



CHARACTERIZATION TEST REPORT
ON
2 TO 18 GHz
SWITCHED BIT ATTENUATOR ASSEMBLY
WITH SWITCHABLE RF ATTENUATION FOR SIX SIGNAL PATHS

PMI MODEL No:
SAA-218-6-093-013542
OPTION HERM
Serial Number: PM603001

DESIGNED
BY
R. Afable, M. Becker, and E. Elder

TESTED
BY
E. Elder

REPORTED
BY
E. Elder

March 30, 2006

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704 • USA
TEL: 301-631-1579 • FAX: 301-662-2029 • EMAIL: sales@planarmonolithics.com
WEBSITE: <http://www.planarmonolithicsindustries.com>

ISO 9001: 2000 CERTIFIED



TABLE OF CONTENTS

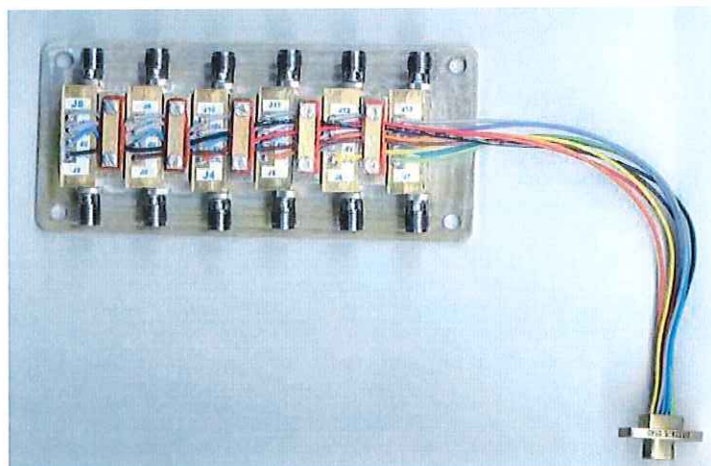
● PRODUCT DESCRIPTION AND ELECTRICAL SPECIFICATIONS	PAGE 3
● PRODUCT FEATURE AND ENVIRONMENTAL SPECIFICATIONS	PAGE 4
● MECHANICAL OUTLINE DRAWING	PAGE 5
● FUNCTIONAL BLOCK DIAGRAM	PAGE 6
● TEST DATA FOR SAA-218-6-093-013542 OPTION HERM, SERIAL NUMBER PM603001 TAKEN AT -40°C	PAGE 7
● TEST DATA FOR SAA-218-6-093-013542 OPTION HERM, SERIAL NUMBER PM603001 TAKEN AT ROOM TEMPERATURE (+23°C)	PAGE 20
● TEST DATA FOR SAA-218-6-093-013542 OPTION HERM, SERIAL NUMBER PM603001 TAKEN AT +71°C	PAGE 33



SWITCHED BIT ATTENUATOR ASSEMBLY WITH SWITCHABLE RF ATTENUATION FOR SIX SIGNAL PATHS PMI MODEL No: SAA-218-6-093-013542 Option HERM

FEATURES:

- 2 TO 18 GHz FREQUENCY RANGE
- FEATURES SIX AMC P/N SBA-218-6
- CONTROLLED BY SIX DIGITAL BITS
- LOW INSERTION LOSS
- RUGGED DESIGN FOR EXTRA STABILITY



SPECIFICATIONS:

- | | |
|---------------------------------|--|
| ● FREQUENCY | ● 2 TO 18 GHz |
| ● CONTINUOUS RF INPUT POWER | ● 24 dBm MAX |
| ● LOGIC HIGH VOLTAGE | ● 5 V MAX |
| ● LOGIC LOW VOLTAGE | ● 0 V MIN, 0.8V MAX |
| ● LOGIC SIGNAL LOAD CAPACITANCE | ● 35 pF MAX |
| ● RISE/FALL TIME | ● 10 nS MAX |
| ● RF RESPONSE TIME | ● 100 nS MAX |
| ● INSERTION LOSS | ● LOGIC "1" ----- 0 dB MIN, 3 dB MAX
● LOGIC "0" ----- 20 dB ± 2 dB |
| ● VSWR | ● 2.0:1 |
| ● ISOLATION | ● 50 dB MIN |
| ● VIDEO SPIKE LEAKAGE | ● 500 mV PEAK-TO-PEAK MAX |
| ● POWER SUPPLY | ● +5V @ 0.30 A MAX
● -5V @ 0.30 A MAX |
| ● P1 CONNECTOR | ● 9 PIN FLANGED MICRO-D |



PRODUCT FEATURE

REV	DESCRIPTION	DATE	APPROVED
1	ORIGINAL RELEASE JOB# P050224E	4/2/05	
A	SEE EOM# P05-006	9/19/06	
B	SEE EOM# P05-007	9/22/06	
C	SEE EOM# P08-001	1/11/08	
D	SEE EOM# P08-004	4/2/08	

DESCRIPTION

PMI MODEL SAA-218-6-093-013542 IS AN ARRAY OF SIX SWITCHED BIT ATTENUATORS (AMC MODEL SBA-218-6) OPERATING FROM 2 TO 18 GHz. THIS ASSEMBLY PROVIDES SWITCHABLE RF ATTENUATION FOR SIX SIGNAL PATHS. THE SETTINGS WILL BE SELECTED BY SIX DIGITAL CONTROL BITS.

SPECIFICATIONS

- FREQUENCY RANGE: 2 TO 18 GHz
- CONTINUOUS RF INPUT POWER: 24 dBm MAX
- LOGIC HIGH VOLTAGE: 5 V MAX
- LOGIC LOW VOLTAGE: 0V MIN, 0.8V MAX
- LOAD CAPACITANCE: 35 pF MAX
- RISE/FALL TIME: 10 nS MAX
- RF RESPONSE TIME: 100 nS MAX
- INSERTION LOSS:
 - 1: 0dB MIN, 3dB MAX
 - 0: 20dB ± 2dB
- VSWR: 2.0:1
- ISOLATION: 50 dB MIN
- VIDEO SPIKE LEAKAGE: 500 mV PEAK-TO-PEAK MAX
- POWER SUPPLY: +5V @ 0.30A MAX
-5V @ 0.30A MAX
- P1 CONNECTOR: 9 PIN FLANGED MICRO-D

OPTIONS:

- HERM: _____ HERMETICALLY SEALED
(STANDARD IS EPOXY SEALED)

ALL DIMENSIONS ARE IN INCHES
 UNLESS OTHERWISE SPECIFIED
 TOLERANCES:
 DIMS ±0.005
 HOLE ±0.010

ENVIRONMENTAL RATINGS:

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

NOTE: SPECIFICATIONS WILL VARY OVER OPERATING TEMPERATURE.
 NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION.

PLANAR MONOLITHICS INDUSTRIES, INC.

7311-G GROVE ROAD
 FREDERICK, MARYLAND 21704 USA
 TEL: 301-631-1579 FAX: 301-662-2029
 WEBSITE: www.planarmonolithics.com
 E-MAIL: sales@planarmonolithics.com
 ISO 9001:2000 CERTIFIED

REV	DATE	APPROVED	TITLE	REV	DATE	APPROVED	TITLE
1	8/9/06		PRODUCT FEATURE	A	100-7474		D
2	9/2/06		SAA-218-6-093-013542				



MECHANICAL OUTLINE DRAWING

DESCRIPTION
 PMI MODEL SAA-218-6-093-013542 IS AN ARRAY OF SIX SWITCHED BIT ATTENUATORS (AMC MODEL SBA-218-6) OPERATING FROM 2 TO 18 GHz. THIS ASSEMBLY PROVIDES SWITCHABLE RF ATTENUATION FOR SIX SIGNAL PATHS. THE SETTINGS WILL BE SELECTED BY SIX DIGITAL CONTROL BITS.

REVISIONS

DATE	BY	DESCRIPTION	DATE	APPROVED
8/21/06		JOB# P506024E	8/21/06	
9/19/06	A	SEE ECN# P05-006	9/19/06	
9/22/06	B	SEE ECN# P05-007	9/22/06	
1/11/06	C	SEE ECN# P06-001	1/11/06	
3/18/06	D	SEE ECN# P06-004	3/18/06	

MECHANICAL OUTLINE

4X0.156
 0.175
 1.953 1.529
 0.200
 0.100
 3.600
 4.000
 0.200
 0.105
 0.100
 0.796
 5X0.500
 P-1

PLANAR MONOLITHICS INDUSTRIES, INC.

7311-G GROVE ROAD
 FREDERICK, MARYLAND 21704 USA
 TEL: 301-631-1579 FAX: 301-662-2029
 WWW.PLANARMONOLITHICS.COM
 E-MAIL: SALES@PLANARMONOLITHICS.COM
 ISO 9001:2000 CERTIFIED

APPROVALS	DATE
DESIGNED	8/21/06
CHECKED	9/19/06
RELEASED	

TITLE	
MECHANICAL OUTLINE	
SAA-218-6-093-013542	2 - 18 GHz SWITCHED BIT ATTENUATOR ARRAY
REV. A	DATE 07XZ8
100-7474	REV. D
2 OF 4	SHEET

ALL DIMENSIONS ARE IN INCHES
 UNLESS OTHERWISE SPECIFIED



FUNCTIONAL BLOCK DIAGRAM

DESCRIPTION
 PMI MODEL SAA-218-6-093-013542 IS AN ARRAY OF SIX SWITCHED BIT ATTENUATORS (AMC MODEL SBA-218-6) OPERATING FROM 2 TO 18 GHz. THIS ASSEMBLY PROVIDES SWITCHABLE RF ATTENUATION FOR SIX SIGNAL PATHS. THE SETTINGS WILL BE SELECTED BY SIX DIGITAL CONTROL BITS.

REV	DATE	DESCRIPTION	DATE	APPROVAL
A	8/24/06	JOB# P506024F	8/24/06	
B	9/19/06	SEE ECN# P05-006	9/19/06	
C	9/28/06	SEE ECN# P05-007	9/28/06	
D	1/11/08	SEE ECN# P08-001	1/11/08	
	3/9/08	SEE ECN# P08-004	3/9/08	

The diagram shows six parallel signal paths. Each path consists of a switch (labeled J7 through J2 from left to right) that can route the signal either 'THRU' or through a '20 dB' attenuator. The outputs of these paths are connected to a common 'DRIVER' block. The driver is powered by CTL0, +5V, and -5V, and has two bias outputs labeled 'BIAS A' and 'BIAS B'.

FUNCTIONAL BLOCK DIAGRAM

PLANAR MONOLITHICS INDUSTRIES, INC.
 7311-G GROVE ROAD
 FREDERICK, MARYLAND 21704 USA
 TEL: 301-631-1579 FAX: 301-662-2029
 WEBSITE: www.planarmonolithicsindustries.com
 E-MAIL: sales@planarmonolithics.com
 ISO 9001:2000 CERTIFIED

APPROVAL	DATE	REV	DESCRIPTION
DESIGN	8/9/06	A	2 - 18 GHz SWITCHED BIT ATTENUATOR ARRAY
REWORK	8/9/06	A	0ZXZ8
REVISED	8/9/06	A	100-7474
REVISED			

TITLE	DATE	REV	DESCRIPTION
FUNCTIONAL BLOCK DIAGRAM	8/9/06	A	2 - 18 GHz SWITCHED BIT ATTENUATOR ARRAY
SAA-218-6-093-013542			
2 - 18 GHz SWITCHED BIT ATTENUATOR ARRAY			
REVISED			

TEST DATA @ -40°C

DATA PLOTS

FOR

PMI MODEL NUMBER

SAA-218-6-093-013542
OPTION HERM

Serial Number:

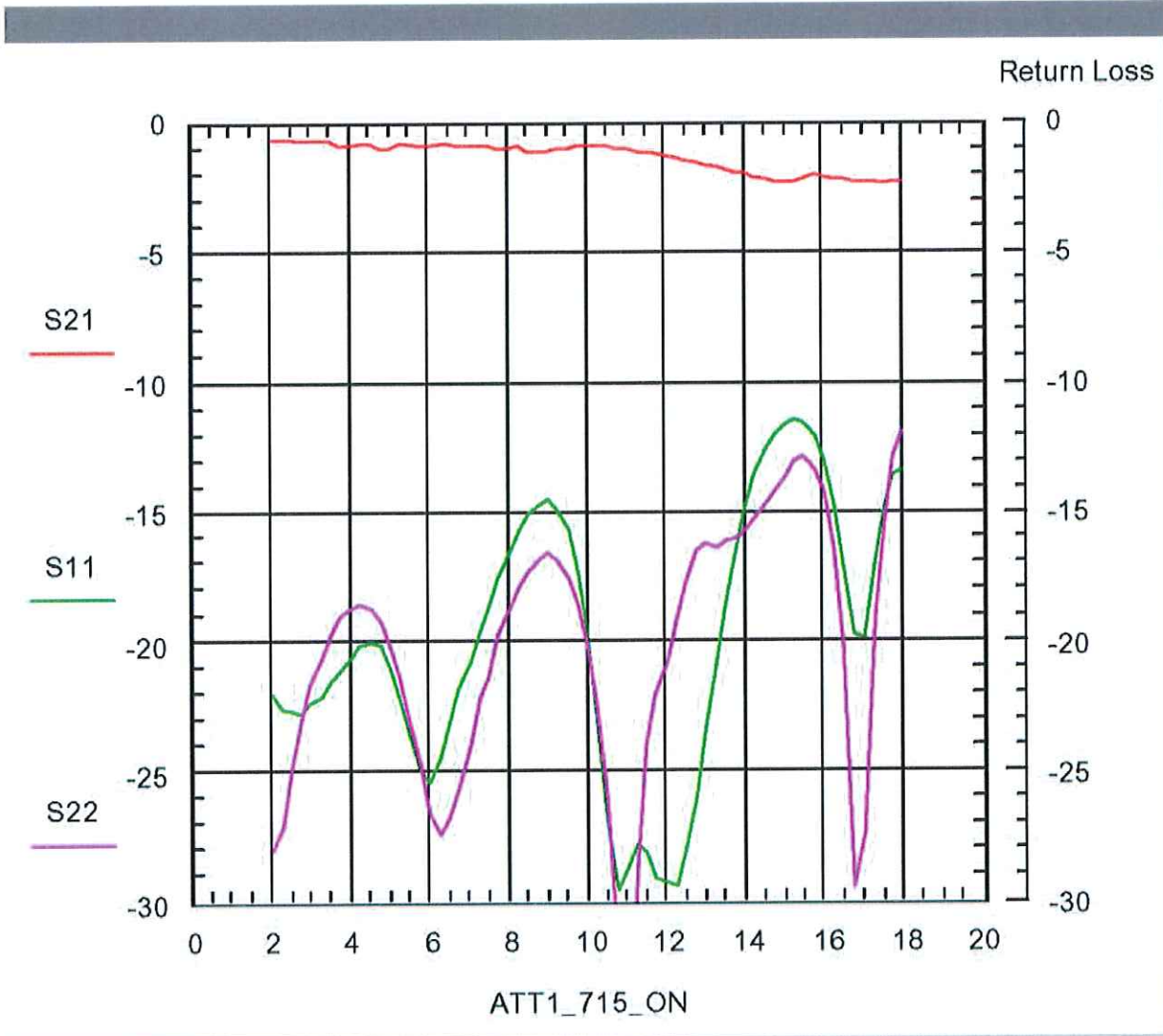
PM603001

TAKEN AT

-40°C

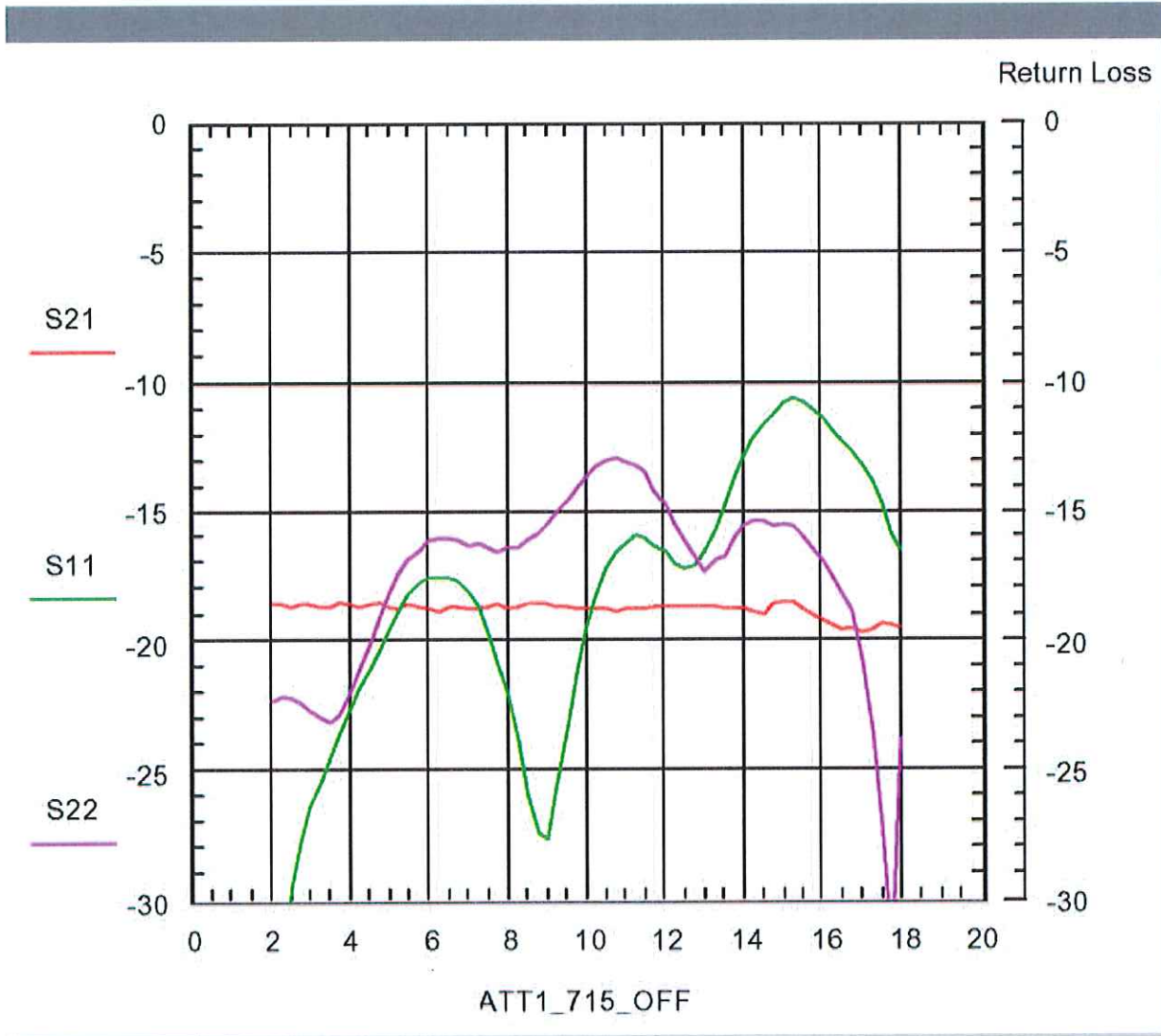


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ -40°C
ATTENUATOR 1 (J2 – J8), SERIAL NUMBER: PM512715



