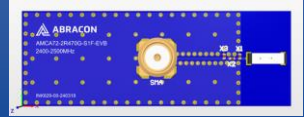


# WLAN Ceramic Chip Antenna 2450MHz – Evaluation Kit



**AMCA72-2R470G-S1F-EVB**

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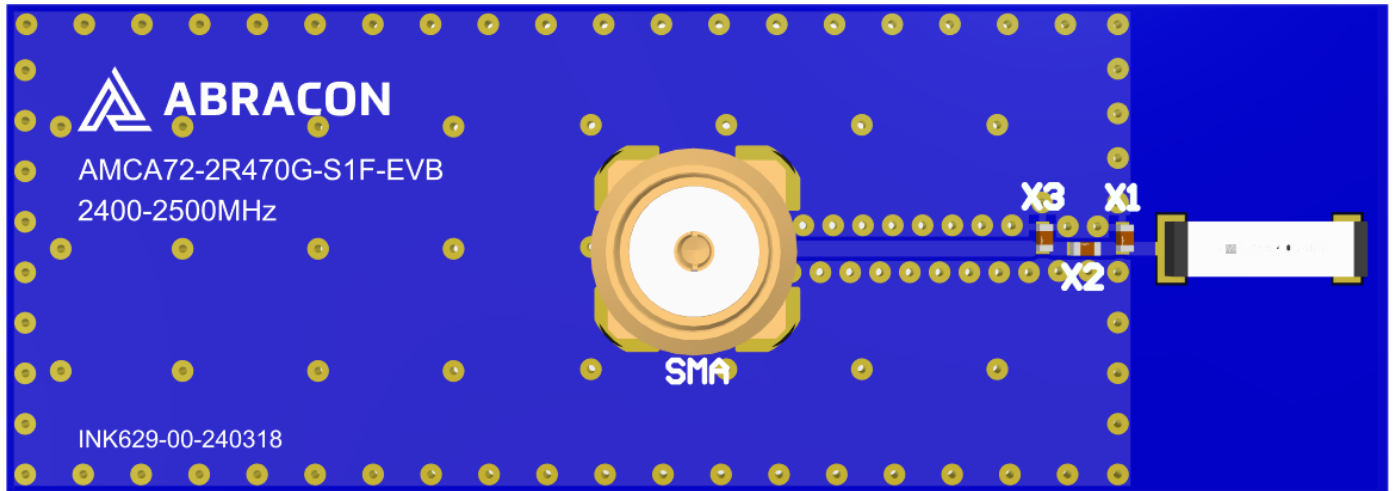
**51 x 18 x 10 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

## Description

The AMCA72-2R470G-S1F-EVB evaluation kit is designed to provide a means to facilitate engineering evaluation of the “WLAN Ceramic Chip Antenna 2450MHz”: AMCA72-2R470G-S1F-T

The kit includes an evaluation board with SMA connector + three additional antennas for further testing.

## Product Image

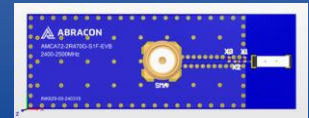


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# WLAN Ceramic Chip Antenna 2450MHz – Evaluation Kit



**AMCA72-2R470G-S1F-EVB**

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**51 x 18 x 10 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

## Electrical Specification

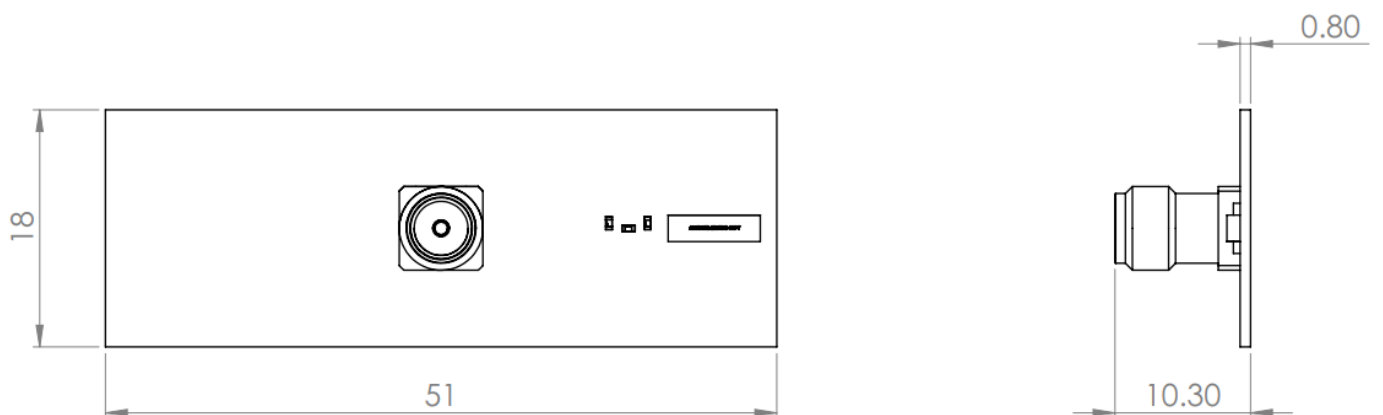
Parameter	Specification	Unit
Operating Frequency	2400 - 2500	MHz
Return Loss	$\leq -13.9$	dB
VSWR	$\leq 1.5$	:1
Polarization	Linear	-
Peak Gain	3.3	dBi
Minimum Total Efficiency	-0.6 (88)	dB (%)
Average Total Efficiency	-0.4 (92)	dB (%)
Maximum Total Efficiency	-0.2 (95)	dB (%)
Impedance	50	$\Omega$
Radiation Pattern	Omni-directional	-
Input Power	$< 3$	W

