



Medtronic, Inc.

Confirma SR MRI SureScan Model BRD1SR1

HarmoniaBP DR MRI SureScan Model HTN3DR2

Active 3D Antenna Pattern Measurements

Report: MDTR1264.0 Rev. 0, Issue Date: June 24, 2026



Approved by:

Trevor Buls

Trevor Buls, Principal EMC Test Engineer
Signed for and on behalf of Element

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REVISION HISTORY



Revision Number		Description	Date (yyyy-mm-dd)	Page Number
00	None			

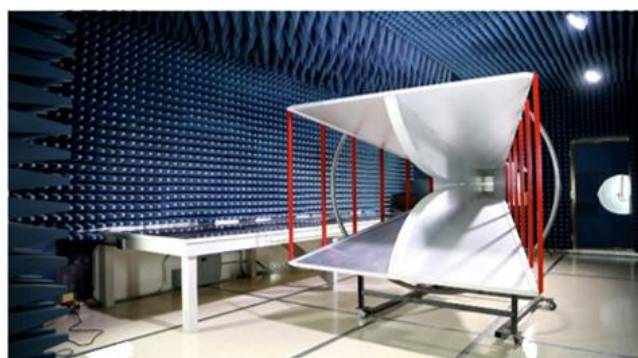
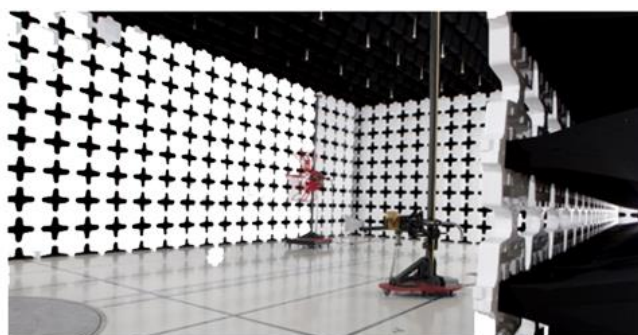
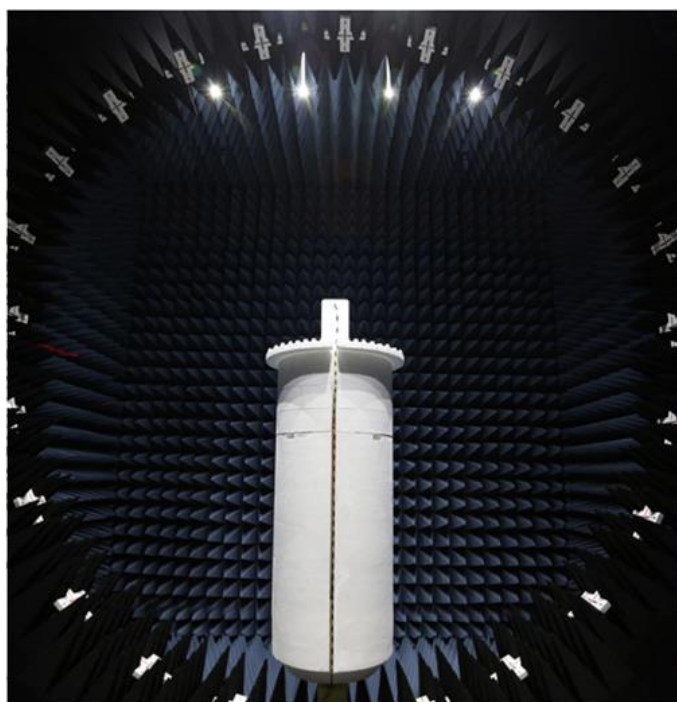
FACILITIES

Testing was performed at the following location(s)

	Location	Labs ⁽¹⁾	Address	A2LA ⁽²⁾	ISED ⁽³⁾	BSMI ⁽⁴⁾	VCCI ⁽⁵⁾	CAB	FDA ⁽⁶⁾
☐	California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
☒	Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
☐	Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
☐	Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
☐	Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A

See data sheets for specific labs

- (1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
- (2) A2LA Certificate No.
- (3) ISED Company No.
- (4) BSMI No.
- (5) VCCI Site Filing No.
- (6) FDA ASCA No.



PRODUCT DESCRIPTION

Client and Equipment under Test (EUT) Information

Company Name:	Medtronic, Inc.
Address:	710 Medtronic Parkway NE
City, State, Zip:	Minneapolis, MN 55432
Test Requested By:	Curt Pies
EUT:	Confirma SR MRI SureScan Model BRD1SR1 HarmoniaBP DR MRI SureScan Model HTN3DR2
First Date of Test:	May 13, 2026
Last Date of Test:	May 13, 2026
Receipt Date of Samples:	May 13, 2026
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

The HarmoniaBP system consists of Azure/Astra mechanical architecture with a single chamber and dual chamber MR conditional IPG with wireless communication. The IPG model included in the HarmoniaBP platform technology, spanning the Vitalis device family, is listed in Table 1. SR models are single chamber devices with one (1) IS-1 port in the connector header and DR models are dual chamber devices with two (2) IS-1 ports in the connector header. All models are equivalent from a mechanical perspective with the exception of the connector header and EMA assemblies which account for the different quantities of feedthroughs between SR and DR. All remaining differences between models are related to device features and labeling for different market geographies and have no impact to device/connector test performance. Device models below include two-way short range Inductive telemetry system.

Name
Confirma DR MRI SureScan
Effectra DR MRI SureScan
Refina CSP DR MRI SureScan
Restoria CSP DR MRI SureScan
ReSyncra CSP DR MRI SureScan
HarmoniaBP DR MRI SureScan
Confirma SR MRI SureScan
Effectra SR MRI SureScan
Refina CSP SR MRI SureScan
Restoria CSP SR MRI SureScan
V70A2
S70A2
V20A2
S20A2
Azure S DR MRI SureScan
Azure S SR MRI SureScan
Azure XT DR MRI SureScan
Azure XT SR MRI SureScan

PRODUCT DESCRIPTION

Manufacturer Provided Testing Model Rationale:

The HarmoniaBP IPG hardware, with Azure/Astra production FW, will be used for this verification testing. Tests being done are not sensitive to connector type. The tests to be performed are not targeting the device to connector interface. DR was selected as it has the maximum number of components. The devices will be fully functional units. The final assembly processes will be production equivalent at SMO. For radio and EMC testing leads used do not impact test results. They are attached to simulate implantation.

There are no differences in hardware between HarmoniaBP and Azure/Astra, therefore the HarmoniaBP IPG hardware and the Azure/Astra IPG hardware are equivalent for the purposes of Radio and EMC testing. There are no impacts from HarmoniaBP FW updates on these tests because the EMC tests are external influences and radio functionality operates the same. The FW algorithms don't alter the analog or digital filtering characteristics of the input signal nor the signal processing/decision characteristics for Radio and EMC, therefore they have no impact on Radio and EMC performance. The HarmoniaBP devices will be configured as AzureTM XT DR MRI SureScan® (model W2DR01) with released 8.1 Azure/Astra (Orion) FW in order to use SmartSync and to execute production functional tests. For the internal device serial numbers, the first three characters will be changed from HTN (HarmoniaBP format) to RNF (Azure format), and the last character will be changed from S to T (to avoid possible confusion with previous Azure/Astra device builds); and the sub-model will be changed from 05 to 07. The baseline conducted antenna output boards will be the exception to this since baseline samples do not go through the functional testing due to internal modifications and battery disconnection.

Testing Objective:

To obtain 3D antenna pattern measurements and calculated antenna performance values (gain, efficiency, TRP, etc.)

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2026-05-13	Active 3D Antenna Pattern Measurements	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

OTA MEASUREMENT SUMMARY



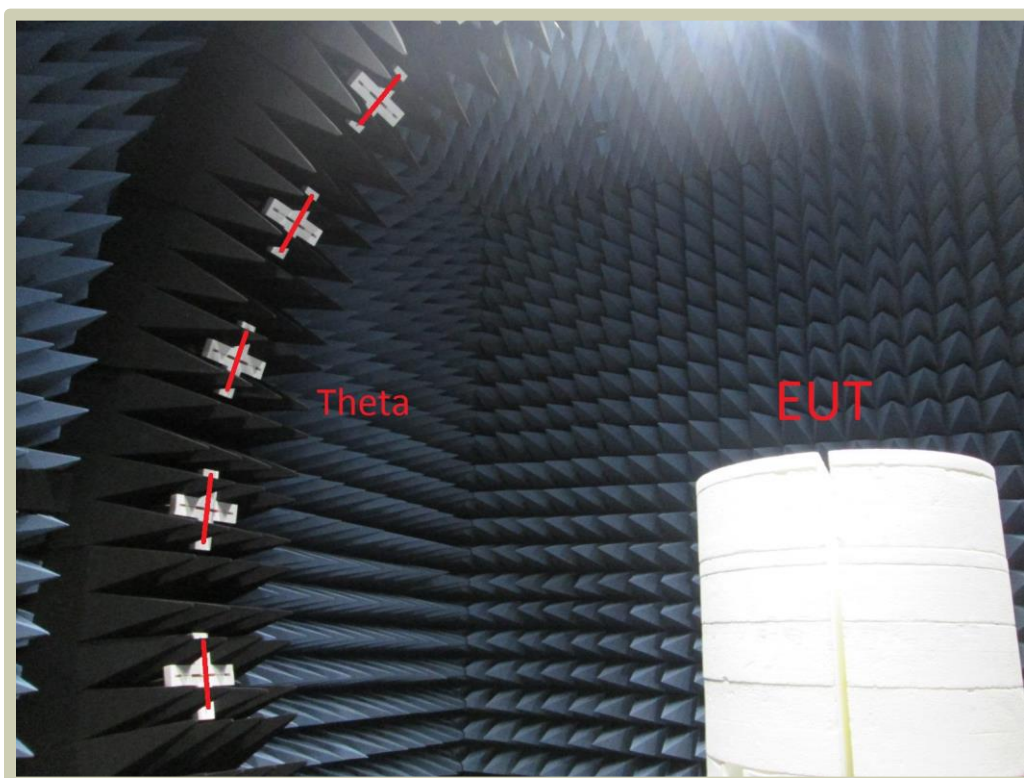
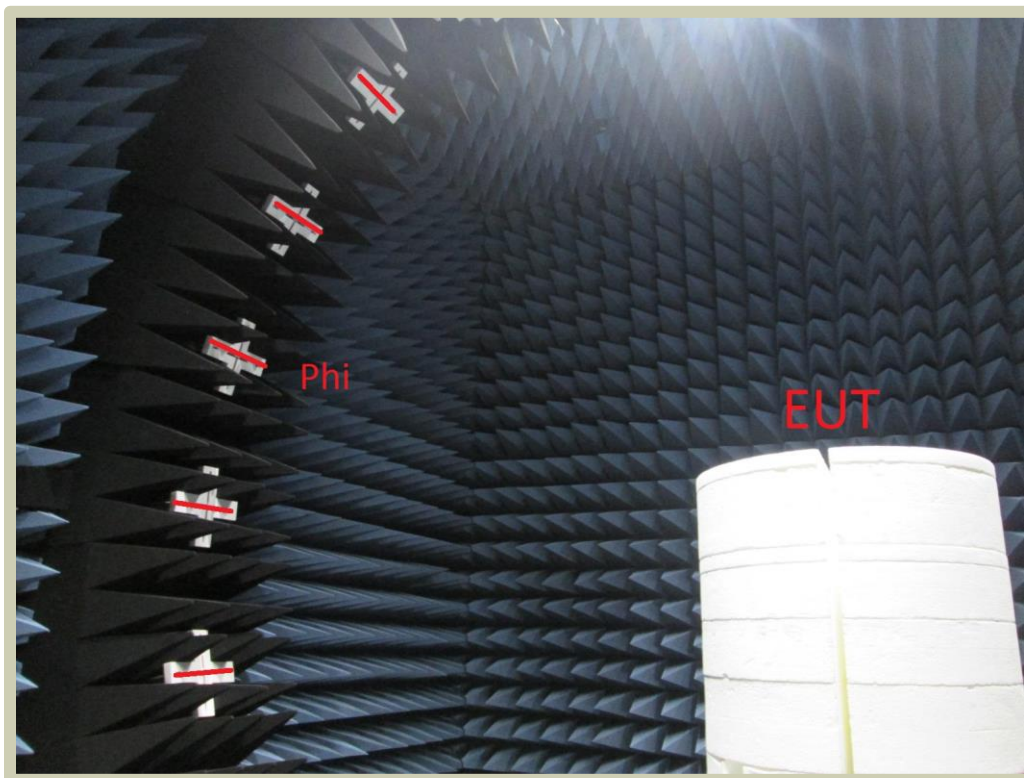
TEST DEFINITIONS

