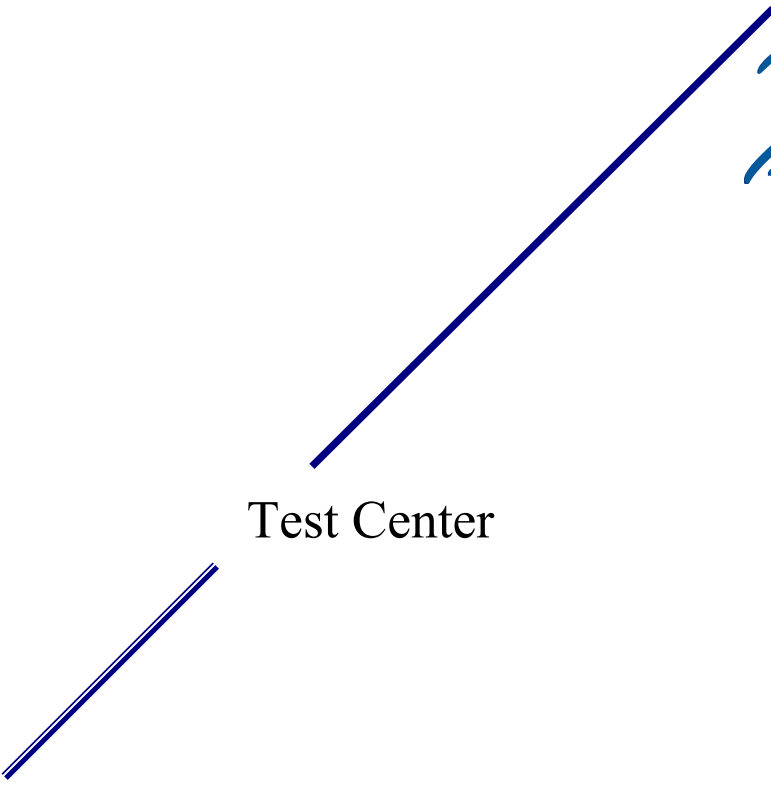


Two blue diagonal lines intersecting at the text 'Test Center'. One line extends from the top left towards the top right, and the other extends from the bottom left towards the top right.

Test Center

Test Report

of Radio Parameter Conformance Tests of the ODU-24 LBT-1 LM,
to be operated in the Broadband Radio Access System AXR-24

ODU-24 LBT-1 LM

Marconi Communications GmbH
Gerberstrasse 33
D-71522 Backnang
Germany

Edition 07.2005

ODU-24 LBT-1 LM

Testing Laboratory:

Marconi Communications GmbH
Gerberstr.33
D-71522 Backnang / Germany
Technical Support - Test Center

Phone: +49 (0)7191- 13 4540
Fax: +49 (0)7191- 13 64540
E-mail: Eberhard.Marx@marconi.com

Client information:

Mr. Khaled Fazel
Marconi Communications GmbH
D-71522 Backnang / Germany
Radio System Engineering

Receipt of item: 08th July 2005
Testing period: 08th July to 15th July 2005

Equipment under Test:

ODU-24 LBT-1 LM for AXR-24
Access Radio System Point-to-Point,
operating in the 24 GHz band

Description no.: ODU-24 LBT-1 LM
05HAA00105AAT
FCC-ID: THB-05HAA00105AAT
IC: 100K-00105AAT
Serial no.: 05 1006340
Manufacturer: Marconi Communications GmbH

Test Standards:

47 CFR 101 Subpart C (USA, 2004-10)
RSS-191 (Canada, 2002-08)

Test Summary:

The EUT is compliant with the requirements.

Tested by: Werner Schlecht
Date: 12th August 2005

Approved by: Eberhard Marx
Date: 12th August 2005



Signature



Signature

The test results relate only to the tested sample. Each modification at the test item may expire this test report.

Test Report:	Description-No.:	Designation:	Index:	Page:
AXR0705	05HAA00105AAT-TLA	ODU-24 UBT-1 LM	0001	1 of 44

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2 Device Under Test	4
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Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 2 of 44
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1 Summary of Compliance Status

All measurements are traceable to national standards.

The tests were performed on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 101, Subpart C, and RSS-191 (Industry Canada).

Tested Parameter	Test Requirement		Compliance Status
Transmitter Power Limitations	47 CFR 101.113	RSS-191 chap. 6.4	Compliant
Microwave Modulation	47 CFR 101.141	RSS-191 chap. 6.2	Compliant Note 2
Occupied Bandwidth	47 CFR 101.111	RSS-191 chap. 6.5	Compliant
Spurious Emissions at Antenna Port	47 CFR 101.111	RSS-191 chap. 6.5	Compliant Note 1
Receiver Spurious Emissions	--	RSS-191 chap. 6.6	Compliant Note 1
Radiated Spurious Emissions	47 CFR 101.111	RSS-191 chap. 6.5	Compliant Note 1
Frequency Stability	47 CFR 101.107	RSS-191 chap. 6.3	Compliant

Explanatory notes:

Compliant	When tested to the indicated specification the EUT was found wholly compliant
Note 1	Reference to Test Report No.: 2-5029-01-02/05 of CETECOM ICT Services.
Note 2	Possible modulation schemes are QPSK 2/3, QPSL 1/1, 16QAM, and 64QAM, configurable in static and adaptive mode. Due to the fact, that modulation format QPSK 2/3 will only be used in adaptive modulation and the typical probability for occurrence of QPSK 2/3 is less than 10 minutes per year, the test result was stated as compliant.

2 General Information

2.1 Device Under Test (ODU-24 LBT-1 LM)

Manufacturer		Marconi Communications GmbH			
Model Name		ODU-24 LBT-1 LM			
Model Number		05HAA00105AAT			
Serial Number		05 1006340			
Frequency Range	transmit receive	24 266 MHz to 24 434 MHz 25 066 MHz to 25 234 MHz		for center frequencies	
Frequency setting stepsize		2 MHz			
Channel spacing		28 MHz		Bandwidth	
Modulation		QPSK 16QAM 64QAM		preconfigurable or adaptive per link	
Internal/External data source		external		IDU-AXR	
Emission Designator		28M0G7W 28M0D7W		QPSK modulated carrier 16QAM and 64QAM modulated carrier	
Output power	modulation maximum	static	adaptive	QPSK 16QAM 64QAM all modulations, via static RTPC	
		+19 dBm	+16 dBm		
		+17 dBm	+16 dBm		
	minimum	+16 dBm	+16 dBm		
+1 dBm		+1 dBm			
Dynamic setting range of output power		15 dB			via ATPC, in addition to RTPC. ATPC and adaptive modulation controlled via receive power level at opposite station
Receive noise figure		6 dB (typ.)			
Antenna port		waveguide R260			
Supply voltage	nominal	-48 Vdc			
	tolerance	-36 Vdc to -72 Vdc			

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2.2 System block diagram / test configuration

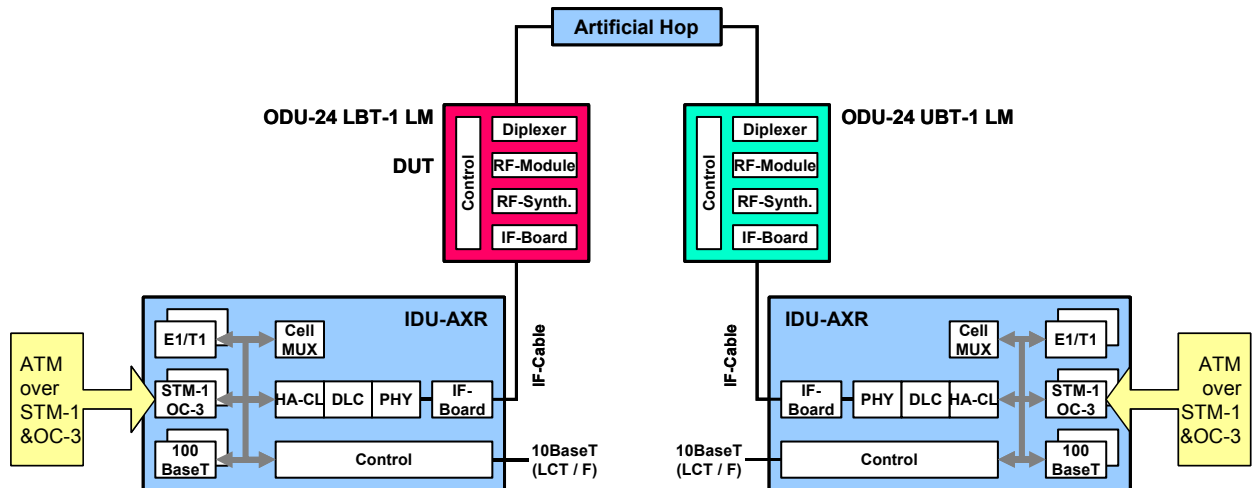


Figure 1 Test configuration

Channel configuration:

Measured frequency pairs :

24 266 MHz / 25 066 MHz
24 350 MHz / 25 150 MHz
24 434 MHz / 25 234 MHz

TX/RX Separation:

800 MHz

Center gap:

600 MHz

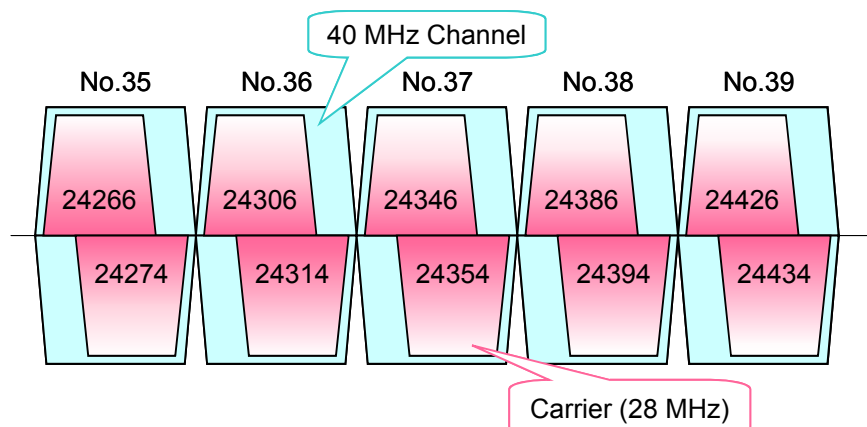


Figure 2 Individual channel carrier arrangement for lower sub band

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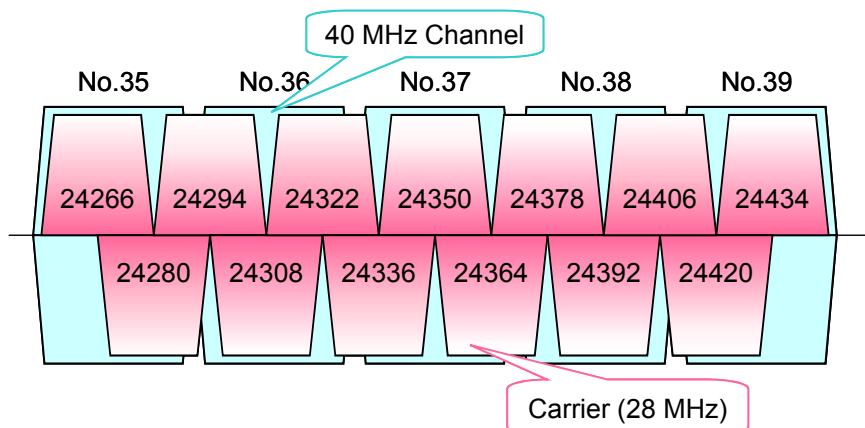


Figure 3 Contiguous channel carrier arrangement for lower sub band

2.3 Equipment list

Designation	Description- No	Serial number	Remarks
Upper band system			
Outdoor Radio Unit			
ODU 24 UBT-1 LM	05HAA00105ABL	05 1006335	
Modem-Unit			
IDU-AXR	05HAN00174AAR	05 1122162	
Lower band system (tested under climatic conditions)			
Outdoor Radio Unit			
ODU 24 LBT-1 LM	05HAA00105AAT	05 1006340	DUT
Modem-Unit			
IDU-AXR	05HAN00174AAR	05 1122159	

AXR Software: 0.9.1

2.4 Definitions and abbreviations

AS	Access Station
DLC	Data Link Control
DRS	Digital Radio System
DUT	Device under test
HA-CL	Hiper Access Convergence Layer
IDU	Indoor Unit
IF	Intermediate frequency
LCT	Local Craft Terminal
ODU	Outdoor Unit
PHY	Physical layer
RX	Receive Direction
SW	Software
TX	Transmit Direction

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2.5 Test equipment

No	Type	Manufacturer	Marconi Id	Serial No..
1	Spectrum Analyzer FSEK 30	R & S	40/63436	826939/009
2	Signal Generator SMP04	R & S	40/63468	826933/003
3	Frequency Counter MF 2414a	Anritsu	40/63462	MT07271
4	Power Meter ML 2438A	Anritsu	40/63459	97400024
5	Power Sensor MA 2424A	Anritsu	40/63461	971394
6	Power Sensor MA 2444A	Anritsu	40/65618	002278
7	GPS PRC SASE 5548	OSA	40/59431	-
8	Precision Rotary Attenuator 21611	Flann	40/63423	21
9	Precision Rotary Attenuator 21110	Flann	40/63418	54
10	SDH Tester ANT-20	W & G	40/59753	AS-0051
11	Attenuator 54-20	Weinschel	-	D9316
12	Ext. Mixer M19HW 40...60 GHz	R & S	-	U90519-4
13	Coupler 4227-16	Narda	40/65174	02856
14	Frequency doubler MUD-15-L-10F0	Millitech	--	10559

Accredited laboratories responsible for calibration: Acterna & Agilent.

2.6 Environmental test conditions

Normal ambient temperature: +23°C

Relative humidity: 33 %

Extreme temperature: Outdoor Unit -45°C and +55°C
Indoor Unit -5 °C and +45°C

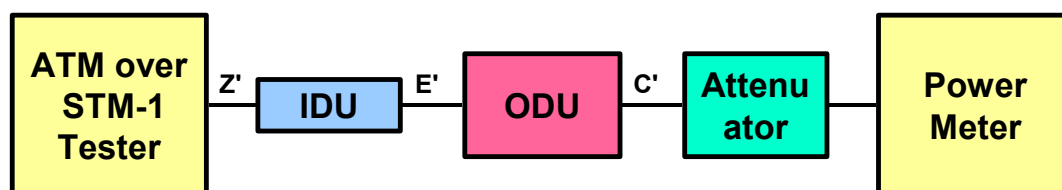
Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 7 of 44
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3 Test cases

3.1 Transmitter Power Limitations

Method of measurement: 47 CFR 2.1046

Test configuration:



Requirement:

RSS-191 chapter 6.4

Maximum carrier power of +10 dBW (+40 dBm) into the antenna.
The output power shall be within +/-1 dB of the rated power.

47 CFR 101.113 and 47 CFR 101.513

Maximum EIRP of +55 dBW for the band 24 250 to 25 250 MHz,
corresponding to +85 dBm (Note 1)

Footnote 5: Maximum power level per 250-kHz-slot of the occupied bandwidth:
0,5 W per nodal transmitter and 0,04 W per user transmitter.

Note 1

Largest antenna to be used with the DUT: 1.2 m diameter, 46.8 dBi on-axis gain. In order to comply with the limit of +85 dBm for EIRP, the transmit power into the antenna must not be higher than +38.2 dBm.