*Note: All measurements were conducted on the evaluation board "AMCA72-2R470G-S1F-EVB" in free space. Performance will vary depending on the ground plane, application, and environment.*

## Mechanical Specification

Parameter	Specification
Evaluation Board Dimensions	51 x 18 x 10 mm
Evaluation Board Ground Plane Dimensions	51 x 18 mm

## Product Dimensions



Unit: mm

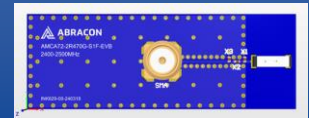


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**AMCA72-2R470G-S1F-EVB**

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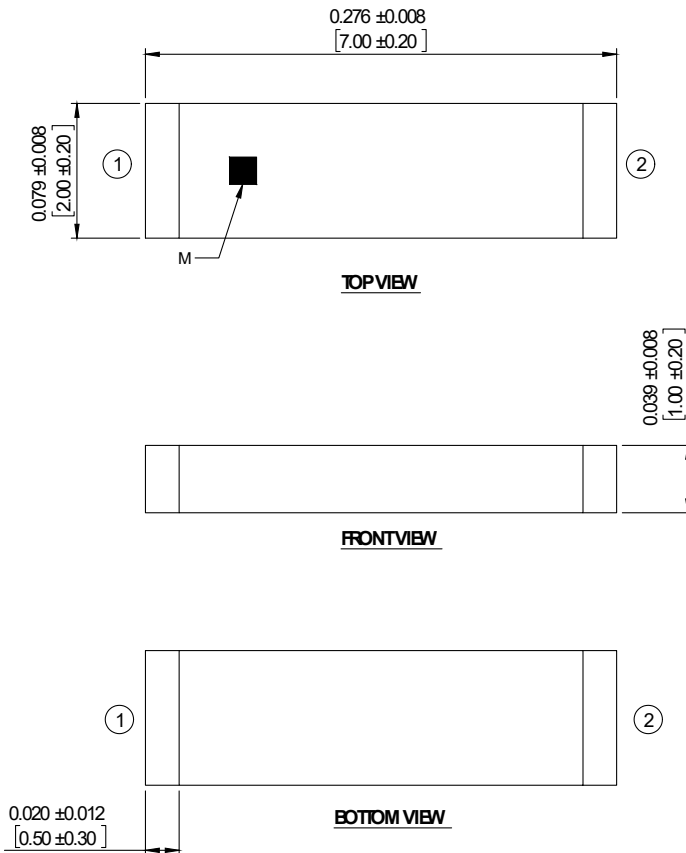


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**51 x 18 x 10 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

## Antenna Dimensions and Terminal Configuration



Symbol	Description
①	Antenna Feed
②	NC (not connected)
M	Mark

Unit: Inches [mm]

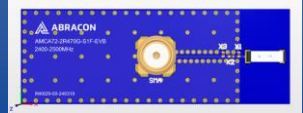


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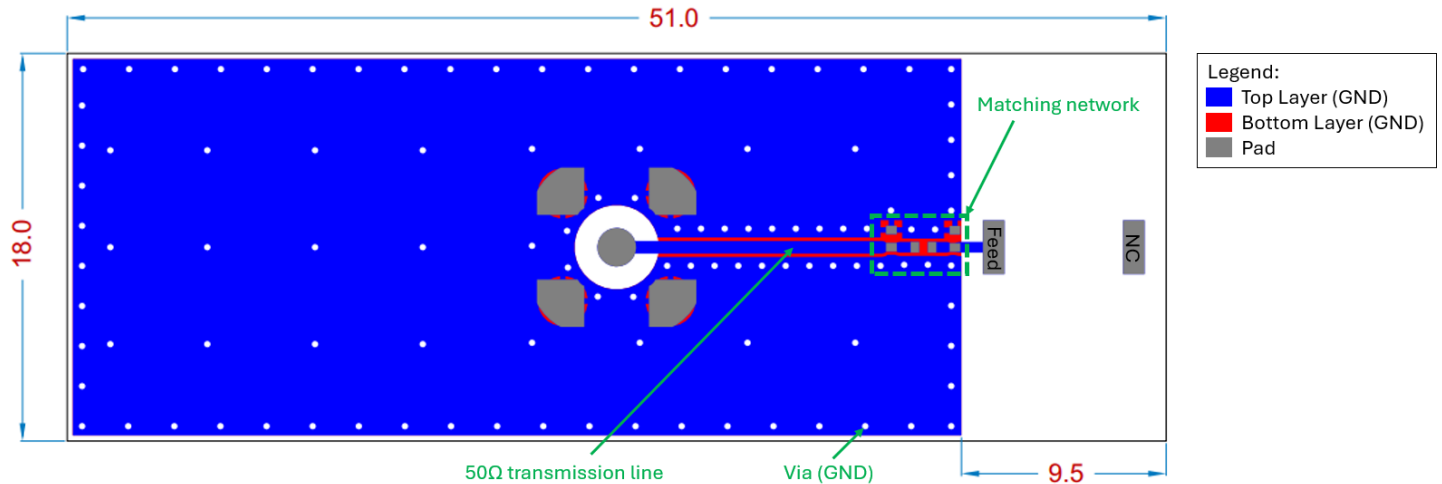


