

## Dielectric Antennas

MCV Microwave Dielectric Antennas are compact size, high performance, reliable, RoHS compliant and cost competitive. MCV offers patch antennas in various sizes for GPS and W-LAN applications.

Rectangular microstrip designed patch antennas have excellent stability and sensitivity through the use of high-performance, proprietary dielectric materials with strict dimensional accuracy, dielectric constant and temperature stability.

Send us your Dielectric Antenna specification requirements today and we will respond quickly to your request.

### FEATURES

- Small patch dimensions
- Rugged construction
- Low Loss Silver High Qu
- Negligible aging effects
- Excellent solderability
- Excellent Temperature Stability

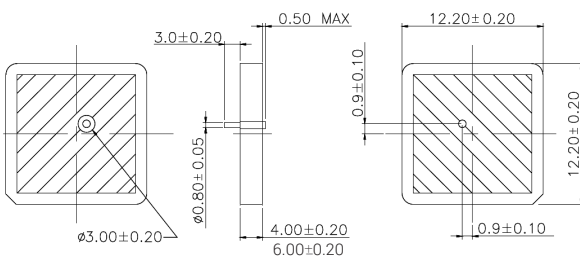
### APPLICATIONS

- Global Positioning Systems (GPS)
- W-LAN.

## Product Dimensions

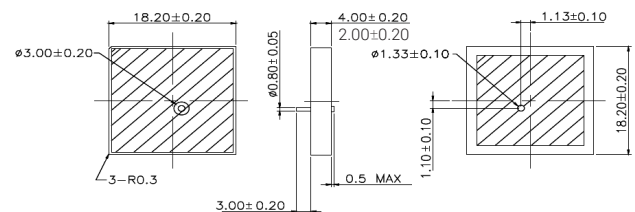
### Dielectric Patch Antenna (12 x 12mm)

Available in 4 mm and 6 mm thicknesses



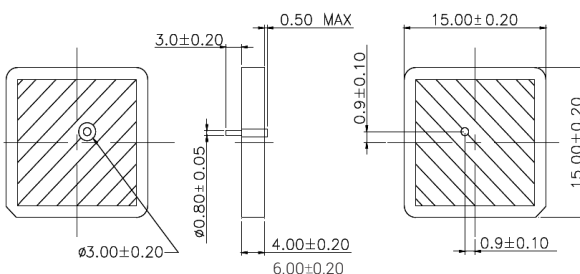
### Dielectric Patch Antenna (18 x 18mm)

Available in 2 mm and 4 mm thicknesses



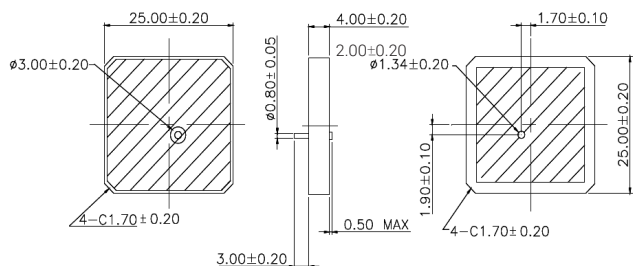
### Dielectric Patch Antenna (15 x 15mm)

