



SYNZEN

PRODUCT DATASHEET

CHARON | GNSS Front End Module | L1 + L2 + L5 band

Part Number / Name

- SZA-N-4G32
- CHARON

Features

- Two stage amplifiers (LNA) with >25dB of Gain
- Dimensions: 15.5 x 15 x 3.5 (mm)
- $V_{in} = +1.8$ to 5.5VDC
- Surface mounted
- RoHS & REACH Compliant

Applications

- RTK Applications
- Drones
- Asset Tracking
- Wearable Tech



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Introduction

Introducing CHARON, the advanced synzen product designed to enhance GNSS capabilities. CHARON is a surface-mount GNSS front-end which is tailored for multiband high-precision applications, covering L1+B1+G1/L2/L5 bands (1166-1249; 1559-1609MHz) for comprehensive GNSS constellation support.

CHARON ensures superior performance with its single input, single-output configuration. Employing a sophisticated SAW/LNA/SAW/LNA topology in both low and high band signal paths, CHARON effectively mitigates unwanted out-of-band interference, preventing the overdrive of GNSS LNAs or receivers while maintaining a low noise figure.

Unlike many dual-band GNSS receivers that necessitate additional RF circuits, CHARON streamlines integration by encapsulating the required RF circuits in a modular form. By seamlessly inserting the modular CHARON between the GNSS antenna and receiver, it offers a hassle-free seamless solution.

Key Features and Benefits of CHARON:

Ease-of-Integration: CHARON provides a single-package solution, combining impedance matching, filter efficiency, and low noise design.

Low-Noise System Design: Integrated pre-filters within CHARON deliver exceptional out-of-band rejection, accommodating multiple band configurations and mitigating neighboring interference to optimize the overall noise figure.

Dual-Gain Stage Architecture: CHARON incorporates cascaded LNAs, pre-filters, and optimized impedance matching, delivering ample gain to the GNSS receiver without succumbing to signal-to-noise overload.

Low-Profile Form Factor: With a small footprint and low-profile design, CHARON saves valuable real estate, eliminating the need for external components and complex routing.



General Specifications

Part Number	SZA-N-4G32
Name	CHARON
Dimensions	15.5 x 15.0 x 3.5 (mm)
Device Type	Surface Mount
Weight	<3g
Adhesive backing	3M 868

Electrical / RF Specifications*

Note: All performance stated is measured on evaluation board (SZDV-1-4G32)

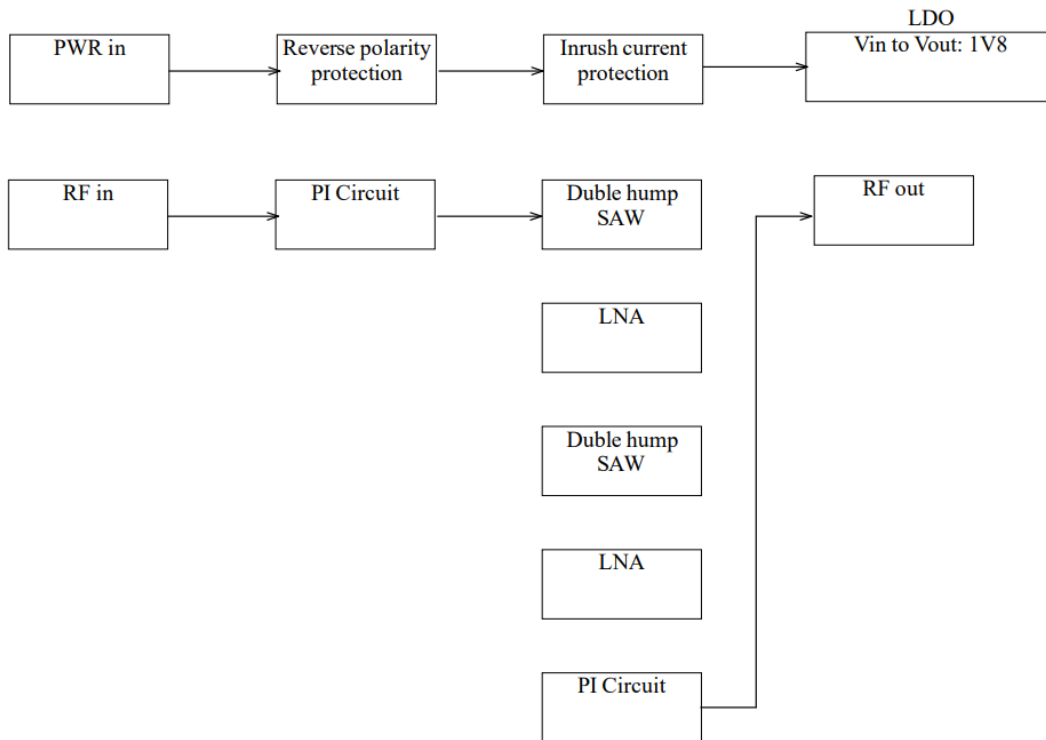
Frequency (MHz)	Noise Figure (dB)	Gain (dB)	Group Delay (nS)	Vin	Current (Typical at 1.8V)
1166	2.7	31	19	+1.8 to 5.5 VDC	10.6 mA
1176	2.2	32	16		
1186	1.8	32	14		
1197	1.8	32	10		
1227	2.0	32	12		
1249	2.2	31	20		
1559	2.8	27	16		
1575.42	3.2	26	17		
1606	2.9	25	21		

