# ENGINEERING EXHIBIT

## Application for License

prepared for

**Hispanic Broadcasters of Philadelphia, L.L.C.**
WWSI-DT Atlantic City, New Jersey
Facility ID 23142
Ch. 49 130 kW 296 m

**Table of Contents**



*This material supplies a "hard copy" of the engineering portions of this application as entered August 12, 2002 for filing electronically. Since the FCC's electronic filing system may be accessed by anyone with the applicant's name and password, and electronic data may otherwise be altered in an unauthorized fashion, we cannot be responsible for changes made subsequent to our entry of this data and related attachments.*

**Section III - Engineering**

**TECHNICAL SPECIFICATIONS**

Ensure that the specifications below are accurate. Contradicting data found elsewhere in this application will be disregarded. All items must be completed. The response "on file" is not acceptable.

**TECH BOX**

1. Channel: 49

2. Operating Constants

| Transmitter power output (average power at input to transmission line, after any filter attached to the transmitter, if used) | | Transmission line power loss |
|---|---|---|
| 2.03 dBk 3.08 kW | | 1.21 dB |
| Antenna Input power | Maximum antenna power gain | Maximum effective radiated power |
| 1.87 dBk | 19.27 dB | 21.14 dBk 130 kW |

3. Antenna Data

| Manufacturer | Model |
|---|---|
| DIE | TUP-SP4-16S-1 |

**NOTE: In addition to the information called for in this section, an explanatory exhibit providing full particulars must be submitted for each question for which a "No" response is provided.**

**CERTIFICATION**

| | | |
|---|---|---|
| 4. | **Main Studio Location.** The main studio location complies with 47 C.F.R. Section 73.1125. | (•) Yes ( ) No<br>See Explanation in [Exhibit 6] |
| 5. | **Constructed Facility** The facility was constructed as authorized in the underlying construction permit or complies with 47 C.F.R. Section 73.1690. | (•) Yes ( ) No<br>See Explanation in [Exhibit 7] |
| 6. | **Special Operating Conditions.** The facility was constructed in compliance with all special operating conditions, terms, and obligations described in the construction permit.<br><br>**An exhibit may be required.** Review the underlying construction permit | (•) Yes ( ) No<br>See Explanation in [Exhibit 8] |
| 7. | **Transmitter.** The transmitter complies with 47 C.F.R. Section 73.1660. | (•) Yes ( ) No<br>See Explanation in [Exhibit 9] |

**APPLICATION FILED PURSUANT TO 47 C.F.R. SECTIONS 73.1675(c) OR 73.1690(c).**

Only applicants filing this application pursuant to 47 C.F.R. Sections 73.1675(c) or 73.1690(c) must complete the following section.

| | | |
|---|---|---|
| 8. | **Changing transmitter power output.** Is this application being filed to authorize a change in transmitter power output caused by the replacement of an omnidirectional antenna with another omnidirectional antenna or an alteration of the transmission line system? See 47 C.F.R. Sections 73.1690(c)(1) and (c)(10). | ( ) Yes ( ) No |
| 9. | **Replacing a directional antenna.** Is this application being filed pursuant to 47 C.F.R. | ( ) Yes ( ) No |

| | | |
|---|---|---|
| | Section 73.1690(c)(3) to replace a directional antenna with another directional antenna?<br><br>If "Yes" to the above, the applicant certifies the following: | |
| | a. **Pattern of Directional Antenna.** The proposed theoretical antenna pattern complies with 47 C.F.R. Section 73.1690(c)(3). **Exhibit is required.** | ○ Yes ○ No<br><br>See Explanation in [Exhibit 10] |
| 10 | **Use a formerly licensed main facility as an auxiliary facility.** Is this application being filed pursuant to 47 C.F.R. Section 73.1675(c)(1) to request authorization to use a formerly licensed main facility as an auxiliary facility and/or change the ERP of the proposed auxiliary facility?<br><br>If "Yes" to the above, the applicant certifies the following: | ○ Yes ○ No |
| | a. **Auxiliary antenna service area.** The proposed auxiliary facility complies with 47 C.F.R. Section 73.1675(a). **Exhibit is required.** | ○ Yes ○ No<br><br>See Explanation in [Exhibit 11] |
| | b. **Environmental Protection Act.** The proposed facility is excluded from environmental processing under 47 C.F.R. Section 1.1 306 (i.e., the facility will not have a significant environmental impact and complies with the maximum permissible radiofrequency electromagnetic exposure limits for controlled and uncontrolled environments).<br><br>By checking "Yes" above, the applicant also certifies that it, in coordination with other users of the site, will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic exposure in excess of FCC guidelines. | ○ Yes ○ No<br><br>See Explanation in [Exhibit 12] |
| 11. | **Change the license status.** Is this application being filed pursuant to 47 C.F.R. Section 73.1690(c)(9) to change the license status from commercial to noncommercial or from noncommercial to commercial?<br><br>If "Yes" to above, submit an exhibit providing full particulars. For applications changing license status from commercial to noncommercial, include Section II of FCC Form 340 as an exhibit to this application. | ○ Yes ○ No<br><br>[Exhibit 13] |