**51 x 18 x 10 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

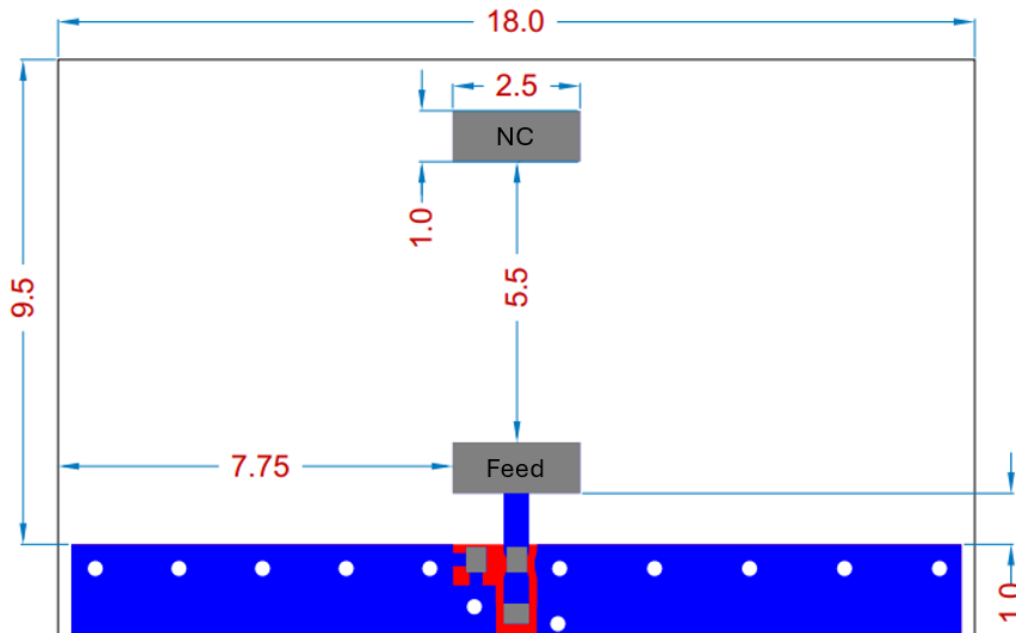
## Recommended PCB layout “AMCA72-2R470G-S1F-EVB”

If there are several layers in the PCB, there is an advantage to add vias for smooth interconnection of the ground areas to avoid splits in the ground plane. It is also important that the ground clearance is respected through all layers of the PCB. It is recommended to implement a matching network to optimize the antenna impedance in your application.

The transmission line should be kept as short as possible and be designed to have a characteristic impedance of 50Ω.



Rotated detailed view of antenna pads and copper clearance:



Unit: mm

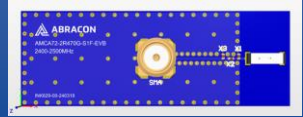


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**AMCA72-2R470G-S1F-EVB**

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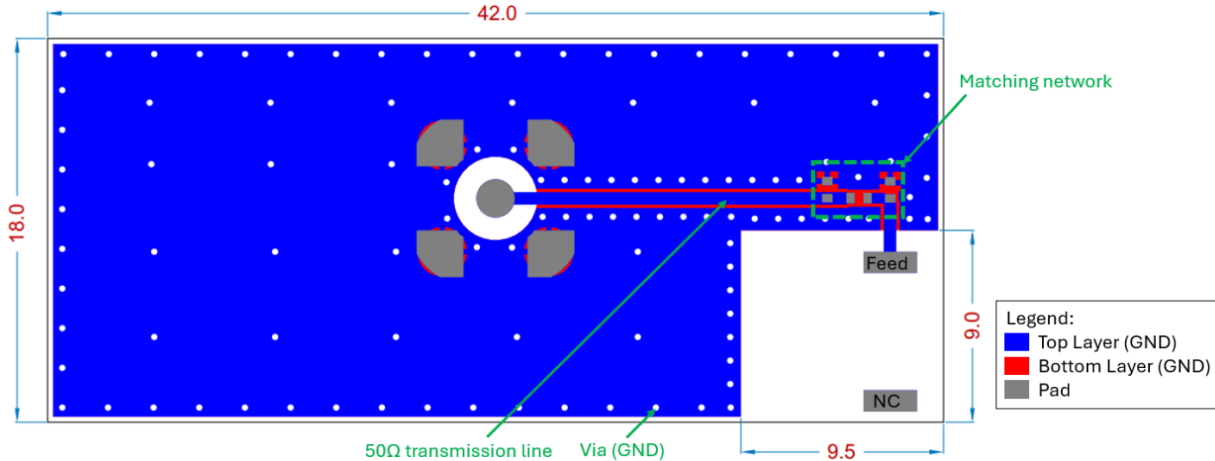


