



Data Sheet

Slot Antenna

Slot Antenna.DS.0001

Data Sheet

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Revision History

Table 1 Revision History

Revision	Date (DD Mon. YYYY)	Name	Chapter	Modification
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Handling and Archiving Note

This document in the present revision state will be archived in the document management system of TQ-Systems GmbH under the name Slot Antenna.DS.0001.docx.

1. Document Scope

1.1 Document Purpose

This document describes the technical data of the broadband 5 to 7 GHz slot antenna which is used in the Polaris NXT OP lamp.

1.2 Legal Disclaimer

All brand names and/or trademarks mentioned in the documentation and, if applicable, protected by third parties are subject - without restriction - to the provisions of the applicable trademark law and the ownership rights of the respective registered owners. The mere mention does not imply that it is trademarks are not protected by the rights of third parties.

1.3 Applicable Standards and Related Documents

Table 2 Applicable Standards and Related Documents

Reference	Document Title/ Description File Name / Document No.	Version / Date (DD Mon. YYYY)	Creator
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1.4 Referenced Documents

Table 3 Referenced Documents

Reference	Document Title/ Description File Name / Document No.	Version / Date (DD Mon. YYYY)	Creator
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1.5 Used Abbreviations

Table 4 Abbreviations

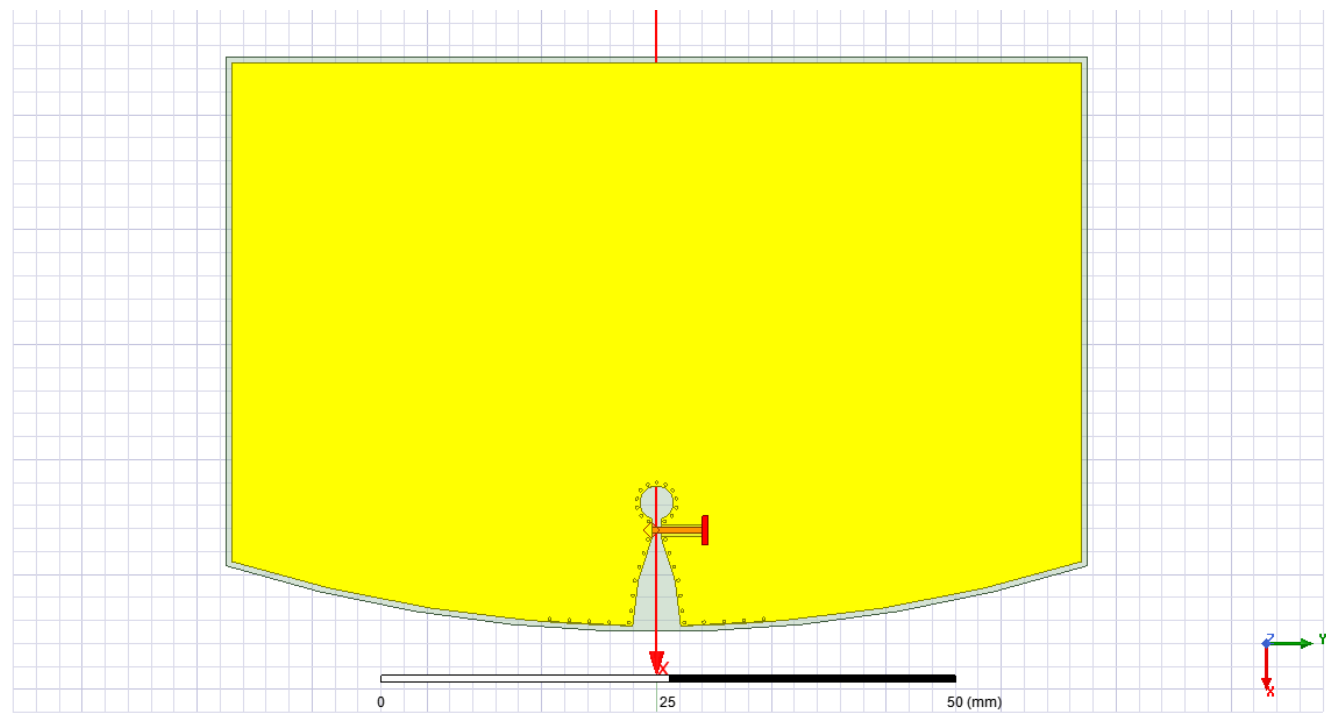
Abbreviation	Explanation
SOW	Statement of Work
DD	Design Document
RS	Requirements Specification
SP	Schematics
SL	Bill of Material
TPD	Technical Product Description
TR	Test Report
TS	Test Specification