**PREPARER'S CERTIFICATION ON PAGE 6 MUST BE COMPLETED AND SIGNED**

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**SECTION III - PREPARER'S CERTIFICATION**

I certify that I have prepared Section III (Engineering data) on behalf of the applicant, and that after such preparation, I have examined and found it to be accurate and true to the best of my knowledge and belief.

| | | |
|---|---|---|
| Name<br>JOSEPH M. DAVIS, P.E. | Relationship to Applicant (e.g., Consulting Engineer)<br>CONSULTING ENGINEER | |
| Signature | Date<br>8/12/2002 | |
| Mailing Address<br>CAVELL, MERTZ & DAVIS, INC.<br>7839 ASHTON AVENUE | | |
| City<br>MANASSAS | State or Country (if foreign address)<br>VA | Zip Code<br>20109 - |

| Telephone Number (include area code) | E-Mail Address (if available) |
|---|---|
| 7033929090 | JDAVIS@CMDCONSULTING.COM |

WILLFUL FALSE STATEMENTS ON THIS FORM ARE PUNISHABLE BY FINE AND/OR IMPRISONMENT (U.S. CODE, TITLE 18, SECTION 1001), AND/OR REVOCATION OF ANY STATION LICENSE OR CONSTRUCTION PERMIT (U.S. CODE, TITLE 47, SECTION 312(a)(1)), AND/OR FORFEITURE (U.S. CODE, TITLE 47, SECTION 503).

## Exhibits

**Exhibit 8**
**Description:** EXHIBIT 8 - ENGINEERING STATEMENT

EXHIBIT 8 - ENGINEERING STATEMENT - ATTACHED AS A PDF FILE

**Attachment 8**

| Description | Type | Conversion | |
|---|---|---|---|
| | | Status | File |
| Exhibit 8 | Adobe Acrobat File | not needed | PDF |

Exhibit 8 - Statement A

**ENGINEERING STATEMENT**

prepared for

**Hispanic Broadcasters of Philadelphia, L.L.C.**

WWSI-DT Atlantic City, New Jersey

Facility ID 23142

Ch. 49 130 kW 296 m

*Hispanic Broadcasters of Philadelphia, L.L.C.* is the licensee of WWSI(TV), Channel 62, Atlantic City (file number BLCT-20010129ADC) and the permittee of WWSI-DT, Channel 49 (BPCDT-19991019ABE). This statement and accompanying table provide additional engineering information to support an *Application for License* on FCC Form 302-DT to cover construction of the WWSI-DT facility. The facility has been constructed as specified in the Construction Permit ("CP"), except as described below. Representatives of the permittee advise that the sole special operating condition (related to health care facility notification) has been met.

**Antenna System Vertical Plane Pattern**

The actual antenna system's vertical (elevation) plane pattern varies slightly from that described in the *Application for Construction Permit* for WWSI-DT. As originally proposed, the antenna system has panel-type radiators oriented in four different azimuths. In order to achieve the desired horizontal plane radiation pattern, the number of stacked panels in each azimuth is varied (along with the relative level and phase of the power fed to each panel). Towards the south and west, where maximum radiation is achieved, a stack of 16 panels are used for each of these directions. To the north and east (where radiation is reduced), stacks of eight and four panels are specified, respectively.

In the *Application for Construction Permit*, electrical beamtilt of 0.5 degrees was proposed for the south, west, and north panel stacks, and 0.3 degrees of electrical beamtilt was proposed for the east panel stack. The actual antenna system, however, provides 0.5 degrees of electrical beamtilt for all four panel stacks. The nature of the vertical plane pattern "null fill" also varies from that originally proposed for all four panel stacks. Accordingly, the instant application provides revised vertical plane patterns to reflect the actual antenna system.

The attached **Figures 1** and **1A** graphically presents the theoretical vertical plane pattern for the south and west panels. **Figures 2** and **2A** show the vertical plane pattern for the north panel stack, and **Figures 3** and **3A** provide the vertical plane pattern for the east panel stack.

**Combiner Loss**

The WWSI antenna system is intended to handle multiple transmitters. Specifically, the paired WWSI(TV) Channel 62 facility (BLCT-20010129ADC) is licensed to use this antenna. A combining system has been installed to couple the analog WWSI and digital WWSI-DT transmitter outputs into the common transmission line and antenna system. The combiner has a loss of 0.10 dB on Channel 49, according to manufacturer's data. The attached **Table 1** provides a summary of the transmission line and combiner loss data, to supplement the data supplied on the accompanying FCC Form 302-DT, Section III, Item 2. The net system loss from **Table 1** (1.21 dB) is reported in the Form 302-DT, Section III, Item 2 "Tech Box" entry for "Transmission Line Power Loss".

