TYPICAL CHARACTERISTICS
ON
PMC-24-7D5-SFF

PMI MODEL: PMC-24-7D5-SFF IS A MONOPULSE COMPARATOR OPERATING OVER THE 2.0 TO 4.0 GHz FREQUENCY RANGE. THIS MODEL OFFERS A TYPICAL INSERTION LOSS OF 0.8 dB IF INPUT SIGNALS AT PORTS A, B, C AND D ARE EQUAL IN AMPLITUDE OR POWER & INPHASE WITH AN OUTPUT AT PORT AZΣ. INSERTION LOSS OF 7.5 dB MAXIMUM IF INPUT SIGNAL AT PORT A, B, C or D AND ALL OTHER PORTS ARE TERMINATED TO 50 OHMS WITH AN OUTPUT AT PORTS ELΔ, AZΣ, AQ or AZΔ, WHILE MAINTAINING A MAXIMUM AMPLITUDE BALANCE OF ±1.0 dB AND A PHASE BALANCE OF ±10°.

November 15th, 2019

Designed By:
Dr. Ashok Gorwara

Tested By:
Brad Willard

Reported By:
Brad Willard

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TYPICAL CHARACTERISTICS ON PMC-24-7D5-SFF

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TYPICAL CHARACTERISTICS ON PMC-24-7D5-SFF

OUTLINE DRAWING

DESCRIPTION

PMI MODEL: PMC-24-7D5-SFF IS A MONOPULSE COMPARATOR OPERATING OVER THE 2.0 TO 4.0 GHz FREQUENCY RANGE. THIS MODEL OFFERS A TYPICAL INSERTION LOSS OF 0.8 dB IF INPUT SIGNALS AT PORTS A, B, C AND D ARE EQUAL IN AMPLITUDE OR POWER & INPHASE WITH AN OUTPUT AT PORT AZΣ. INSERTION LOSS OF 7.5 dB MAXIMUM IF INPUT SIGNAL AT PORT A, B, C or D AND ALL OTHER PORTS ARE TERMINATED TO 50 OHMS WITH AN OUTPUT AT PORTS ELΔ, AZΣ, AQ or AZΔ, WHILE MAINTAINING A MAXIMUM AMPLITUDE BALANCE OF ±1.0 dB AND A PHASE BALANCE OF ±10°.

SPECIFICATIONS

- FREQUENCY RANGE: 2.0 GHz TO 4.0 GHz
- INSERTION LOSS: 0.8 dB TYPICAL (If input signals at ports A, B, C and D are equal Amplitude or Power & Inphase with an output at Port AZΣ)
- INSERTION LOSS: 7.5 dB MAXIMUM (If input signals at port A, B, C or D and all other ports are terminated to 50 Ohms with an output at ports ELΔ, AZΣ, AQ or AZΔ)
- AMPLITUDE BALANCE: ±1.0 dB MAXIMUM
- PHASE BALANCE: ±10°
- ISOLATION: 18 dB MINIMUM
- VSWR: 1.40:1 MAXIMUM
- POWER HANDLING: AVERAGE: 10 WATT MAXIMUM (PORT A, B, C & D) PEAK: 0.1 kW MAXIMUM
- IMPEDANCE: 50 Ω
- CONNECTORS: SMA FEMALE
- SIZE: 82 mm x 82 mm x 11 mm 3.23" x 3.23" x 0.43" EXCLUDING CONNECTORS
- FINISH: BLUE EPOXY POLIMIDE COATING IAW MIL-C-22750, TYPE I OVER EPOXY POLIMIDE PRIMER IAW MIL-P-23377, TYPE I, CLASS 1 OR 3.

ENVIRONMENTAL RATINGS

- TEMPERATURE: -55 °C TO +85 °C (OPERATING) -65 °C TO +125 °C (STORAGE)
- HUMIDITY: MIL-STD-202, METHOD 103B COND. B
- SHOCK: MIL-STD-202, METHOD 213B COND. B
- VIBRATION: MIL-STD-202, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202, METHOD 107D COND. A

NOTE: SPECIFICATIONS WILL VARY OVER OPERATING TEMPERATURE

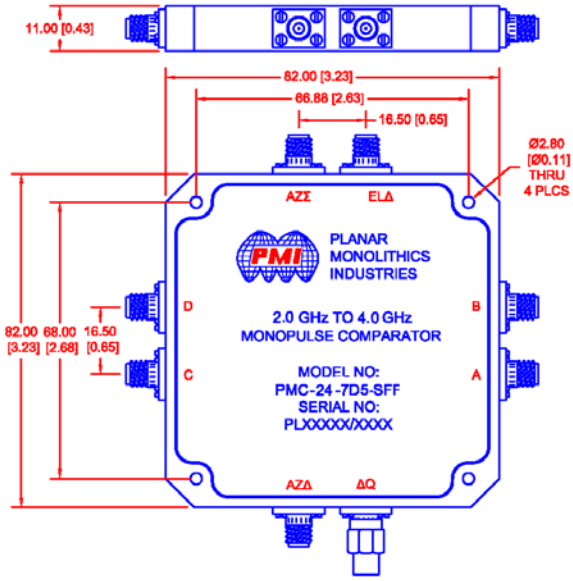
NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

ALL DIMENSIONS ARE IN mm [INCH]
TOLERANCES:
X.XX ± 0.508 [0.020]
X.XXX ± 0.254 [0.010]

PMI CONFIDENTIAL AND PROPRIETARY

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A1	ORIGINAL RELEASE	10/8/19	

MECHANICAL OUTLINE



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ISO 9001 CERTIFIED

APPROVALS	DATE
DRAWN NJA	10/8/19
REDRAWN	
ISSUED	

TITLE: PRODUCT FEATURE
2.0 TO 4.0 GHz Monopulse Comparator
PMC-24-7D5-SFF

SIZE	FSCM NO.	DWG NO.	REV.
A			A1

SCALE N:S SHEET 1 OF 1

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TYPICAL CHARACTERISTICS
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TEST DATA SUMMARY

Test Item No.	Parameters	Specified Value	**-55°C**	**+25°C**	**+85°C**
1	Frequency Range:	2.0 GHz to 4.0 GHz	2.0 GHz to 4.0 GHz	2.0 GHz to 4.0 GHz	2.0 GHz to 4.0 GHz
2	Insertion Loss: (if input signals at ports A, B, C, and D are equal Amplitude or Power & Inphase with an output at port AZΣ)	0.8 dB Typical	**0.4 dB**	**0.4 dB**	**0.5 dB**
3	Insertion Loss: (if input signals at ports A, B, C, or D and all other ports are terminated to 50 Ohms with an output at ports ELΔ, AZΣ, AQ or AZΔ)	7.5 dB Maximum	**7.0 dB**	**7.2 dB**	**7.5 dB**
4	Amplitude Balance:	±1.0dB Maximum	**±0.7 dB**	**±0.7 dB**	**±0.7 dB**
5	Phase Balance:	±10°	**±5.0°**	**±5.1°**	**±8.8°**
6	Isolation:	18 dB Minimum	**18**	**18 dB**	**18 dB**
7	VSWR:	1.4:1 Maximum	**1.3:1**	**1.3:1**	**1.3:1**
8	Power Handling:	Average: 10 Watt Maximum (Port A, B, C, & D) Peak: 0.1 kW Maximum	**10 Watts MAX (Port A, B, C, D)**	**10 Watts MAX (Port A, B, C, D)**	**10 Watts MAX (Port A, B, C, D)**
9	Impedance:	50 Ω	**50 Ω**	**50 Ω**	**50 Ω**

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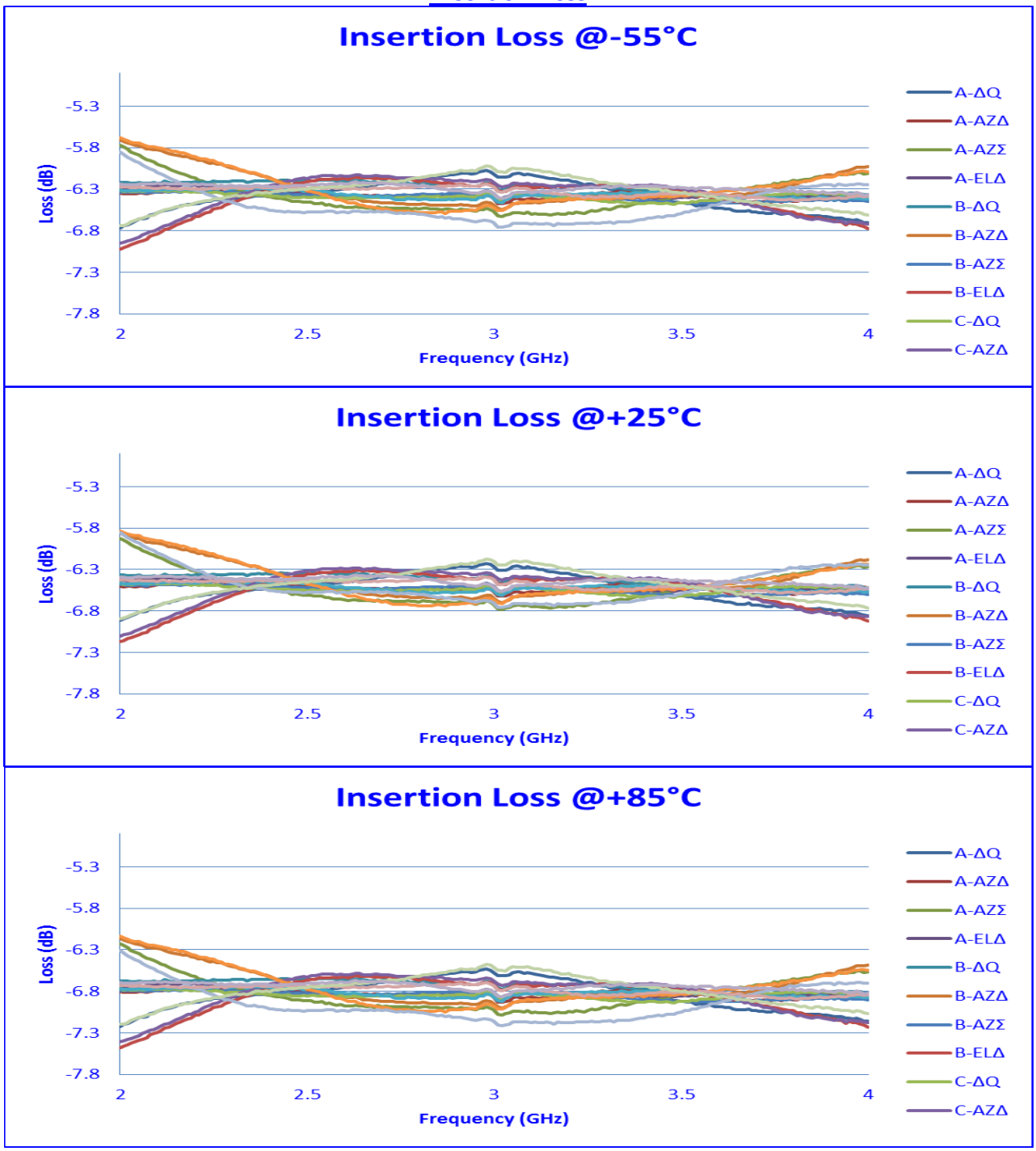
Insertion Loss



