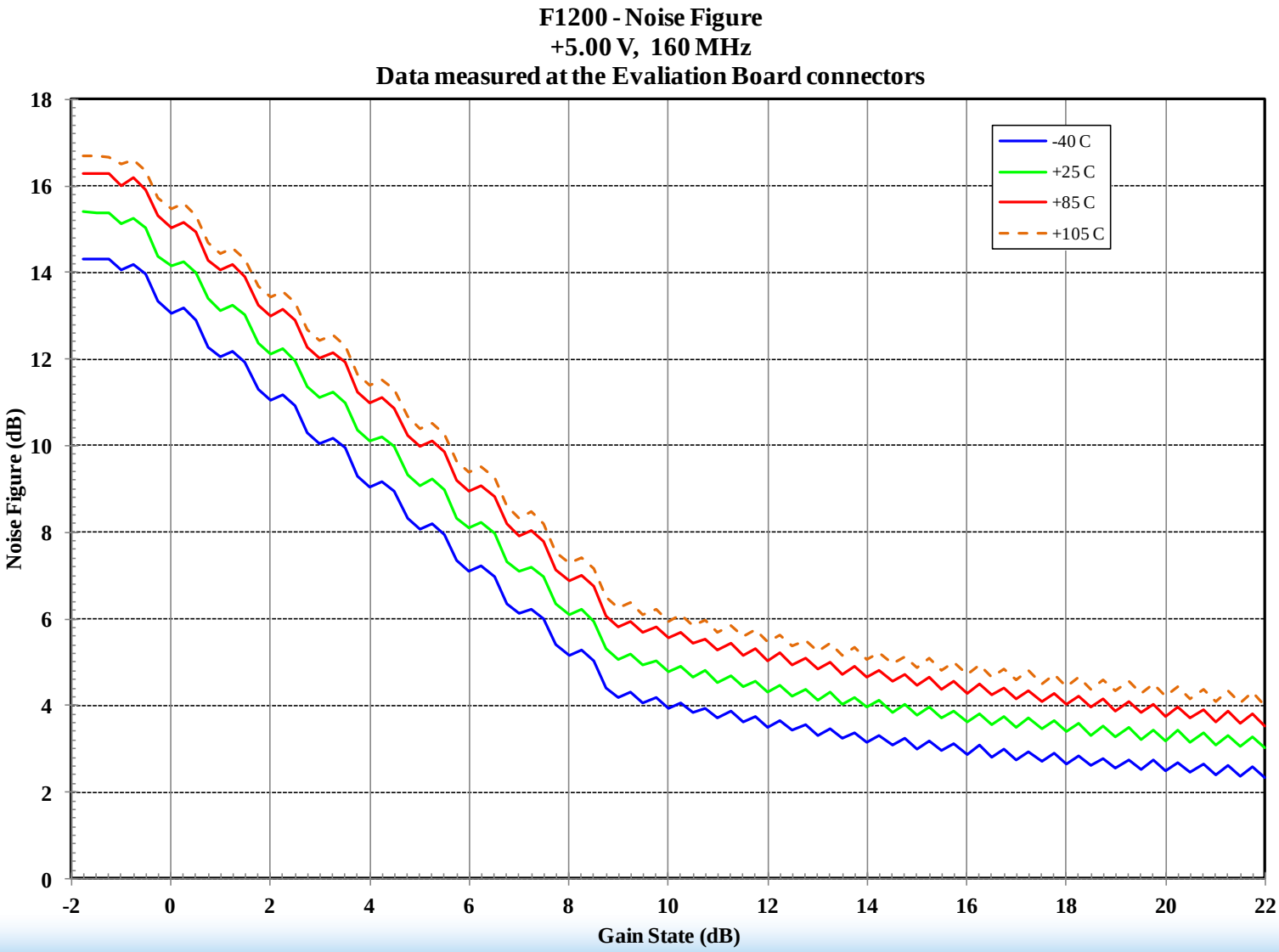
# Noise Figure: 50 MHz



# Noise Figure: 100 MHz



# Noise Figure: 160 MHz



# Conclusion

- Data was taken at -45, +25, +85, and +105 °C.
- Data shows that there is a nominal change from +85 to +105 C for all parameters.
- Use of the product for LONG PERIODS of time beyond 85 °C will increase the failure rate and is NOT RECOMMENDED.