Exhibit 8 - Table 1

**TRANSMISSION LINE AND COMBINER LOSS SUMMARY**

prepared for

**Hispanic Broadcasters of Philadelphia, L.L.C.**

WWSI-DT Atlantic City, New Jersey

Facility ID 23142

Ch. 49  130 kW  296 m

**A. Transmission Line Loss**

| | | |
|---|---|---|
| Line Loss: | 1.11 dB | Dielectric DC-DL77  75 Ohm Coaxial, 304.8 meter length |

**B. Combiner Loss**

| | | |
|---|---|---|
| Combiner System Loss: | 0.10 dB | on Channel 49, per manufacturer |

**C. Total Losses**

| | | |
|---|---|---|
| Total System Loss: | 1.21 dB | Line Loss plus Combiner Loss |

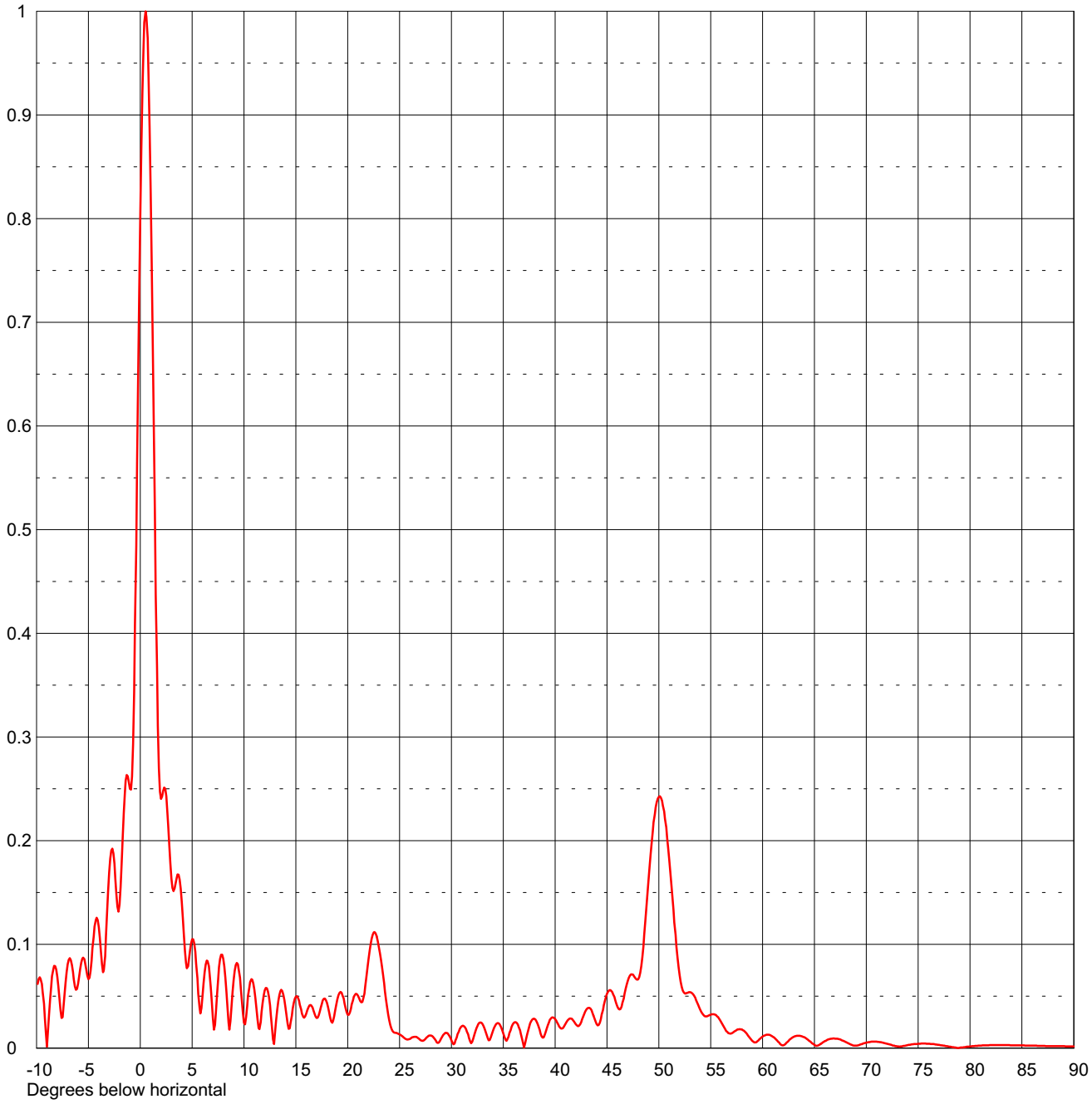
Dielectric

**FIGURE 1**
**ANTENNA VERTICAL PLANE (ELEVATION) PLANE PATTERN**
**SOUTH AND WEST**

prepared August 2002 for
**Hispanic Broadcasters of Philadelphia, L.L.C.**
WWSI-DT Atlantic City, New Jersey
Facility ID 23142
Ch. 49 130 kW 296 m