Phi Polarity	The detector antennas that are pointing in the same direction as the phi axis positioner rotates. See following page for photos.
Theta Polarity	The detector antennas that are pointing in the same direction as when the ring of detector antennas. See following page for photos.
Phi Angle	The position of the phi axis positioner, usually between 0° and 180°
Theta Angle	The position of the detector antenna, usually between -165° and 165°
Antenna Port Input Power (APIP)	The absolute power going into the antenna. This is used to calculate Efficiency and Gain.
Effective Isotropic Radiated Power (EIRP)	After combining phi and theta polarity measurements, the highest reading seen at any phi and theta angle during the measurement is the Effective Isotropic Radiated Power.
Total Radiated Power (TRP)	The sum of the power seen at all measuring antennas at all Theta and Phi angles and at both polarities. Represented in equation form by: $TRP = \frac{1}{4\pi} \int_0^{2\pi} \int_0^{\pi} \left(EIRP_{\theta}(\theta, \phi) + EIRP_{\phi}(\theta, \phi) \right) * \sin(\theta) d\theta d\phi$ Where θ is the theta angle of the measurement, ϕ is the phi angle of the measurement, $EIRP_{\theta}(\theta, \phi)$ is the reading on the theta polarity at a given theta and phi angle, and $EIRP_{\phi}(\theta, \phi)$ is the reading on the phi polarity at a given theta and phi angle.
Minimum Effective Isotropic Sensitivity (Min. EIS)	After finding the inverse of the sum of the inverses of the phi and theta polarity measurements for each single phi and theta angle, the lowest value is the Min. EIS. EIS is represented in equation form as: $EIS = \left(EIS_{\theta}(\theta_n, \phi_n)^{-1} + EIS_{\phi}(\theta_n, \phi_n)^{-1} \right)^{-1}$ Where θ is the theta angle of the measurement, ϕ is the phi angle of the measurement, $EIS_{\theta}(\theta, \phi)$ is the reading on the theta polarity at a given theta and phi angle, and $EIS_{\phi}(\theta, \phi)$ is the reading on the phi polarity at a given theta and phi angle. The lowest value found across all EIS values is the Minimum Effective Isotropic Sensitivity.
Total Isotropic Sensitivity (TIS)	The inverse of the sum of the inverses of all the individual EIS readings. Represented in equation form as: $TIS = \frac{4\pi}{\int_0^{2\pi} \int_0^{\pi} \left(EIS_{\theta}(\theta, \phi)^{-1} + EIS_{\phi}(\theta, \phi)^{-1} \right) * \sin(\theta) d\theta d\phi}$ Where θ is the theta angle of the measurement, ϕ is the phi angle of the measurement, $EIS_{\theta}(\theta, \phi)$ is the reading on the theta polarity at a given theta and phi angle, and $EIS_{\phi}(\theta, \phi)$ is the reading on the phi polarity at a given theta and phi angle.
Directivity	The difference between the EIRP and the TRP or the Min. EIS and the TIS.
Efficiency	The difference between the TRP and the APIP.
Gain (also called Peak Gain)	The difference between the EIRP and the APIP.
3 dB Beamwidth	The angle between the locations of the half-power (3 dB down) points referenced against the location of the highest EIRP of the azimuth cut.



OTA MEASUREMENT SUMMARY

PHI POLARITY AND THETA POLARITY VISUALIZATION



ACTIVE 3D ANTENNA PATTERN MEASUREMENT



OTA 2018.01.04

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna - Dipole	ETS Lindgren	3126-2450	OTF2	4/18/2024	36 mo
Analyzer - Spectrum Analyzer	Agilent	E4443A	AAS	7/23/2025	12 mo
Analyzer - Network Analyzer	Agilent	E5071C	NAM	5/23/2025	36 mo
Chamber - OTA	ETS Lindgren	AMS-8923-195	OTA	10/8/2024	36 mo

TEST DESCRIPTION

Using the modes of operation and configurations noted within this report, a radiated pattern measurement test was performed. The frequency ranges investigated (scanned), are also noted in this report.

The EUT was placed on a low dielectric constant support structure (Phi Axis Positioner) in the 3D center of the measurement zone using a laser alignment system.

The test begins with a measurement path configured (via ETS-Lindgren EMQuest Data Acquisition and Analysis Software) such that an electrical path is present from the Theta polarization element of the -165° detector antenna, to the measurement port of a spectrum analyzer. The EUT is commanded to transmit at the desired frequency and an absolute power measurement is obtained at the spectrum analyzer. The measurement path is then reconfigured (again via EMQuest) such that an electrical path is present from the Phi polarization element of the -165° detector antenna, to the measurement port of the spectrum analyzer. Another absolute power measurement is obtained at the spectrum analyzer. This process is repeated at each of the 23 detector antennas in turn. This process is repeated for every rotation of the Phi Axis Positioner up to 180° - Phi Axis Resolution. When this process is complete, EMQuest applies factors from a Range Calibration and Normalization to produce a final data set with 1D/2D/3D patterns and tabular values such as antenna efficiency, Equivalent Isotropic Radiated Power (EIRP), Total Radiated Power (TRP), etc.

A measurement uncertainty estimation has been performed for this testing. When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution. The expanded measurement uncertainty, 95% confidence level (K=2), for Maximum Gain / Efficiency for 2400-2483.5 MHz on active measurements is +/-1.08 dB. The expanded measurement uncertainty, 95% confidence level (K=2), for Maximum Gain / Efficiency for 2400-2483.5 MHz on passive measurements is +/-1.29. The calculations for estimating measurement uncertainty are available upon request.

Procedures for the Range Calibration and Normalization can be found in Element Materials Technology document: WP Antenna Pattern Measurements (3D)

ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	Confirma SR MRI SureScan Model BRD1SR1
Serial Number:	RWG600012S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run1

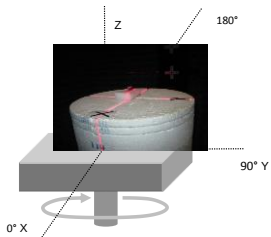
Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

COMMENTS

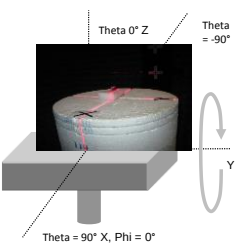
Single chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. Free space.

3D PATTERN DATA	
Frequency (MHz)	2402
Ant. Port Input Pwr. (dBm)	-0.43
Tot. Rad. Pwr. (dBm)	-8.44
Peak EIRP (dBm)	-4.87
Directivity (dB)	3.57
Efficiency (dB)	-8.01
Efficiency (%)	15.81
Gain (dB)	-4.44
Average Gain (dB)	-8.01
E-Plane 3 dB BW (°)	128.00

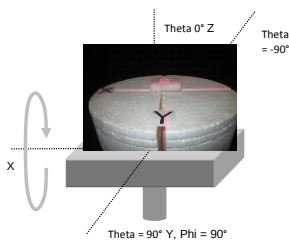
Azimuth Cut (Theta Axis = 90°)



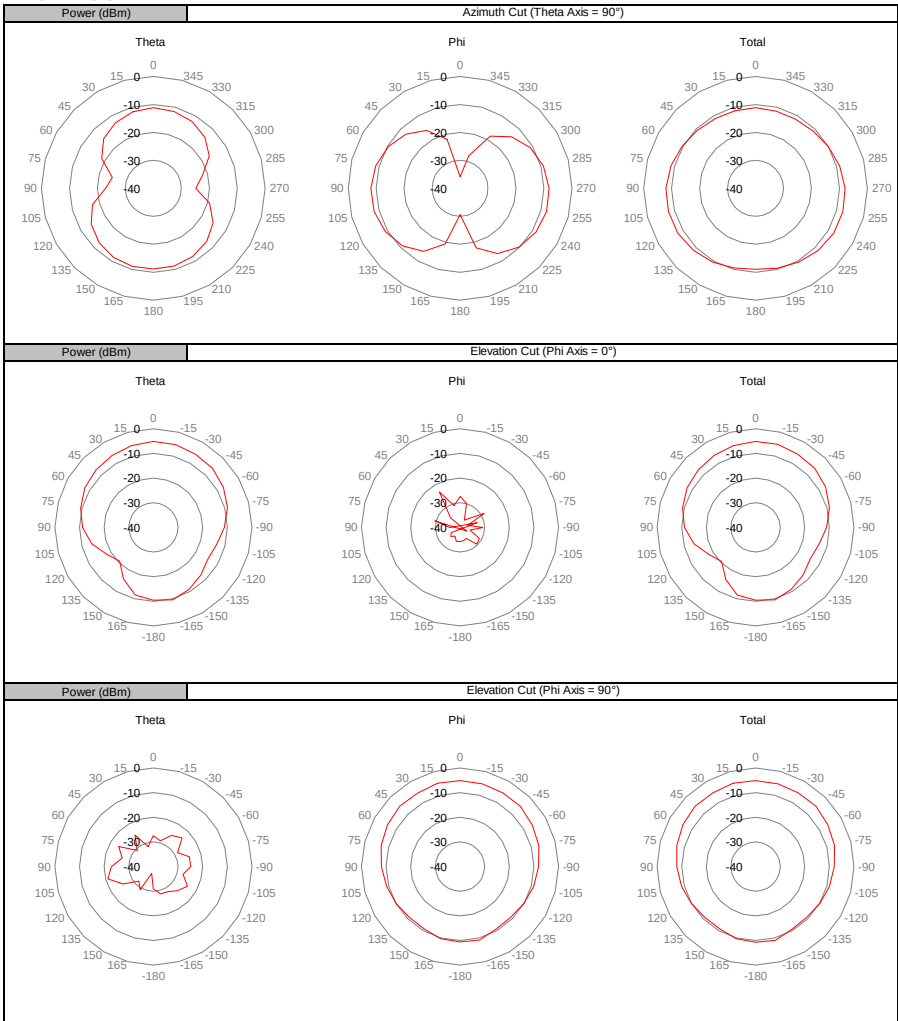
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS

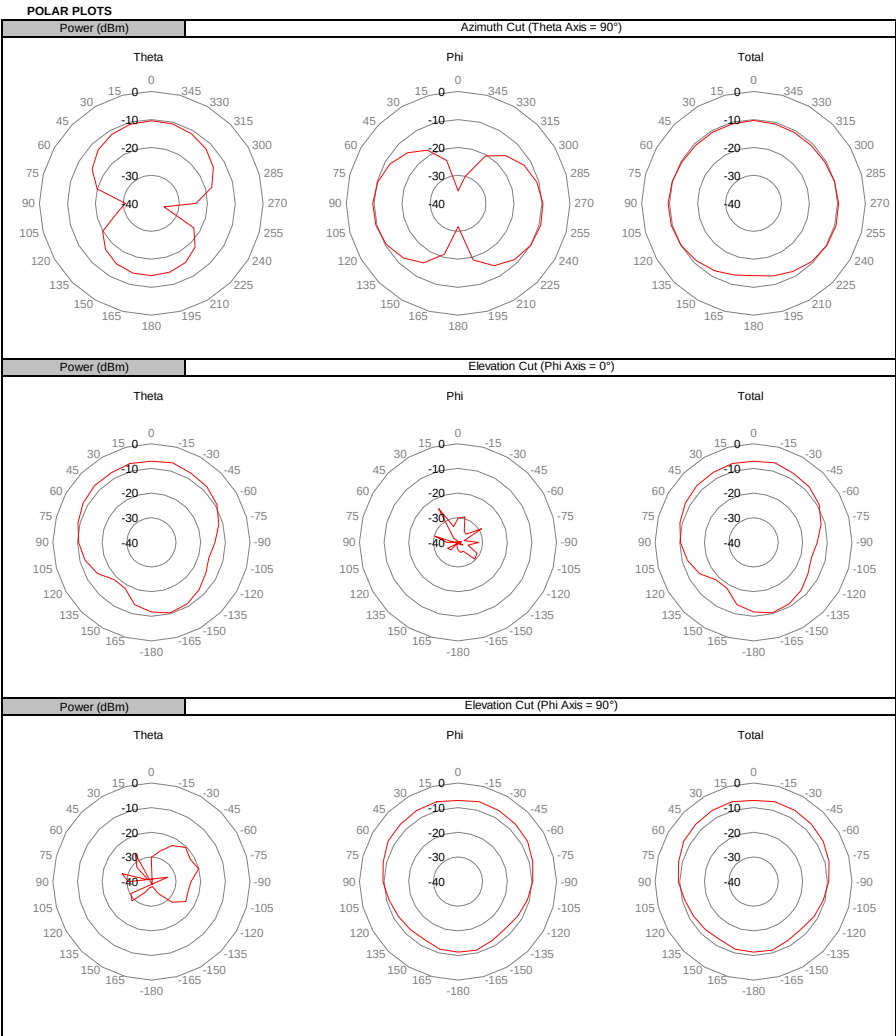
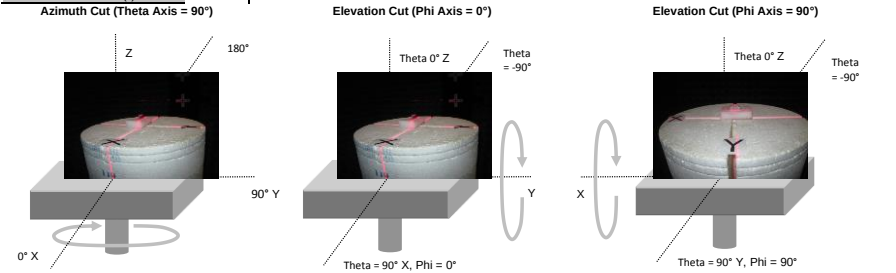


EUT:	Confirma SR MRI SureScan Model BRD1SR1
Serial Number:	RWG600012S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run2

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

COMMENTS
Single chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. Free space.

3D PATTERN DATA	
Frequency (MHz)	2442
Ant. Port Input Pwr. (dBm)	-0.86
Tot. Rad. Pwr. (dBm)	-9.74
Peak EIRP (dBm)	-6.31
Directivity (dB)	3.43
Efficiency (dB)	-6.88
Efficiency (%)	12.94
Gain (dB)	-5.45
Average Gain (dB)	-8.88
E-Plane 3 dB BW (°)	139.00



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS

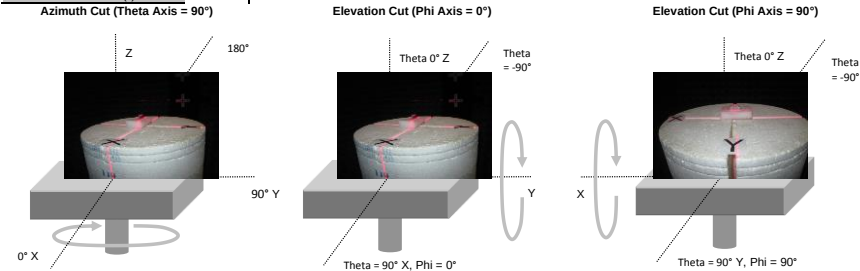


EUT:	Confirma SR MRI SureScan Model BRD1SR1
Serial Number:	RWG600012S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run3

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

COMMENTS
Single chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. Free space.

3D PATTERN DATA	
Frequency (MHz)	2480
Ant. Port Input Pwr. (dBm)	-1.29
Tot. Rad. Pwr. (dBm)	-11.00
Peak EIRP (dBm)	-7.68
Directivity (dB)	3.32
Efficiency (dB)	-9.71
Efficiency (%)	10.69
Gain (dB)	-6.39
Average Gain (dB)	-9.71
E-Plane 3 dB BW (°)	146.00



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



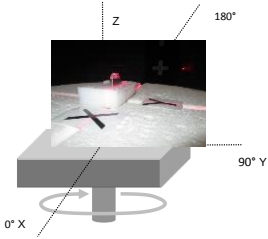
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Serial Number:	HTN600034S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run4

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

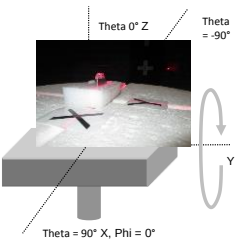
COMMENTS
Dual chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. Free space.

3D PATTERN DATA	
Frequency (MHz)	2402
Ant. Port Input Pwr. (dBm)	-0.43
Tot. Rad. Pwr. (dBm)	-3.00
Peak EIRP (dBm)	-0.10
Directivity (dB)	2.90
Efficiency (dB)	-2.57
Efficiency (%)	55.34
Gain (dB)	0.33
Average Gain (dB)	-2.57
E-Plane 3 dB BW (°)	117.00

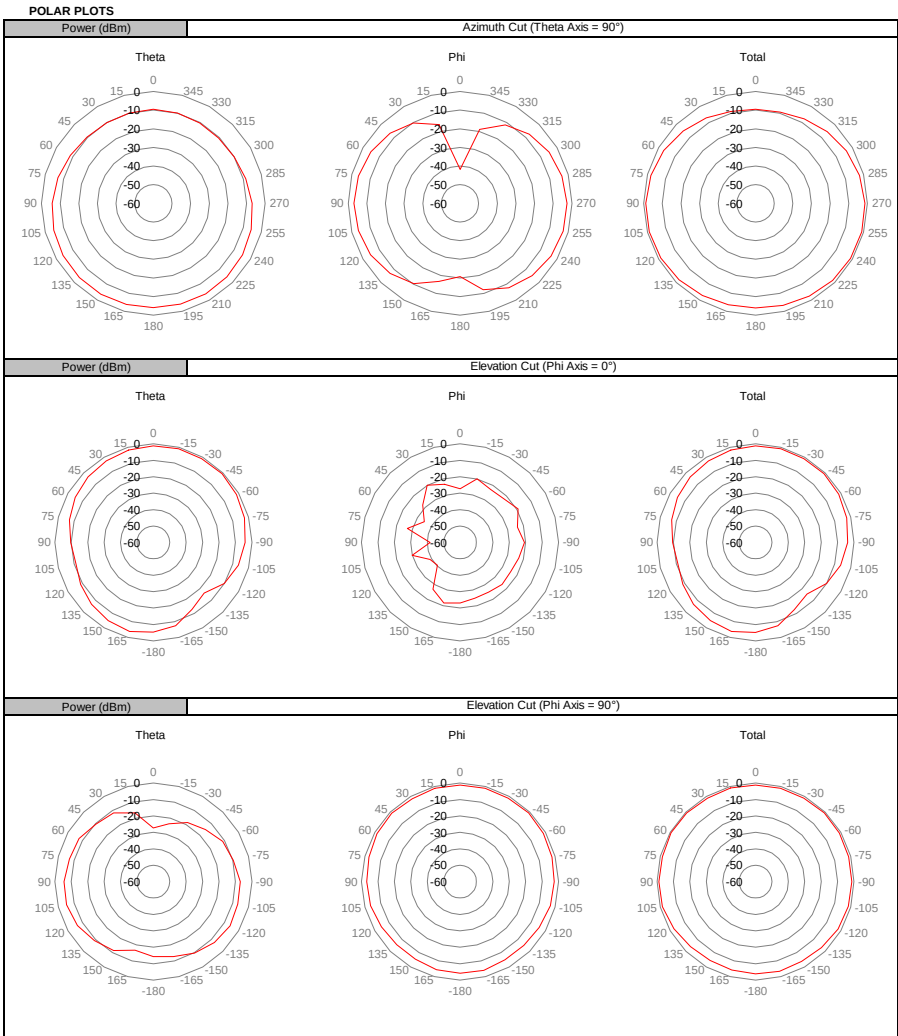
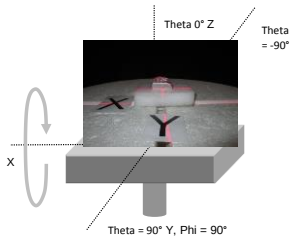
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	HarmoniaBP DR MRI SureScan Model HTN3DR2
Serial Number:	HTN600034S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run5

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

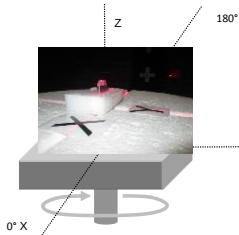
OTA 2018.01.04

COMMENTS

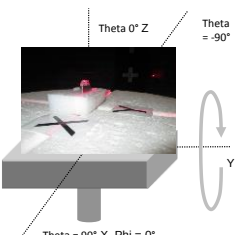
Dual chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. Free space.

3D PATTERN DATA	
Frequency (MHz)	2442
Ant. Port Input Pwr. (dBm)	-0.86
Tot. Rad. Pwr. (dBm)	-3.76
Peak EIRP (dBm)	-0.55
Directivity (dB)	3.20
Efficiency (dB)	-2.90
Efficiency (%)	51.29
Gain (dB)	0.30
Average Gain (dB)	-2.90
E-Plane 3 dB BW (°)	110.00

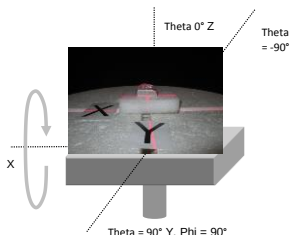
Azimuth Cut (Theta Axis = 90°)



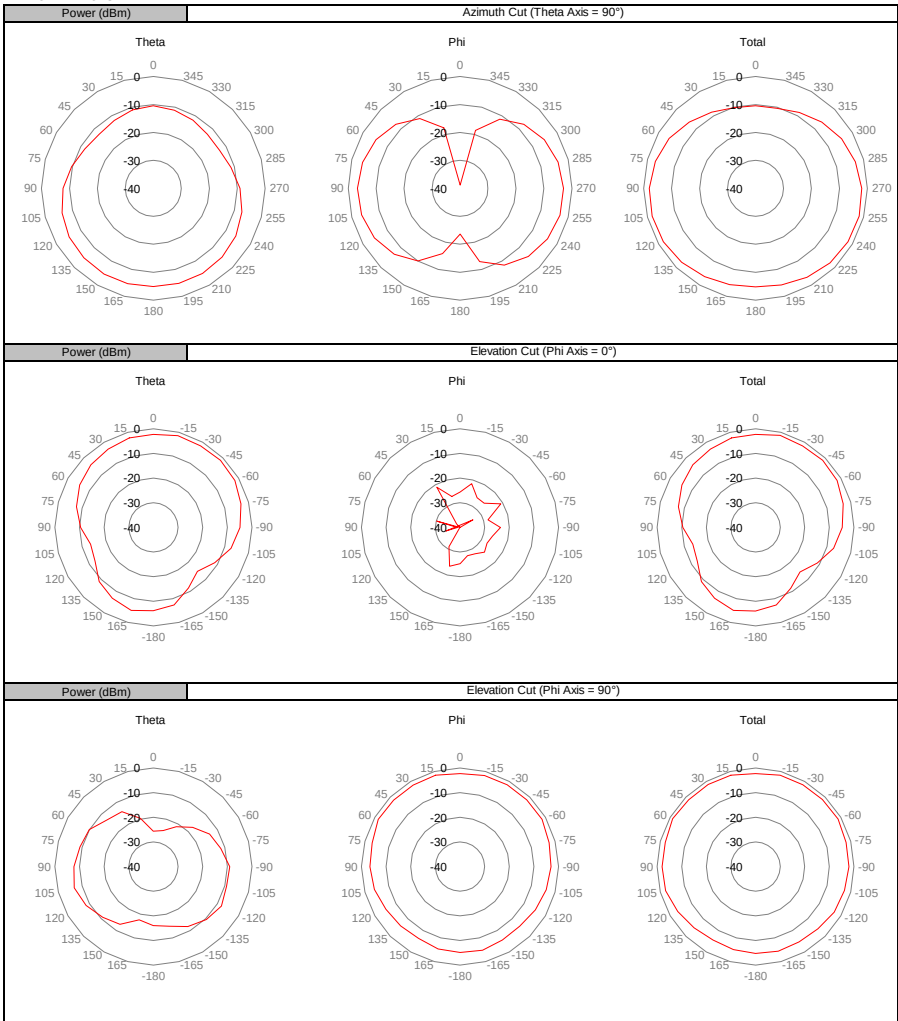
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	HarmoniaBP DR MRI SureScan Model HTN3DR2
Serial Number:	HTN600034S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run6

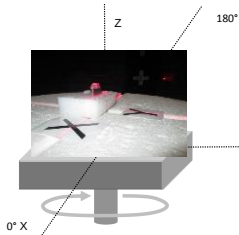
Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

COMMENTS

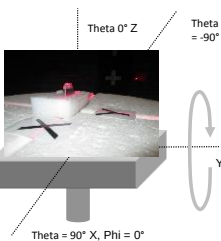
Dual chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. Free space.

3D PATTERN DATA	
Frequency (MHz)	2480
Ant. Port Input Pwr. (dBm)	-1.29
Tot. Rad. Pwr. (dBm)	-5.37
Peak EIRP (dBm)	-2.16
Directivity (dB)	3.21
Efficiency (dB)	-4.08
Efficiency (%)	39.08
Gain (dB)	-0.87
Average Gain (dB)	-4.08
E-Plane 3 dB BW (°)	114.00

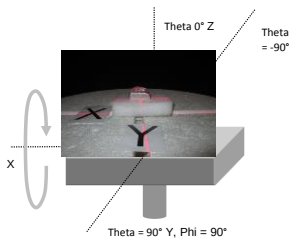
Azimuth Cut (Theta Axis = 90°)



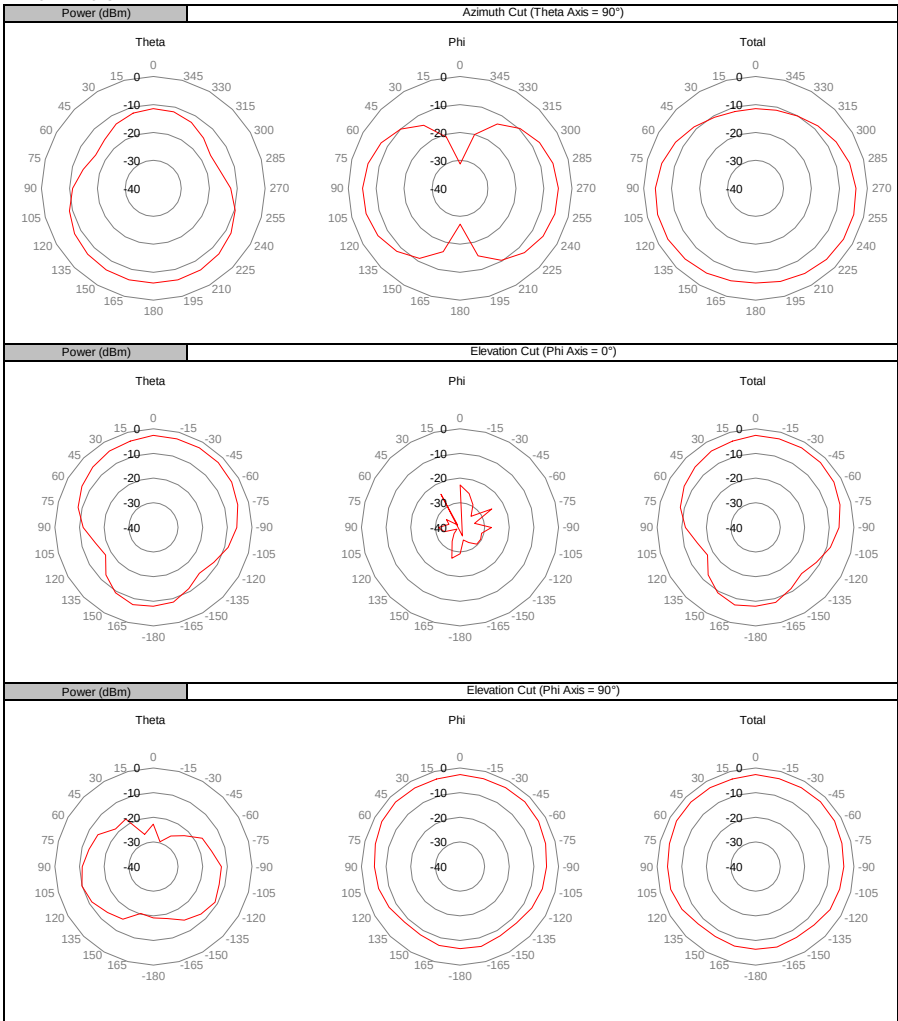
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



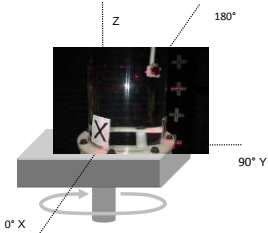
EUT:	HarmoniaBP DR MRI SureScan Model HTN3DR2
Serial Number:	HTN600034S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run7

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

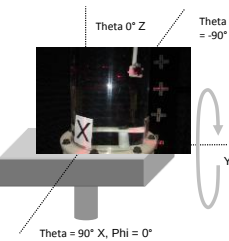
COMMENTS
Dual chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 4cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2402
Ant. Port Input Pwr. (dBm)	-0.43
Tot. Rad. Pwr. (dBm)	-39.66
Peak EIRP (dBm)	-34.89
Directivity (dBi)	4.77
Efficiency (dB)	-39.23
Efficiency (%)	0.01
Gain (dBi)	-34.46
Average Gain (dB)	-39.23
E-Plane 3 dB BW (°)	162.00

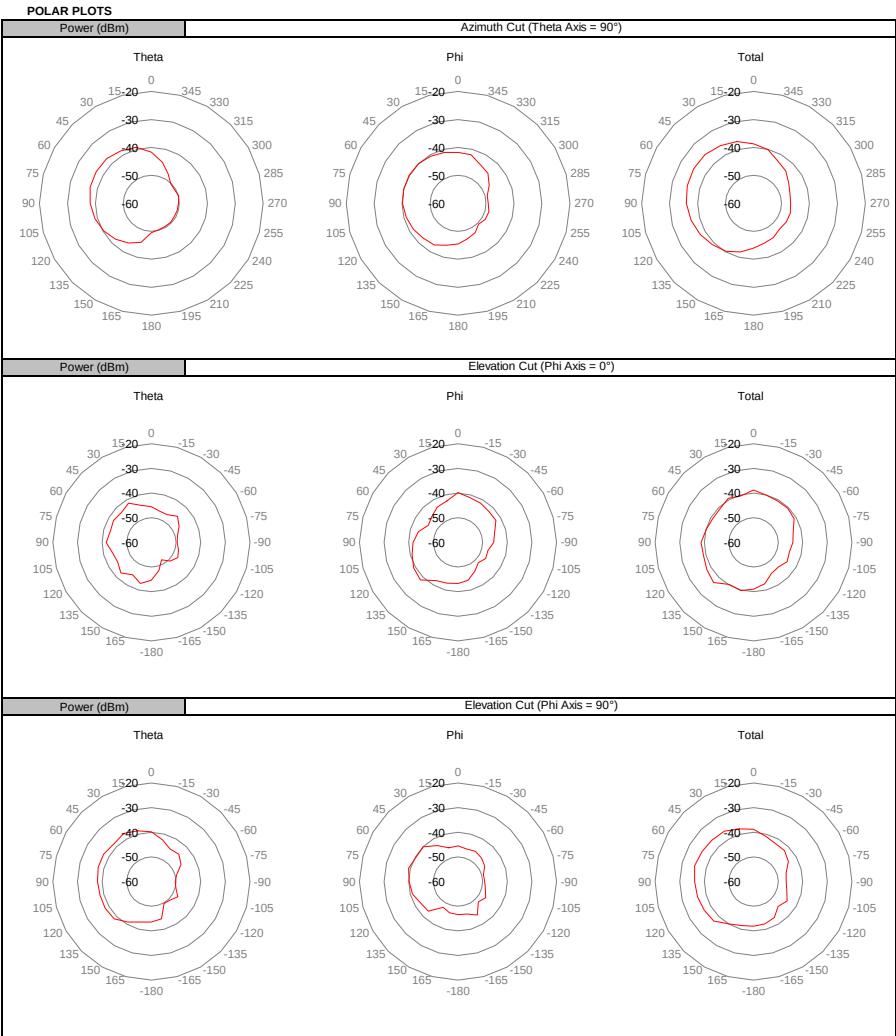
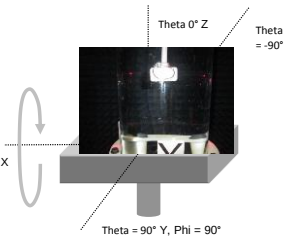
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	HarmoniaBP DR MRI SureScan Model HTN3DR2
Serial Number:	HTN600034S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run8

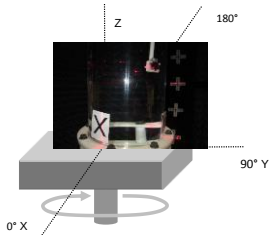
Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

COMMENTS

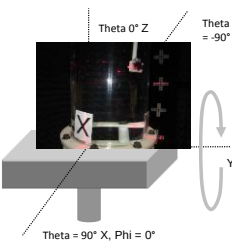
Dual chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 4cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2442
Ant. Port Input Pwr. (dBm)	-0.86
Tot. Rad. Pwr. (dBm)	-39.89
Peak EIRP (dBm)	-35.08
Directivity (dB)	4.81
Efficiency (dB)	-39.03
Efficiency (%)	0.01
Gain (dB)	-34.22
Average Gain (dB)	-39.03
E-Plane 3 dB BW (°)	161.00

