



GNSS FRONT END

CHARON

Multiband GNSS Front End Module

SZA-N-4G32
BANDS
L1 + L2 + L5
GAIN
Up to 32 dB
VIN
1.8 to 5.5 VDC
SIZE
15.5 × 15.0 × 3.5 mm

LOW BAND	1166 to 1249 MHz	Covers L2, L5
HIGH BAND	1559 to 1609 MHz	Covers L1, B1, G1

Key Features

- Two stage amplifiers (LNA) with >25 dB of gain
- Dimensions: 15.5 × 15.0 × 3.5 mm
- Vin = +1.8 to 5.5 VDC
- Surface mounted
- RoHS and REACH compliant

1 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 to 1249; 1559 to 1609 MHz) 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.

— Features

- ◆ Ease of integration: a single-package solution, combining impedance matching, filter efficiency, and low noise design
- ◆ Low-noise system design: integrated pre-filters deliver exceptional out-of-band rejection, accommodating multiple band configurations and mitigating neighboring interference to optimize the overall noise figure
- ◆ Dual-gain stage architecture: cascaded LNAs, pre-filters, and optimized impedance matching deliver ample gain to the GNSS receiver without succumbing to signal-to-noise overload
- ◆ Low-profile form factor: a small footprint and low-profile design saves valuable real estate, eliminating the need for external components and complex routing

— Applications

- | | |
|--------------------|------------------|
| ◆ RTK Applications | ◆ Asset Tracking |
| ◆ Drones | ◆ Wearable Tech |

2 General Specifications

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

3 Electrical / RF Specifications

Frequency (MHz)	Noise Figure (dB)	Gain (dB)	Group Delay (ns)	Vin	Current (Typical at 1.8 V)
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		

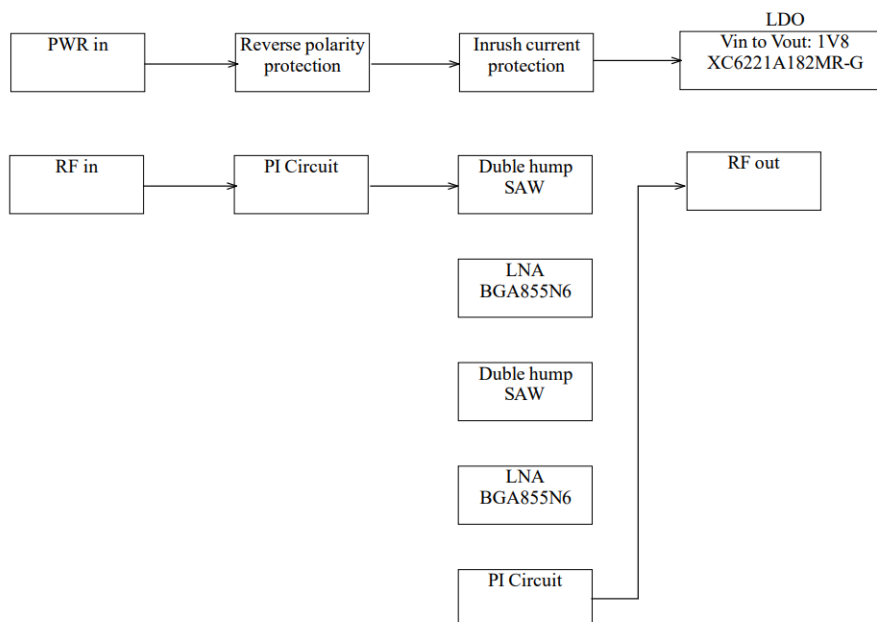
Note: All performance stated is measured on evaluation board (SZDV-1-4G32).

