MOTOROLA
Motorola Solutions

Material or Methods Specification

Number: PMAN5100A
Issue: A
Page 1 **of** 14

TITLE: APX8500 2.4 GHz Covert Glass-Mount BT/WIFI ANTENNA

ISSUE	ORIGINATOR	DETAIL SPEC CHANGES	DATE
A	HAMMEL, BRANDON; CALHOUN, ALEC; GRADA, SAMUEL	PRODUCTION RELEASE	DEC 09, 2016

MOTOROLA
Motorola Solutions

Material or Methods Specification

TITLE: APX8500 2.4 GHz Covert Glass-Mount BT/WIFI ANTENNA

TABLE OF CONTENTS

MOTOROLA
Motorola Solutions

Material or Methods Specification

TITLE: APX8500 2.4 GHz Covert Glass-Mount BT/WIFI ANTENNA

1. SCOPE

This document contains specifications pertinent to the AXP8500 2.4 GHz Covert Glass-Mount BT/WIFI antenna for use in mobile radios. It includes General, Mechanical and Electrical Requirements, VQA/Final tests, and Qualification tests.

2. APPLICABLE DOCUMENTS

12M02897W18	Controlled and Reportable Materials Disclosure
12M05022A87	Motorola Quality Procedure Outsourced Assembled Kits
12M05041A30	Motorola Barcode and Label Applications Standard
12M80967A78	Motorola Vendor Material Quality Control
12S10601A	Motorola Packaging Rules for Vendors
12S10616A	Motorola Marking and Containers for Consumer Products Division
12G13933A01	Motorola Receiving Bar Code Specification for Vendors

3. REQUIREMENTS

3.1 General

Manufacturer needs to report any change in process/ material that would affect the electrical/ mechanical performance of the antenna.

2.4 GHz Covert Glass-Mount BT/WIFI ANTENNA DEFINED IN THIS DOCUMENT	
Part Number	**Description**
PMAN5100A	2.4 GHz Covert Glass-Mount BT/WIFI Antenna with 17ft Cable and QMA Connector

3.1.1 Application: This antenna is used with vehicle mount mobile radios.

MOTOROLA
Motorola Solutions

Material or Methods Specification

TITLE: APX8500 2.4 GHz Covert Glass-Mount BT/WIFI ANTENNA

3.1.2 Mechanical Requirements: Table 1. See Antenna diagram on page 6.

Part Number	Description	WIFI Antenna Cable	Install Manual
PMAN5100A	2.4GHz BT/WIFI Glass Mount for vehicle installations	PVC Free RG316 FEP 1ft and PFP-195 16ft with QMA Plug (QMA Plug: Amphenol LMR-195 or Motorola Approved Equivalent)	Install Manual for Wi-Fi Glass Mount PMLN7726A

Table 1: Mechanical Requirements

3.1.2 Mechanical:

Random Vibration Test: Per MIL-STD-810E, Method 514.4, Procedure I-3.3

Temperature Cycle Test: In temperature/humidity chamber and perform 5 contiguous cycles of the following temperature cycle:

a. Begin test at room temperature (+23°C).
b. Ramp up to 70°C in 94 + 15/-0 minutes (0.5°C/min).
c. Soak at 70°C for 60 +30/-0 minutes.
d. Ramp down to -40°C in 220 + 15 minutes/-0 (0.5°C/min).
e. Soak at -40°C for 60 +30/-0 minutes.
f. Ramp back to room temperature in 126 + 15 minutes/-0 (0.5°C/min).

Humidity Cycle Test: In temperature/humidity chamber and perform the following 24-hour temperature/humidity profile:

a. Begin test at 25°C/50% relative humidity.
b. Ramp temperature to 40°C + 5°C and relative humidity to 95% + 5% in 3 hours + 30 minutes/-0.
c. Hold at 40°C + 5°C and 95% + 5% relative humidity for 6 hours + 30 minutes/-0.
d. Ramp temperature to 25°C + 5°C and relative humidity to 80% + 5% in 3 hours + 30 minutes/-0.

e. Ramp relative humidity to 95% + 5% while maintaining temperature at 25°C + 5°C in 3 hours + 30 minutes/-0.
f. Soak at 25°C + 5°C and 95% + 5% relative humidity for 6 hours.
g. Ramp temperature to 40°C + 5°C while maintaining relative humidity at 95% + 5% in 3 hours + 30 minutes/-0.
h. Repeat steps c through g for a total of 6 cycles.