Cavell, Mertz & Davis, Inc.
Manassas, Virginia

| | | | |
|---|---|---|---|
| RMS Gain at Main Lobe | **36.7 (15.65 dB)** | Beam Tilt | **0.50 Degrees** |
| RMS Gain at Horizontal | **23.6 (13.73 dB)** | Frequency | **MHz** |
| Calculated / Measured | **Calculated** | Drawing # | **O138E49050-90** |




Remarks:

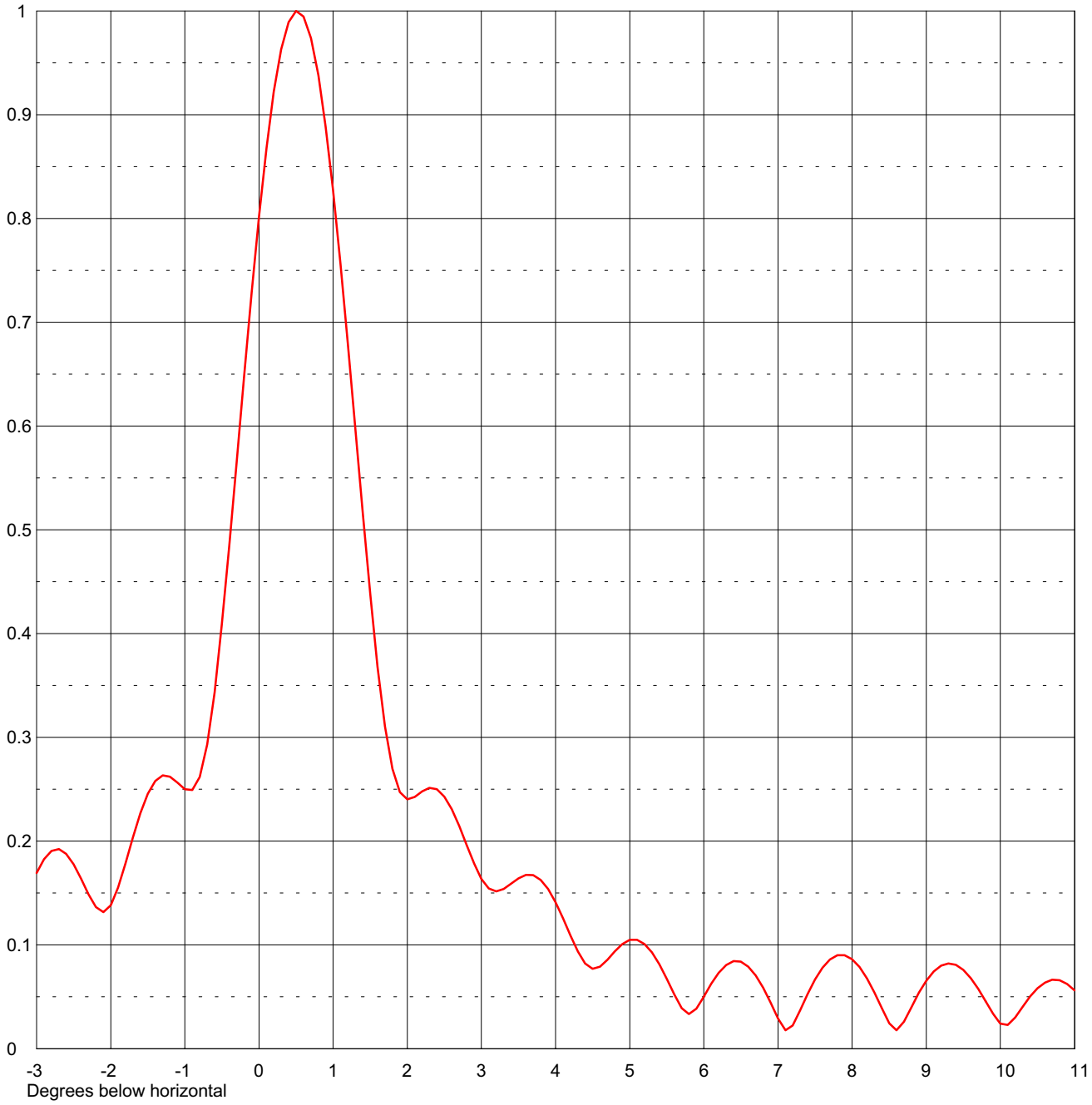
Dielectric

**FIGURE 1A**
**ANTENNA VERTICAL PLANE (ELEVATION) PLANE PATTERN DETAIL**
**SOUTH AND WEST**

prepared August 2002 for
**Hispanic Broadcasters of Philadelphia, L.L.C.**
WWSI-DT Atlantic City, New Jersey
Facility ID 23142
Ch. 49 130 kW 296 m