4 Environmental

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

5 Block Diagram

Block Diagram



6 Recommended Antennas

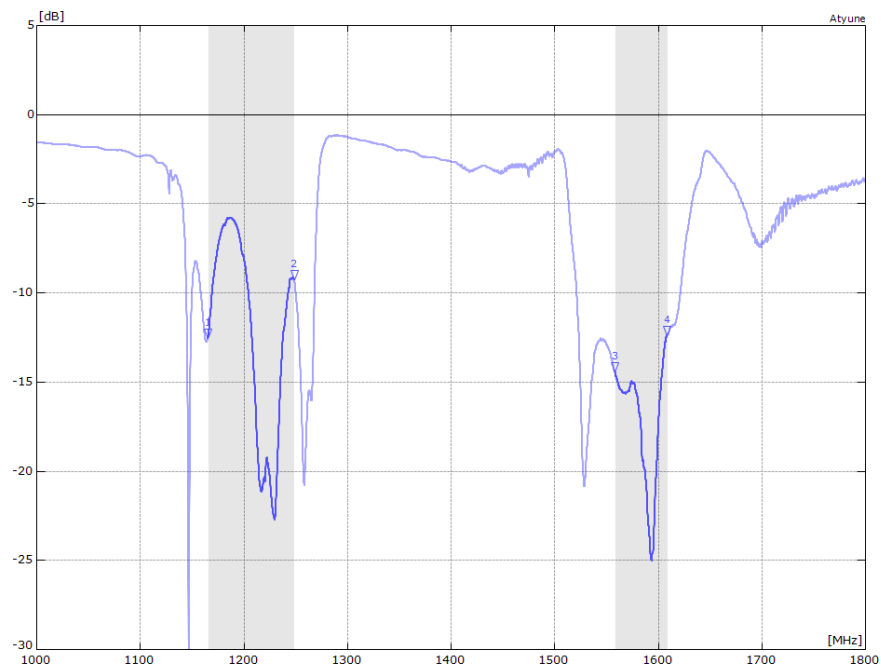
Compatible Antennas

ZENDE (SZP-C-1G12)

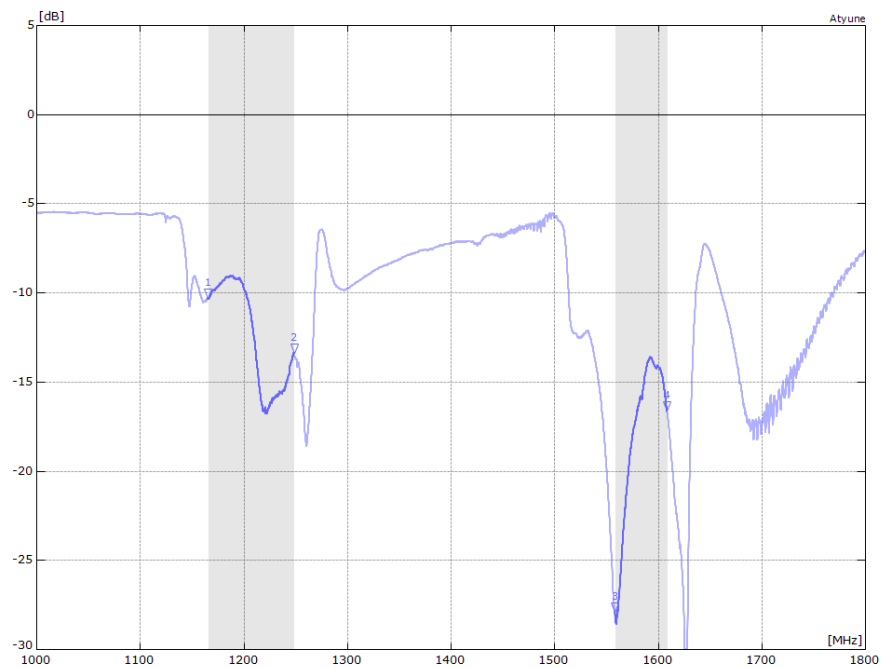
DIONE (SZC-N-3G30)

TABIT (SZK-C-3G22)