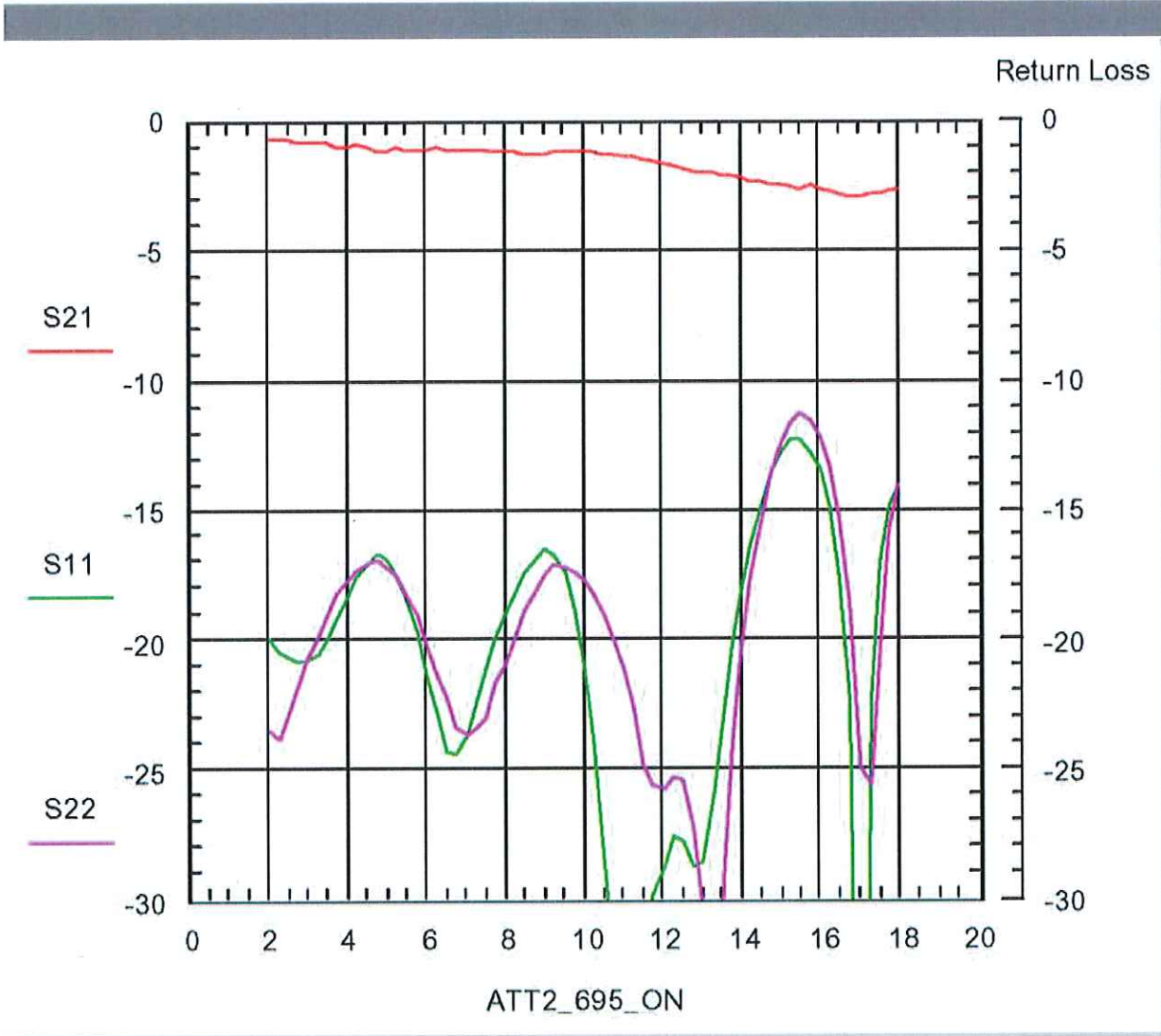


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ -40°C
ATTENUATOR 1 (J2 – J8), SERIAL NUMBER: PM512715



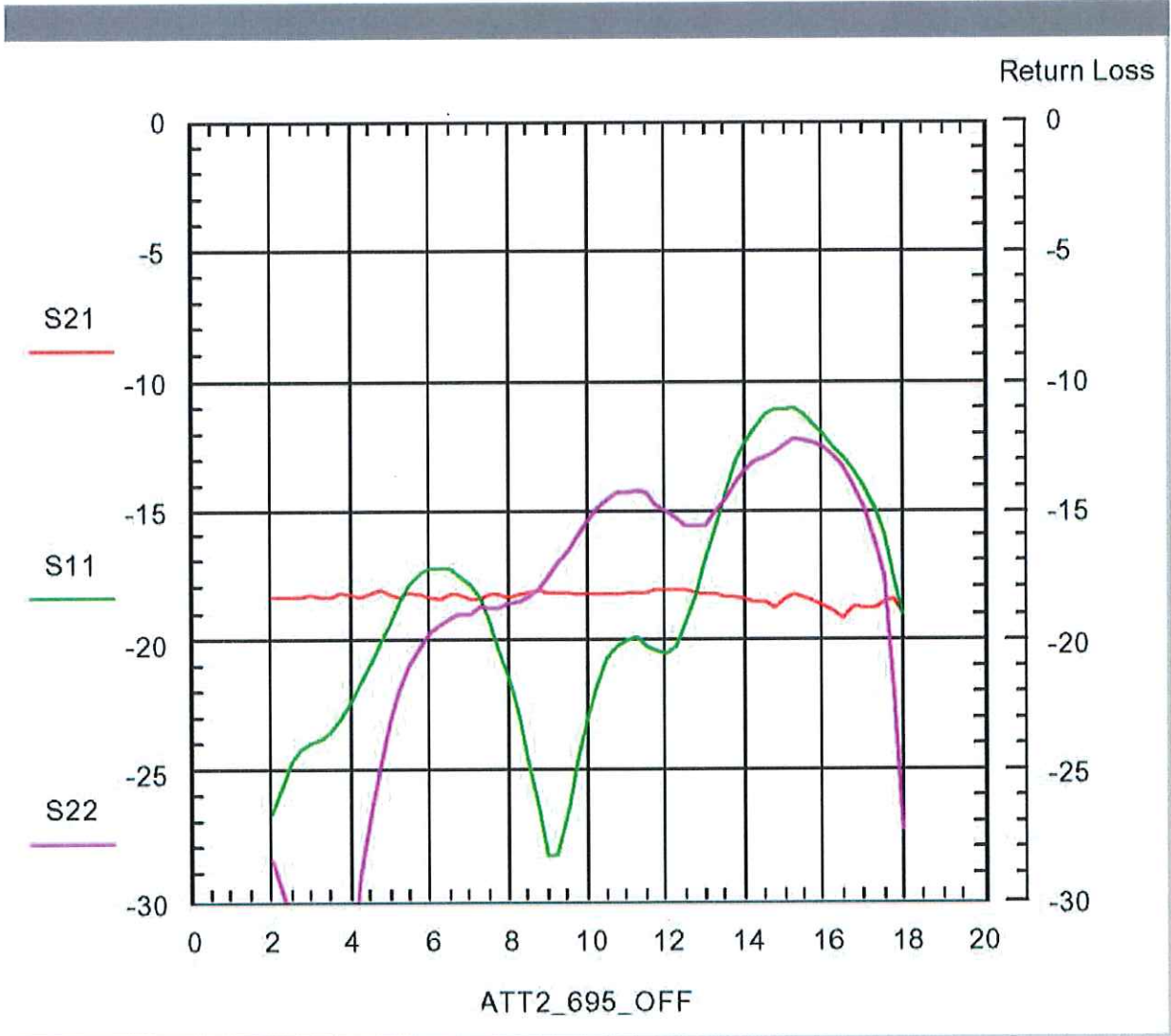


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ -40°C
ATTENUATOR 2 (J3 – J9), SERIAL NUMBER: PM512695



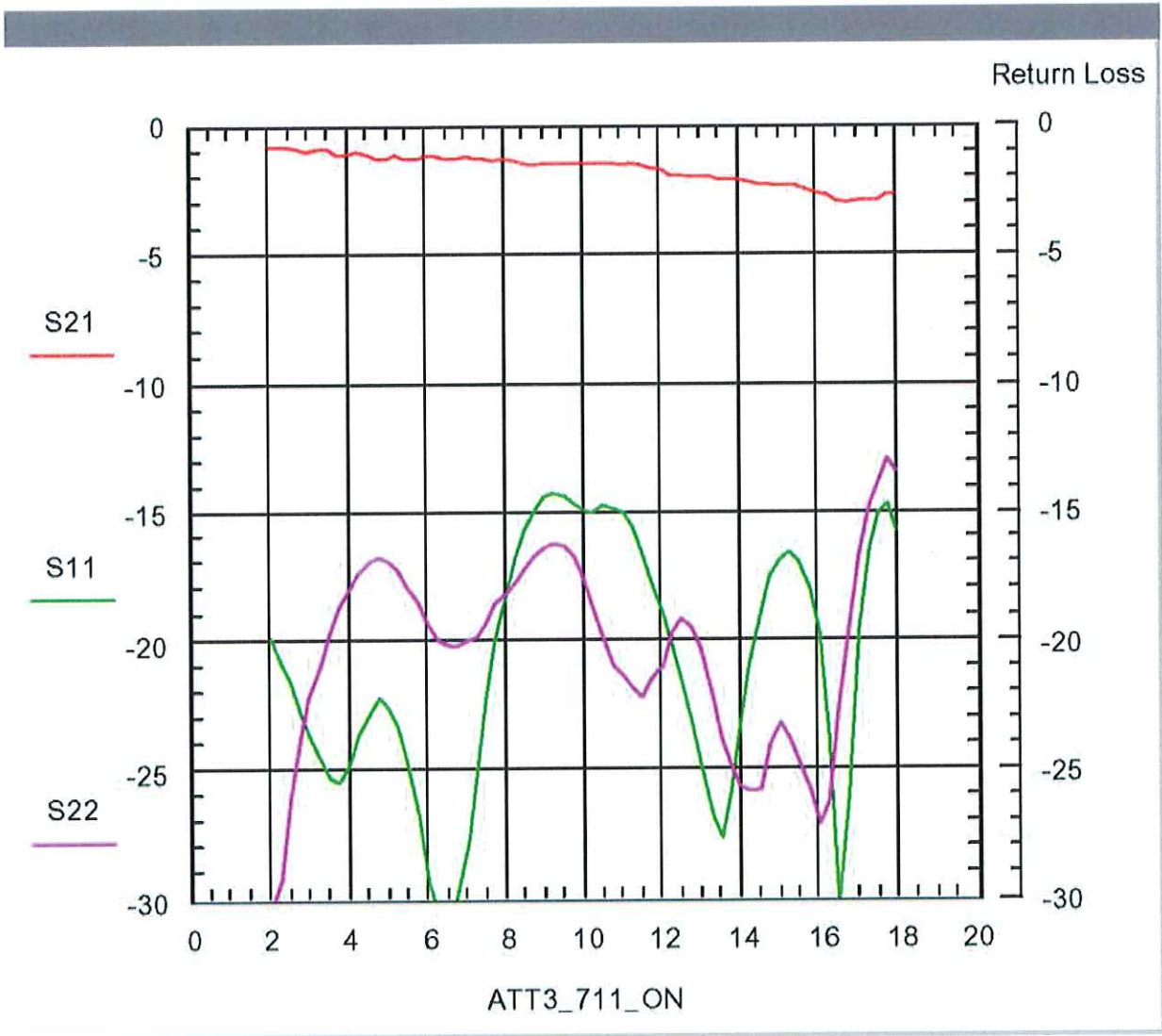


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ -40°C
ATTENUATOR 2 (J3 – J9), SERIAL NUMBER: PM512695



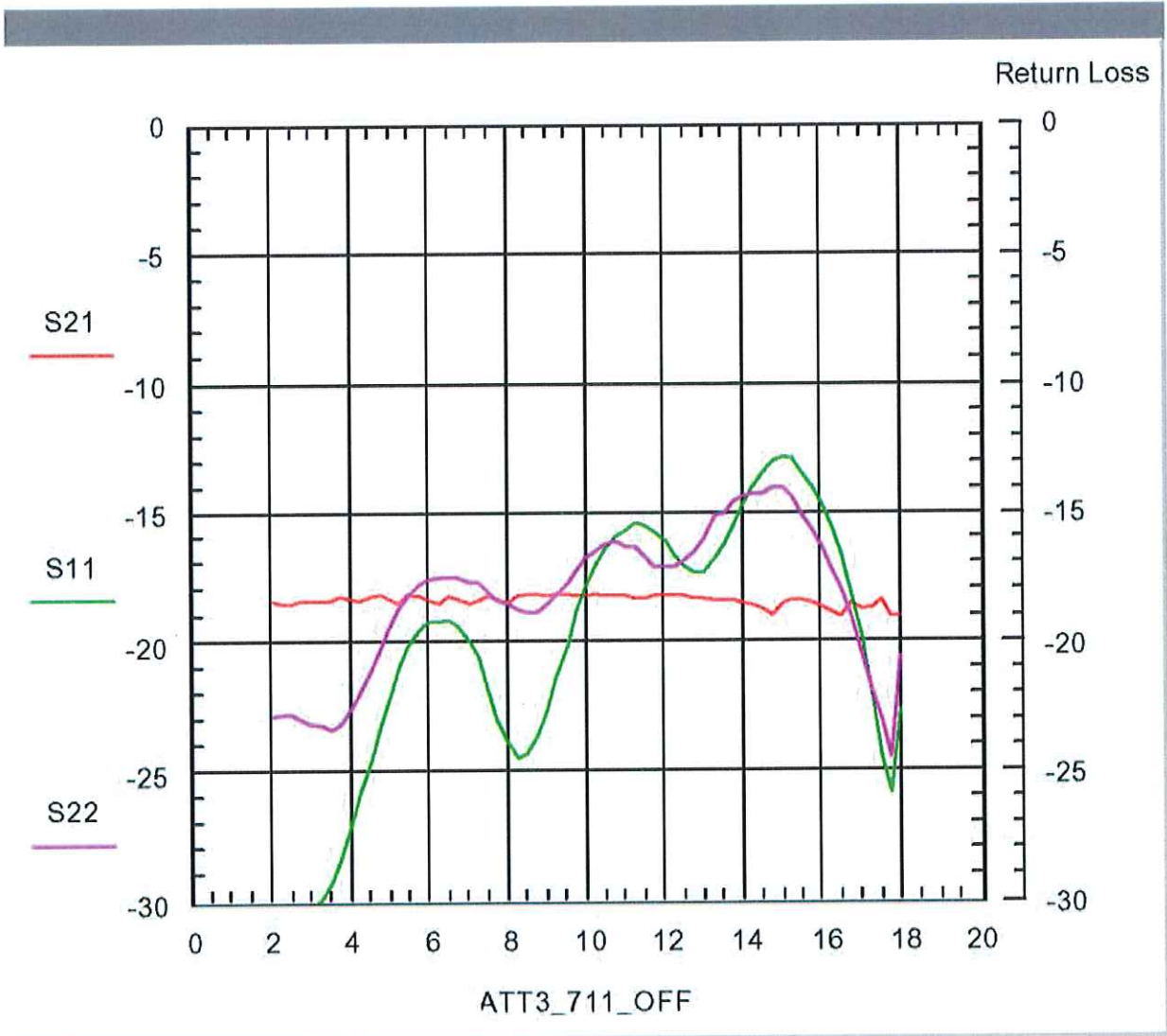


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ -40°C
ATTENUATOR 3 (J4 – J10), SERIAL NUMBER: PM512711



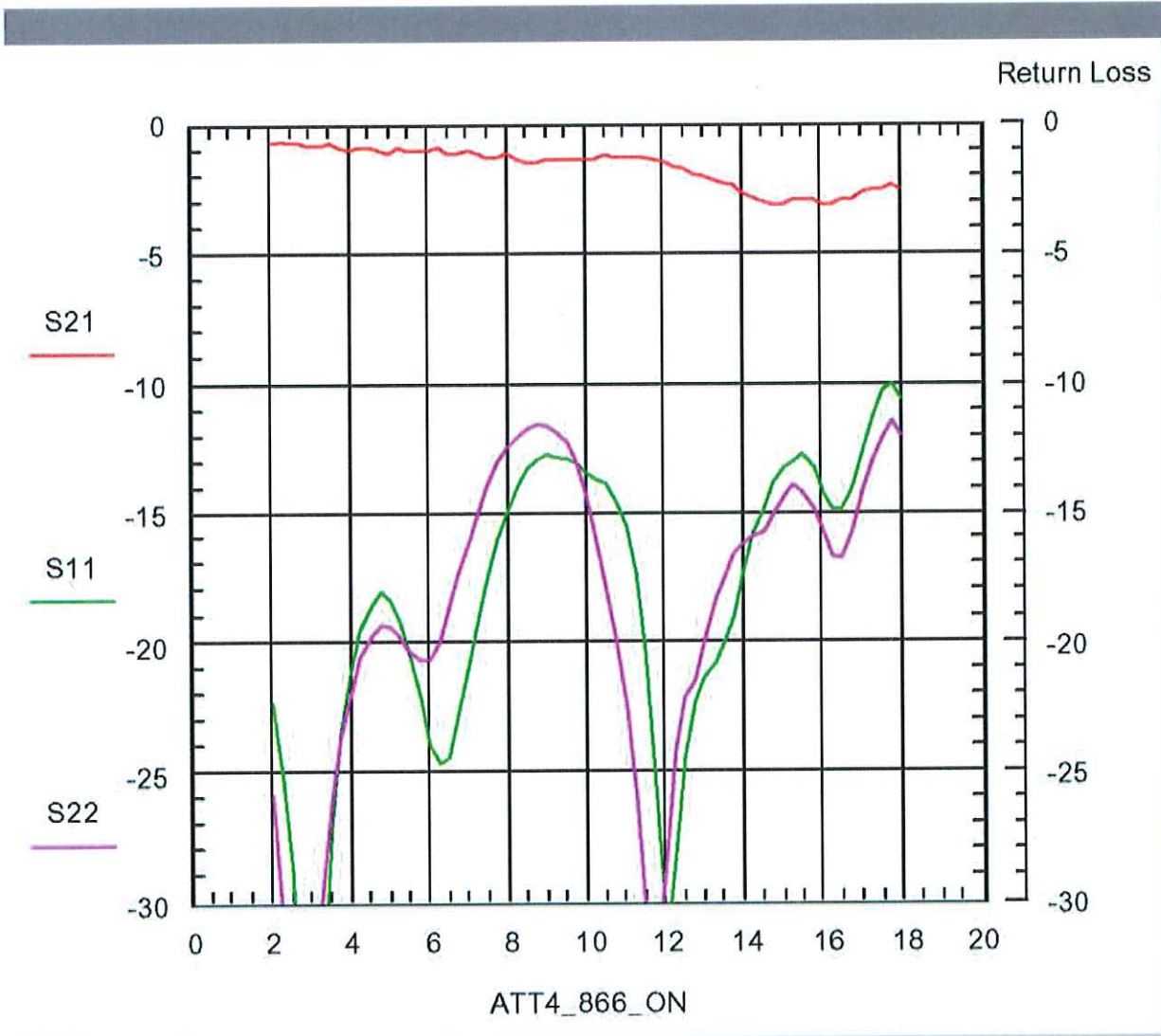


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ -40°C
ATTENUATOR 3 (J4 – J10), SERIAL NUMBER: PM512711



