

MULTI-BAND GNSS CERAMIC SMD

LILII2

Multi-GNSS Ceramic Chip Antenna

SZC-C-4G37

BANDS
L1 + L2 + L5 + E6

PEAK GAIN
Up to 3.90 dBi

MOUNTING
SMD, PCB edge

SIZE
1.6 × 0.8 × 0.8 mm

LOW BAND	1164 to 1300 MHz	Covers GPS L2, L5, GLONASS L2, Galileo E5a, E5b, E6, BeiDou B2, IRNSS L5, QZSS L6
HIGH BAND	1559 to 1609 MHz	Covers GPS L1, GLONASS L1, Galileo E1, BeiDou B1, QZSS

Key Features

- Multi-band GNSS: 1164 to 1189, 1215 to 1249, 1260 to 1300, 1559 to 1609 MHz
- Minimal clearance of 15.0 × 10.0 mm
- SMD ceramic chip delivered on tape and reel
- Omnidirectional radiation pattern
- Edge-of-board mounting

1 Introduction

LILII2 (SZC-C-4G37) is an advanced, compact embedded ceramic chip antenna that supports multiple GNSS bands, including L1, L2, L5, L6, and E6, covering a wide frequency range from 1164 to 1300 MHz and 1559 to 1609 MHz. This antenna is compatible with all major GNSS systems, such as GPS (L1, L2, L5), GLONASS (L1, L2), Galileo (E1, E5a, E5b, E6), BeiDou (B1, B2), IRNSS (L5), QZSS, and L6.

With a minimal clearance requirement of just 15 × 10 mm on the PCB, the LILII2 is designed for high-precision, multi-band GNSS applications in space-constrained devices. Its small size and SMD form factor, delivered on tape and reel, make it ideal for edge-of-board mounting, ensuring a seamless integration process. The omnidirectional radiation pattern guarantees stable, reliable performance even in devices where orientation may vary or undergo frequent movement.

The LILII2 offers excellent bandwidth and high efficiency across all supported GNSS bands, with efficiency levels ranging from 60% to 90% and a peak gain between 3.00 to 3.90 dBi. Its performance rivals larger patch antennas while maintaining a compact size, thanks to advanced ceramic materials and a carefully optimized design that ensures reliable operation in compact and demanding environments.

— Features

- ◆ Multi-band GNSS: 1164 to 1189, 1215 to 1249, 1260 to 1300, 1559 to 1609 MHz
- ◆ Minimal clearance of 15.0 × 10.0 mm
- ◆ SMD ceramic chip delivered on tape and reel
- ◆ Omnidirectional radiation pattern
- ◆ Edge-of-board mounting

— Applications

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

2 Mechanical Specifications

Part Number	SZC-C-4G37
Name	LILII-2
Dimensions (mm)	1.6 × 1.6 × 0.8
Clearance Area (mm)	15.0 × 10.0
Weight	<0.1 g
Antenna Type	Surface Mount Ceramic Chip

3 Electrical / RF Specifications

Band	Frequency Range (MHz)	Efficiency (%)	Peak Gain (dBi)	VSWR	Impedance
L5 / E5	1164 to 1189	>60	2.50	2.80:1	50 Ω
L2 / E2 / L3	1215 to 1249	>73	3.00	2.50:1	
E6	1260 to 1300	>62	2.60	3.10:1	
L1 / E1	1559 to 1609	>80	3.90	2.20:1	