**Cavell, Mertz & Davis, Inc.**
Manassas, Virginia

| | | | |
|---|---|---|---|
| RMS Gain at Main Lobe | **36.7 (15.65 dB)** | Beam Tilt | **0.50 Degrees** |
| RMS Gain at Horizontal | **23.6 (13.73 dB)** | Frequency | **MHz** |
| Calculated / Measured | **Calculated** | Drawing # | **O138E49050** |




Remarks:

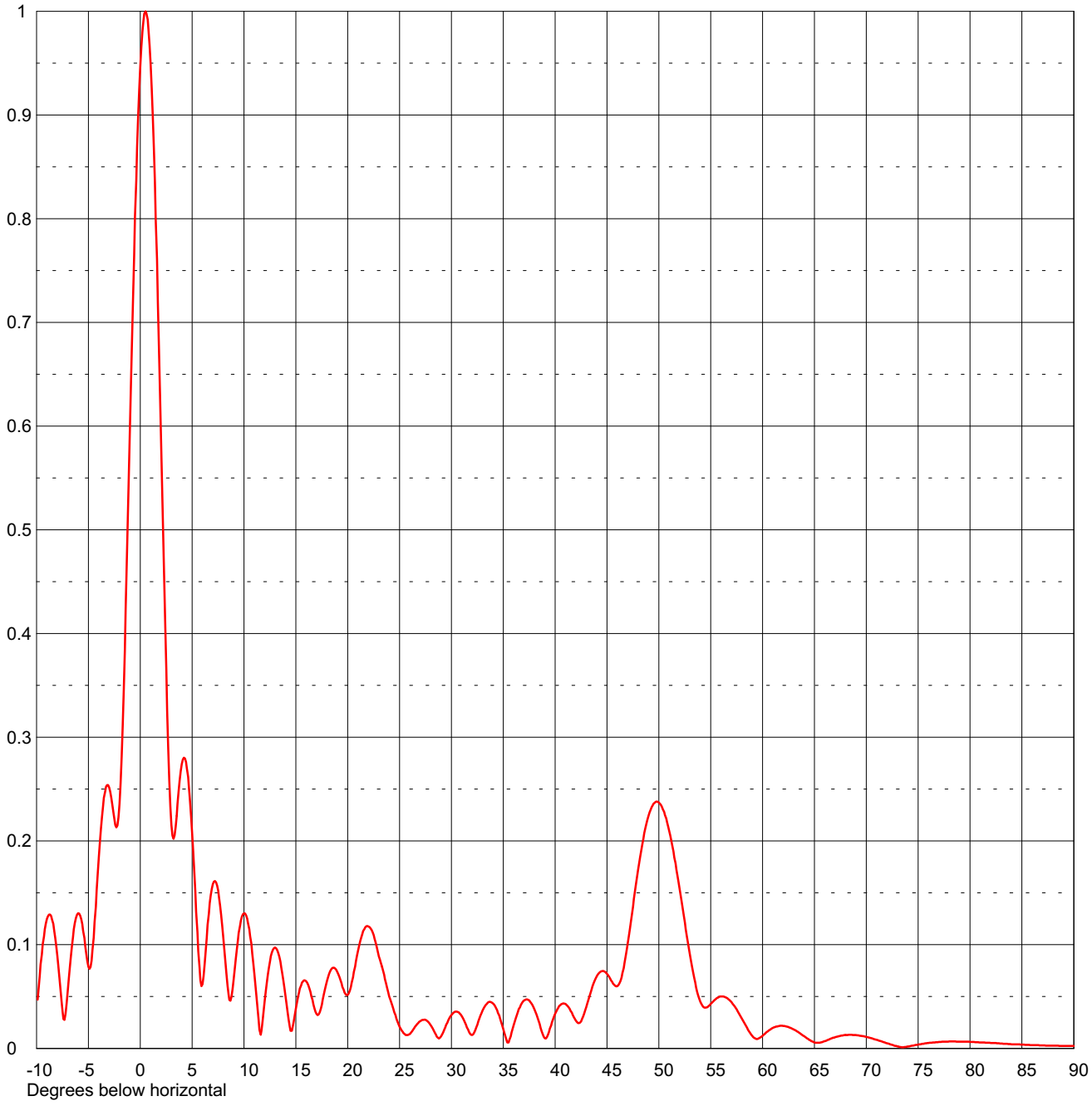
Dielectric

**FIGURE 2**
**ANTENNA VERTICAL PLANE (ELEVATION) PLANE PATTERN**
**NORTH**

prepared August 2002 for
**Hispanic Broadcasters of Philadelphia, L.L.C.**
WWSI-DT Atlantic City, New Jersey
Facility ID 23142
Ch. 49 130 kW 296 m