Test Result:

Maximum transmit power capability of the DUT	+19 dBm +/- 1 dB
Maximum transmit power density per 250 kHz-slot	0.002 W

The tests were performed

- for maximum and minimum transmit power at the antenna port of the DUT
- at the lowest, the medium, and the highest foreseen carrier frequencies (see fig. 2 & 3)
- at all potential modulation schemes (QPSK / 16QAM / 64QAM)
- at low, ambient, and high operational temperatures
- at low, nominal, and high supply voltage

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3.1.1 Maximum RF Output Power

Marconi Specification:

Maximum power at C'	
QPSK	+19 dBm ± 1 dB
16QAM	+17 dBm ± 1 dB
64QAM	+16 dBm ± 1 dB

Test Results:

ATPC enabled, nominal and max power set to max. output power values as specified.

Test conditions					Maximum transmitter power level at C'		
Temp. IDU	Temp. ODU	Bitrate	Modulation	Power supply	24266 MHz	24350 MHz	24434 MHz
[°C]	[°C]	Mbit/s		[V]	[dBm]	[dBm]	[dBm]
-5	-45	38	QPSK	36/48/72	+19.5	+19.3	+19.2
-5	-45	77	16QAM	36/48/72	+17.5	+17.3	+17.2
-5	-45	116	64QAM	36/48/72	+16.7	+16.5	+16.4
+23	+23	38	QPSK	36/48/72	+19.4	+19.3	+19.2
+23	+23	77	16QAM	36/48/72	+17.3	+17.2	+17.1
+23	+23	116	64QAM	36/48/72	+16.5	+16.4	+16.3
+45	+55	38	QPSK	36/48/72	+18.9	+18.8	+18.7
+45	+55	77	16QAM	36/48/72	+16.8	+16.7	+16.6
+45	+55	116	64QAM	36/48/72	+15.9	+15.8	+15.8

Measurement uncertainty	±0.3 dB
Test equipment used (item no)	4, 5

3.1.2 Minimum RF Output Power

Marconi Specification:

Minimum power at C'	
QPSK	+1 dBm
16QAM	+1 dBm
64QAM	+1 dBm

Test Results:

ATPC enabled, nominal and max. power set to min. output power values as specified.

Test conditions					Minimum transmitter power level at C'		
Temp IDU	Temp ODU	Bitrate	Modulation	Power supply	24266 MHz	24350 MHz	24434 MHz
[°C]	[°C]	Mbit/s		[V]	[dBm]	[dBm]	[dBm]
-5	-45	38	QPSK	36/48/72	+2.0	+1.8	+1.7
-5	-45	77	16QAM	36/48/72	+2.1	+1.8	+1.6
-5	-45	116	64QAM	36/48/72	+2.3	+2.1	+2.0
+23	+23	38	QPSK	36/48/72	+2.0	+1.8	+1.7
+23	+23	77	16QAM	36/48/72	+1.8	+1.7	+1.6
+23	+23	116	64QAM	36/48/72	+2.1	+1.8	+1.6
+45	+55	38	QPSK	36/48/72	+1.2	+1.1	+1.0
+45	+55	77	16QAM	36/48/72	+1.3	+1.1	+1.0
+45	+55	116	64QAM	36/48/72	+1.4	+1.4	+1.3

Measurement uncertainty	±0.3 dB
Test equipment used (item no)	4, 5

3.2 Microwave Modulation

Method of measurement: 47 CFR 2.1046

Requirement:

47 CFR 101.141 (DUT with digital modulation techniques)

For the 24 GHz-service, subparagraph (a)(1) is applicable, requiring a modulation efficiency of at least 1 bit/s/Hz. For customers having received licenses of more than a single 40-MHz-channel, the allocated channels can be used in a contiguous manner as stated in 47 CFR 101.109 footnote 7. This approach is applied in **Figure 3**.

Test Result:

Correlation between modulation format and efficiency:

modulation	occupied bandwidth	user data rate per carrier	single channel (40 MHz)		continuous channels	
			user data rate	efficiency	user data rate	efficiency
QPSK 2/3	28 MHz	25 Mbps	25 Mbps	0.625 bps/Hz	175 Mbps	0.875 bps/Hz
QPSK 1/1	28 MHz	38 Mbps	38 Mbps	0.95 bps/Hz	266 Mbps	1.33 bps/Hz
16QAM 1/1	28 MHz	77 Mbps	77 Mbps	1.925 bps/Hz	539 Mbps	2.695 bps/Hz
64QAM 1/1	28 MHz	116 Mbps	116 Mbps	2.9 bps/Hz	812 Mbps	4.06 bps/Hz

The user data rate shown in this table is fully available for user traffic, overheads are not included. Thus the modulation efficiency relates to the radio interface capacity and not to the gross bit rate (which would lead to higher figures)

3.3 Occupied Bandwidth

Method of measurement: 47 CFR 2.1049

Requirement:

RSS-191 chapter 6.5

47 CFR 101.111 (a)(2)(ii) & (iv) Spectrum mask for operating frequencies above 15 GHz

In any 1 MHz band, the center frequency of which is removed from the assigned frequency by more than 50 percent up to an including 250 percent of the authorized bandwidth: As specified by the following equation but in no event less than 11 decibels:

$$A = 11 + 0.4 \cdot (P - 50) + 10 \cdot \log(B)$$

with P = percent removed from center frequency

B = allocated channel (40-MHz-channels)

Attenuation greater than 56 decibels or to an absolute power of less than -13 dBm/1MHz is not required.

The maximum authorized bandwidth is 40 MHz according to 47 CFR 101.109. Unwanted emissions must be suppressed at the aggregate channel block edges based on the same roll-off rate as specified for a single channel block in 47 CFR 101.111 (a) (2) (ii), (iii) and (iv).

The formula including the power density limit of -13 dBm/MHz, which is referred to the transmit power capability of the ODU-24 LBT-1 LM and the occupied bandwidth of the carrier, is outlined in **Figure 4**. I.e., the blue line shows the requirement according to 47 CFR 101.111. The figure includes also the internal specification for the transmit spectrum mask of the ODU, for the worst case where the carrier is shifted by 4 MHz to the edge of the 40-MHz-channel. The suppliers ODU specification is significantly more stringent than required by 47 CFR 101.111.

The RSS-191 contains the same approach and the same limits as 47 CFR 101.111(a)(2).

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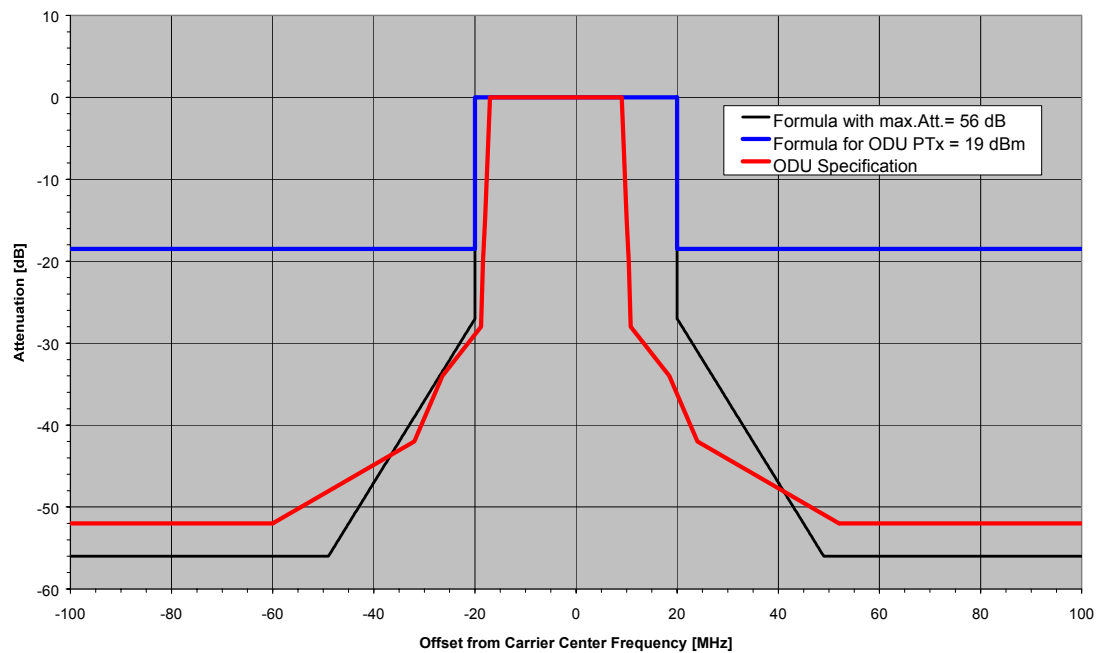
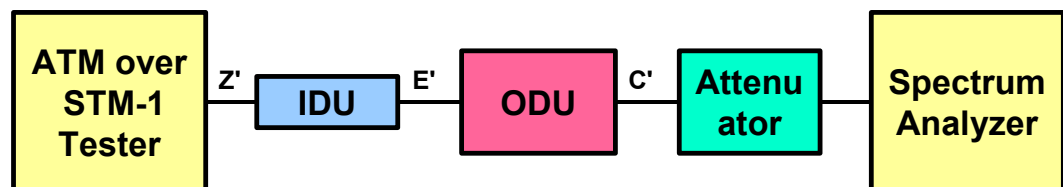


Figure 4 Spectrum Mask acc. to 47 CFR 101.111, with ODU specification for carrier shifted by 4 MHz from channel center

Test configuration:



Parameter	Setting
IF-Bandwidth	100 kHz
Total sweep width	160 MHz
Total scan time	automatic

Test Results:

The graphs for the occupied bandwidth signals are shown in the Annex. The ODU was set to the maximum transmitter power depending on the modulation scheme. '

The test were performed for

- the potential modulation schemes (QPSK / 16QAM / 64QAM)
- low, ambient, and high operational temperatures
- low, nominal, and high supply voltage

Test conditions					RF Spectrum at C' at max. Power		
Temp IDU	Temp ODU	Bitrate	Modulation	Power supply	24266 MHz	24350 MHz	24434 MHz
[°C]	[°C]	Mbit/s		[V]	Plot	Plot	Plot
-5	-45	38	QPSK	36/48/72	Plot No. 1	Plot No. 2	Plot No. 3
-5	-45	77	16 QAM	36/48/72	Plot No. 4	Plot No. 5	Plot No. 6
-5	-45	116	64 QAM	36/48/72	Plot No. 7	Plot No. 8	Plot No. 9
+23	+23	38	QPSK	36/48/72	Plot No. 10	Plot No. 11	Plot No. 12
+23	+23	77	16 QAM	36/48/72	Plot No. 13	Plot No. 14	Plot No. 15
+23	+23	116	64 QAM	36/48/72	Plot No. 16	Plot No. 17	Plot No. 18
+45	+55	38	QPSK	36/48/72	Plot No. 19	Plot No. 20	Plot No. 21
+45	+55	77	16 QAM	36/48/72	Plot No. 22	Plot No. 23	Plot No. 24
+45	+55	116	64 QAM	36/48/72	Plot No. 25	Plot No. 26	Plot No. 27

Measurement uncertainty (linearity) [dB]	<0.5
Measurement uncertainty (frequency) df/f	<3E-12
Test equipment used (item no)	1, 4, 6

3.4 Spurious Emissions at Antenna Terminals

This test and the results are covered by the test report:

CETECOM ICT Services GmbH: Test Report No.: 2-5029-01-02/05

3.5 Receiver Spurious Emissions

Transmitter and receiver are operated at the same waveguide port to the antenna, therefore the "Receiver Spurious Emissions" are also covered by the test report:

CETECOM ICT Services GmbH: Test Report No.: 2-5029-01-02/05

3.6 Field Strength of Spurious Radiation

This test and the results are covered by the test report:

CETECOM ICT Services GmbH: Test Report No.: 2-5029-01-02/05

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3.7 Frequency Stability

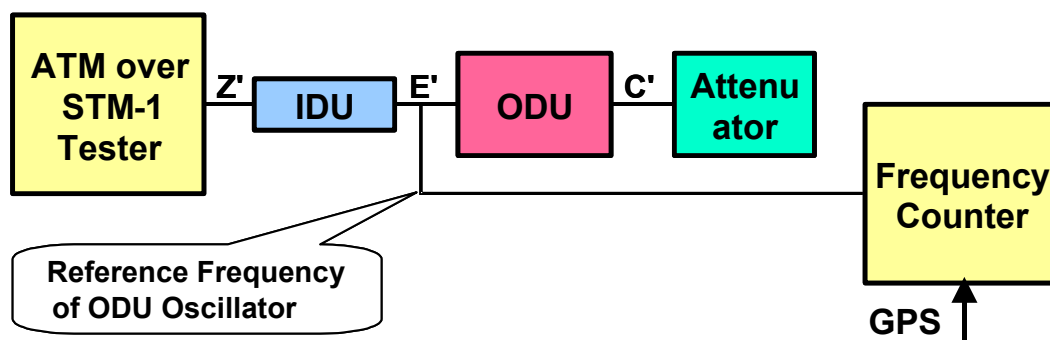
Method of measurement:

47 CFR 2.1055
RSS191 Item 4.3(b)

Requirement:

47 CFR 101.107	0.001% (= 10 ppm)
47 CFR 101.507	0.001% for Nodal Station 0.003% for User Station
RSS-191 chapter6.3	+/- 10 ppm

Test configuration:



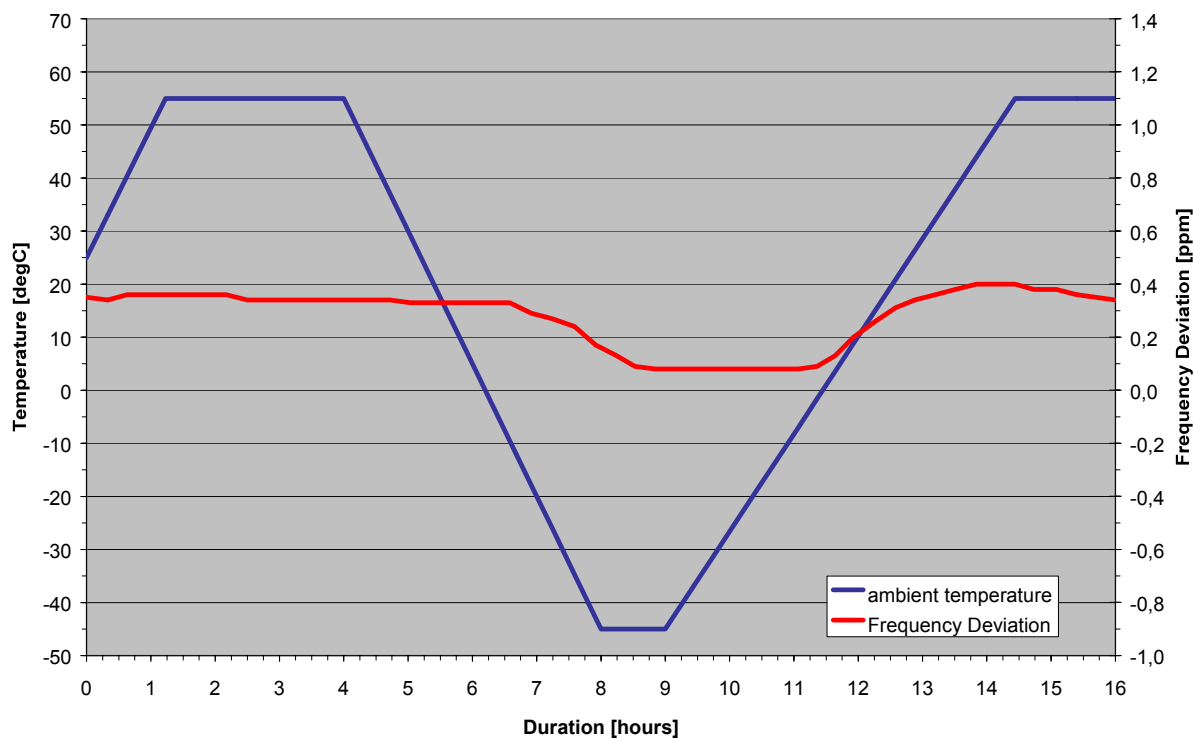
The DUT provides a reference signal at 55 MHz. This signal is directly correlated with all conversion frequencies of the ODU. Therefore measurement of this signal indicates the frequency stability of the unit.