Available in 4 mm thickness



### Dielectric Patch Antenna (25 x 25mm)

Available in 2 mm and 4 mm thicknesses



# DIELECTRIC PATCH ANTENNAS

## Material Availability

Characteristics		Specifications	
<b>MCV Part No.</b>	<b>MA 1204XXP (12mm x 12mm x 4 mm)</b>	<b>MA 1206XXP (12mm x 12mm x 6 mm)</b>	
Frequency Range (MHz.)	1595 - 1614	1595 - 1614	
Center Frequency 10 <sup>-1</sup>	1605.0 ±3.0 MHz	1605.0 ±3.0 MHz	
Bandwidth	5.0 min MHz Return Loss ≤ -10dB	5.0 min MHz Return Loss ≤ -10dB	
Gain at Zenith	+0 typical dBi @1605.0 MHz	+1.0 typical dBi @1605.0 MHz	
Gain at 10° elevation	-8.0 typical dBi @1605.0 MHz	-7.0 typical dBi @1605.0 MHz	
Impedance	50Ω	50Ω	
Axial ratio	3 max dB	3 @1605.0 MHz max dB @1605.0 MHz	
Dielectric Constant K	90 ± 2.5	90 ± 2.5	
Quality Factor, Q (=1/tan)	≥5000@9GHz	≥5000@9GHz	
Temp. Coef. t of 10 <sup>-2</sup>	0 ± 20 ppm/°C	0 ± 20 ppm/°C	
<b>MCV Part No.</b>	<b>MA 1504XXP (15mm x 15mm x 4 mm)</b>		
Frequency Range (MHz.)	1576 - 1595		
Center Frequency 10 <sup>-1</sup>	1585.0 ±3.0 MHz		
Bandwidth	5.0 min MHz Return Loss ≤ -10dB		
Gain at Zenith	+1 typical dBi @1585.0 MHz		
Gain at 10° elevation	-7.0 typical dBi @1585.0 MHz		
Impedance	50Ω		
Axial ratio	3 max dB @1585.0 MHz		
Dielectric Constant K	65 ± 2.5		
Quality Factor, Q (=1/tan)	≥5000@9GHz		
Temp. Coef. t of 10 <sup>-2</sup>	0 ± 20 ppm/°C		
<b>MCV Part No.</b>	<b>MA 1802XXP (18 mm x 18mm x 2mm)</b>	<b>MA 1804XXP (18 mm x 18mm x 2mm)</b>	
Frequency Range (MHz.)	1576 - 1595	1576 - 1595	
Center Frequency 10 <sup>-1</sup>	1580.0 ±3.0 MHz	1580.0 ±3.0 MHz	
Bandwidth	6.0 min MHz Return Loss ≤ -10dB	6.0 min MHz Return Loss ≤ -10dB	
Gain at Zenith	+1 typical dBi @1580.0 MHz	+3.5 typical dBi @1580.0 MHz	
Gain at 10° elevation	-5.5 typical dBi @1580.0 MHz	-4.0 typical dBi @1580.0 MHz	
Impedance	50Ω	50Ω	
Axial ratio	3 max dB @1580.0 MHz	3 max dB @1580.0 MHz	
Dielectric Constant K	37 ± 2.5	37 ± 2.5	
Quality Factor, Q (=1/tan)	≥5000@9GHz	≥5000@9GHz	
Temp. Coef. t of 10 <sup>-2</sup>	0 ± 20 ppm/°C	0 ± 20 ppm/°C	
<b>MCV Part No.</b>	<b>MA 2502XXP (25 mm x 25mm x 2mm)</b>	<b>MA 1804XXP (25 mm x 25mm x 4mm)</b>	
Frequency Range (MHz.)	1576 - 1595	1576 - 1595	
Center Frequency 10 <sup>-1</sup>	1580.0 ±3.0 MHz	1580.0 ±3.0 MHz	
Bandwidth	9.0 min MHz Return Loss ≤ -10dB	6.0 min MHz Return Loss ≤ -10dB	
Gain at Zenith	+4.5 typical dBi @1580.0 MHz	+5.0 typical dBi @1580.0 MHz	
Gain at 10° elevation	-3.0 typical dBi @1580.0 MHz	-1.0 typical dBi @1580.0 MHz	
Impedance	50Ω	50Ω	
Axial ratio	3 max dB @1580.0 MHz	3 max dB @1580.0 MHz	
Dielectric Constant K	20 ± 2.5	20 ± 2.5	
Quality Factor, Q (=1/tan)	≥5000@9GHz	≥5000@9GHz	
Temp. Coef. t of 10 <sup>-2</sup>	0 ± 20 ppm/°C	0 ± 20 ppm/°C	