**Cavell, Mertz & Davis, Inc.**
Manassas, Virginia

| | | | |
|---|---|---|---|
| RMS Gain at Main Lobe | **18.5 (12.67 dB)** | Beam Tilt | **0.50 Degrees** |
| RMS Gain at Horizontal | **16.6 (12.20 dB)** | Frequency | **MHz** |
| Calculated / Measured | **Calculated** | Drawing # | **TUP-8-49-90** |




Remarks:

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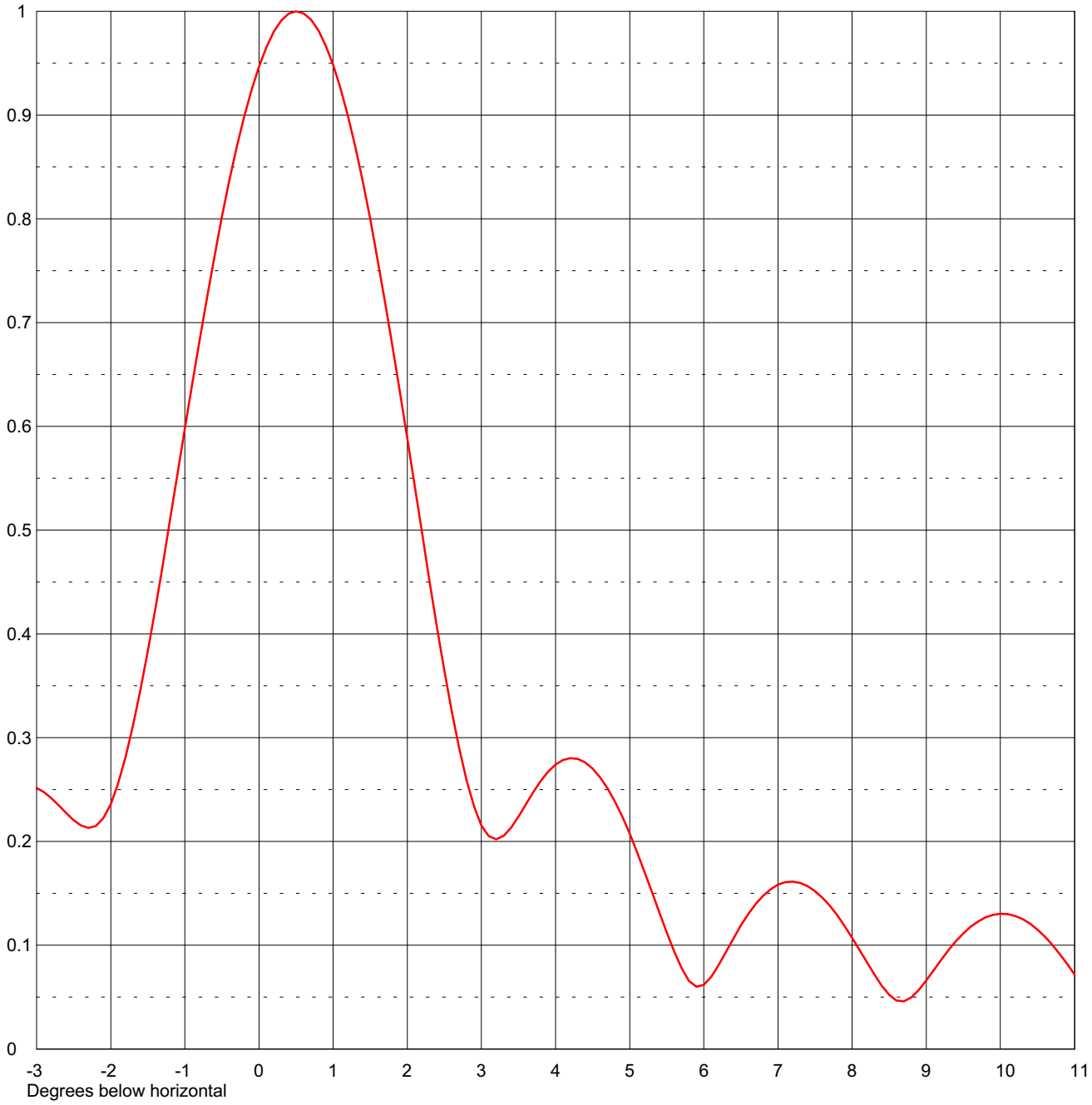
**FIGURE 2A**
**ANTENNA VERTICAL PLANE (ELEVATION) PLANE PATTERN DETAIL**
**NORTH**

prepared August 2002 for
**Hispanic Broadcasters of Philadelphia, L.L.C.**
WWSI-DT Atlantic City, New Jersey
Facility ID 23142
Ch. 49 130 kW 296 m