Salt Spray (Fog) Test: Per MIL-STD-810E, Procedure I, Method 509.3

3.1.3 Electrical Requirements:

Table 2: BT/WLAN Specifications

Motorola P/N	Freq Range (GHz)	Nominal Impedance (Ohms)	Max. Power (Watts)	Peak Gain (dBi)	Nominal VSWR (over 90 %BW)	MAX. VSWR
PMAN5100A	2.30- 2.50	50	1	2.0 – 3.0 [1]	< 1.6:1 [1]	< 2.0:1 [1]

[1] Note: Measured in an anechoic setup/ open space with no interference. The antenna cable was cut to 1-foot length and terminated with SMA Male connector. A 16-foot PFP-240 cable assembly was attached to the antenna pigtail and terminated with Male QMA. The antenna was mounted on a 12 W x 5 H x .25- inch glass pane bordered with a metal rim (right side border of the pane).
Additional Note: PFP-195 is used on the shipping product, instead of PFP-240 used during testing. The difference in these cables is 0.7 dB, and this is already included in the numbers above.

MOTOROLA
Motorola Solutions

Material or Methods Specification

Number: PMAN5100A
Issue: A

TITLE: APX8500 2.4 GHz Covert Glass-Mount BT/WIFI ANTENNA

4. EXCEPTIONS AND WAIVERS

No change shall be allowed on production material, regardless of whether such change affects requirements specified, without prior explicit written permission of Motorola Development Engineering and Purchasing departments.