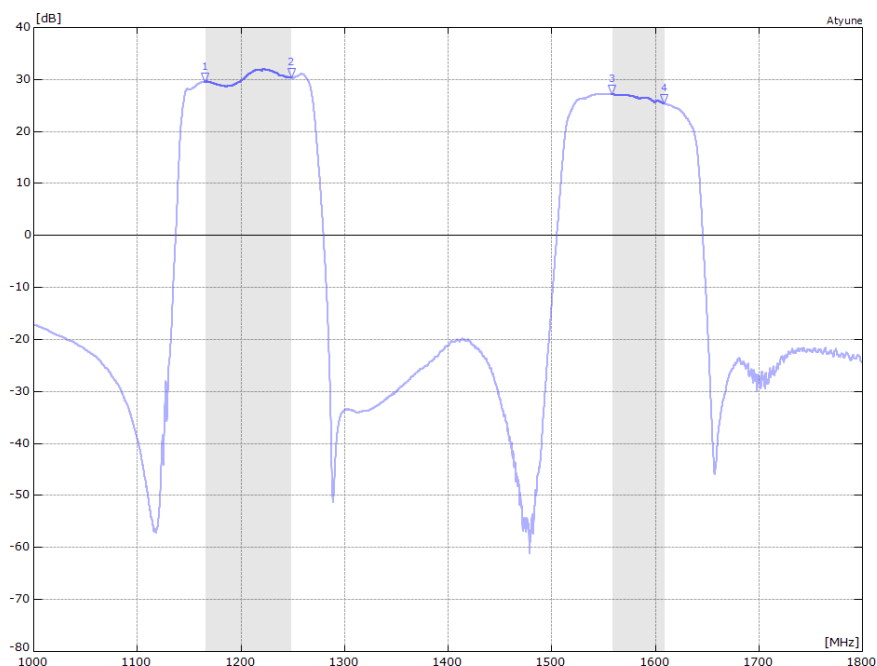
7 Input S11



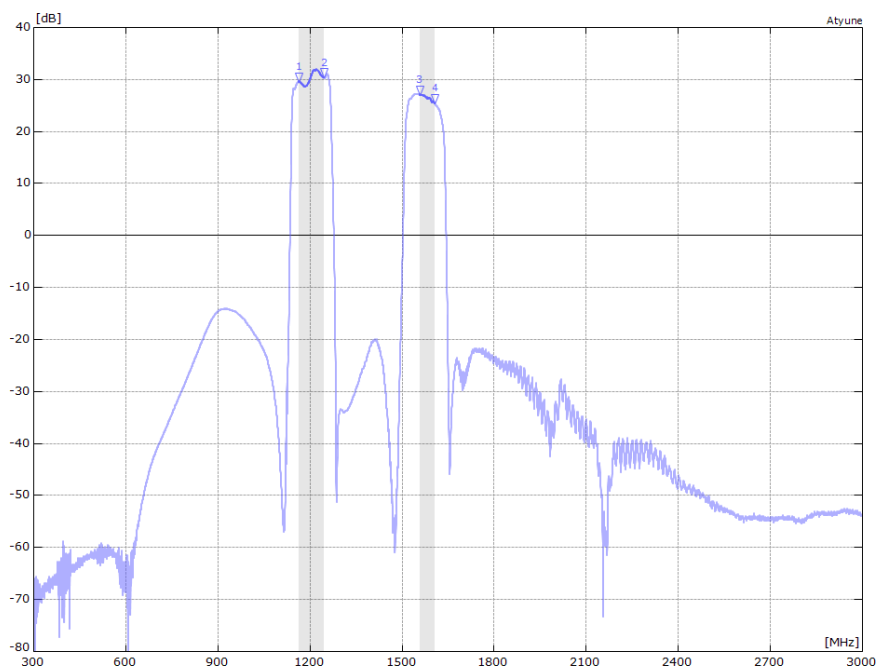
8 Output S11



9 In Band Gain (S21)

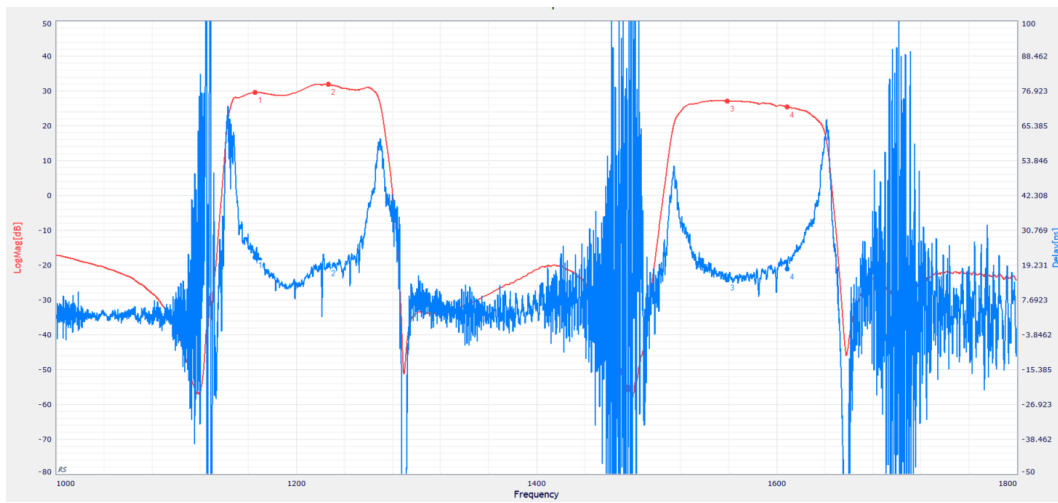


10 Wideband Rejection (S21)



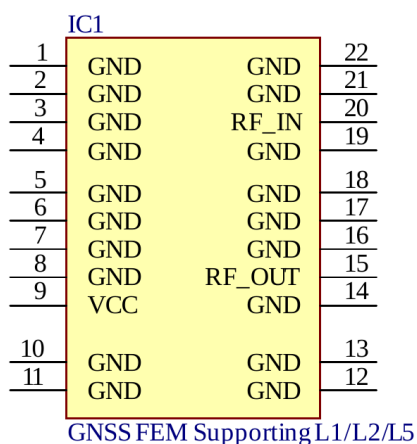
11

Group Delay



12 Schematic Symbol / Pinout

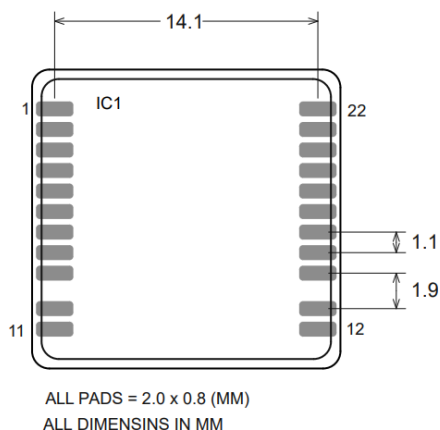
The circuit symbol for SZA-N-4G32 is shown here. The integrated library is available for download in the members area of our website.



Pin	Description
1 to 8, 10 to 14, 16 to 19, 21, 22	Ground connections
9	Bias input V = 1.8 to 5.5 V
20	RF input
15	RF output

