



Ultra-Wide Band Ceramic Antenna

SZC-C-2U03

UWB Channels 5,6,7,8,9,10,11,12,13,14,15: 6.0 - 10.5GHz

Description

CHARA, for the ultimate compact and low-profile UWB solution, CHARA was developed to be compact but still cover the frequency range of **6 – 10.5GHz**.

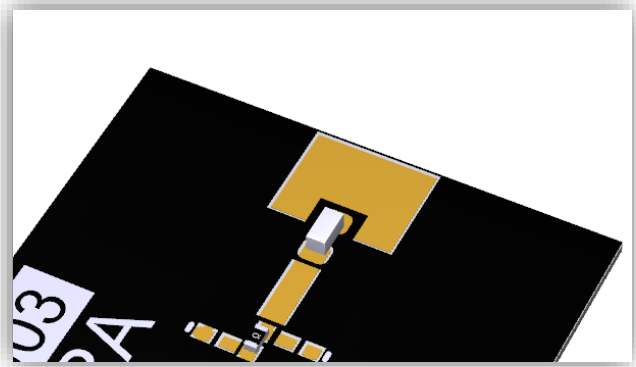
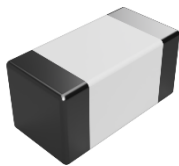
- For European and USA applications
- UWB Channels 5 to 15
- Small form factor of 1.6 x 0.8 x 0.8 (mm).
- Minimal clearance of 10.0 x 4.0 (mm)

Typical Applications

Automotive
Tracking

Precision Surveying
Entertainment Devices

Smart home
Sensors





General Specifications

Mechanical Specifications

Part Number	SZC-C-2U03
Name	CHARA
Dimensions	1.6 x 0.8 x 0.8 (mm)
Required Clearance area	9.5 x 5.0 (mm)
Weight	<0.5g
Antenna Type	Surface Mount Device
Material	Ceramic

Electrical / RF Specifications*

Band	Frequency Range (MHz)	Avg Efficiency (%)	Peak Gain (dBi)	Impedance	Polarization
5,6,7,8	6000-8000	>65	5.90	50Ω	Linear
9,10,11,12,13,14,15	8000-10500	>65	5.30		

*All performance stated is measured of SZDV-C-2U03 evaluation kit with 21 x 20 (mm) GND plane.

Environmental Specifications

Operational Temperature	-40 to +125 (°C)
Storage Temperature	-10 to +40 (°C)
Relative Humidity	≤75%
Moisture Sensitivity Level (MSL)	1
RoHs & REACH compliant	Yes



UWB Channel List

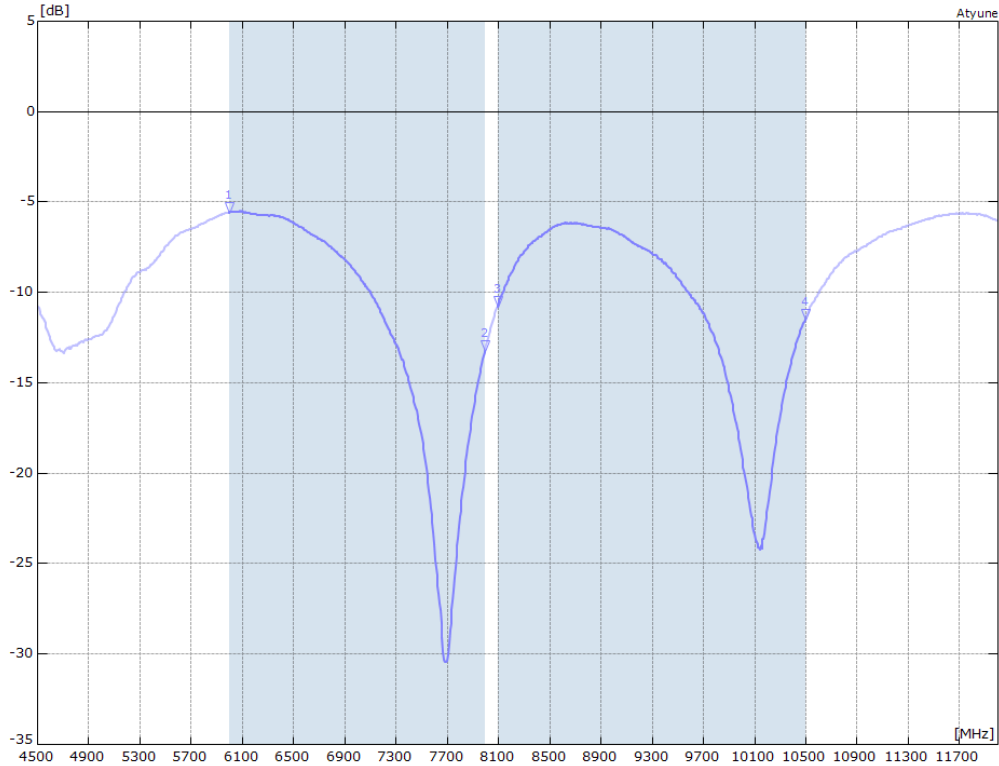
Supported Channels

Channel	Centre Frequency (MHz)	BW (MHz)	Region	Supported
1	3494.4	499.2	USA	N
2	3993.6	499.2	USA,Europe	N
3	4492.8	499.2	USA,Europe, Japan, Korea	N
4	3993.6	1331.2	USA,Europe, Japan, Korea	N
5	6489.6	499.2	USA,Europe	Y
6	6988.8	499.2	USA,Europe	Y
7	6489.6	1081.6	USA,Europe	Y
8	7488	499.2	USA	Y
9	7987.2	499.2	USA,Europe, Japan, Korea	Y
10	8486.4	499.2	USA,Europe, Japan, Korea	Y
11	7987.2	1331.2	USA,Europe, Japan, Korea	Y
12	8985.6	499.2	USA, Japan, Korea	Y
13	9484.8	499.2	USA, Japan, Korea	Y
14	9984	499.2	USA, Japan, Korea	Y
15	9484.8	1354.97	USA, Japan, Korea	Y

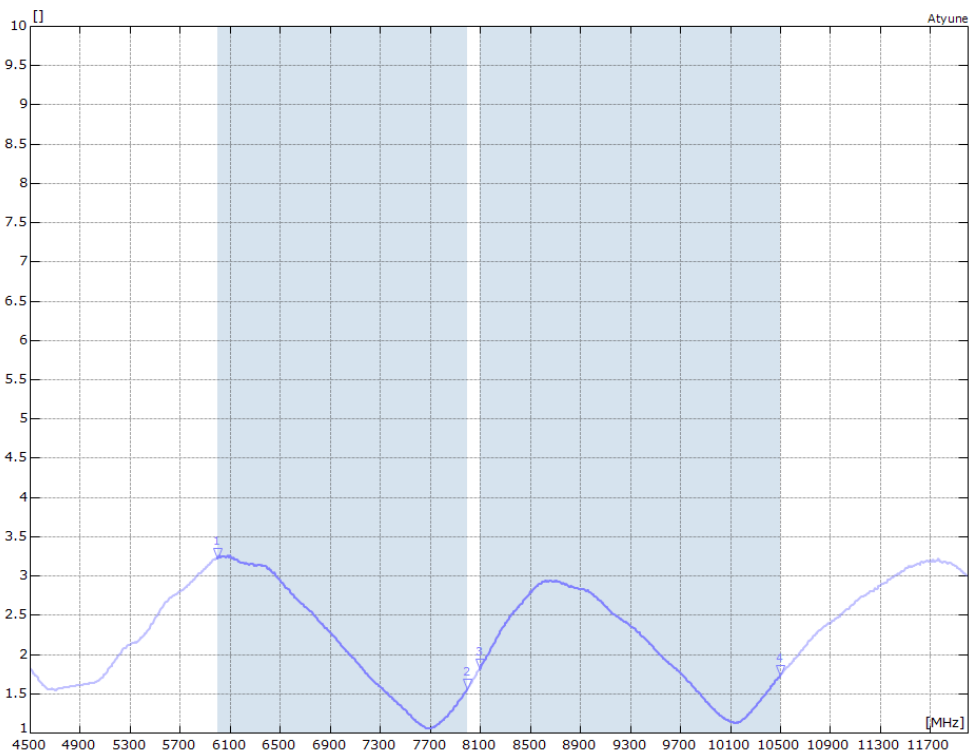


RF Characteristics

S11 Parameter



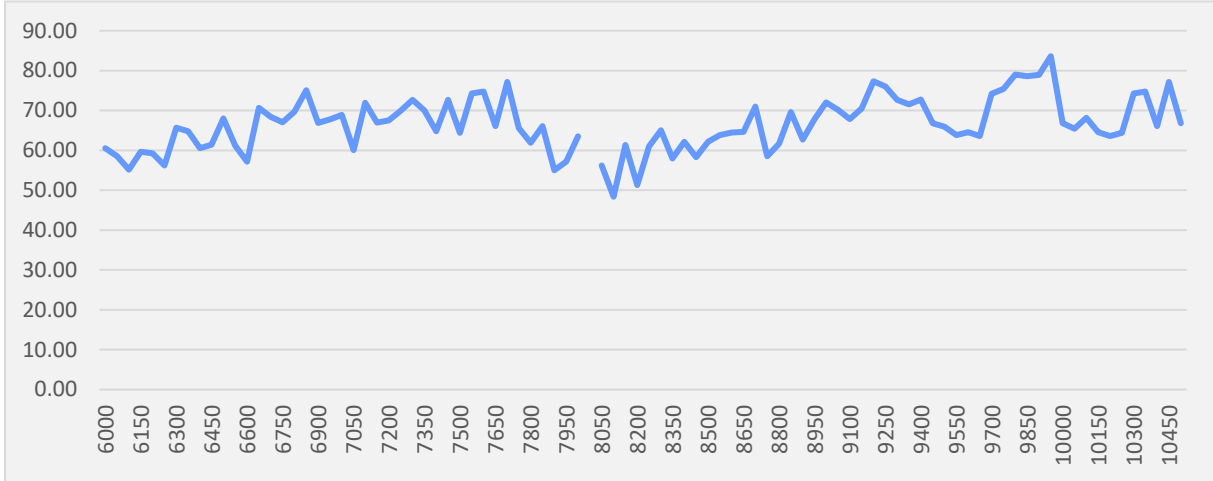
VSWR



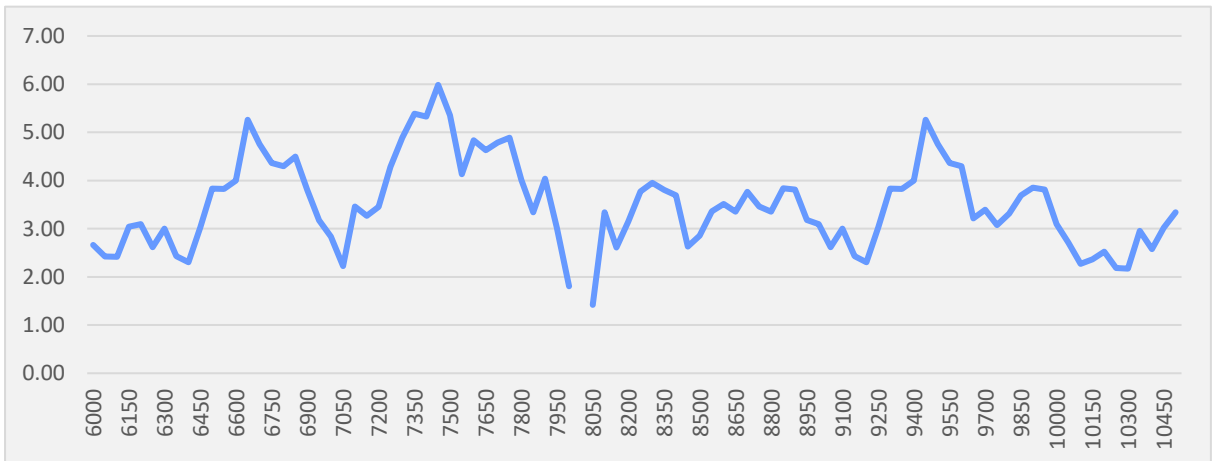


Antenna Performance

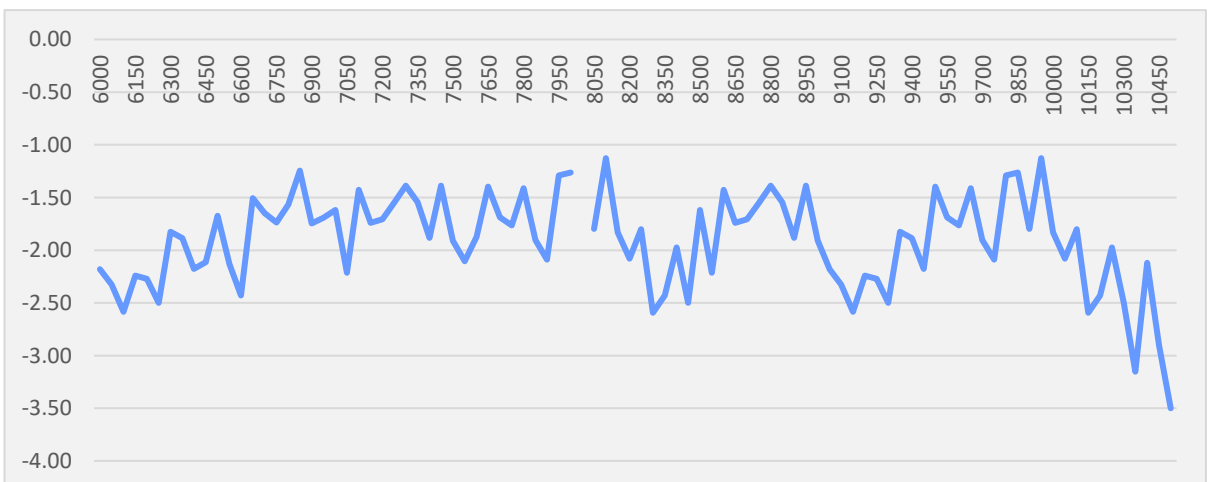
Efficiency



Peak Gain



Average Gain

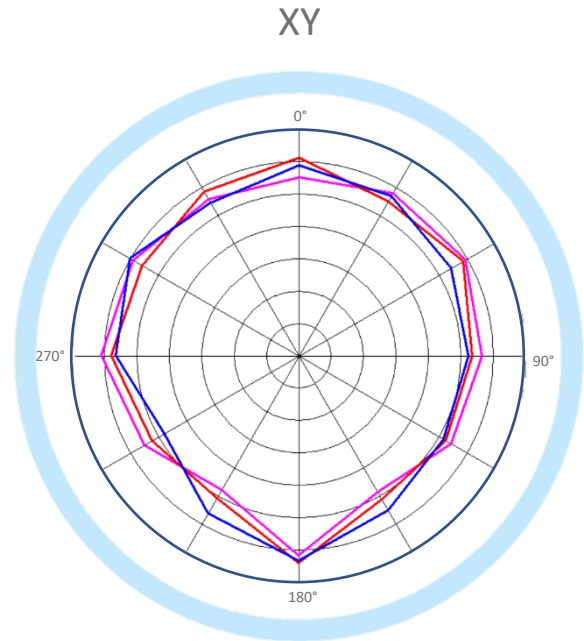
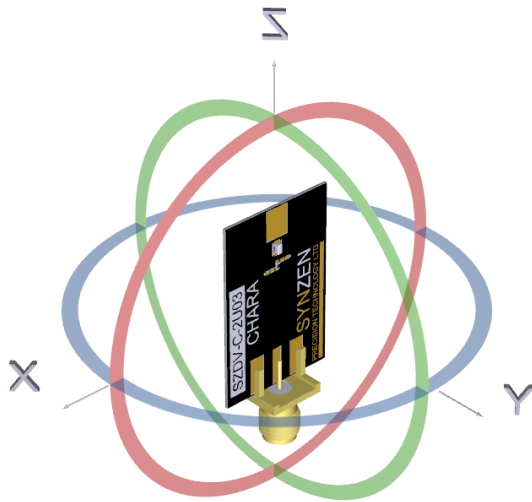




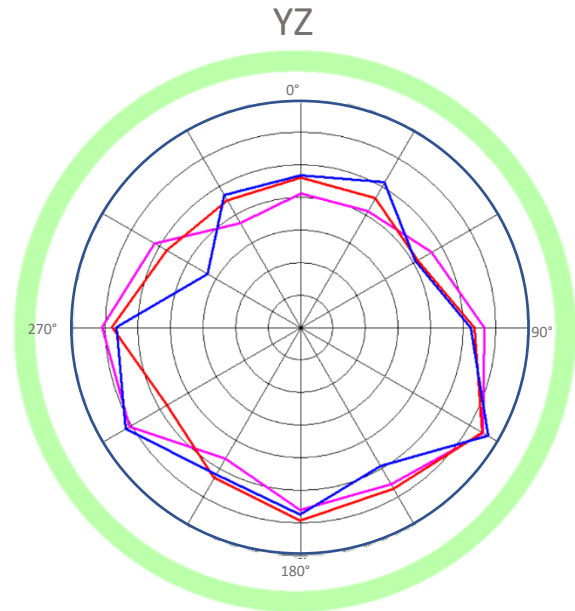
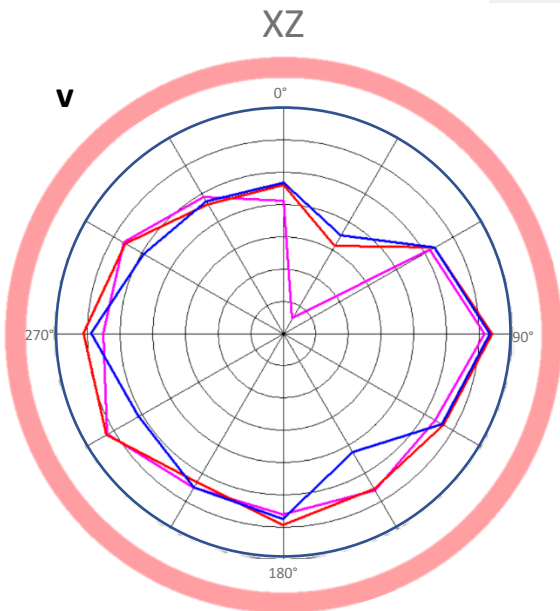
Radiated Performance

2D Polar Plot 6000 - 10500MHz

The data shown was measured on Synzen EVK (SZDV-C-2U03)



Max: 5 **6500**
Min: -30 **7500**
Scale: 5/div **9000**

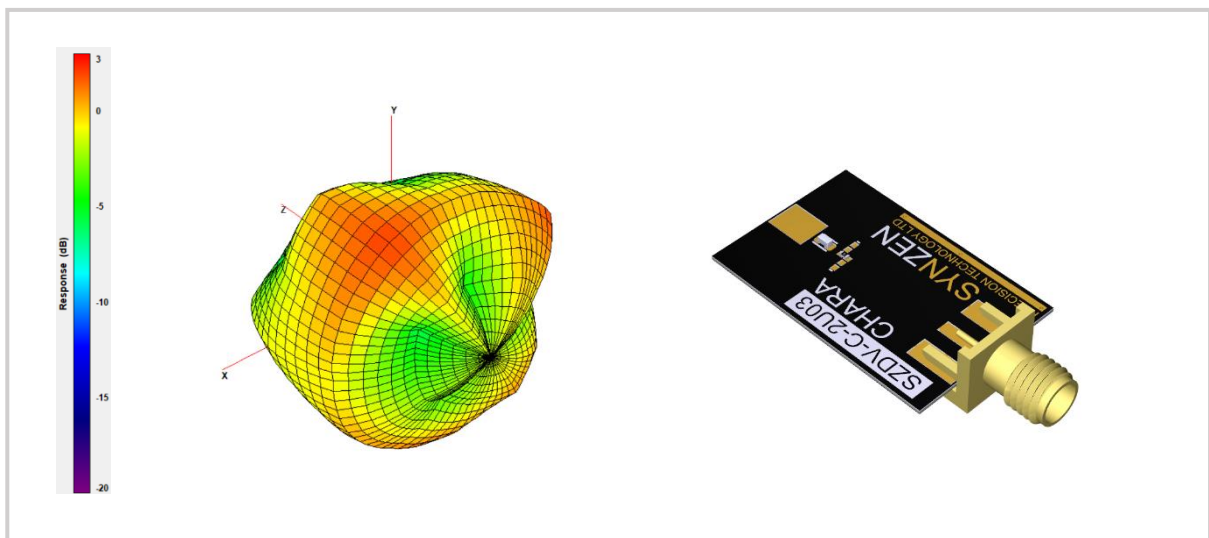
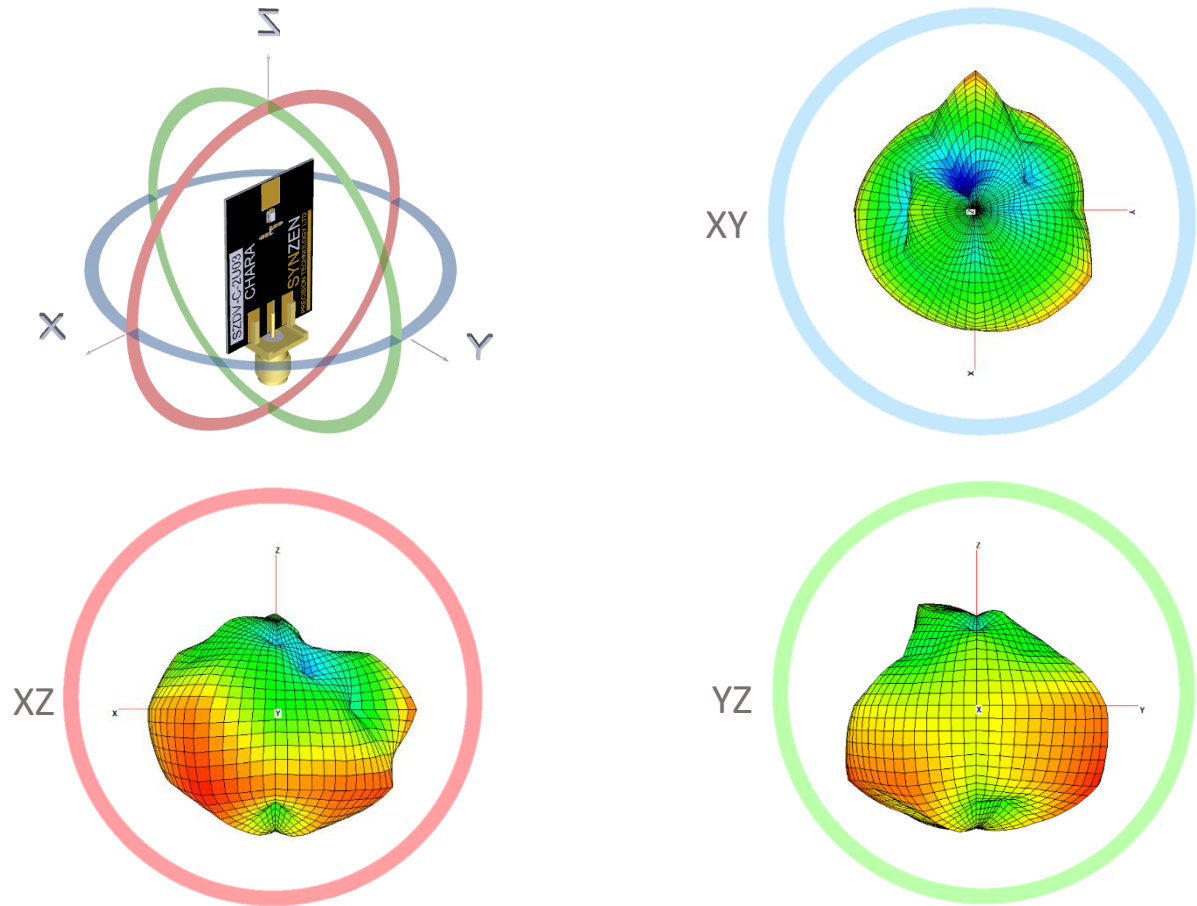




Radiated Performance

3D Radiation Pattern at 7000MHz

The data shown was measured on Synzen EVK (SZDV-C-2U03). The frequency point shown here is 7000MHz.

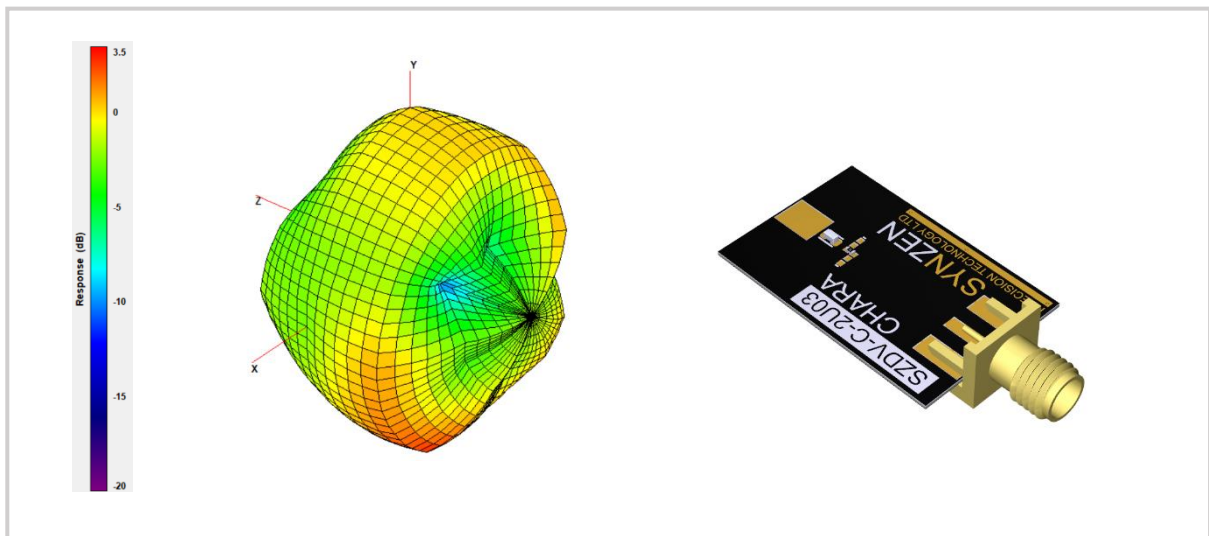
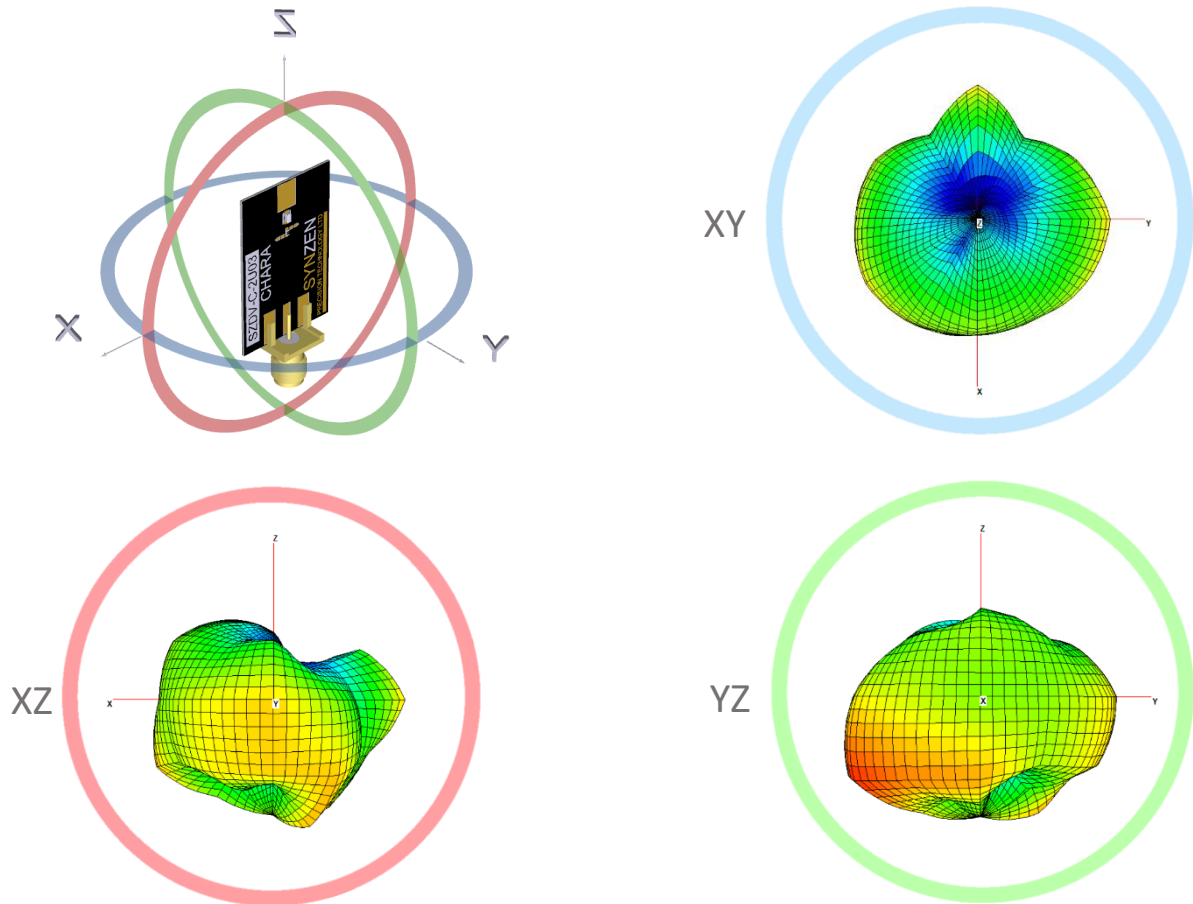




Radiated Performance

3D Radiation Pattern at 9000MHz

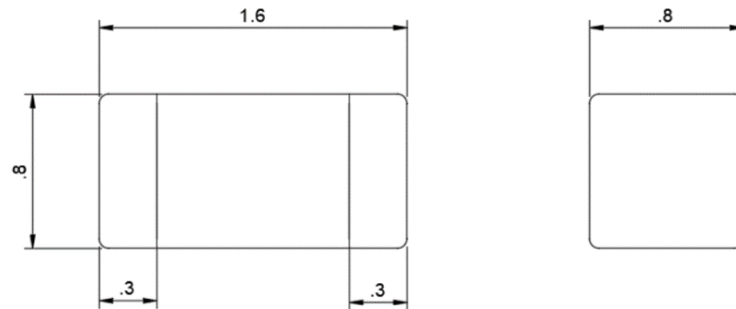
The data shown was measured on Synzen EVK (SZDV-C-2U03). The frequency point shown here is 9000MHz.





Mechanical

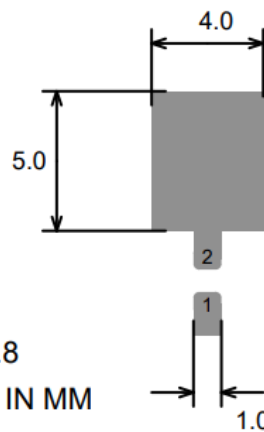
Antenna Mechanical Drawing



All dimensions in mm

Required Host PCB Footprint

The host PCB requires the footprint shown below. PCB library files and DXF is available from our website www.synzen.com.tw/products.



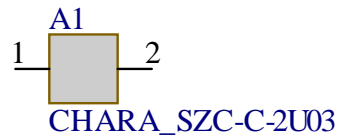
PADS 1,2= 1.0 x 0.8
ALL DIMENSIONS IN MM



Antenna Pinout

SZC-C-2U03 Schematic Symbol

The schematic symbol for the antenna is shown below with a description of each pin.

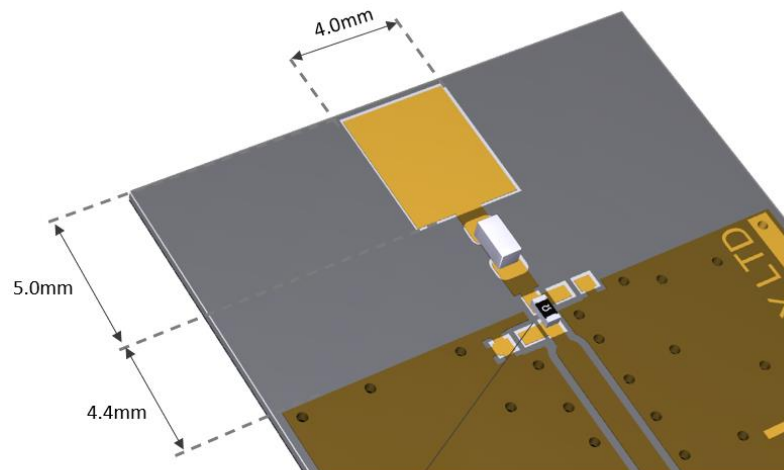


Pin	Description
1	RF Feed
2	Mechanical / PCB Patch Section

PCB Layout Requirements

Placement

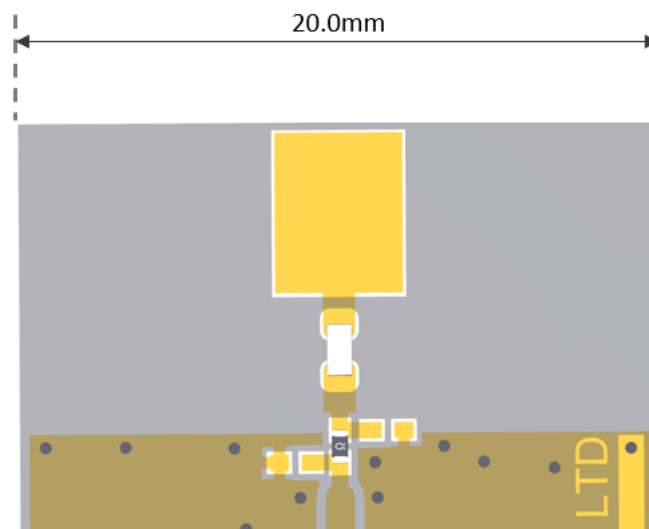
The antenna is designed to function placed at the PCB edge with clearance either side to the PCB ends.



Matching Network Components must be close to the antenna.
Transmission line should be kept as short possible to the RF port.

Required Clearance

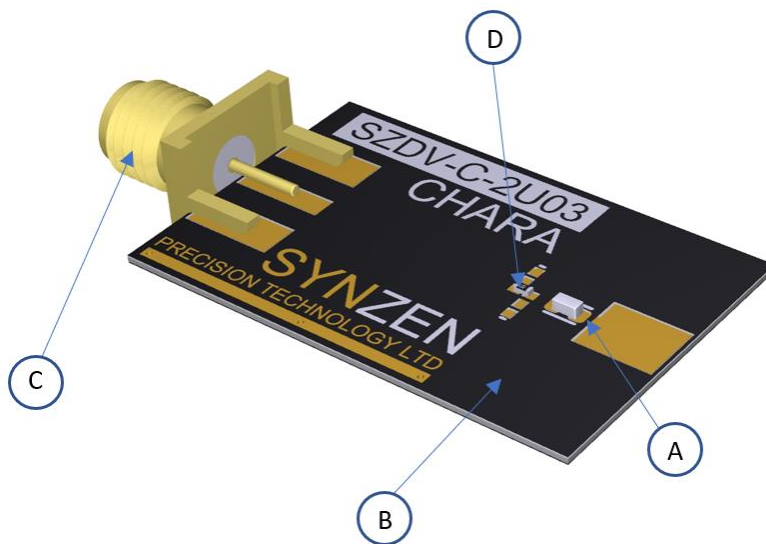
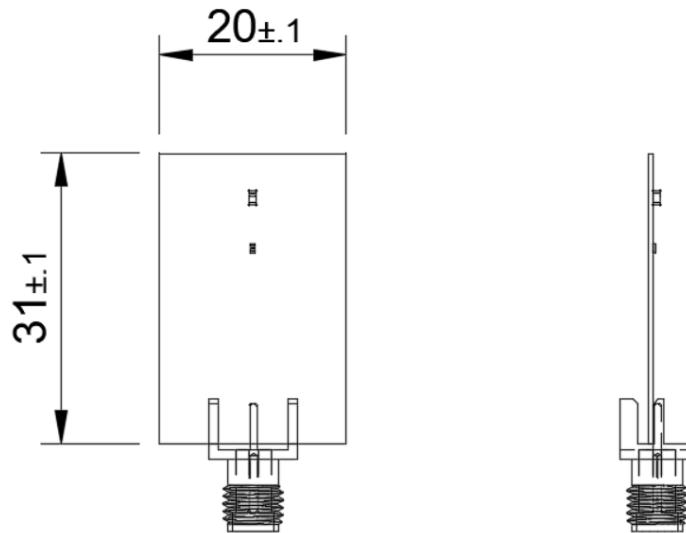
A clearance is required through all PCB layers. Adjacent copper to either side should be a minimum of 10mm distance, ask Synzen for advice on placement and use our free support service for optimal performance.



Evaluation Kit

SZDV-C-2U03 Evaluation Kit

The SZDV-C-2U03 evaluation kit is a PCBA with the antenna (SZP-C-2U03) fitted and optimised with a matching network. Connection to the antenna is made using the fitted female SMA connector.

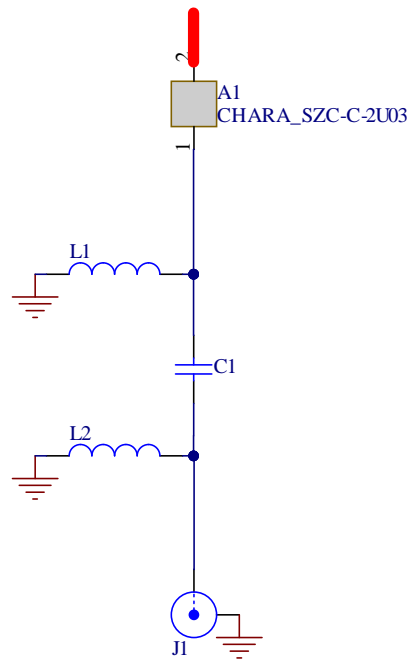


A	SZC-C-2U03 (CHARA)
B	Host PCB
C	SMA Connector
D	Matching Circuit

Evaluation Kit Schematic

Evaluation Kit Matching Circuit

The circuit of the EVK kit along with the BOM is shown below. The matching network topology should be used on the device host PCB although the matching values will be dependent on the host PCB and device environment. Synzen provide a matching service to optimise your device to ensure the best performance, please contact sales@synzen.com.tw for more information.

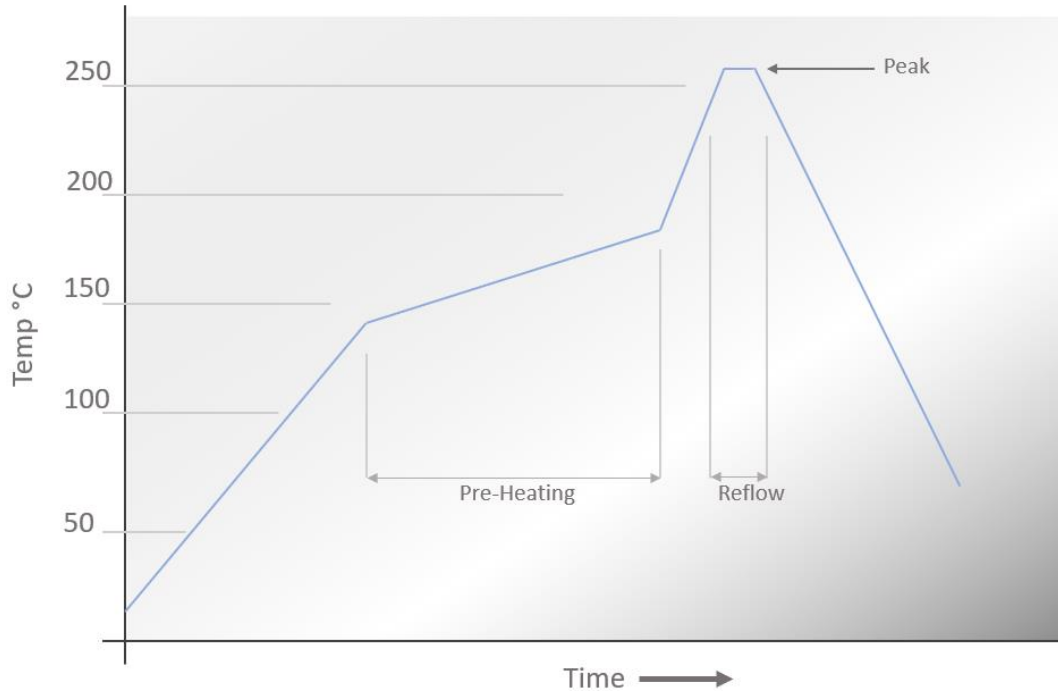


Designator	Component Type	Value	Size	Manufacturing Part No.
A1	Antenna	CHARA	-	SZC-C-2U03
C1	Resistor	0R	0402	Non-specific part
L1, L2	NA	DNP	-	Not Fitted
J1	SMA Connector		-	ct-sab04x (Joymax)



Soldering

Reflow Profile



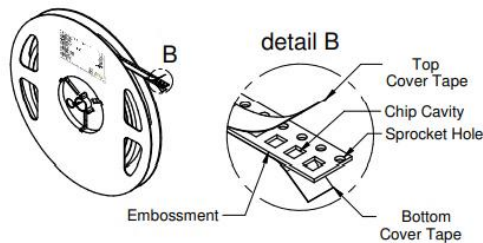
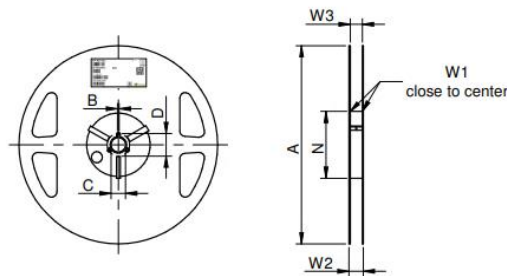
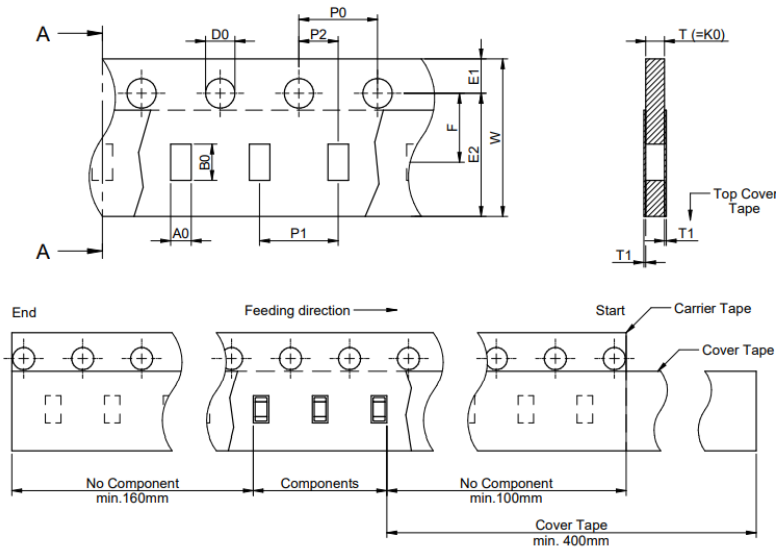
Pre-Heating	130 - 180°C	50 to 190 seconds
Reflow	>220 °C	50 to 160 seconds
Peak Temperature	260 °C	15 to 45 seconds



Packaging

Tape and Reel

		A0	B0	W	T	T1	P0	P1	P2	D0	E1	E2	F	Tape Type 1a	VPE / packaging unit
tolerance	Tolerances	typ.	typ.	+0.3/-0.1	typ.	max.	±0.1		+0.05	+0.1 / -0.0	±0.1	min.	±0.05		pcs.
size	0603	1.05	1.85	8.00	0.95	0.10	4.00	4.00	2.00	1.50	1.75	6.25	3.50	Paper	4000



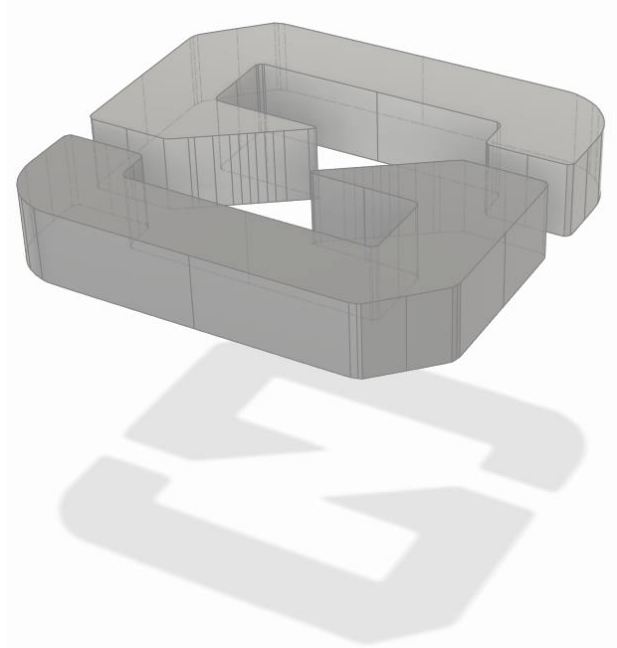
A (mm)	B (mm)	C (mm)	D (mm)	N (mm)	W1 (mm)	W2 (mm)	W3 (mm)	W3 (mm)	Material
± 2.0	min.	min.	min.	min.	+1.5	max.	min.	max.	
178	1.5	12.8	20.2	50	8.4	14.4	7.9	10.9	Polystyrene/ Polyurethane



Environmental

Material Regulation

The antenna has been tested to conform to RoHS requirements. A certificate of conformance is available upon request.



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