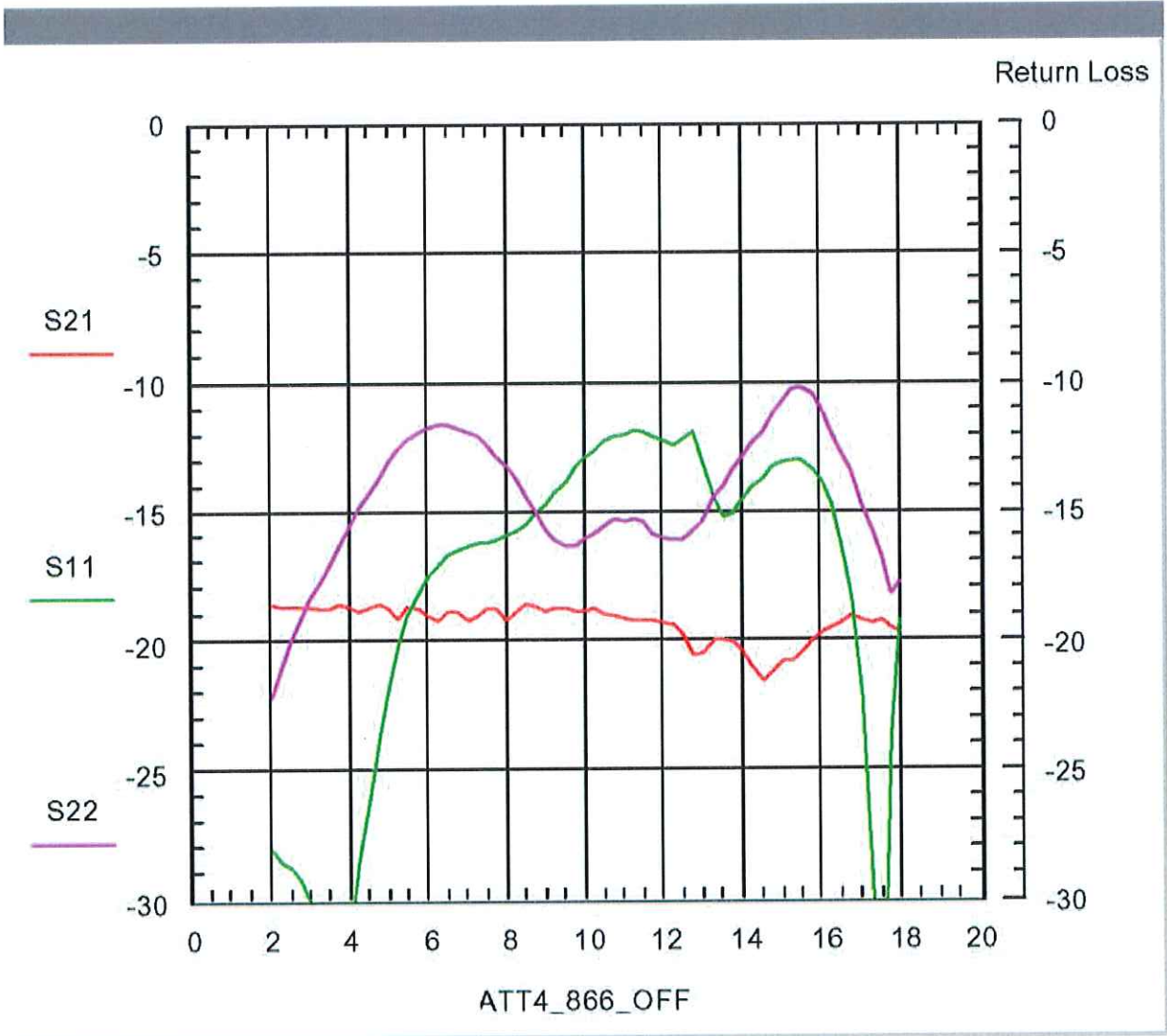


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ -40°C
ATTENUATOR 4 (J5 – J11), SERIAL NUMBER: PM512866



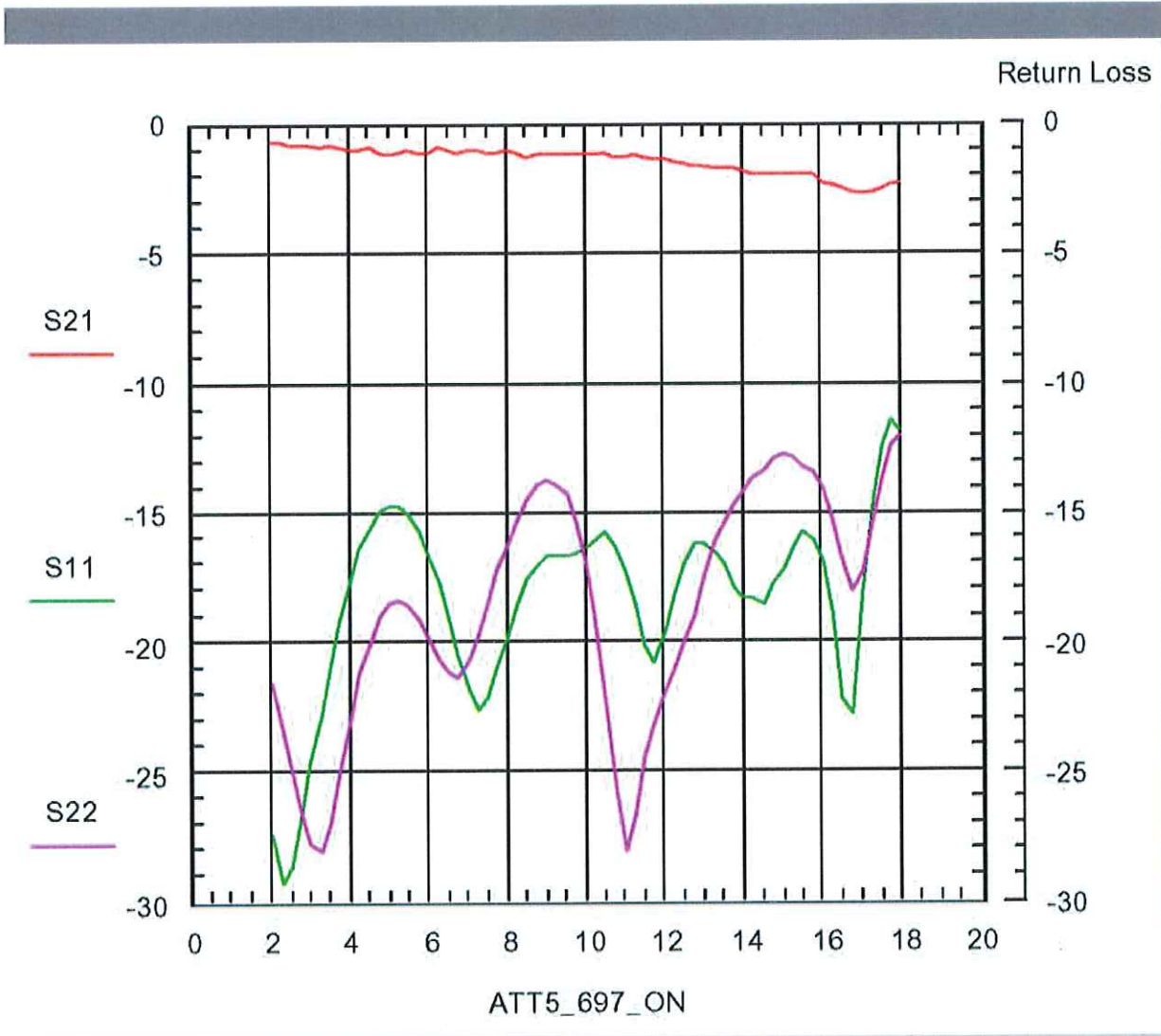


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ -40°C
ATTENUATOR 4 (J5 – J11), SERIAL NUMBER: PM512866



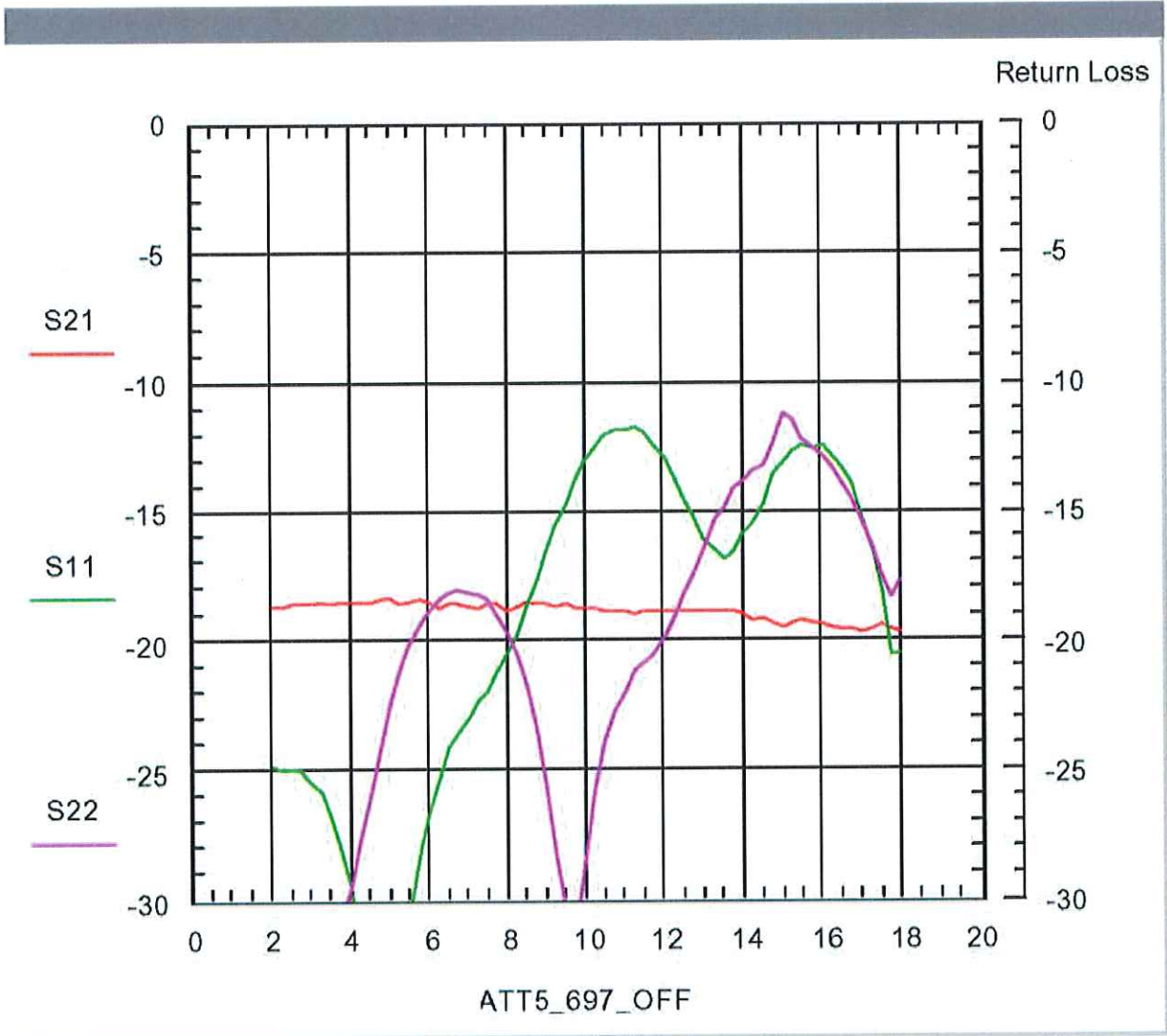


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ -40°C
ATTENUATOR 5 (J6 – J12), SERIAL NUMBER: PM512697



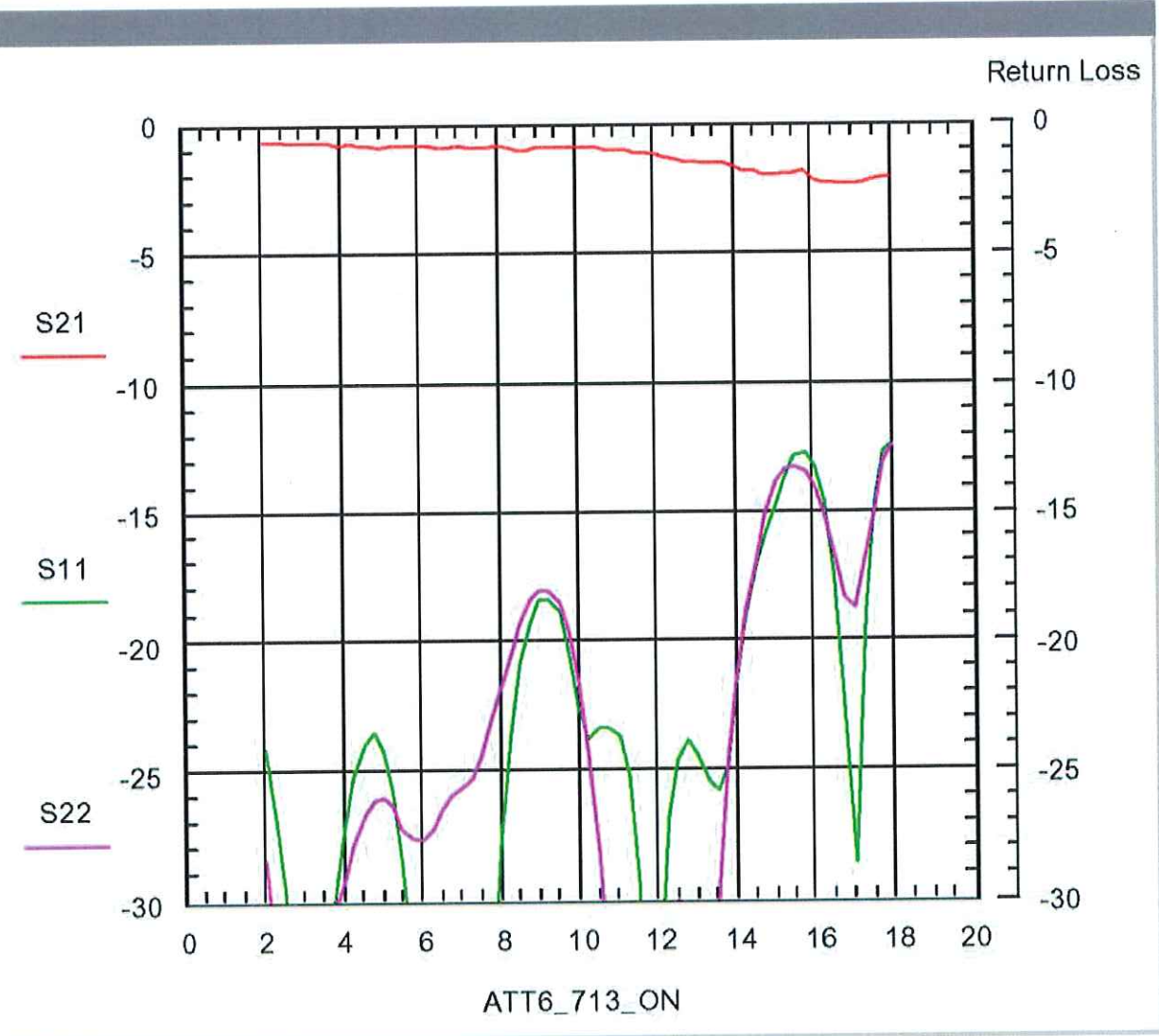


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ -40°C
ATTENUATOR 5 (J6 – J12), SERIAL NUMBER: PM512697