**51 x 18 x 10 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

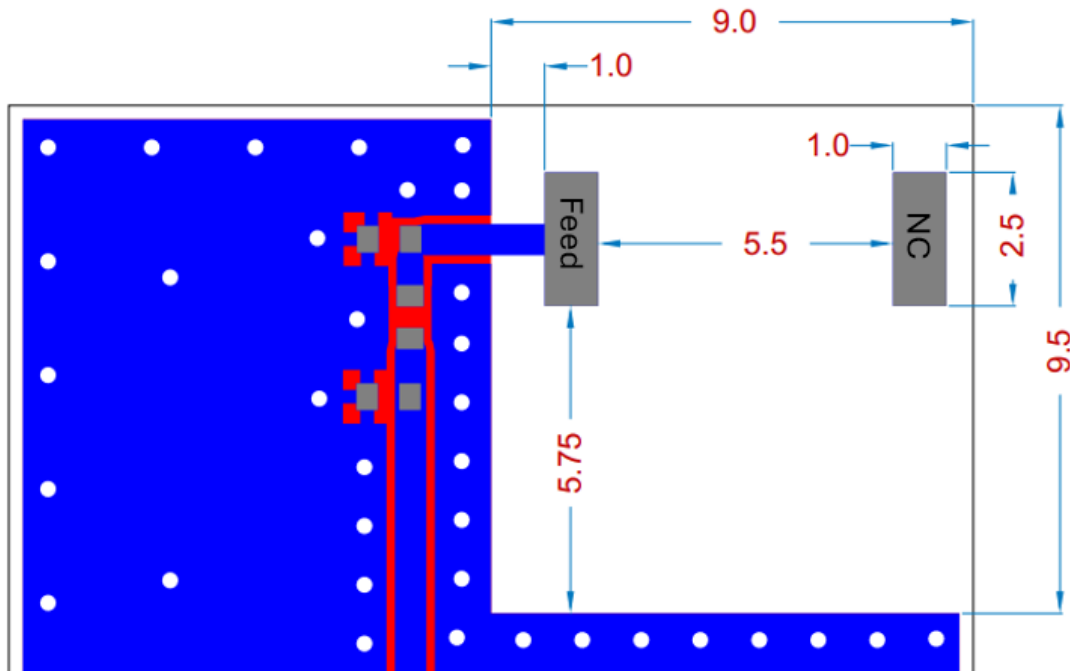
## Alternative PCB layout “Corner Mount”

If there are several layers in the PCB, there is an advantage to add vias for smooth interconnection of the ground areas to avoid splits in the ground plane. It is also important that the ground clearance is respected through all layers of the PCB. It is recommended to implement a matching network to optimize the antenna impedance in your application.

The transmission line should be kept as short as possible and be designed to have a characteristic impedance of 50Ω.



Rotated detailed view of antenna pads and copper clearance:



Unit: mm

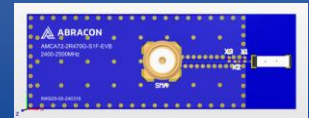


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# WLAN Ceramic Chip Antenna 2450MHz – Evaluation Kit



**AMCA72-2R470G-S1F-EVB**

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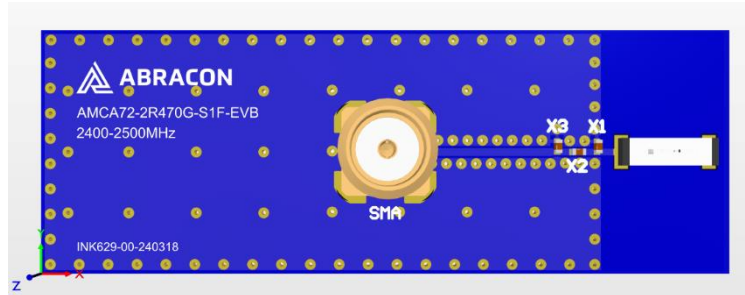
Check Inventory



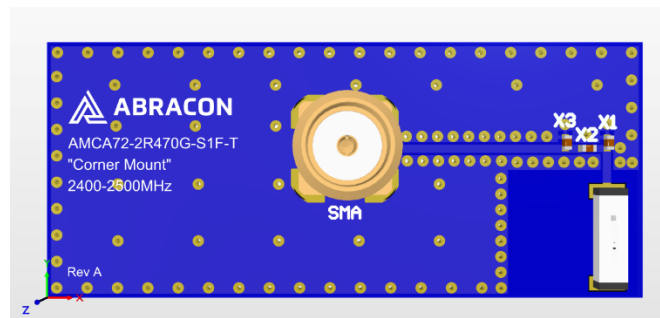
**51 x 18 x 10 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

## Measurement Setup

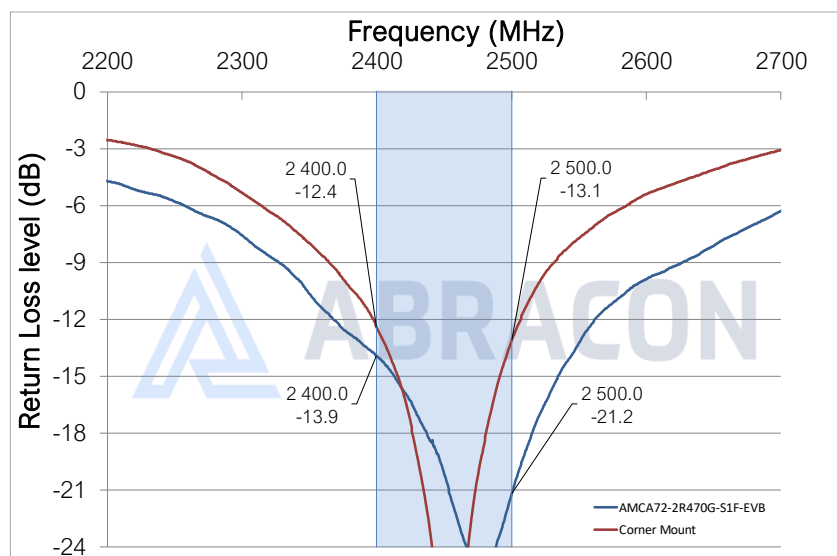
The antenna measurements were all done in free space, with the chip antenna implemented on its evaluation board (AMCA72-2R470G-S1F-EVB) that has a PCB size of 51 by 18 (X by Y) mm:



Measurements were also done with the antenna mounted on a PCB with the Alternative PCB layout “Corner Mount” that has a PCB size of 42 by 18 (X by Y) mm:



## Reflection Characteristics – Return Loss

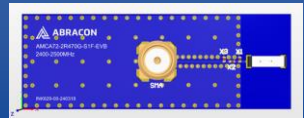


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AMCA72-2R470G-S1F-EVB

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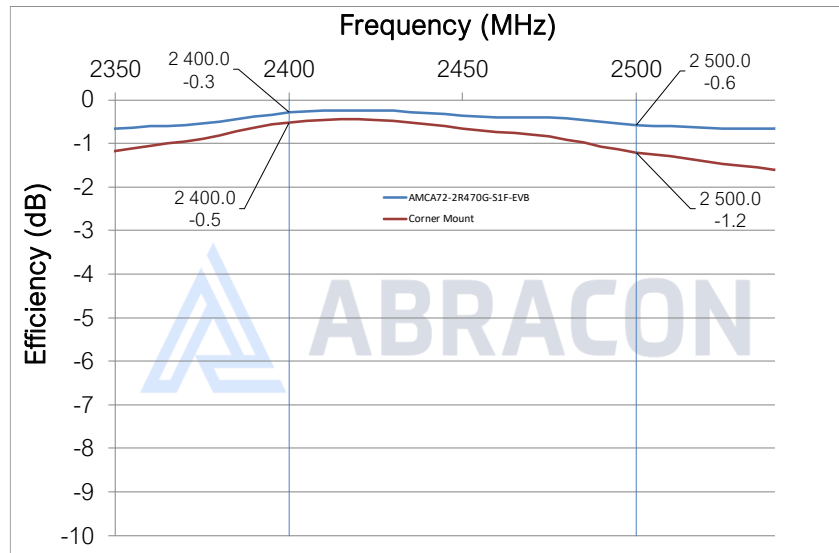


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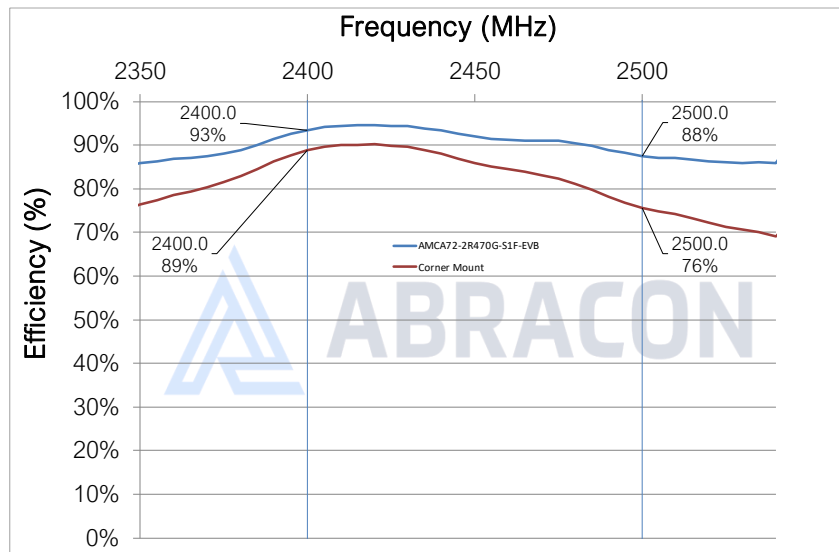


51 x 18 x 10 mm  
RoHS/RoHS II Compliant  
MSL Level = 1

## Radiation Characteristics – Total Efficiency (dB)



## Radiation Characteristics – Total Efficiency (%)

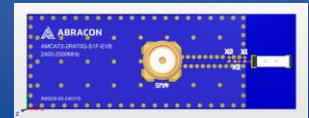


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AMCA72-2R470G-S1F-EVB

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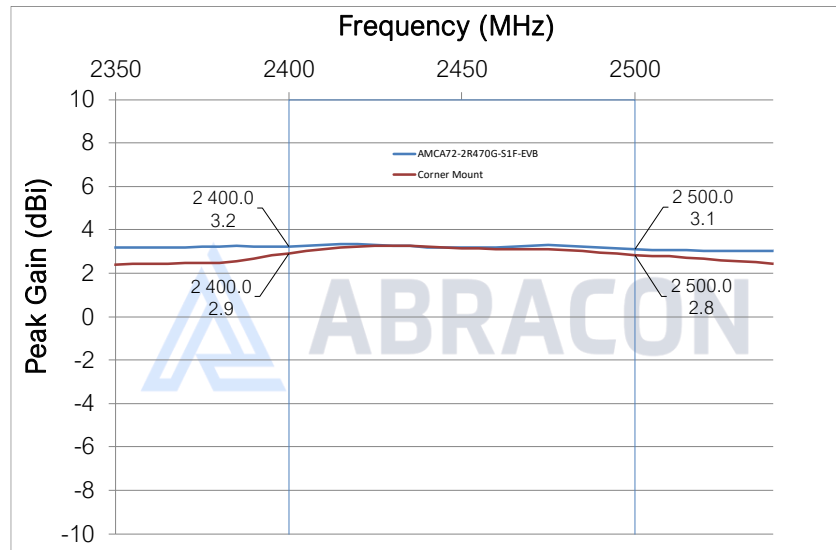


