TAOGLAS

Datasheet

ADCP.12A.01.3000K

Part No:
ADCP.12A.01.3000K

Description:

Active 5.9GHz DSRC Patch Antenna 12*12*4mm on PCB 50*50mm 150mm RG-316 SMA(M)

Features:

- 5850MHz to 5925MHz band
- For DSRC and CB2X Applications
- Transmit and Receive Amplifiers
- Low-EVM Power Amplifier
- High-performance Patch Antenna
- Robust ISO 16750 Compliant Power Input
- AEC-Q Compliant
- Manufactured in a IATF16949 approved facility
- Cable : 150mm RG-316
- Connector : SMA(M)
- Cable & Connector Customizable
- Dims: 50*50*5 mm

1. Introduction

The Taoglas ADCP.12A is an embedded ceramic DSRC patch active antenna module. At 50*50*5 mm, it is a high performance, yet compact, 5.5dBi directional antenna designed to operate at 5850 MHz to 5925 MHz for DSRC (Dedicated Short Range Communications) and C-V2X (Cellular Vehicle to Everything) systems.

DSRC is the communications media of choice for active safety V2V/V2X (Vehicle to Vehicle and Vehicle to Other) systems, primarily allocated for vehicle safety applications. DSRC supports high speed, low latency, short- range V2V/V2X wireless communications.

The ADCP.12 active antenna features a circularly polarized ceramic patch with high efficiency of 65% and peak gain of 5.5 dBi. The circular polarization enables a more stable system signal strength on moving vehicles.

The ADCP.12 enables new, remote placement options for the secondary DSRC antenna. This revolutionary device packages a high-performance 5.9GHz ceramic patch antenna with a high-linearity power amplifier, a robust low-noise amplifier, and transmit/receive switches to provide a fully remote front-end.

By including the front-end with the remote antenna, two benefits are found:

- Higher transmit and receive performance is available by counteracting the coaxial cable losses, and
- Smaller-diameter coaxial cable can be utilized, reducing total vehicle weight and cost.

The Rx/Tx path control comes from the module along with DC supply designed to cover the automotive 9-26 V range. DC and overvoltage protection has also been implemented. This antenna is uniquely suited as the antenna of choice when it comes to V2X automotive applications due to this.

The ADCP.12 is produced in a TS16949-compliant facility and is fully automotive qualified.

For further optimization to customer specific device environments where positioning is off centre or a different ground-plane size, a custom tuned patch antenna can be supplied, subject to NRE and MOQ. The ADCP.12A is supplied with 150mm of RG-316 with an SMA(M) connector, both of which can be customized.

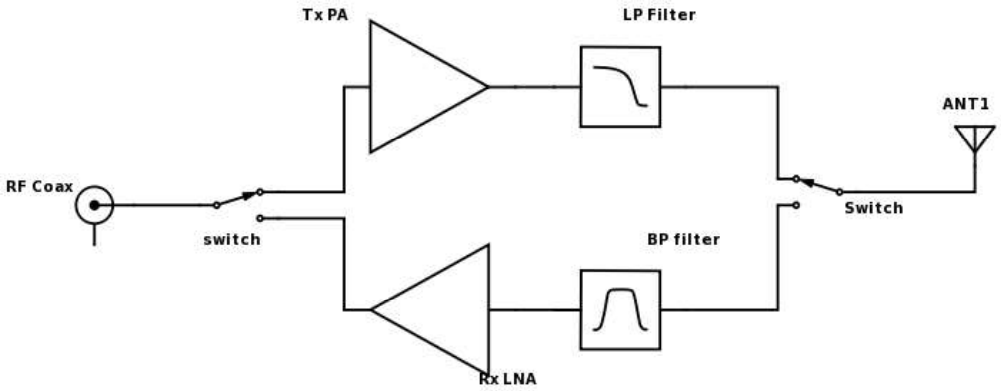
Contact your regional Taoglas office for support on how to integrate and test this antenna's performance in your device.

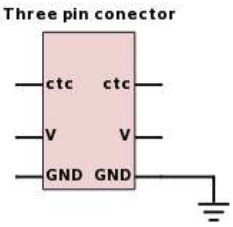
2. Specifications

Antenna Specification		
Operation Frequency	5850 MHz	5925 MHz
Efficiency	>65%	>65%
Peak Gain	+5.5 dBi	+5.5 dBi
Axial Ratio	< 5.5 dB	
Polarization	RHCP	
Impedance	50 ohms	
Receive Path		
Gain	+11 dB	
Noise Figure	4.3 dB	
In-band Input P1dB	-8 dBm	
Transmit Path		
Gain	+27.5 dB	
In-band Input P1dB (CW)	-5 dBm	
Electrical		
Input Voltage	+9 ~ +26VDC	
Current Consumption (Receive Mode)	3.5 mA Typical	
Current Consumption (Tx Mode)	200mA Typical	
Current Consumption (Idle Mode)	165 uA Typical	
Mechanical		
Ceramic Dimension	12 x 12 x 4 mm	
PCB Dimension	50 x 50 mm	
Cable	Coax: RG316 Control & Power: 3-conductor 24AWG	
Environmental		
Operating Temperature	-40°C to +105°C	
Shock, Vibration	ISO 16750	
ESD	ISO 10605, Contact: 8kV Air: 15kV	
Power Supply Immunity	ISO 16750-2	