2. Mechanical Properties

The antenna is embedded into a large ground plane on a PCB.

The antenna is realized as a resonating slot with length $\lambda/4$ which is excited by a galvanical bridge connected to a grounded coplanar waveguide (GCPW) with 50R impedance.

Here a picture of the antenna:



Property	Value	Unit	Remarks
PCB Overall Size	50x70x1.6	mm	Size in x-, y-, and z-direction
Slot Size	12x4	mm	
Keep Out Area	16x14	mm	Symmetrically around the slot

3. Electrical Properties

3.1 Overview

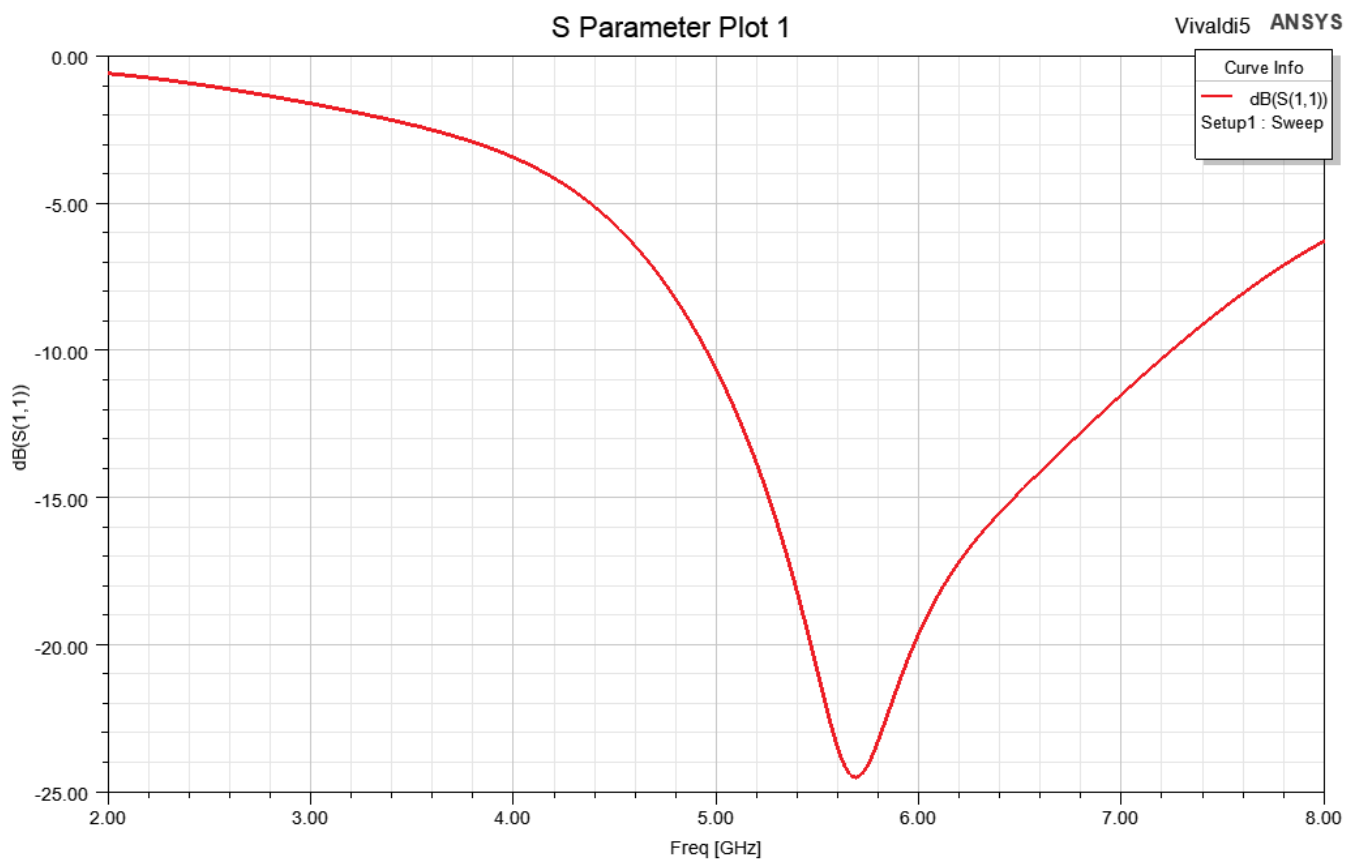
The PCB slot antenna has the following electrical properties (on a 70x50mm evaluation board):