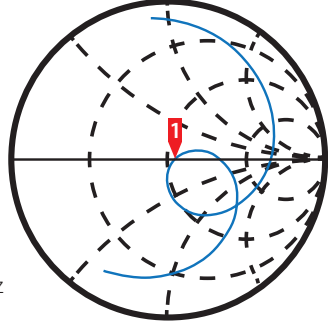
## Specifications (12 x 12 mm)

### PART No. MA1204XXP, MA1206XXP

MA12 = Size, 04 and 06 = Height, XX=Frequency

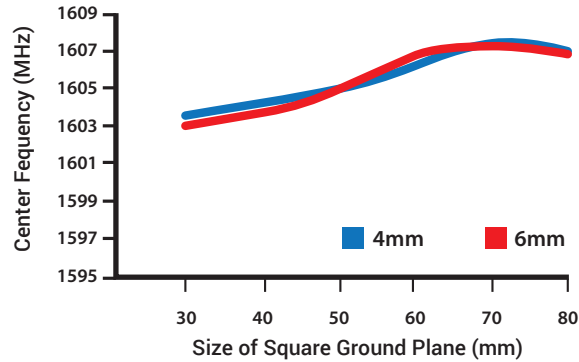
#### TYPICAL: Input Impedance on a Smith Chart

CH1 S<sub>11</sub>/M 1 U FS  
PRm  
Cor  
MARKER 1  
1.6053 GHz  
-548.83 mΩ 180.65 pF  
1 605.300 000 MHz  
1: 55.311 Ω



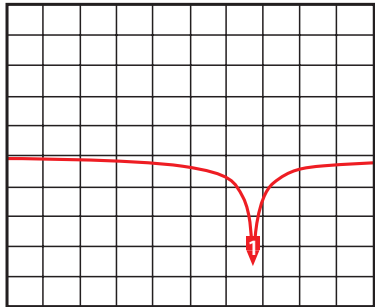
START 1 555.000 000 MHz  
STOP 1 630.000 000 MHz

#### Center Frequency vs. Ground Plane



#### TYPICAL: Reflection Coefficient

CH 2 S<sub>11</sub>/M log MAG  
10 dB/ REF 0 dB  
1: -32.166 dB  
1 605.300 000 MHz  
MARKER 1  
1.6053 GHz  
START  
1 555.000 000 MHz  
STOP  
1 630.000 000 MHz



**ORDER INFORMATION** (ex. MA120400P; 1600 MHz)  
MA1204XXP; 12 = size (mm); 04 = thickness (mm); XX = Frequency

XX	f <sub>0</sub>	XX	f <sub>0</sub>	XX	f <sub>0</sub>	XX	f <sub>0</sub>
95	1595	00	1600	05	1605	10	1610
96	1596	01	1601	06	1606	11	1611
97	1597	02	1602	07	1607	12	1612
98	1598	03	1603	08	1608	31	1613
99	1599	04	1604	09	1609	14	1614

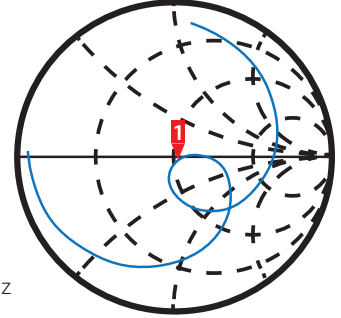
## Specifications (15 x 15 mm)

### PART No. MA1504XXP

MA15 = Size, 04 = Height, XX=Frequency

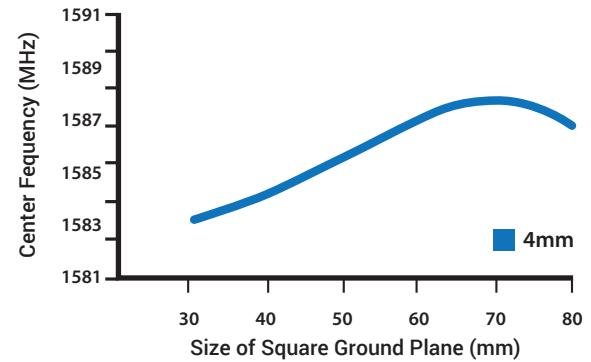
#### Input Impedance on a Smith Chart

CH1 S<sub>11</sub>/M 1 U FS  
PRm  
Cor  
MARKER 1  
1.58525 GHz  
-2.4082 mΩ 41.69 pF  
1 585.250 000 MHz  
1: 52.256 Ω