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Test Result:

The test was performed under climatic conditions.

Max. measured frequency deviation: + 0.4ppm



Measurement uncertainty df/f	$<3E-12$
Test equipment used (item no)	3, 8

The test was performed for the range of supply voltage at ambient temperature.

Min. Voltage	-48 V range (85% to 115%)	-60 V range (85% to 115%)	Max. Voltage	Deviation
-36.0 V				variation less than 0.02 ppm
	-40.8 V			
	-48.0 V			
		-51.0 V		
	-55.2 V			
		-60.0 V		
		-69.0 V		
			-72.0 V	

Annex Plots

Plot No. 1

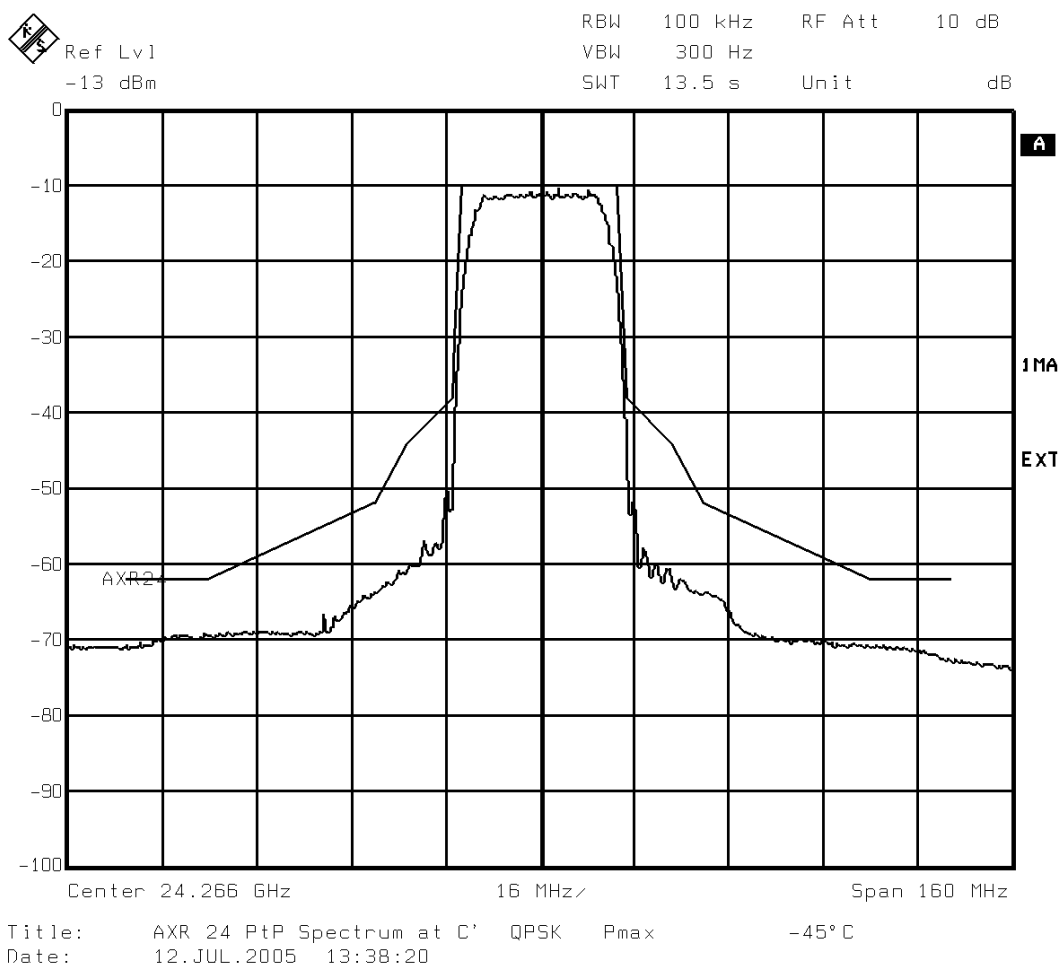
RF-Spectrum lower band

28 MHz Bandwidth QPSK

24 266 MHz

Temperature IDU -5°C

Temperature ODU -45 °C



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Plot No. 2

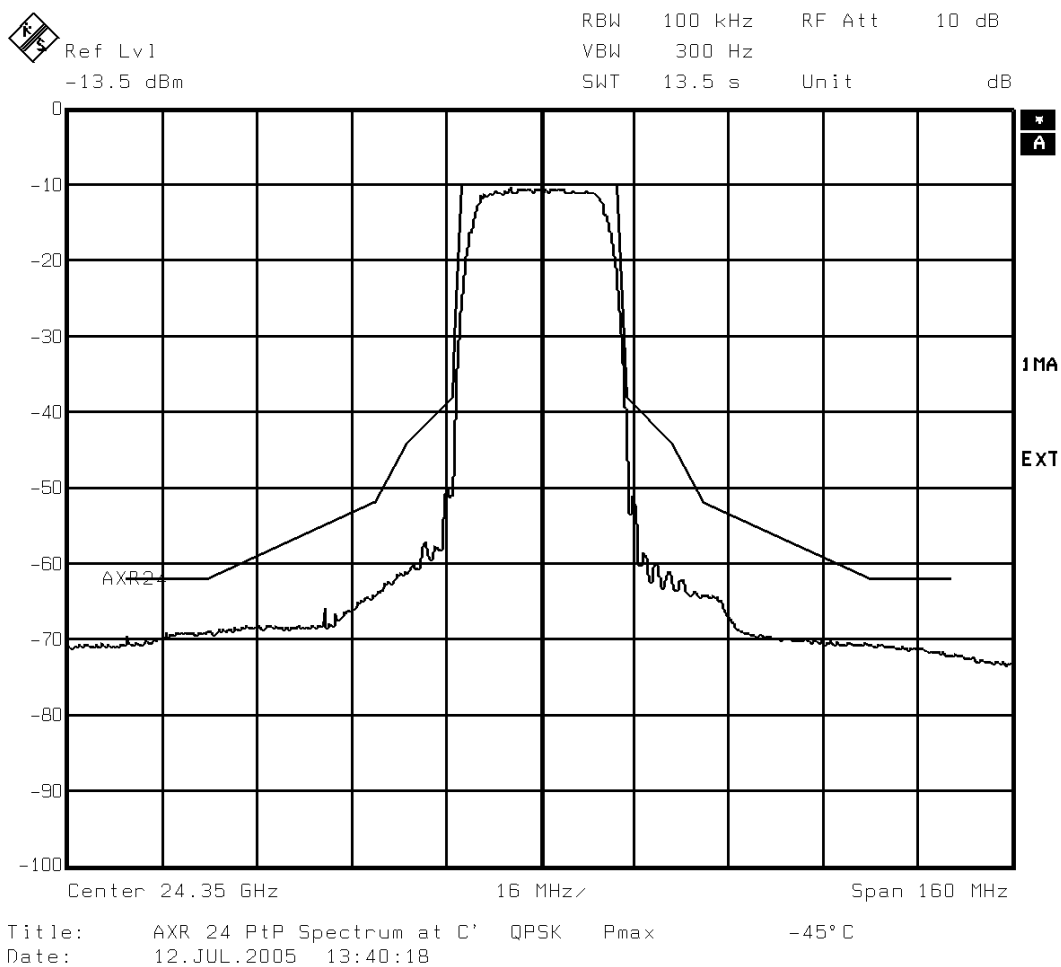
RF-Spectrum lower band

28 MHz Bandwidth QPSK

24 350 MHz

Temperature IDU -5°C

Temperature ODU -45 °C



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Plot No. 3

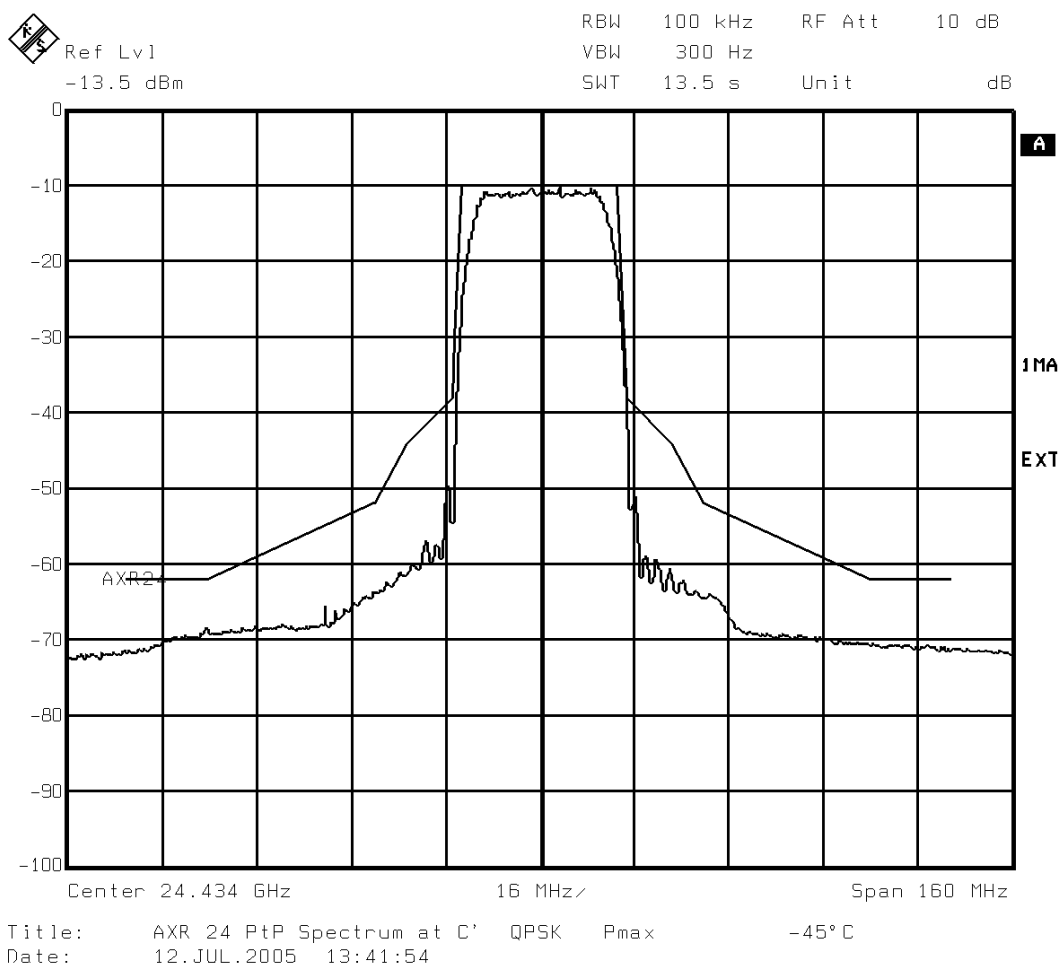
RF-Spectrum lower band

28 MHz Bandwidth QPSK

24 434 MHz

Temperature IDU -5°C

Temperature ODU -45 °C



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Plot No. 4

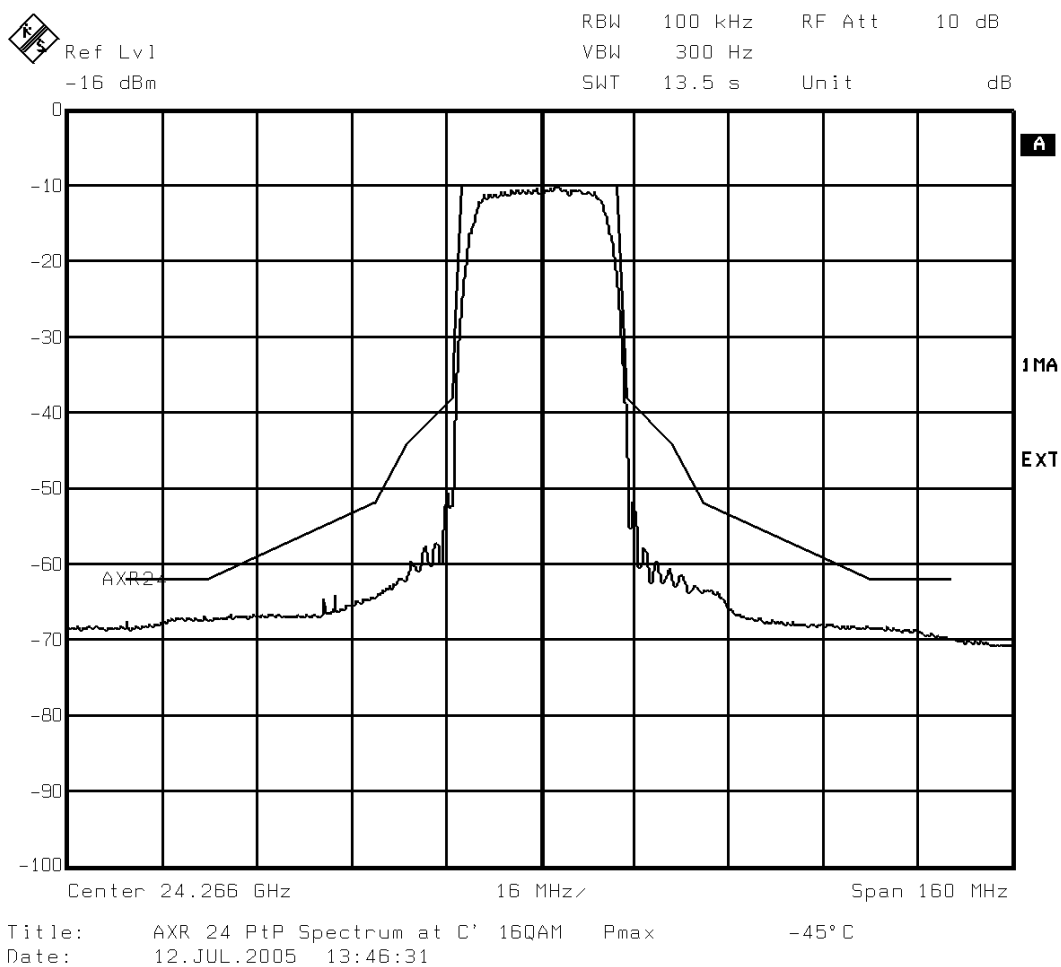
RF-Spectrum lower band

28 MHz Bandwidth 16 QAM

24 266 MHz

Temperature IDU -5°C

Temperature ODU -45 °C



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Plot No. 5