Property	Value	Unit	Remarks
Impedance	50	Ω	
Frequency Range	5.0-7.0	GHz	at RL=10dB as given below.
Return Loss	10	dB	
Efficiency	94	%	@5GHz (corresponds to average gain of -0.3dB)
	95	%	@6GHz
	94	%	@7GHz
Peak Gain	1.9	dB	@5GHz. Peak gain is achieved $\sim 60^\circ$ from slot direction
	3.5	dB	@6GHz. Peak gain is achieved $\sim 45^\circ$ from slot direction
	4.0	dB	@7GHz. Peak gain is achieved $\sim 45^\circ$ from slot direction

When the slot antenna is integrated into a large circular PCB of diameter 250mm, the radiation diagrams become more isotropic and the peak gains reduce to:

Property	Value	Unit	Remarks
Peak Gain	1.8	dB	@5GHz
	2.5	dB	@6GHz
	2.8	dB	@7GHz

3.2 Return Loss

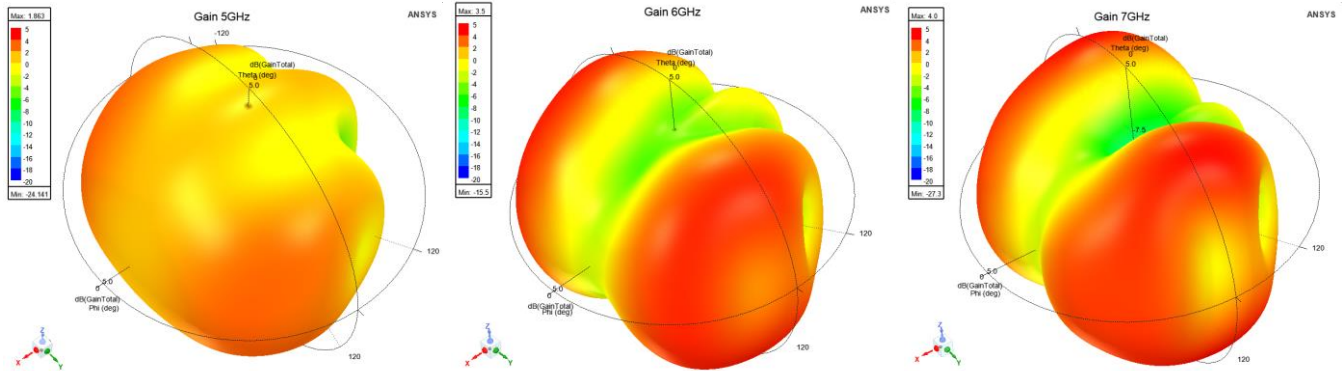


The return loss of better than 10dB corresponds to a VSWR of less than 2.0.

3.3 Radiation Diagrams

3.3.1 70x50mm Evaluation Board

Here the radiation diagrams (gain in dB) for the slot antenna on the 70x50mm eval board:



Note that with a different PCB length, the radiation can be directed more to boresight (+x direction).

3.3.2 Circular PCB with 250mm Diameter

Here the radiation diagrams for 5, 6, and 7 GHz for the slot antenna on a circular PCB as used for the Polaris NXT lamp:

