



Product Name: 5-in-1 5G NR/ 4G LTE/ WiFi/ GNSS

Combination Antenna **Part Number:** ADA-10-WXYZ

Features:

- 1*GNSS, 2*LTE, 2*WIFI Antenna Combination
- GPS L1 / GLONASS L1 / BEIDOU L1 Bands Supporting
- LTE 698-960MHz, 1710-2690MHz, 3300-3800MHz Supporting
- WiFi Dual Bands, 2400-2500MHz, 5150-5850MHz Supporting
- Excellent Out of Band Suppression, Up to 55dB
- 27dBi Active Peak Gain
- Customizable Cables and Connectors
- RoHS & REACH Compliant, E-mark & R118-03 Certified

Applications:

- Fleet Management & Telematics
- Vehicle Navigation

5-in-1 5G NR/ 4G LTE/ WiFi/ GNSS Combination Antenna

MODEL: ADA-10-WXYZ

WI-RD-D-394 V1.0

I. Specifications:

| Category | GNSS | | |
|-----------------------------|---|-----------------|-------------|
| Passive Antenna Performance | | | |
| Application Band | BeiDou | GPS | GLONASS |
| Frequency (MHz) | 1561 | 1575.42 | 1602 |
| Efficiency (%) | 49.89 | 42.76 | 58.61 |
| Average Gain (dBi) | -3.02 | -3.69 | -2.32 |
| Peak Gain (dBi) | 1.21 | 1.21 | 1.44 |
| V.S.W.R | < 3 | | |
| Return loss (dB) | < -6 | | |
| Impedance (Ω) | 50 | | |
| Polarization | R.H.C.P. (Right Handed Circular Polarization) | | |
| Active Antenna Performance | | | |
| Application band | BeiDou | GPS | GLONASS |
| Frequency (MHz) | 1561 ± 2.046 | 1575.42 ± 1.023 | 1602 ± 5 |
| Gain (dB) | 27 | 27 | 27 |
| Noise Figure (dB) | 0.98 | 0.98 | 0.92 |
| Current Consumption | 9.0mA (typical) | | |
| Operation Voltage (V) | 3.3 ~ 5 | | |
| Output Impedance (Ω) | 50 | | |
| GNSS _Out of Band Rejection | | | |
| Frequency (MHz) | 600 ~ 1300 | 1300 ~ 1530 | 1650 ~ 3000 |
| Gain (dB) | 55 | 30 | 30 |
| ESD Protection | +/- 8 KV (direct discharge) +/- 15KV (air discharge) | | |
| Cable / Length | H-100 / 1 meter | | |

All specifications subject to change without notice.

| | |
|-----------|------------|
| Connector | SMA (Male) |
|-----------|------------|

| Category | | LTE 1 | | | | | | |
|---------------------------|------|-----------|-------------|-----------------|-----------------|-------------------|---------------------|------------------------|
| Application Band | | LTE 700 | GSM 850/900 | DCS 1710 ~ 1880 | PCS 1850 ~ 1990 | UMTS1 1920 ~ 2170 | LTE2600 2300 ~ 2690 | 5G NR Band 3300 ~ 3800 |
| Frequency (MHz) | | 698 ~ 824 | 824 ~ 960 | 1710 ~ 1880 | 1850 ~ 1990 | 1920 ~ 2170 | 2300 ~ 2690 | 3300 ~ 3800 |
| Efficiency (%) | | | | | | | | |
| Free Space | 30cm | 51.10 | 36.95 | 63.55 | 63.70 | 56.71 | 60.72 | 54.39 |
| | 1m | 44.92 | 32.48 | 52.37 | 51.93 | 45.68 | 47.68 | 40.69 |
| | 2m | 37.36 | 27.02 | 39.73 | 38.80 | 33.54 | 33.76 | 26.88 |
| | 3m | 31.08 | 22.47 | 30.14 | 28.98 | 24.63 | 23.90 | 17.76 |
| | 5m | 21.50 | 15.55 | 17.34 | 16.17 | 13.28 | 11.98 | 7.75 |
| With 30*30cm Ground Plane | 30cm | 46.43 | 44.67 | 59.95 | 67.01 | 58.79 | 59.20 | 55.59 |
| | 1m | 40.82 | 39.26 | 49.41 | 54.63 | 47.36 | 46.86 | 43.38 |
| | 2m | 33.95 | 32.66 | 37.48 | 40.81 | 34.77 | 32.91 | 27.48 |
| | 3m | 28.24 | 27.16 | 28.43 | 30.49 | 25.53 | 23.30 | 18.16 |
| | 5m | 19.54 | 18.79 | 16.36 | 17.01 | 13.76 | 11.68 | 7.93 |
| Average Gain (dBi) | | | | | | | | |
| Free Space | 30cm | -2.92 | -4.32 | -1.97 | -1.96 | -2.46 | -2.17 | -2.65 |
| | 1m | -3.48 | -4.88 | -2.81 | -2.85 | -3.40 | -3.22 | -3.91 |
| | 2m | -4.28 | -5.68 | -4.01 | -4.11 | -4.74 | -4.72 | -5.71 |
| | 3m | -5.08 | -6.48 | -5.21 | -5.38 | -6.09 | -6.22 | -7.51 |
| | 5m | -6.68 | -8.08 | -7.61 | -7.91 | -8.77 | -9.22 | -11.11 |
| With 30*30cm Ground Plane | 30cm | -3.33 | -3.50 | -2.22 | -1.74 | -2.31 | -2.28 | -2.55 |
| | 1m | -3.89 | -4.06 | -3.06 | -2.63 | -3.25 | -3.29 | -3.63 |
| | 2m | -4.69 | -4.86 | -4.26 | -3.89 | -4.59 | -4.83 | -5.61 |
| | 3m | -5.49 | -5.66 | -5.46 | -5.16 | -5.93 | -6.33 | -7.41 |
| | 5m | -7.09 | -7.26 | -7.86 | -7.69 | -8.61 | -9.33 | -11.01 |