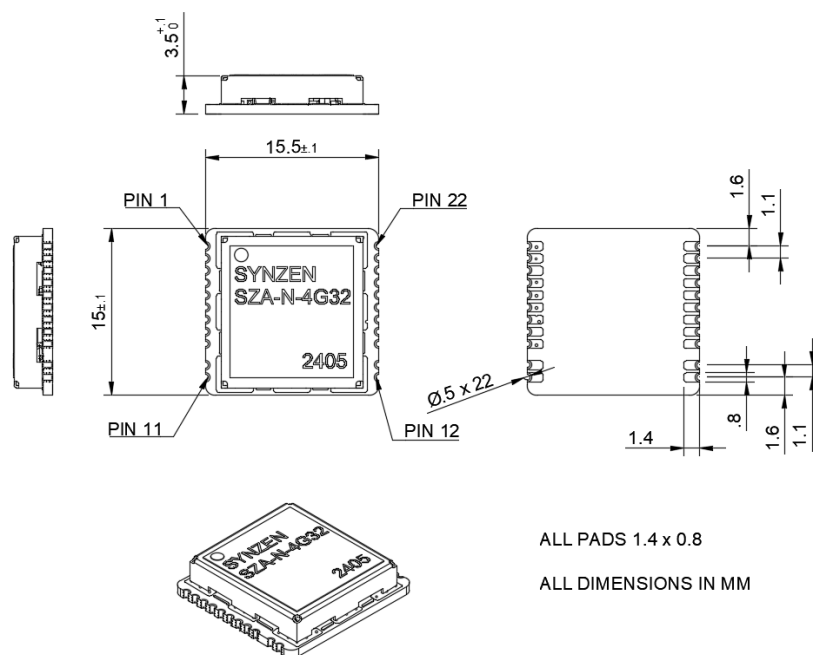
13 Module Footprint

Below is the required footprint for the FEM module. Footprint files are available from our download area.