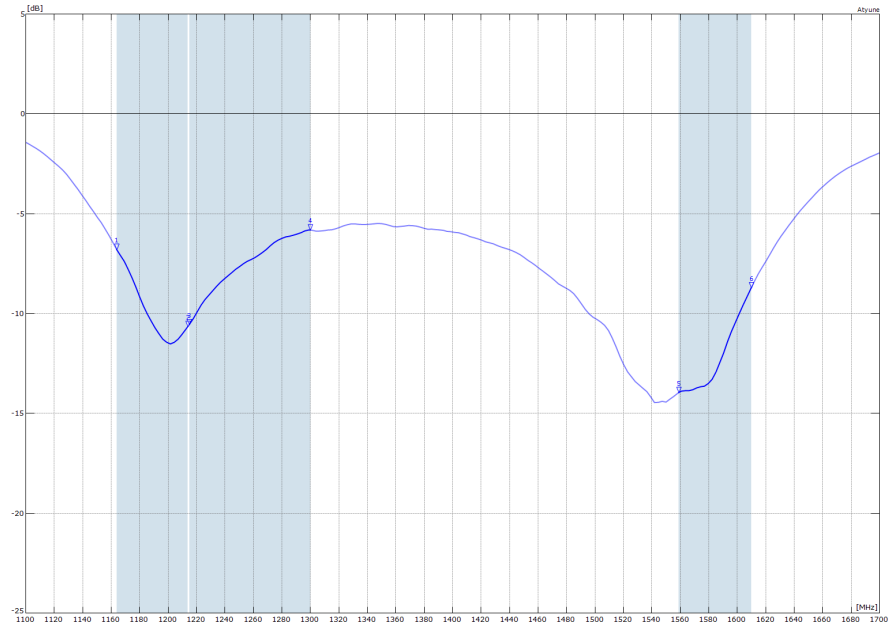
Note: All performance stated is measured on the SZDV-C-4G37 evaluation kit.

4 Environmental

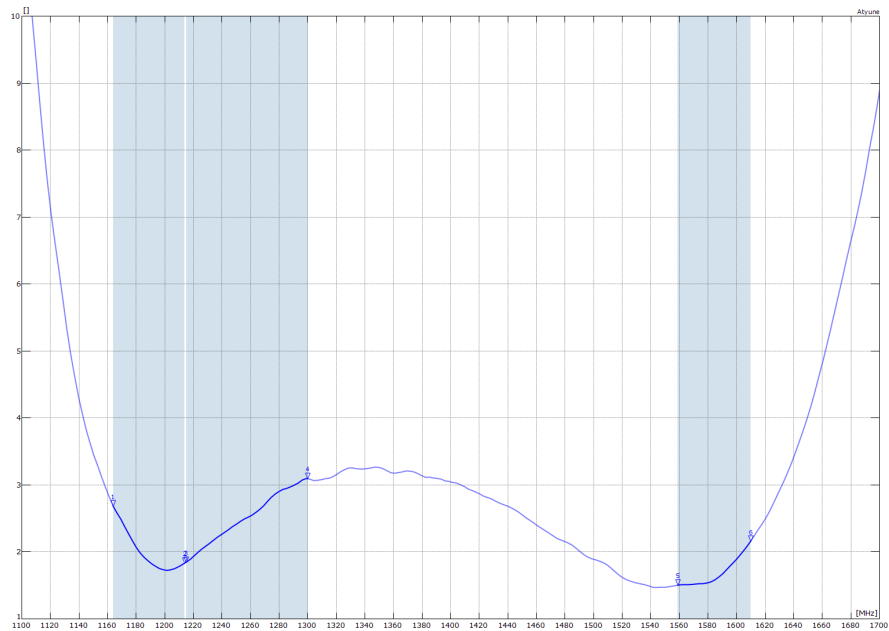
Operational Temperature	-40 to +125°C
Storage Temperature	-10 to +40°C
Relative Humidity (Storage)	65 ±20% RH
Moisture Sensitivity Level (MSL)	1
RoHS and REACH compliant	Yes