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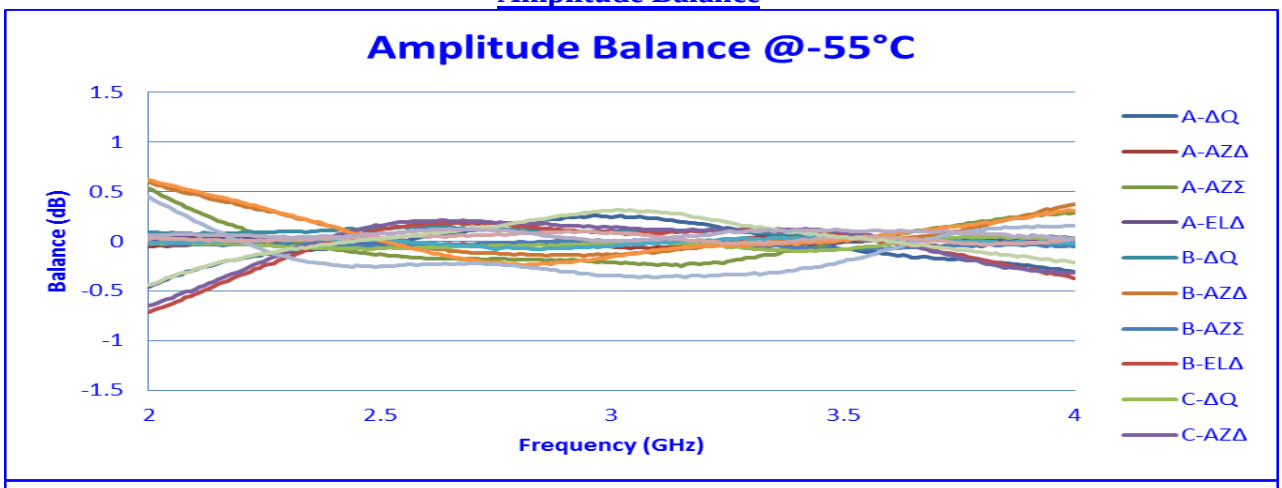
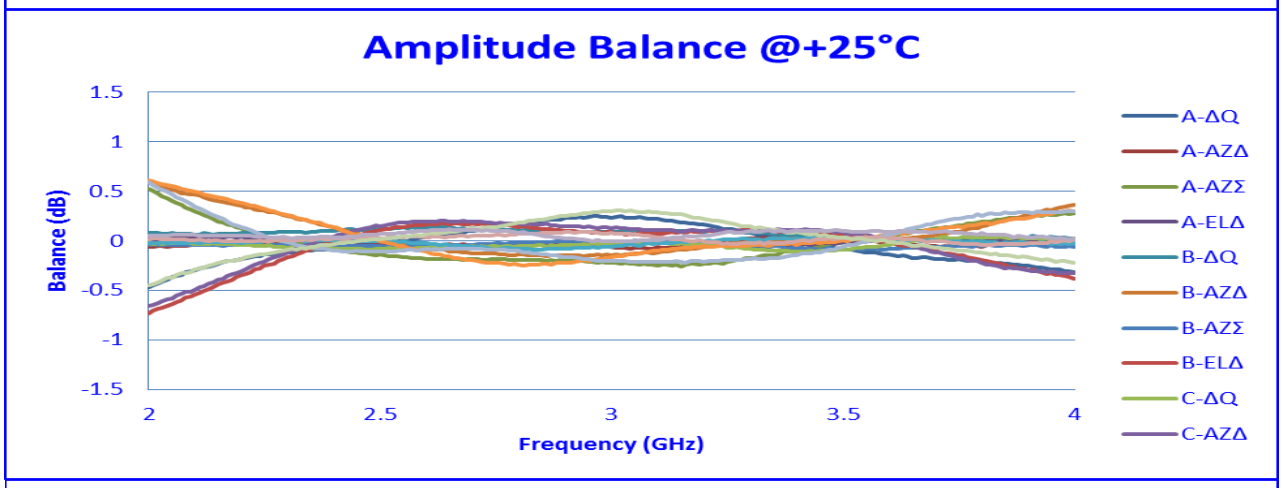
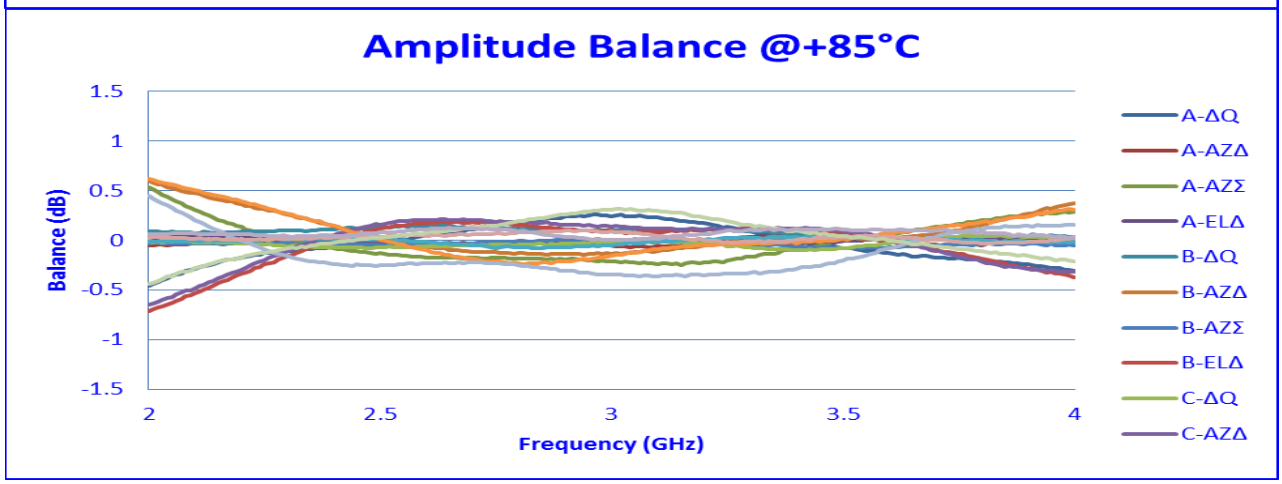
Amplitude Balance







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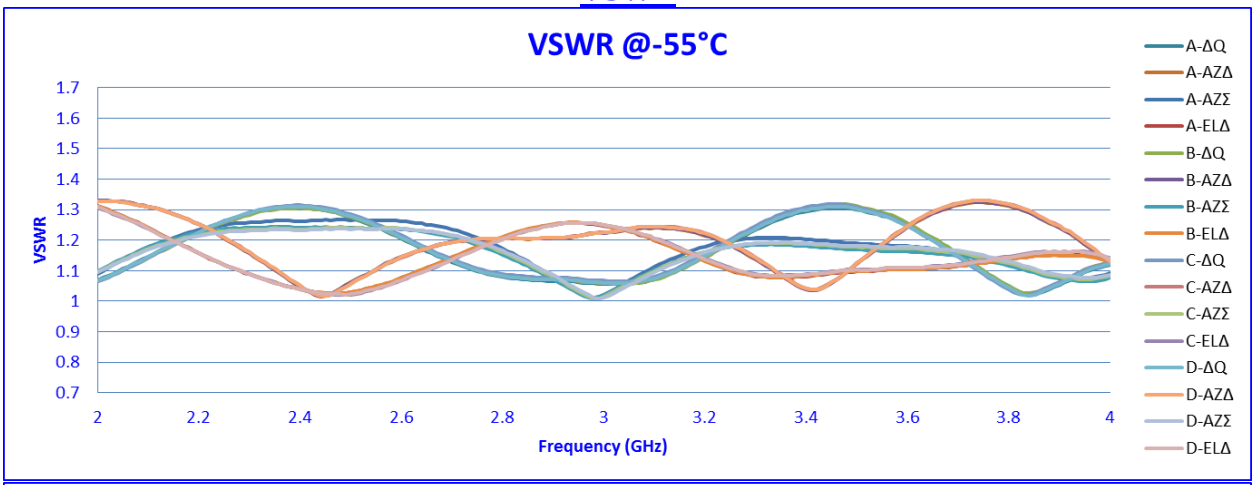
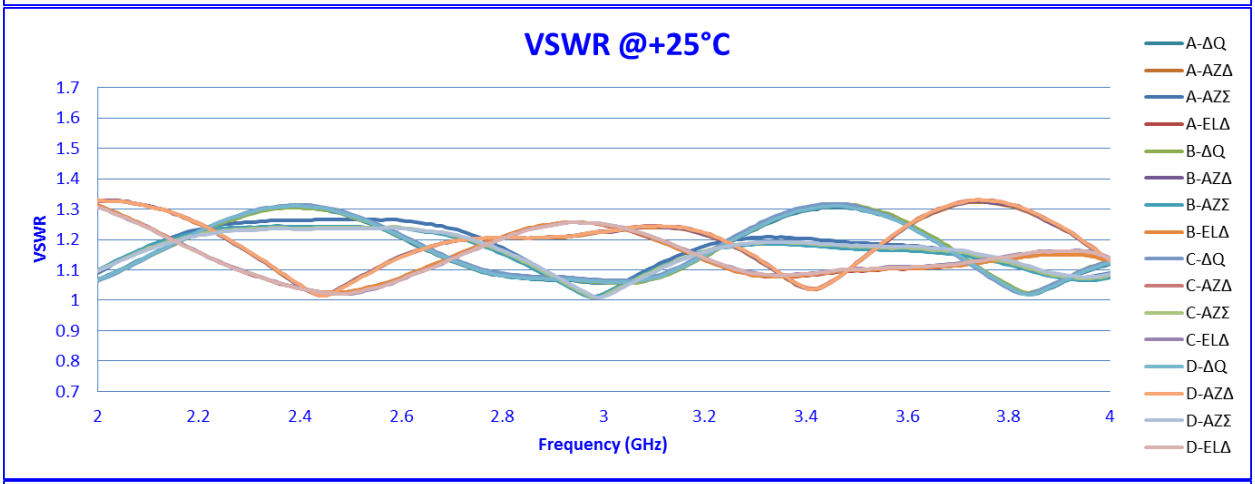
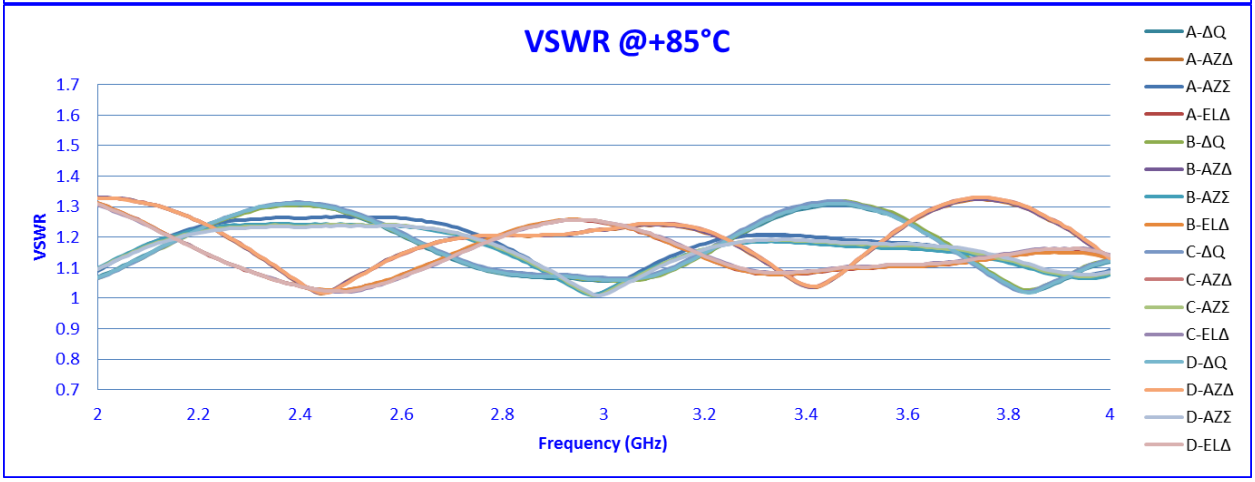
VSWR







