众驰电子

ZC-G1

Antenna made of PCB

USER MANUAL

ZC-G1

Independent package, Apply to SMT process.

Operating Rang：

BD	B1	1561 MHz
GPS	L1	1575 MHz
GLONESS	L1	1602 MHz

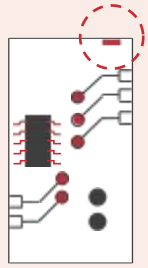
Dimenision ：

8mm*3.0mm*1.6mm

「ZC-G1」

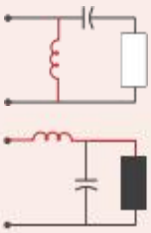
Chapter Index

How to embed an Antenna



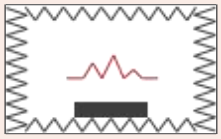
STEP 1: Place the antenna component

1. Select one corner of your PCB
2. Design the feeder of antenna and connect it with antenna at clearance area,
3. Make sure that the space around the antenna maintains a clearance of 5mm, away from metal objects and circuits.



STEP 2: Design your matching network

1. It is recommended to control the impedance of RF microstrip feeder by 50 ohms，and reserve π - type LC matching network to adjust the antenna and module for optimal impedance matching, to avoid antenna signal transmission loss.
2. It is very important to fine-tune the matching network in the design process to obtain the best signal.



STEP 3:Test your device

1. Perform a field test in which your antenna is placed in its final housing. Fine-tune the MN if needed
2. Use network analyzer to adjust mismatch
3. Test the antenna efficiency with an anechoic chamber.

东莞市众驰电子有限公司
Dongguan Zhongchi Electronic Co.,Ltd
Tel :0769-81238620
地址：东莞市长长安镇上角埔新路1号B栋3楼
https://www.dgzhongchi.cn

Antenna Specifications

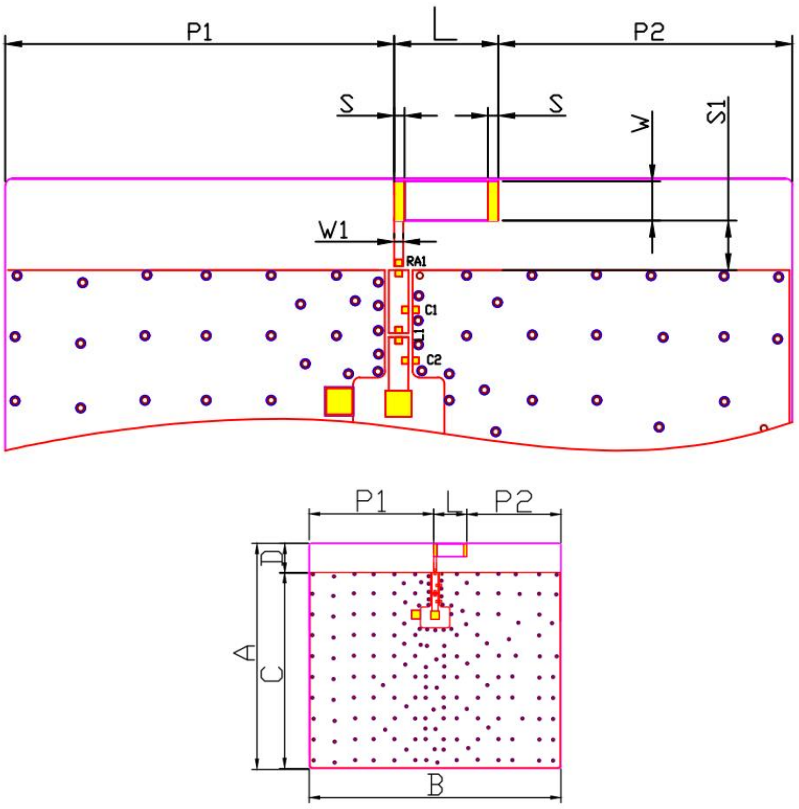
The G1 antenna booster has been specifically designed for providing worldwide Global Navigation Satellite Systems (GNSS) performance in wireless devices with small space requirements. Here we will compare BeiDou, GPS & Galileo and GLONASS performance operating. Using one of our Evaluation Boards, an example of a common G1 placement is seen. Finally, a matching networks are selected, using the ports for GNSS, allowing us to test, obtain, and analyze the VSWR, total efficiency, gain and radiation patterns.