5. ANTENNA DIAGRAM

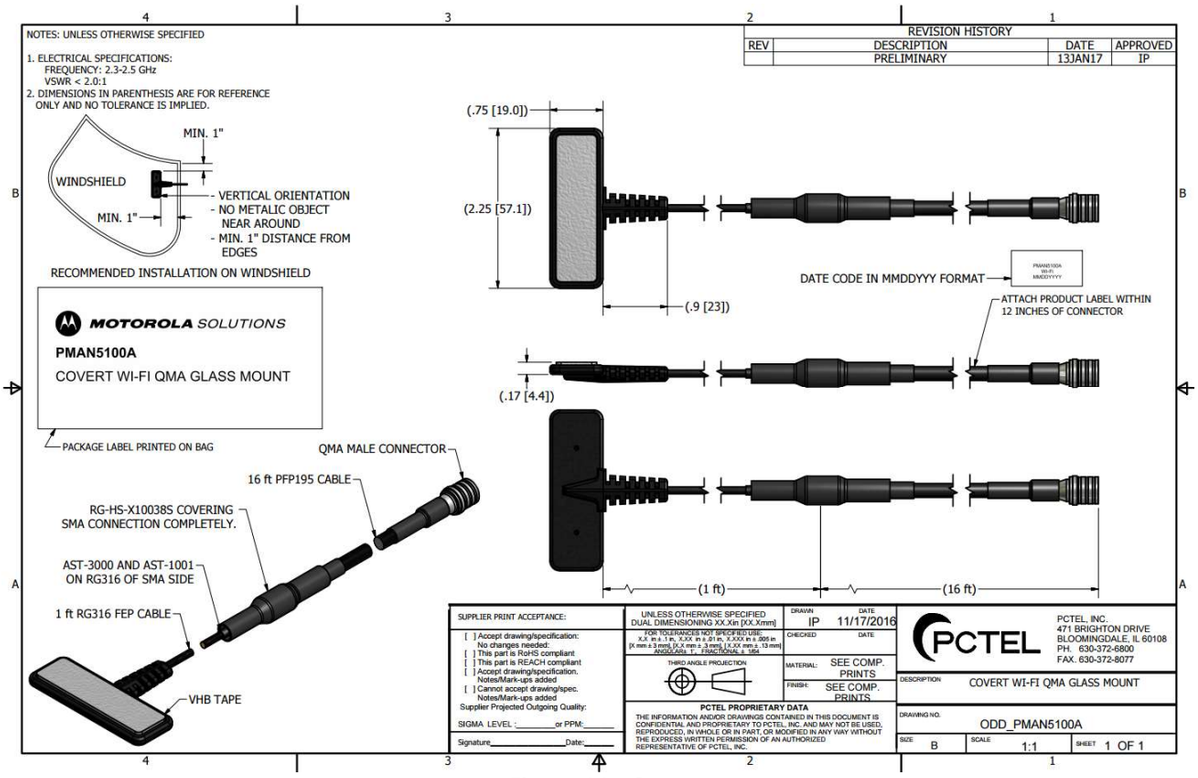


Figure 1A - Spec

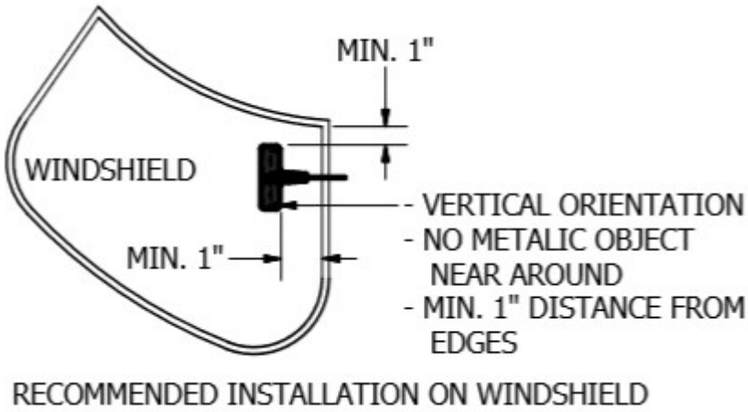


Figure 1B – Windshield Installation Diagram

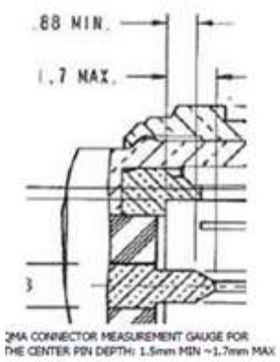
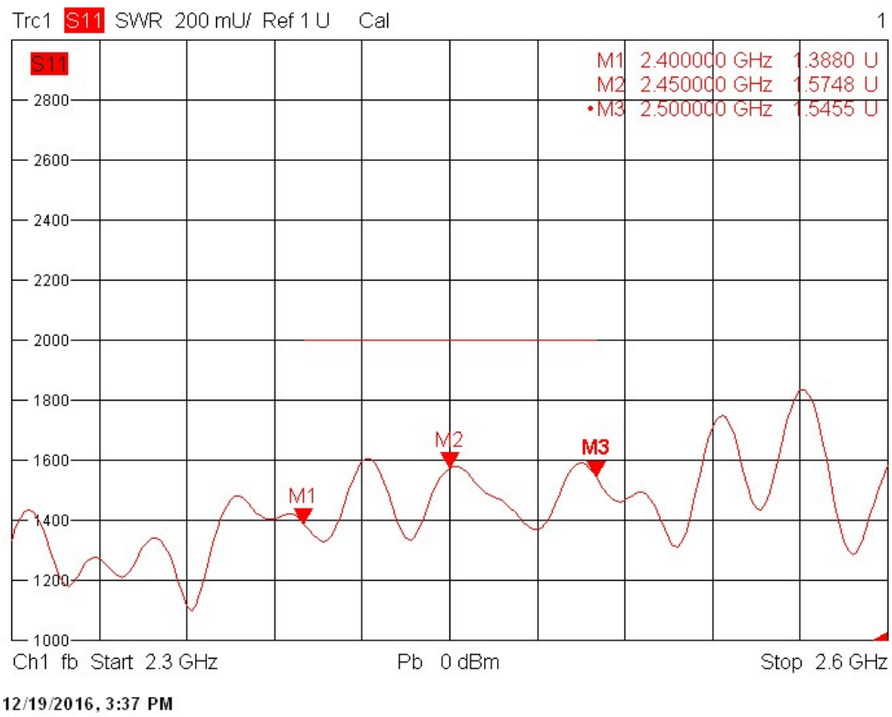