**Cavell, Mertz & Davis, Inc.**
Manassas, Virginia

| | | | |
|---|---|---|---|
| RMS Gain at Main Lobe | **18.5 (12.67 dB)** | Beam Tilt | **0.50 Degrees** |
| RMS Gain at Horizontal | **16.6 (12.20 dB)** | Frequency | **MHz** |
| Calculated / Measured | **Calculated** | Drawing # | **TUP-8-49** |




Remarks:

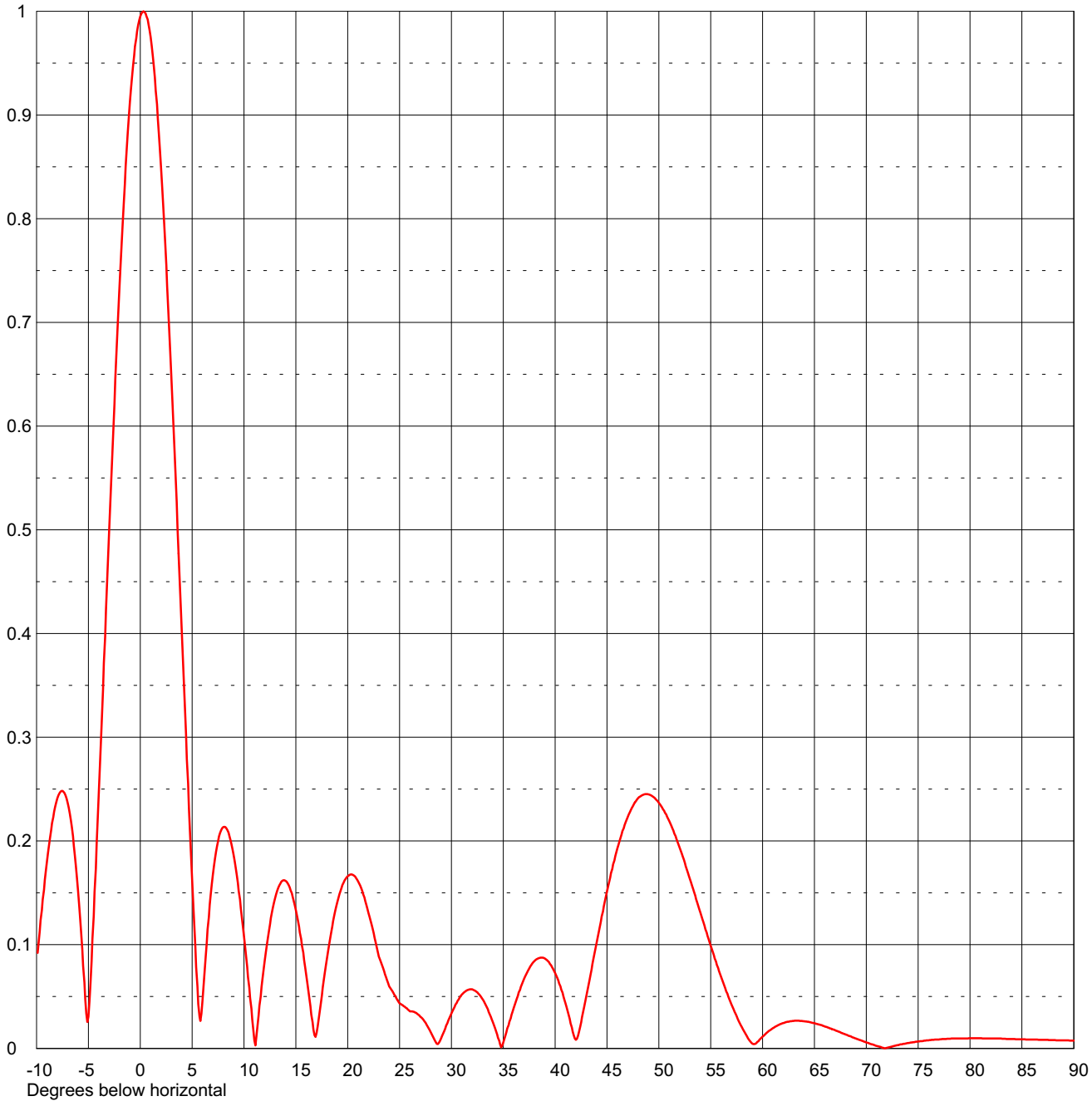
Dielectric

**FIGURE 3**
**ANTENNA VERTICAL PLANE (ELEVATION) PLANE PATTERN**
**EAST**

prepared August 2002 for
**Hispanic Broadcasters of Philadelphia, L.L.C.**
WWSI-DT Atlantic City, New Jersey
Facility ID 23142
Ch. 49 130 kW 296 m

**Cavell, Mertz & Davis, Inc.**
Manassas, Virginia

| | | | |
|---|---|---|---|
| RMS Gain at Main Lobe | **10.2 (10.09 dB)** | Beam Tilt | **0.30 Degrees** |
| RMS Gain at Horizontal | **10.1 (10.04 dB)** | Frequency | **MHz** |
| Calculated / Measured | **Calculated** | Drawing # | **TUP-4-49-90** |