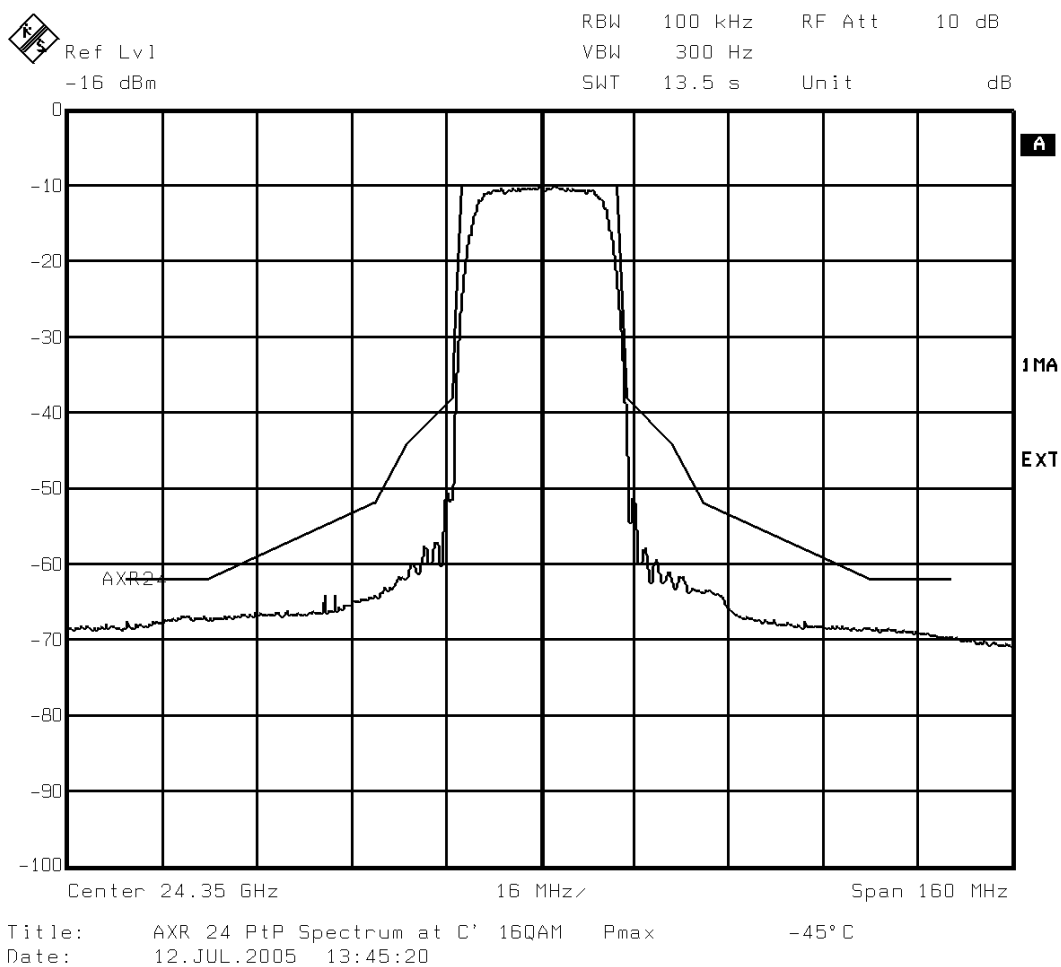
RF-Spectrum lower band

28 MHz Bandwidth 16 QAM

24 350 MHz

Temperature IDU -5°C

Temperature ODU -45 °C



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Plot No. 6

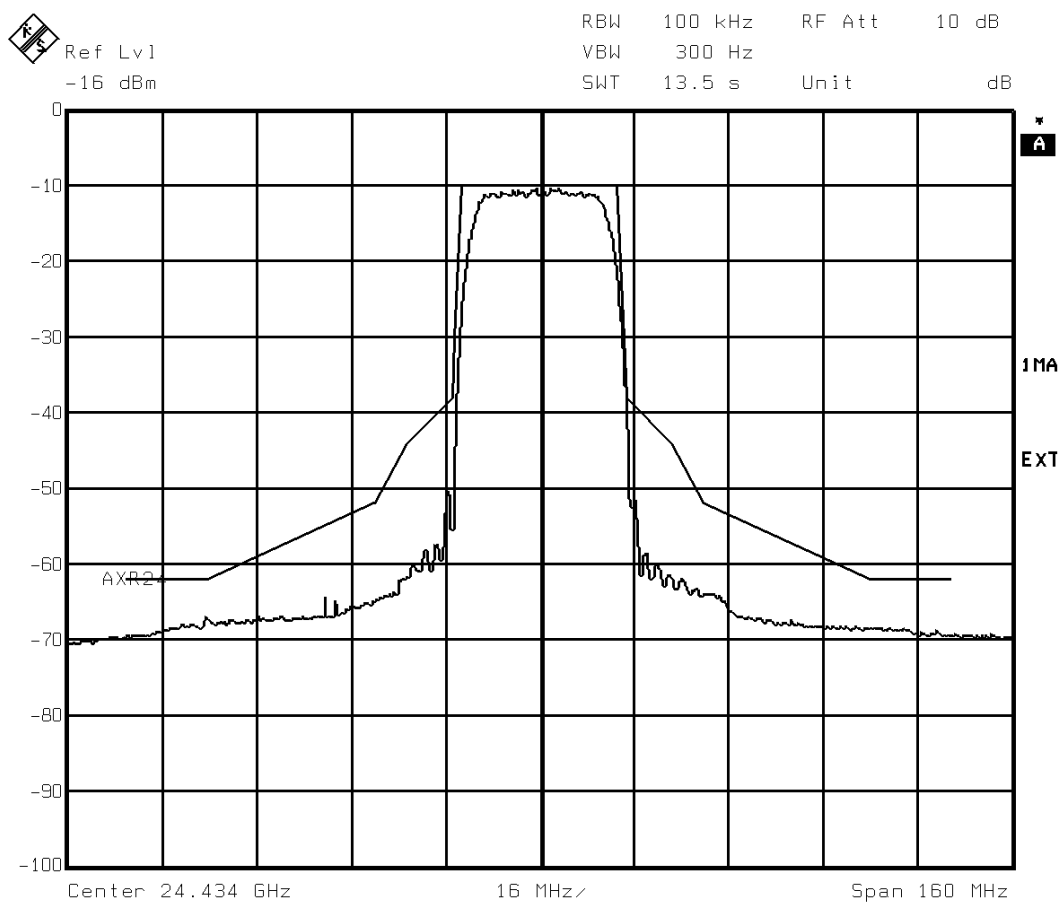
RF-Spectrum lower band

28 MHz Bandwidth 16 QAM

24 434 MHz

Temperature IDU -5°C

Temperature ODU -45 °C



Title: AXR 24 PtP Spectrum at C' 16QAM Pmax -45°C
 Date: 12.JUL.2005 13:44:09

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Plot No. 7

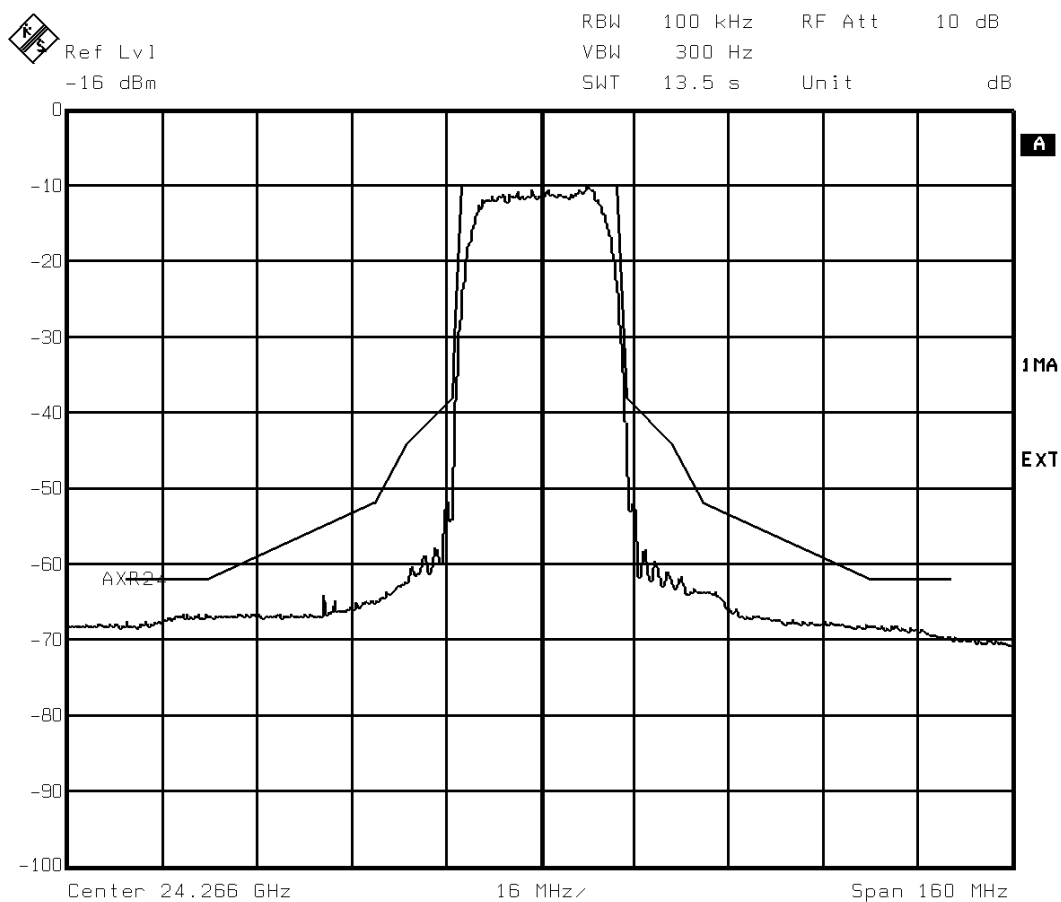
RF-Spectrum lower band

28 MHz Bandwidth 64 QAM

24 266 MHz

Temperature IDU -5°C

Temperature ODU -45 °C



Title: AXR 24 PtP Spectrum at C' 64QAM Pmax -45°C
Date: 12.JUL.2005 13:49:26

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 24 of 44
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Plot No. 8

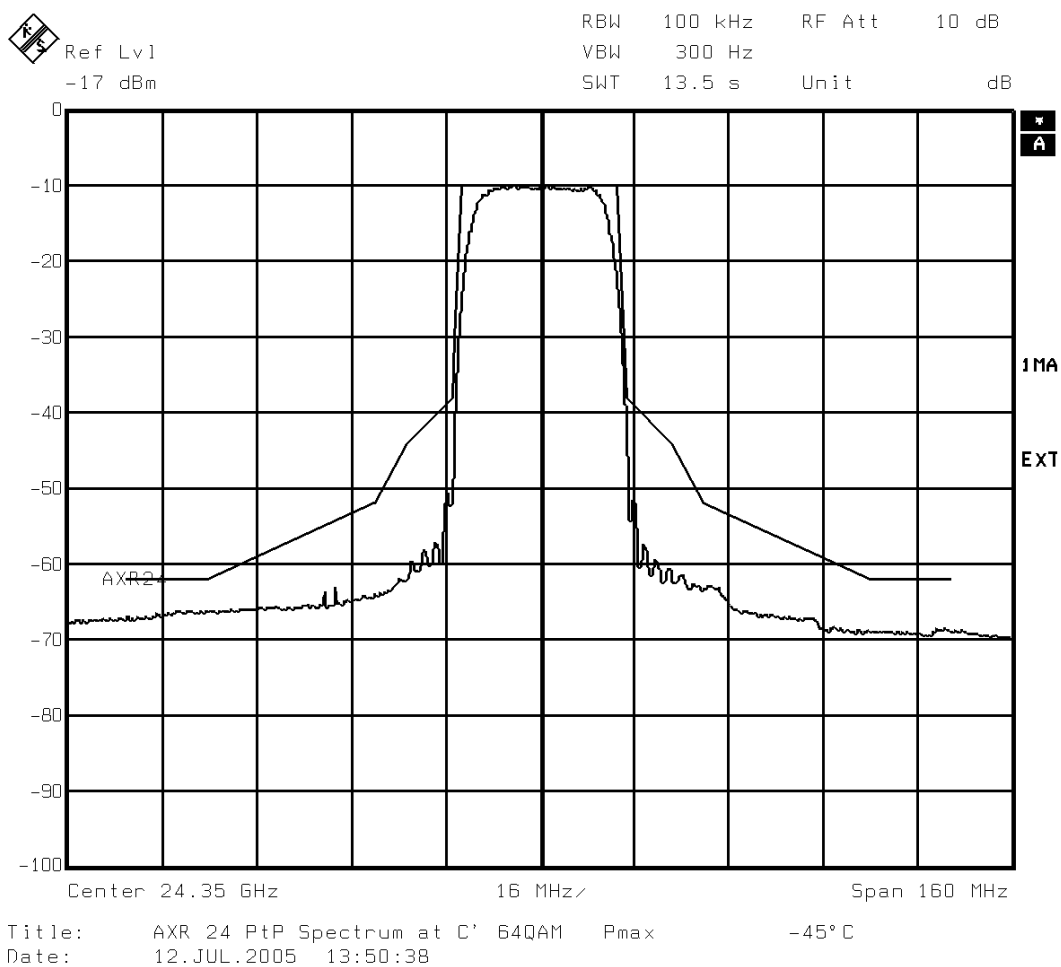
RF-Spectrum lower band

28 MHz Bandwidth 64 QAM

24 350 MHz

Temperature IDU -5°C

Temperature ODU -45 °C



Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 25 of 44
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Plot No. 9

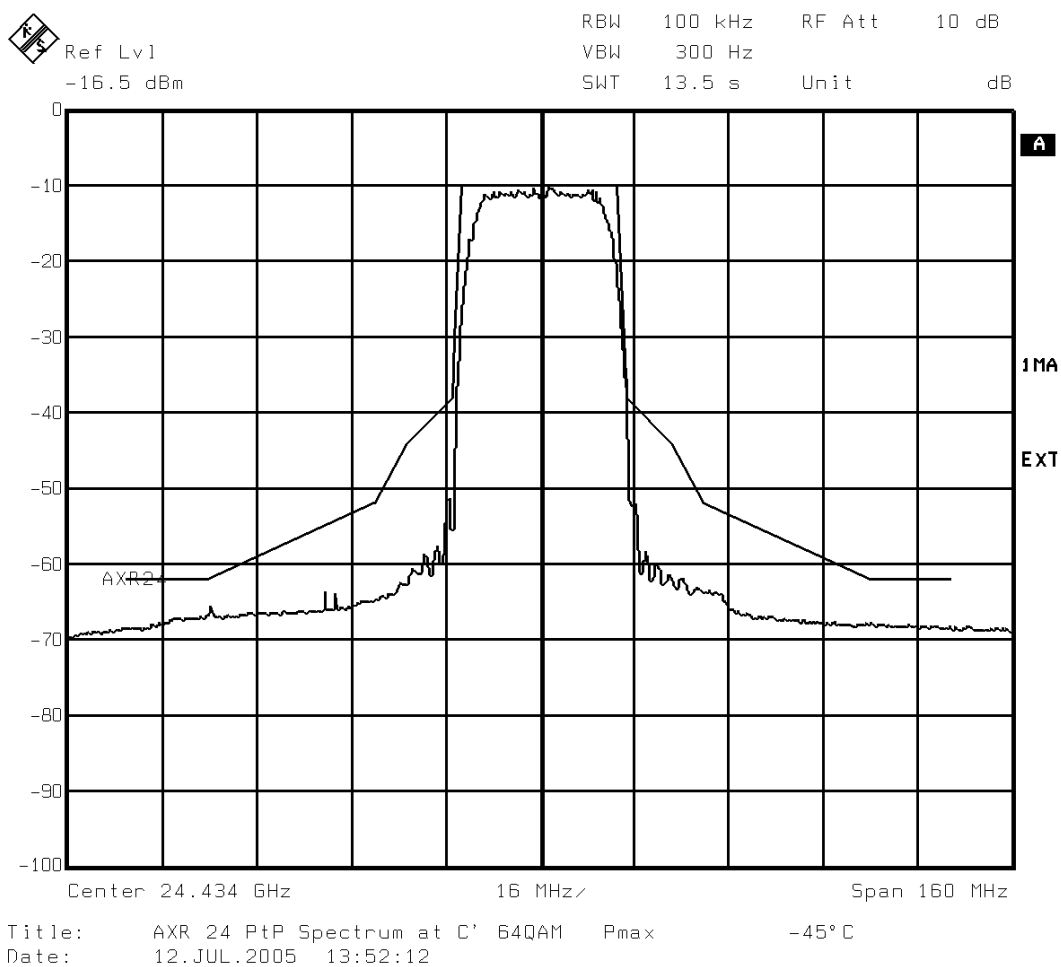
RF-Spectrum lower band

28 MHz Bandwidth 64 QAM

24 434 MHz

Temperature IDU -5°C

Temperature ODU -45 °C



Test Report:	Description-No.:	Designation:	Index:	Page:
AXR0705	05HAA00105AAT-TLA	ODU-24 UBT-1 LM	0001	26 of 44