3. Antenna Characteristics

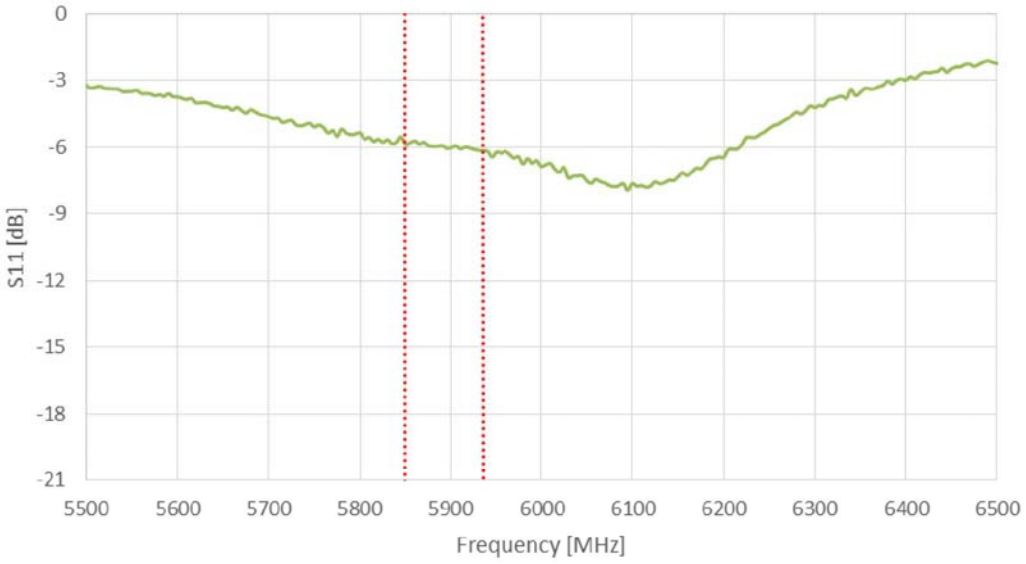
3.1 Block Diagram (Active Antenna)



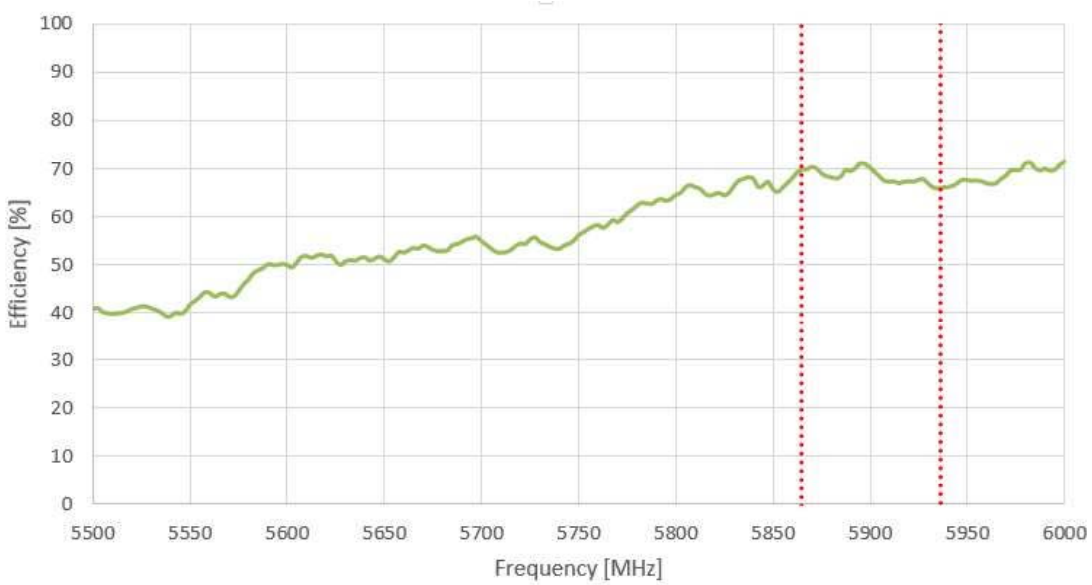


-ctc is external control signal for switches to actuate Rx or Tx path

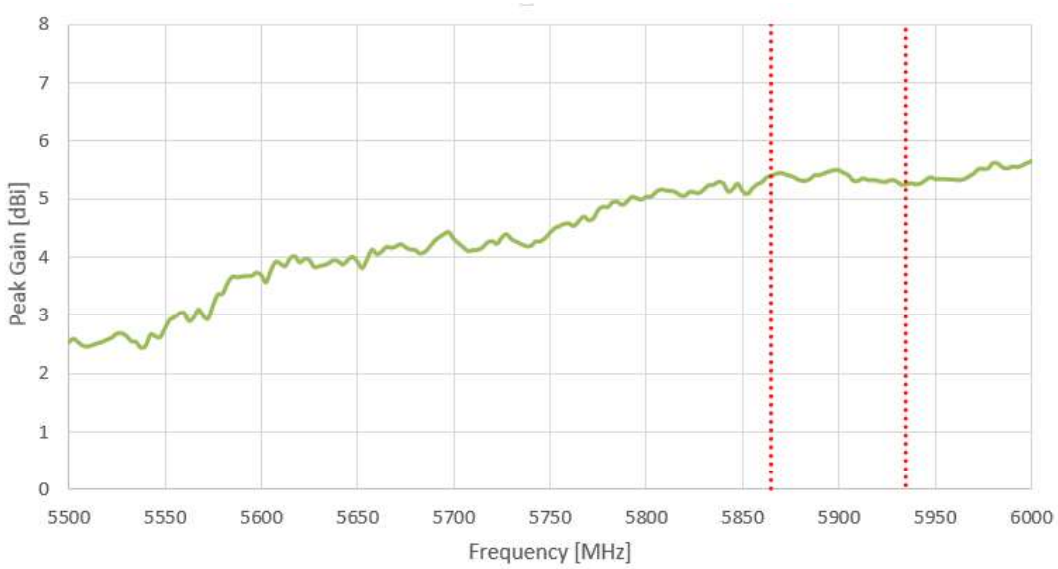
3.2 Return Loss (Passive Antenna)



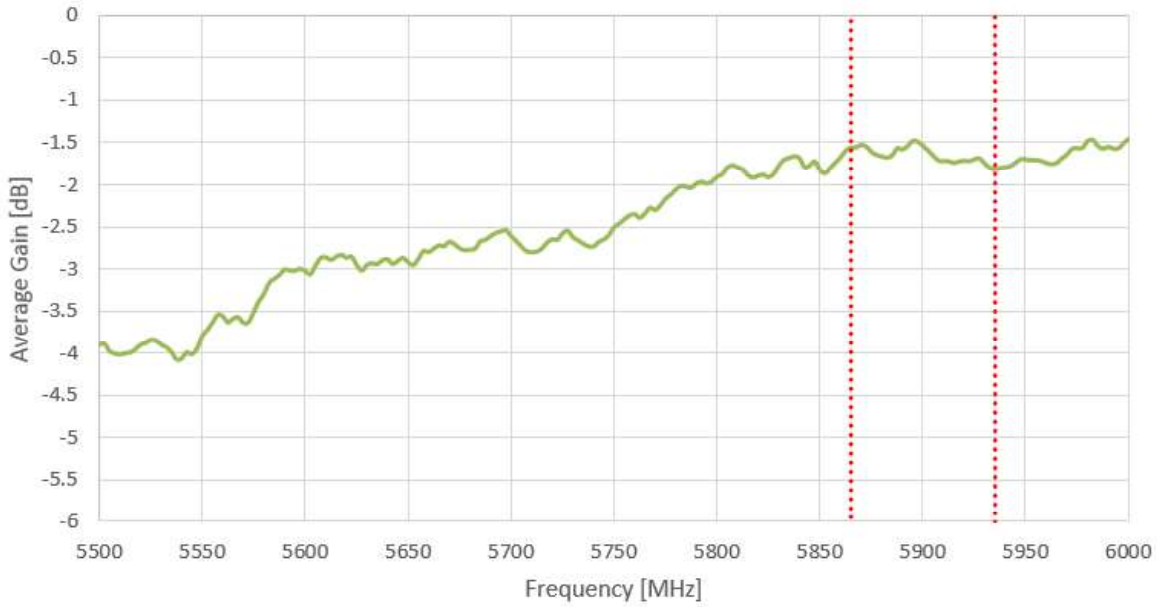
3.3 Efficiency (Passive Antenna)