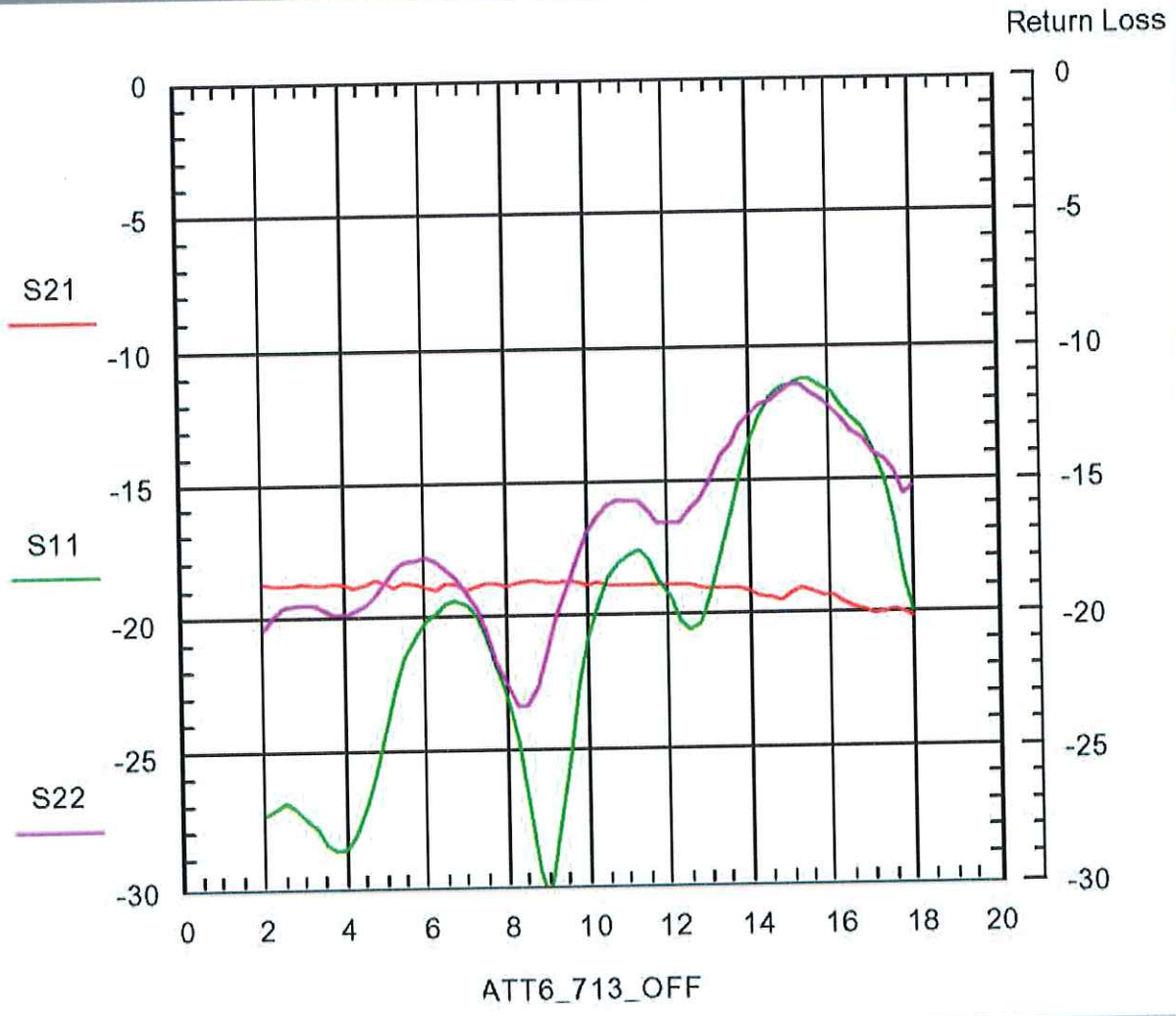


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ -40°C
ATTENUATOR 6 (J7 – J13), SERIAL NUMBER: PM512713





20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ -40°C
ATTENUATOR 6 (J7 - J13), SERIAL NUMBER: PM512713



PT121-EJE-SAA-0306
SAA-218-6-093-013542 OPT HERM
MARCH 30, 2006



TEST DATA @ ROOM TEMPERATURE (+23°C)

DATA PLOTS
FOR
PMI MODEL NUMBER

SAA-218-6-093-013542
OPTION HERM

Serial Number:

PM603001

TAKEN AT

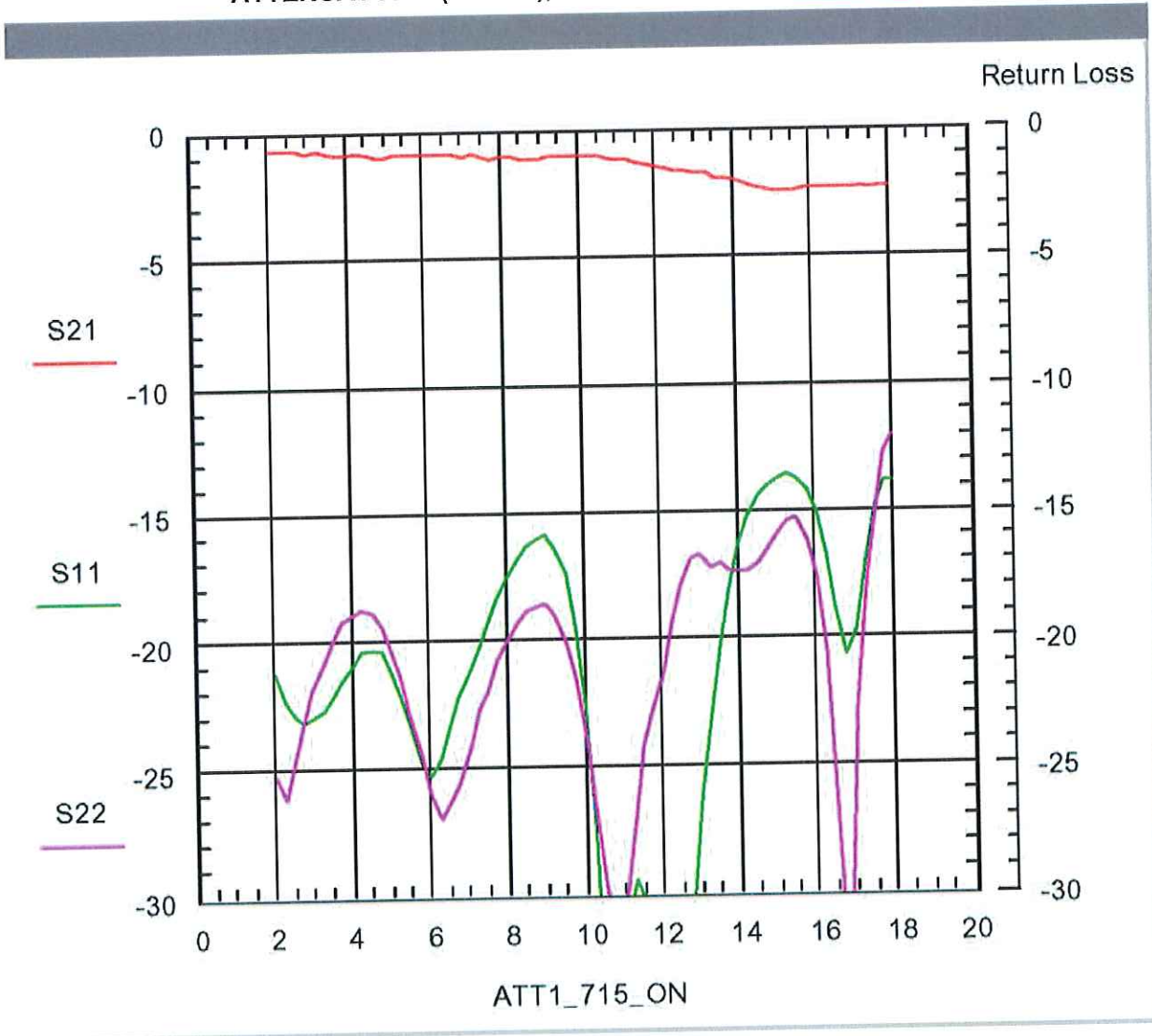
+23°C

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704 • USA
TEL: 301-631-1579 • FAX: 301-662-2029 • EMAIL: sales@planarmonolithics.com
WEBSITE: <http://www.planarmonolithicsindustries.com>

ISO 9001: 2000 CERTIFIED

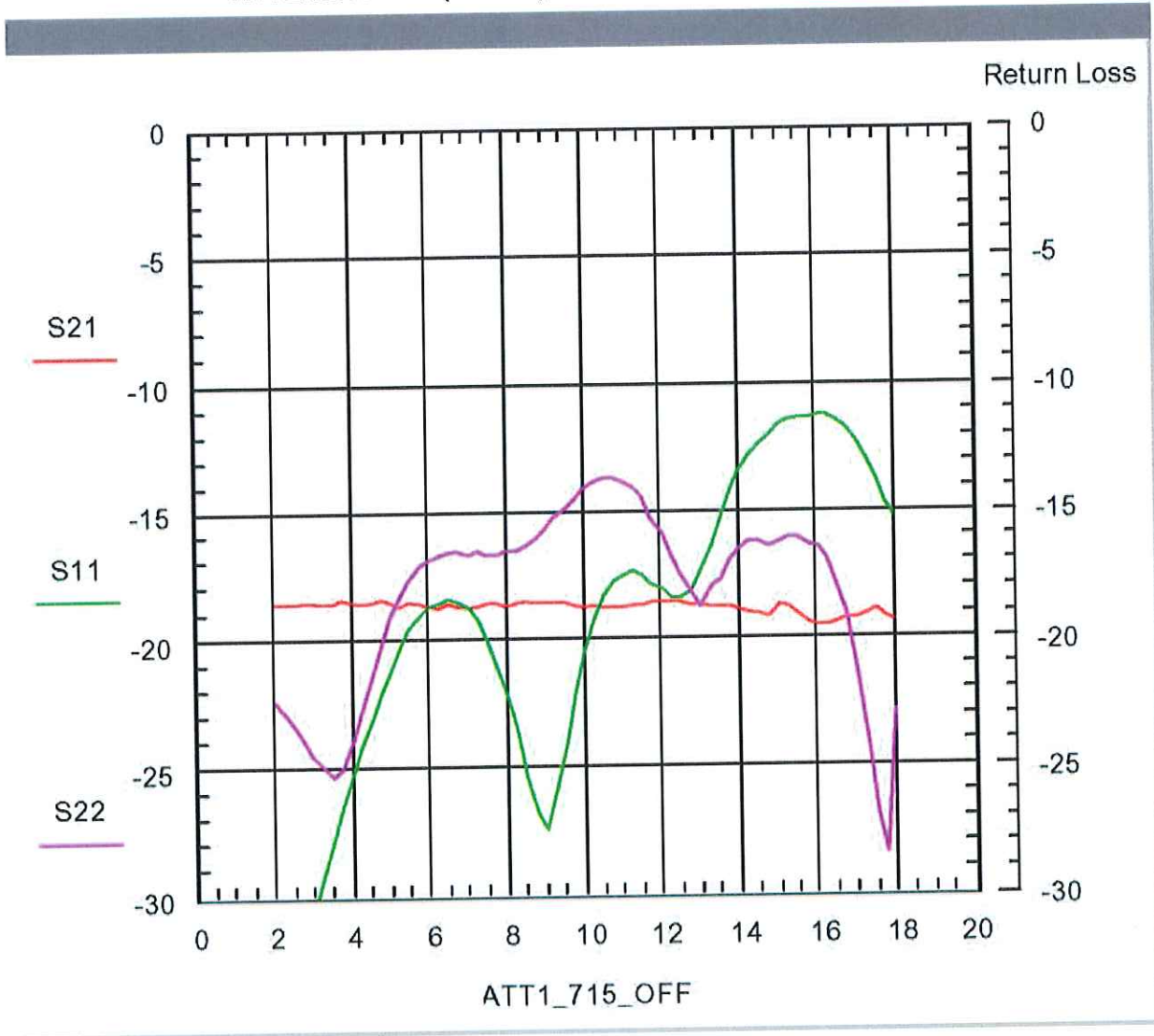


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +23°C
ATTENUATOR 1 (J2 – J8), SERIAL NUMBER: PM512715



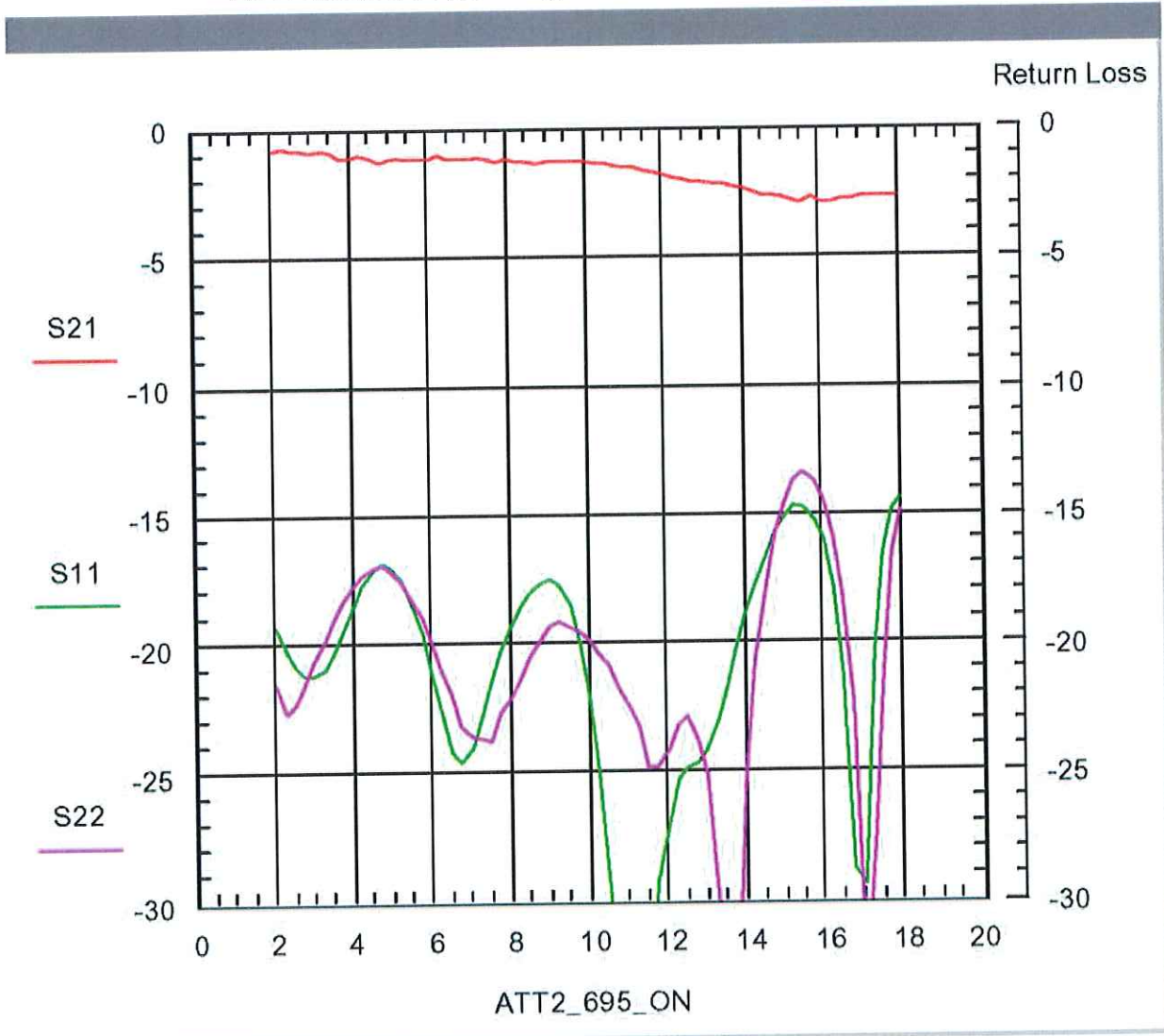


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +23°C
ATTENUATOR 1 (J2 – J8), SERIAL NUMBER: PM512715



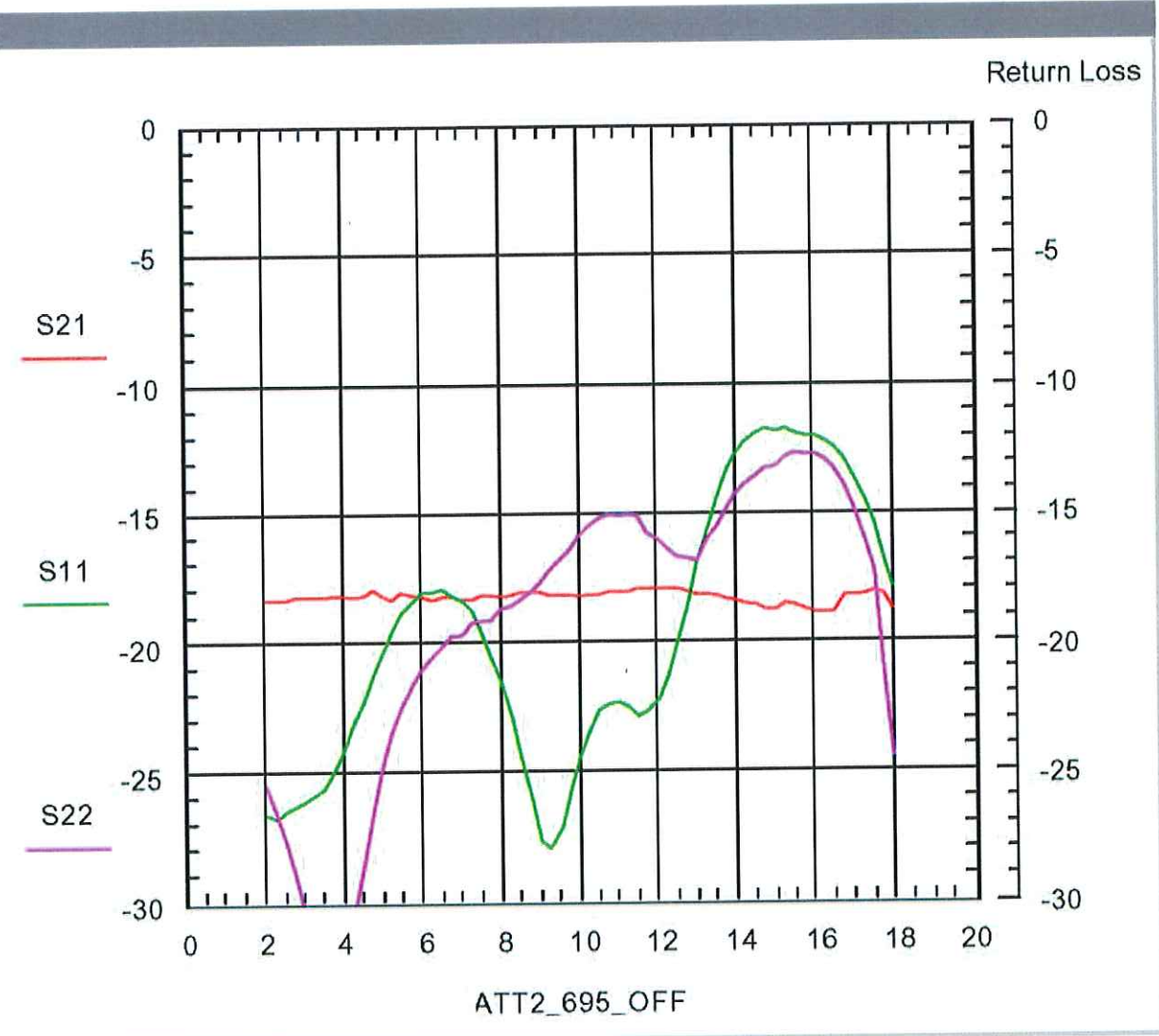


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +23°C
ATTENUATOR 2 (J3 – J9), SERIAL NUMBER: PM512695