Plot No. 10

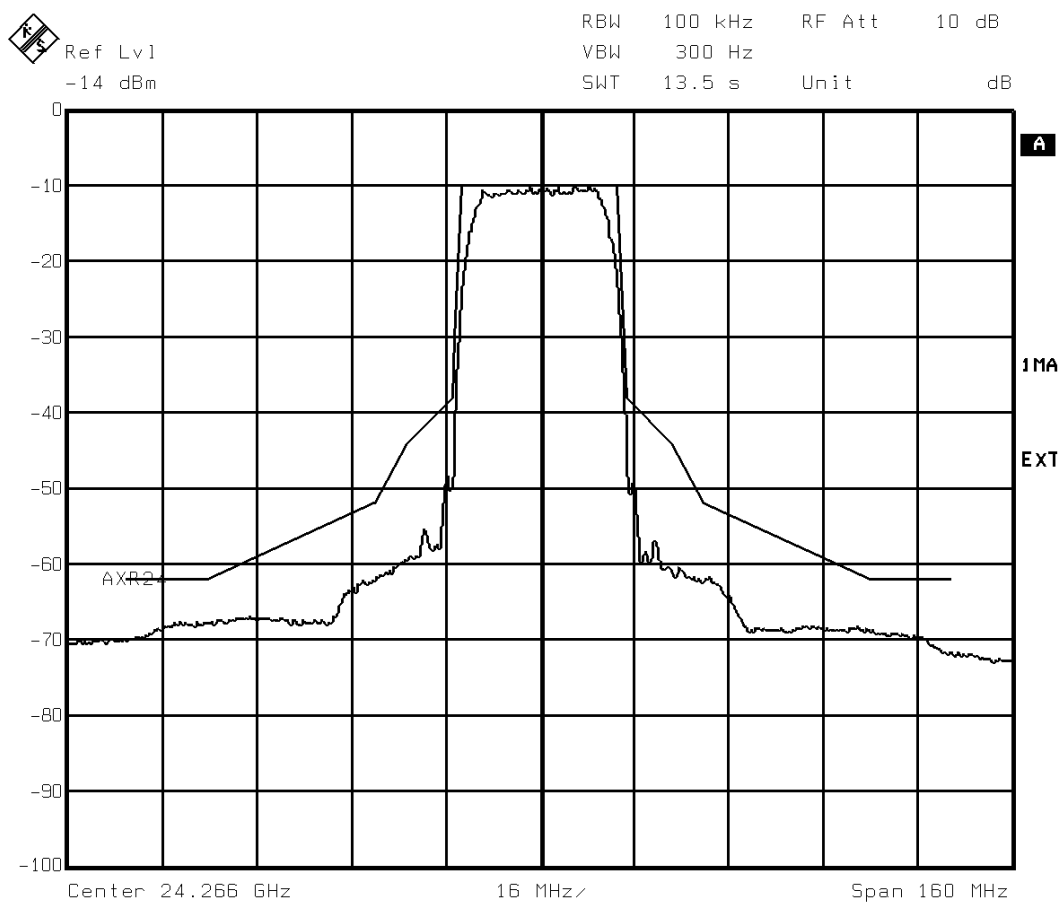
RF-Spectrum lower band

28 MHz Bandwidth QPSK

24 266 MHz

Temperature IDU +23°C

Temperature ODU +23 °C



Title: AXR 24 PtP Spectrum at C' QPSK Pmax +23°C
 Date: 8.JUL.2005 13:40:59

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 27 of 44
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Plot No. 11

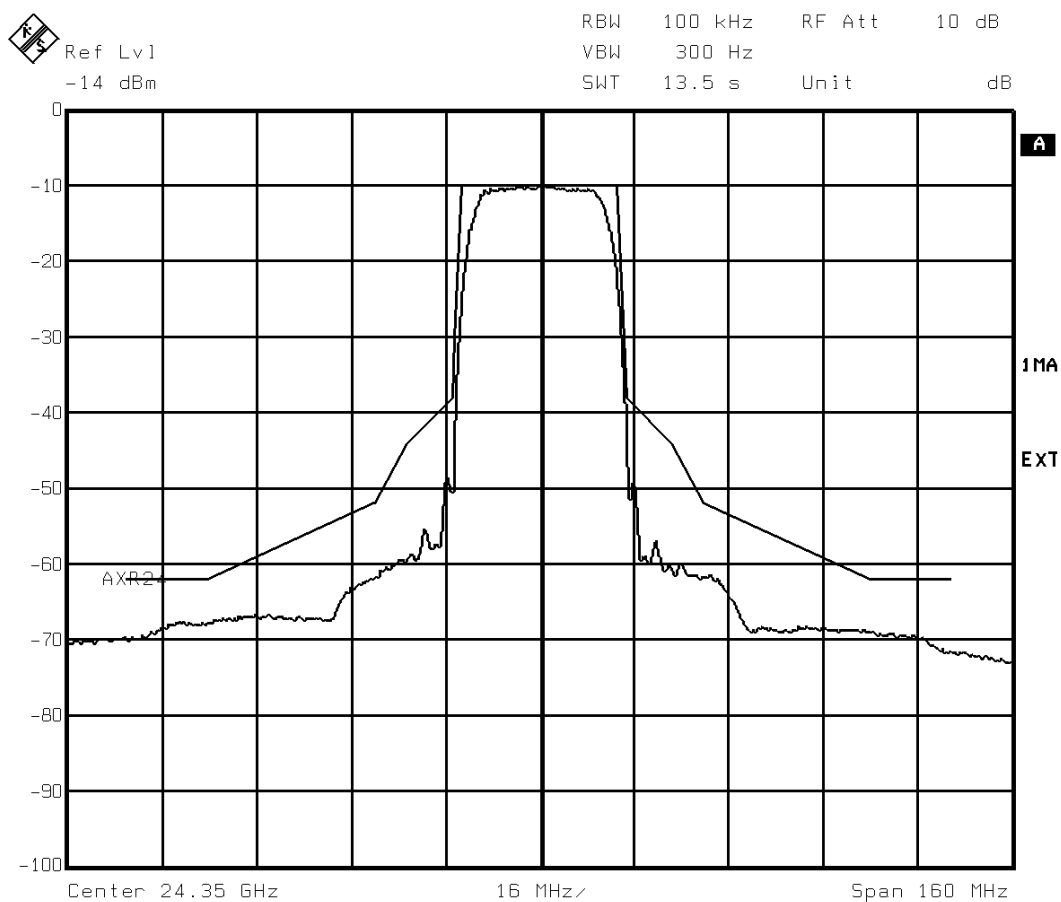
RF-Spectrum lower band

28 MHz Bandwidth QPSK

24 350 MHz

Temperature IDU +23°C

Temperature ODU +23 °C



Title: AXR 24 PtP Spectrum at C' QPSK 24350 MHz Pmax +23°C
 Date: 8.JUL.2005 12:28:02

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 28 of 44
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Plot No. 12

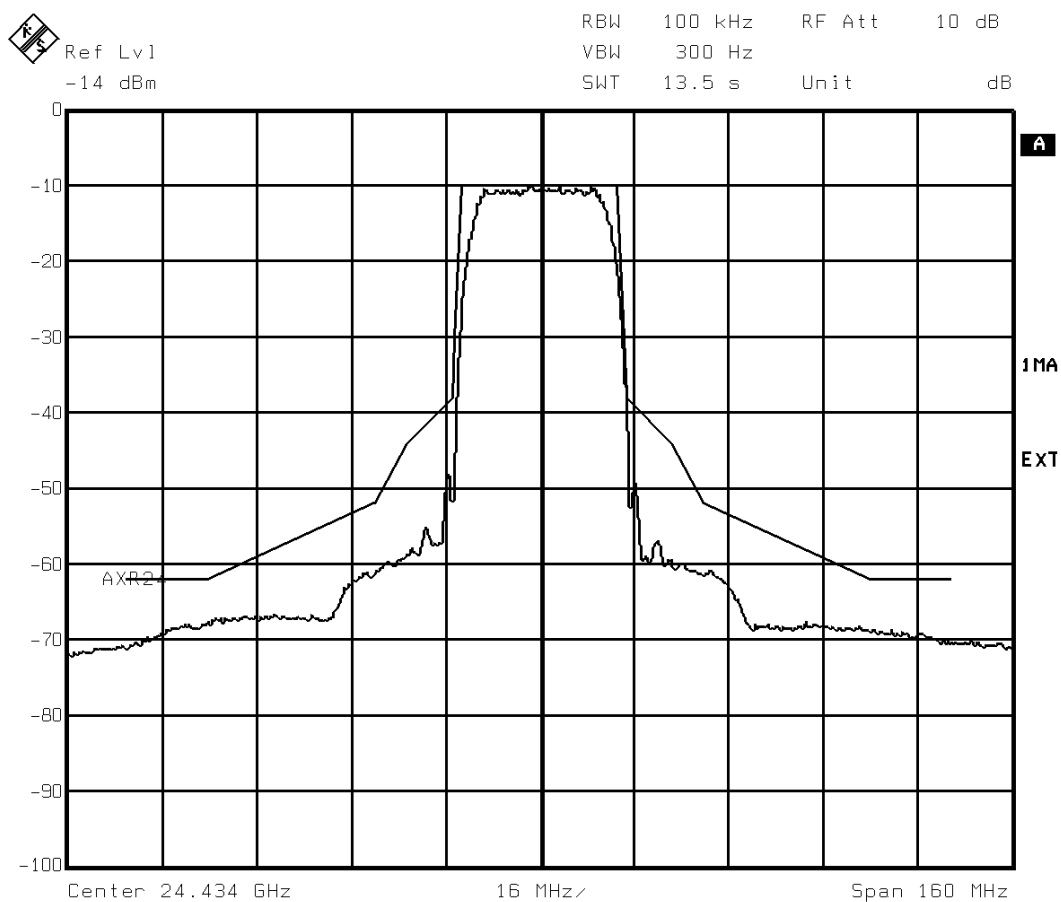
RF-Spectrum lower band

28 MHz Bandwidth QPSK

24 434 MHz

Temperature IDU +23°C

Temperature ODU +23 °C



Title: AXR 24 PtP Spectrum at C' QPSK Pmax +23°C

Date: 8.JUL.2005 13:43:16

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 29 of 44
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Plot No. 13

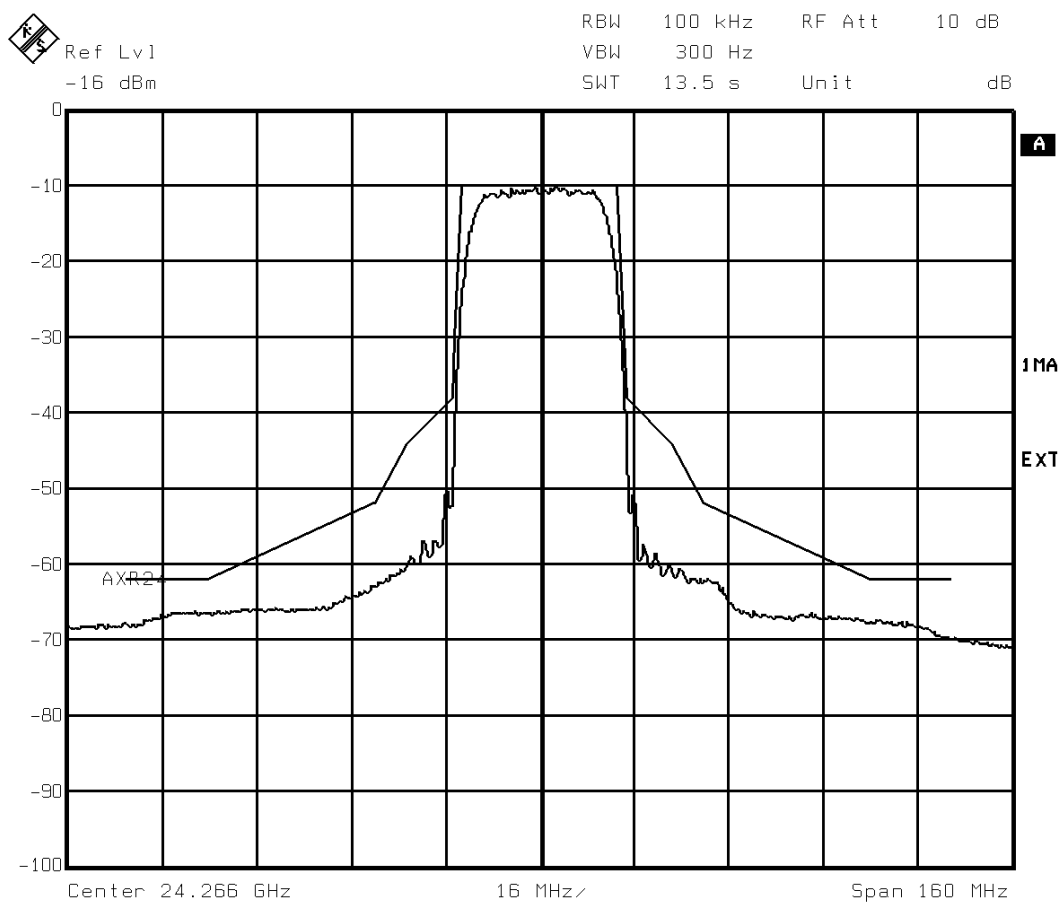
RF-Spectrum lower band

28 MHz Bandwidth 16QAM

24 266 MHz

Temperature IDU +23°C

Temperature ODU +23 °C



Title: AXR 24 PtP Spectrum at C' 16QAM Pmax +23° C

Date: 8.JUL.2005 13:47:29

Test Report:	Description-No.:	Designation:	Index:	Page:
AXR0705	05HAA00105AAT-TLA	ODU-24 UBT-1 LM	0001	30 of 44