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TYPICAL CHARACTERISTICS
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Phase Data Relative to AZΣ (Normalized) @ -55°C, +25°C and +85°C

Phase Data Relative to AZΣ @-55°C		A	B	C	D	ELΔ	AZΣ	ΔQ	AZΔ
	A	-	Isolation	Isolation	Isolation	+91°	0°	+90°	-1°
	B	Isolation	-	Isolation	Isolation	+90°	0°	-90°	-181°
	C	Isolation	Isolation	-	Isolation	-90°	0°	+91°	+180°
	D	Isolation	Isolation	Isolation	-	-90°	0°	-90°	0°
	ELΔ	+89°	+89°	-90°	-91°	-	Isolation	Isolation	Isolation
	AZΣ	0°	0°	0°	0°	Isolation	-	Isolation	Isolation
	ΔQ	+90°	-90°	+89°	-90°	Isolation	Isolation	-	Isolation
	AZΔ	0°	-179°	+178°	-1°	Isolation	Isolation	Isolation	-

Phase Data Relative to AZΣ @+25°C		A	B	C	D	ELΔ	AZΣ	ΔQ	AZΔ
	A	-	Isolation	Isolation	Isolation	+90°	0°	+90°	-1°
	B	Isolation	-	Isolation	Isolation	+90°	0°	-90°	-181°
	C	Isolation	Isolation	-	Isolation	-90°	0°	+91°	+181°
	D	Isolation	Isolation	Isolation	-	-90°	0°	-89°	-2°
	ELΔ	+89°	+89°	-90°	-91°	-	Isolation	Isolation	Isolation
	AZΣ	0°	0°	0°	0°	Isolation	-	Isolation	Isolation
	ΔQ	+90°	-89°	+89°	-90°	Isolation	Isolation	-	Isolation
	AZΔ	0°	-179°	+178°	-1°	Isolation	Isolation	Isolation	-

Phase Data Relative to AZΣ @+85°C		A	B	C	D	ELΔ	AZΣ	ΔQ	AZΔ
	A	-	Isolation	Isolation	Isolation	+91°	0°	+90°	-1°
	B	Isolation	-	Isolation	Isolation	+90°	0°	-90°	-181°
	C	Isolation	Isolation	-	Isolation	-90°	0°	+91°	+180°
	D	Isolation	Isolation	Isolation	-	-90°	0°	-90°	0°
	ELΔ	+89°	+89°	-91°	-91°	-	Isolation	Isolation	Isolation
	AZΣ	0°	0°	0°	0°	Isolation	-	Isolation	Isolation
	ΔQ	+87°	-92°	+90°	-90°	Isolation	Isolation	-	Isolation
	AZΔ	-2°	-181°	+178°	-1°	Isolation	Isolation	Isolation	-

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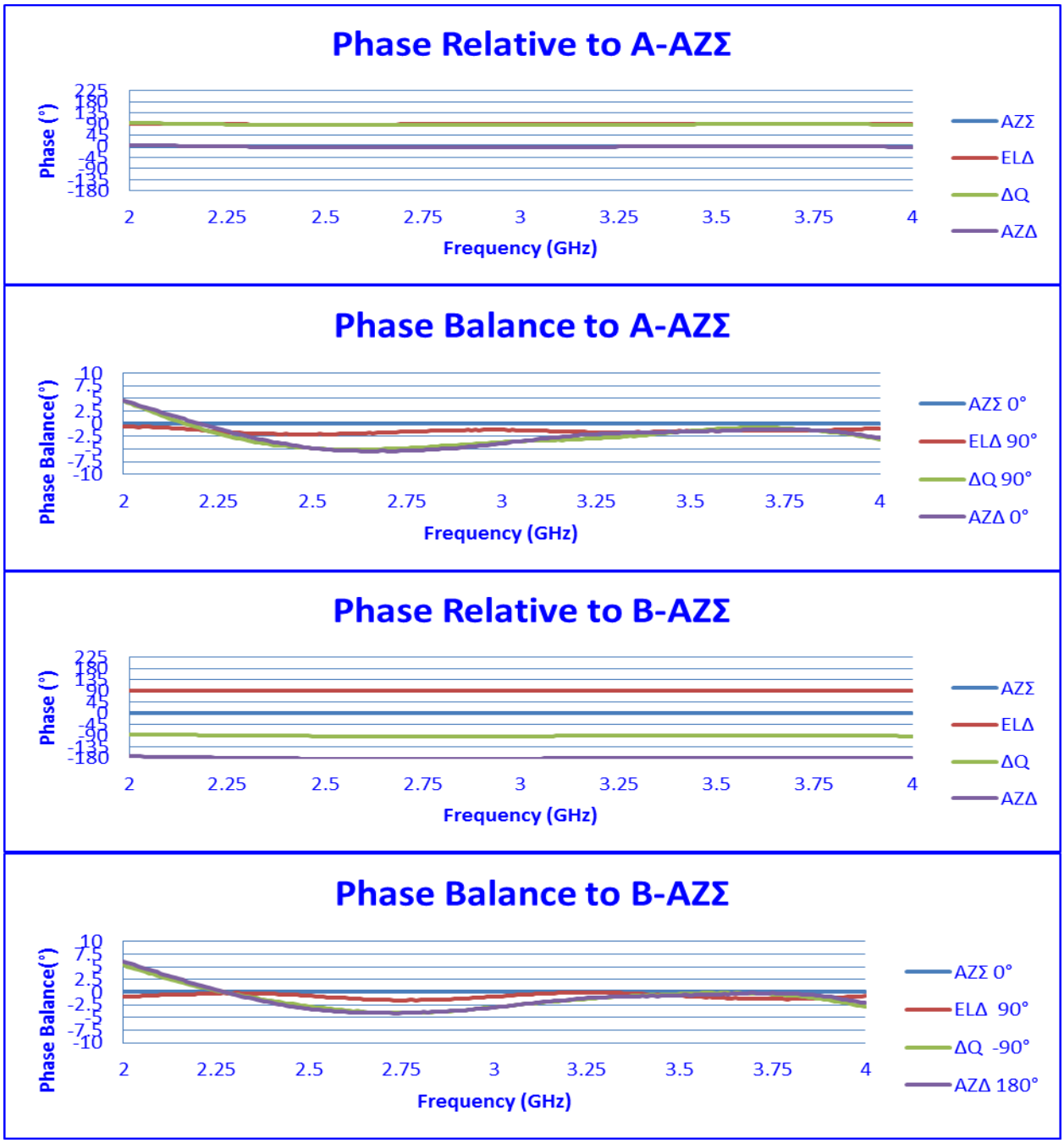
Phase Data/ Phase Balance Relative to AZΣ (Normalized) @ -55°C, +25°C and +85°C



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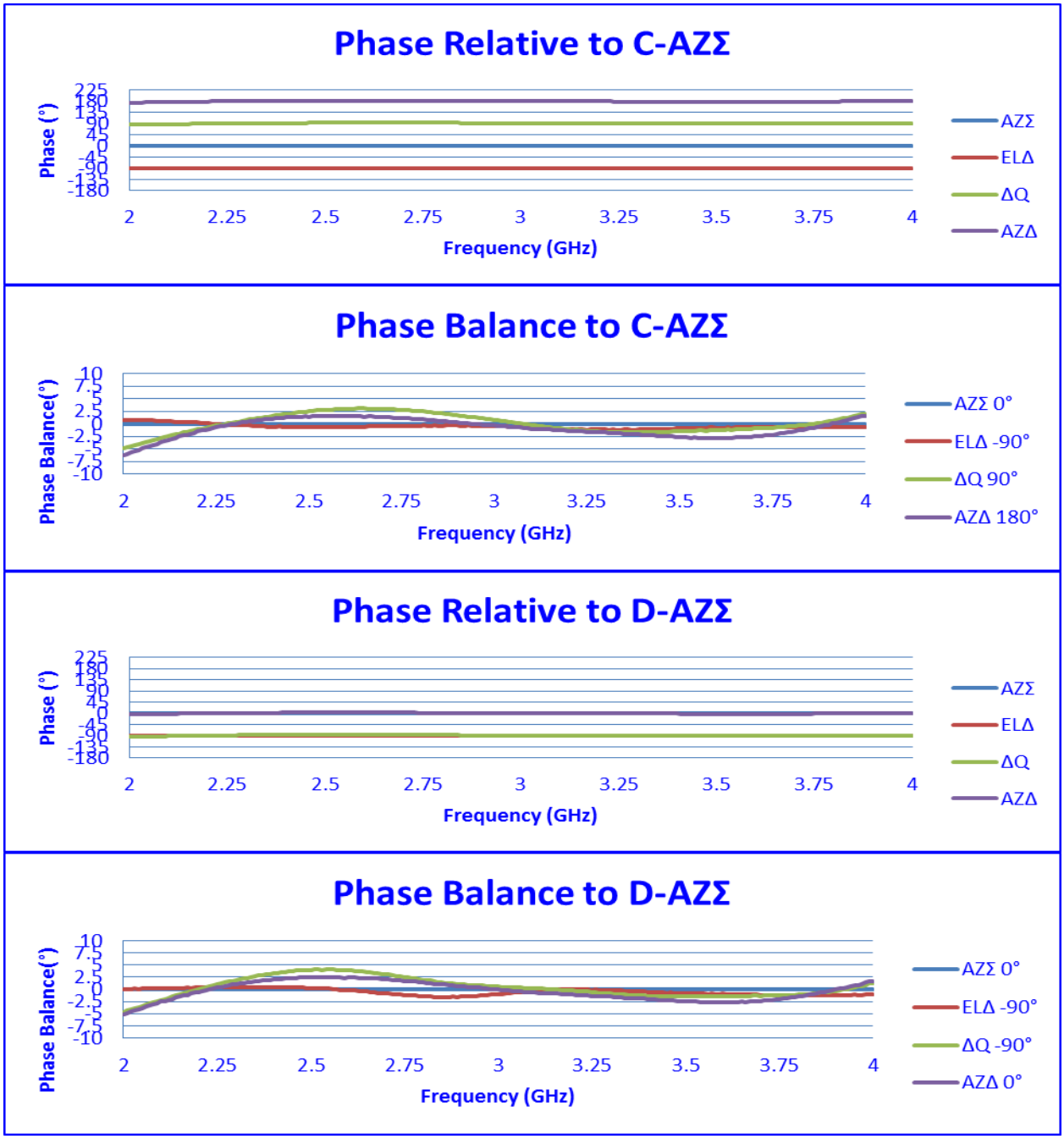

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Phase Data Relative to ELΔ (Normalized) -55°C, +25°C and +85°C

Phase Data Relative to ELΔ @-55°C		A	B	C	D	ELΔ	AZΣ	ΔQ	AZΔ
	A	-	Isolation	Isolation	Isolation	0°	-91°	-1°	-91°
	B	Isolation	-	Isolation	Isolation	0°	-90°	-180°	+89°
	C	Isolation	Isolation	-	Isolation	0°	+90°	+181°	-90°
	D	Isolation	Isolation	Isolation	-	0°	+90°	+0°	+90°
	ELΔ	0°	0°	0°	0°	-	Isolation	Isolation	Isolation
	AZΣ	-89°	-89°	+90°	+91°	Isolation	-	Isolation	Isolation
	ΔQ	+1°	-178°	+179°	+0°	Isolation	Isolation	-	Isolation
	AZΔ	-90°	+92°	-91°	+89°	Isolation	Isolation	Isolation	-