Quick Reference Guide

Technical features	BeiDoui	GPS & GALILEO	GLONASS
	1561MHz	1575MHz	1598 – 1606MHz
Average Efficiency	> 58%	> 55%	> 51%
Peak Gain	0.5 dBi	0.2 dBi	0.1 dBi
VSWR	< 2:1		
Radiation Pattern	Omnidirectional		
Polarization	Linear		
Weight (approx.)	0.08 g.		
Temperature	-40 to +125 ºC		
Impedance	50 Ω		
Dimensions (L x W x H)	8 mm x 3.8 mm x 1.6 mm		

Table 1 – Technical Features. Measures from the Evaluation Board.

Evaluation Board



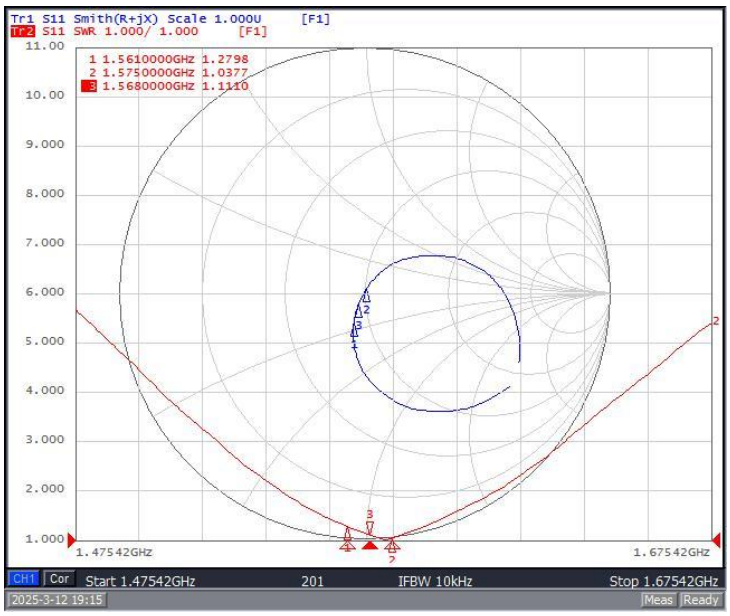
Measure	mm	Measure	mm
A	54	P2	22.55
B	60.4	S	0.8
C	47	S1	3.8
D	7	W	3
L	8	W1	0.7
P1	29.85		

Figure 1–Evaluation Board

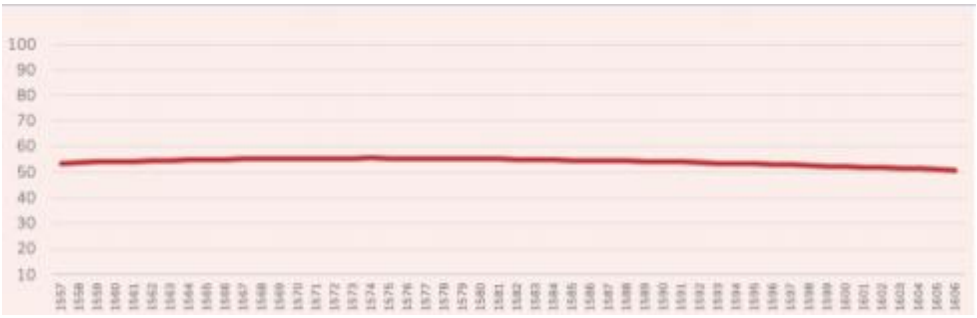
Tolerance: ±0.2 mm

Material: The Evaluation Boards are built on FR4 substrate.Thickness is 1.5 mm

Antenna S11 parametetr



Radiation Patterns, Gain and Efficiency

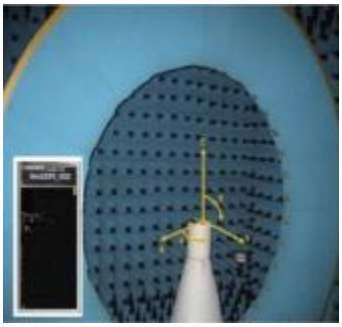


Frequency&Gain chart

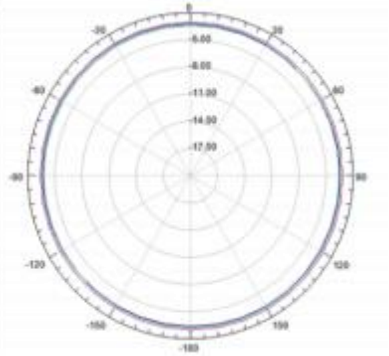
>>>

Frequency&Efficiency chart

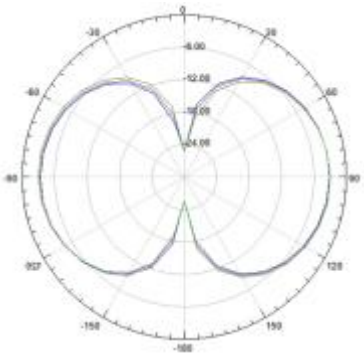
>>>



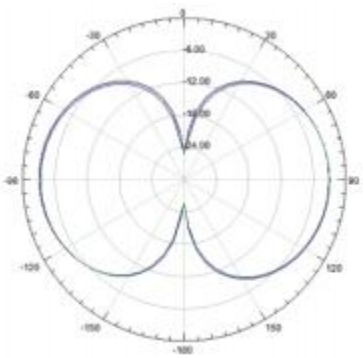
Measurement System Set-Up
Evaluation Board in Plane XY



θ = 90° Plane XY at 1.561 GHz,
1.575 GHz and 1.602 GHz



φ = 0° Plane XY at 1.561 GHz,
1.575 GHz and 1.602 GHz



φ = 90° Plane XY at 1.561 GHz,
1.575 GHz and 1.602 GHz

Gain and efficiency	BeiDou	GPS	GLONASS
Peak Gain	-0.9dBi	0.5dBi	0.2dBi
Average Gain across the band	-0.87dBi	0.45dBi	0.1dBi
Gain Range across the band	-0.8dBi ~ -0.9dBi	0.42dBi ~ 0.5dBi	-0.2dBi ~ 0.2dBi
Peak Efficiency	58.3%	55.5%	52.7%
Average Efficiency across the band	58.13%	55.26%	51.87%
Efficiency Range across the band	57.72%~58.3%	54.89%~55.5%	51.62%~52.7%

Table 2: – Antenna Gain and Total Efficiency from the Evaluation Board for BeiDou E1 (1561 MHz), GPS L1 (1575 MHz) and GLONASS L1 (1598 MHz – 1606 MHz) bands.

Recommended Antenna Footprint for Evaluation Board

Assuming that the G1 antenna booster is placed in the middle of the PCB, see below the recommended footprint dimensions.

