

ANTENNA PATTERN REPORT	
Report Reference No	G0M-2407-2638-AUT01-V02
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Applicant	BIOTRONIK SE & Co. KG
Address	Woermannkehre 1 12359 Berlin GERMANY
Equipment under Test (EUT):	
Product Description	ICD4200-10 / Implantable Cardioverter Defibrillator
Model(s)	Acticor Sky HF-T QP, additional models see family list
Additional Model(s)	None
Brand Name(s)	BIOTRONIK
Hardware Version(s)	0A
Software Version(s)	ROM: 6.0 / RAM: 7.0
Test Result	PASSED

Possible test case verdicts:		
Required by standard but not tested	N/T	
Not required by standard	N/R	
Not applicable to EUT	N/A	
Test object does meet the requirement	P(PASS) – equivalent to GOOD	
Test object does not meet the requirement	F(FAIL) – equivalent to NG	
Testing:		
Test Lab Temperature	20 - 25 °C	
Test Lab Humidity	45 – 65 %	
Date of receipt of test item	2024-08-01	
Report:		
Compiled by	Md Abu Bakar Siddique	
Tested by (+ signature) (Responsible for Test)	Md Abu Bakar Siddique	
Approved by (+ signature) (Senior Expert)	Radwan Jaafar	
Date of Issue	2025-09-10	
Total number of pages	14	
General Remarks:		
The test results presented in this report relate only to the object tested. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		
None		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2025-03-26	Initial Release	--
02	2025-09-10	Deleted test setup photos	Siddique

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
AUT	Antenna Under Test
OCTRCC	Ordinance concerning technical regulations conformity certification
ORRE	Japanese Ordinance regulating radio equipment
PPM	Part per million
RBW	Resolution bandwidth
RMS	Root mean square
VBW	Video bandwidth
V _{NOM}	Nominal supply voltage
V _{MIN}	Minimum supply voltage
V _{MAX}	Maximum supply voltage

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1 Equipment (Test Item) Under Test

Description	ICD4200-10 / Implantable Cardioverter Defibrillator			
Model	Acticor Sky HF-T QP, additional models see family list			
Additional Model(s)	None			
Brand Name(s)	BIOTRONIK			
Sample identification	EUT #	Sample-ID	Serial Number	Date of receipt
	EUT 1 (Cond.)	50617	938	2025-01-20
	EUT 2 (Rad.)	50612	1000428866	2025-01-20
Hardware Version(s)	0A			
Software Version(s)	ROM: 6.0 / RAM: 7.0			
Equipment type	End Product			
Assigned frequency bands	402 - 405 MHz			
Operating frequency range	402.45 - 404.85 MHz			
Radio technology	MedRadio (MICS) active medical implant			
Modulation	CW			
Number of antenna ports	1			
Antenna	Type	Integrated		
	Model	4200-10		
	Manufacturer	BIOTRONIK SE & Co. KG		
Supply Voltage	V _{NOM}	3.0 V DC		
	V _{MIN}	2.5 V DC		
	V _{MAX}	3.2 V DC		
Operating Temperature	T _{NOM}	37°C		
	T _{MIN}	25°C		
	T _{MAX}	45°C		
Manufacturer	BIOTRONIK SE & Co. KG Woermannkehre 1 12359 Berlin GERMANY			

1.1 Antenna Properties

Product:	ICD4200-10 / Implantable Cardioverter Defibrillator
EUT Model:	Acticor Sky HF-T QP
Antenna Model:	4200-10
Antenna Type:	Integrated
Manufacturer:	BIOTRONIK SE & Co. KG

1.2 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Communication Adapter	BIOTRONIK SE & Co. KG	TELBOX II	--
AE	Programming Head	BIOTRONIK SE & Co. KG	Renamic PGH	--
AE	Cardio Messenger	BIOTRONIK SE & Co. KG	Cardio Messenger II	--
AE	Laptop	DELL	Latitude 5520	--
SFT	Biotronic Engineering tool	BIOTRONIK SE & Co. KG	2.17328.1.878	--
CBL	USB cable	--	--	--
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment: --				

1.3 Test Modes

Mode	Description
Unmodulated	Mode = Standalone Transmit Modulation = None Dutycycle = 100 %
Comment: --	