Phase Data Relative to ELΔ @+25°C		A	B	C	D	ELΔ	AZΣ	ΔQ	AZΔ
	A	-	Isolation	Isolation	Isolation	0°	-90°	+0°	-91°
	B	Isolation	-	Isolation	Isolation	0°	-90°	-181°	+88°
	C	Isolation	Isolation	-	Isolation	0°	+90°	+181°	-89°
	D	Isolation	Isolation	Isolation	-	0°	+90°	+1°	+88°
	ELΔ	0°	0°	0°	0°	-	Isolation	Isolation	Isolation
	AZΣ	-89°	-89°	+90°	+91°	Isolation	-	Isolation	Isolation
	ΔQ	+1°	-178°	+179°	0°	Isolation	Isolation	-	Isolation
	AZΔ	-89°	+92°	-92°	+89°	Isolation	Isolation	Isolation	-

Phase Data Relative to ELΔ @+85°C		A	B	C	D	ELΔ	AZΣ	ΔQ	AZΔ
	A	-	Isolation	Isolation	Isolation	0°	-91°	-1°	-91°
	B	Isolation	-	Isolation	Isolation	0°	-90°	-180°	+89°
	C	Isolation	Isolation	-	Isolation	0°	+90°	+181°	-90°
	D	Isolation	Isolation	Isolation	-	0°	+90°	0°	+90°
	ELΔ	0°	0°	0°	0°	-	Isolation	Isolation	Isolation
	AZΣ	-89°	-89°	+91°	+91°	Isolation	-	Isolation	Isolation
	ΔQ	0°	-181°	+181°	0°	Isolation	Isolation	-	Isolation
	AZΔ	-90°	+89°	-91°	+90°	Isolation	Isolation	Isolation	-

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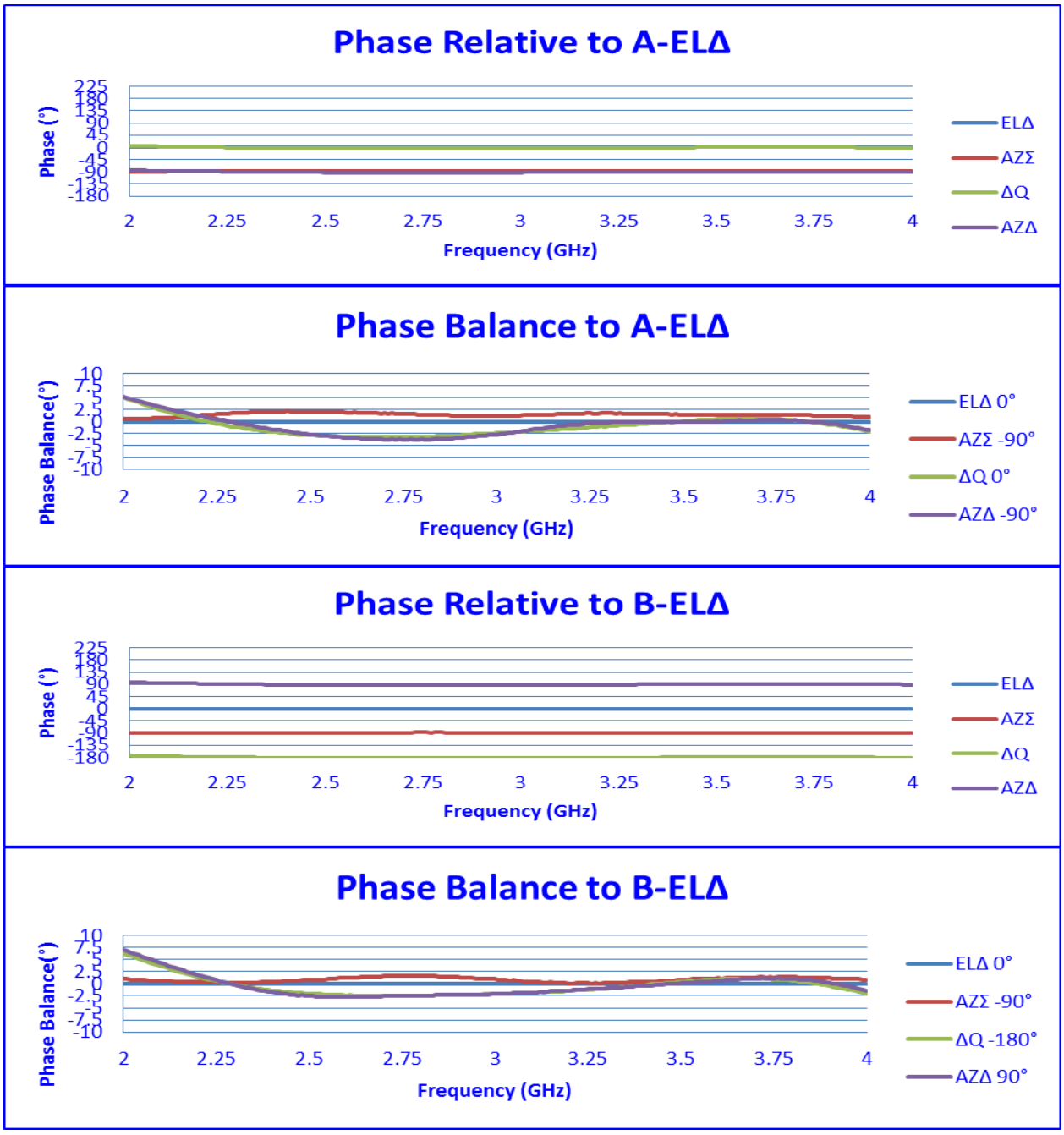
Phase Data Relative to ELΔ (Normalized) -55°C, +25°C and +85°C



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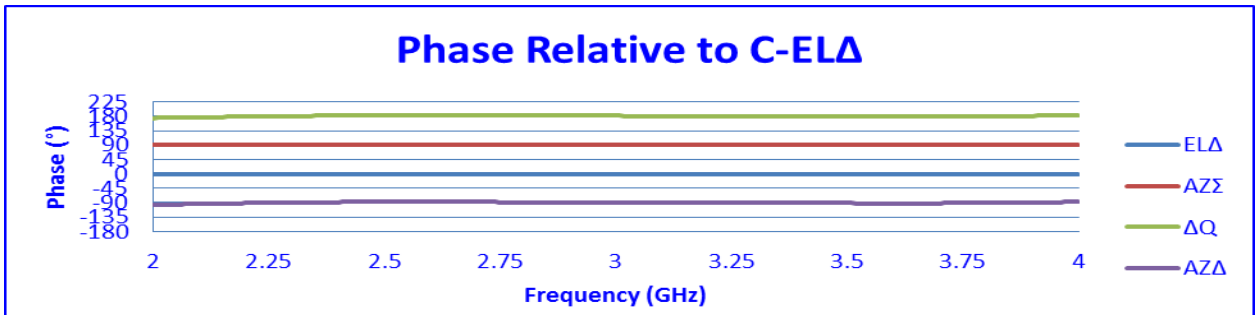