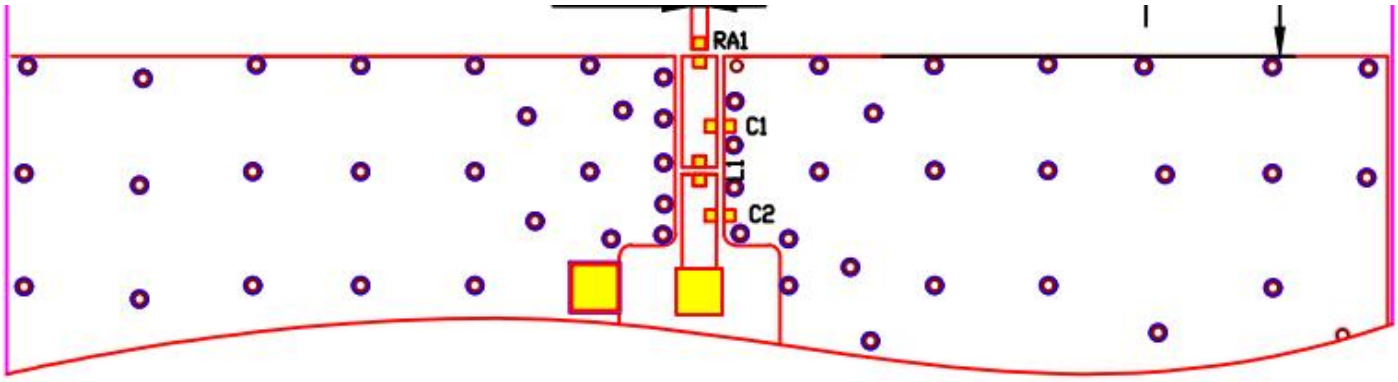


Figure 2 – Footprint dimensions for the evaluation board

Component matching value	Series Circuit RA1	0 Ω
	Series Circuit L1	0 Ω
	Parallel Circuit C1	3.6nH
	Parallel Circuit C2	NC

Tolerance : ±0.05mm

For additional support in the integration process, please contact jackchen@dgzhongchi.cn

Next graphic shows temperature profile (grey zone) for the G1 antenna booster assembly process reflow ovens..