5 RF Characteristics

S11 Parameter

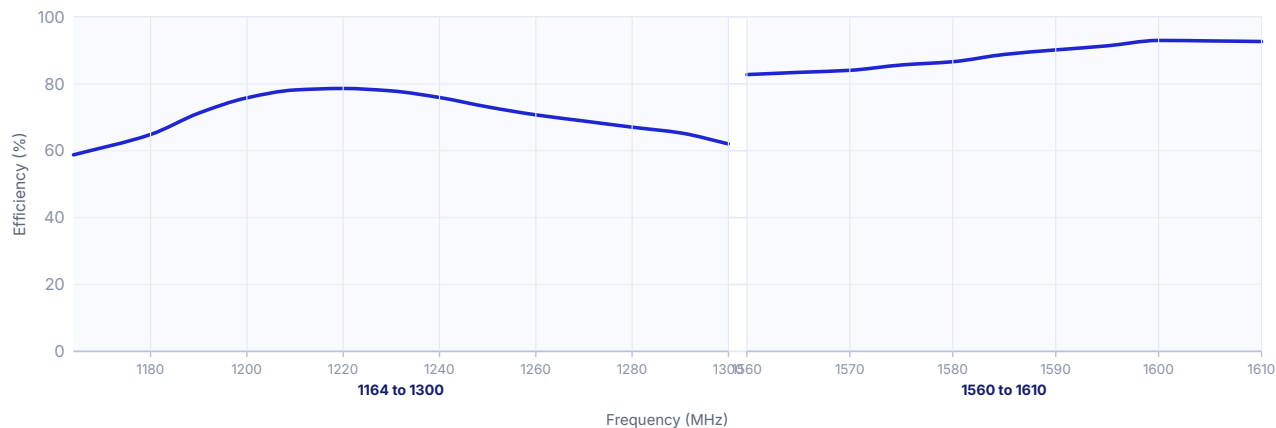


VSWR

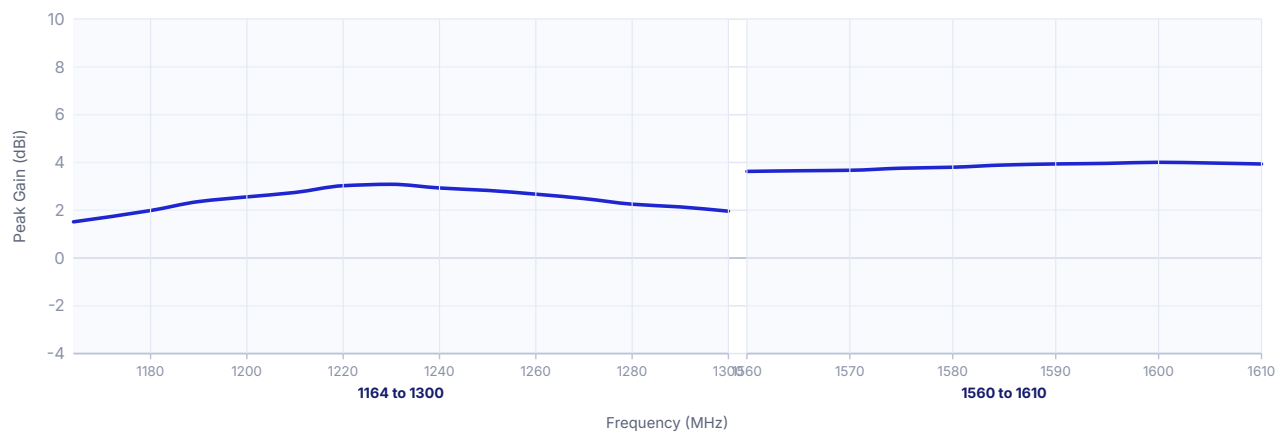


6 Antenna Performance

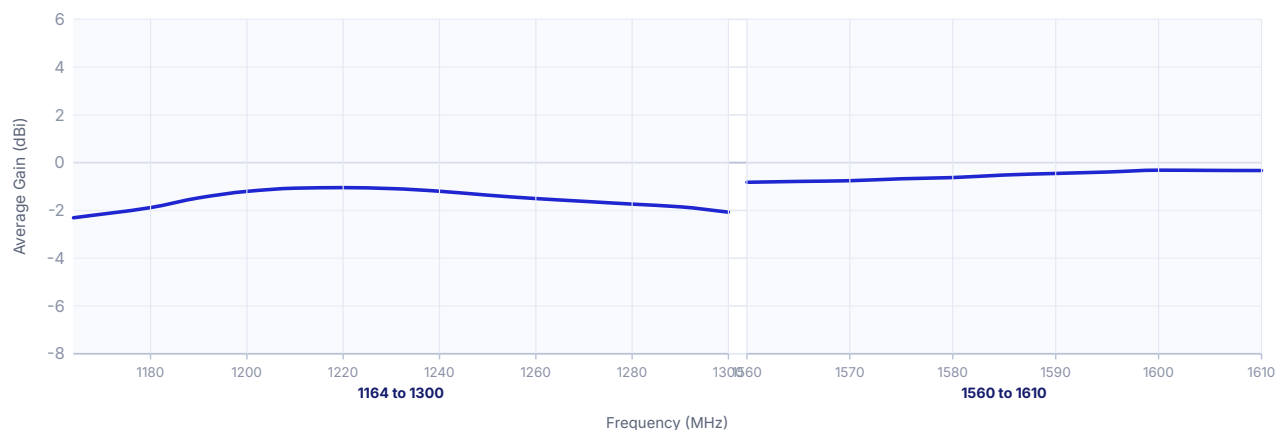
Efficiency



Peak Gain

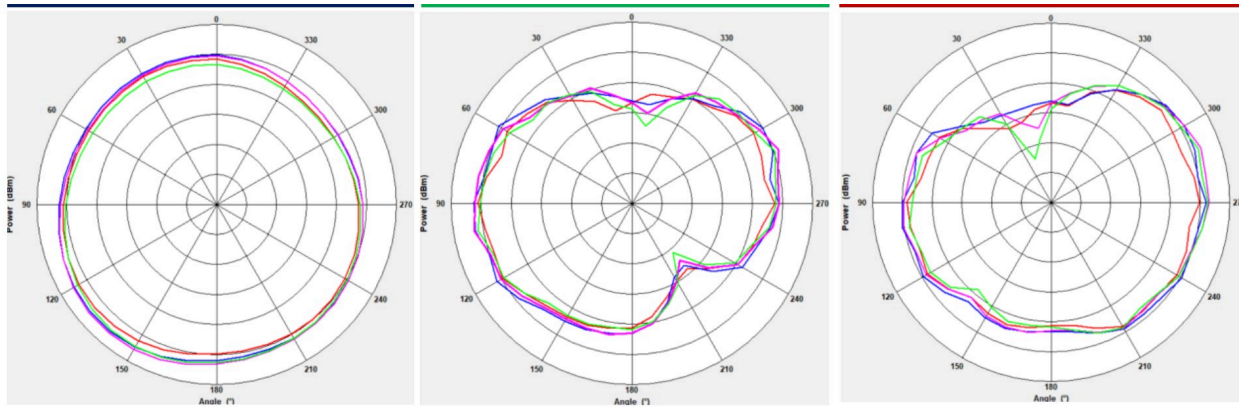
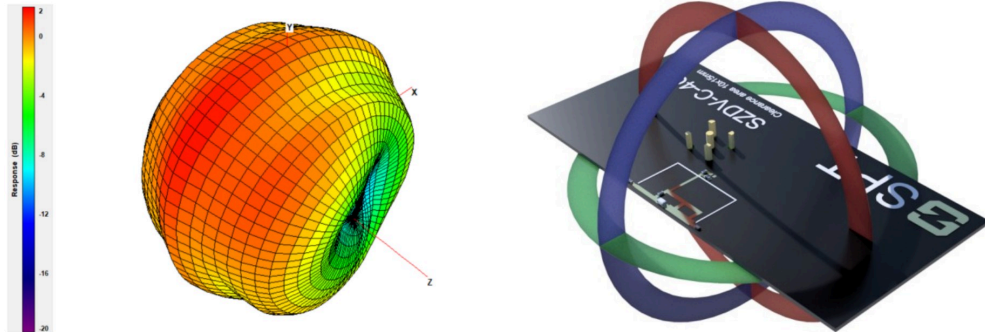


Average Gain



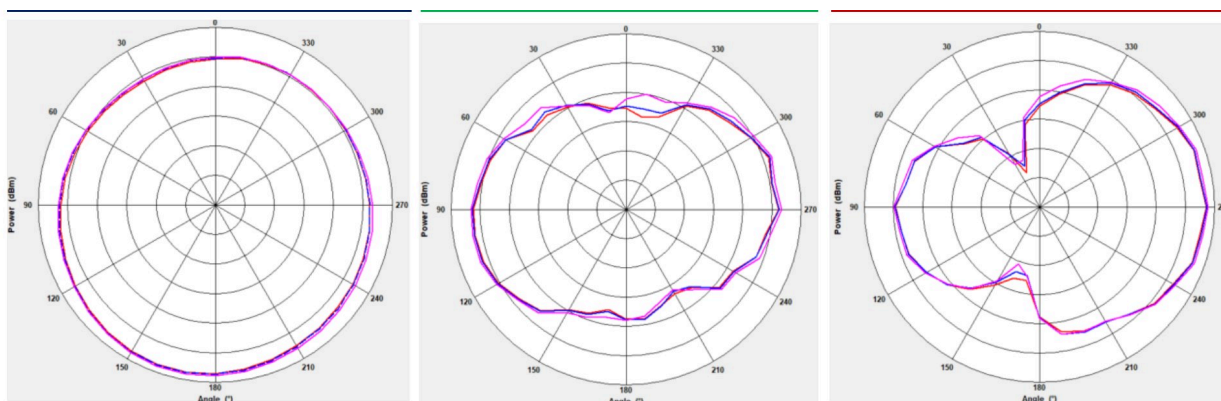
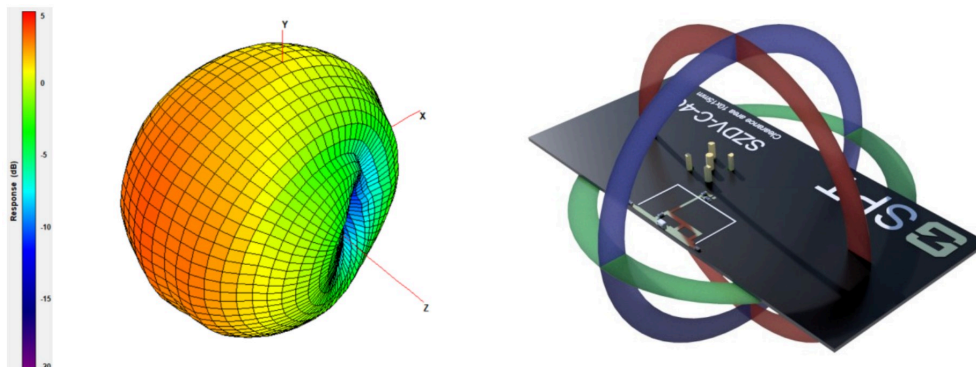
7 Radiation Patterns at 1176 MHz

MEASURED ON SYNZEN EVK (SZDV-C-4G37)

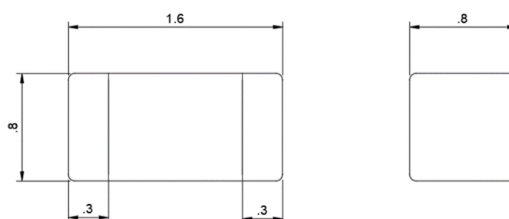


8 Radiation Patterns at 1575 MHz

MEASURED ON SYNZEN EVK (SZDV-C-4G37)



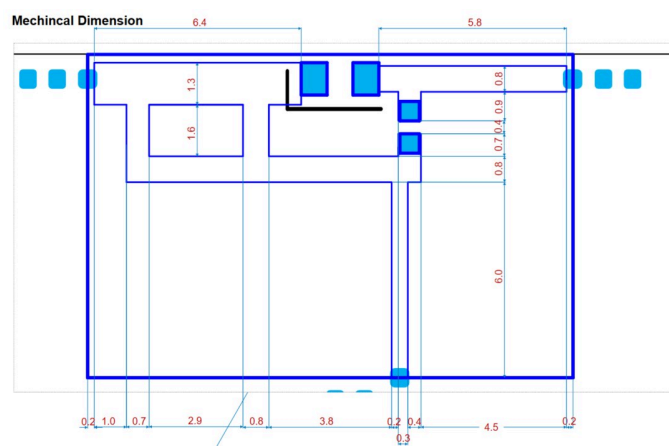
9 Mechanical Drawing



All dimensions in mm

L	W	T
1.6 ±0.15	0.8 ±0.15	0.8 ±0.15

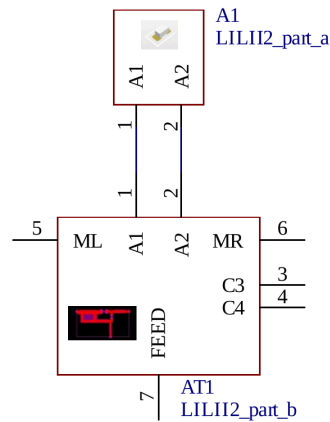
10 Required Host PCB Footprint



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

The required clearance for the host PCB is 15.0 × 10.0 mm on all layers.

11 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

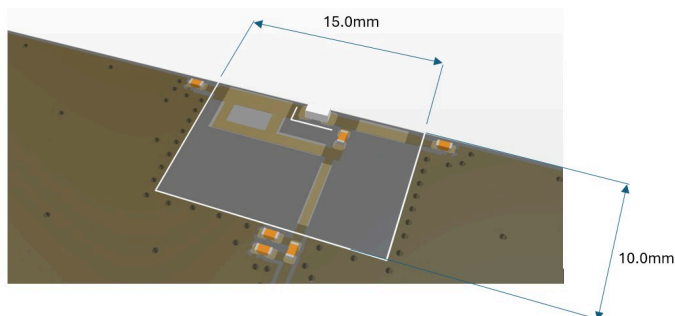
12 Placement

The antenna is designed to function placed at the center 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.