Figure 1C – Tolerance of QMA center pin

PMAN5100A
Note: Dimensions in Millimeters

6. TYPICAL VSWR FOR REFERENCE

(Mounted as shown in Fig 1B, with 17ft Cable)



Note: Measured in an anechoic setup/ open space with no interference. The antenna cable was cut to 1-foot length and terminated with SMA Male connector. A 16-foot PFP-240 cable assembly was attached to the antenna pigtail and terminated with Male QMA. The antenna was mounted on a 12 W x 5 H x .25- inch glass pane bordered with a metal rim (right side border of the pane).
Additional Note: PFP-195 is used on the shipping product, instead of PFP-240 used during testing. The difference in these cables is 0.7 dB, but it NOT included in the results above.

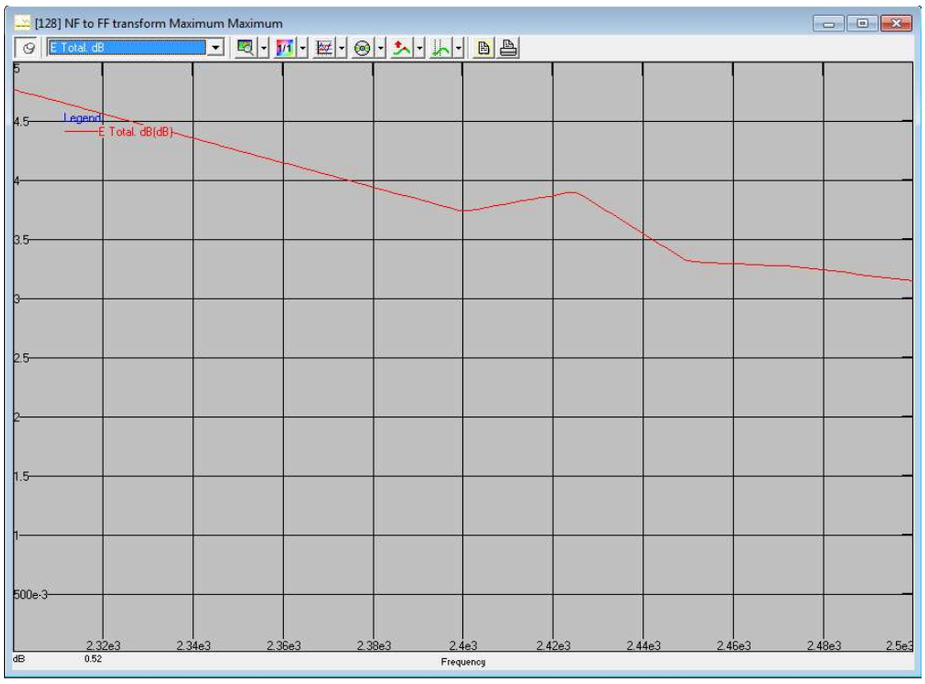
MOTOROLA
Motorola Solutions

Material or Methods Specification

TITLE: APX8500 2.4 GHz Covert Glass-Mount BT/WIFI ANTENNA

7. TYPICAL PEAK GAIN FOR REFERENCE

(Mounted as shown in Fig 1B, with 17ft Cable Loss)



Note: Measured in an anechoic setup/ open space with no interference. The antenna cable was cut to 1-foot length and terminated with SMA Male connector. A 16-foot PFP-240 cable assembly was attached to the antenna pigtail and terminated with Male QMA. The antenna was mounted on a 12 W x 5 H x .25- inch glass pane bordered with a metal rim (right side border of the pane).
Additional Note: PFP-195 is used on the shipping product, instead of PFP-240 used during testing. The difference in these cables is 0.7 dB, but it NOT included in the results above.

