

1	Antenna Description.....	2
1.1	Features.....	2
1.2	Applications.....	2
1.3	Antenna Picture.....	2
2	Electromagnetics Parameters.....	3
2.1	Typical Antenna Return Loss.....	3
2.2	Typical Antenna Radiation Pattern.....	3
3	Material Specs.....	4
3.1	PCB.....	4
3.2	Cable.....	5
3.3	Connector.....	6
4	Mechanical Description.....	7
4.1	Technical Drawings.....	7

1 ADANT ARUWB59

Dual Band Printed Patch Antenna

ARUWB59 is a dual band PCB directional antenna covering the UWB Channel CH5 and CH9. The antenna is designed to be used stand-alone or embedded into a device.

The antenna is suitable to be used with UWB modules and it is specifically indicated for UWB radar.

A The antenna is fed through an I-PEX micro-coaxial cable.

Key Features	
Frequency	6.25 – 6.75 GHz 7.75 – 8.25 GHz
Polarization*	Linear
Operating temperature	-30°C to 105°C
Max Power	2 W
Input impedance	~50 Ω
Dimensions	18 x 18 x 1.6 [mm]
RF Connections	I-PEX
Max Gain CH5	3.3 dBi
Max Gain CH9	4.4 dBi
Efficiency CH5	65 %
Efficiency CH9	63 %
Return Loss	< - 10 dB
Cable Length	150 mm
Cable Color	Black

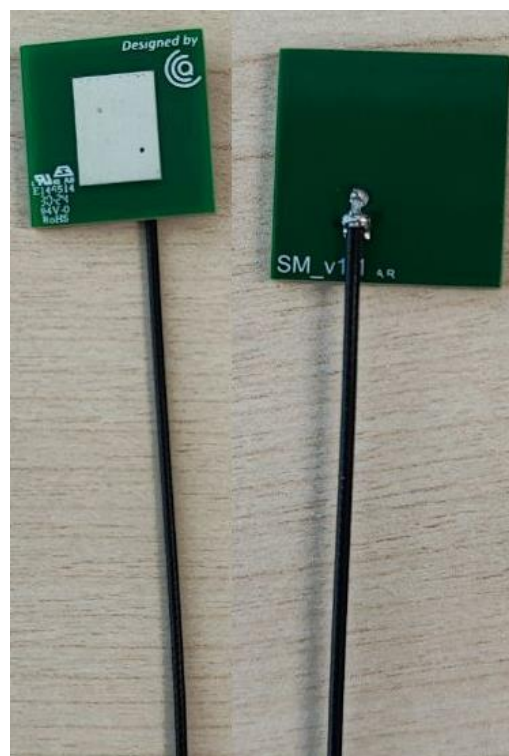
1.1 Features

- Dual Band UWB CH5 – CH9 antenna
- Directional radiation pattern

1.2 Applications

- Radar Motion Sensing
- UWB modules

1.3 Antenna Picture



2 ELECTROMAGNETICS PARAMETERS

2.1 Typical Antenna Return Loss

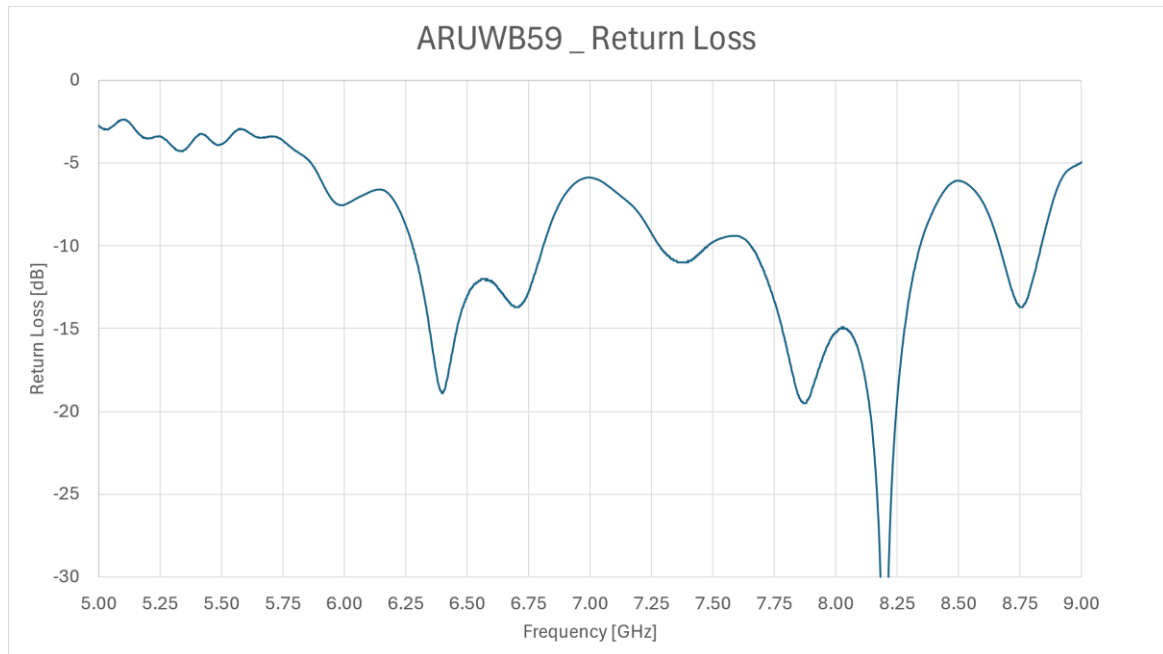


Figure 1: Typical Antenna Return Loss

2.2 Typical Antenna Radiation Pattern

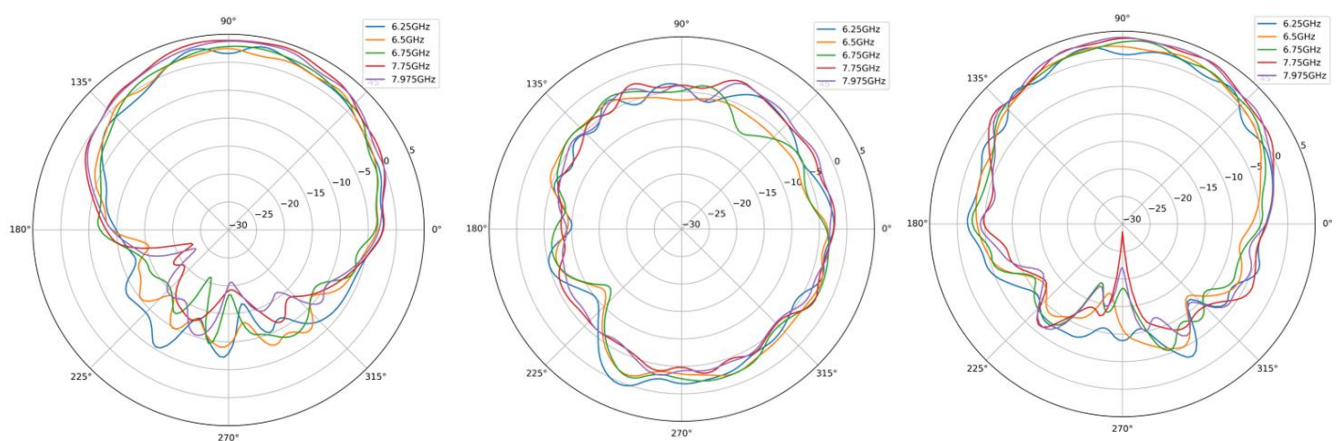


Figure 2: Typical Antenna Radiation Pattern

3 MATERIAL SPECS

3.1 PCB

Property		Typical Value	Units	Test Method
			Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		180	°C	2.4.25C
Decomposition Temperature (Td) by TGA @ 5% weight loss		340	°C	2.4.24.6
Time to Delaminate by TMA (Copper removed)	A. T260 B. T288	60 30	Minutes	2.4.24.1
Z-Axis CTE	A. Pre-Tg B. Post-Tg C. 50 to 260°C, (Total Expansion)	45 230 2.8	ppm/°C ppm/°C %	2.4.24C
X/Y-Axis CTE	Pre-Tg	13/14	ppm/°C	2.4.24C
Thermal Conductivity		—	W/mK	ASTM E1952
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched B. Etched	Pass	Pass Visual	2.4.13.1
Dk, Permittivity	A. @ 100 MHz	4.24	—	2.5.5.3
	B. @ 1 GHz	4.17		2.5.5.9
	C. @ 2 GHz	4.04		Bereskin Stripline
	D. @ 5 GHz	3.92		Bereskin Stripline
	E. @ 10 GHz	3.92		Bereskin Stripline
Df, Loss Tangent	A. @ 100 MHz	0.0150	— — —	2.5.5.3
	B. @ 1 GHz	0.0161		2.5.5.9
	C. @ 2 GHz	0.0210		Bereskin Stripline
	D. @ 5 GHz	0.0250		2.5.5.5
	E. @ 10 GHz	0.0250		2.5.5.5
Volume Resistivity	A. After moisture resistance B. At elevated temperature	3.0 x 10 ⁸ 7.0 x 10 ⁸	MΩ-cm	2.5.17.1
Surface Resistivity	A. After moisture resistance B. At elevated temperature	3.0 x 10 ⁶ 2.0 x 10 ⁸	MΩ	2.5.17.1
Dielectric Breakdown		>50	kV	2.5.6B
Arc Resistance		115	Seconds	2.5.1B
Electric Strength (Laminate & laminated prepreg)		54 (1350)	kV/mm (V/mil)	2.5.6.2A
Comparative Tracking Index (CTI)		3 (175-249)	Class (Volts)	UL 746A ASTM D3638
Peel Strength	A. Low profile copper foil and very low profile copper foil all copper foil >17 µm [0.669 mil]	1.14 (6.5)	N/mm (lb/inch)	2.4.8C
	B. Standard profile copper	1.25 (7.0)		2.4.8.2A
	1. After thermal stress	1.25 (7.0)		2.4.8.3
	2. At 125°C (257°F)	1.14 (6.5)		2.4.8.3
Flexural Strength	A. Length direction	90.0	ksi	2.4.4B
	B. Cross direction	77.0		
Tensile Strength	A. Length direction	55.9	ksi	ASTM D3039
	B. Cross direction	35.6		
Test data generated from rigid laminate	A. Length direction	3744	ksi	ASTM D790-15e2
	B. Cross direction	3178		
Poisson's Ratio	A. Length direction	0.177	—	ASTM D3039
	B. Cross direction	0.171		
Moisture Absorption		0.15	%	2.6.2.1A
Flammability (Laminate & laminated prepreg)		V-0	Rating	UL 94
Max Operating Temperature		130	°C	UL 796

3.2 Cable

SY-3JS-003-A

型号 Type	RF-1.37/50	料号 P/N	SY137/50-003(Black)	
结构图 Structure drawing				
结构特性 Structure characteristics				
结构 Structure	项目 Item		标准值 Standard value	
①内导体 Inner conductor	材料 Material		镀银铜线 Silverplated copper wire	
	组成总根数/单根外径(mm) Makeup total / O.D. of every wire(mm)		7/0.102	
	(绞合)标称外径(mm) (Intertwist)NOM.O.D.(mm)		0.306±0.02	
②绝缘层 Insulation	材料 Material		聚全氟乙丙烯 FEP	
	颜色 Color		透明 Clarity	
	标称外径(mm) NOM.O.D.(mm)		0.9±0.03	
③外导体 Outer conductor	材料 Material		镀锡铜线 Tinned copper wire	
	组成总根数/单根外径(mm) Makeup total / O.D. of every wire(mm)		5/0.05	
	标称外径(mm) NOM.O.D.(mm)		1.13±0.05	
	覆盖率(%) Coverage ratio(%)		90±5	
④护套层 Jacket	材料 Material		聚全氟乙丙烯 FEP	
	颜色 Color		黑 Black	
	标称外径(mm) NOM.O.D.(mm)		1.37±0.05	
电性能特性 Electrical characteristics				
项目 Item	标准值 Standard value	项目 Item	频率 Frequency	标准值 Standard value 单位 Unit:dB/m
电容(pF/m) Capacitance(pF/m)	96	衰减 Attenuation	1GHz	≤1.7
速率(%) Velocity(%)	70		2GHz	≤2.5
阻抗(Ω) Impedance(Ω)	50±2		3GHz	≤3
驻波比 Standing wave ratio	≤1.3@0~6GHz		4GHz	≤3.5
最大工作电压(V) Max.operating voltage(V)	1000		5GHz	≤4
最大工作频率(GHz) Max.operating frequency(GHz)	6		6GHz	≤4.5
可靠性 Dependability				
项目 Item	单位 Unit	标准值 Standard value		
最小弯曲半径(一次) Min.bending radius static	mm	5		
最小弯曲半径(重复) Min.bending radius repeated	mm	—		
工作温度范围 Operating temperature	℃	-55~+200		
包装 Packing				
项目 Item	单位 Unit	标准值 Standard value		
包装方式 Packing mode	/	纸盘 Papery plate		
每盘长度 The length of each plate	m	500		
每盘接头数 Each connector plate number	/	≤3		
每段最短长度 The shortest length of each root	m	≥10		
使用提示 Use tips				
存储环境 Storage environment	温度: 30℃以下; 湿度: 20%~65%			
最佳保存周期 The best save cycle	2个月; 2个月以上作业性下降, 如上锡效果变差, 但电性能不受影响。夏季高温高湿环境开剥后需尽快流转			
加工温度 Processing temperature	260℃的极限情况下, 可短时间承受; 300℃以上分子通常带有的等端基会分解; 400℃以上发生显著的热分解			
铁氟龙收缩 Teflon Shrink	固有材料特性。绝缘: 0.2mm以下; 护套: 0.3mm以下			
护套窜动 Jacket traverse	加工长度(护套残留长度)低于5cm易发生			
其他 Other				
特殊加工工艺, 请与供方协商后使用				

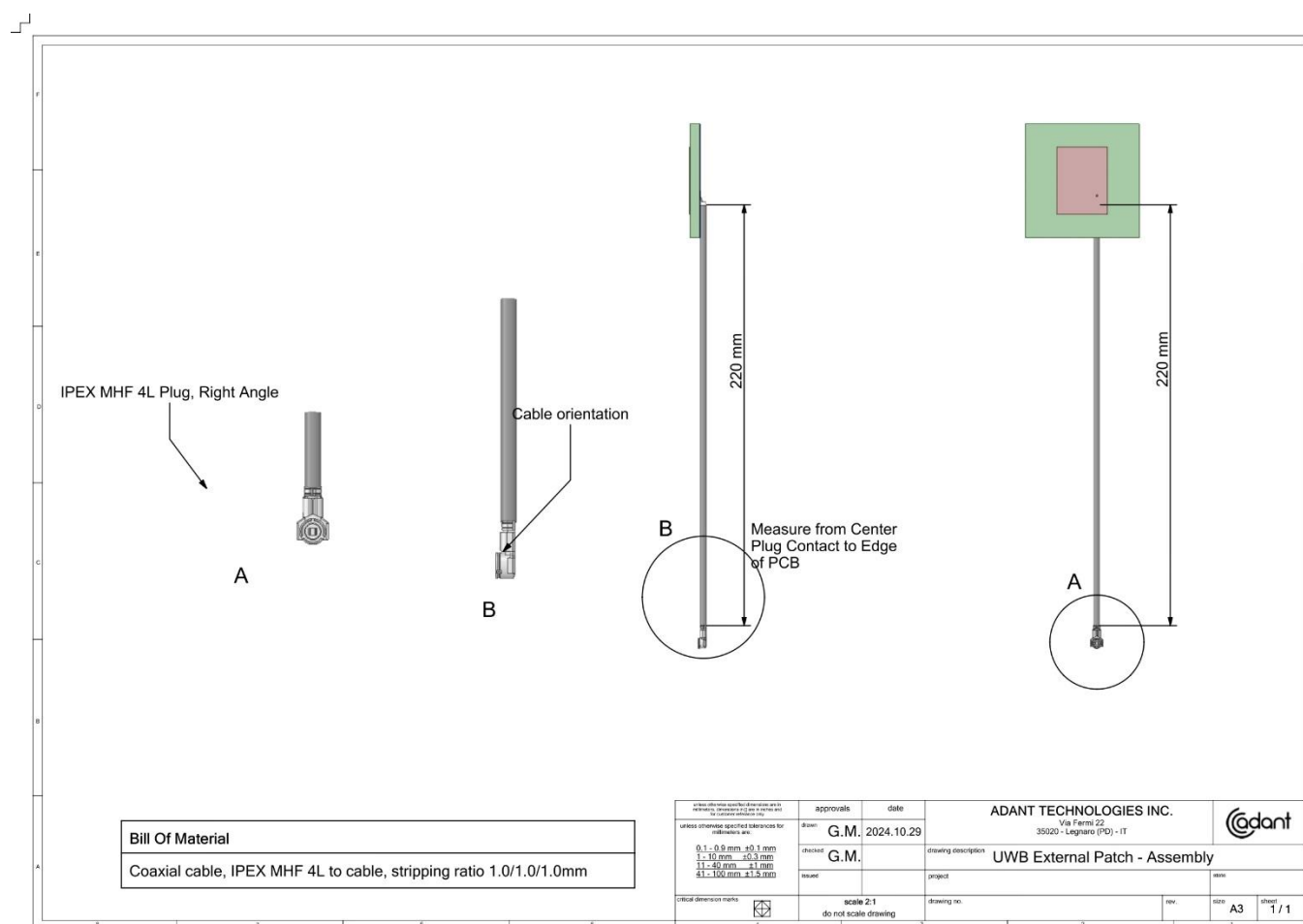


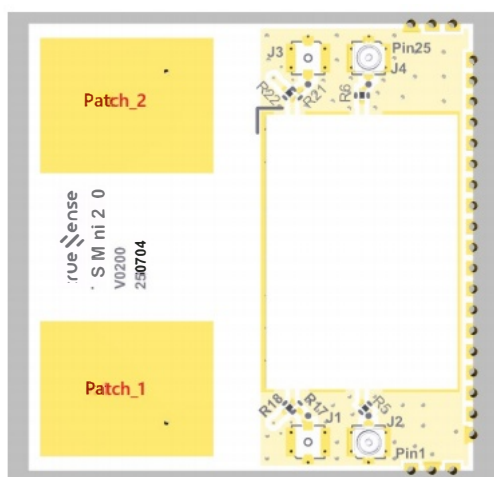
ITEMS		SPECIFICATION	
RECOMMENDED APPLICABLE CONNECTOR		20449-001E-**-	20579-001E-**-
PART No.			
RATING VOLTAGE		60 V AC (R.M.S)	
RATING FREQUENCY		DC~9 GHz	DC~12 GHz
OPERATING TEMPERATURE		233~363K (-40℃~+90℃)	
VSWR (MATED WITH SMA ADAPTER PART No. 90449-001)		1.30 MAX. AT 0.1~3 GHz, 1.40 MAX. AT 3~6 GHz, 1.50 MAX. AT 6~9 GHz, 1.60 MAX. AT 9~12 GHz	
MAIN CONTACT RESISTANCE		INITIAL: 20 mohm MAX. / AFTER TEST: <R 20 mohm MAX.	
GROUND CONTACT RESISTANCE		INITIAL: 20 mohm MAX. / AFTER TEST: <R 20 mohm MAX.	
INSULATION RESISTANCE		INITIAL: 500 Mohm MIN. / AFTER TEST: 100 Mohm MIN.	
DIELECTRIC WITHSTANDING VOLTAGE		200 V AC, 1 MINUTE	
DURABILITY		30 CYCLES	
MATING FORCE (INITIAL / AFTER TEST)		INITIAL: 30 N MAX. / AFTER TEST: 30 N MAX.	
UNMATING FORCE (INITIAL / AFTER TEST)		INITIAL: 20 N MAX. 5 N MIN. / AFTER TEST: 20 N MAX. 3 N MIN.	
PRODUCT SPECIFICATION		PRS-2008	PRS-1907
TEST REPORT		TR-14100	TR-14097
PACKING STANDARD		PST-12066	
INSTRUCTION MANUAL		HIM-16011	
APPEARANCE CRITERIA No.		QLS-A***	

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4 MECHANICAL DESCRIPTION

4.1 Technical Drawings

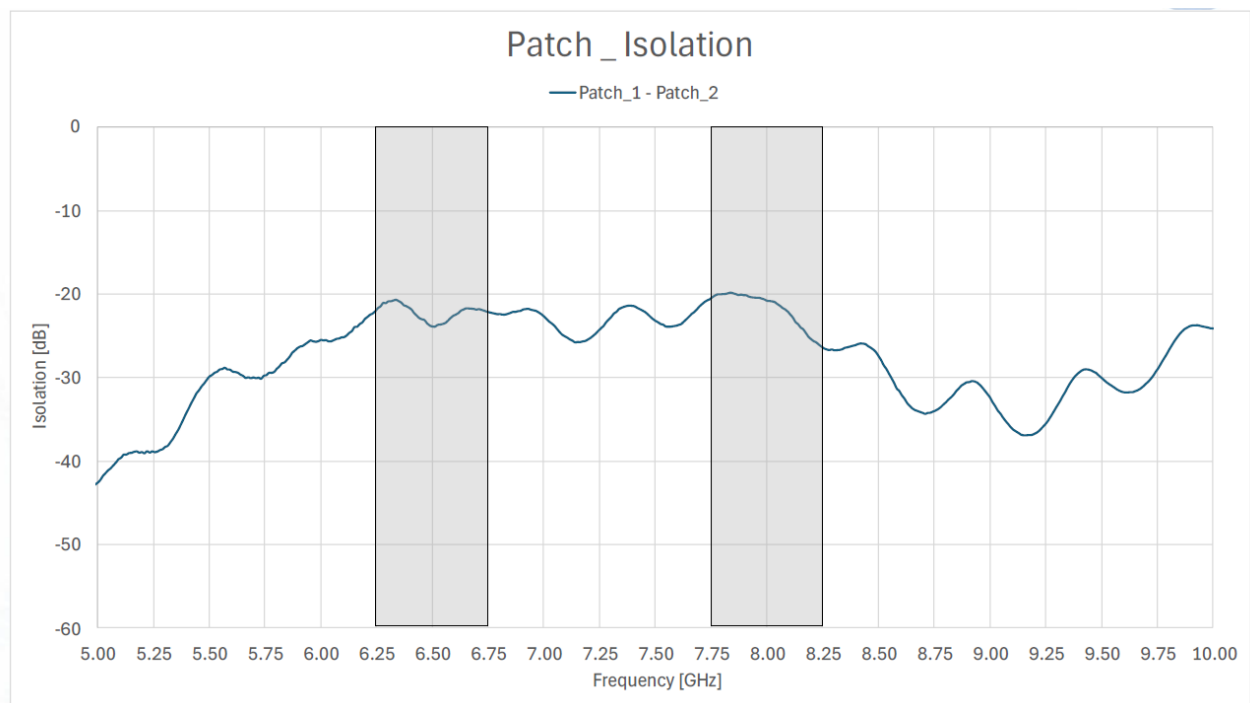




Return Loss2.3.



2 Isolation

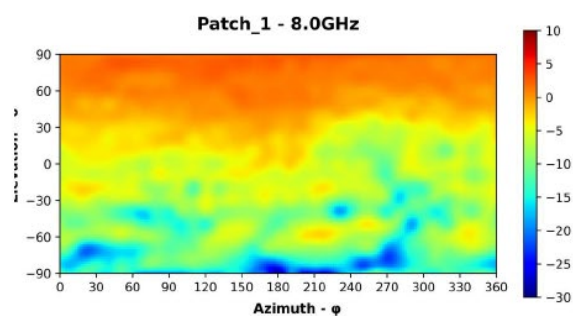
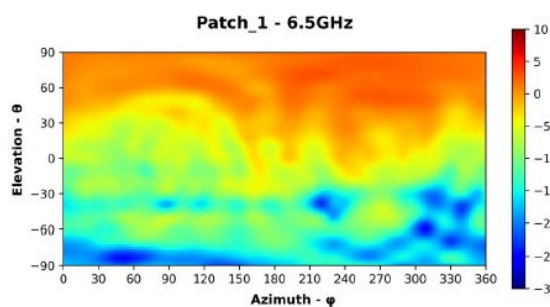


2.3.3 Radiation Pattern

Patch_1

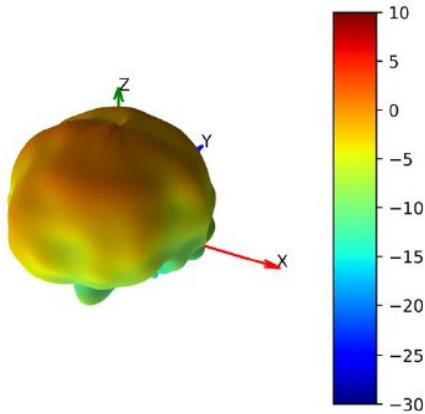
Peak Gain & Efficiency:

Patch_1	CH5	Frequency [GHz]	Peak Gain [dBi]	Tot. Efficiency [%]
		6.25	1.54	50
		6.50	2.83	58
		6.75	2.14	56
	CH9	7.75	2.40	62
		8.00	2.71	62
		8.25	-	-

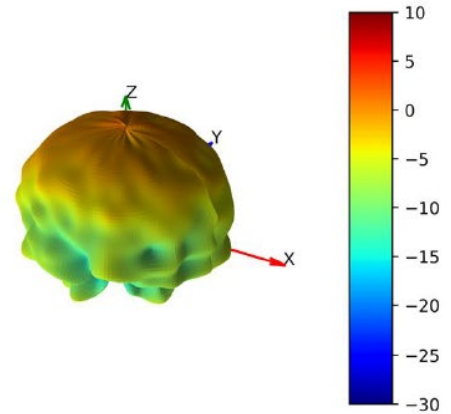


3D Radiation Patterns:

Patch_1 - 6.5GHz

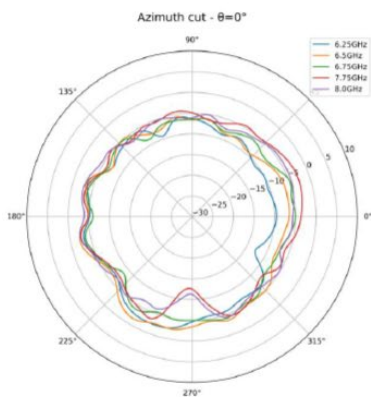


Patch_1 - 8.0GHz

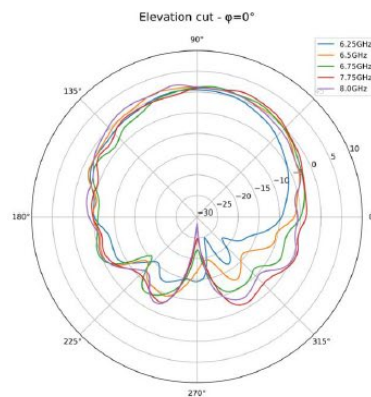


Polar Plots:

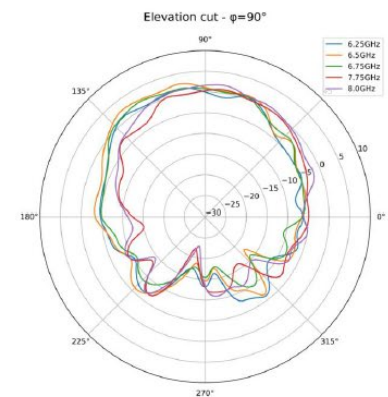
Azimuth $\theta = 0^\circ$



Azimuth $\phi = 0^\circ$



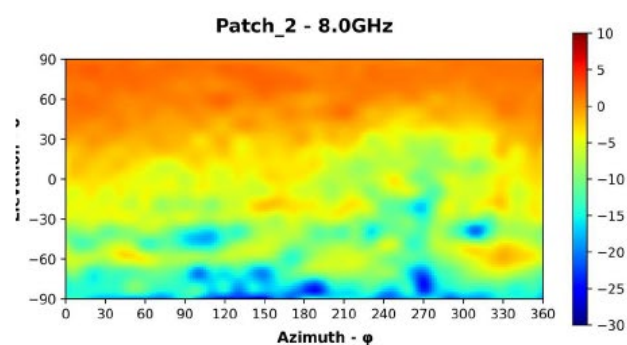
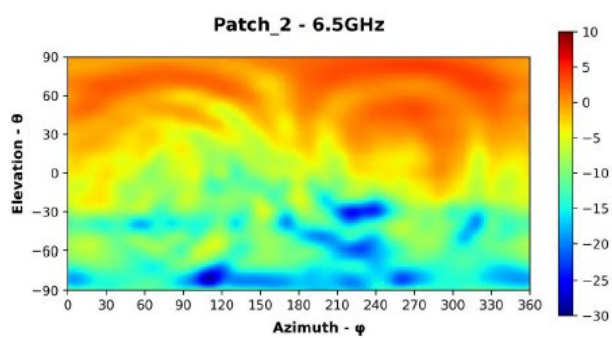
Azimuth $\phi = 90^\circ$