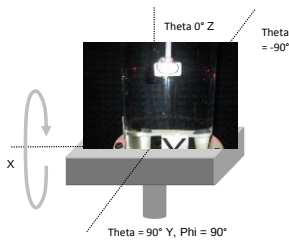
Azimuth Cut (Theta Axis = 90°)



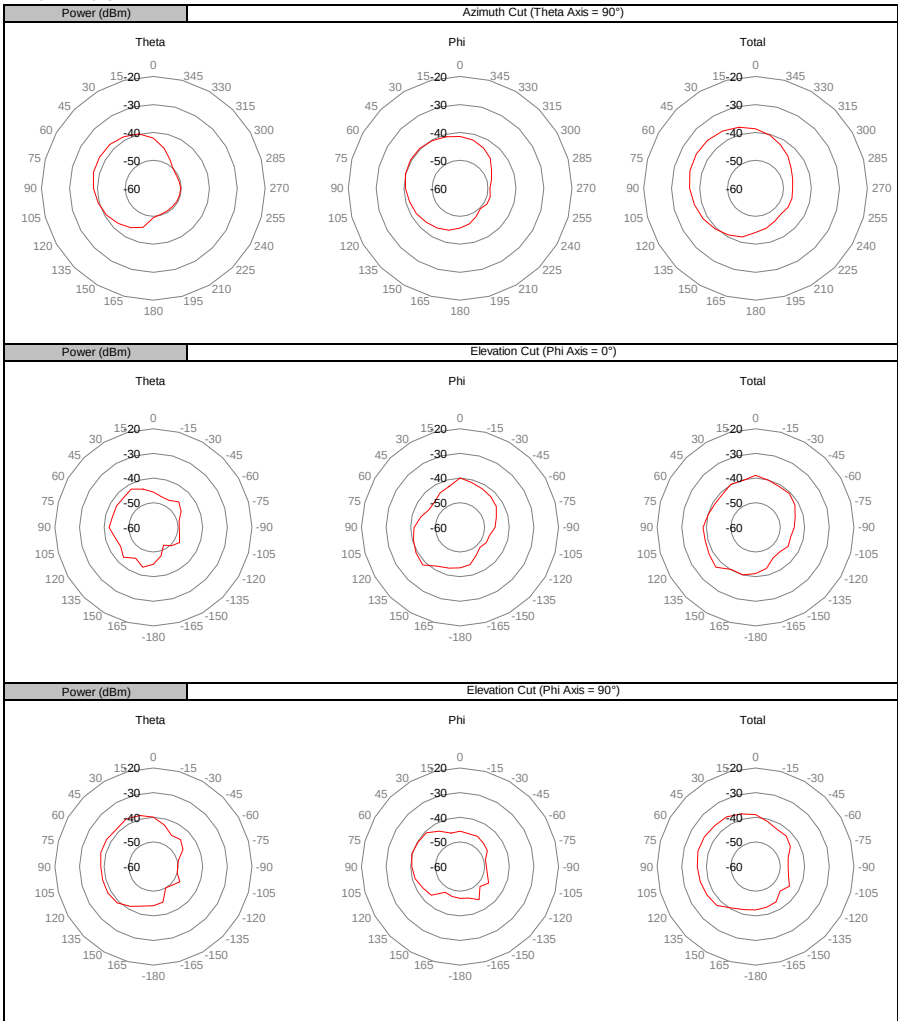
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



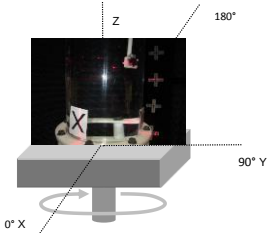
EUT:	HarmoniaBP DR MRI SureScan Model HTN3DR2
Serial Number:	HTN600034S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run9

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

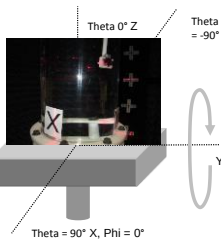
COMMENTS
Dual chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 4cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2480
Ant. Port Input Pwr. (dBm)	-1.29
Tot. Rad. Pwr. (dBm)	-40.13
Peak EIRP (dBm)	-35.29
Directivity (dBi)	4.84
Efficiency (dB)	-38.84
Efficiency (%)	0.01
Gain (dBi)	-34.00
Average Gain (dB)	-38.84
E-Plane 3 dB BW (°)	160.00

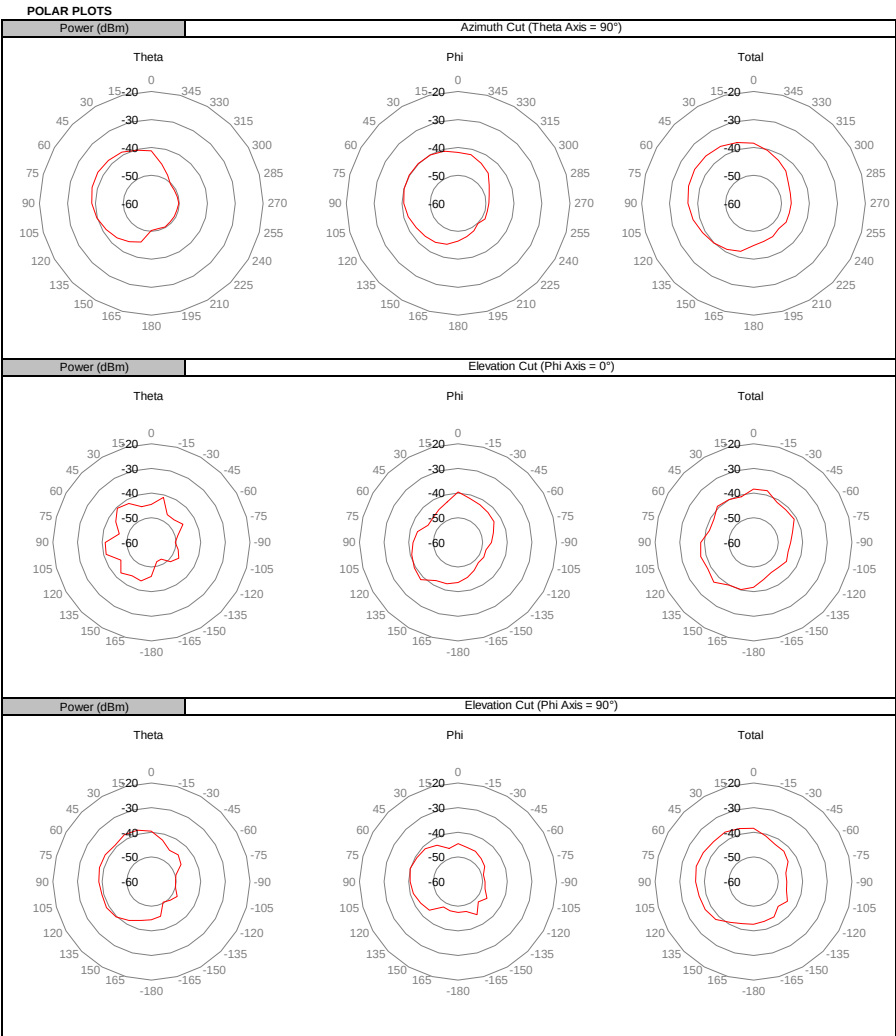
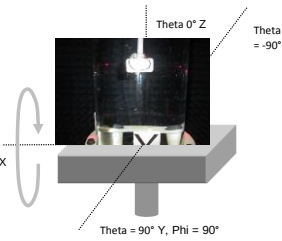
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS

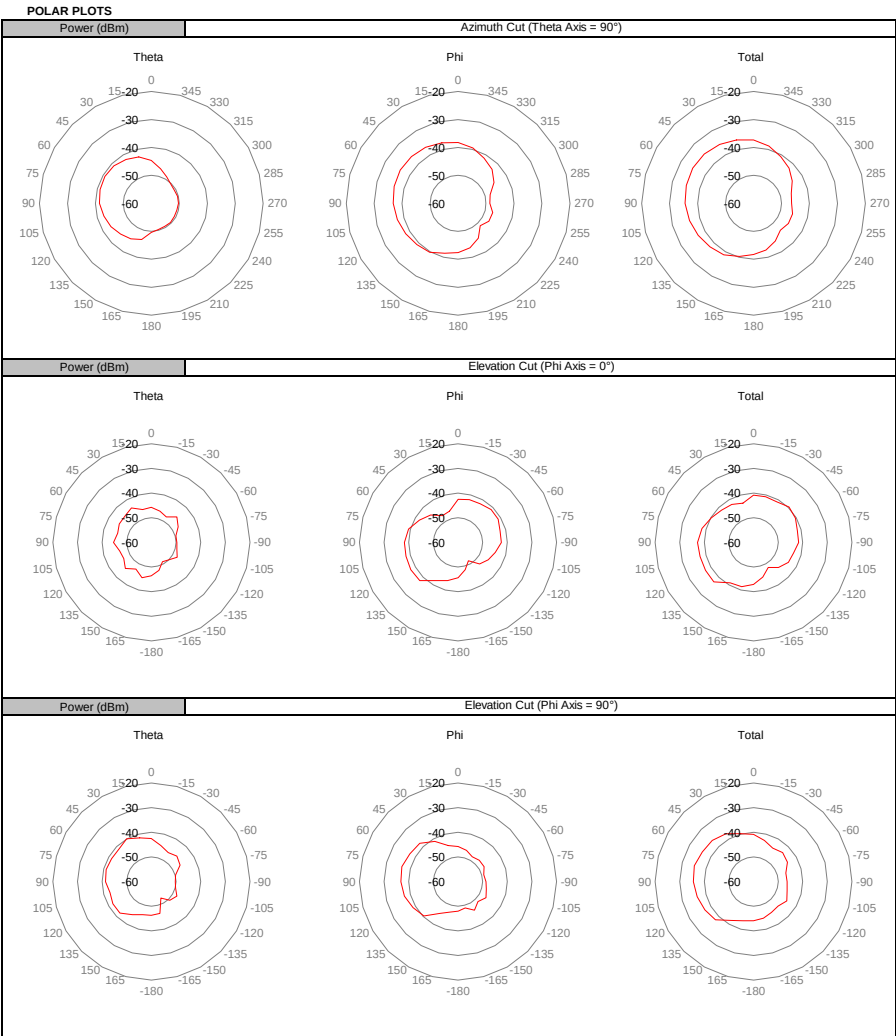
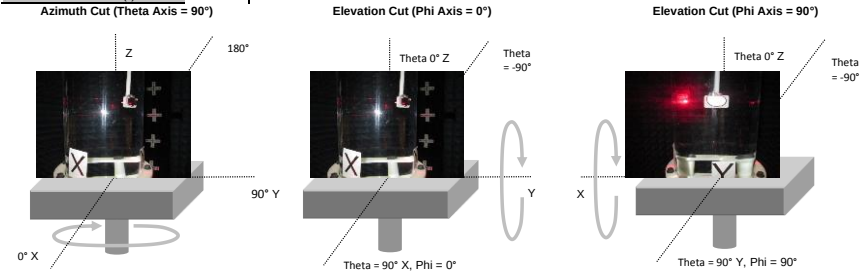


EUT:	Confirma SR MRI SureScan Model BRD1SR1
Serial Number:	RWG600012S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run10