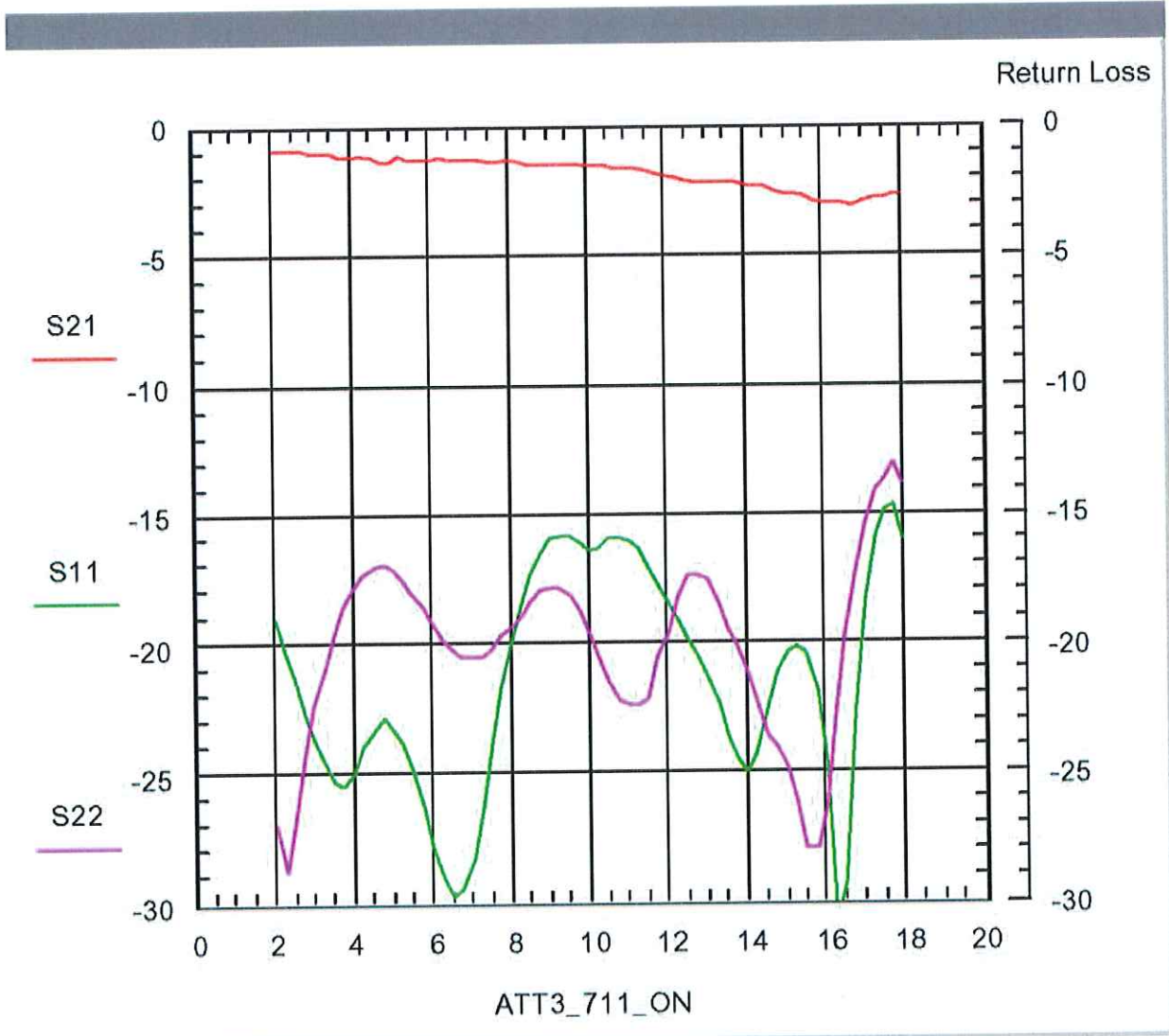


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +23°C
ATTENUATOR 2 (J3 – J9), SERIAL NUMBER: PM512695



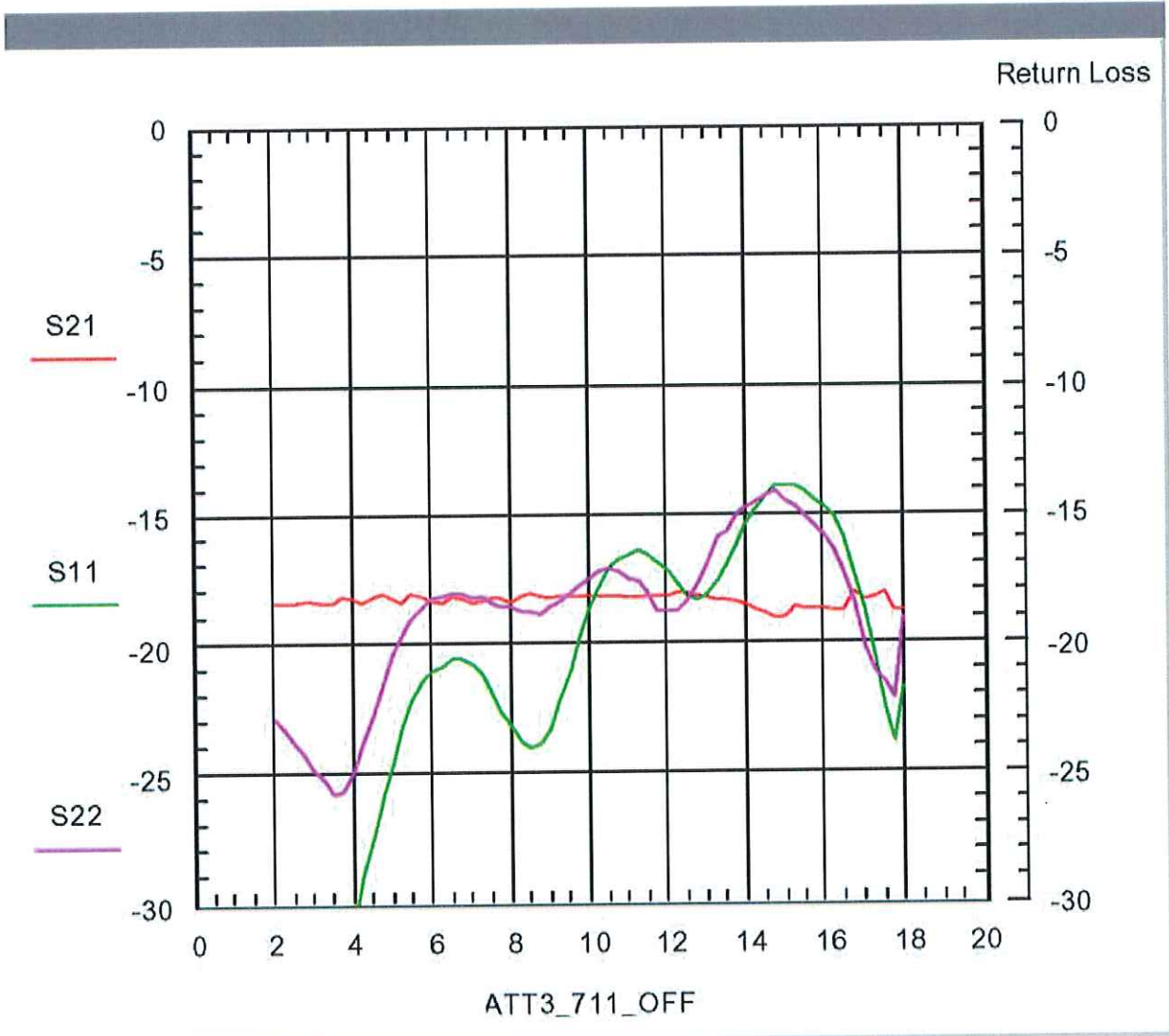


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +23°C
ATTENUATOR 3 (J4 – J10), SERIAL NUMBER: PM512711



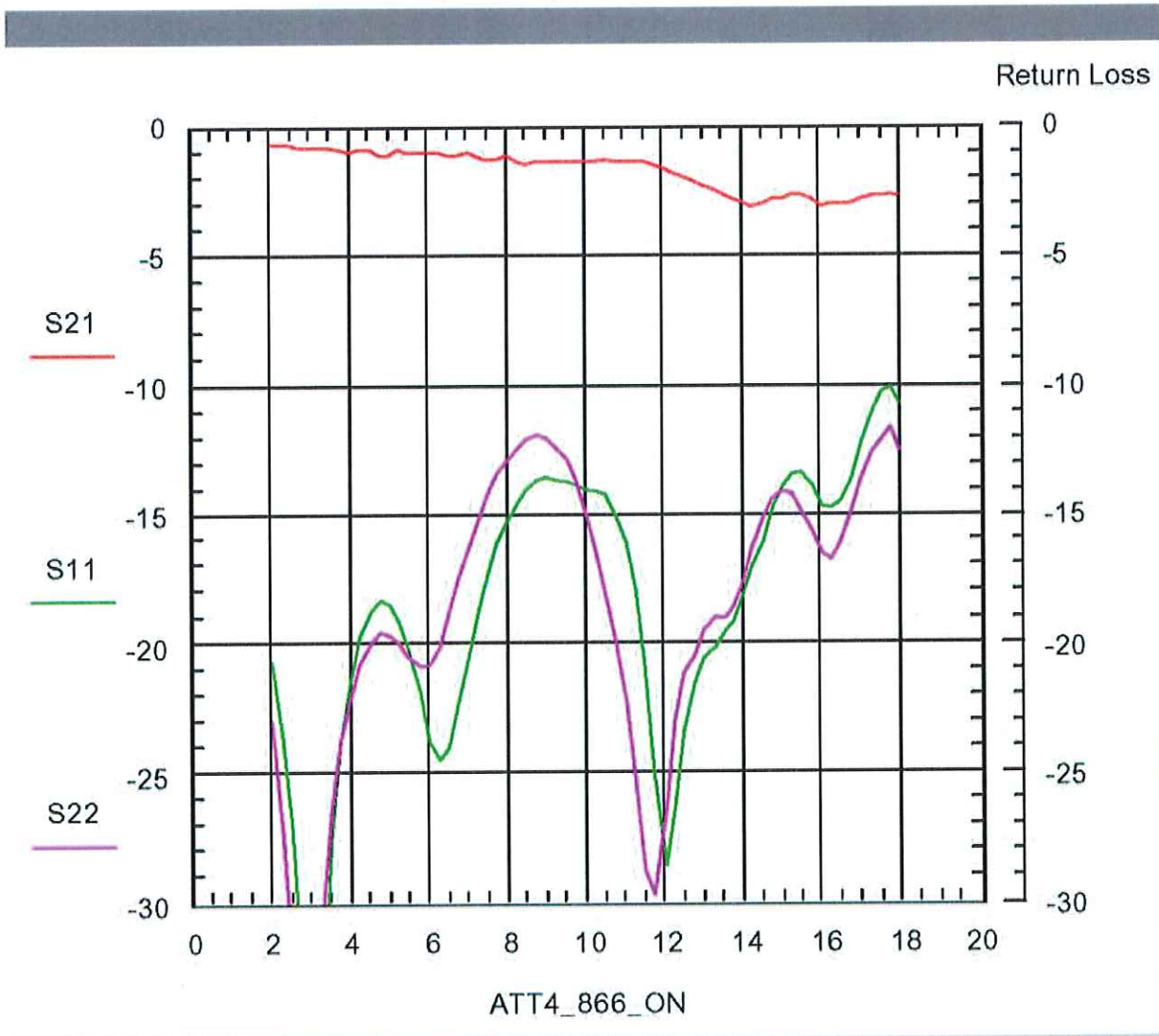


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +23°C
ATTENUATOR 3 (J4 – J10), SERIAL NUMBER: PM512711



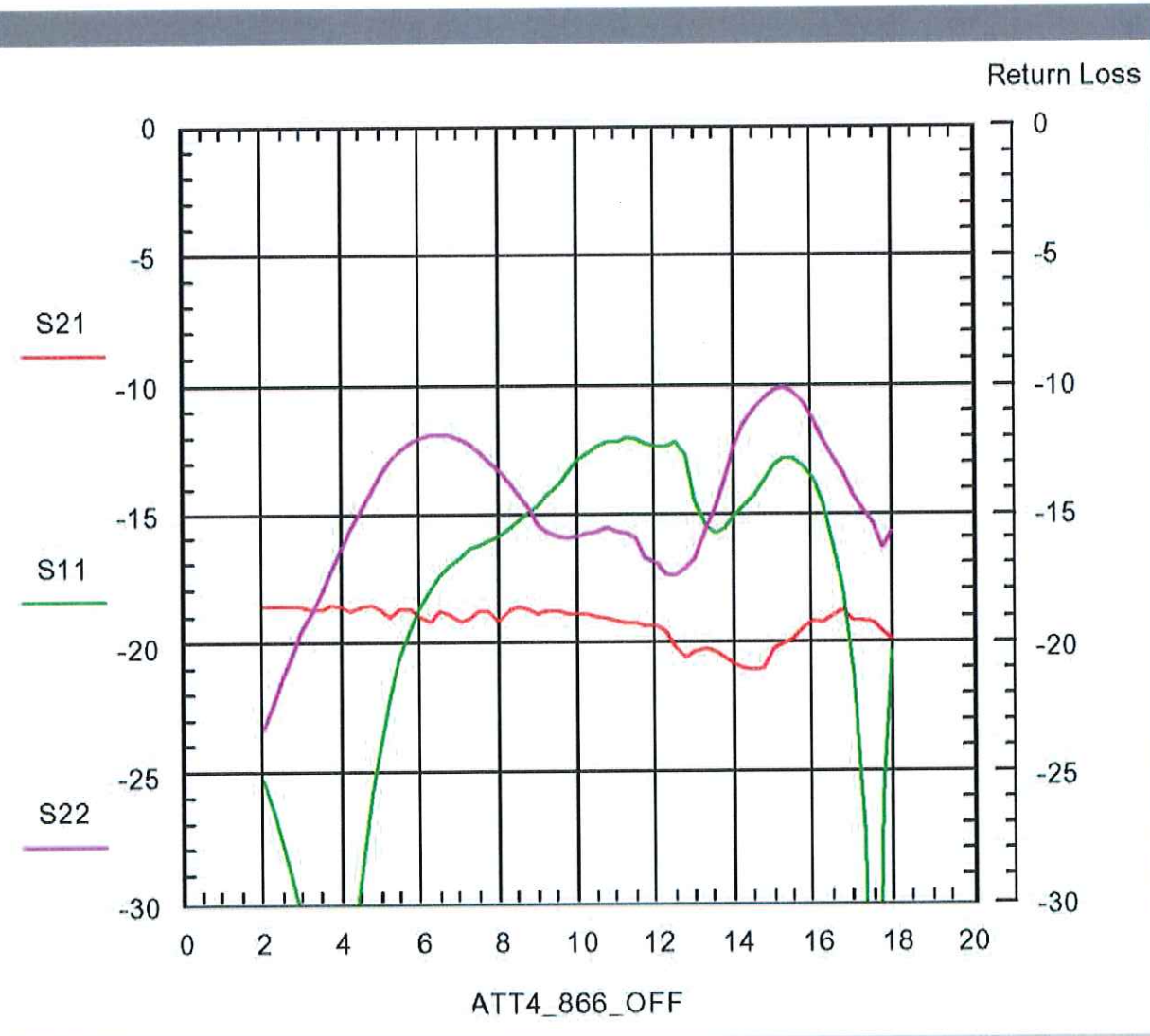


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +23°C
ATTENUATOR 4 (J5 – J11), SERIAL NUMBER: PM512866



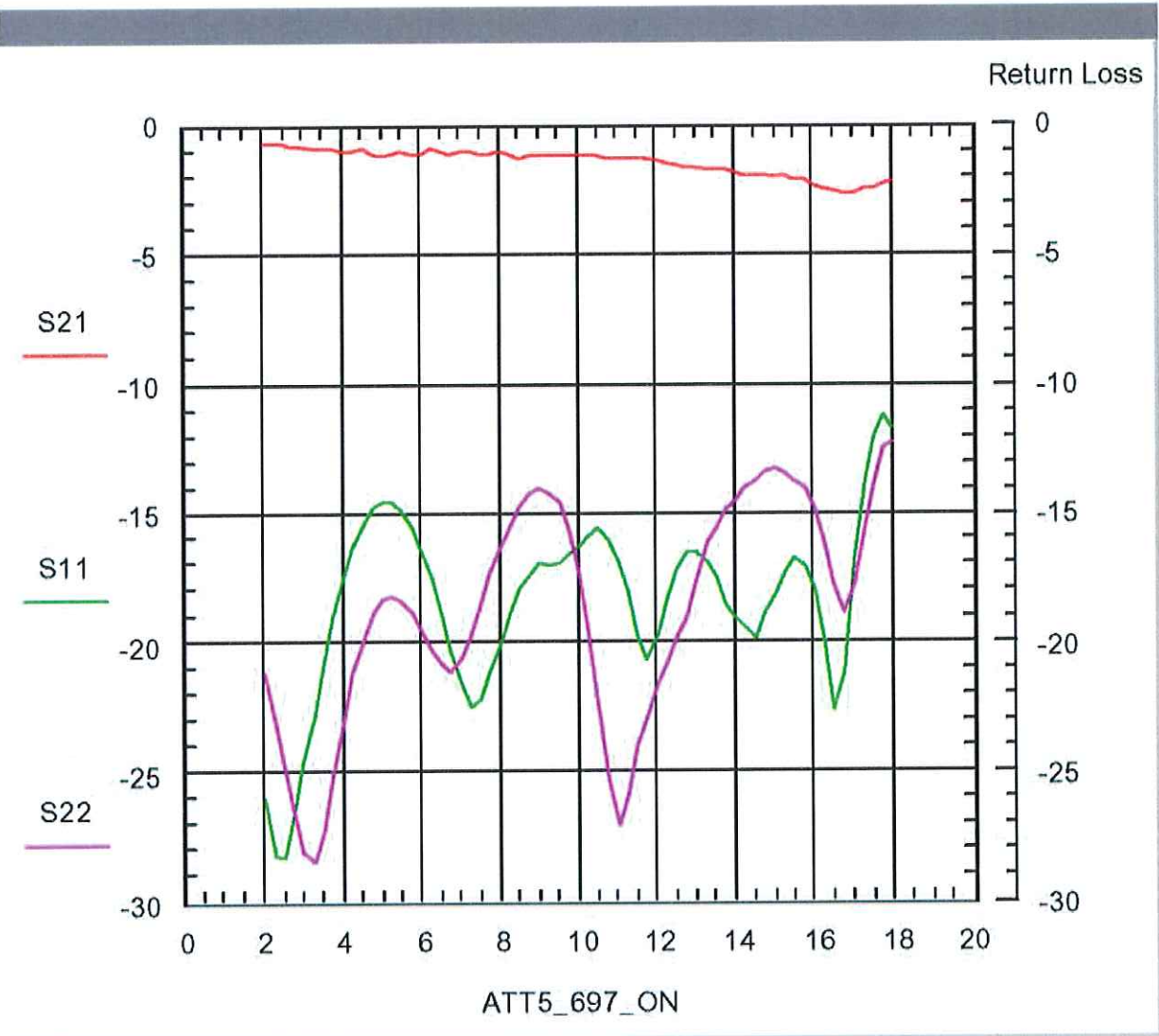


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +23°C
ATTENUATOR 4 (J5 – J11), SERIAL NUMBER: PM512866