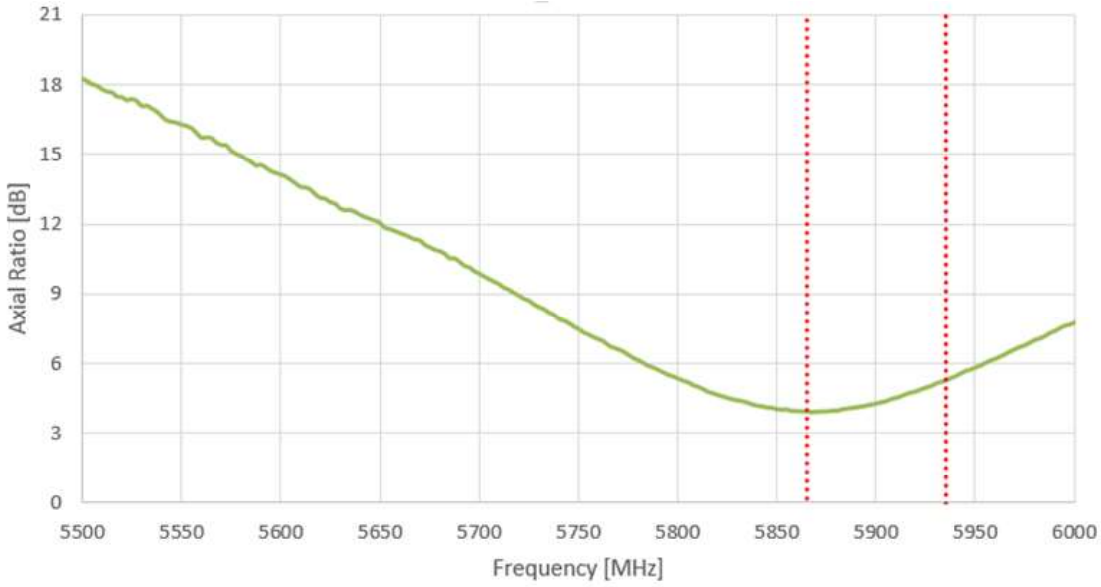
3.4 Peak Gain (Passive Antenna)



3.5 Average Gain (Passive Antenna)

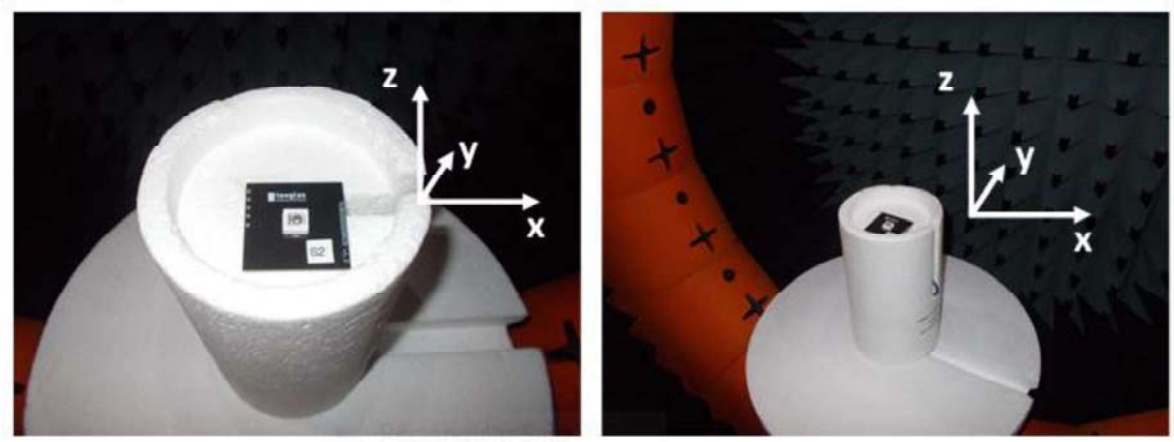


3.6 Axial Ratio

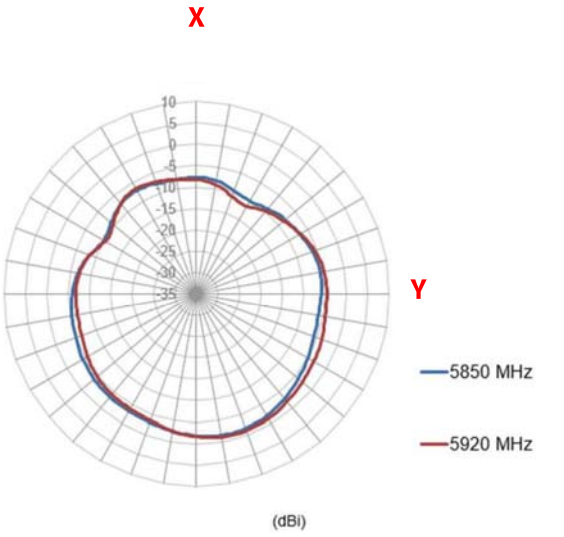


4. 2D Radiation Patterns

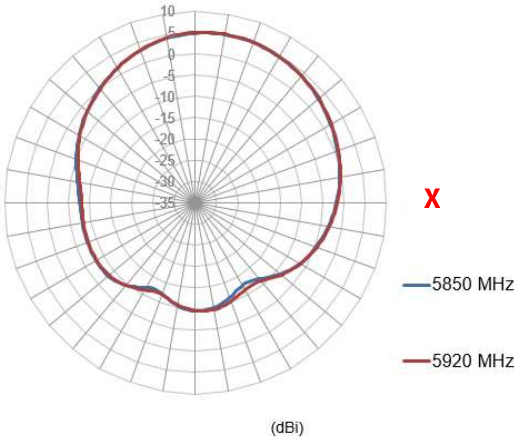
4.1 Test Setup



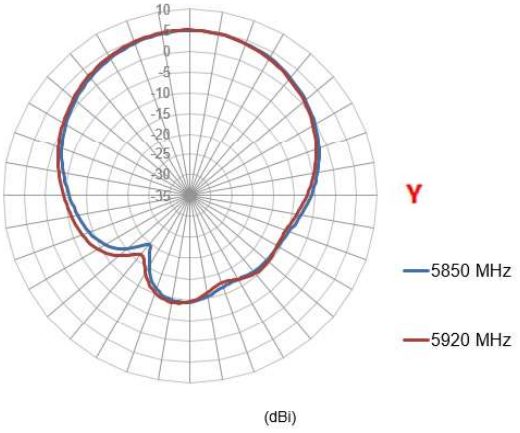
XY Plane



XZ Plane

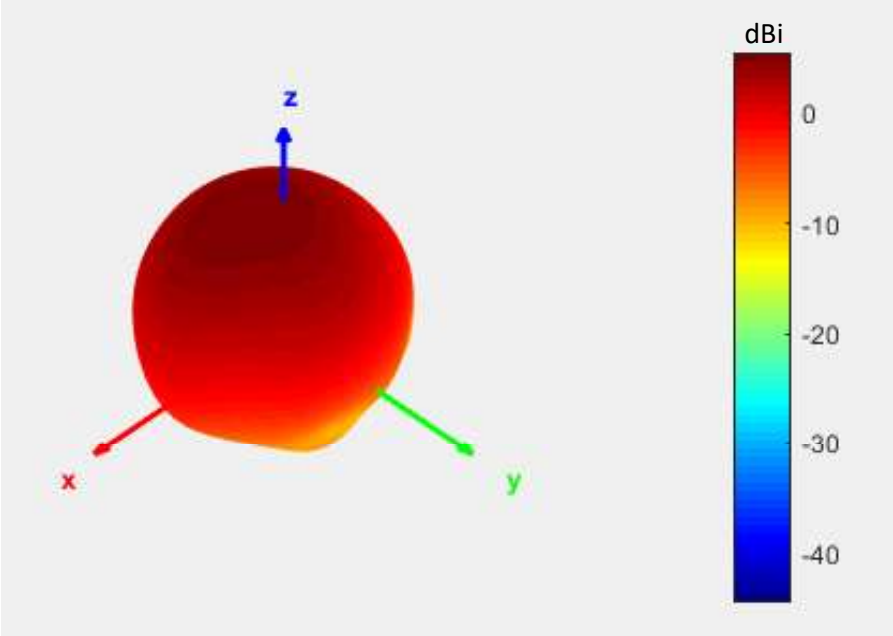


YZ Plane



5. 3D Radiation Patterns

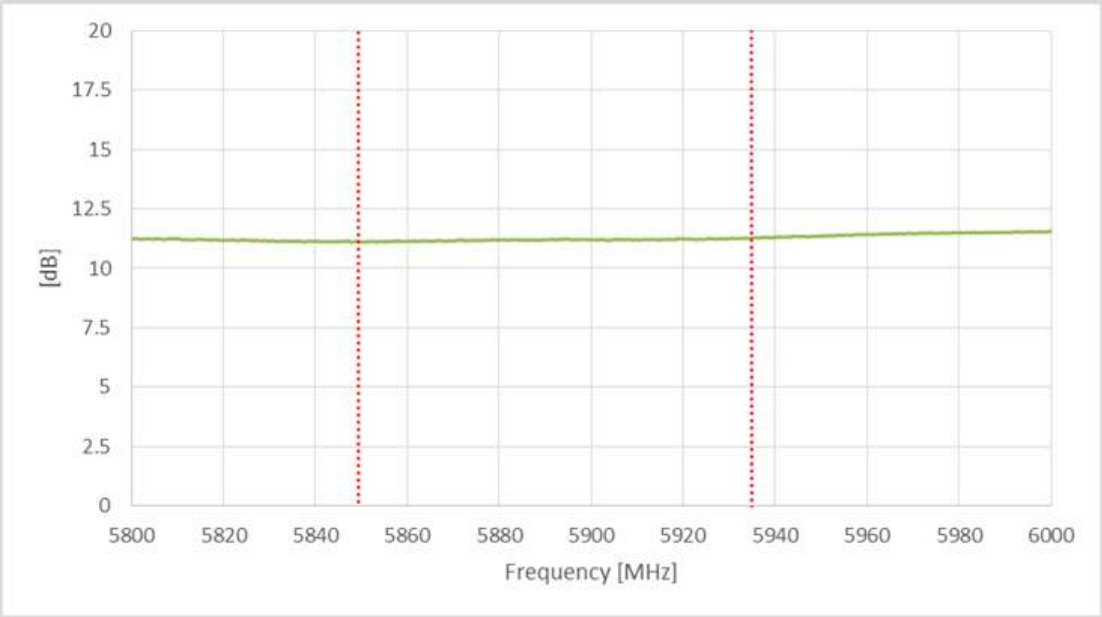
5.1 5900MHz



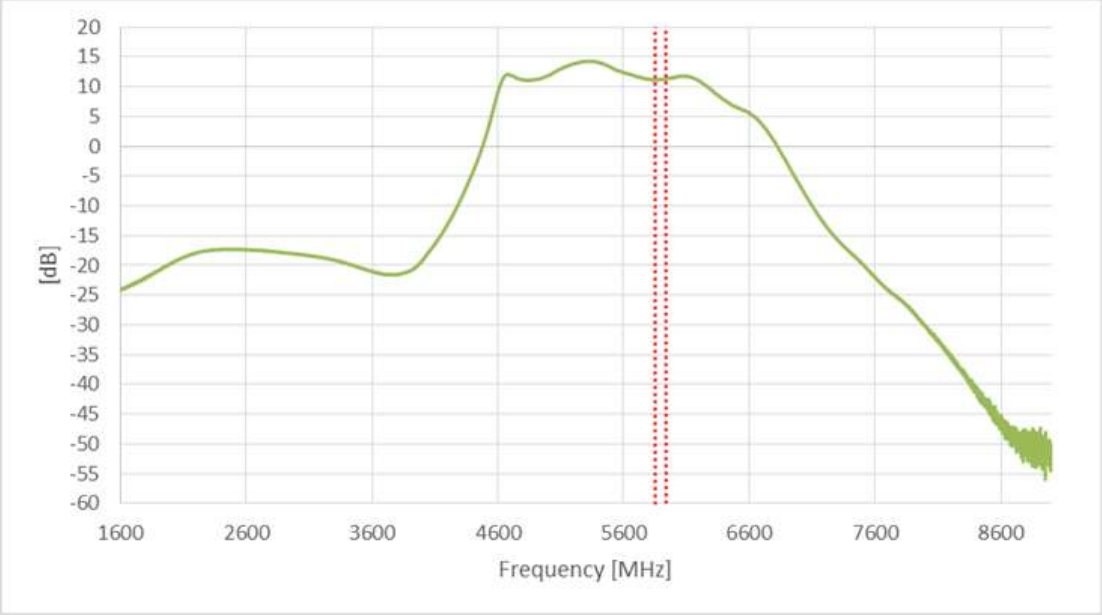