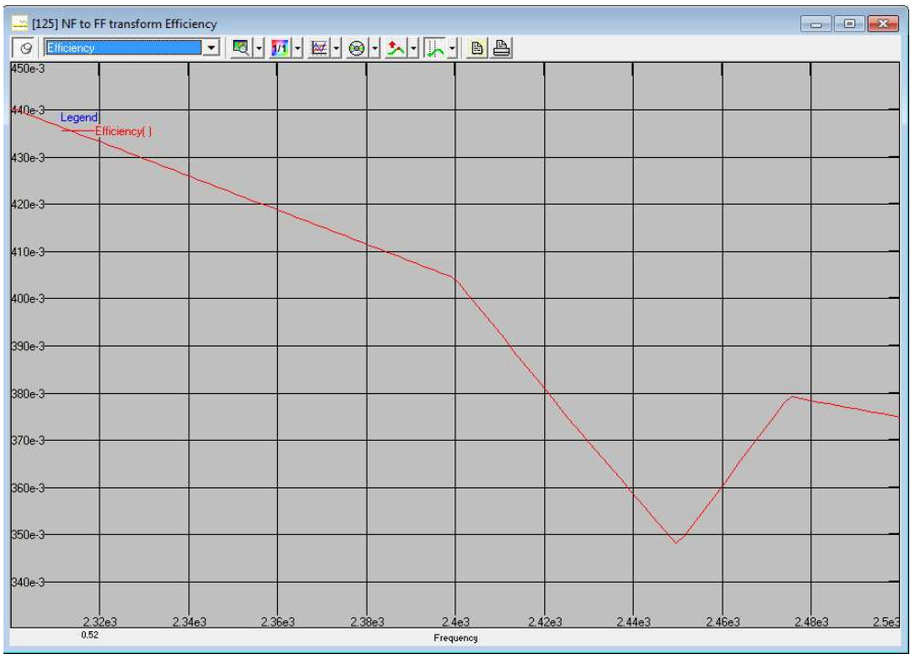
MOTOROLA
Motorola Solutions

Material or Methods Specification

TITLE: APX8500 2.4 GHz Covert Glass-Mount BT/WIFI ANTENNA

8. TYPICAL EFFICIENCY FOR REFERENCE

(Mounted as shown in Fig 1B, with 17ft Cable Loss)



Note: Measured in an anechoic setup/ open space with no interference. The antenna cable was cut to 1-foot length and terminated with SMA Male connector. A 16-foot PFP-240 cable assembly was attached to the antenna pigtail and terminated with Male QMA. The antenna was mounted on a 12 W x 5 H x .25- inch glass pane bordered with a metal rim (right side border of the pane).
Additional Note: PFP-195 is used on the shipping product, instead of PFP-240 used during testing. The difference in these cables is 0.7 dB, but it NOT included in the results above.

.