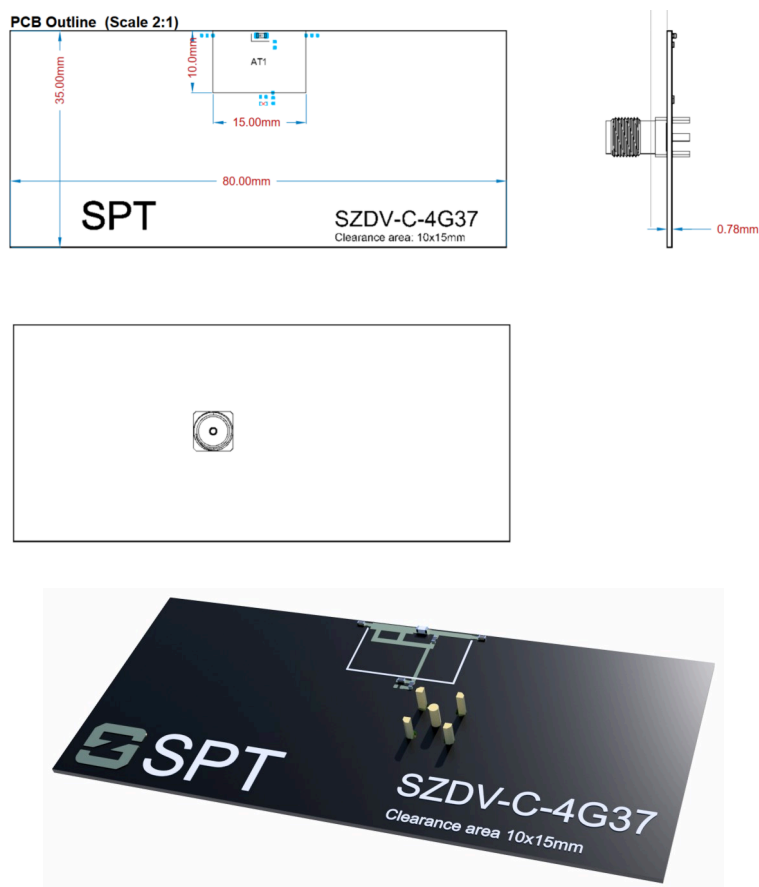
13 Clearance

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.



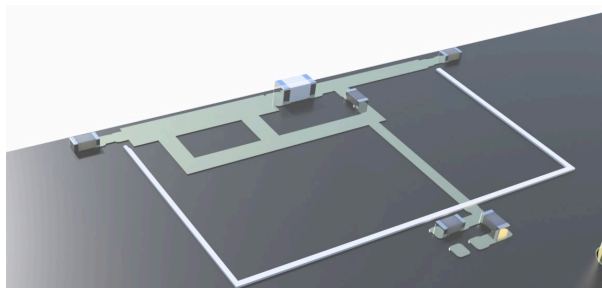
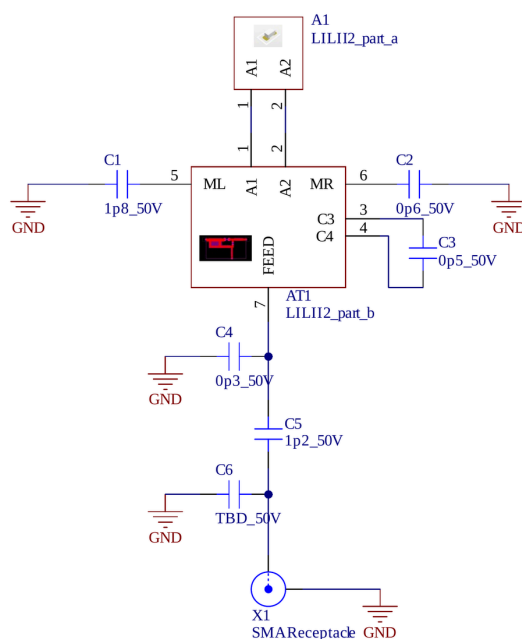
14 SZDV-C-4G37 Evaluation Kit

The SZDV-C-4G37 evaluation kit is a PCBA with the antenna (SZC-C-4G37) fitted and optimized with a matching network. Connection to the antenna is made using the fitted female SMA connector.



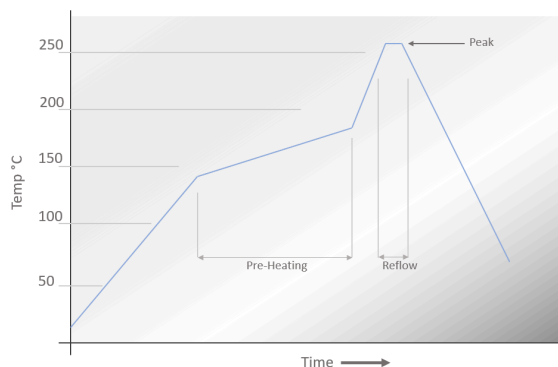
15 Evaluation Kit Matching Circuit

The circuit of the EVK 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 optimize your device to ensure the best performance. Please contact sales@synzen.com.tw for more information.