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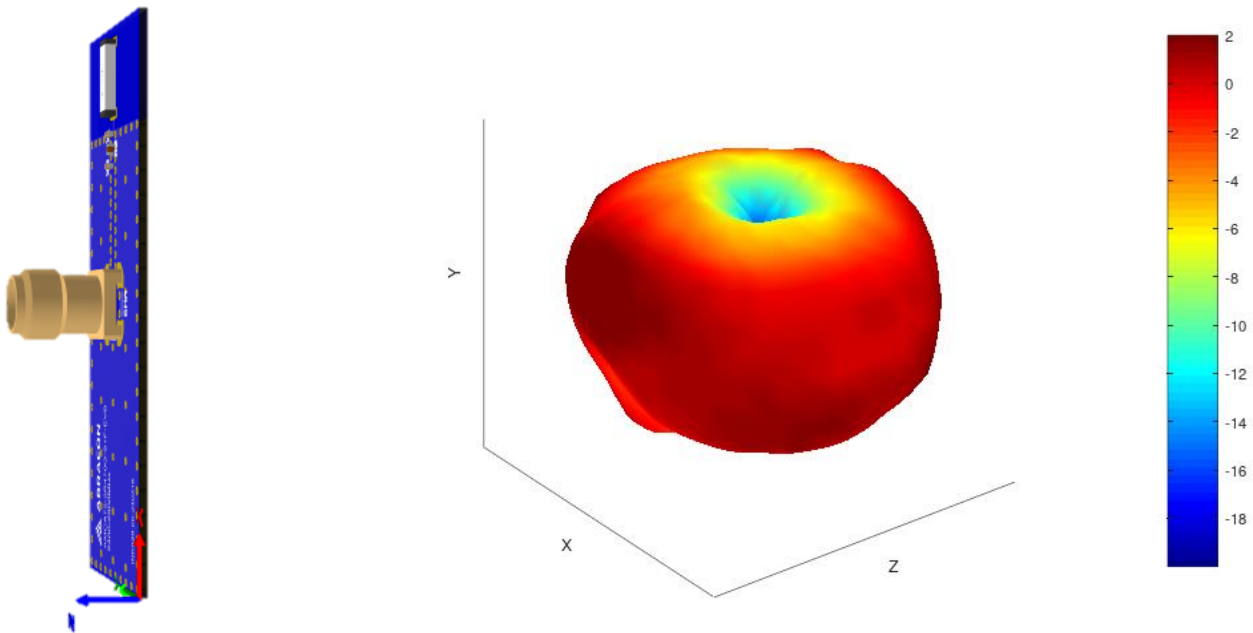


51 x 18 x 10 mm  
RoHS/RoHS II Compliant  
MSL Level = 1

## Radiation Characteristics – Maximum Gain



## Radiation Characteristics – 3D Pattern @ 2450 MHz (AMCA72-2R470G-S1F-EVB)



Unit: dBi

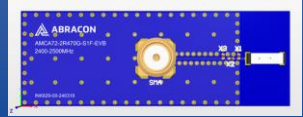


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# WLAN Ceramic Chip Antenna 2450MHz – Evaluation Kit



**AMCA72-2R470G-S1F-EVB**

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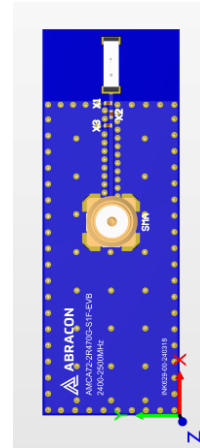
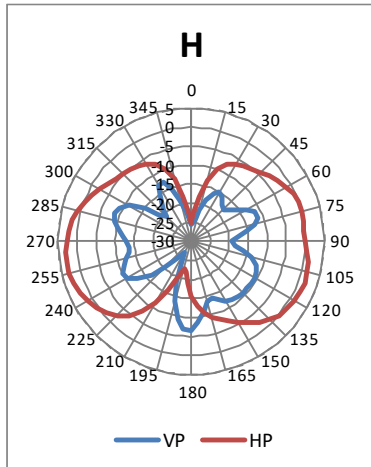
Check Inventory



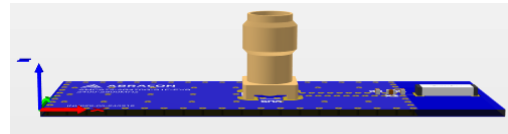
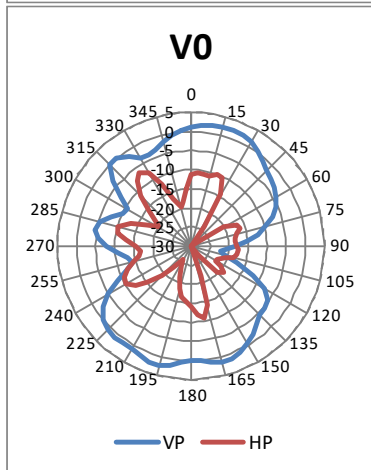
**51 x 18 x 10 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