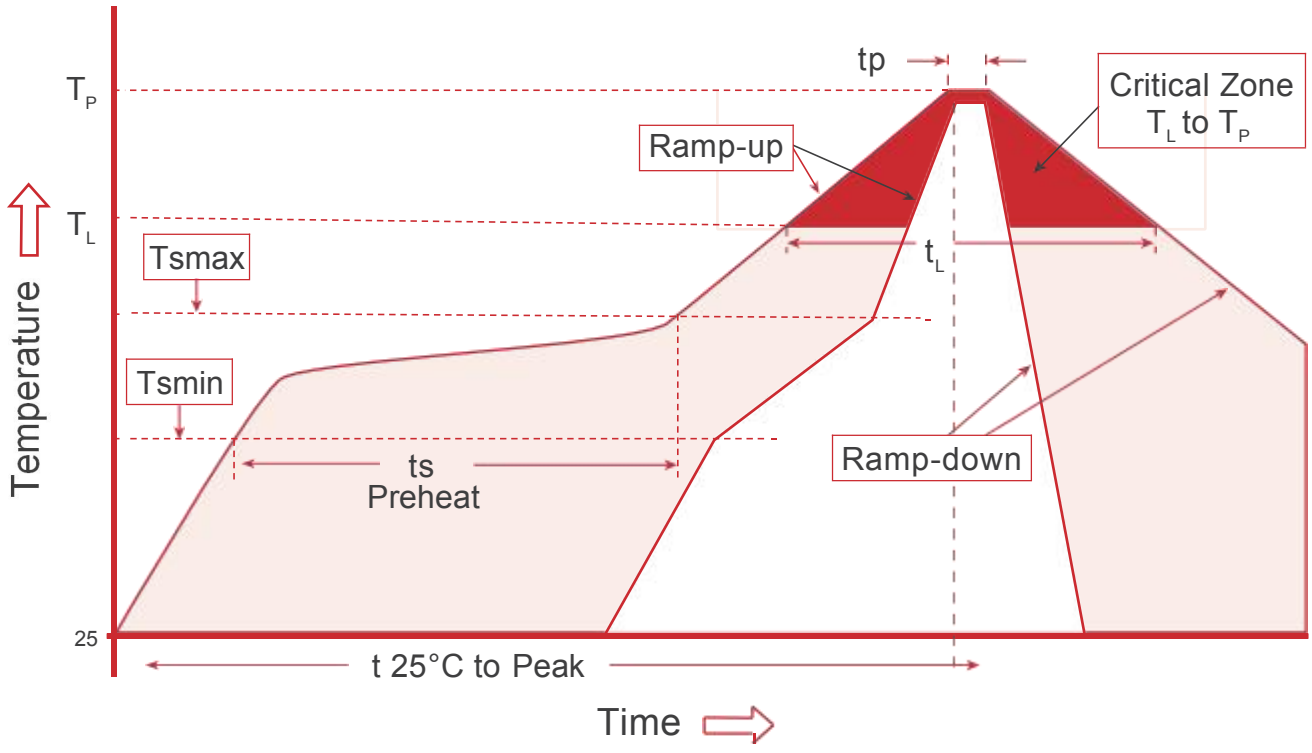


Figure 3 – Temperature profile

Packaging

The G1 antenna booster is delivered in plastic tape and reel packaging.

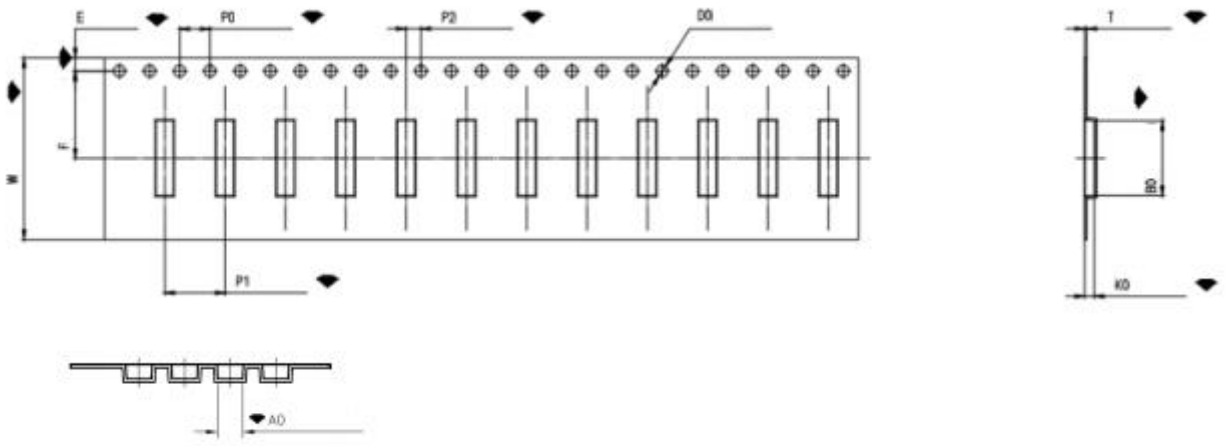
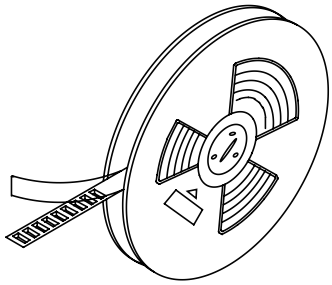
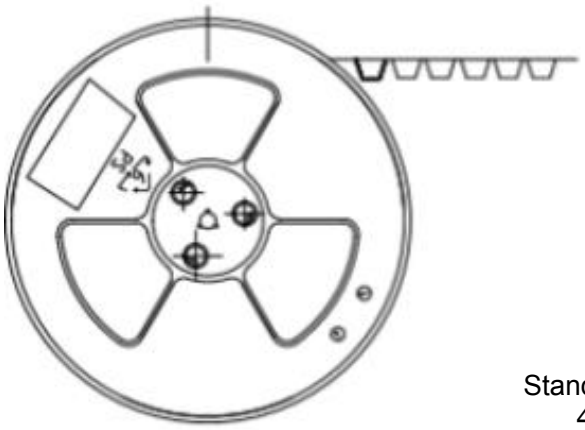


Figure 4 – Temperature profile





Standard quantity:
4400pcs/plate

ITEM	W	A_0	B_0	K_0	P_1	F	E	D	P_0	P_2	T
DIM	12. 0±0.3	3.3±0.1	8. 3±0.1	1.8±0.3	8. 0±0.1	5.5±0.3	1. 75±0.1	1. 5±0.1	4. 0±0.1	2. 0±0.1	0. 3±0.05