Environmental Specifications

Operational Temperature	-40 to +85 (°C)
Storage Temperature	-10 to +40 (°C)
Relative Humidity	≤75%
Moisture Sensitivity Level (MSL)	MSL 3
RoHs & REACH compliant	Yes

Block Diagram

Block Diagram

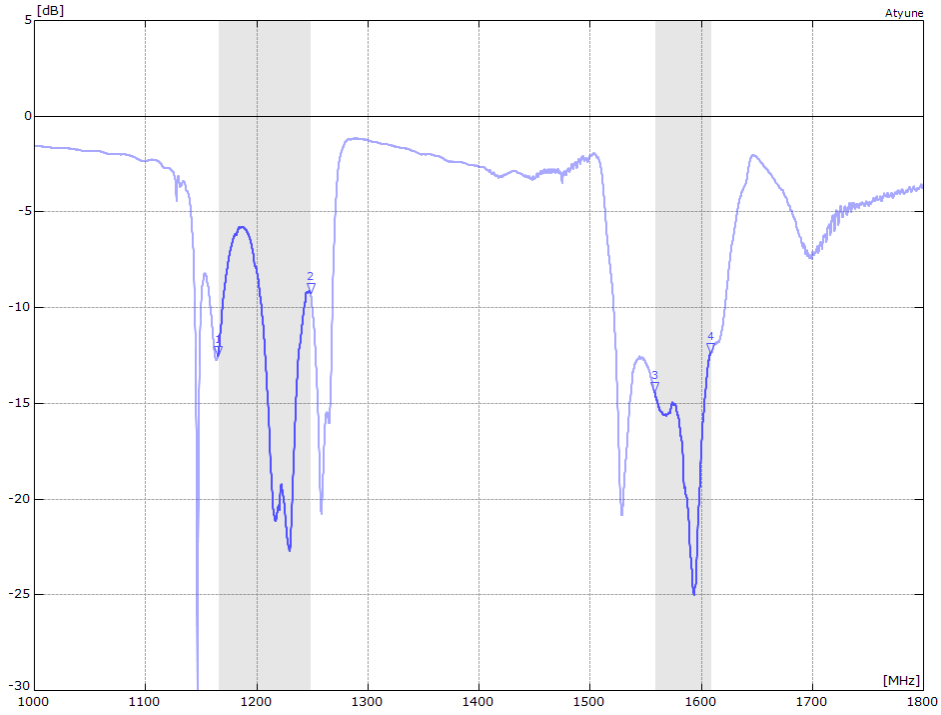


Recommended antennas

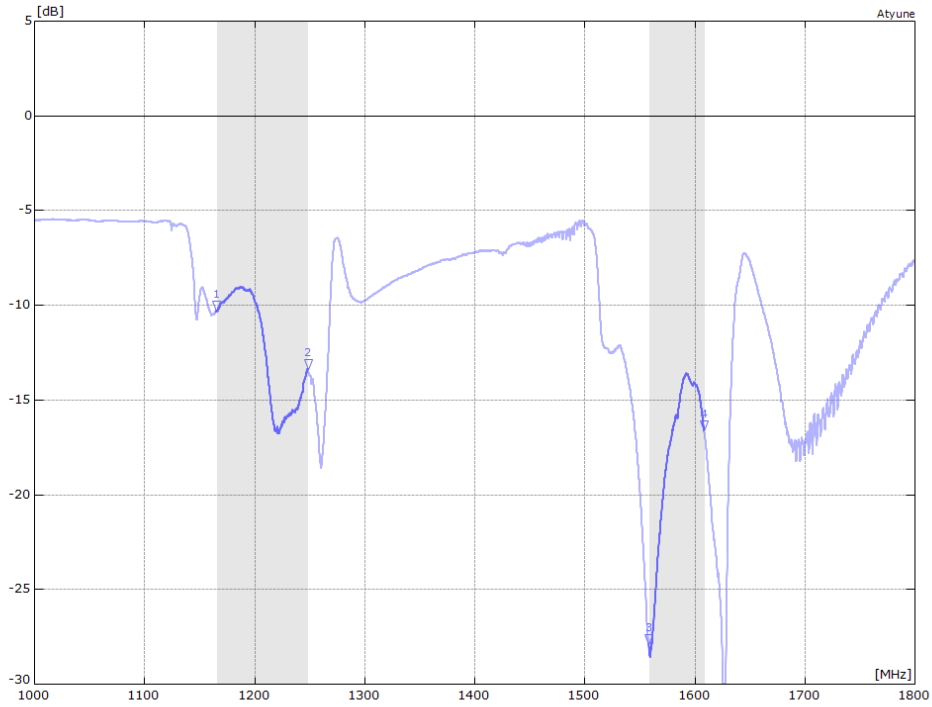
Compatible Antennas
ZENDE (SZP-C-1G12)
DIONE (SZC-N-3G30)
TABIT (SZK-C-3G22)