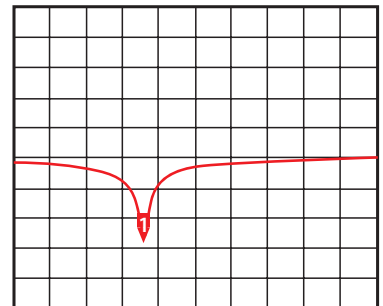
START 1 550.000 000 MHz  
STOP 1 650.000 000 MHz

#### Center Frequency vs. Ground Plane



#### TYPICAL: Reflection Coefficient

CH 2 S<sub>11</sub>/M log MAG  
10 dB/ REF 0 dB  
1: -28.214 dB  
1 585.250 000 MHz  
MARKER 1  
1.58525 GHz  
START  
1 550.000 000 MHz  
STOP  
1 650.000 000 MHz



**ORDER INFORMATION** (ex. MA150481P; 1581 MHz)  
MA1504XXP; 15 = size (mm); 04 = thickness (mm); XX = Frequency

XX	f <sub>0</sub>	XX	f <sub>0</sub>	XX	f <sub>0</sub>	XX	f <sub>0</sub>
76	1576	81	1581	86	1586	91	1591
77	1577	82	1582	87	1587	92	1592
78	1578	83	1583	88	1588	93	1593
79	1579	84	1584	89	1589	94	1594
80	1580	85	1585	90	1590	95	1595

# DIELECTRIC PATCH ANTENNAS

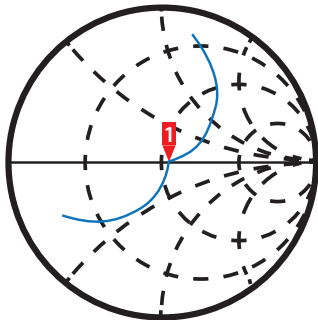
## Specifications (18 x 18 mm)

### PART No. MA1802XXP, MA1804XXP

MA12 = Size, 02 and 04 = Height, XX=Frequency

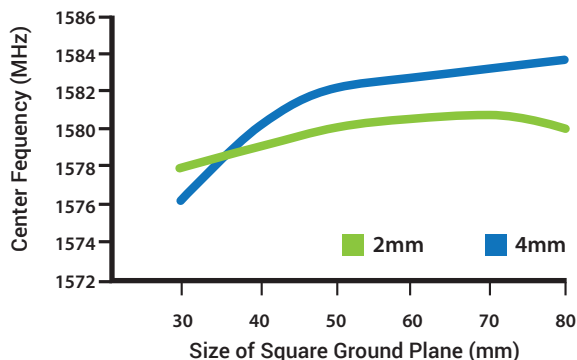
#### Input Impedance on a Smith Chart

CH1 S<sub>11</sub>/M 1 U FS  
PRm  
Cor  
MARKER 1  
1.580554 GHz  
-1.252 mΩ 80.431 pF  
1.580.554 000 MHz  
1: 52.57 Ω



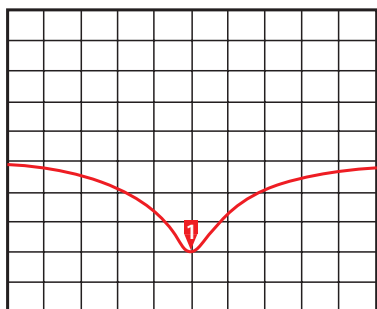
START 1 555.000 000 MHz  
STOP 1 610.000 000 MHz