6. Active Circuit Characteristics

6.1 LNA Gain and Noise Figure (Active Antenna)

S21 Narrowband Plot

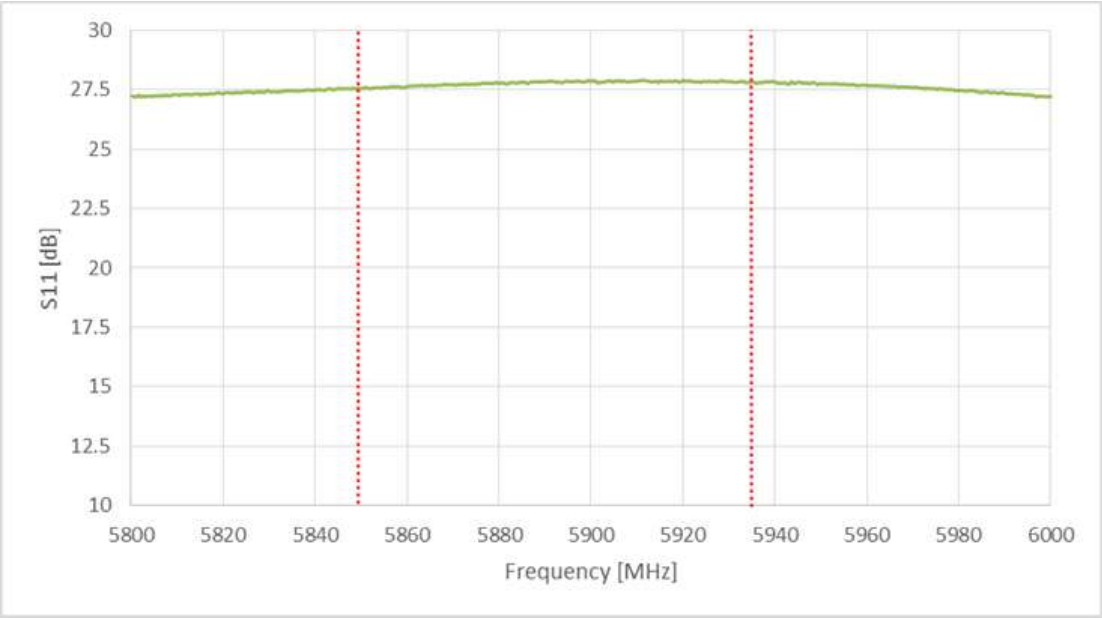


S21 Wideband Plot

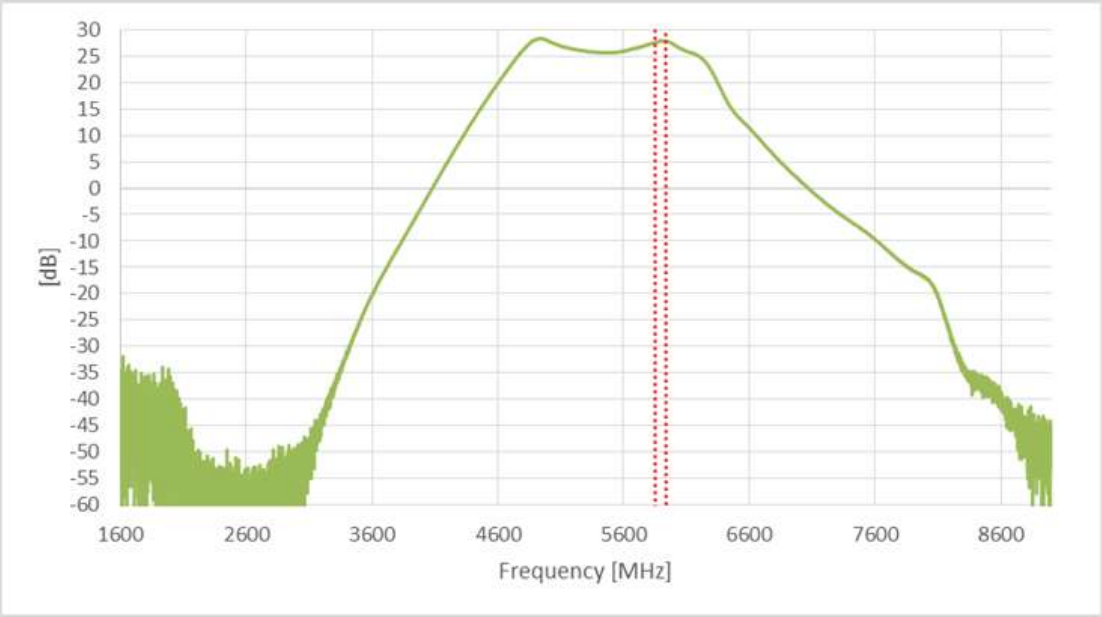


6.2 PA Gain (Active Antenna)

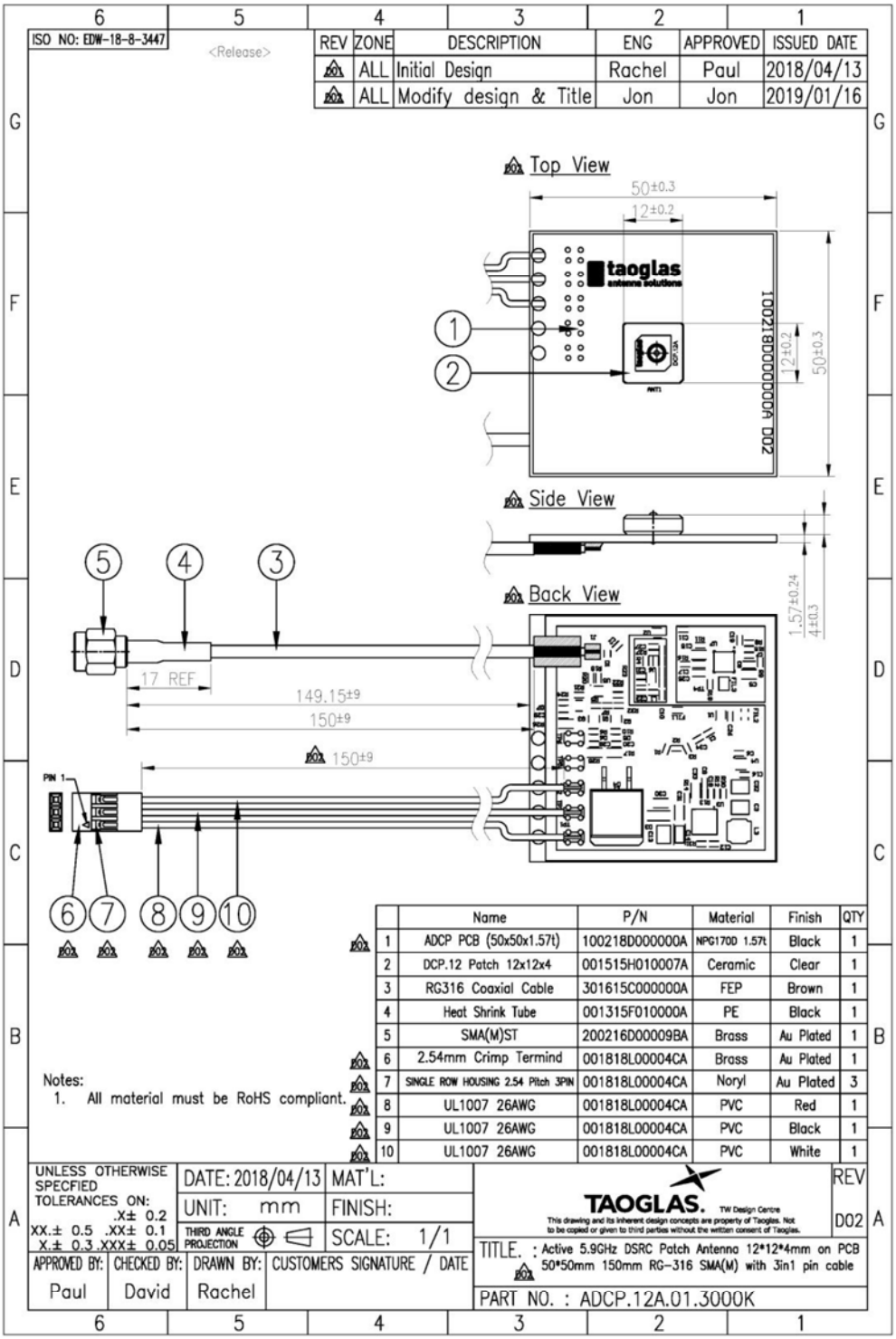
S21 Narrowband Plot



S21 Wideband Plot

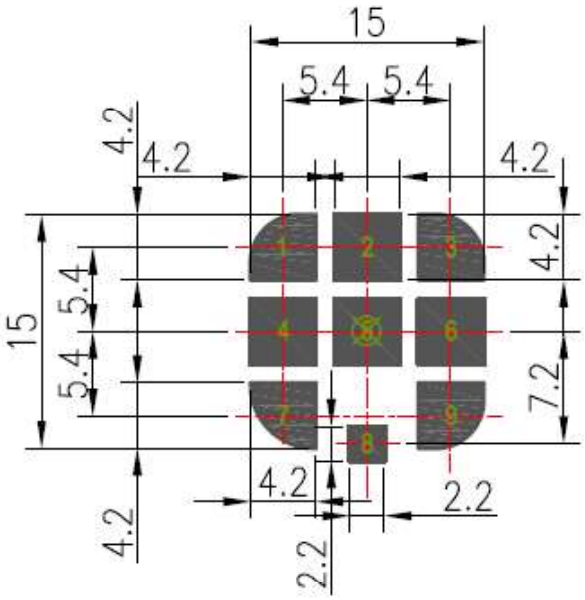


7. Mechanical Drawing (Unit: mm)

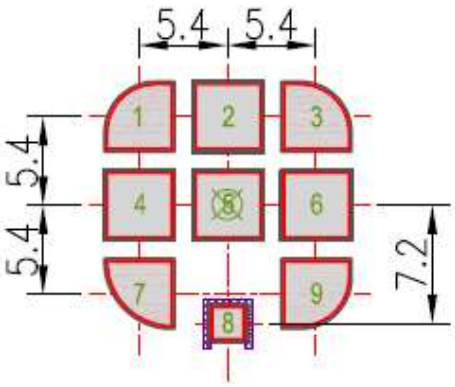