RF Characteristics – S11

Input S11

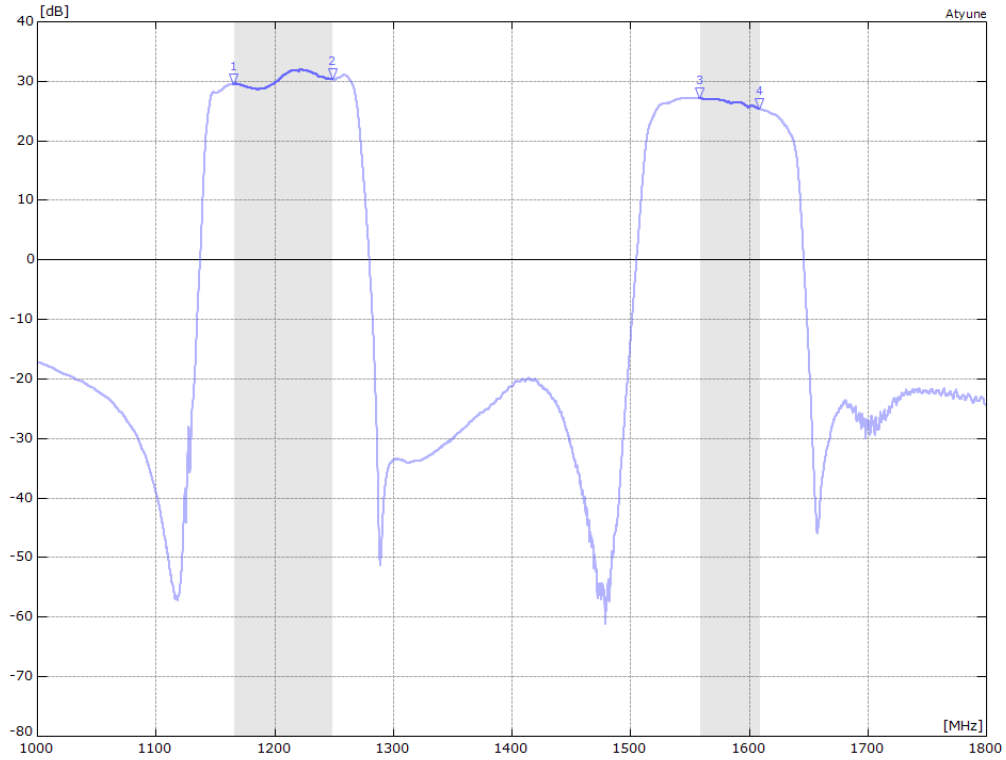


Output S11

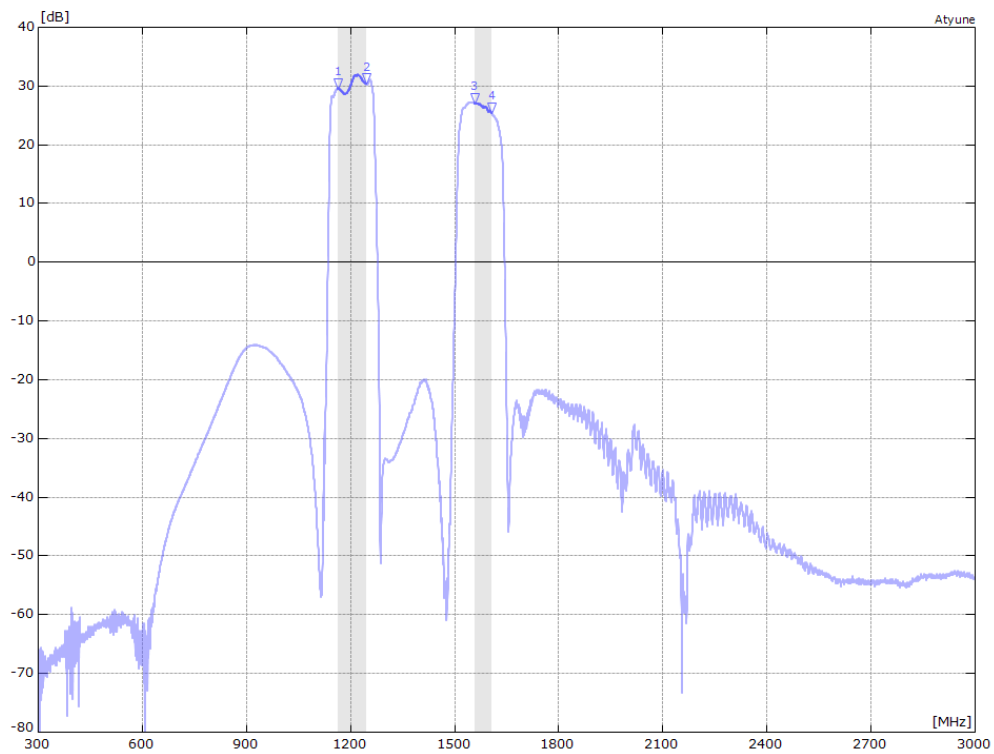


RF Characteristics – S21

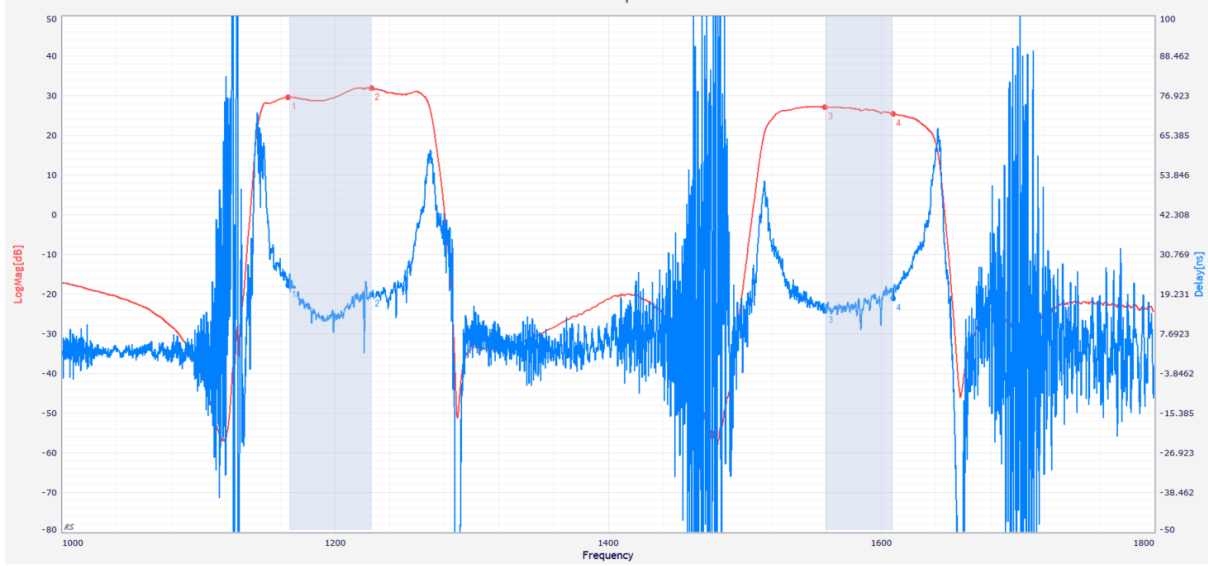
In Band Gain



Wideband Rejection



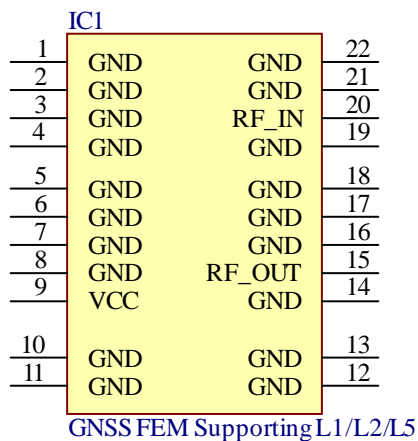
RF Characteristics – Group Delay



Schematic Symbol / Pinout

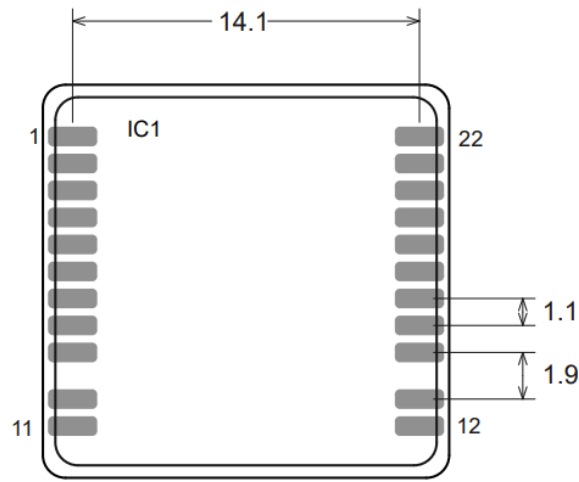
Circuit symbol for SZA-N-4G32 is shown here. The integrated library is available for download in the members area of our website. [Signup](#)

Pin	Description
1,2,3,4,5,6,7,8,10,11,12,13,14,16,17,18,19,21,22	Ground connections
9	Bias Input V = 1.8 to 5.5V
20	RF INPUT
15	RF OUTPUT



Module Footprint

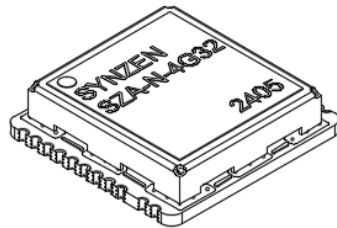
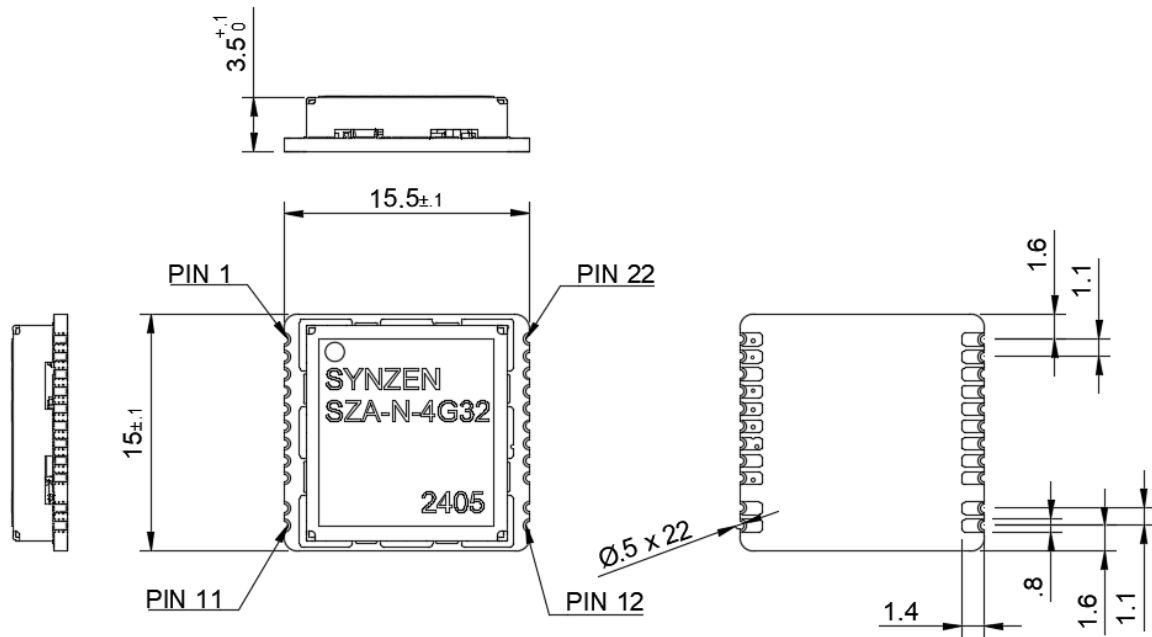
Below is the required footprint for the FEM module. Footprint files are available from our download area. [Signup](#)



ALL PADS = 2.0 x 0.8 (MM)
ALL DIMENSINS IN MM

Module Mechanical Drawing

SZA-N-4G32 Module



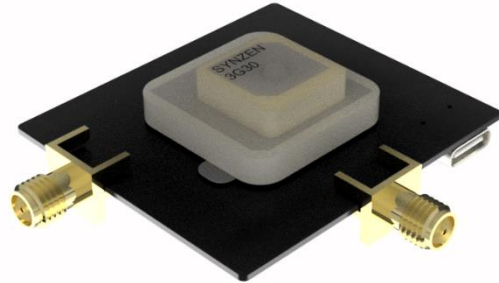
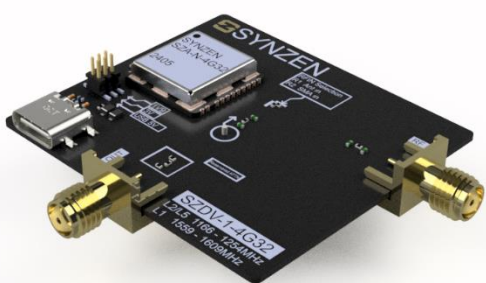
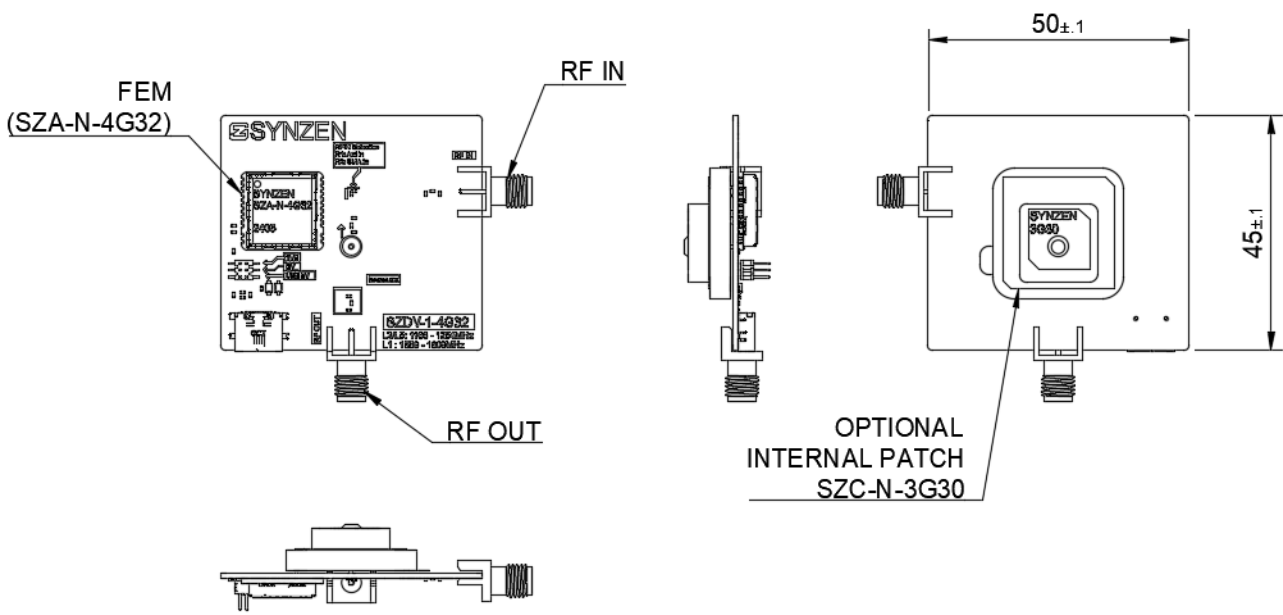
ALL PADS 1.4 x 0.8

ALL DIMENSIONS IN MM

EVK -1 Mechanical Drawing

SZDV-1-4G32 Evaluation kit

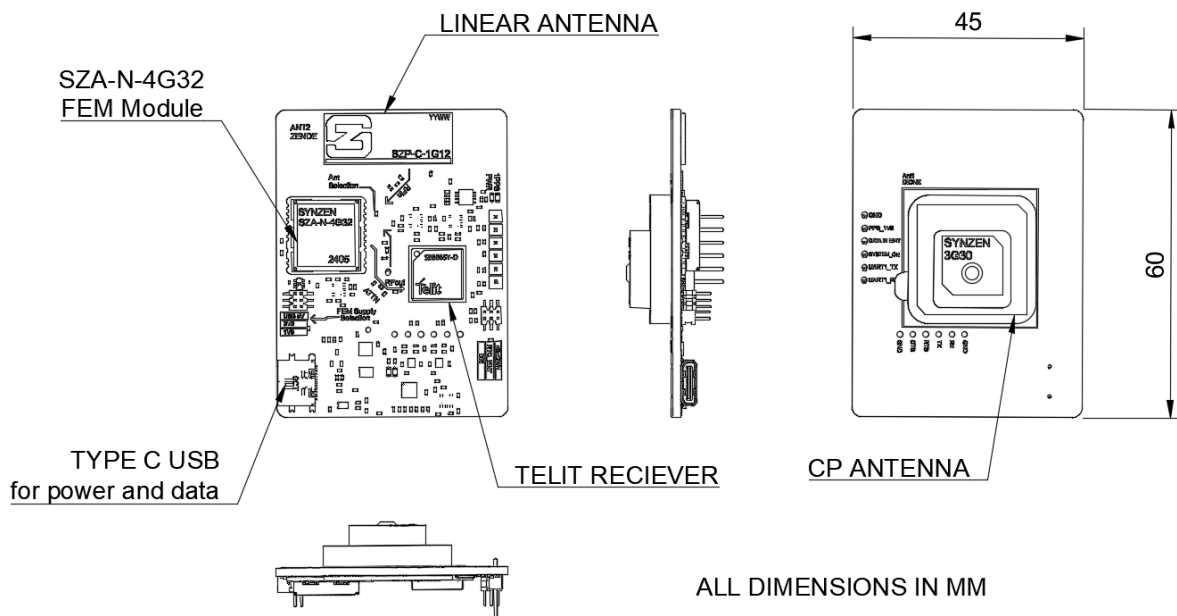
- Internal or external antenna selection
- VDC selection
- Attenuator option