Plot No. 14

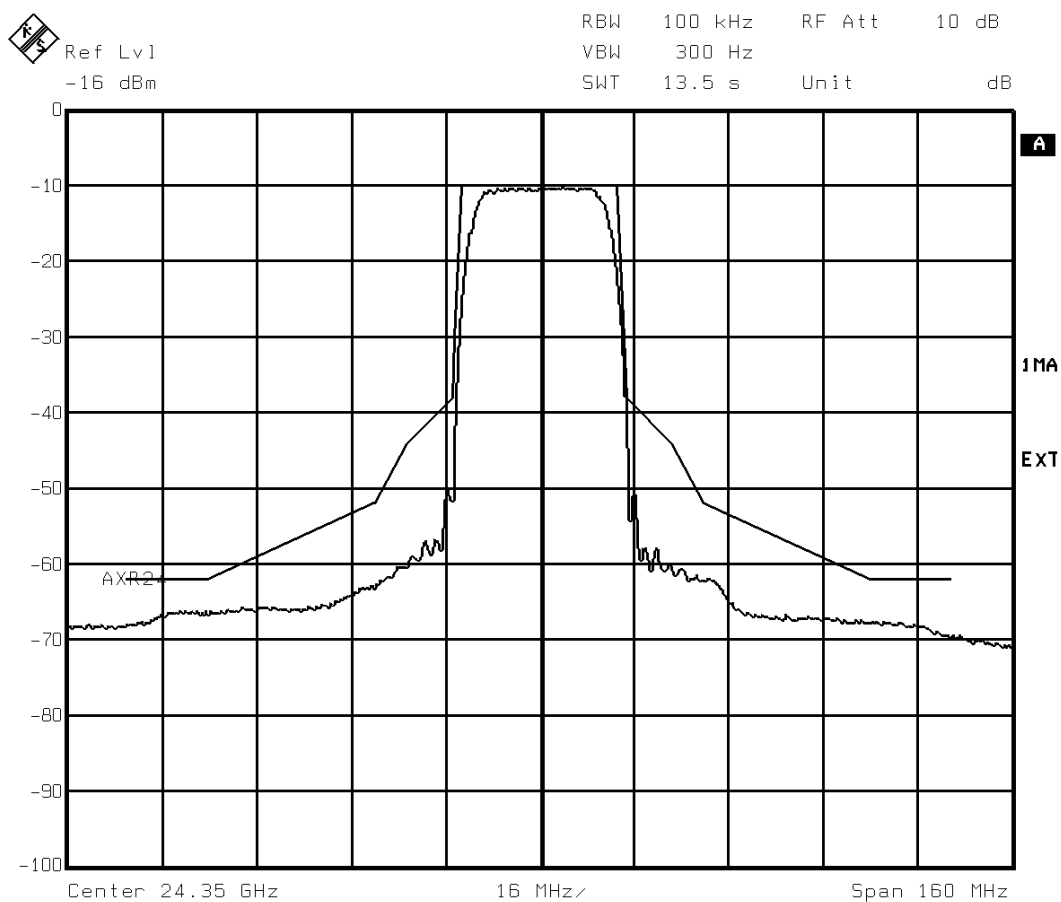
RF-Spectrum lower band

28 MHz Bandwidth 16QAM

24 350 MHz

Temperature IDU +23°C

Temperature ODU +23 °C



Title: AXR 24 PtP Spectrum at C' 16QAM Pmax +23° C
 Date: 8.JUL.2005 13:45:56

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 31 of 44
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Plot No. 15

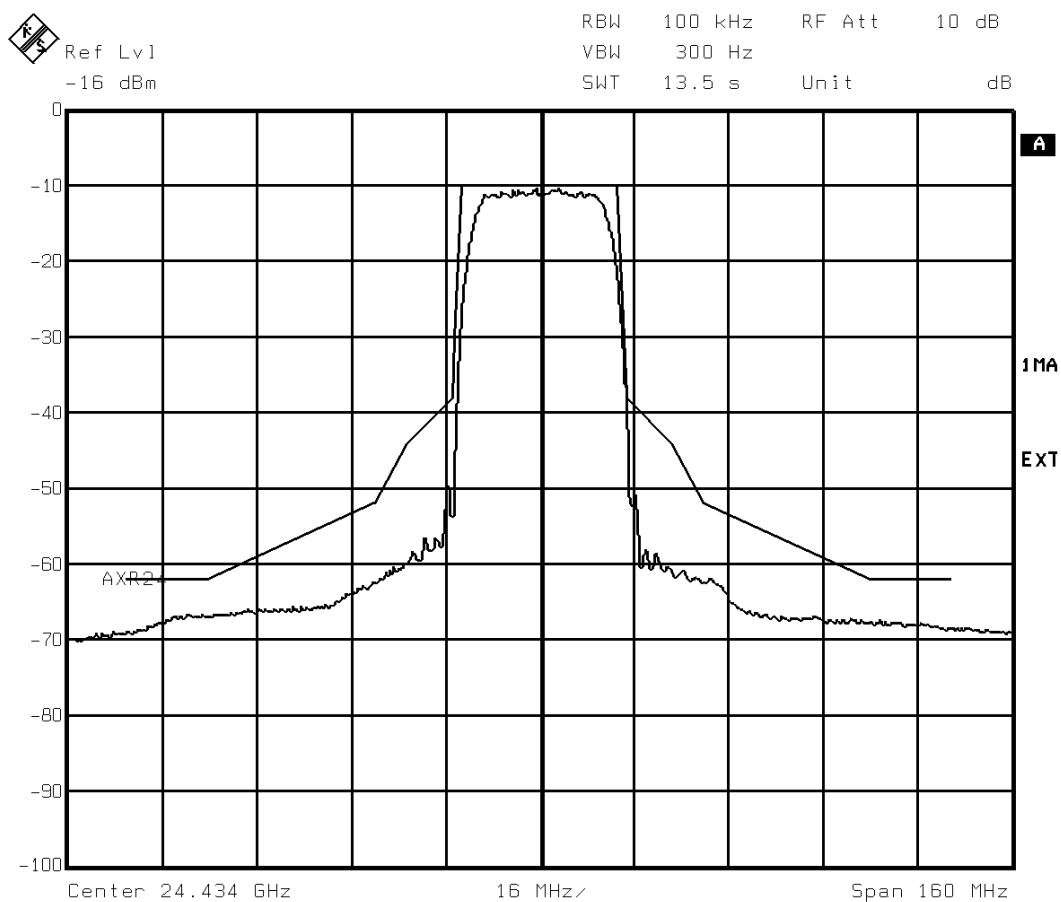
RF-Spectrum lower band

28 MHz Bandwidth 16QAM

24 434 MHz

Temperature IDU +23°C

Temperature ODU +23 °C



Title: AXR 24 PtP Spectrum at C' 16QAM Pmax +23° C
Date: 8.JUL.2005 13:45:02

Test Report:	Description-No.:	Designation:	Index:	Page:
AXR0705	05HAA00105AAT-TLA	ODU-24 UBT-1 LM	0001	32 of 44

Plot No. 16

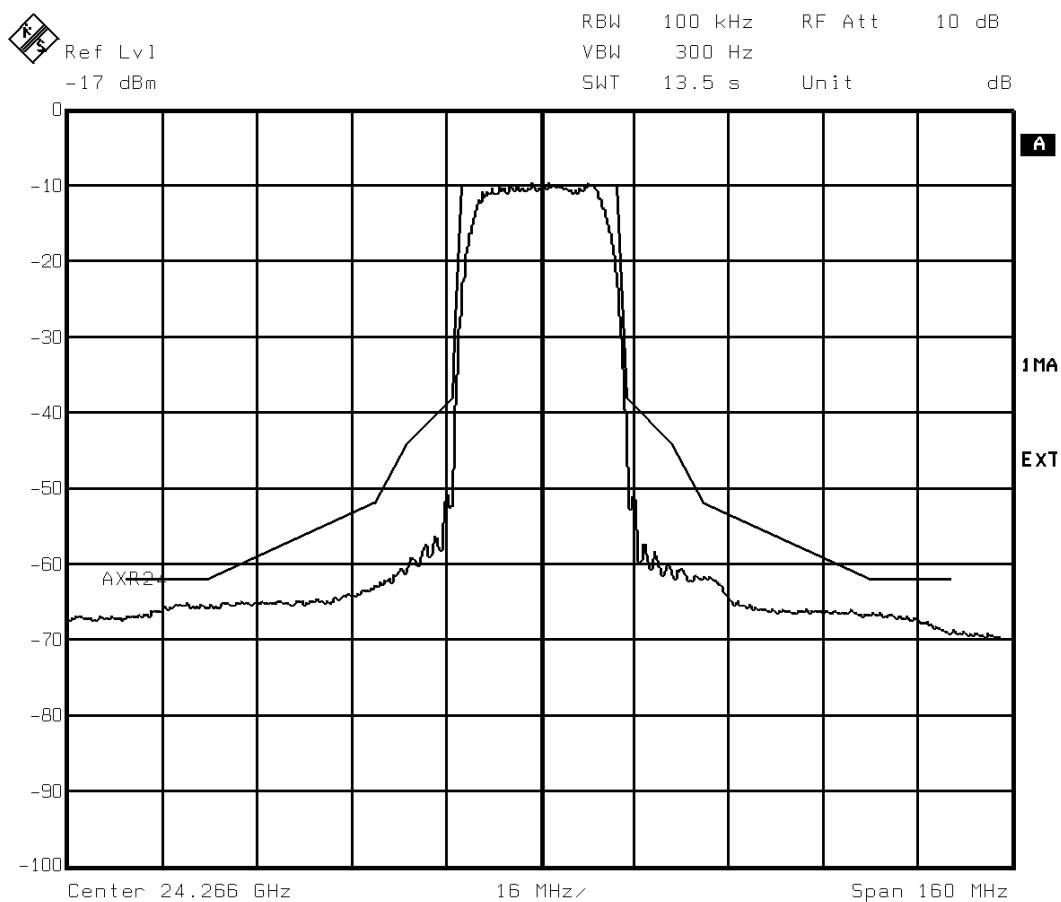
RF-Spectrum lower band

28 MHz Bandwidth 64 QAM

24 266 MHz

Temperature IDU +23°C

Temperature ODU +23 °C



Title: AXR 24 PtP Spectrum at C' 64QAM Pmax +23° C
Date: 8.JUL.2005 13:51:03

Test Report:	Description-No.:	Designation:	Index:	Page:
AXR0705	05HAA00105AAT-TLA	ODU-24 UBT-1 LM	0001	33 of 44

Plot No. 17

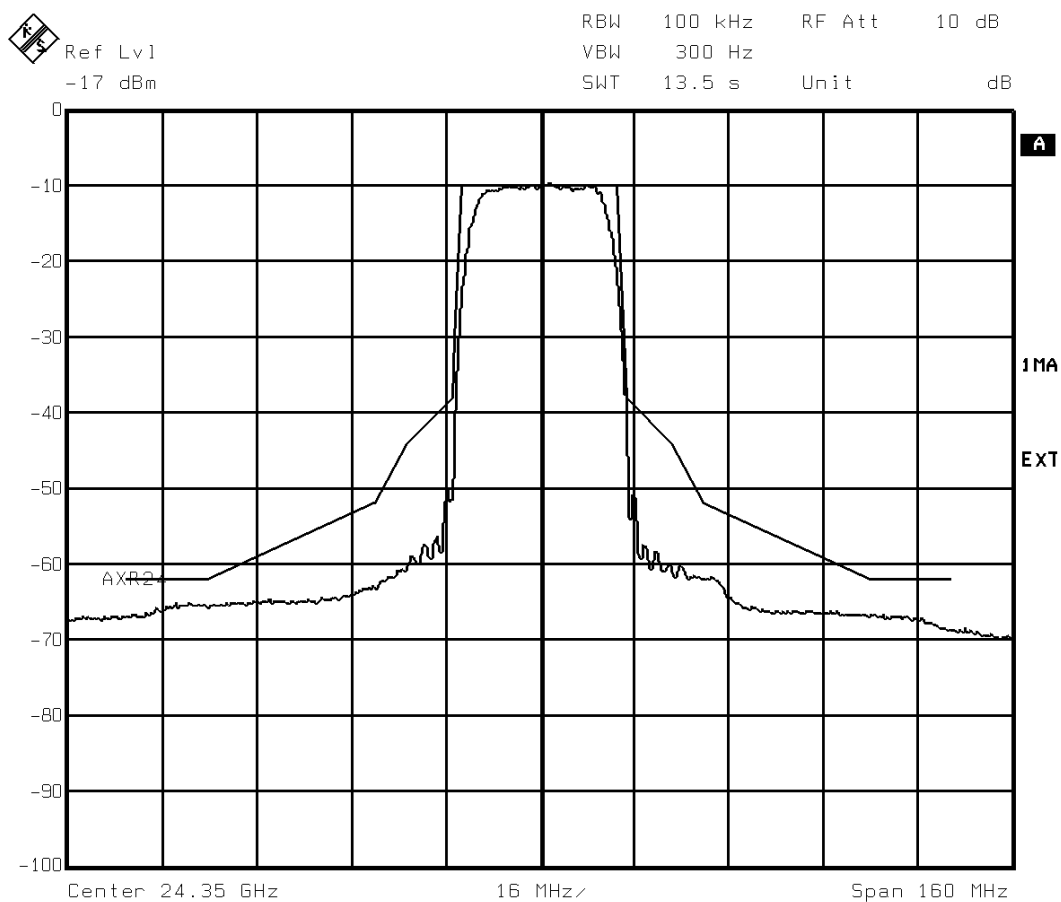
RF-Spectrum lower band

28 MHz Bandwidth 64 QAM

24 350 MHz

Temperature IDU +23°C

Temperature ODU +23 °C



Title: AXR 24 PtP Spectrum at C' 64QAM Pmax +23° C

Date: 8.JUL.2005 13:52:38

Test Report:	Description-No.:	Designation:	Index:	Page:
AXR0705	05HAA00105AAT-TLA	ODU-24 UBT-1 LM	0001	34 of 44

Plot No. 18

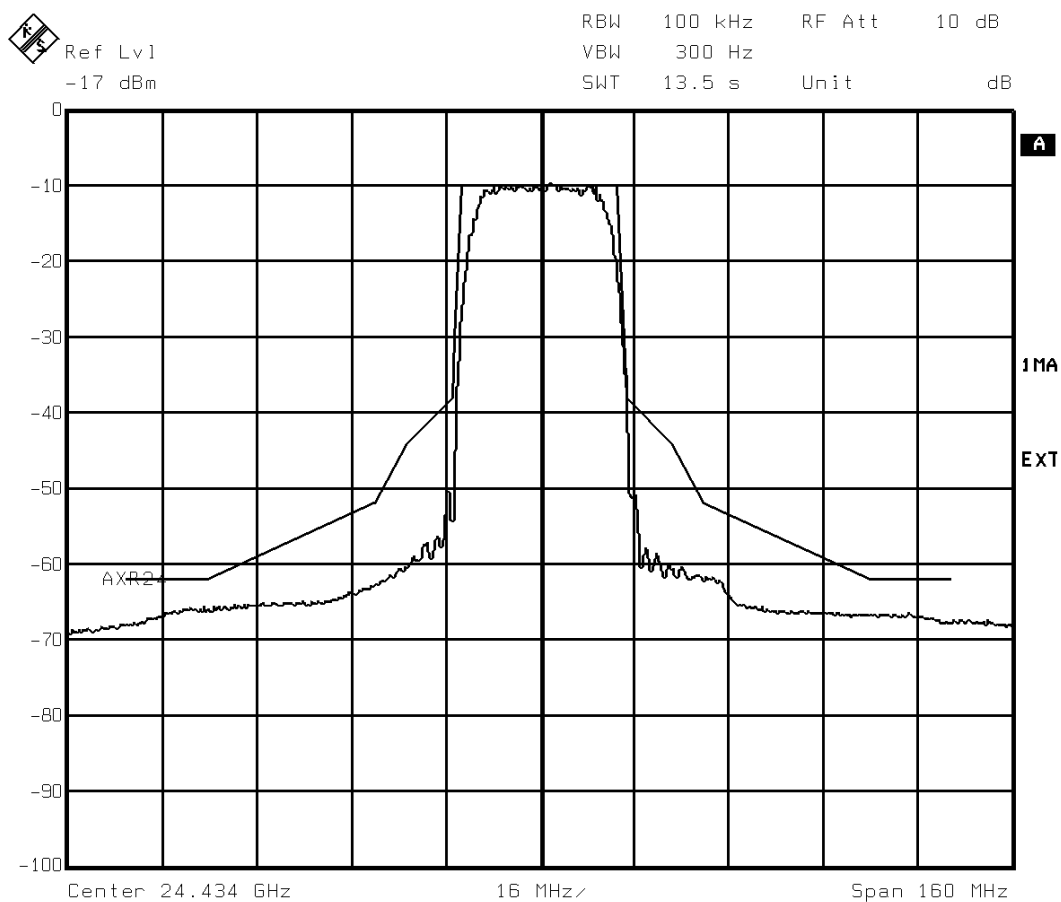
RF-Spectrum lower band

28 MHz Bandwidth 64 QAM

24 434 MHz

Temperature IDU +23°C

Temperature ODU +23 °C



Title: AXR 24 PtP Spectrum at C' 64QAM Pmax +23° C

Date: 8.JUL.2005 13:54:18

Test Report:	Description-No.:	Designation:	Index:	Page:
AXR0705	05HAA00105AAT-TLA	ODU-24 UBT-1 LM	0001	35 of 44