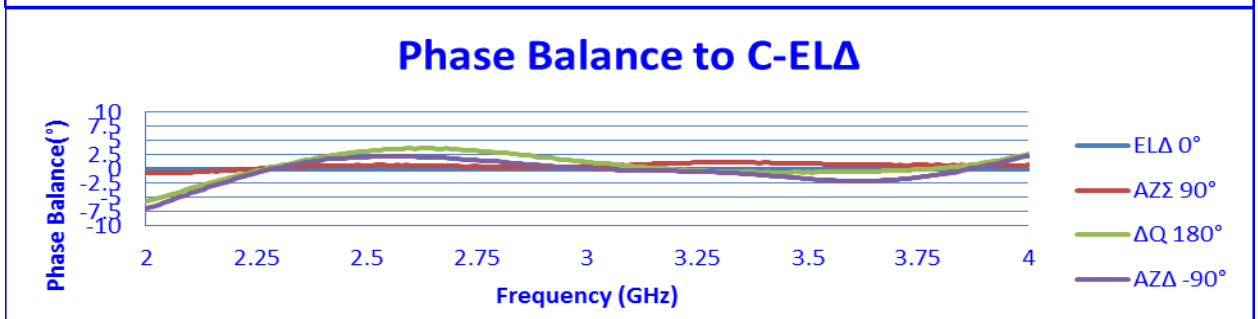

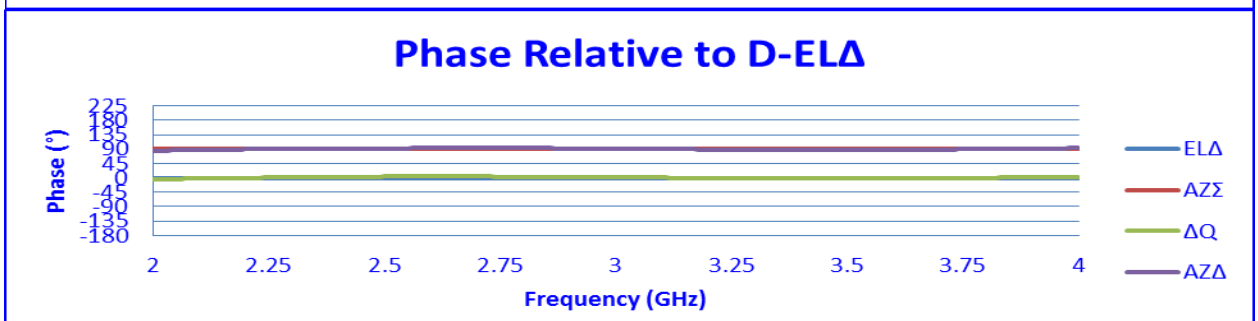

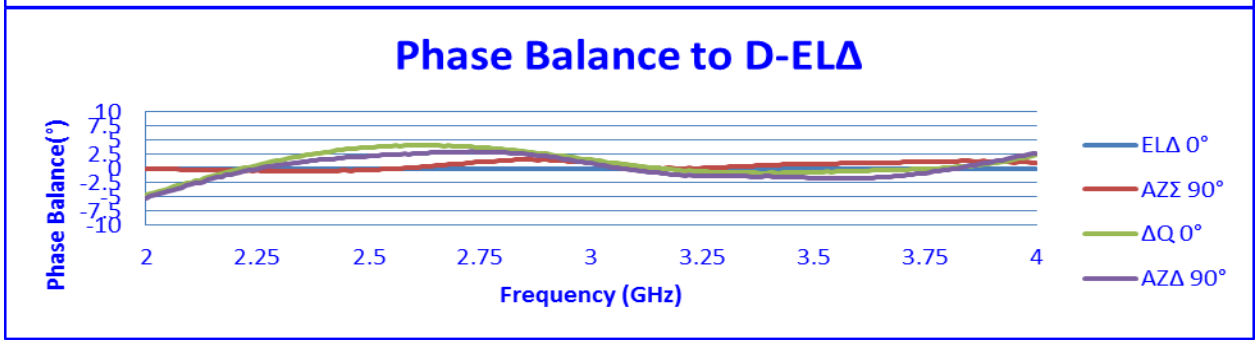

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TYPICAL CHARACTERISTICS
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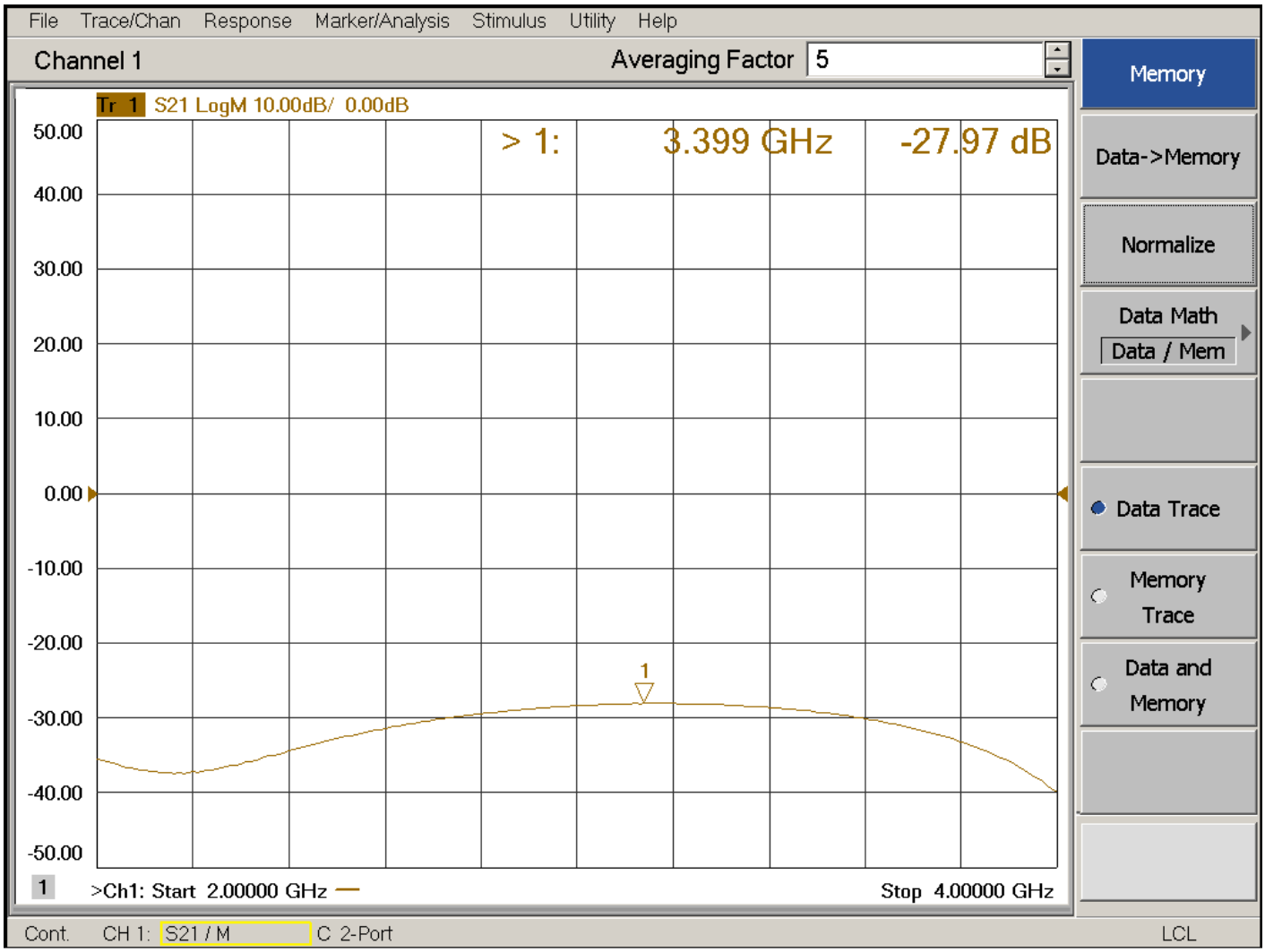
Port A to Port B Isolation



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TYPICAL CHARACTERISTICS
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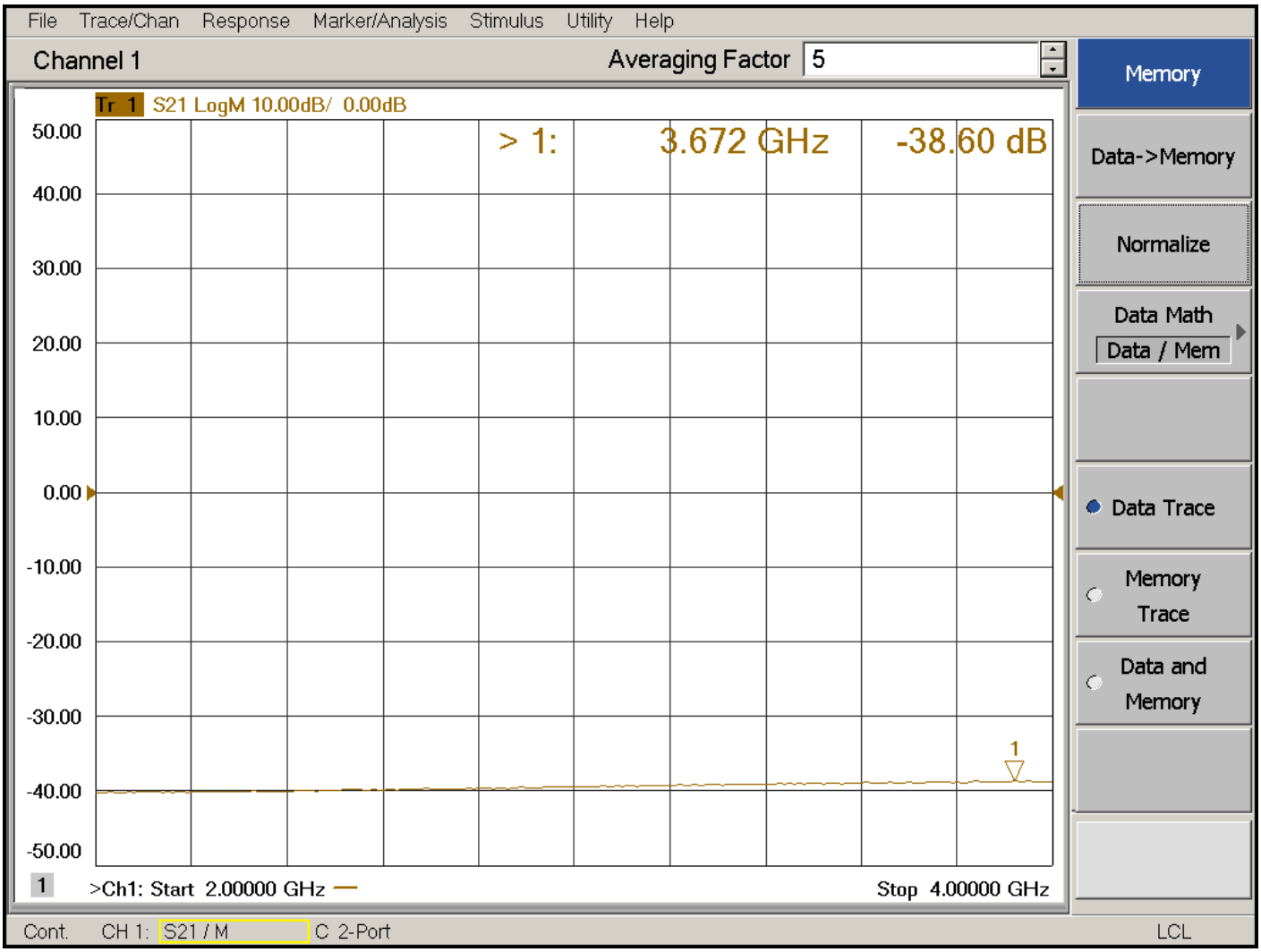
Port A to Port C Isolation



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TYPICAL CHARACTERISTICS
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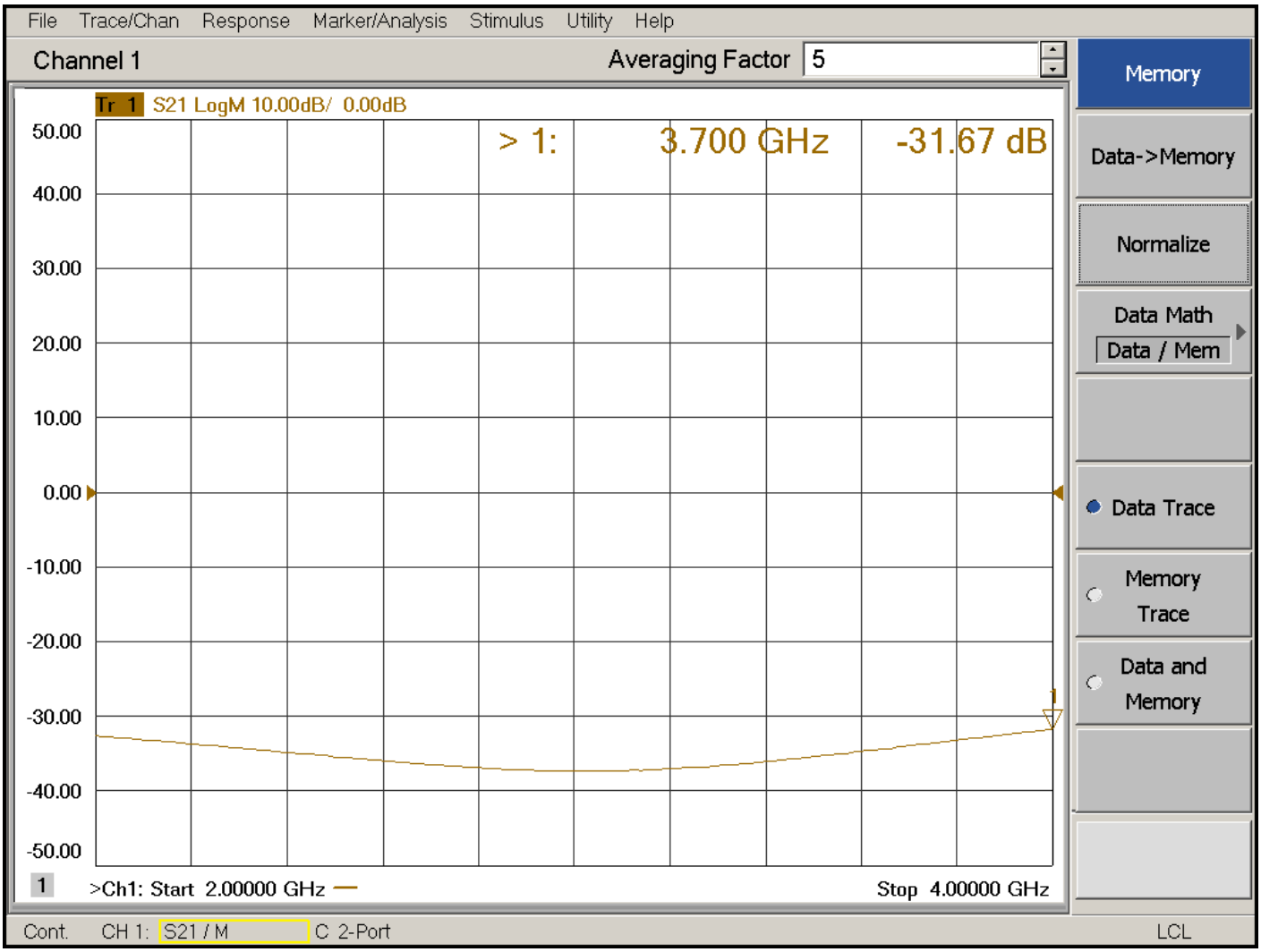
Port A to Port D Isolation