1.4 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx/RX	0	403.65

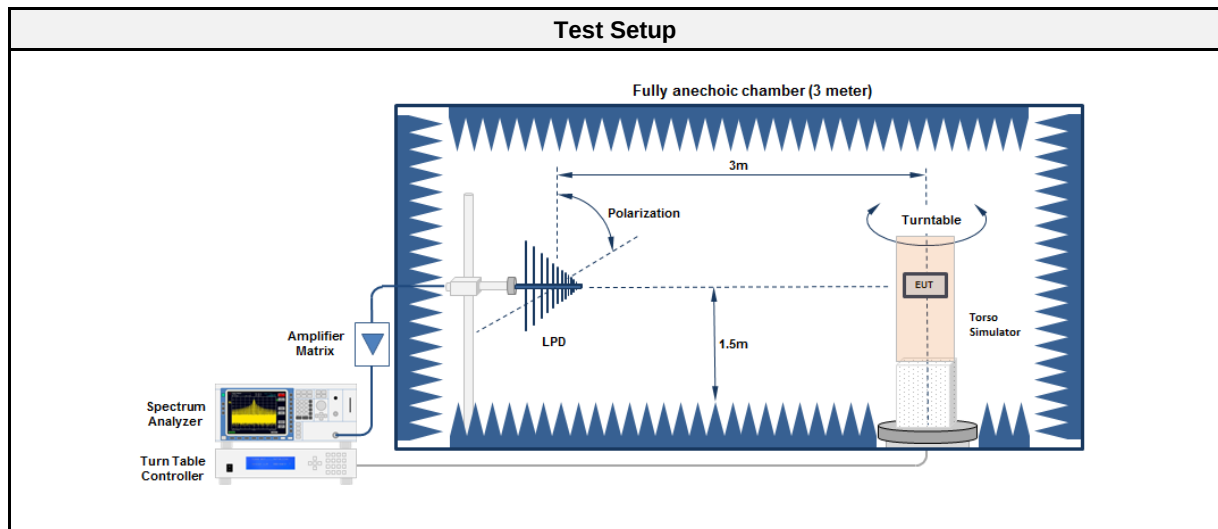
2 Test Conditions and Results

2.1 Test Conditions and Results - Antenna pattern

2.1.1 Information

Test Information	
Operator	Md Abu Bakar Siddique
Measurement uncertainty	$\pm 5.73 \%$
Date	2025-01-23

2.1.2 Setup



2.1.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
Antenna pattern software	Eurofins Product Service GmbH	Eurofins Antenna Pattern	1.9

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber	Frankonia	AC 2	EF01616	2024-07	2025-07
Spectrum analyzer	R&S	FSW43	EF00896	2024-07	2025-07
LPD antenna	R&S	HL223	EF00187	2022-06	2025-06

2.1.4 Procedure

Test Procedure	
1.	EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground
2.	The EUT is activated in test mode on the test channel
3.	The measurement antenna is set to vertical polarization
4.	The spectrum analyser is set to the EUT channel in zero span with RBW = 1 MHz and peak detection
5.	The EUT is rotated through 0° to 360°
6.	The measurement procedure is repeated for all possible EUT positions.
7.	The measurement antenna polarization is changed to horizontal and the measurement is repeated

2.1.5 Results

Test result				
Test Frequency	Conducted Power [dBm]	Half power beam width [°]	Max. rad. Power [dBm e.i.r.p]	Max. antenna gain [dBi]
403.65	-2.83	139.6	-27.07	-24.24