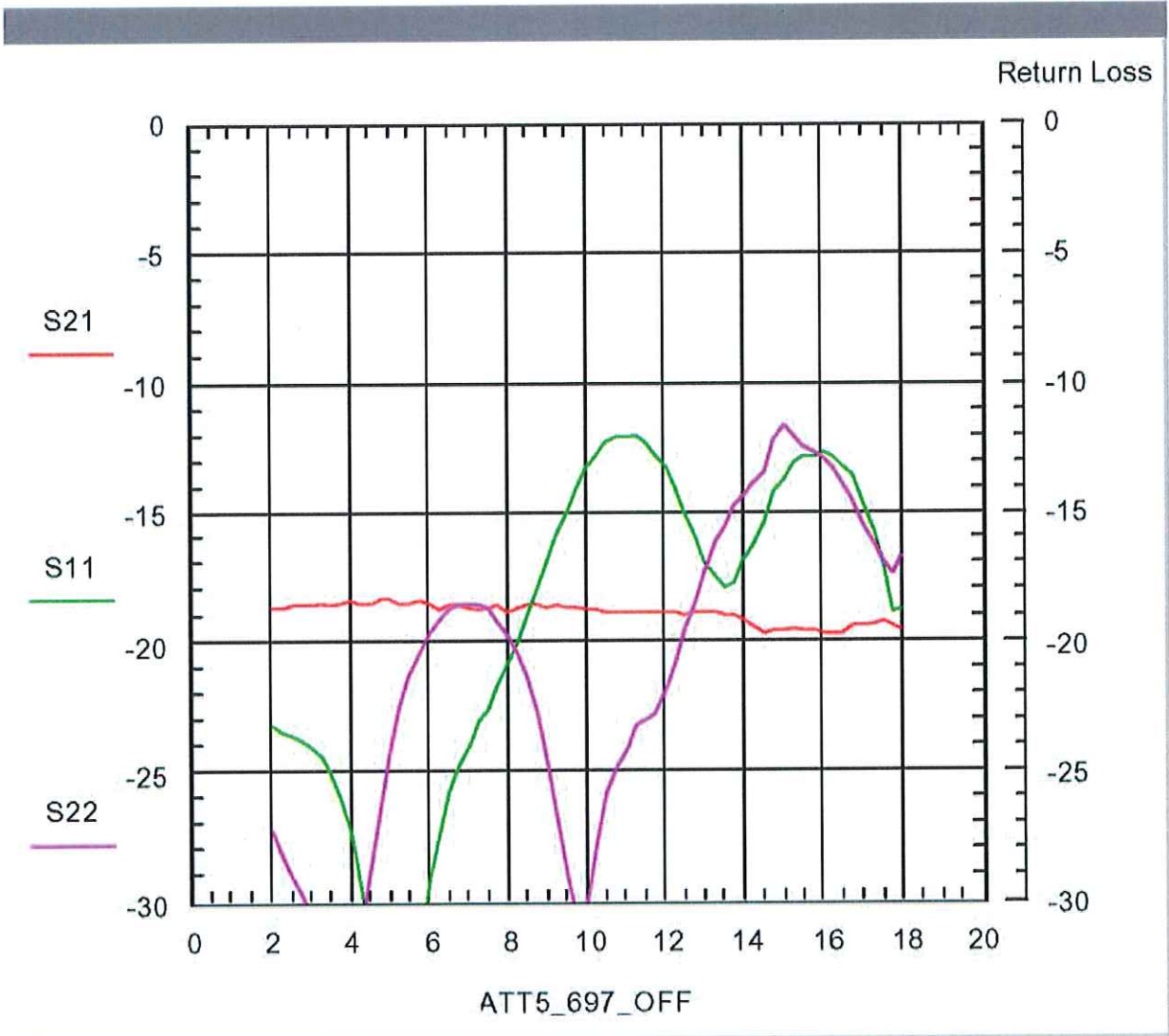


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +23°C
ATTENUATOR 5 (J6 – J12), SERIAL NUMBER: PM512697



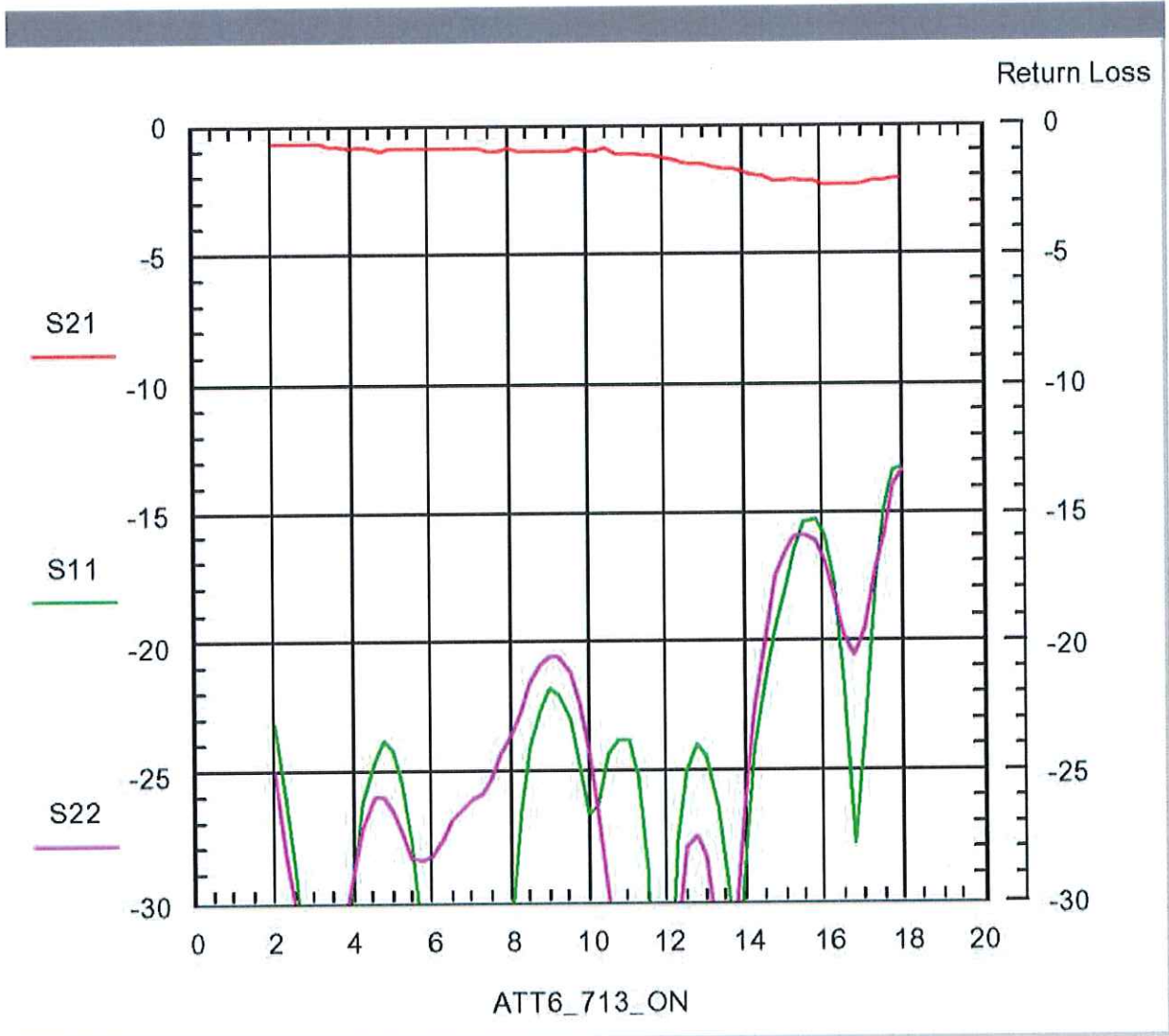


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +23°C
ATTENUATOR 5 (J6 – J12), SERIAL NUMBER: PM512697



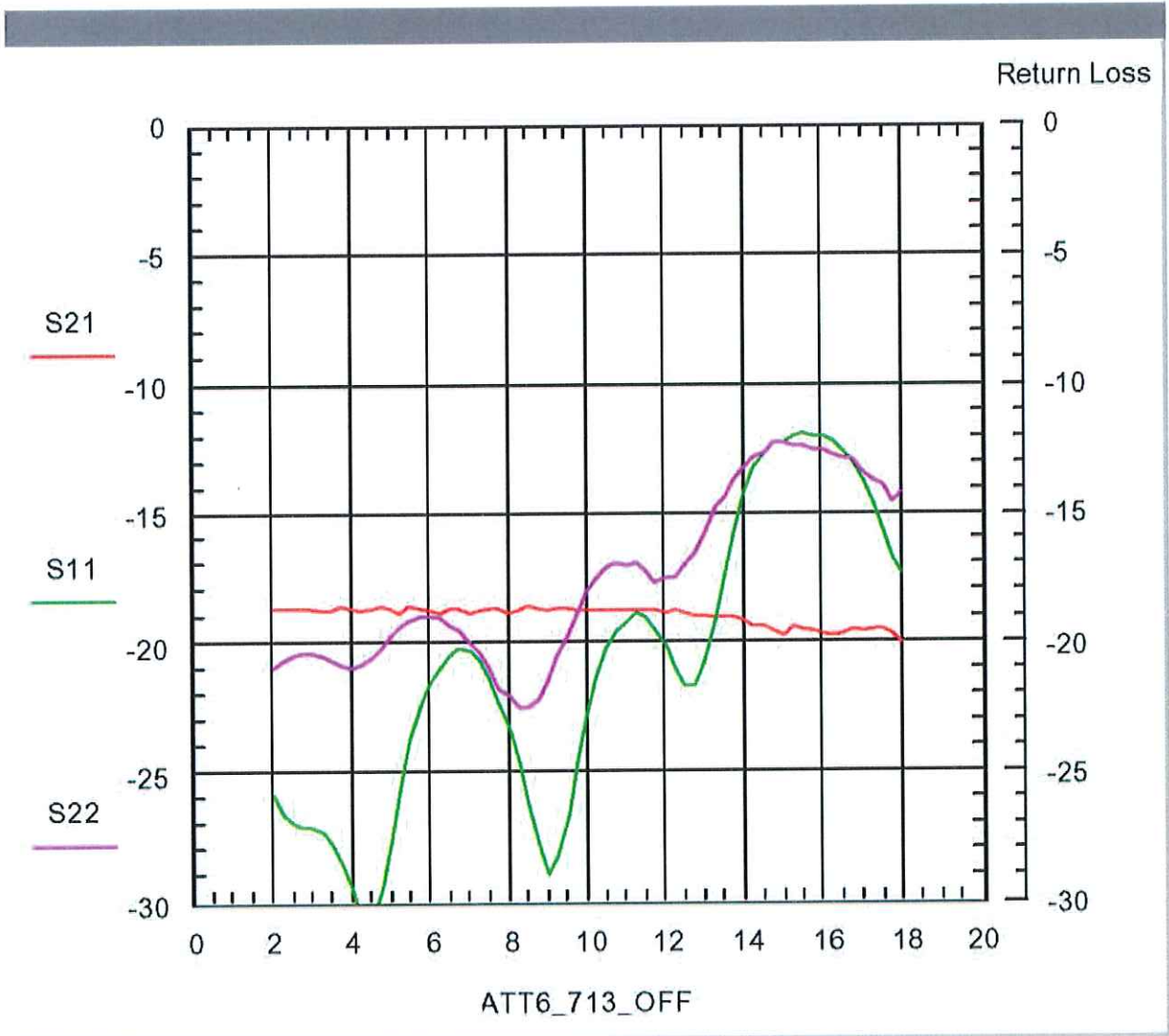


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +23°C
ATTENUATOR 6 (J7 – J13), SERIAL NUMBER: PM512713





20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +23°C
ATTENUATOR 6 (J7 – J13), SERIAL NUMBER: PM512713



TEST DATA @ +71°C

DATA PLOTS

FOR

PMI MODEL NUMBER

SAA-218-6-093-013542
OPTION HERM

Serial Number:

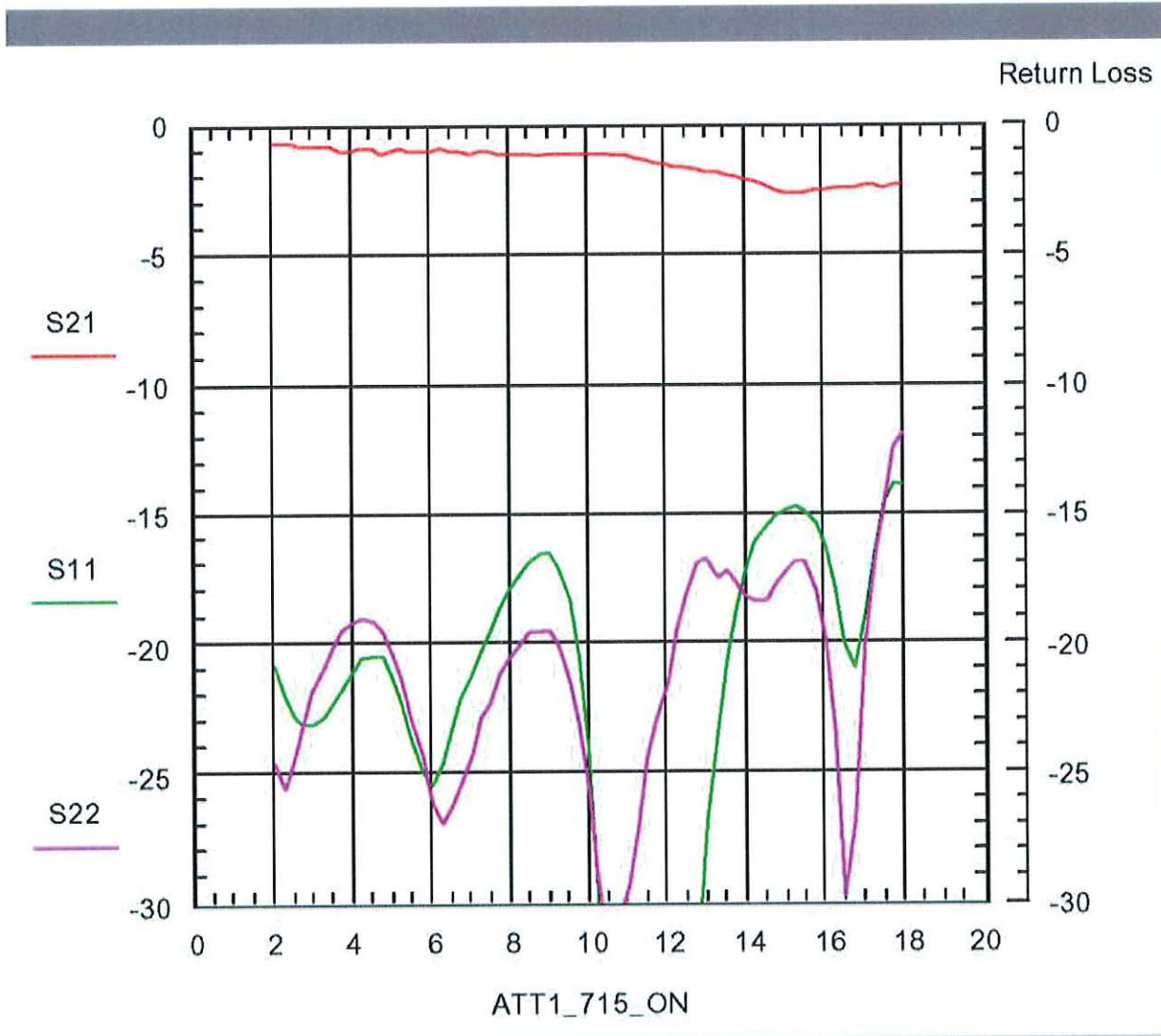
PM603001

TAKEN AT

+71°C

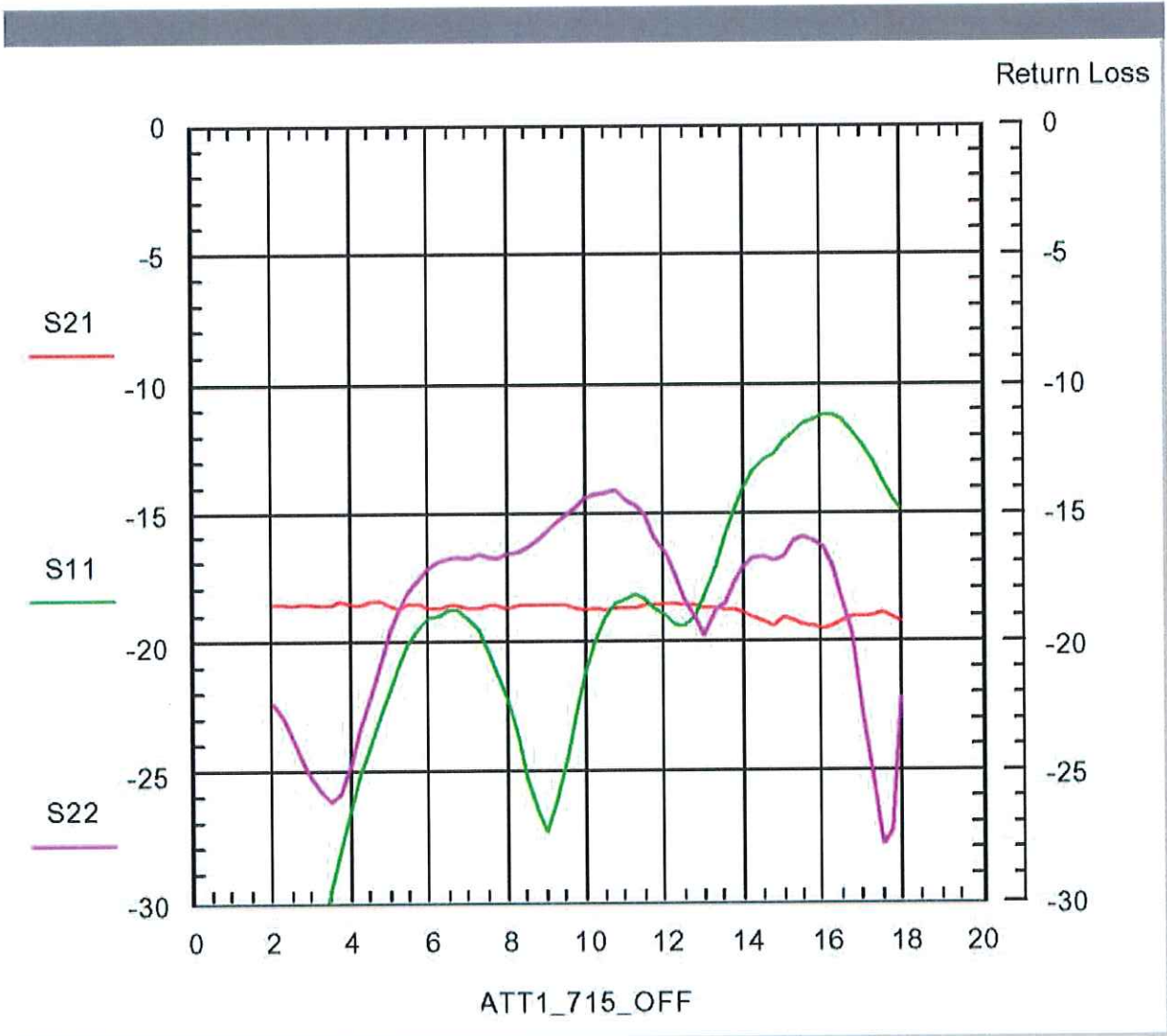


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +71°C
ATTENUATOR 1 (J2 – J8), SERIAL NUMBER: PM512715