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TYPICAL CHARACTERISTICS
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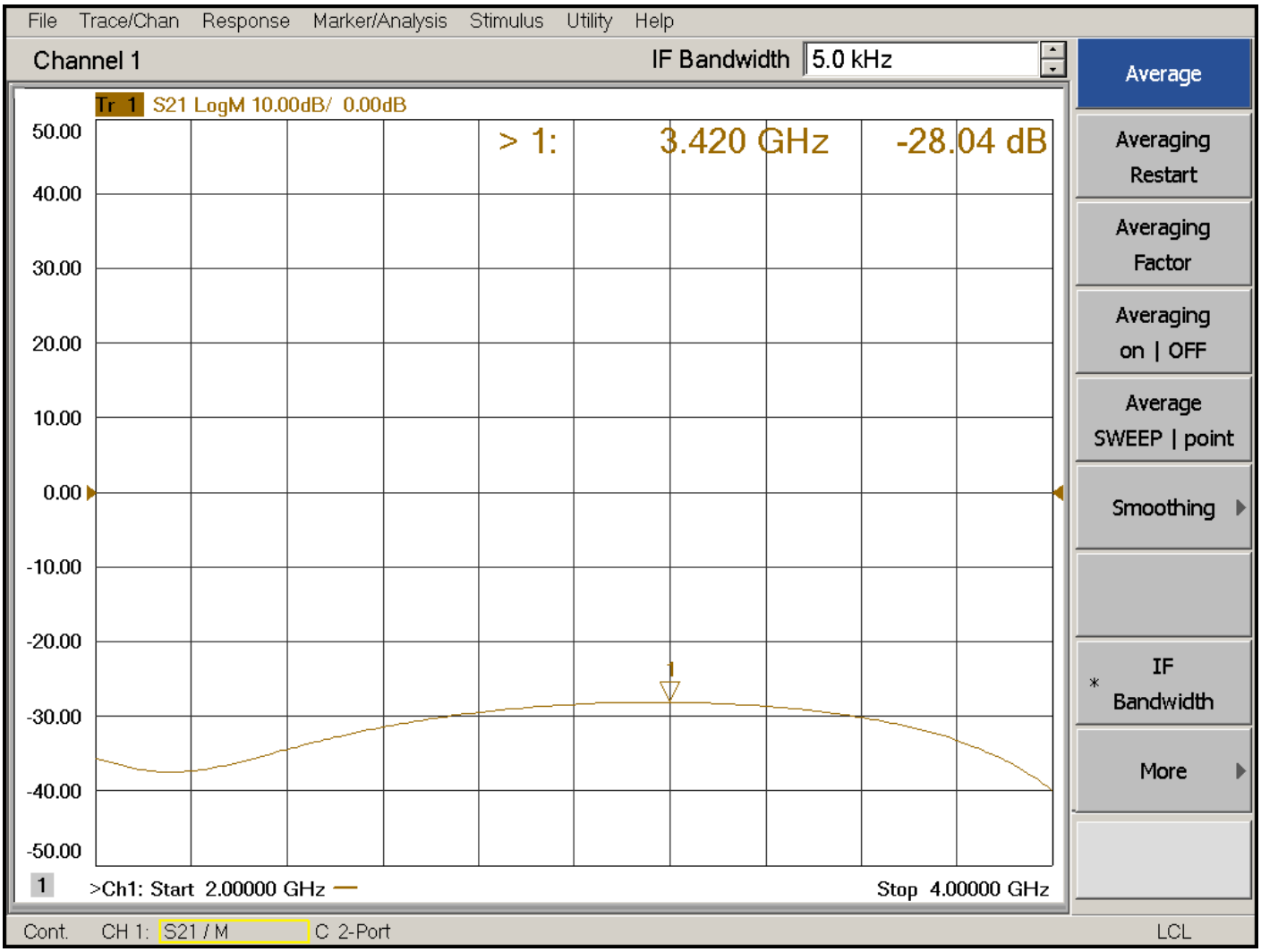
Port B to Port A Isolation



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TYPICAL CHARACTERISTICS
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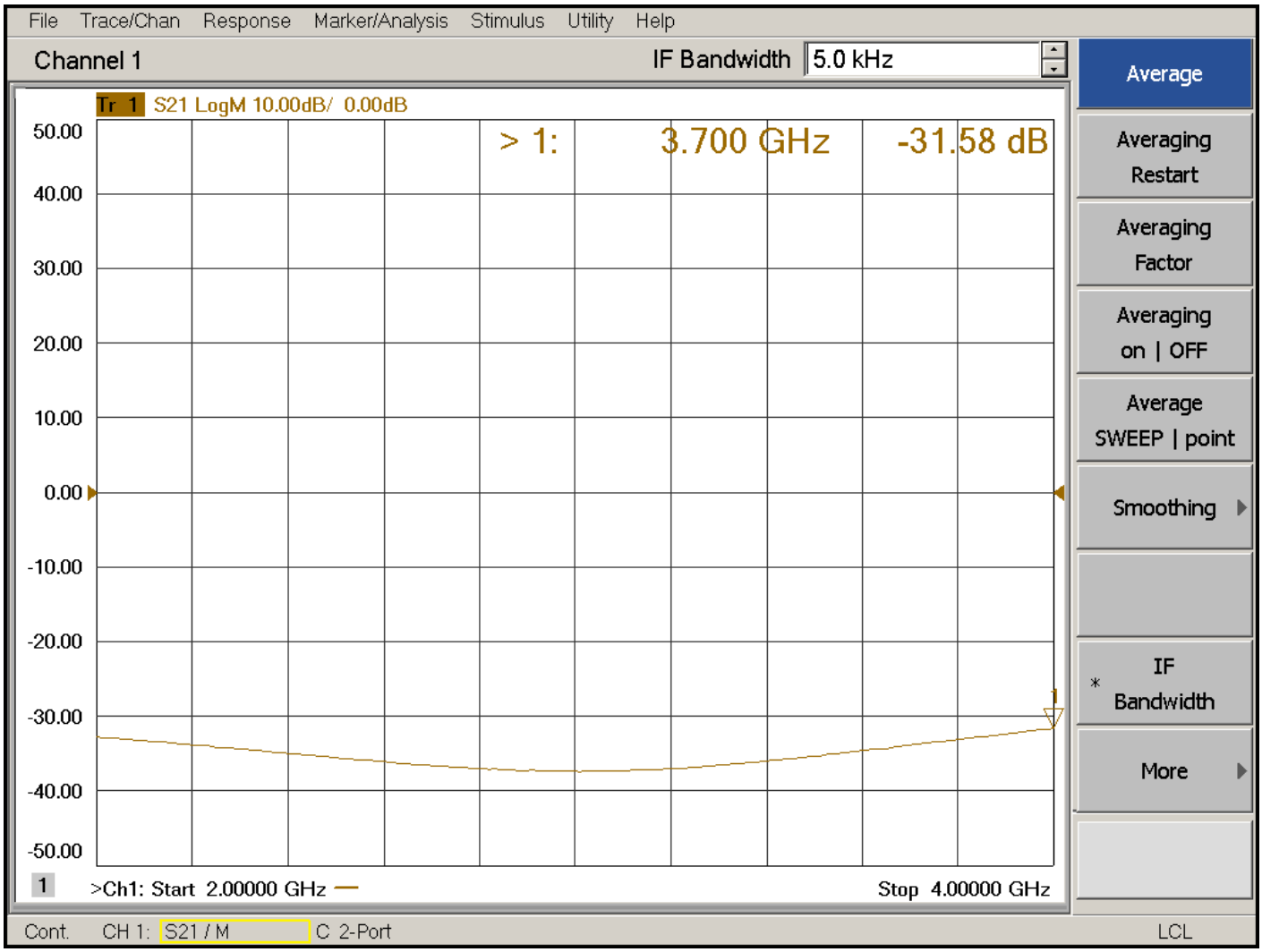
PMC-24-7D5-SFF

Port B to Port C Isolation



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TYPICAL CHARACTERISTICS
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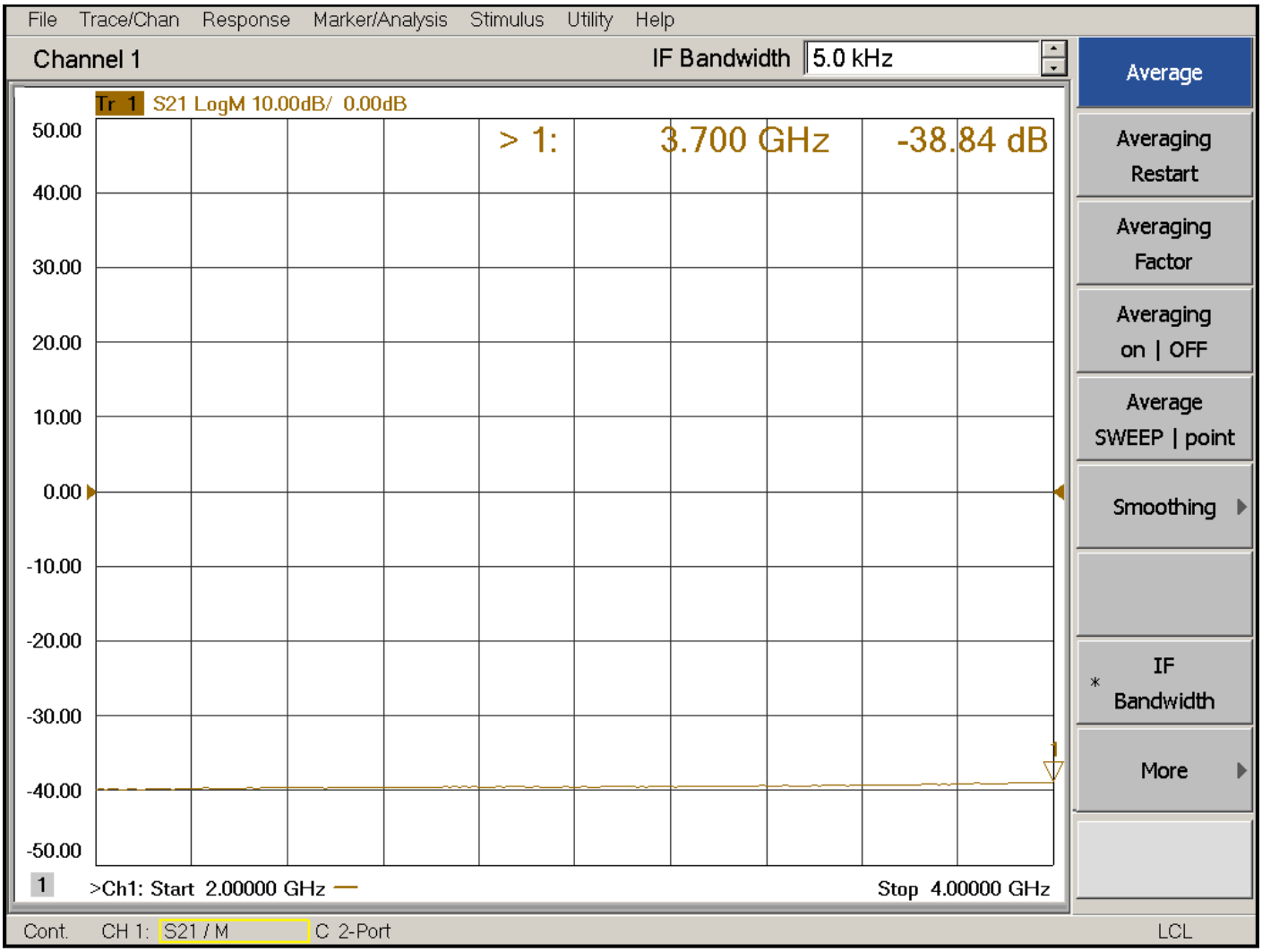
Port B to Port D Isolation