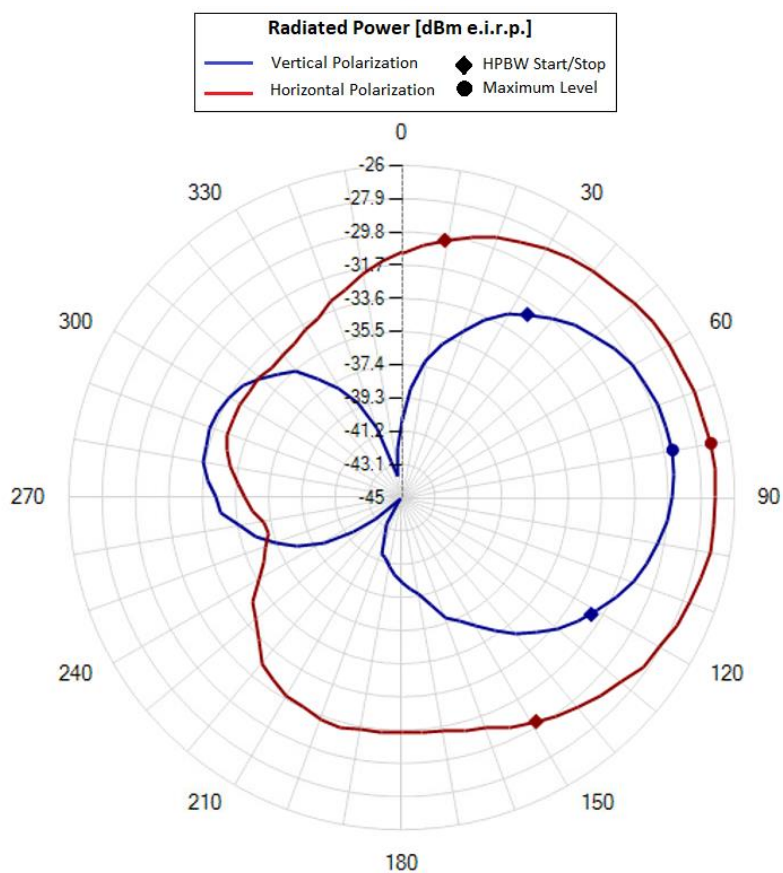
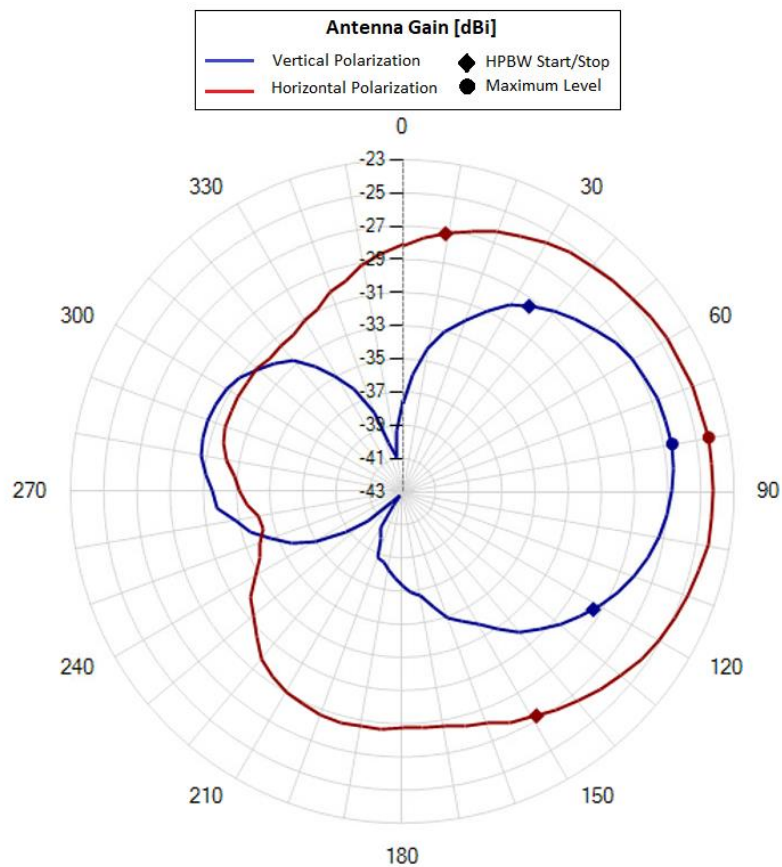
ANNEX A Antenna Pattern

Antenna Pattern

Project Number: G0M-2407-2638
 Product: ICD4200-10 / Implantable Cardioverter Defibrillator
 Model: Acticor Sky HF-T QP, additional models see family list
 Operating Conditions: Tnom / Vnom
 Operating Frequency: 403.65 MHz
 Detector: Peak
 RBW: 1 MHz
 VBW: 3 MHz
 Sweep Time: 100 ms
 Conducted Power: -2.83 dBm
 Operator: Md Abu Bakar Siddique
 Date: 2025-01-23

Result Summary

Antenna Polarization	Half power beam width [°]	Max. rad. power [dBm e.i.r.p.]	Max. antenna gain [dBi]
Vertical	87.3	-29.3	-26.47
Horizontal	139.6	-27.07	-24.24



=== END OF TEST REPORT ===

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