## Radiation Characteristics – 2D Pattern @ 2450 MHz (AMCA72-2R470G-S1F-EVB)

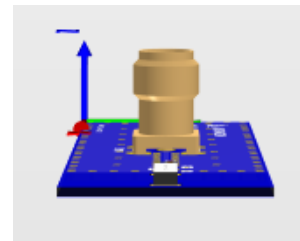
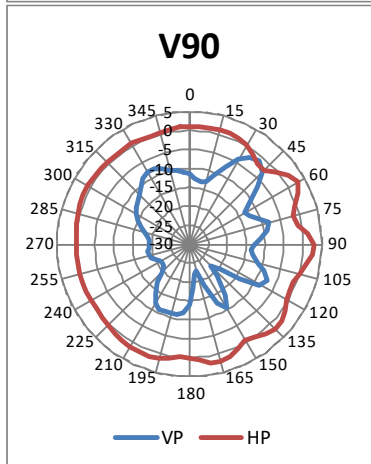
**XY-plane:**



**XZ-plane:**



**YZ-plane:**



VP: Vertical Polarization  
 HP: Horizontal Polarization

Unit: dBi

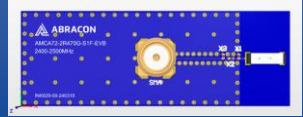


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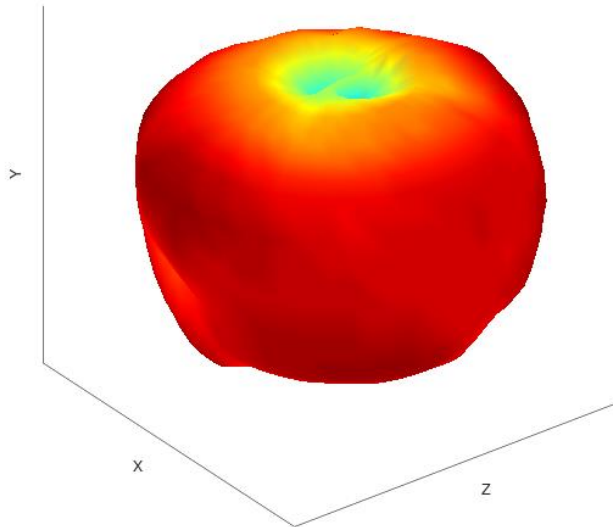
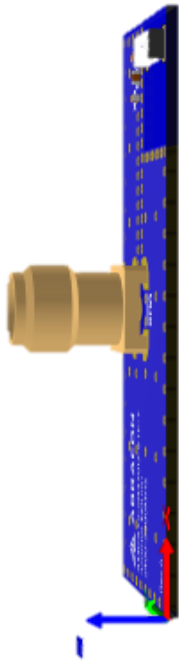


Check Inventory



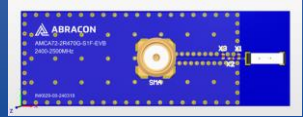
**51 x 18 x 10 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

## Radiation Characteristics – 3D Pattern @ 2450 MHz (Corner Mount)



*Unit: dBi*

# WLAN Ceramic Chip Antenna 2450MHz – Evaluation Kit



**AMCA72-2R470G-S1F-EVB**

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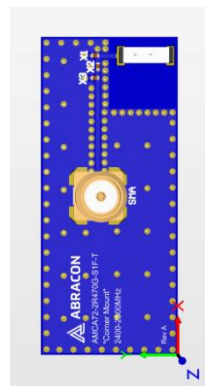
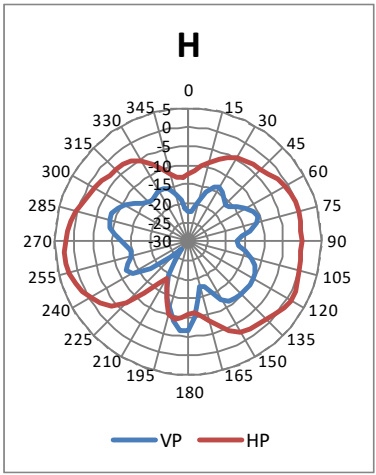
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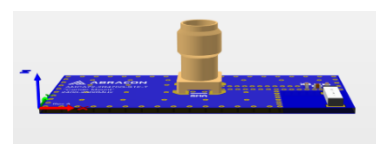
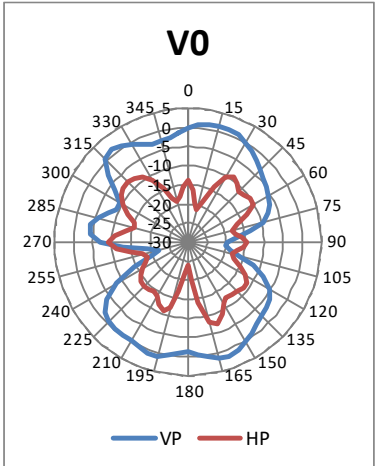
**51 x 18 x 10 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

## Radiation Characteristics – 2D Pattern @ 2450 MHz (Corner Mount)

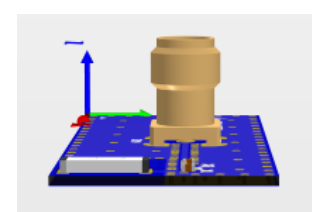
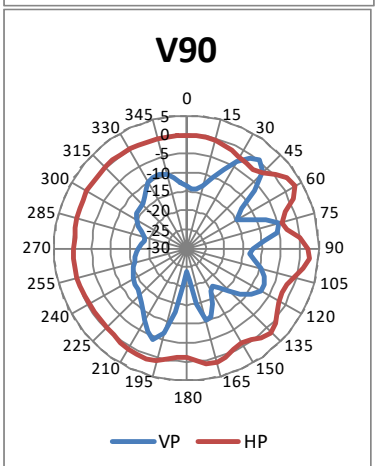
**XY-plane:**