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Module Mechanical Drawing

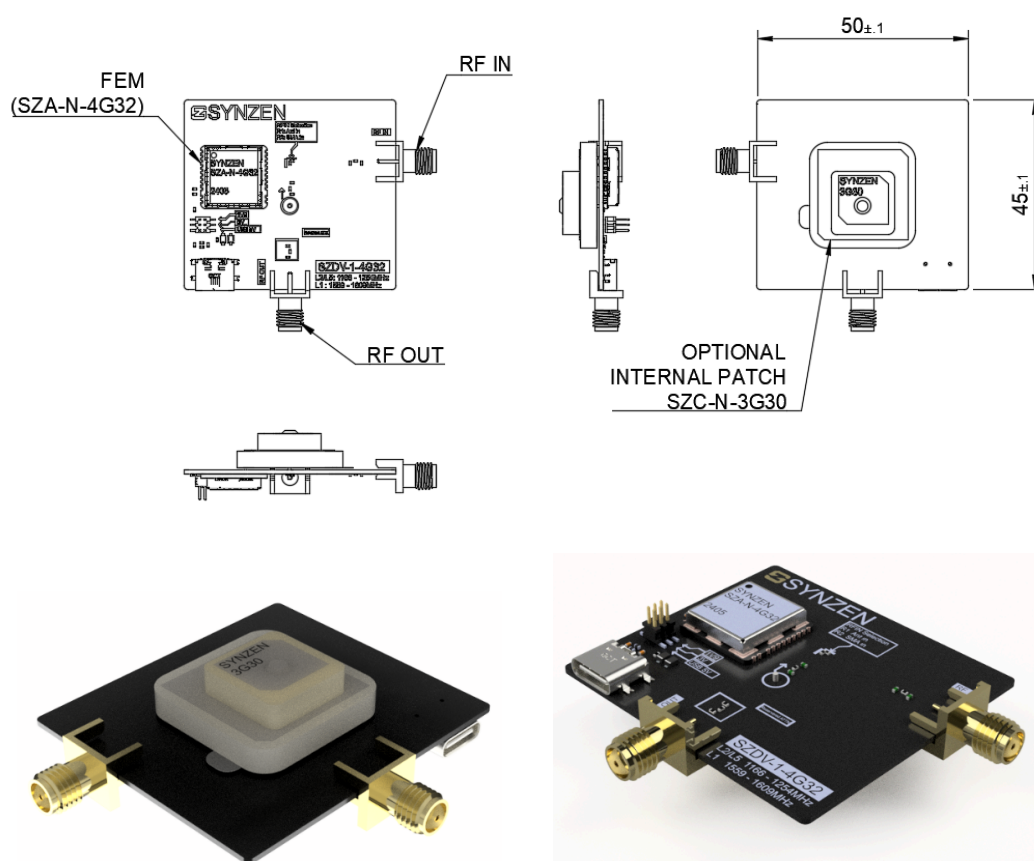


15 SZDV-1-4G32 Evaluation Kit

Internal or external antenna selection

VDC selection

Attenuator option



16

SZDV-2-4G32 Evaluation Kit

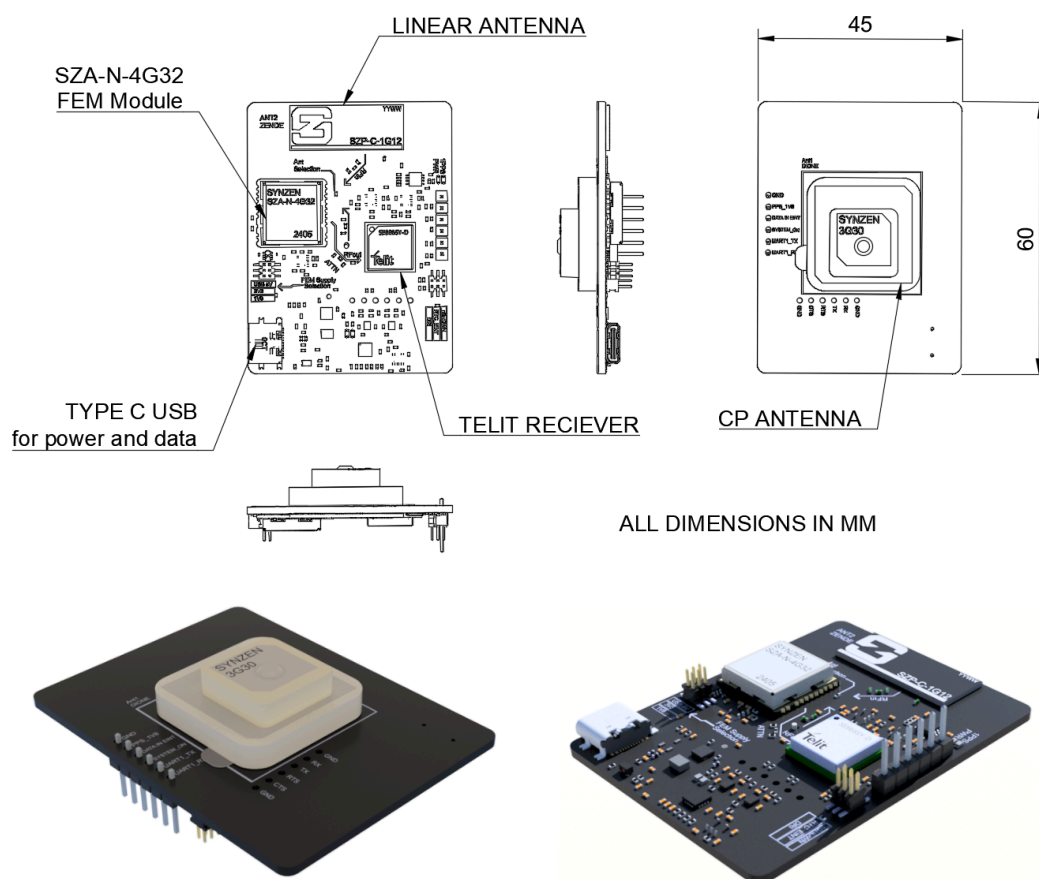
Linear antenna selection using Synzen multiband antenna ZENDE

Circular polarized antenna option using Synzen ceramic dual band DIONE

Telit receiver SE868SY-D multi constellation and high precision GNSS

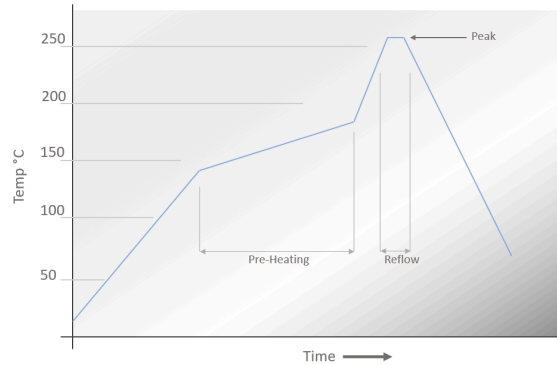
Ability to functionally test our FEM module with antenna options with the Telit receiver

Works with Telit View software or with Synzen GNSS viewer tool



17 Recommended Reflow Profile

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



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

18 Packaging

Packed in tape and reel (1000 pcs).

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.

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