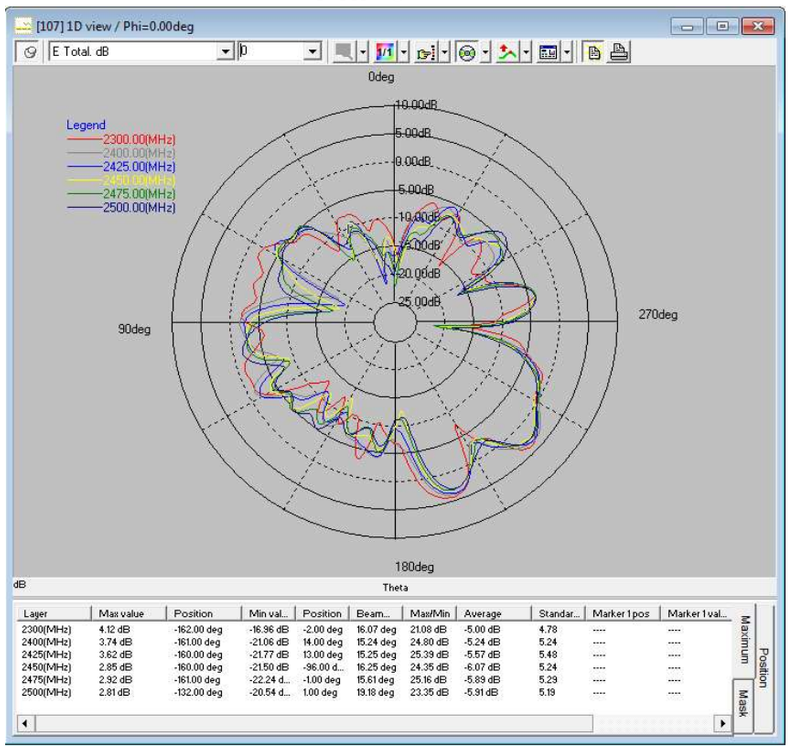
MOTOROLA
Motorola Solutions

Material or Methods Specification

TITLE: APX8500 2.4 GHz Covert Glass-Mount BT/WIFI ANTENNA

9. TYPICAL RADIATION PATTERNS

(Mounted as shown in Fig 1B, with 17ft Cable)
Phi=0



Note: Measured in an anechoic setup/ open space with no interference. The antenna cable was cut to 1-foot length and terminated with SMA Male connector. A 16-foot PFP-240 cable assembly was attached to the antenna pigtail and terminated with Male QMA. The antenna was mounted on a 12 W x 5 H x .25- inch glass pane bordered with a metal rim (right side border of the pane).

Additional Note: PFP-195 is used on the shipping product, instead of PFP-240 used during testing. The difference in these cables is 0.7 dB, but it NOT included in the results above.

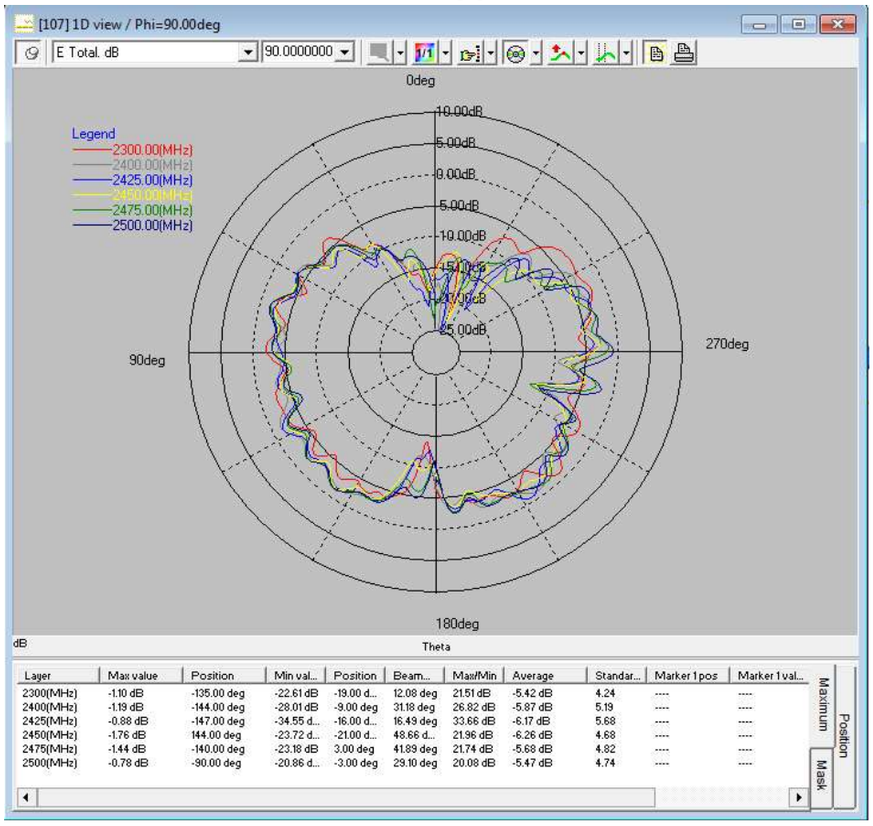
MOTOROLA
Motorola Solutions

Material or Methods Specification

Number: PMAN5100A
Issue: A
Page 12 **of** 14

TITLE: APX8500 2.4 GHz Covert Glass-Mount BT/WIFI ANTENNA

(Mounted as shown in Fig 1B, with 17ft Cable)
Phi=90



Note: Measured in an anechoic setup/ open space with no interference. The antenna cable was cut to 1-foot length and terminated with SMA Male connector. A 16-foot PFP-240 cable assembly was attached to the antenna pigtail and terminated with Male QMA. The antenna was mounted on a 12 W x 5 H x .25- inch glass pane bordered with a metal rim (right side border of the pane).