Plot No. 19

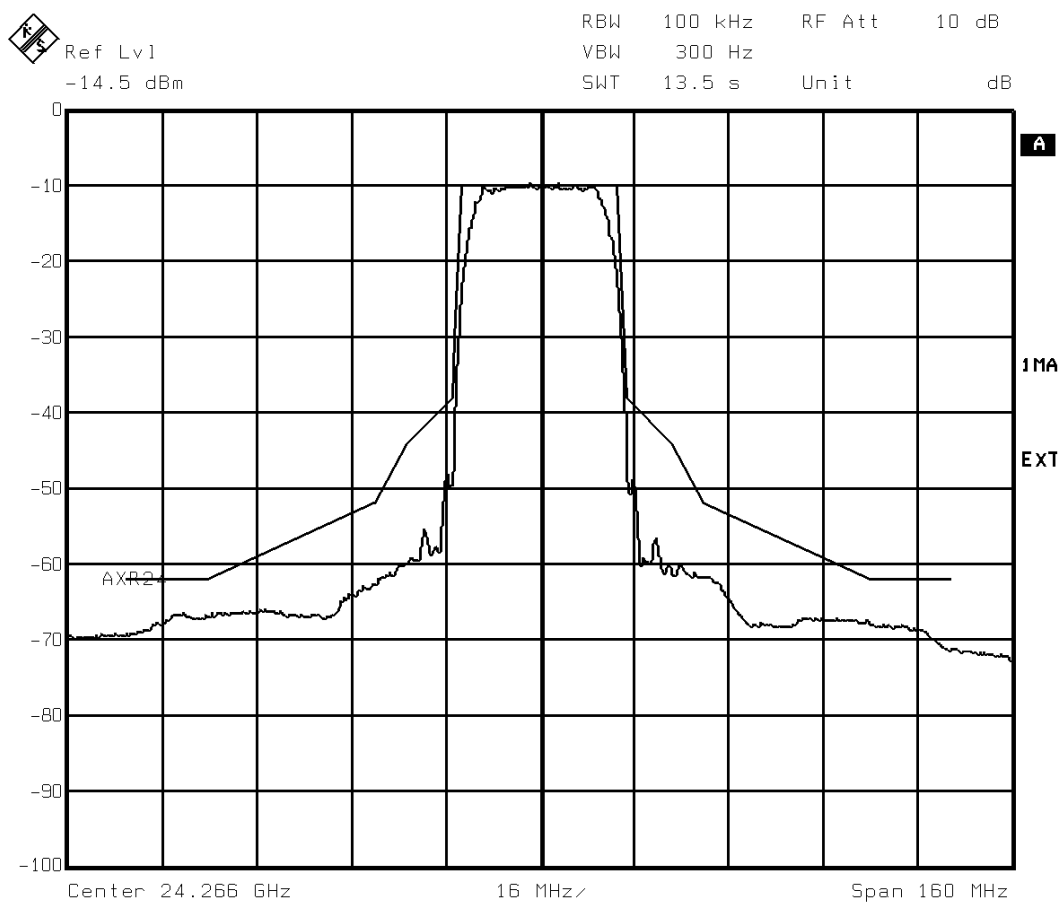
RF-Spectrum lower band

28 MHz Bandwidth QPSK

24 266 MHz

Temperature IDU +45°C

Temperature ODU +55 °C



Title: AXR 24 PtP Spectrum at C' QPSK Pmax +55°C
Date: 11.JUL.2005 14:44:41

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 36 of 44
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Plot No. 20

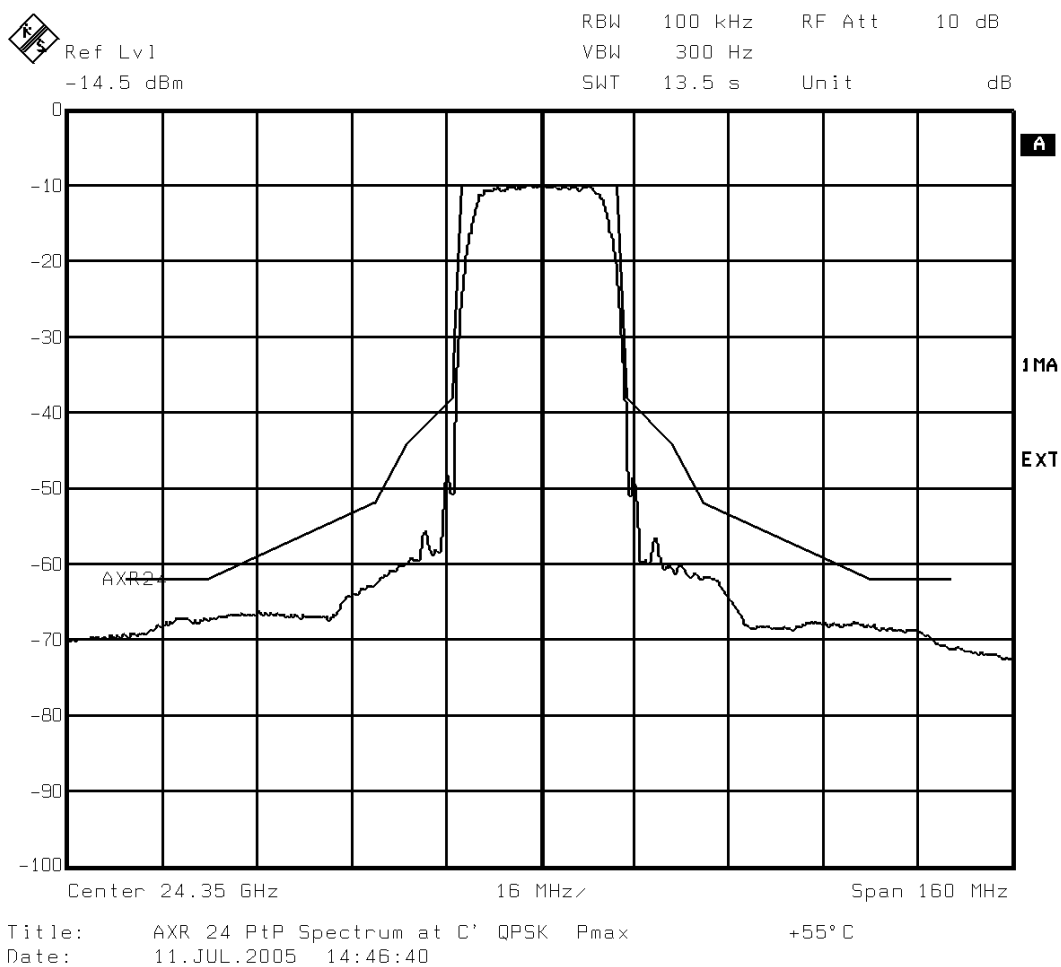
RF-Spectrum lower band

28 MHz Bandwidth QPSK

24 350 MHz

Temperature IDU +45°C

Temperature ODU +55 °C



Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 37 of 44
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Plot No. 21

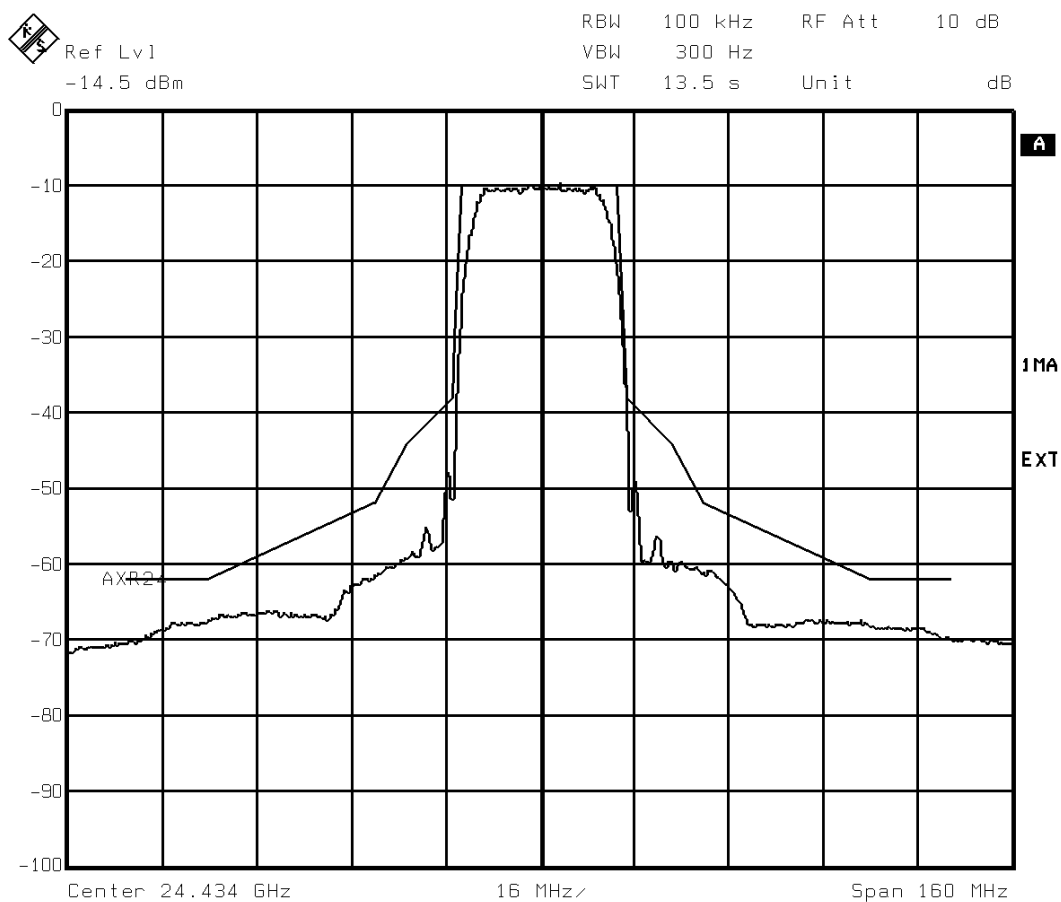
RF-Spectrum lower band

28 MHz Bandwidth QPSK

24 434 MHz

Temperature IDU +45°C

Temperature ODU +55 °C



Title: AXR 24 PtP Spectrum at C' QPSK Pmax +55°C
Date: 11.JUL.2005 14:49:01

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 38 of 44
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Plot No. 22

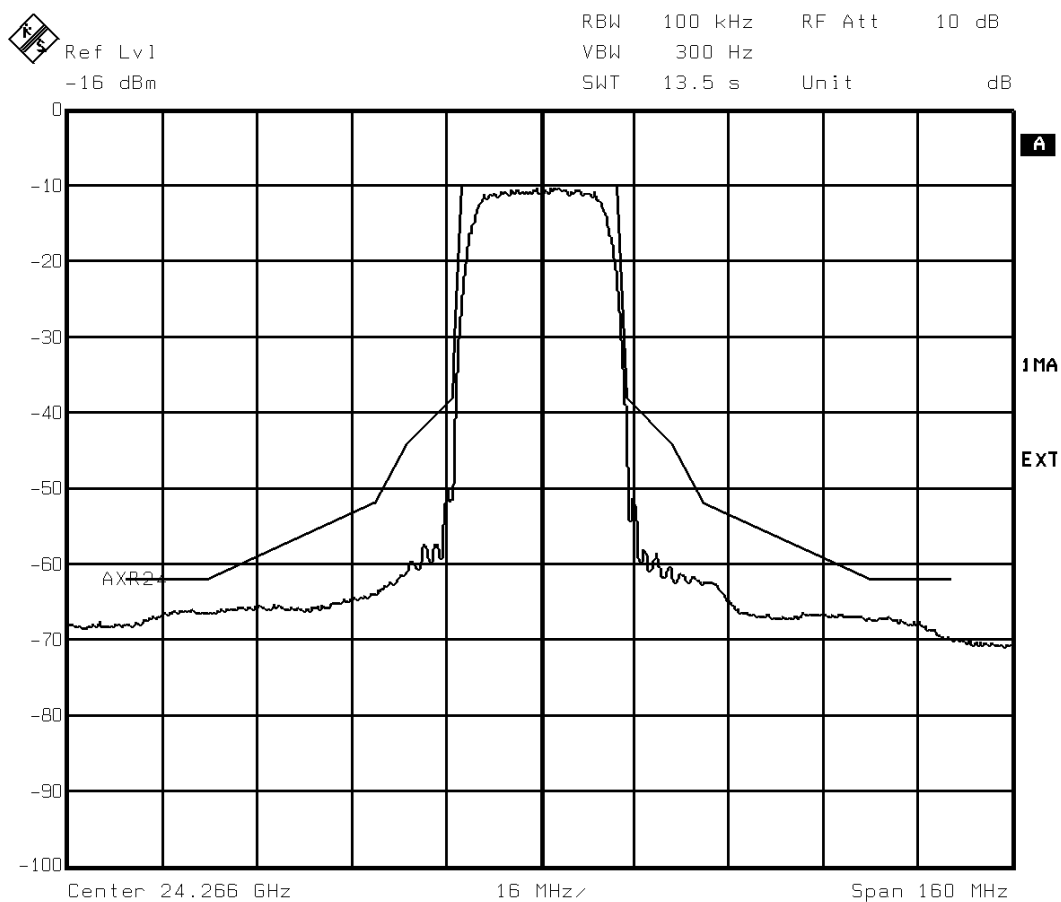
RF-Spectrum lower band

28 MHz Bandwidth 16QAM

24 266 MHz

Temperature IDU +45°C

Temperature ODU +55 °C



Title: AXR 24 PtP Spectrum at C' 16 QAM Pmax +55°C
 Date: 11.JUL.2005 14:53:32

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 39 of 44
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Plot No. 23