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

COMMENTS
Single chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 4cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2402
Ant. Port Input Pwr. (dBm)	-0.43
Tot. Rad. Pwr. (dBm)	-39.58
Peak EIRP (dBm)	-34.72
Directivity (dBi)	4.86
Efficiency (dB)	-39.15
Efficiency (%)	0.01
Gain (dBi)	-34.29
Average Gain (dB)	-39.15
E-Plane 3 dB BW (°)	151.00



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS

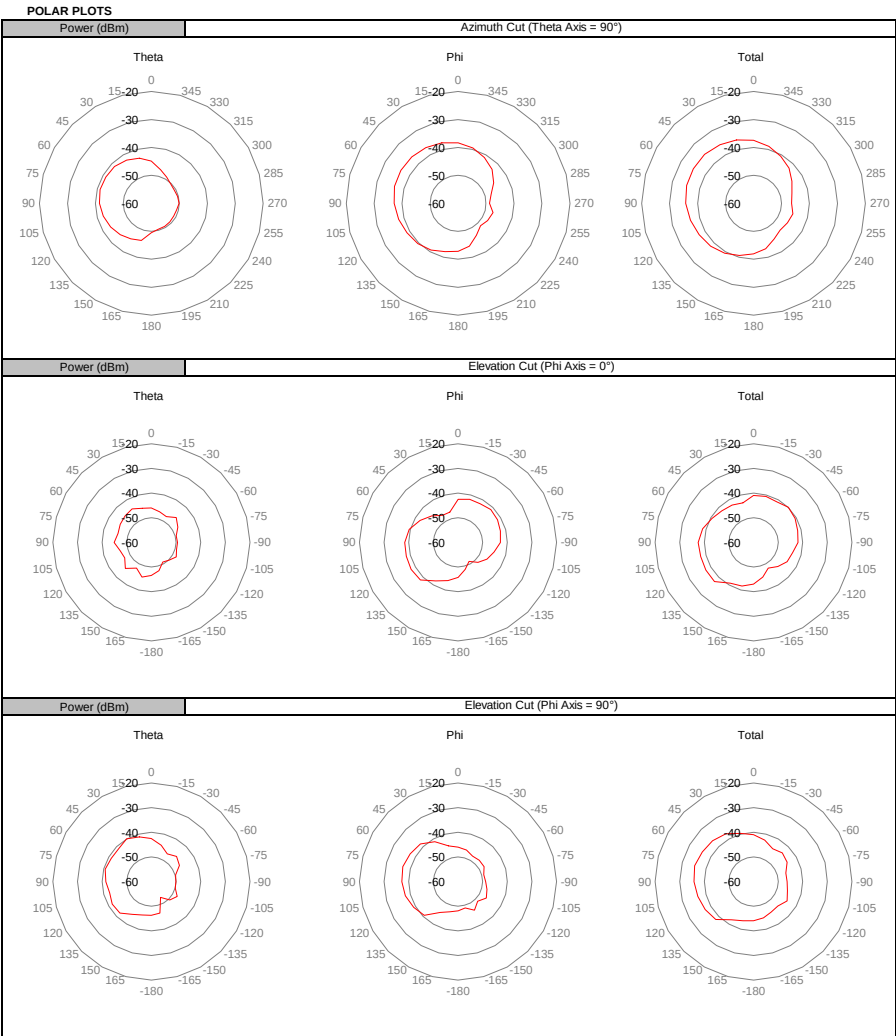
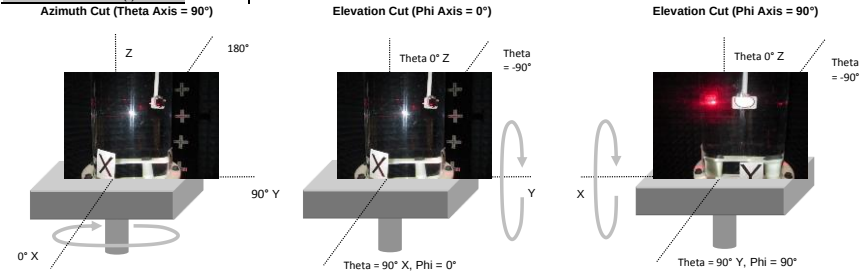


EUT:	Confirma SR MRI SureScan Model BRD1SR1
Serial Number:	RWG600012S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run11

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

COMMENTS
Single chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 4cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2442
Ant. Port Input Pwr. (dBm)	-0.86
Tot. Rad. Pwr. (dBm)	-39.74
Peak EIRP (dBm)	-34.90
Directivity (dB)	4.84
Efficiency (dB)	-38.88
Efficiency (%)	0.01
Gain (dB)	-34.04
Average Gain (dB)	-38.88
E-Plane 3 dB BW (°)	156.00



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS

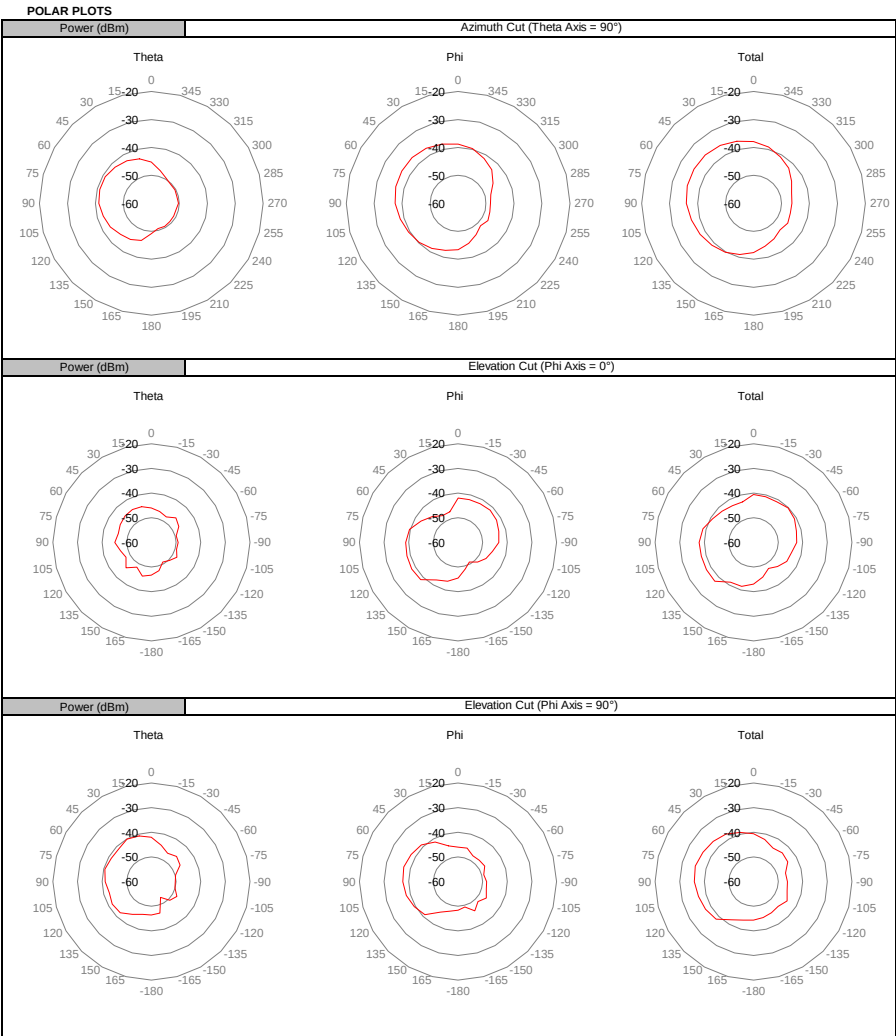
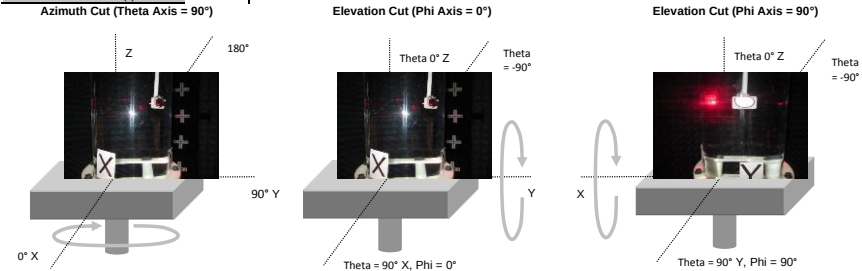


EUT:	Confirma SR MRI SureScan Model BRD1SR1
Serial Number:	RWG600012S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run12

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

COMMENTS
Single chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 4cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2480
Ant. Port Input Pwr. (dBm)	-1.29
Tot. Rad. Pwr. (dBm)	-39.99
Peak EIRP (dBm)	-35.23
Directivity (dBi)	4.76
Efficiency (dB)	-38.70
Efficiency (%)	0.01
Gain (dBi)	-33.94
Average Gain (dB)	-38.70
E-Plane 3 dB BW (°)	161.00



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



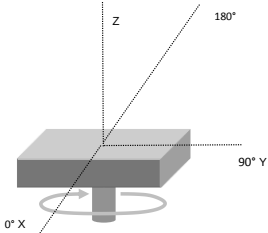
EUT:	Confirma SR MRI SureScan Model BRD1SR1
Serial Number:	RWG600012S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run13

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

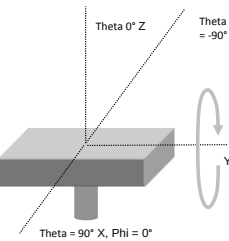
COMMENTS
Single chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 2cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2402
Ant. Port Input Pwr. (dBm)	-0.43
Tot. Rad. Pwr. (dBm)	-35.74
Peak EIRP (dBm)	-30.51
Directivity (dB)	5.23
Efficiency (dB)	-35.31
Efficiency (%)	0.03
Gain (dB)	-30.08
Average Gain (dB)	-35.31
E-Plane 3 dB BW (°)	145.00

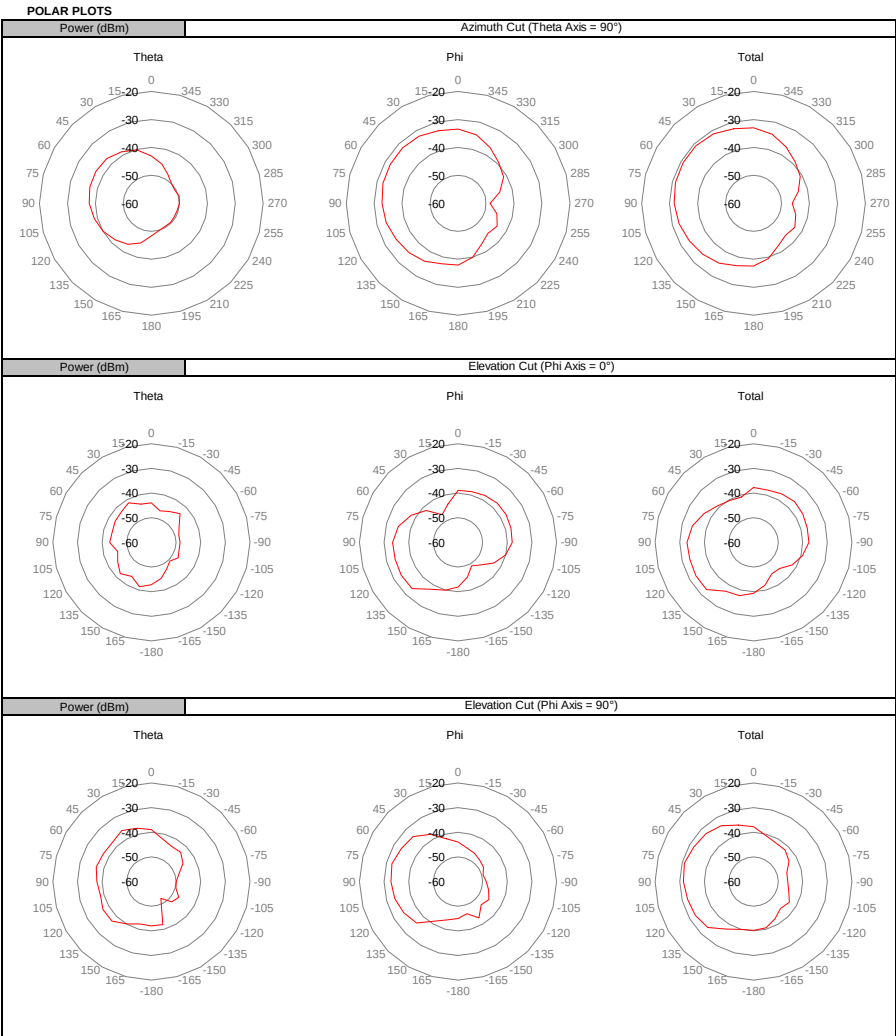
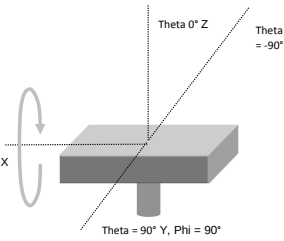
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