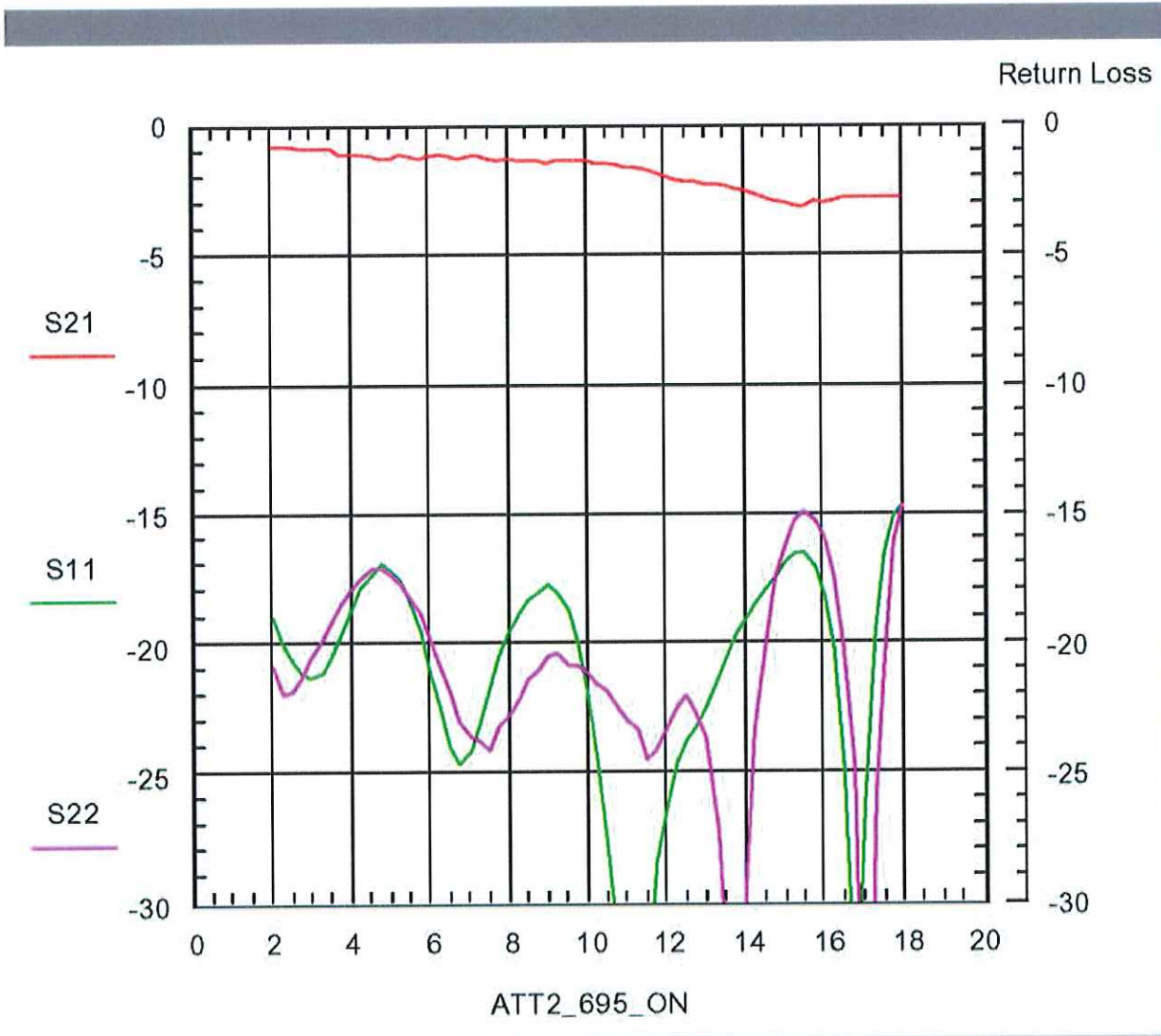


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +71°C
ATTENUATOR 1 (J2 – J8), SERIAL NUMBER: PM512715



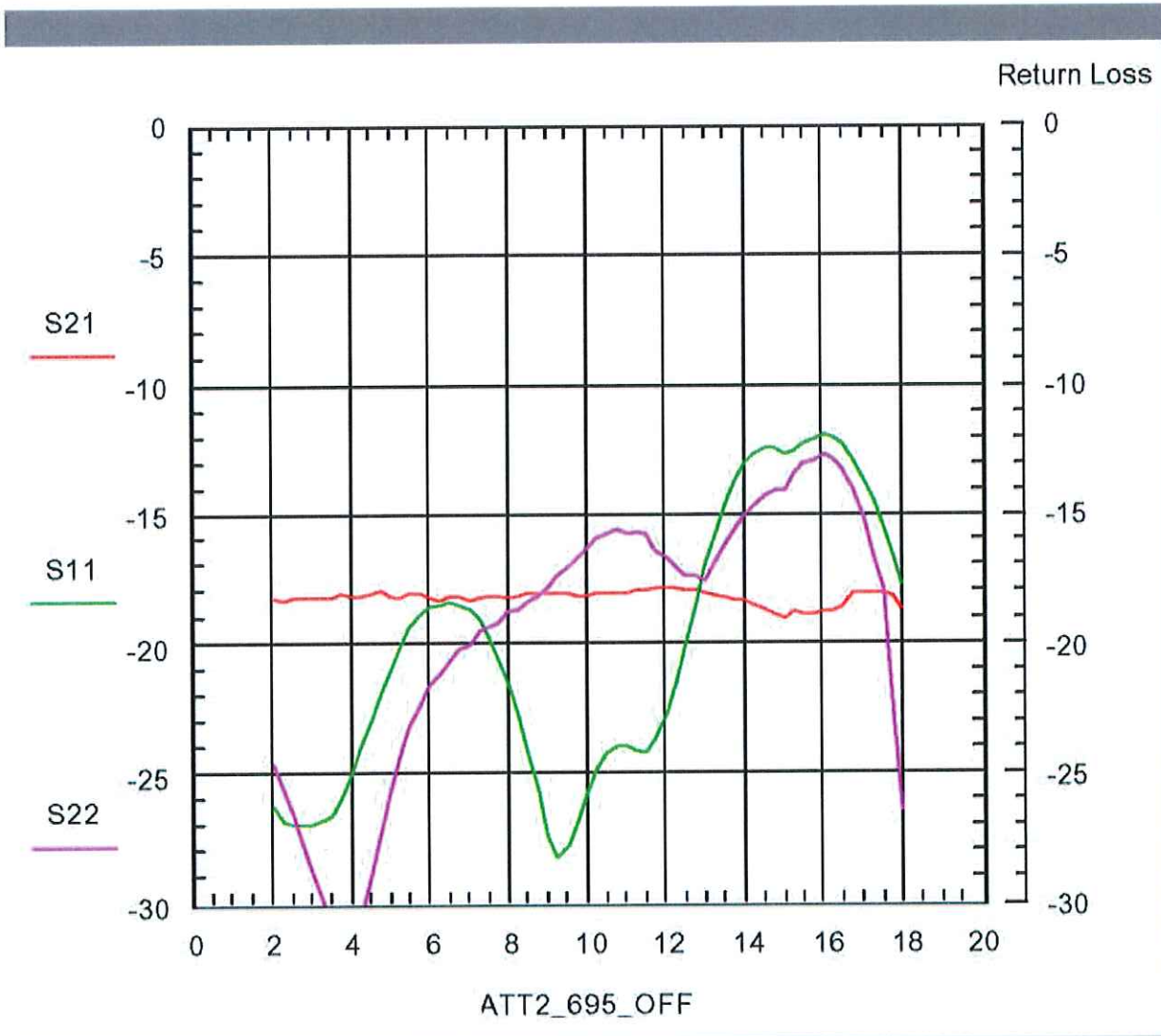


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +71°C
ATTENUATOR 2 (J3 – J9), SERIAL NUMBER: PM512695



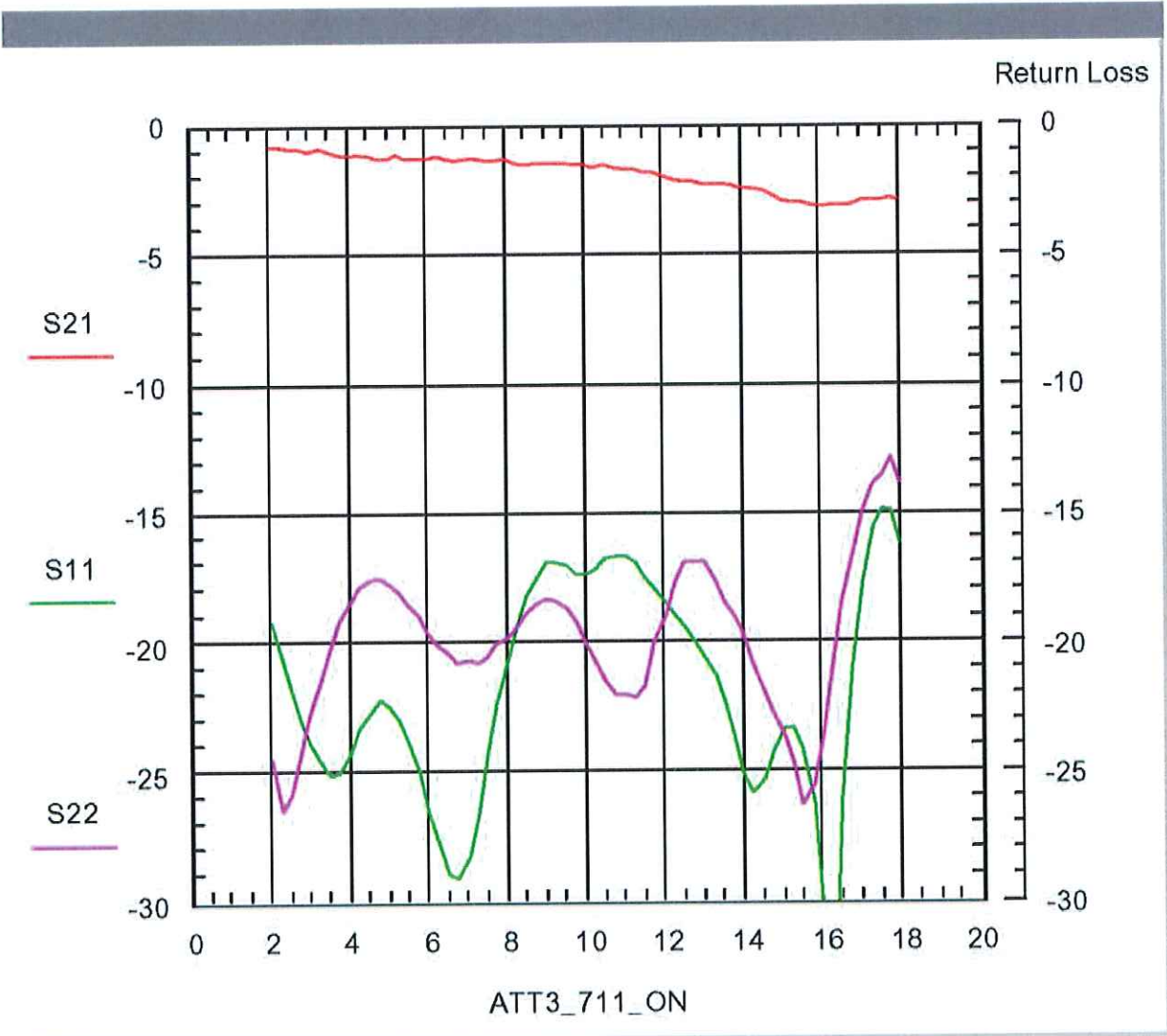


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +71°C
ATTENUATOR 2 (J3 – J9), SERIAL NUMBER: PM512695



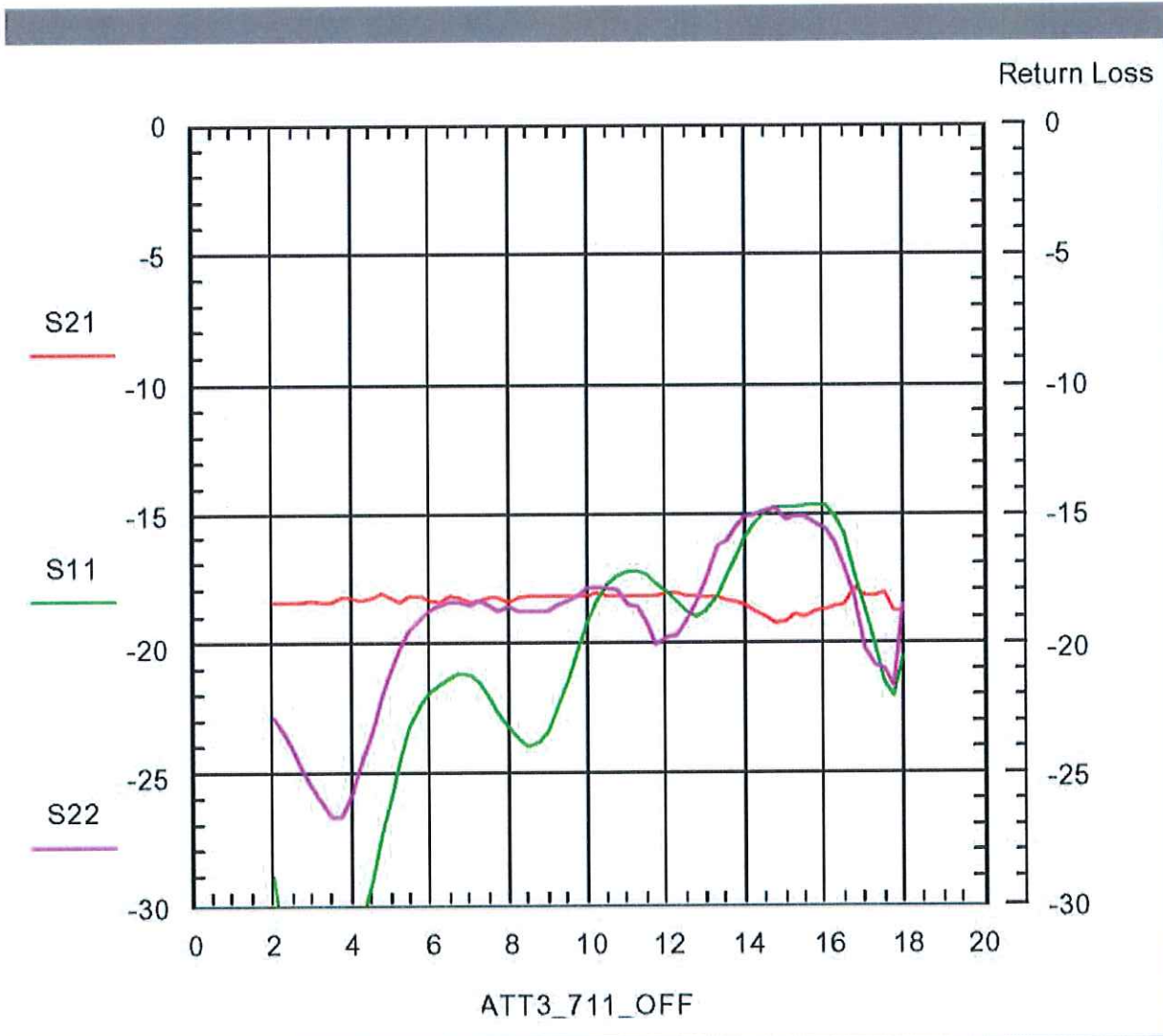


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +71°C
ATTENUATOR 3 (J4 – J10), SERIAL NUMBER: PM512711