EVK-2 Mechanical Drawing

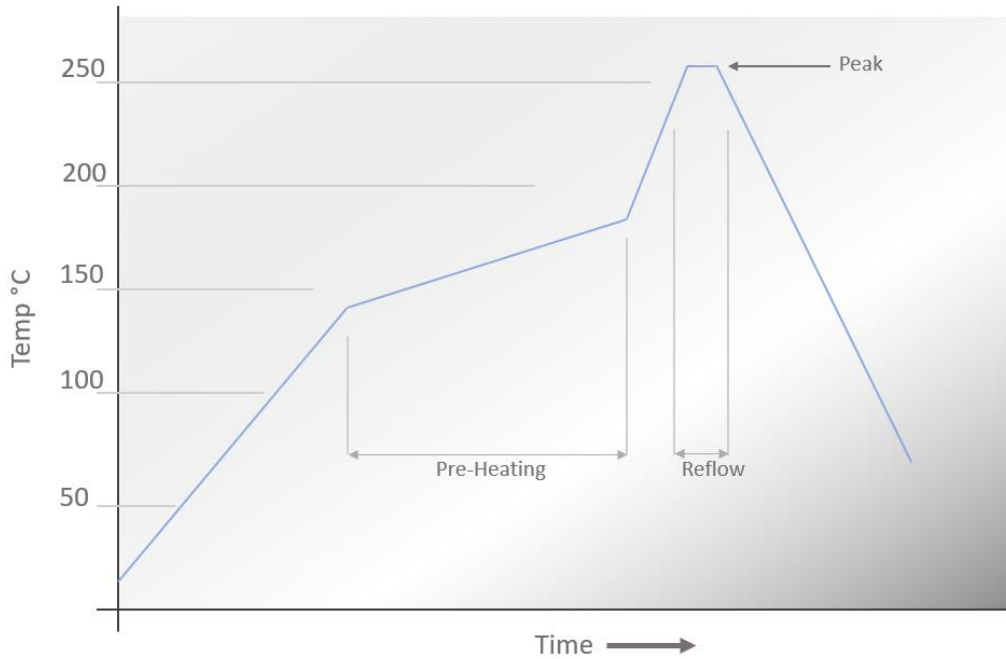
SZDV-2-4G32 Evaluation kit

- Linear antenna selection using Synzen multiband antenna [ZENDE](#)
- Circular polarized antenna option using Synzen ceramic dual band [DIONE](#)
- Telit receiver SE868SY-D Mult constellation and High-Precision GNSS
- Ability to functionally test our FEM module with antenna options with the Telit receiver.
- Works with Telit View software or with Synzen GNSS viewer tool.



Recommended Reflow Profile

The module can be reflowed onto the host PCB by following the recommended profile shown here.

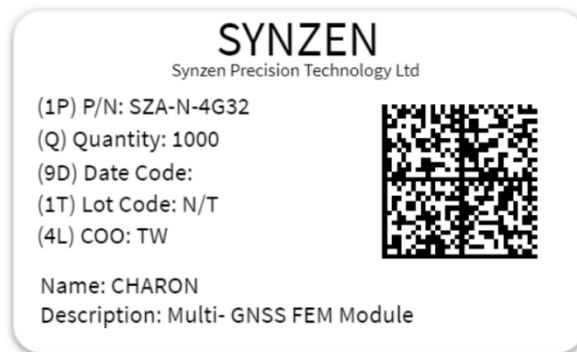


Pre-Heating	130 - 180°C	50 to 190 seconds
Reflow	>220 °C	50 to 160 seconds
Peak Temperature	260 °C	15 to 45 seconds

Packaging

Antennas packed Tape and Reel (1000pcs)

Label



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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