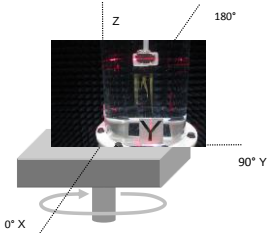
EUT:	Confirma SR MRI SureScan Model BRD1SR1
Serial Number:	RWG600012S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run14

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

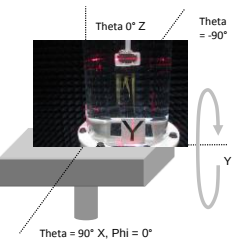
COMMENTS
Single chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 2cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2442
Ant. Port Input Pwr. (dBm)	-0.86
Tot. Rad. Pwr. (dBm)	-35.92
Peak EIRP (dBm)	-30.57
Directivity (dB)	5.35
Efficiency (dB)	-35.06
Efficiency (%)	0.03
Gain (dB)	-29.71
Average Gain (dB)	-35.06
E-Plane 3 dB BW (°)	147.00

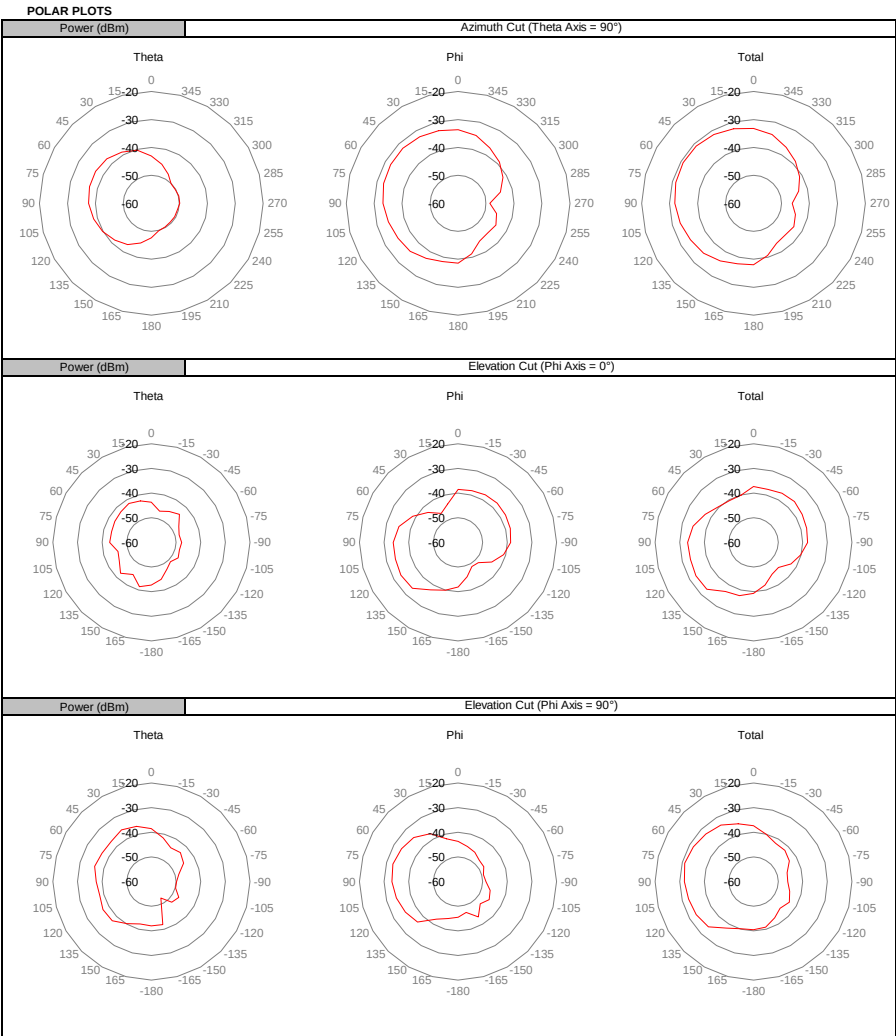
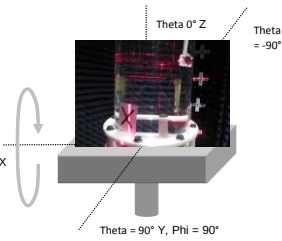
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



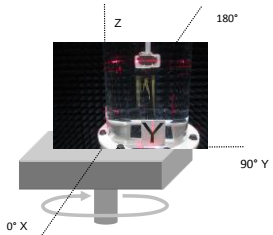
EUT:	Confirma SR MRI SureScan Model BRD1SR1
Serial Number:	RWG600012S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run15

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

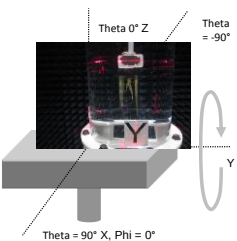
COMMENTS
Single chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 2cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2480
Ant. Port Input Pwr. (dBm)	-1.29
Tot. Rad. Pwr. (dBm)	-36.09
Peak EIRP (dBm)	-30.68
Directivity (dBi)	5.41
Efficiency (dB)	-34.80
Efficiency (%)	0.03
Gain (dBi)	-29.39
Average Gain (dB)	-34.80
E-Plane 3 dB BW (°)	149.00

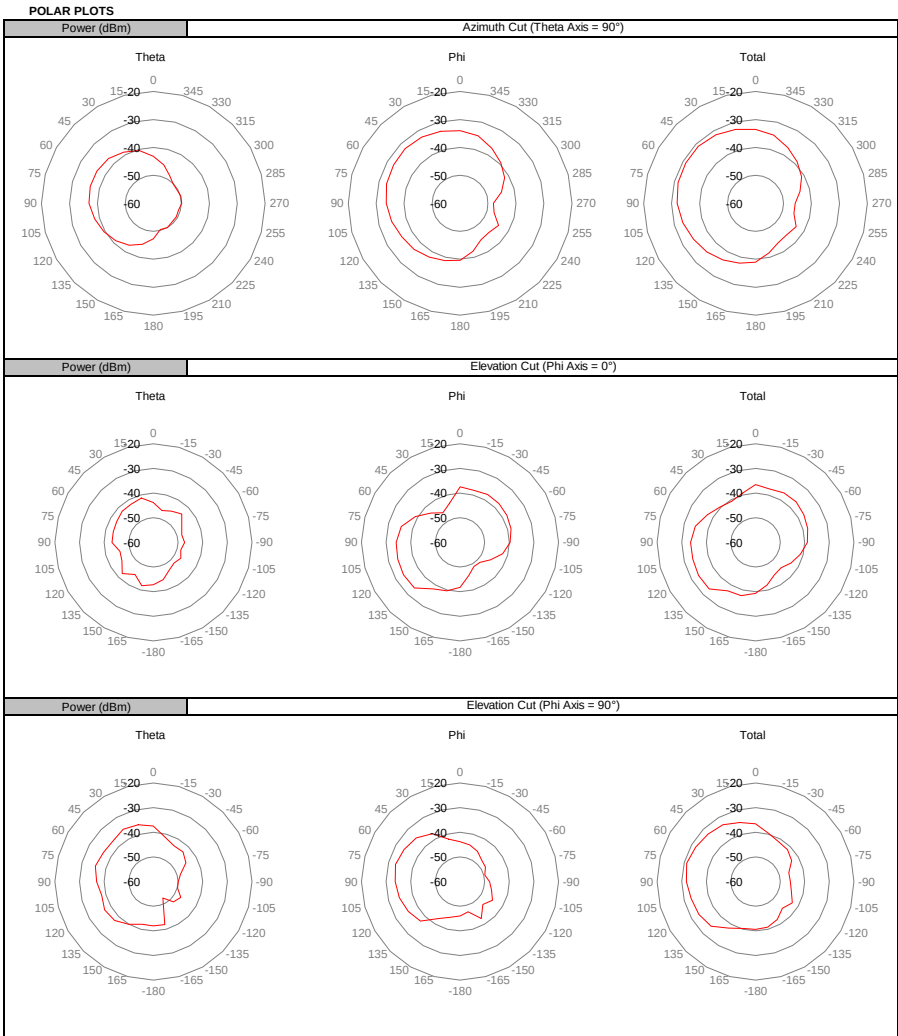
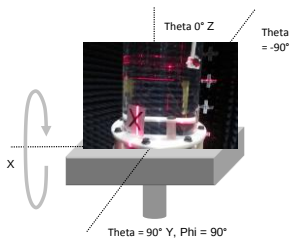
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



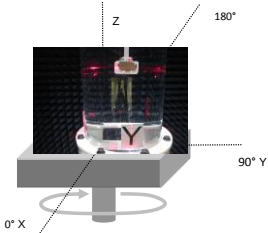
EUT:	HarmoniaBP DR MRI SureScan Model HTN3DR2
Serial Number:	HTN600034S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run16

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

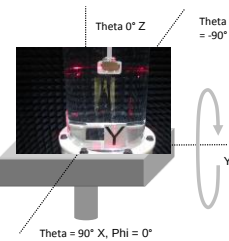
COMMENTS
Dual chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 2cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2402
Ant. Port Input Pwr. (dBm)	-0.43
Tot. Rad. Pwr. (dBm)	-35.27
Peak EIRP (dBm)	-29.71
Directivity (dBi)	5.57
Efficiency (dB)	-34.84
Efficiency (%)	0.03
Gain (dBi)	-29.27
Average Gain (dB)	-34.84
E-Plane 3 dB BW (°)	155.00