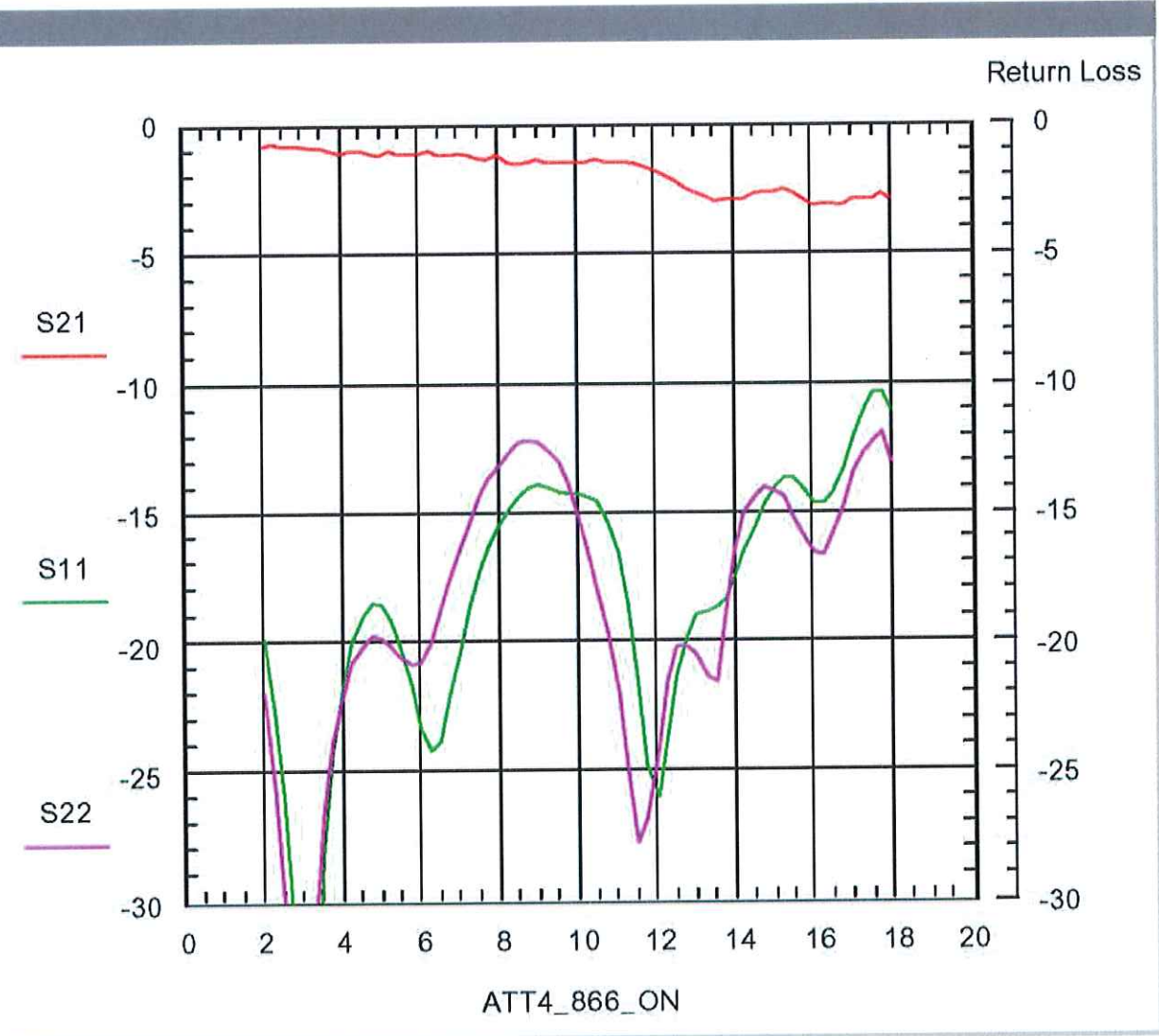


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +71°C
ATTENUATOR 3 (J4 – J10), SERIAL NUMBER: PM512711



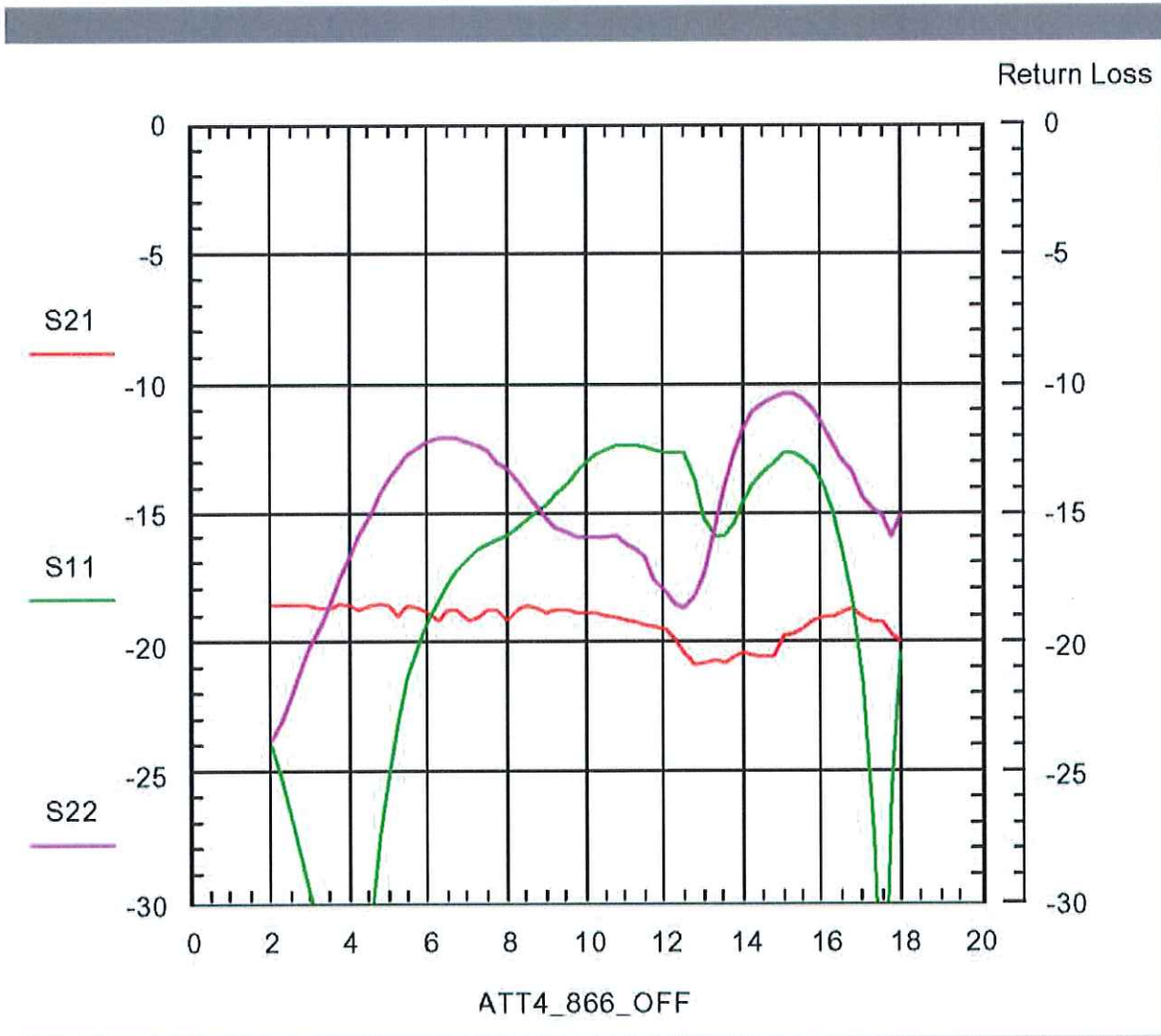


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +71°C
ATTENUATOR 4 (J5 – J11), SERIAL NUMBER: PM512866



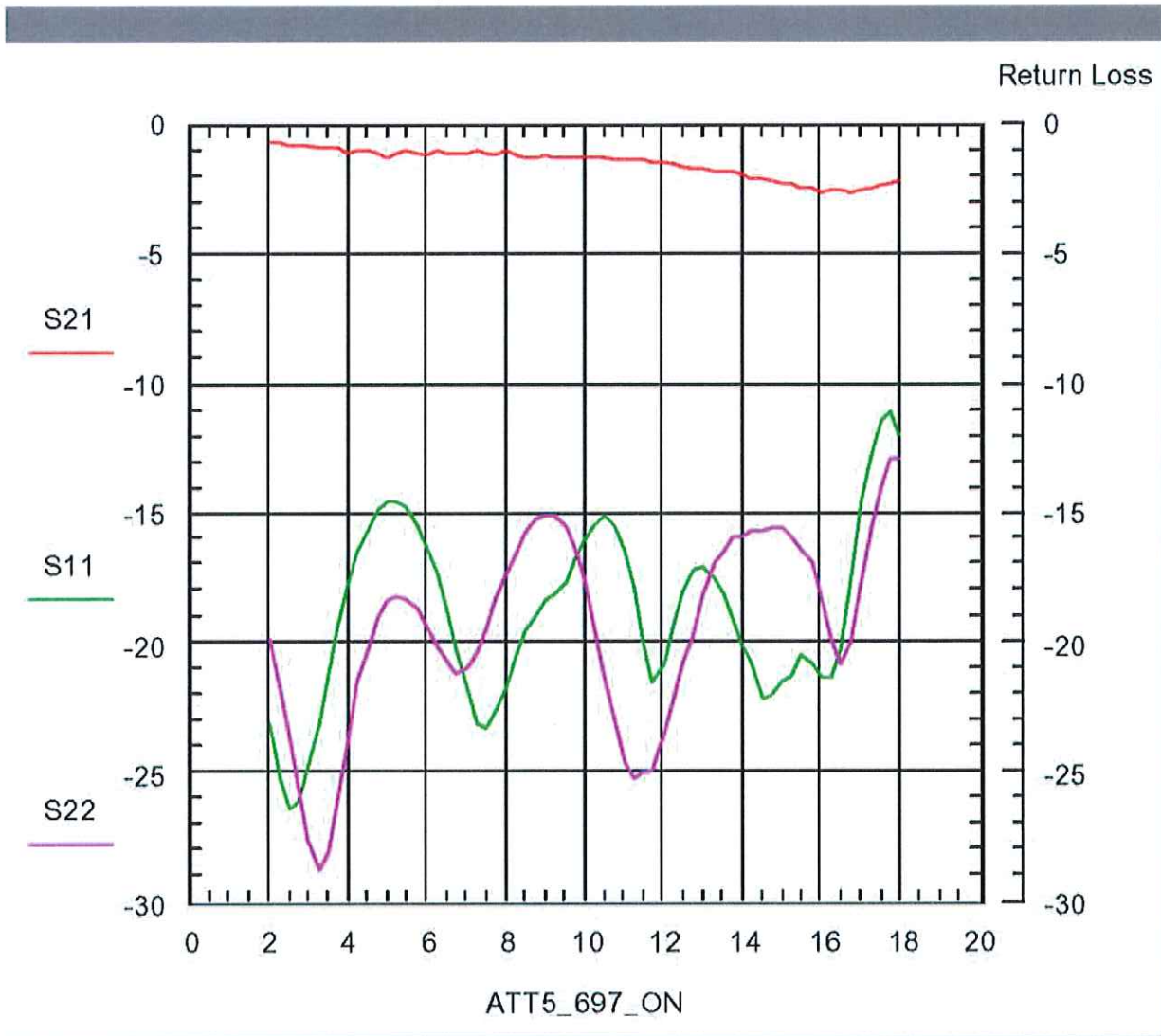


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +71°C
ATTENUATOR 4 (J5 - J11), SERIAL NUMBER: PM512866



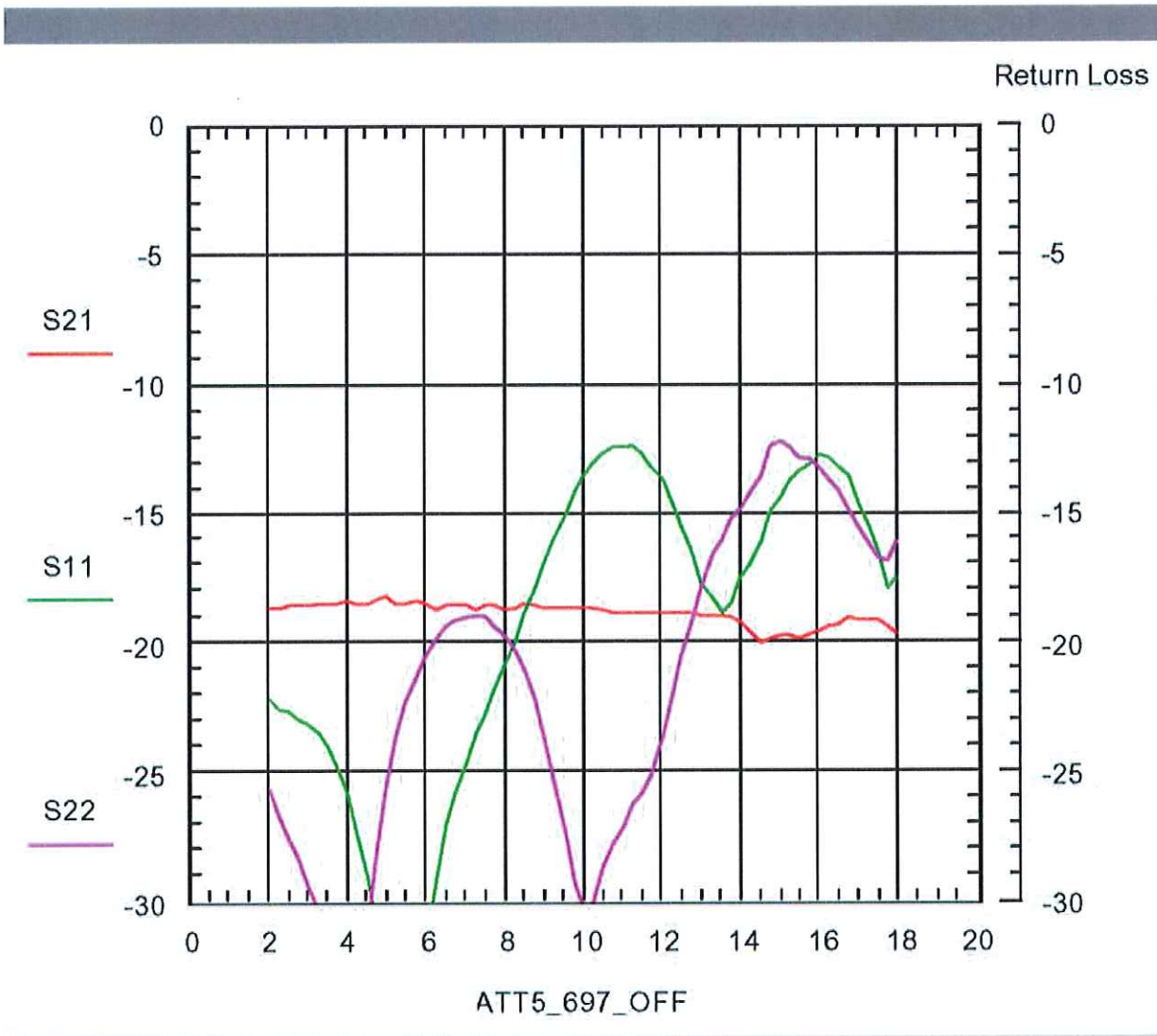


INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +71°C
ATTENUATOR 5 (J6 – J12), SERIAL NUMBER: PM512695



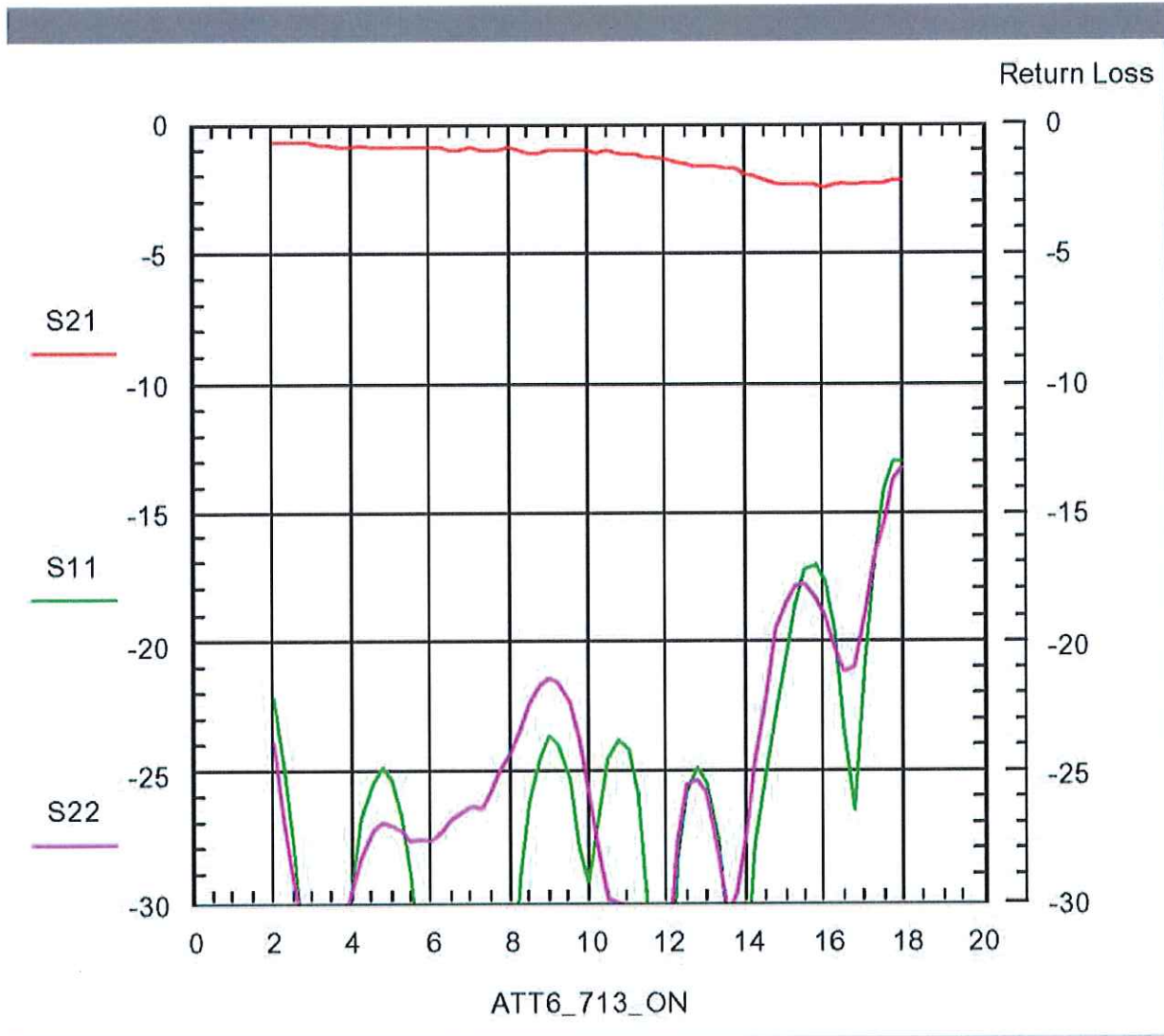


20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +71°C
ATTENUATOR 5 (J6 – J12), SERIAL NUMBER: PM512697





INSERTION LOSS (LOGIC: 1) DATA PLOT TAKEN @ +71°C
ATTENUATOR 6 (J7 – J13), SERIAL NUMBER: PM512713





20 dB ATTENUATION (LOGIC: 0) DATA PLOT TAKEN @ +71°C
ATTENUATOR 6 (J7 – J13), SERIAL NUMBER: PM512713