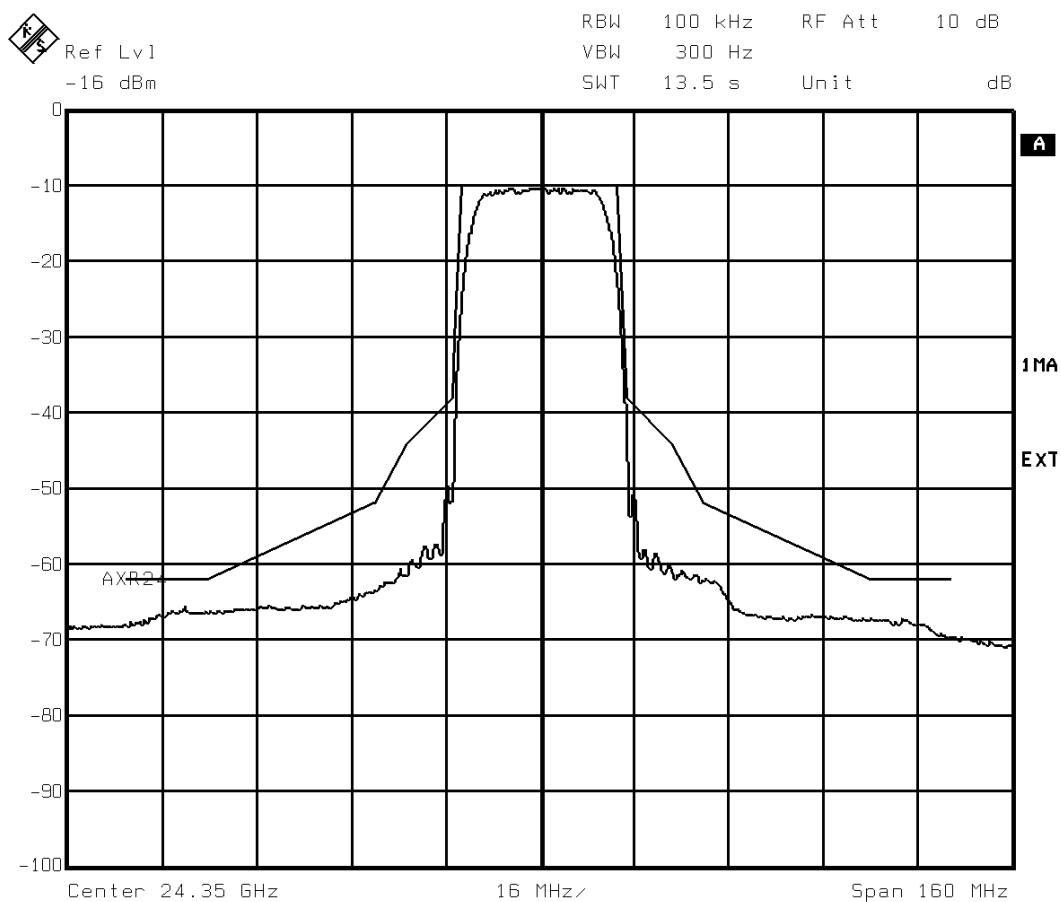
RF-Spectrum lower band

28 MHz Bandwidth 16QAM

24 350 MHz

Temperature IDU +45°C

Temperature ODU +55 °C



Title: AXR 24 PtP Spectrum at C' 16 QAM Pmax +55°C
Date: 11.JUL.2005 14:52:34

Test Report:	Description-No.:	Designation:	Index:	Page:
AXR0705	05HAA00105AAT-TLA	ODU-24 UBT-1 LM	0001	40 of 44

Plot No. 24

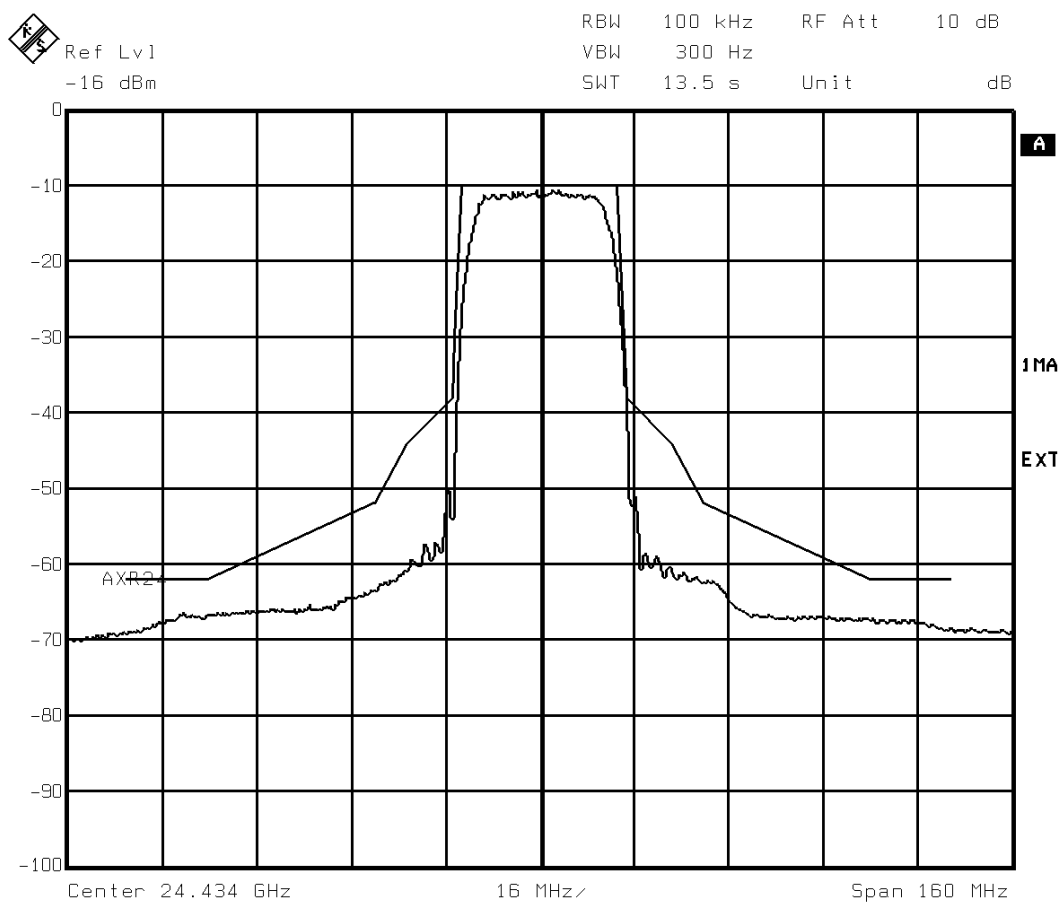
RF-Spectrum lower band

28 MHz Bandwidth 16QAM

24 434 MHz

Temperature IDU +45°C

Temperature ODU +55 °C



Title: AXR 24 PtP Spectrum at C' 16 QAM Pmax +55°C

Date: 11.JUL.2005 14:51:31

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 41 of 44
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Plot No. 25

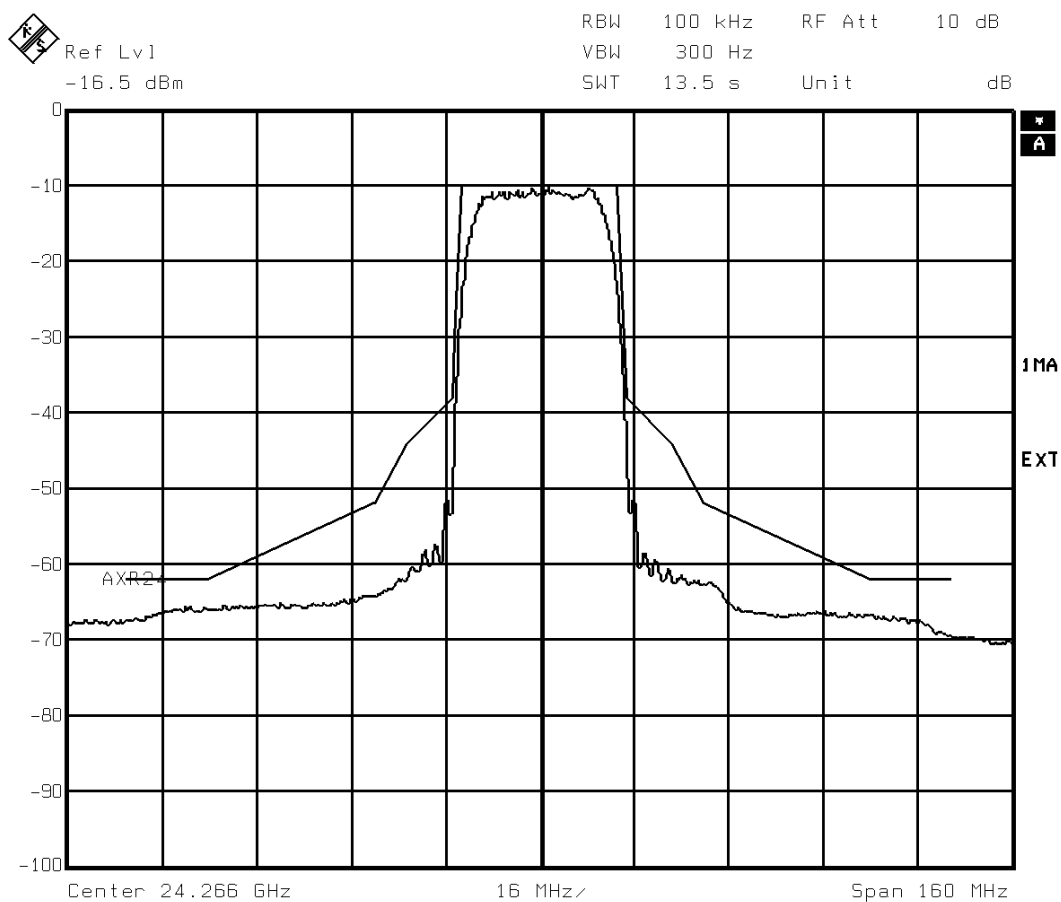
RF-Spectrum lower band

28 MHz Bandwidth 64 QAM

24 266 MHz

Temperature IDU +45°C

Temperature ODU +55 °C



Title: AXR 24 PtP Spectrum at C' 64 QAM Pmax +55°C
Date: 11.JUL.2005 14:54:52

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 42 of 44
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Plot No. 26

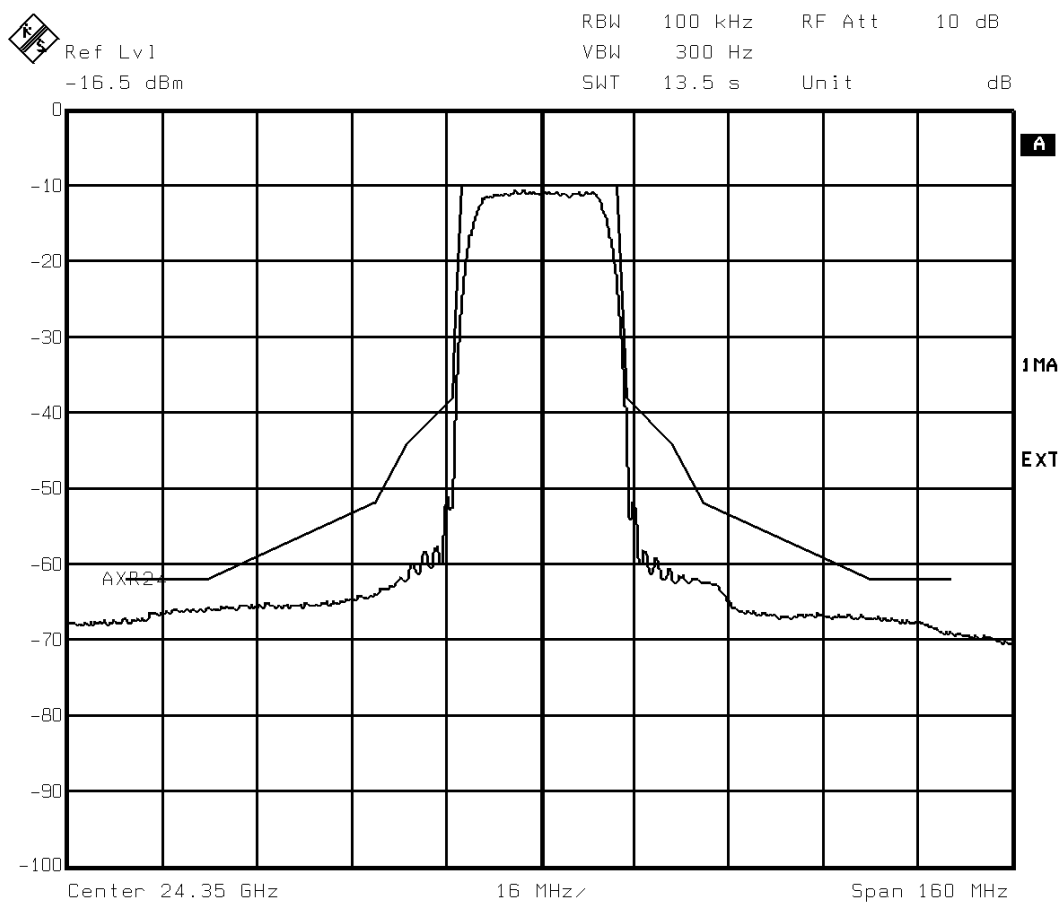
RF-Spectrum lower band

28 MHz Bandwidth 64 QAM

24 350 MHz

Temperature IDU +45°C

Temperature ODU +55 °C



Title: AXR 24 PtP Spectrum at C' 64 QAM Pmax +55°C
Date: 11.JUL.2005 14:56:14

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 43 of 44
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Plot No. 27

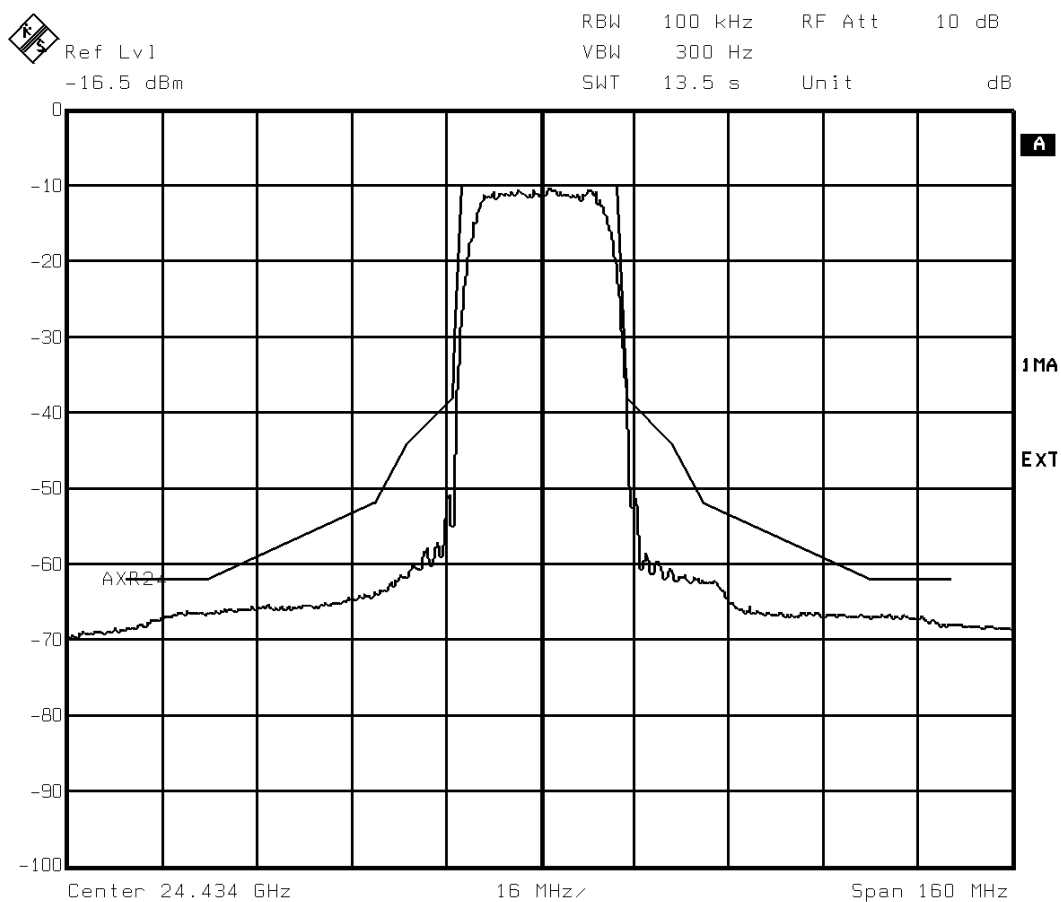
RF-Spectrum lower band

28 MHz Bandwidth 64 QAM

24 434 MHz

Temperature IDU +45°C

Temperature ODU +55°C



Title: AXR 24 PtP Spectrum at C' 64 QAM Pmax +55°C
Date: 11.JUL.2005 14:57:49

Test Report: AXR0705	Description-No.: 05HAA00105AAT-TLA	Designation: ODU-24 UBT-1 LM	Index: 0001	Page: 44 of 44
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