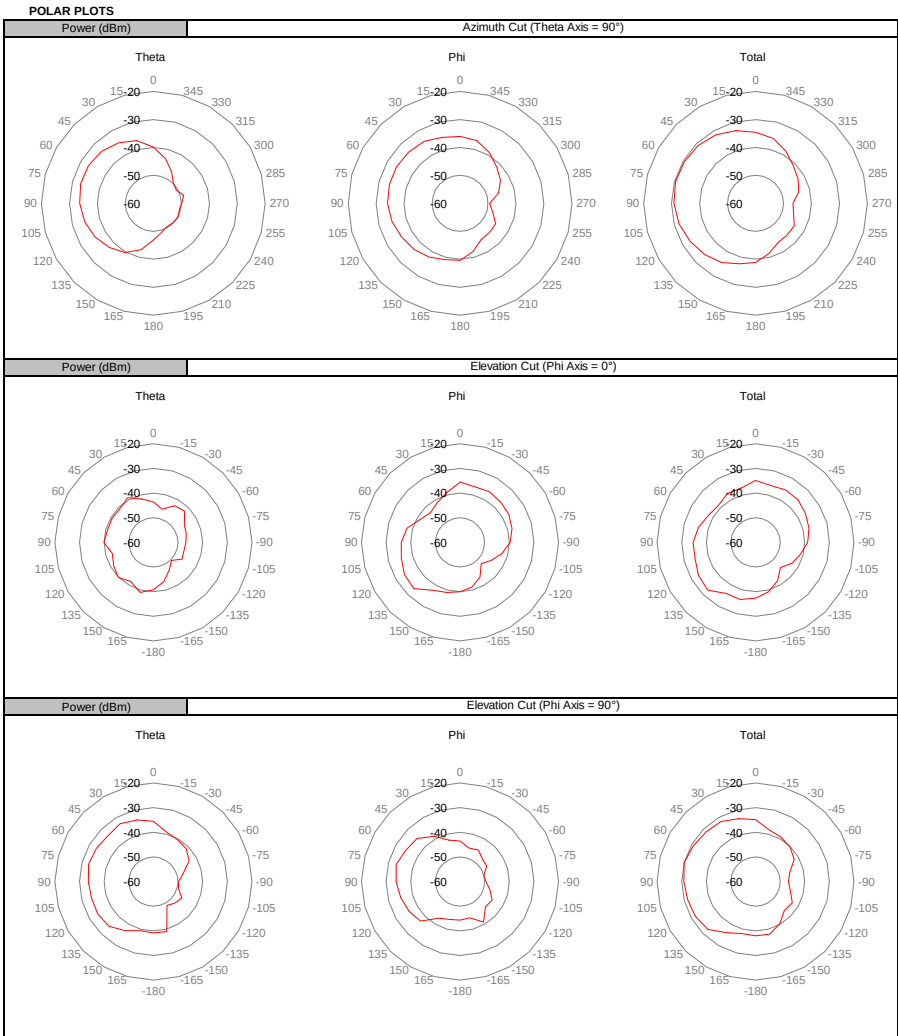
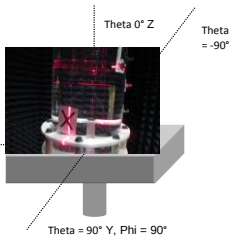
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



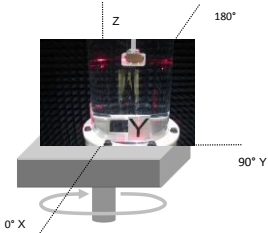
EUT:	HarmoniaBP DR MRI SureScan Model HTN3DR2
Serial Number:	HTN600034S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run17

Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

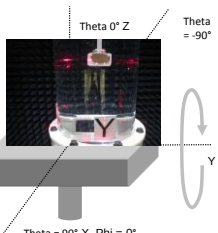
COMMENTS
Dual chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 2cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2442
Ant. Port Input Pwr. (dBm)	-0.86
Tot. Rad. Pwr. (dBm)	-35.38
Peak EIRP (dBm)	-29.89
Directivity (dBi)	5.49
Efficiency (dB)	-34.52
Efficiency (%)	0.04
Gain (dBi)	-29.03
Average Gain (dB)	-34.52
E-Plane 3 dB BW (°)	155.00

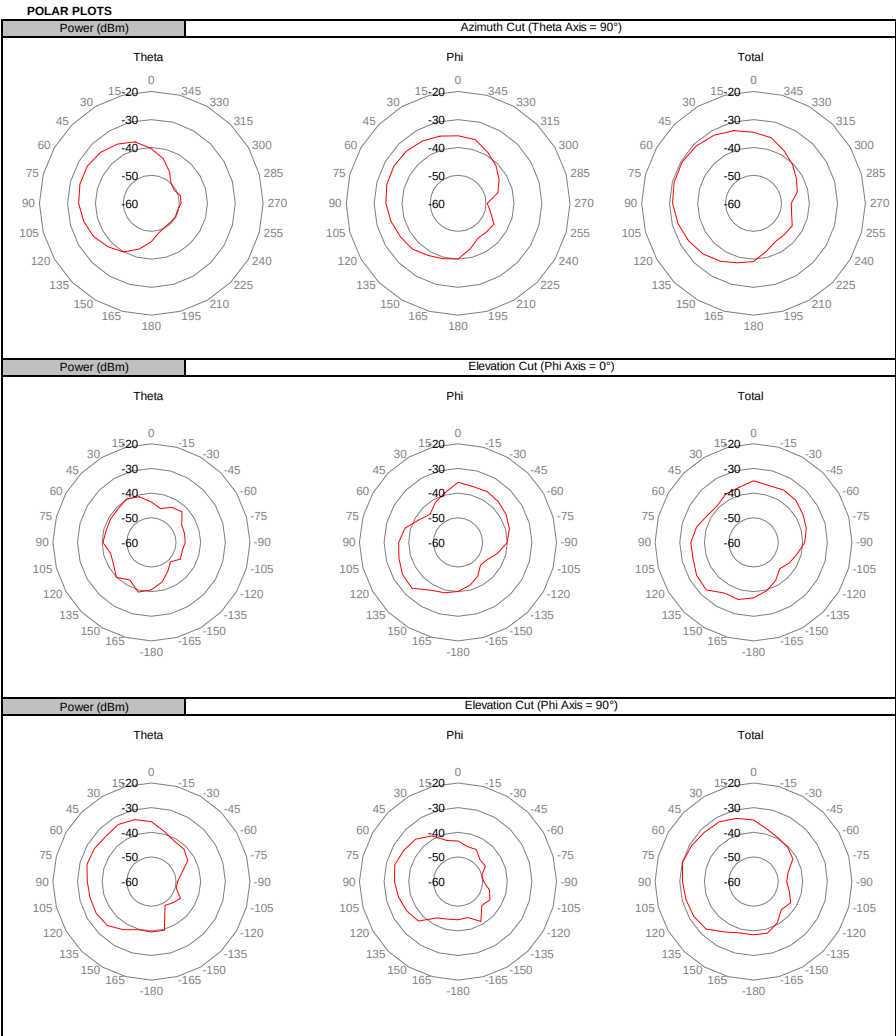
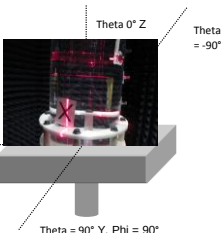
Azimuth Cut (Theta Axis = 90°)



Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



ACTIVE 3D ANTENNA PATTERN MEASUREMENTS



EUT:	HarmoniaBP DR MRI SureScan Model HTN3DR2
Serial Number:	HTN600034S
Customer:	Medtronic, Inc.
Attendees:	Curt Pies
Customer Project:	None
Tested By:	Christopher Heintzelman
Test Run Description:	Run18

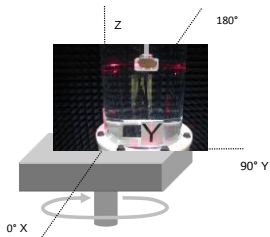
Work Order:	MDTR1264
Date:	5/13/2026
Temperature:	22.3 °C
Relative Humidity:	33.3% RH
Bar. Pressure:	1023 mbar
Job Site:	MN10

COMMENTS

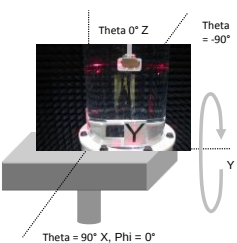
Dual chamber device. Antenna port input power was referenced from report MDTR1212.3 Rev 3. In saline - 2cm tank depth, declared to be 1.96 S/m.

3D PATTERN DATA	
Frequency (MHz)	2480
Ant. Port Input Pwr. (dBm)	-1.29
Tot. Rad. Pwr. (dBm)	-35.50
Peak EIRP (dBm)	-29.94
Directivity (dB)	5.56
Efficiency (dB)	-34.21
Efficiency (%)	0.04
Gain (dB)	-28.65
Average Gain (dB)	-34.21
E-Plane 3 dB BW (°)	156.00

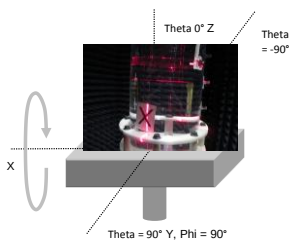
Azimuth Cut (Theta Axis = 90°)



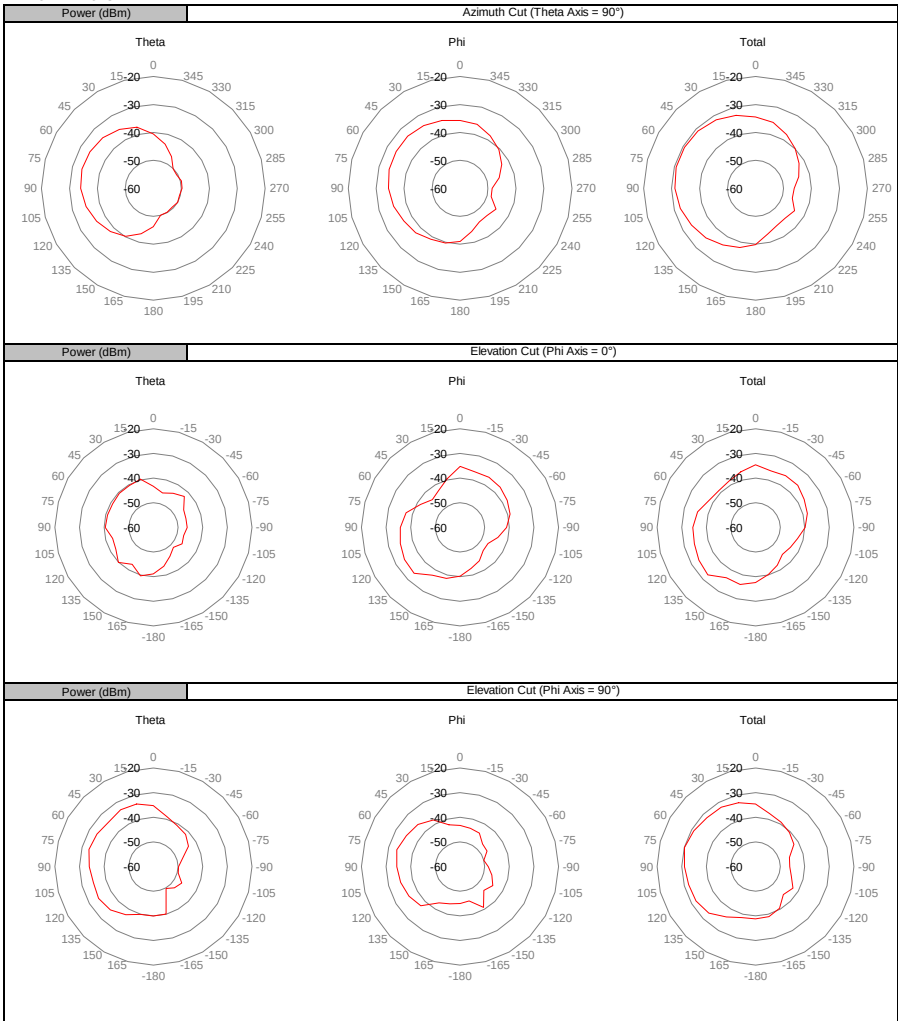
Elevation Cut (Phi Axis = 0°)



Elevation Cut (Phi Axis = 90°)



POLAR PLOTS



End of Test Report