Additional Note: PFP-195 is used on the shipping product, instead of PFP-240 used during testing. The difference in these cables was 0.7 dB, and this is already included in the results above.

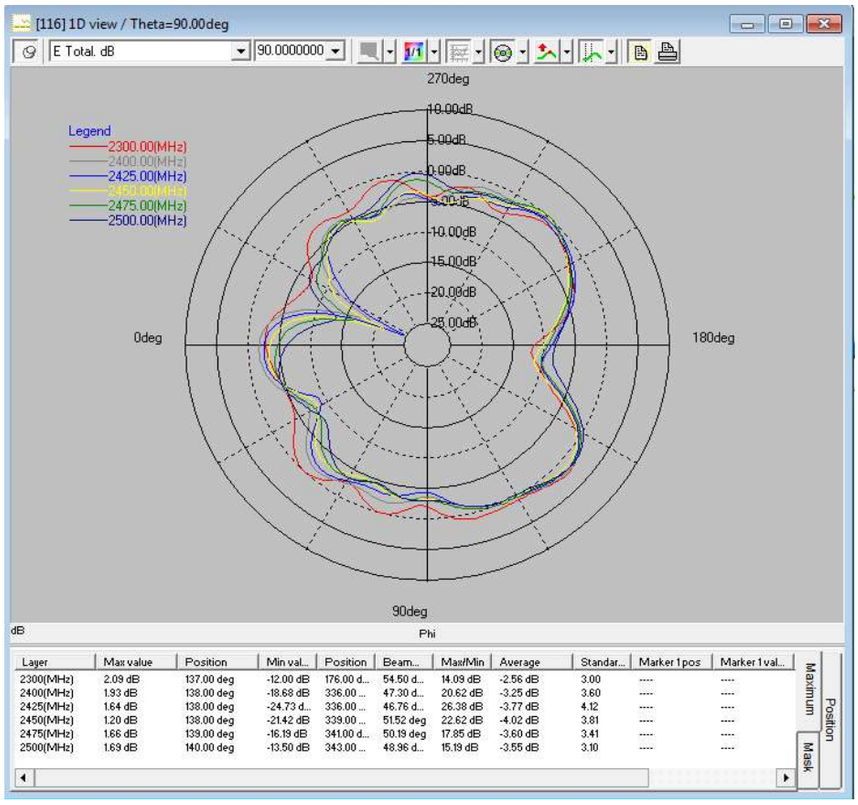
MOTOROLA
Motorola Solutions

Material or Methods Specification

Number: PMAN5100A
Issue: A
Page 13 **of** 14

TITLE: APX8500 2.4 GHz Covert Glass-Mount BT/WIFI ANTENNA

(Mounted as shown in Fig 1B, with 17ft Cable)
Theta=90



Note: Measured in an anechoic setup/ open space with no interference. The antenna cable was cut to 1-foot length and terminated with SMA Male connector. A 16-foot PFP-240 cable assembly was attached to the antenna pigtail and terminated with Male QMA. The antenna was mounted on a 12 W x 5 H x .25- inch glass pane bordered with a metal rim (right side border of the pane).
Additional Note: PFP-195 is used on the shipping product, instead of PFP-240 used during testing. The difference in these cables is 0.7 dB, but it NOT included in the results above.

10. OTHER ANTENNA PARAMETERS

(Mounted as shown in Fig 1B, with 17ft Cable)

Band	Frequency (GHz)	3 dB Vertical Beamwidth (degrees)	Peak Gain Angle from Horizon (degrees)
2.4 GHz	2.45	48’ (With Cable)	21’ (With Cable)

Note: Measured in an anechoic setup/ open space with no interference. The antenna cable was cut to 1-foot length and terminated with SMA Male connector. A 16-foot PFP-240 cable assembly was attached to the antenna pigtail and terminated with Male QMA. The antenna was mounted on a 12 W x 5 H x .25- inch glass pane bordered with a metal rim (right side border of the pane).
Additional Note: PFP-195 is used on the shipping product, instead of PFP-240 used during testing. The difference in these cables is 0.7 dB, but it NOT included in the results above.