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TYPICAL CHARACTERISTICS
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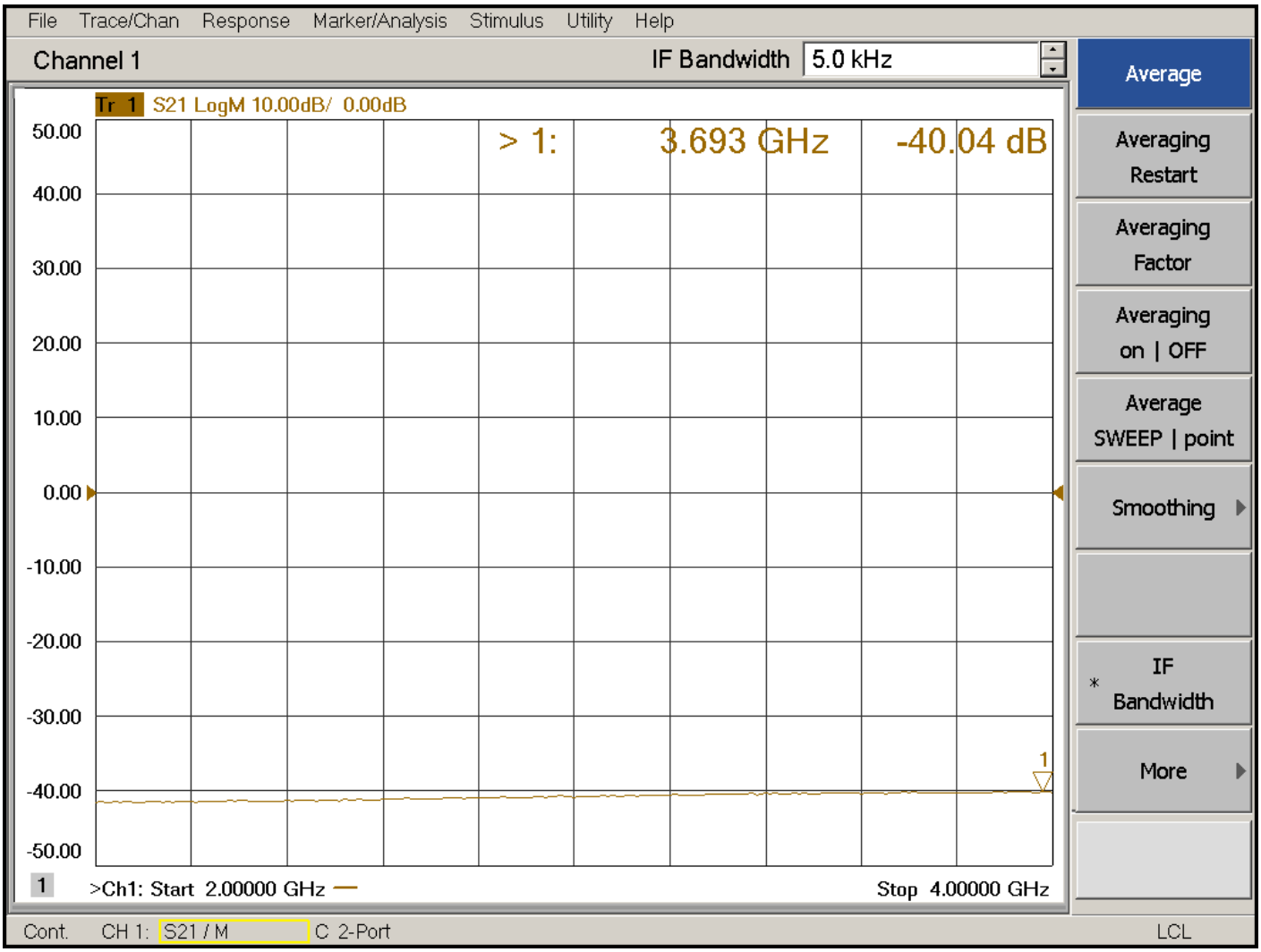
PMC-24-7D5-SFF

Port C to Port A Isolation



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TYPICAL CHARACTERISTICS
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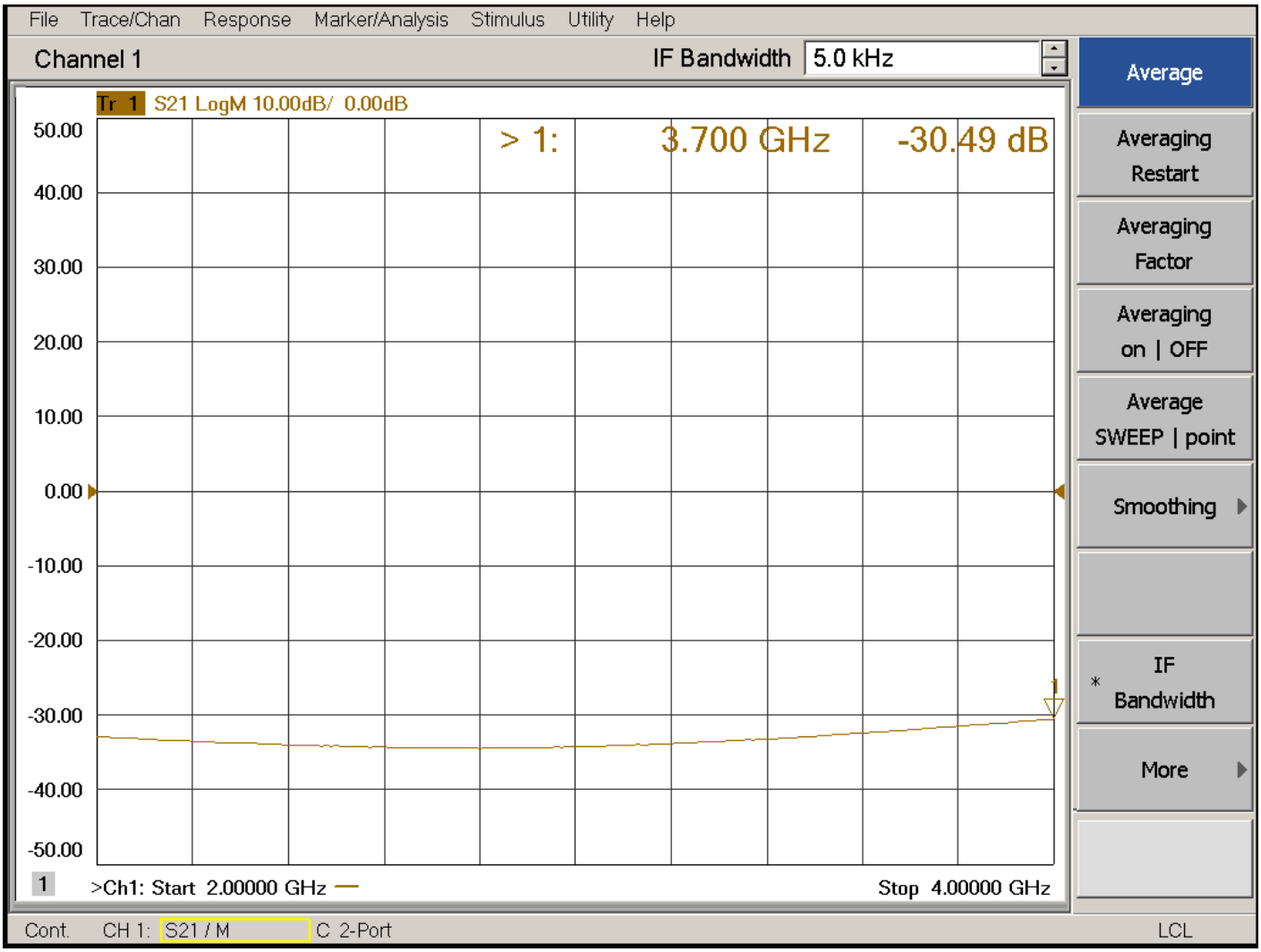
Port C to Port B Isolation



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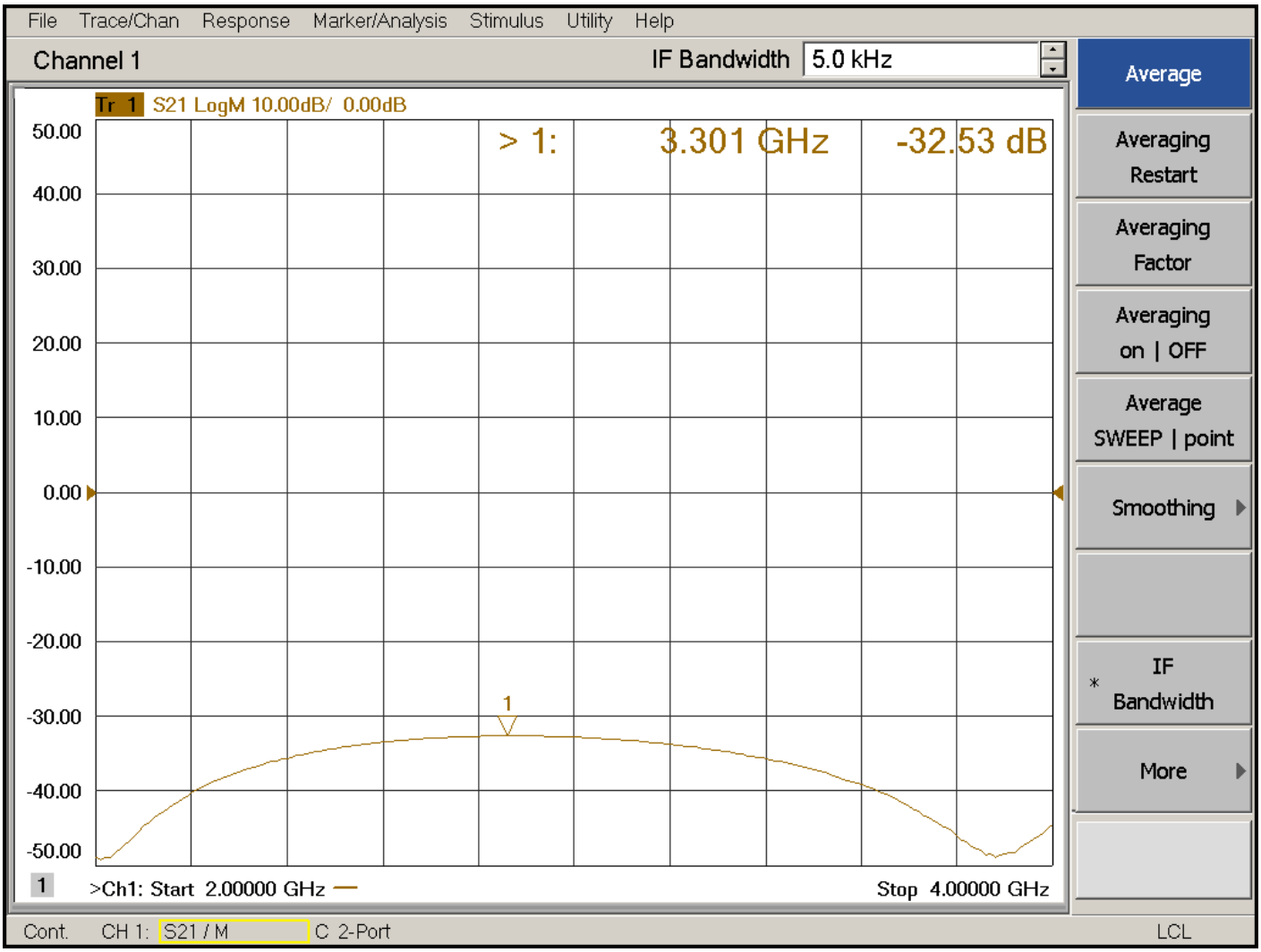
Port C to Port D Isolation



