

Datasheet

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GPS

Chip antenna

Features:

The chip antenna supports GPS and has much higher efficiency with small form factor, suitable for mounting inside device.

Applications:

- Navigation device
- Telematics box
- Fleet management
- Portable Handsets
- Tracking and Positioning



Electrical Specifications							
Antenna Characteristics							
Antenna Type	Radiation Pattern	Pola	rization	Max. Input Power	Impedance		
Chip Antenna	Omni	Li	inear	1W	50Ω		
Frequency (GHz)			1.56~1.59				
Return Loss (dB)			< -10				
Peak Gain (dBi)			2.9				
Average Gain (dB)			-1.6				
Efficiency (%)			70				



 $3.2 \times 1.6 \times 0.5$ mm

Chip Antenna



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Mechanical Specifications

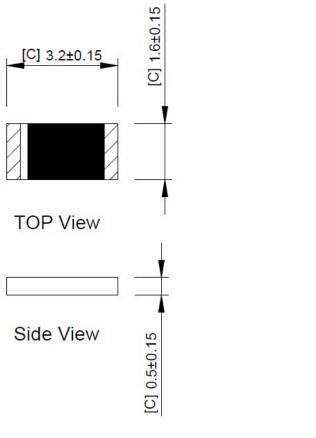
Mechanical			
Dimension (mm)	$3.2 \times 1.6 \times 0.5$		
Material	Ceramic		
Weight (g)	0.01		

Environmental			
Temperature Range (°C)	-25 to 70		
Humidity	Non-condensing 65°C 95% RH		
Del IC Compliant			

RoHS Compliant

Mechanical Drawing

Unit : mm





Bottom View

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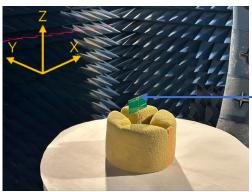
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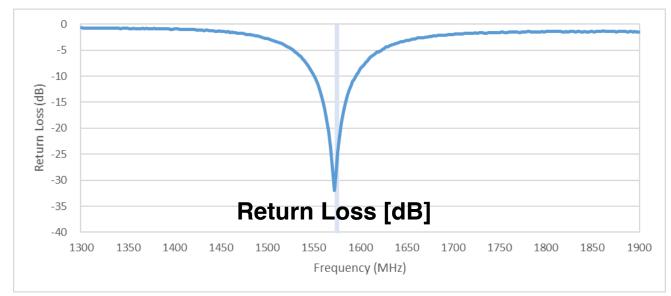
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Antenna Testing Includes Evaluation Board

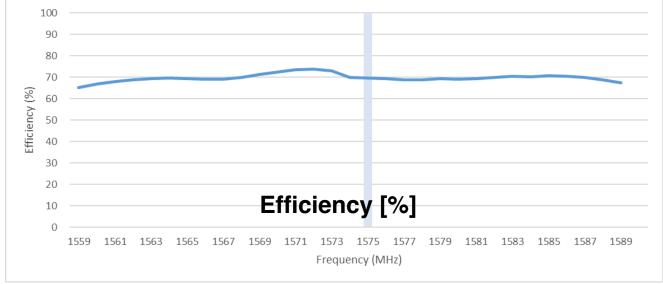


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Test setup, measurement performed in 3D anechoic chamber.



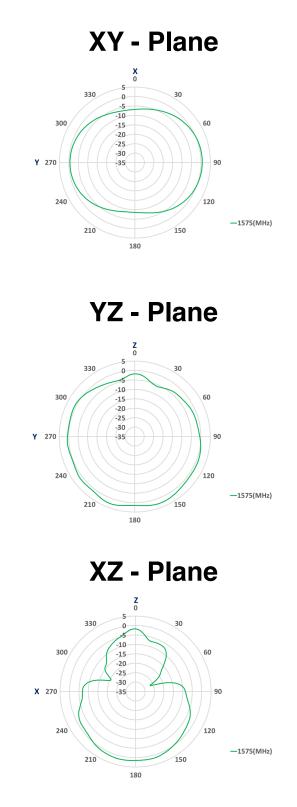
Blue background represents frequency response.





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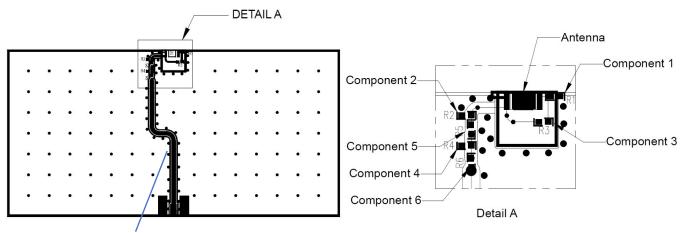
Radiation Pattern - Free Space





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Matching Circuit Design



⁵⁰Ω Transmission

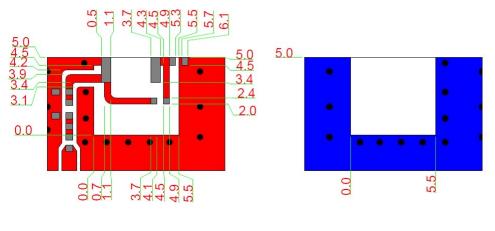
- * To make the antenna have this resonance, must be matched with matching circuit.
- * The matching component may be slightly different than that show depending ondistance to ground plane, dielectric constant of PCB, and PCB material thickness.

Circuit Matching Components				
Circuit Symbol	Size	Description		
Component 1	0402	2.5 pF Capacitor		
Component 2	0402	0 Ohm Resistance		
Component 3	0402	None		
Component 4	0402	4.7 pF Capacitor		
Component 5	0402	1 pF Capacitor		
Component 6	0402	0 Ohm Resistance		



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Clearance Area Design

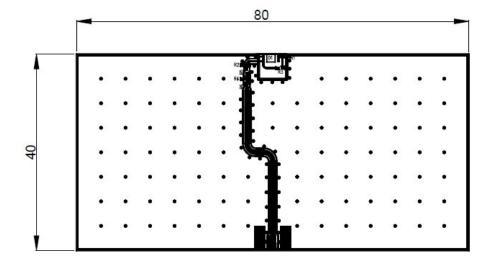


Top View

Bottom View

Evaluation Board

Unit : mm



Base Material : FR-4, T=1.2



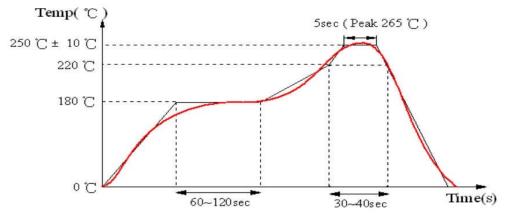
Recommended Reflow Temperature Profile

Flux :

- Use rosin flux, prohibit the use of strong acid flux with halide content exceeding 0.2wt%.
- Use pure tin solder.

Reflow Soldering Conditions :

- During preheating, the maximum temperature difference between the surface of the product and the solder is not allowed to exceed 150°C.
- When cooling down after soldering, the temperature difference between the surface of the product and the solvent is not allowed to exceed 100°C.
- Insufficient preheating may cause cracks on the product surface, resulting in a decline in product quality.



The graphic shows temperature profile component assembly process in reflow ovens.

Soldering With Iron				
Soldering condition				
Item	The conditions			
Pre-heating	150°C, 1 Minute			
Tip temperature	350°C Max.			
Soldering iron output	80W Max.			
End of soldering	Ф3mm Max.			
Soldering time	3 Seconds Max.			



Revisions				
Rev.	Description	Date	ECN	Approval
А	Initial Release	2023-02-23	ST0543-00-N08-U-RA00	ATC

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