**XZ-plane:**



**YZ-plane:**



*VP: Vertical Polarization*  
*HP: Horizontal Polarization*

*Unit: dBi*

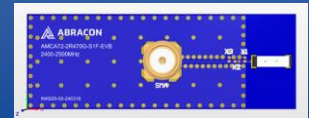


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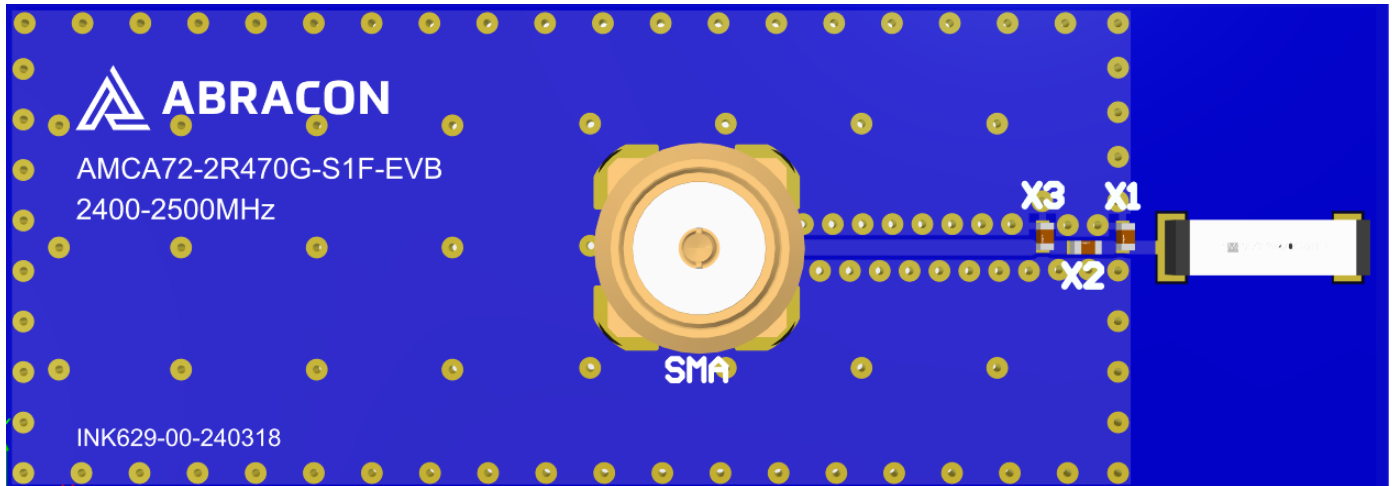
Check Inventory



51 x 18 x 10 mm  
RoHS/RoHS II Compliant  
MSL Level = 1

## Evaluation Board Outline & Matching Circuit

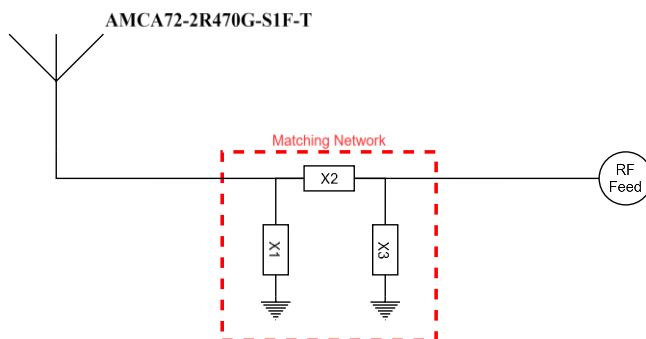
The evaluation board (AMCA72-2R470G-S1F-EVB) is developed to simplify antenna testing and evaluation. It has an arbitrary size of 51 x 18 mm and includes an SMA connector. The purpose is to give a reference design for an optimal antenna implementation. The evaluation board can also be used to test other implementations by cutting and soldering the PCB into any device.



### Evaluation board outline

The evaluation board has a matching circuit implemented next to the antenna. This is aimed to enable optimization possibilities for the user. The component positions are sized for 0402 (1005 metric) SMD components.

The antenna needs a matching circuit to adjust the resonant frequency balance. When delivered, the evaluation board is tuned for optimum balance at 2.4 – 2.5 GHz using the following (can be replaced by equivalent):



X1 = 7.3 nH (Murata LQW15AN7N3G00D)  
X2 = 0.8 pF (Murata GJM1555C1HR80WB01D)  
X3 = not mounted

However, it is common that the resonant frequency will shift during implementation in an arbitrary device. Therefore, this matching may be changed with other values/components/brands for compensation of such effects.



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# WLAN Ceramic Chip Antenna 2450MHz – Evaluation Kit



**AMCA72-2R470G-S1F-EVB**

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51 x 18 x 10 mm

RoHS/RoHS II Compliant

MSL Level = 1

## Packaging Information

The evaluation kit consists of one complete evaluation board + three additional AMCA72-2R470G-S1F-T antennas.

One evaluation kit per Box

34 Boxes per Carton

Dimension of the Box: 15 x 10 x 4 cm

Dimension of the Carton: 43 x 34 x 19 cm

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