7.3 Top Solder Mask (Unit: mm)

Pads 2, 4, 5, 6, are the same size.
This drawing is a negative of solder mask. Black regions are anti–mask.



7.4 Composite Diagram (Unit: mm)



NOTE:
1. Ag Plated area
2. Solder Mask area
3. Copper area
4. Paste area
5. Copper Keepout Area

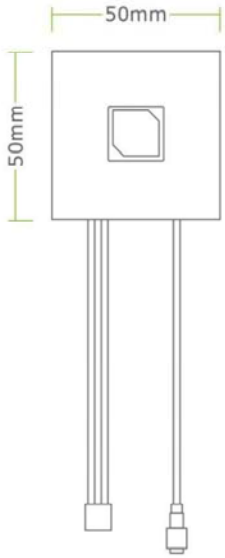
6. Copper keepout should extend through all PCB layers.

7. Any vias in pads should be either filled or tented to prevent solder from wicking away from the pad during reflow.

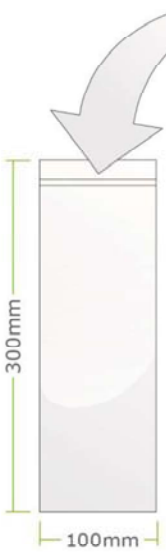
8. The dimension tolerances should follow standard PCB manufacturing guidelines

8. Packaging

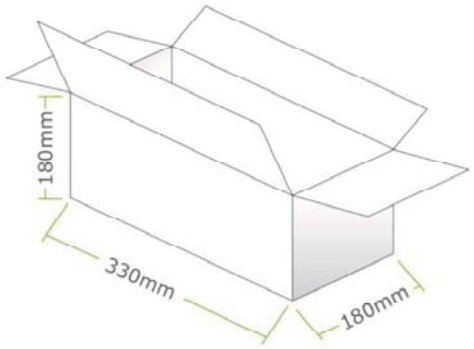
1pc ADCP.12A.01.3000K
Dimensions - 50*50*5mm
Weight - 0.26Kg



1 Small Carton per PE Bag
Bag Dimensions - 100*300
Weight - 0.26Kg



30pcs per Large Carton
Carton Dimensions - 330*180*180mm
Weight - 0.780Kg



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