#### Center Frequency vs. Ground Plane



#### TYPICAL: Reflection Coefficient

CH 2 S<sub>11</sub>/M log MAG  
1: -29.745 dB  
1: -32.166 dB  
1.580.554 000 MHz  
MARKER 1  
1.580554 GHz  
START  
1 555.000 000 MHz  
STOP  
1 610.000 000 MHz



**ORDER INFORMATION** (ex. MA180481P; 1581 MHz)  
MA1804XXP; 18 = size (mm); 04 = thickness (mm); XX = Frequency

XX	f <sub>0</sub>	XX	f <sub>0</sub>	XX	f <sub>0</sub>	XX	f <sub>0</sub>
76	1576	81	1581	86	1586	91	1591
77	1577	82	1582	87	1587	92	1592
78	1578	83	1583	88	1588	93	1593
79	1579	84	1584	89	1589	94	1594
80	1580	85	1585	90	1590	95	1595

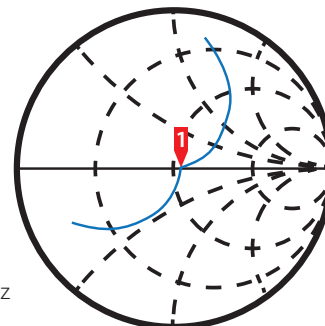
## Specifications (25 x 25 mm)

### PART No. MA2502XXP, MA2504XXP

MA25 = Size, 02 and 04 = Height, XX=Frequency

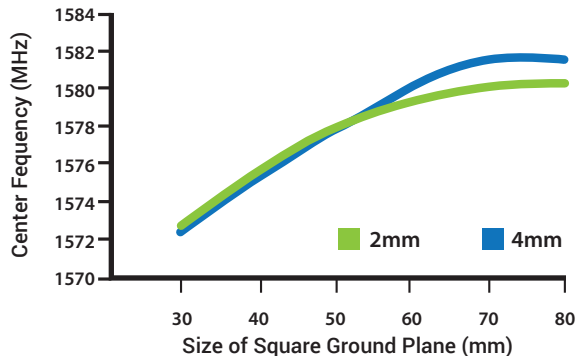
#### Input Impedance on a Smith Chart

CH1 S<sub>11</sub>/M 1 U FS  
PRm  
Cor  
MARKER 1  
1.580554 GHz  
-1.252 mΩ 80.431 pF  
1.580.554 000 MHz  
1: 52.57 Ω



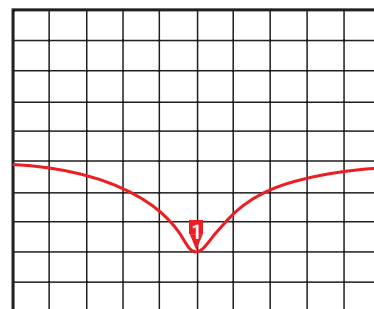
START 1 555.000 000 MHz  
STOP 1 610.000 000 MHz

#### Center Frequency vs. Ground Plane



#### TYPICAL: Reflection Coefficient

CH 2 S<sub>11</sub>/M log MAG  
1: -29.745 dB  
1: -32.166 dB  
1.580.554 000 MHz  
MARKER 1  
1.580554 GHz  
START  
1 555.000 000 MHz  
STOP  
1 610.000 000 MHz



**ORDER INFORMATION** (ex. MA250481P; 1581 MHz)  
MA2504XXP; 25 = size (mm); 04 = thickness (mm); XX = Frequency

XX	f <sub>0</sub>	XX	f <sub>0</sub>	XX	f <sub>0</sub>	XX	f <sub>0</sub>
76	1576	81	1581	86	1586	91	1591
77	1577	82	1582	87	1587	92	1592
78	1578	83	1583	88	1588	93	1593
79	1579	84	1584	89	1589	94	1594
80	1580	85	1585	90	1590	95	1595