Remarks:

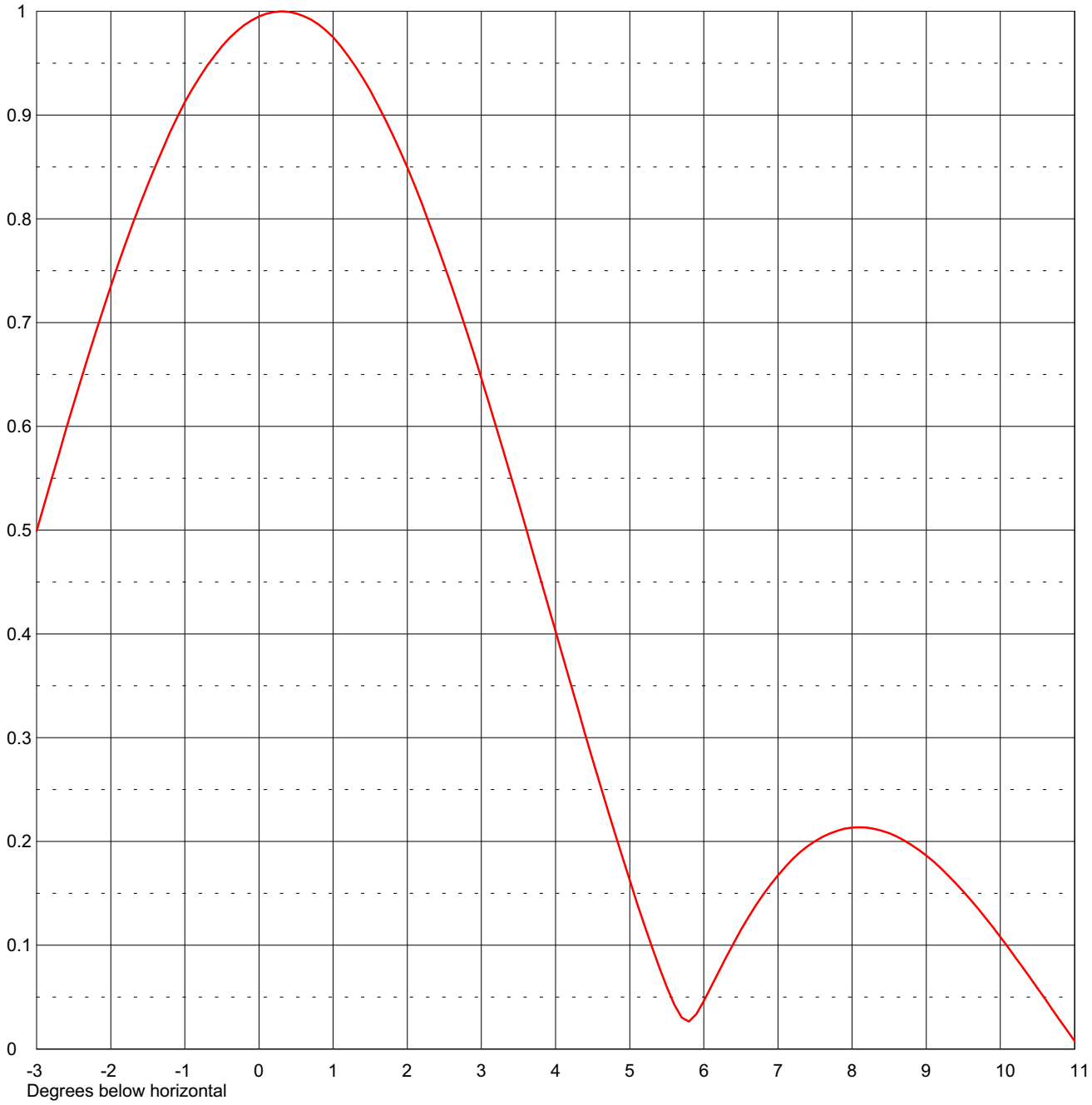
Dielectric

**FIGURE 3A**
**ANTENNA VERTICAL PLANE (ELEVATION) PLANE PATTERN DETAIL**
**EAST**

prepared August 2002 for
**Hispanic Broadcasters of Philadelphia, L.L.C.**
WWSI-DT Atlantic City, New Jersey
Facility ID 23142
Ch. 49 130 kW 296 m

Cavell, Mertz & Davis, Inc.
Manassas, Virginia

| | | | |
|---|---|---|---|
| RMS Gain at Main Lobe | **10.2 (10.09 dB)** | Beam Tilt | **0.30 Degrees** |
| RMS Gain at Horizontal | **10.1 (10.04 dB)** | Frequency | **MHz** |
| Calculated / Measured | **Calculated** | Drawing # | **TUP-4-49** |




Remarks: