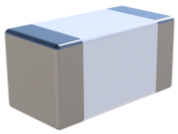
SYNZEN



DATASHEET

LILII-1 SZC-C-4G36 | Ceramic Chip Antenna | multi-GNSS

Features:

GNSS : L5/E5a/E5b/L2/E2/L3/L1/E1
GNSS: 1164-1214; 1215-1240; 1559-1609 MHz

>2.0/3.0dBi Peak Gain, >50/70% Efficiency

Dimensions: 1.6 x 1.6 x 0.8 mm
Clearance Area: 12.0 x 8.0 mm
RoHs compliant

Contents

Introduction

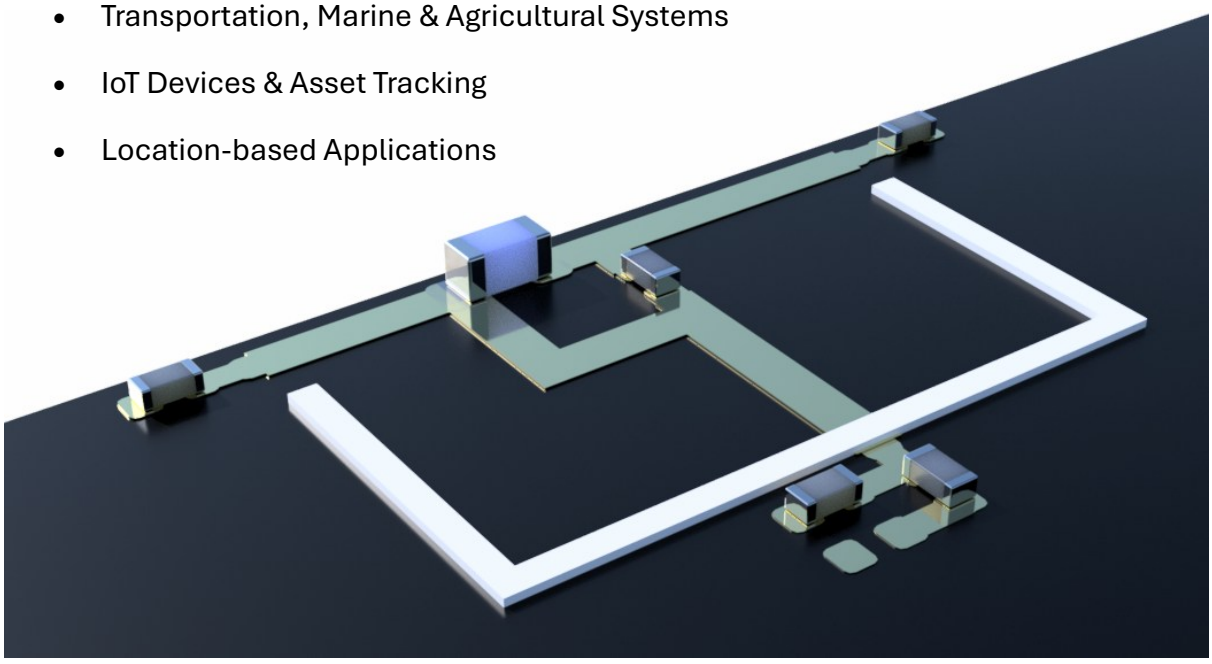
LILII1 (SZC-C-4G36) is a compact embedded ceramic chip antenna designed to cover the **L1, L2, and L5 GNSS bands**, supporting a wide frequency range of **1164–1249 MHz** and **1559–1609 MHz**. This antenna meets the requirements for all major GNSS systems, including GPS (L1, L2, L5), GLONASS (L1, L2), Galileo (E1, E5a, E5b), BeiDou (B1, B2), IRNSS (L5), and QZSS.

With a minimal clearance requirement of just **12 x 8 mm** on the PCB, the **LILII1** offers an ideal solution for multi-band GNSS applications in compact, high-precision devices. Its small size and SMD design, delivered on tape and reel, make it an excellent choice for edge-of-board mounting. The omnidirectional radiation pattern ensures consistent performance, even in devices where the orientation may be unknown or subject to frequent movement.

The **LILII1** features wide bandwidth, enabling high efficiency and stable reception across all GNSS bands. It exhibits efficiency levels between **50% and 80%**, with a peak gain of **2.0–3.2 dBi**, making it comparable to larger patch antennas while maintaining a much smaller footprint. This performance is achieved using advanced ceramic material and a carefully optimized design, ensuring reliable operation even in space-constrained applications.

Applications:

- Navigation & RTK Systems
- UAVs, Robotics & Drones
- Transportation, Marine & Agricultural Systems
- IoT Devices & Asset Tracking
- Location-based Applications



Mechanical Specifications

Parameter	
Part Number	SZC-C-4G36
Name	LILII-1
Dimensions (mm)	1.6 x 1.6 x 0.8
Clearance Area (mm)	12.0 x 8.0
Weight	<0.1g
Antenna Type	Surface Mount Ceramic Chip

Electrical / RF Specifications

Band	Frequency Range (MHz)	Efficiency (%)	Peak Gain (dBi)	VSWR	Impedance
L5/E5	1164-1189	>50	2.00	3.50:1	
L2/E2/L3	1215-1249	>50	2.00	3.50:1	50 Ω
L1/E1	1559-1609	>70	3.20	2.00:1	

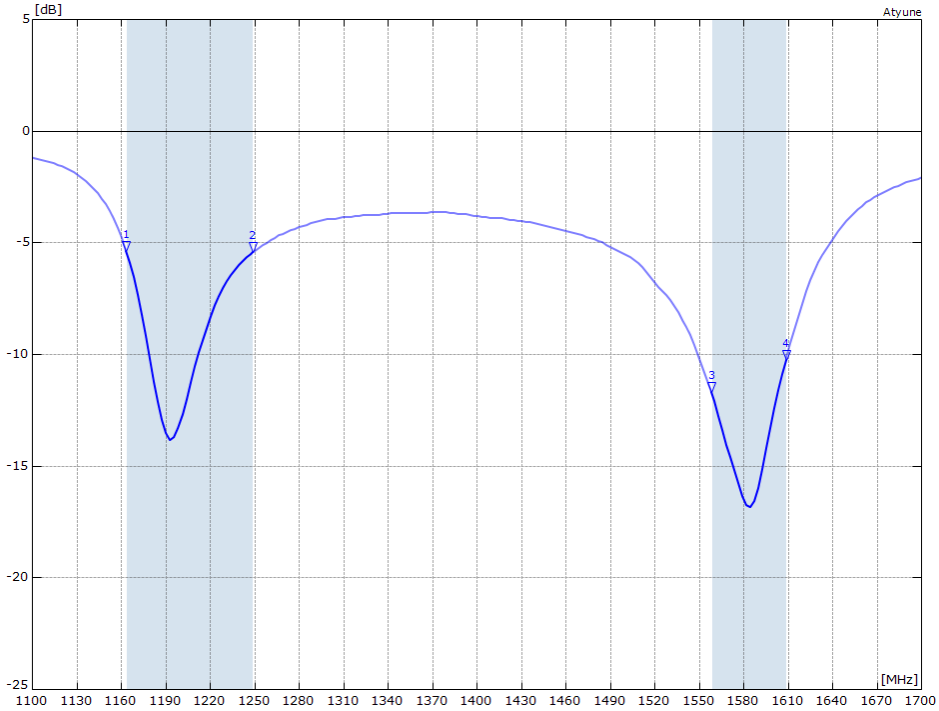
Note: All performance stated is measured of SZDV-C-4G36 evaluation kit

Environmental

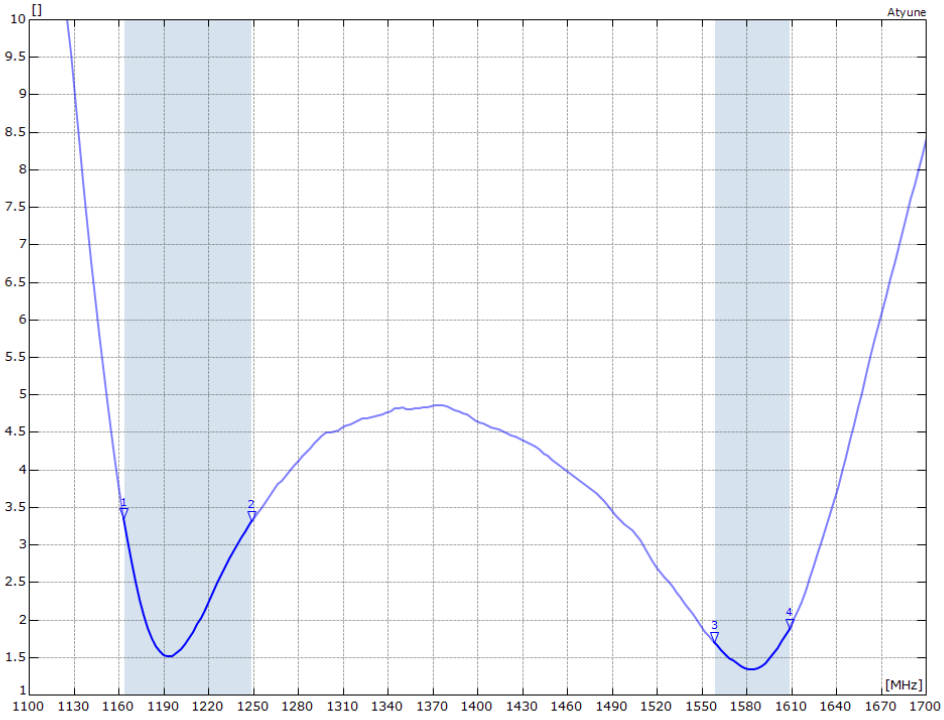
Parameter	
Operational Temperature	-40 to +125
Storage Temperature	-10 to +40
Relative Humidity (Storage)	65±20% RH
Moisture Sensitivity	1
RoHs and REACH compliant	Yes

RF Characteristics

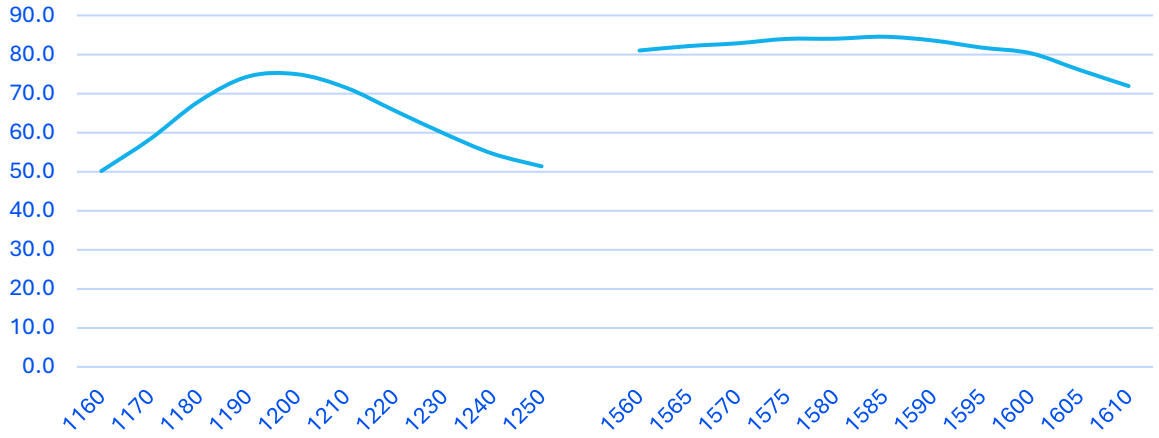
Return loss



VSWR



Efficiency

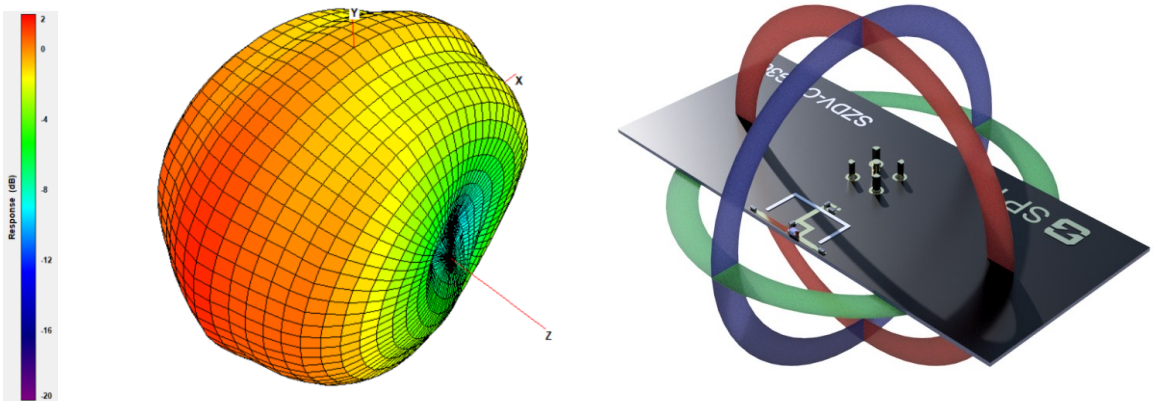


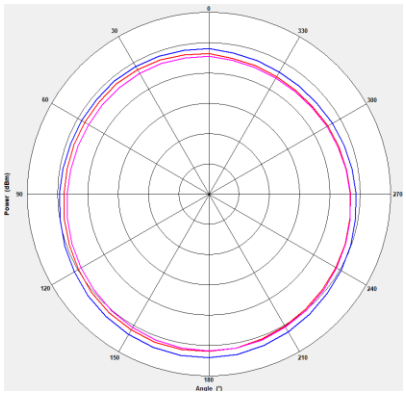
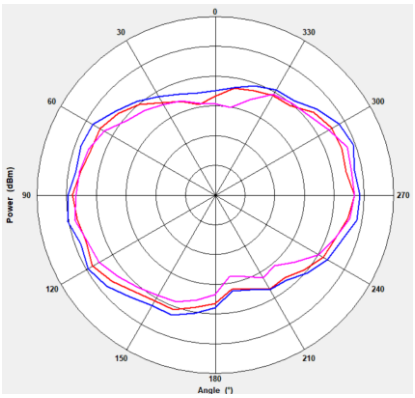
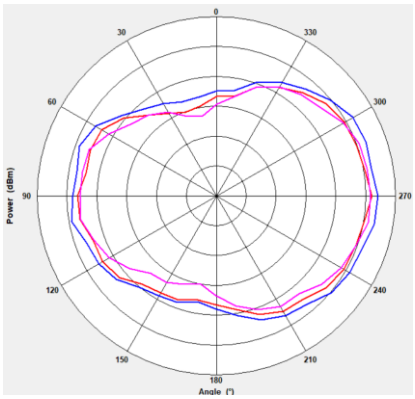
Peak Gain

Average Gain

RF Radiation Patterns

RF Radiation Patterns at 1176MHz



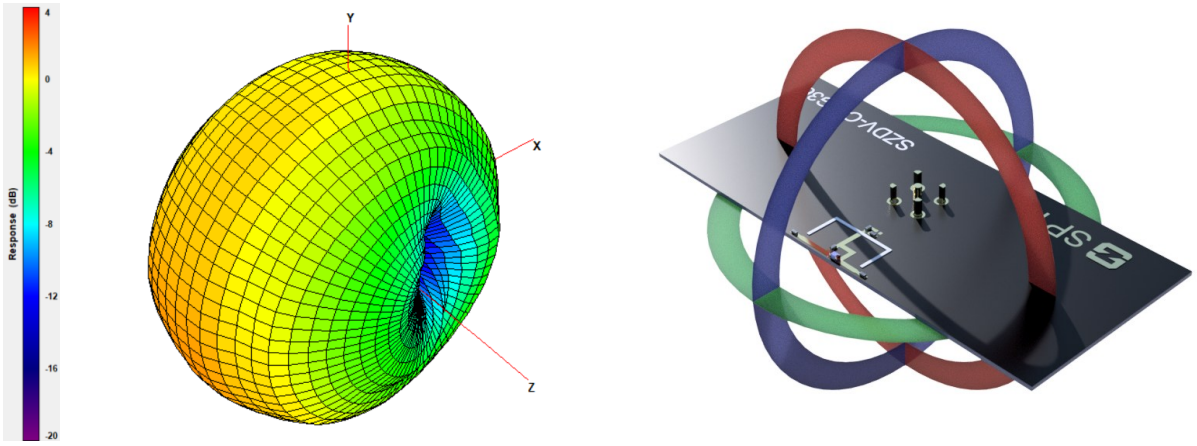
XY	XZ	YZ
		

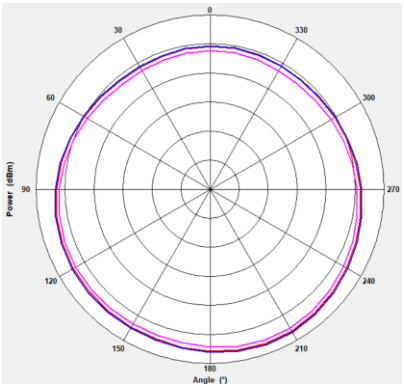
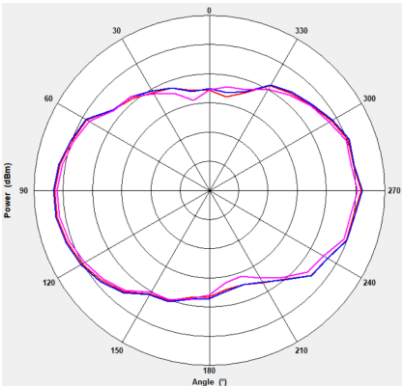
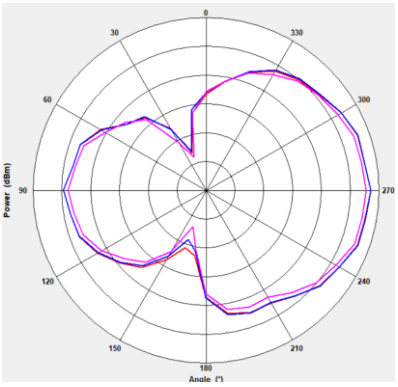
Max: 5
Min-25
Scale: 5/div

1170 MHz
1200 MHz
1240 MHz

RF Radiation Patterns

RF Radiation Patterns at 1575MHz

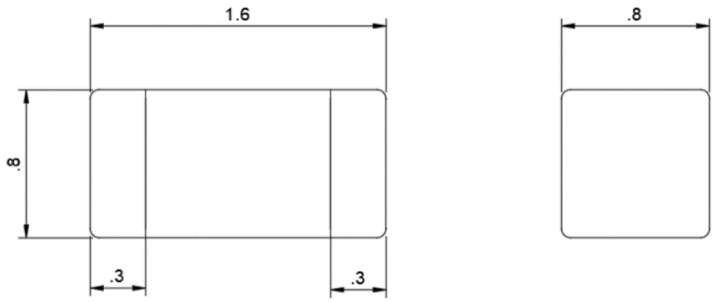


XY	XZ	YZ
		

Max: 5
Min-25
Scale: 5/div

1560 MHz
1575 MHz
1610 MHz

Mechanical Drawing



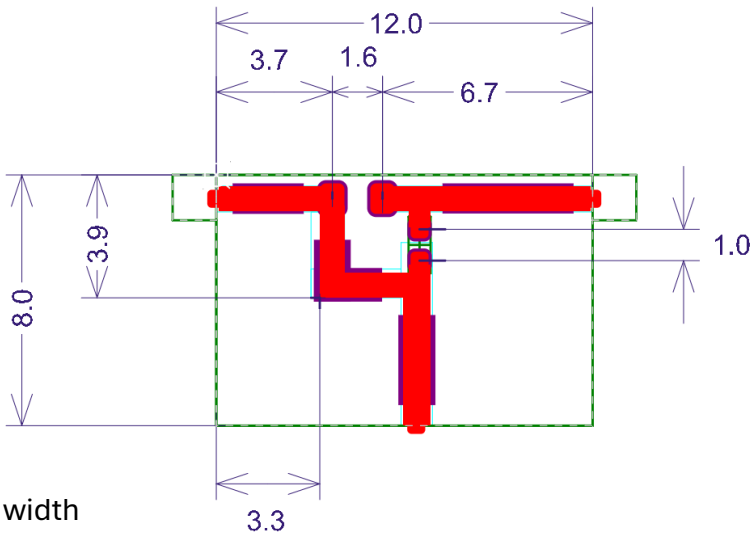
All dimensions in mm

L	W	T
1.6 ±0.15	0.8 ±0.15	0.8 ±0.15

Required Host PCB Footprint

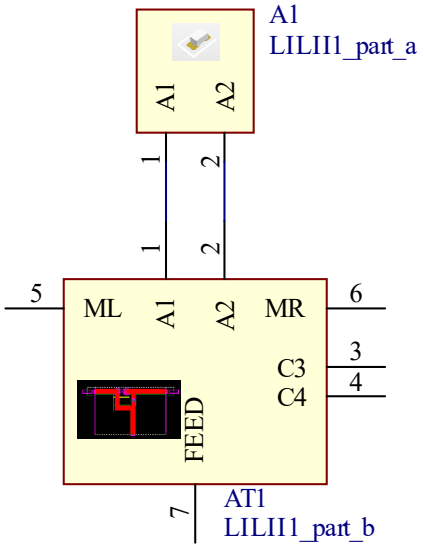
The host PCB requires the footprint shown below. PCB library files and DXF is available from our website www.synzen.com.tw/products.

The required clearance for the host PCB is 12.0 x 8.0 (mm) on all layers.



Traces = 0.8mm width

Schematic Symbol

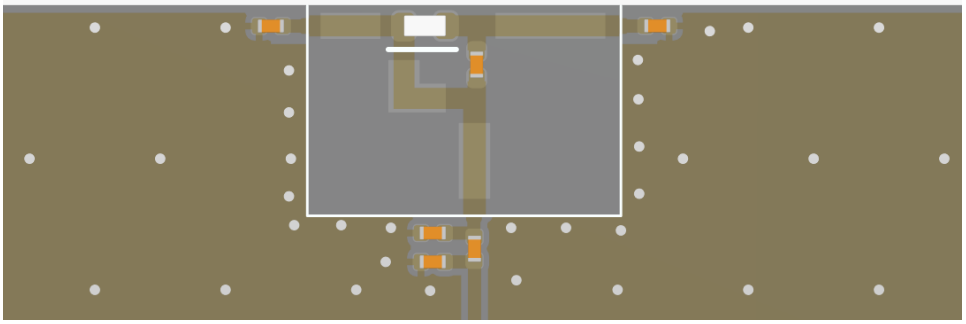


Pin	Description
1	Antenna pad 1 - Not orientation sensitive
2	Antenna pad 2 - Not orientation sensitive
3	Tuning capacitor pad
4	Tuning capacitor pad
5	Tuning component Left
6	Tuning component Right
7	Antenna feed – 50R transmission line

PCB Layout Guide

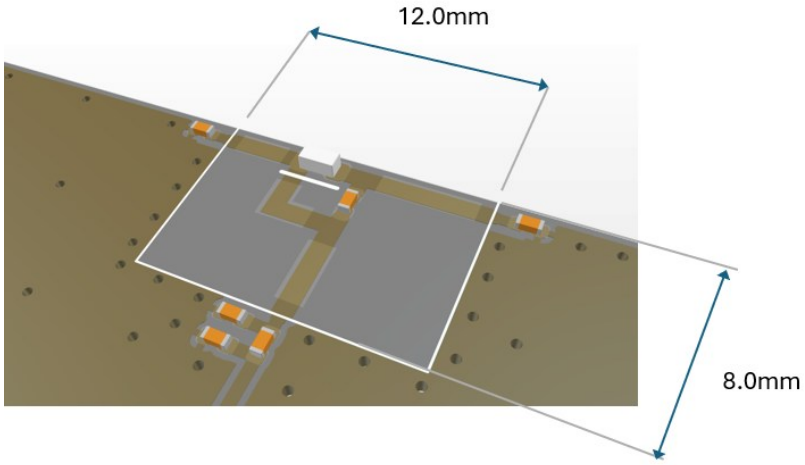
Placement

The antenna is designed to function placed at the centre of the longest PCB edge. Where possible the top and bottom layers of the PCB should be flooded with GND, this optimizes the antenna performance.



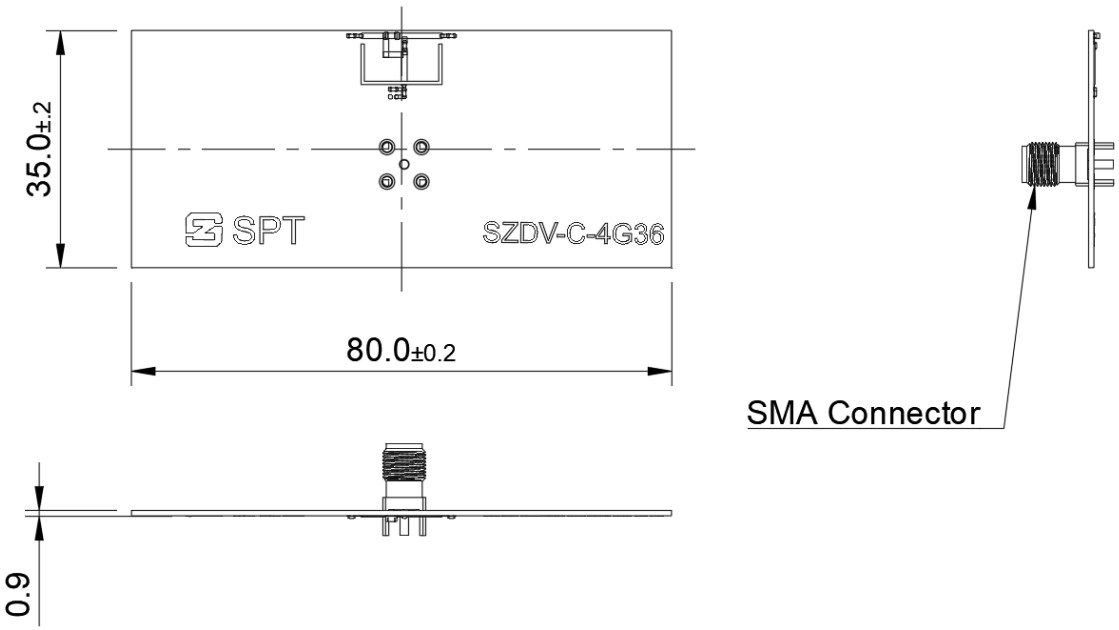
Clearance

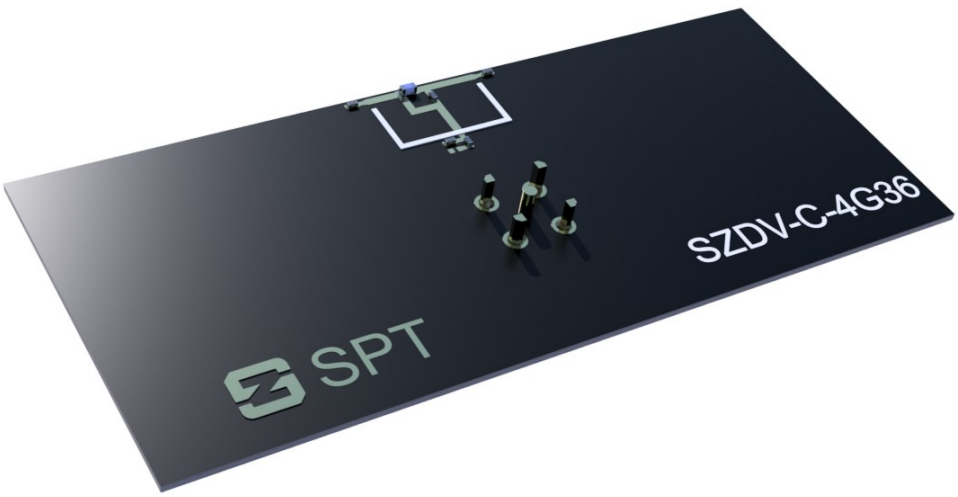
A clearance is required through all PCB layers for the precise area shown. Also, any components such as battery or display must also avoid this area. The rest of the area under the antenna should be filled GND.



Evaluation Kit

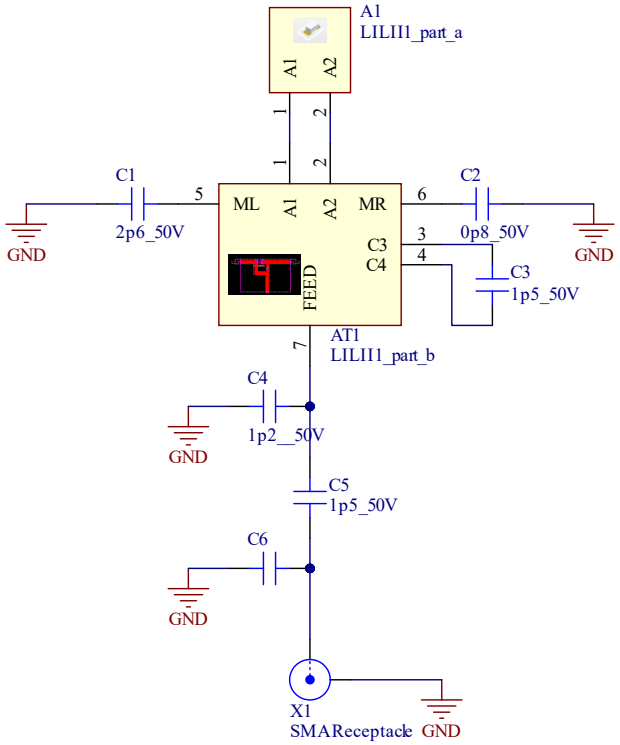
The SZDV-C-4G36 development kit is a PCBA with the antenna (SZC-C-4G36) fitted and optimised with a matching network. Connection to the antenna is made using the fitted female SMA connector.



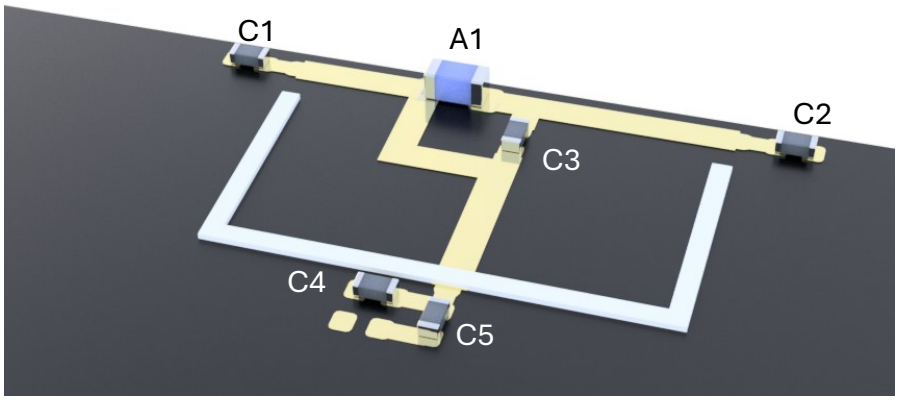


Evaluation Kit Matching Circuit

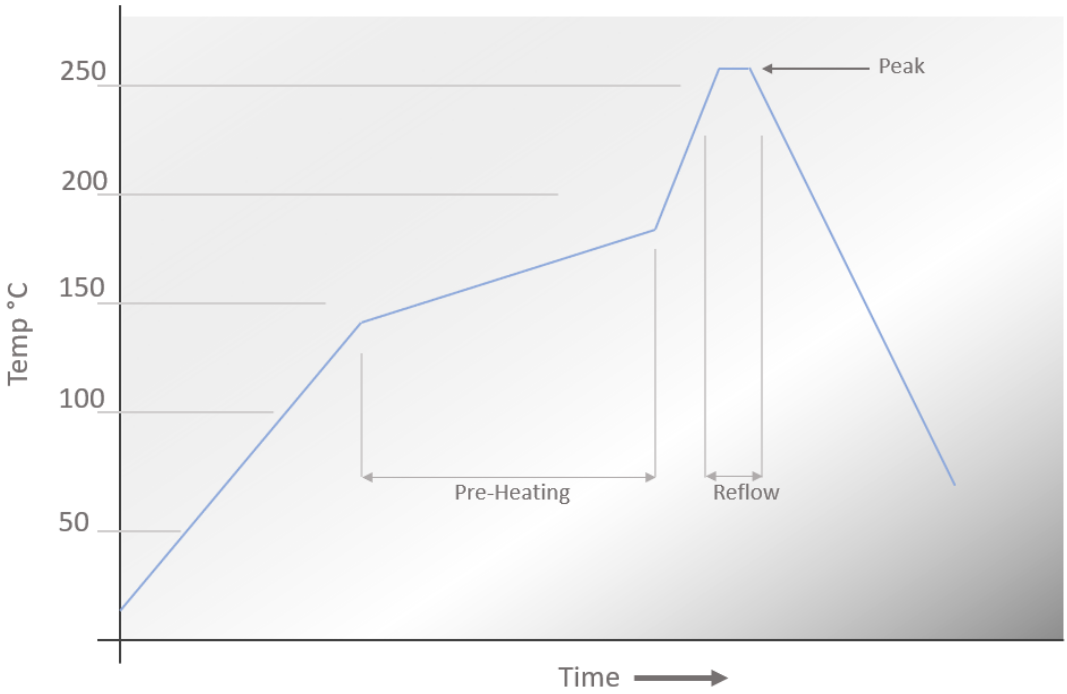
The circuit of the DEV kit along with the BOM is shown below. The matching network topology should be used on the device host PCB although the matching values will be dependent on the host PCB and device environment. Synzen provide a matching service to optimise your device to ensure the best performance,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



Designator	Component Type	Value	Size	Manufacturing Part No.
A1	Antenna	LILII1	-	SZC-C-4G36
C5, C3	Capacitor	1.5pF	0402	
C4	Capacitor	0.8pF	0402	
C1	Capacitor	2.6pF	0402	GCM1555C1H1R0CA16J



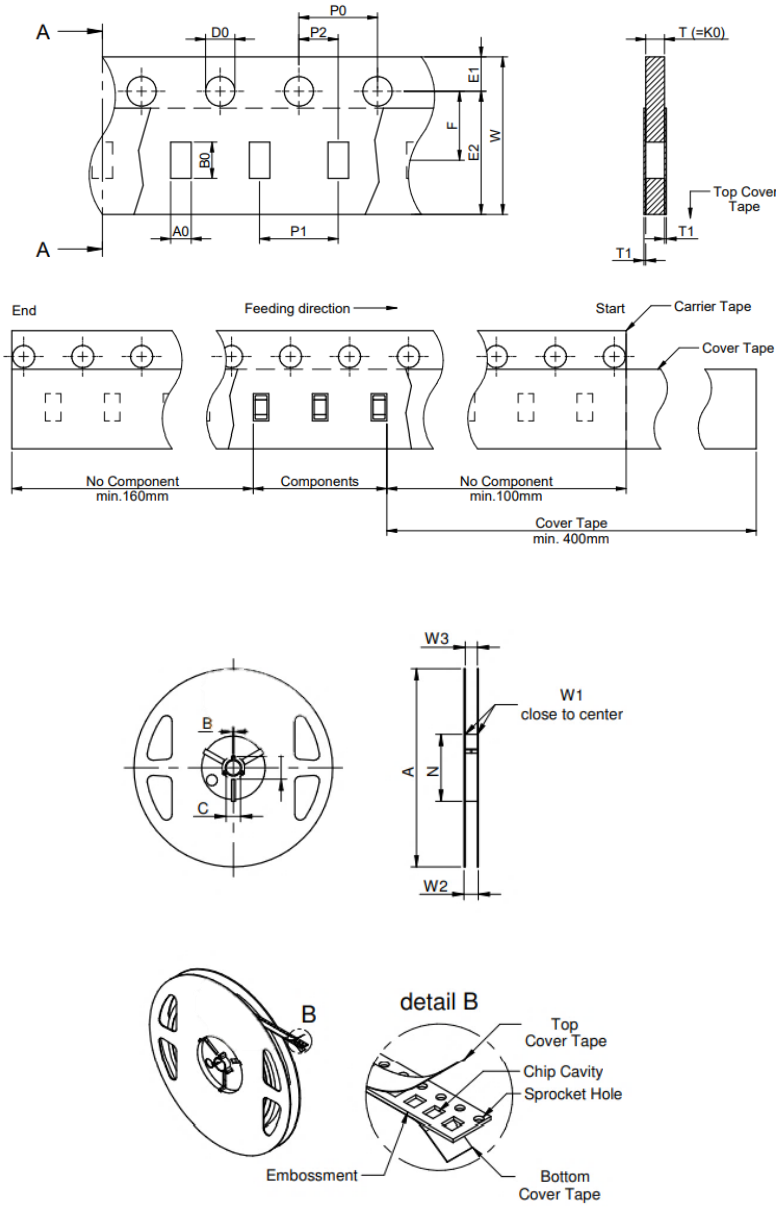
Soldering Profile



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

		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

Material Regulation

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