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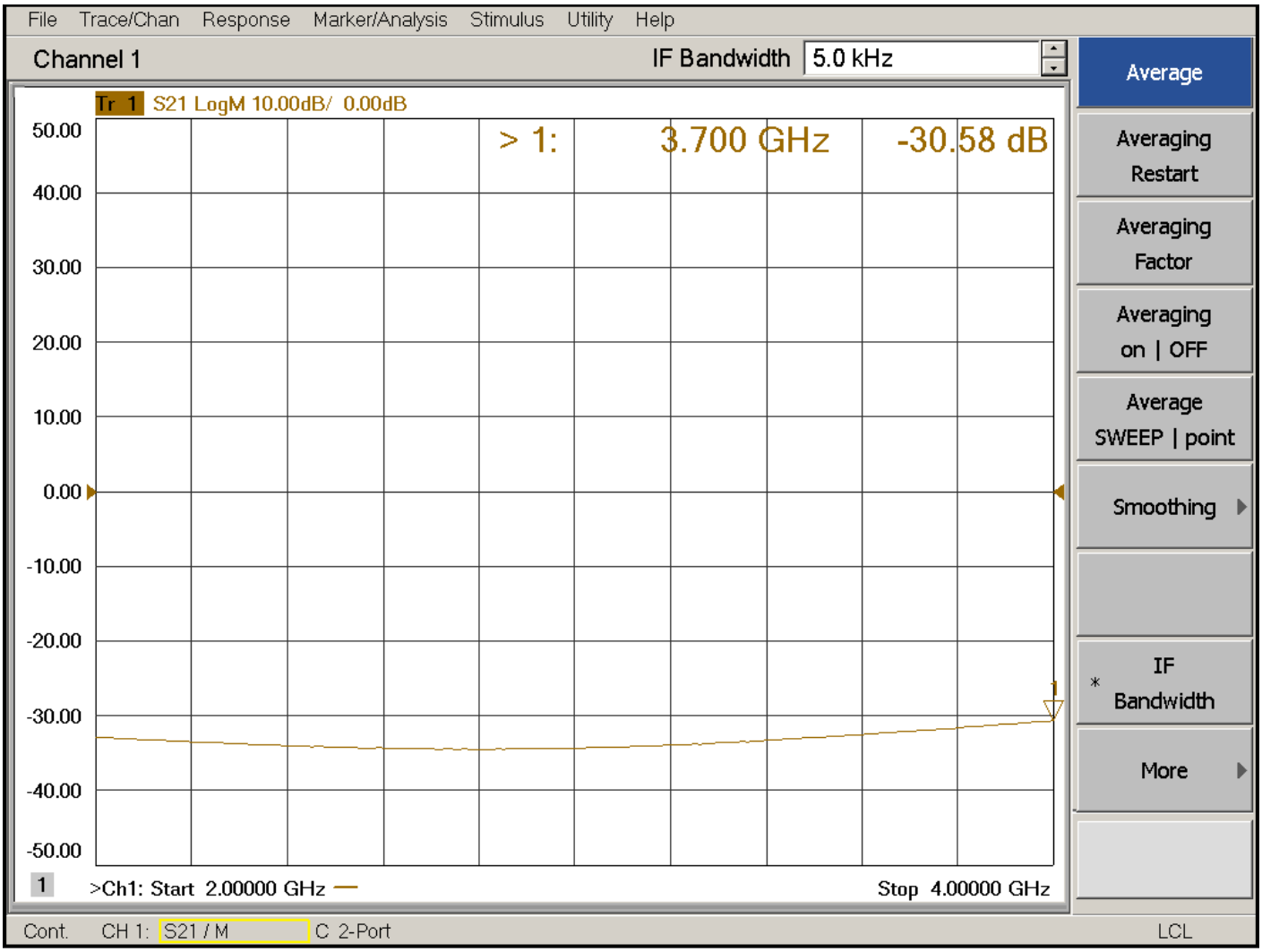
Port D to Port A Isolation



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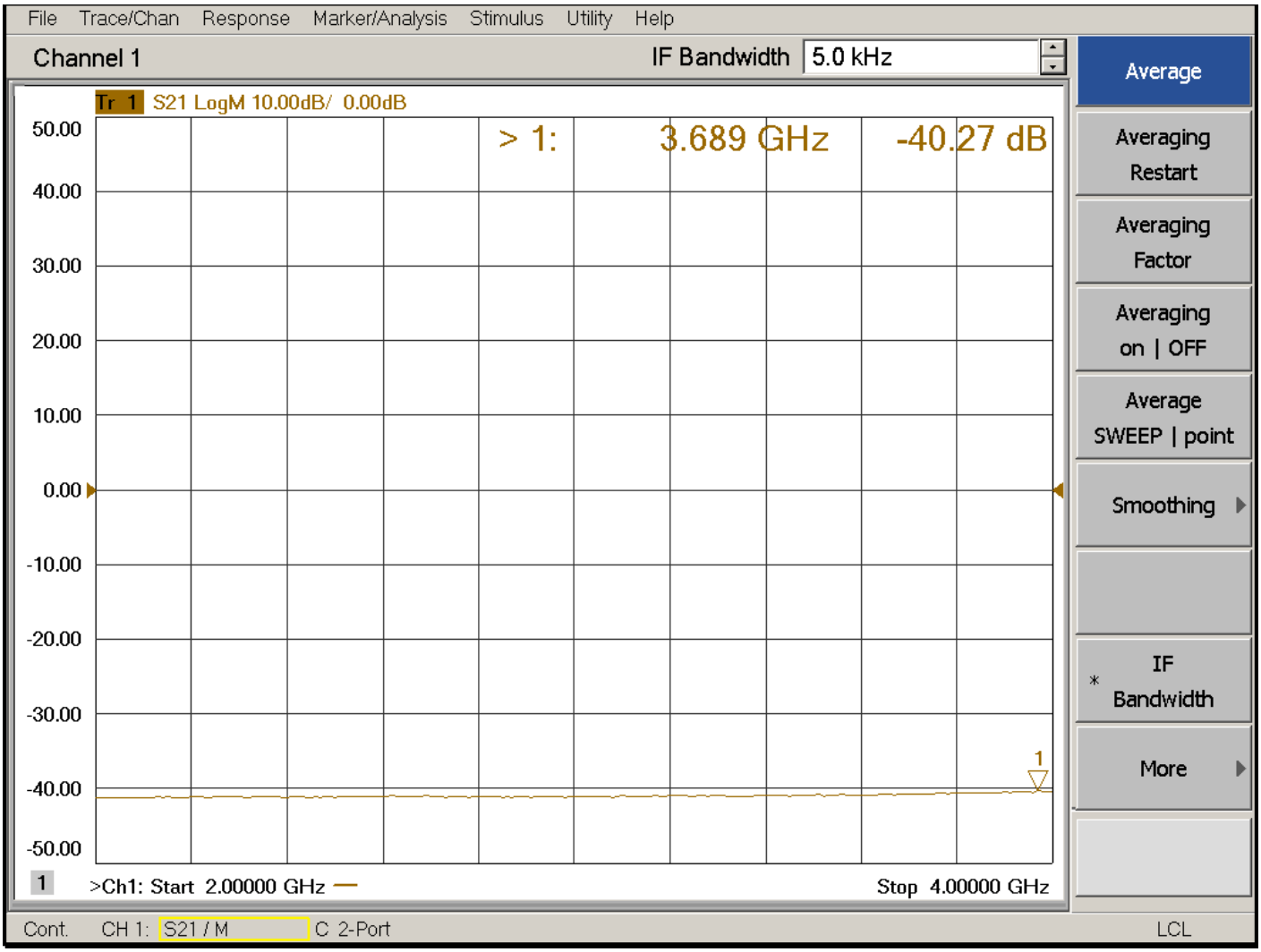
Port D to Port B Isolation



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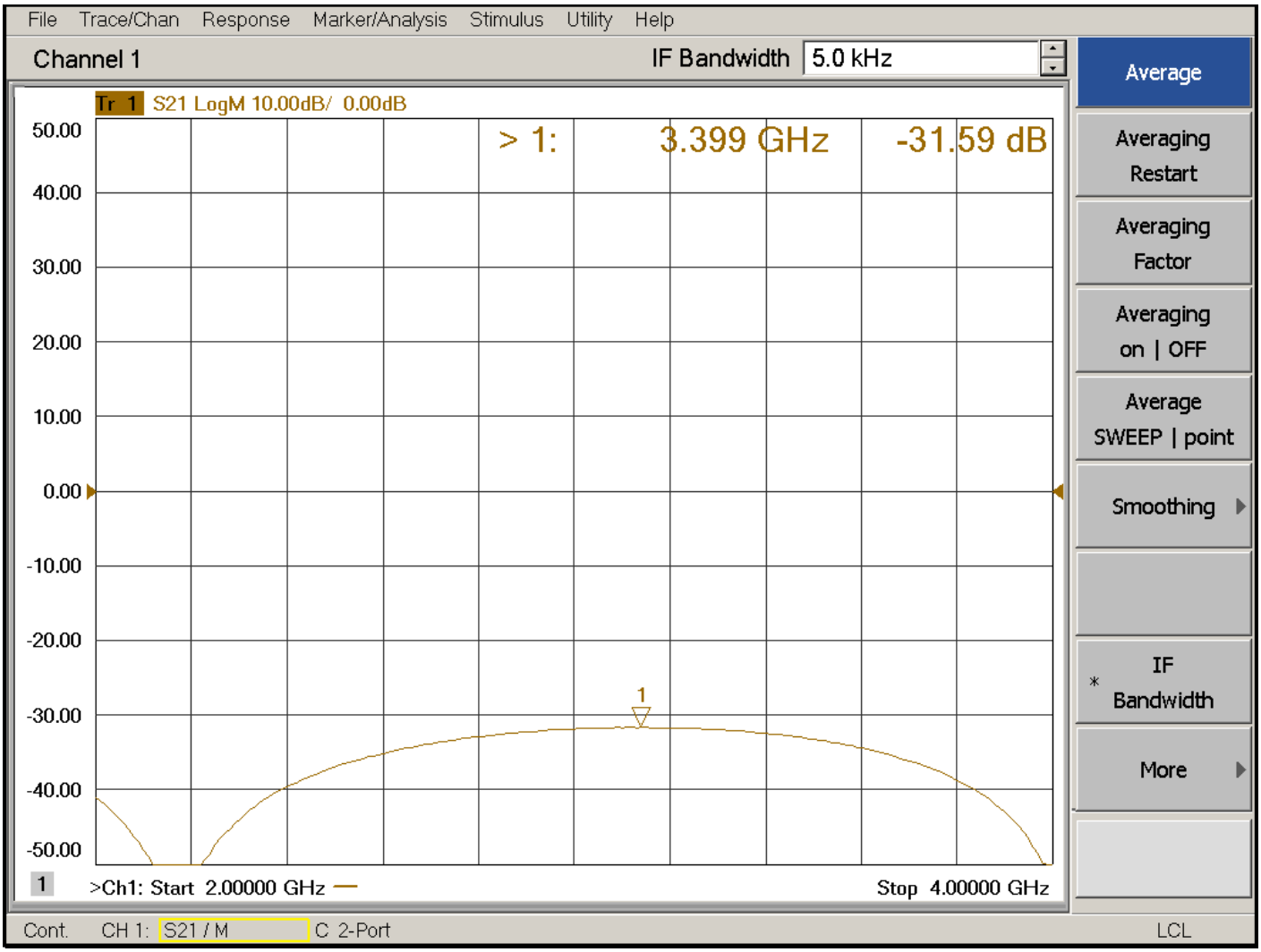
Port D to Port C Isolation



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Test Setup to Validate Summation of Port (A+B) + (C+D)

Test No. 1 at 3.00 GHz

RF Power @ Port A = 0dBm (1 mW)
RF Power @ Port B = 0dBm (1 mW)
RF Power @ Port C = 0dBm (1 mW)
RF Power @ Port D = 0dBm (1 mW)
All other Ports Terminated to 50 Ohms

RF Power @ Port AZ∑ = 5.6 dBm (3.6 mW) = (6 dBm (4 mW) – Insertion Loss of 0.4 dB)
RF Power @ Port ΔQ = -20.5 dBm

Test No. 2 at 3.00 GHz

RF Power @ Port A = 40.38 dBm (10.00 W)
RF Power @ Port B = 40.38 dBm (10.00 W)
RF Power @ Port C = 40.38 dBm (10.00 W)
RF Power @ Port D = 40.38 dBm (10.00 W)
All other Ports Terminated to 50 Ohms

RF Power @ Port AZ∑ = 46 dBm (40 W) = (46.4 dBm (40.00 W) – Insertion Loss of 0.4 dB)
RF Power @ Port ΔQ = 25.5 dBm

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