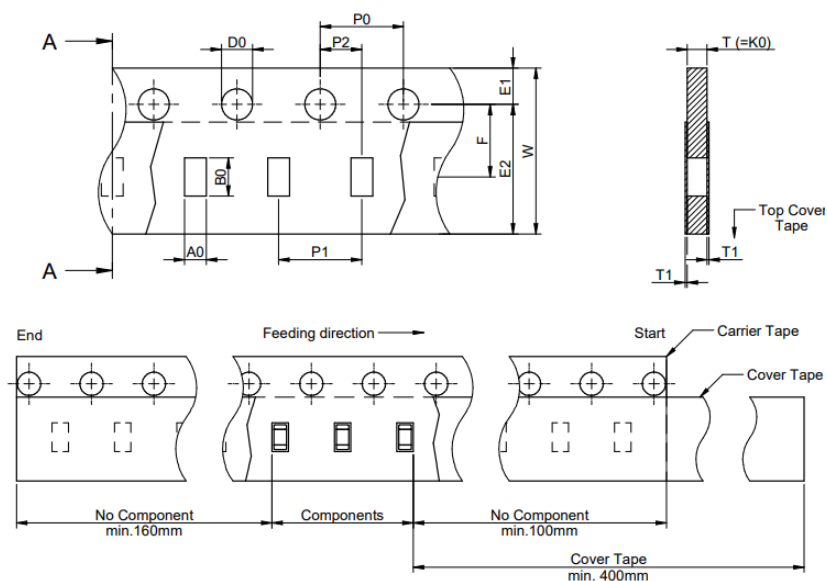
Designator	Component Type	Value	Size	Manufacturing Part No.
A1	Antenna	LILII2		SZC-C-4G37
C6		DNP	0402	Not Fitted
C5	Capacitor	1.2 pF	0402	
C4	Capacitor	0.3 pF	0402	
C1	Capacitor	1.8 pF	0402	
C3	Capacitor	0.5 pF	0402	
C2	Capacitor	0.6 pF	0402	

16 Reflow Profile



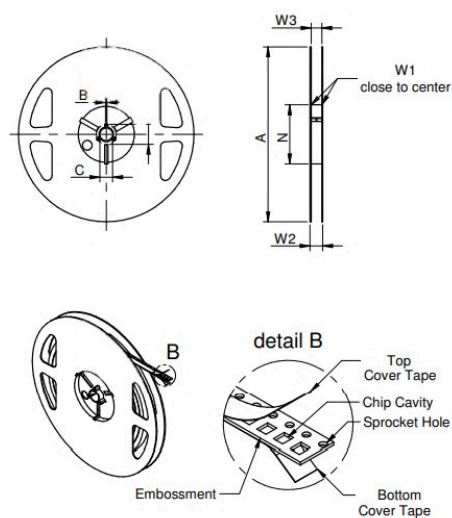
Stage	Temperature	Time
Pre-Heating	130 to 180°C	50 to 190 seconds
Reflow	>220°C	50 to 160 seconds
Peak Temperature	260°C	15 to 45 seconds

17 Tape



Dimension	Size 0603 (mm)	Tolerance
A0	1.05	typ.
B0	1.85	typ.
W	8.00	+0.3 / -0.1
T	0.95	typ.
T1	0.10	max.
P0	4.00	±0.1
P1	4.00	
P2	2.00	+0.05
D0	1.50	+0.1 / -0.0
E1	1.75	±0.1
E2	6.25	min.
F	3.50	±0.05
Tape type	Paper (type 1a)	
Packaging unit	4000 pcs	

18 Reel



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

19

Compliance

ROHS

Compliant

Conforms to EU RoHS Directive 2011/65/EU as amended by Delegated Directive (EU) 2015/863.

REACH

Compliant

Conforms to EU REACH Regulation (EC) No 1907/2006.

CERTIFICATE

On request

A certificate of conformance is available upon request from sales@synzen.com.tw.

Synzen Precision Technology Ltd makes no warranties based on the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. Synzen reserves all rights to this document and the information contained herein. Reproduction, use or disclosure to third parties without express permission is strictly prohibited.