Patch_2

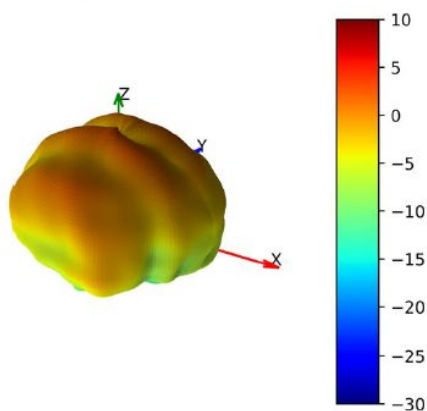
Peak Gain & Efficiency:

		Frequency [GHz]	Peak Gain [dBi]	Tot. Efficiency [%]
Patch_2	CH5	6.25	2.04	50
		6.50	3.63	61
		6.75	2.74	56
	CH9	7.75	3.00	65
		8.00	2.41	62
		8.25	-	-

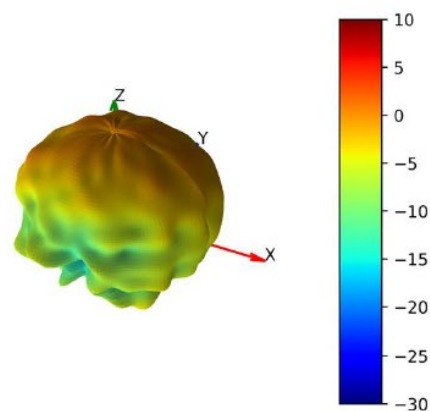


3D Radiation Patterns:

Patch_2 - 6.5GHz

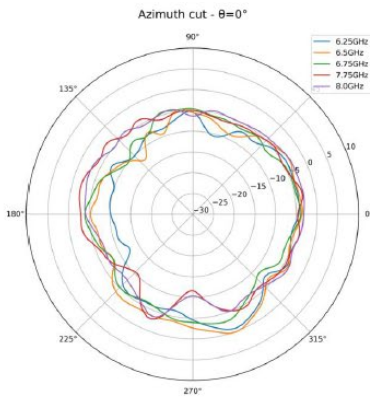


Patch_2 - 8.0GHz

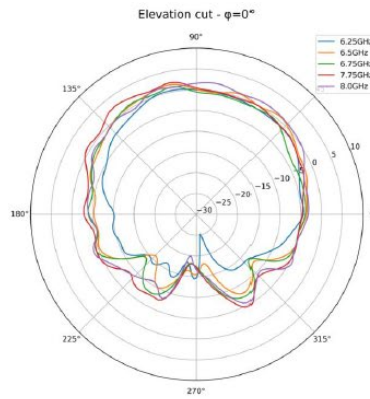


Polar Plots:

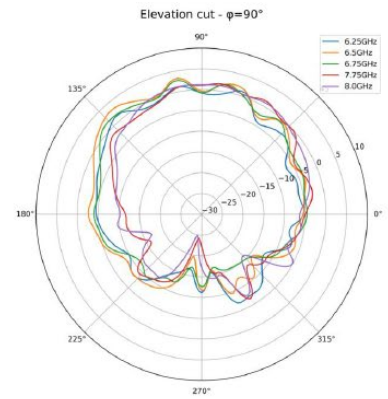
Azimuth $\theta = 0^\circ$



Azimuth $\varphi = 0^\circ$



Azimuth $\varphi = 90^\circ$



2.4.External Antenna Connector Size information

TS Mini 250 module adopts the fourth-generation external antenna connector shown in below figure, which is compatible with MHF-4 connector of I-PEX.