All specifications subject to change without notice.

| Peak Gain (dBi) | | | | | | | | |
|---------------------------|------|-------------------|-------|-------|-------|-------|-------|-------|
| Free Space | 30cm | 2.42 | 1.49 | 3.95 | 3.95 | 2.96 | 4.29 | 3.09 |
| | 1m | 1.86 | 0.93 | 3.11 | 3.11 | 2.05 | 3.24 | 1.83 |
| | 2m | 1.06 | 0.13 | 1.91 | 1.91 | 0.75 | 1.74 | 0.03 |
| | 3m | 0.26 | -0.67 | 0.71 | 0.71 | -0.55 | 0.24 | -1.77 |
| | 5m | -1.34 | -2.27 | -1.69 | -1.69 | -3.15 | -2.76 | -5.37 |
| With 30*30cm Ground Plane | 30cm | 5.11 | 3.48 | 6.85 | 6.59 | 6.59 | 6.01 | 6.67 |
| | 1m | 4.55 | 2.92 | 6.01 | 5.68 | 5.68 | 4.96 | 5.41 |
| | 2m | 3.75 | 2.12 | 4.81 | 4.38 | 4.38 | 3.46 | 3.61 |
| | 3m | 2.95 | 1.32 | 3.61 | 3.08 | 3.08 | 1.96 | 1.81 |
| | 5m | 1.35 | -0.28 | 1.21 | 0.48 | 0.48 | -1.04 | -1.79 |
| V.S.W.R | | | | | | | | |
| Free Space | | < 3 | | | | | | |
| With 30*30cm Ground Plane | | < 3 | | | | | | |
| Return Loss (dB) | | | | | | | | |
| Free Space | | < -6 | | | | | | |
| With 30*30cm Ground Plane | | < -6 | | | | | | |
| Impedance (Ω) | | 50 | | | | | | |
| Polarization | | Linear | | | | | | |
| Cable / Length | | SNC-200 / 1 meter | | | | | | |
| Connector | | SMA (Male) | | | | | | |

All specifications subject to change without notice.

| Category | | LTE 2 | | | | | | |
|------------------------------|------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Application Band | | LTE 700 | GSM 850/900 | DCS | PCS | UMTS1 | LTE2600 | 5G NR Band |
| Frequency (MHz) | | 698 ~ 824 | 824 ~ 960 | 1710 ~ 1880 | 1850 ~ 1990 | 1920 ~ 2170 | 2300 ~ 2690 | 3300 ~ 3800 |
| Efficiency (%) | | | | | | | | |
| Free Space | 30cm | 44.62 | 45.00 | 64.70 | 68.02 | 62.54 | 61.89 | 55.11 |
| | 1m | 39.22 | 39.56 | 53.32 | 55.46 | 50.38 | 48.60 | 44.53 |
| | 2m | 32.62 | 32.90 | 40.45 | 41.43 | 36.99 | 34.41 | 27.24 |
| | 3m | 27.13 | 27.37 | 30.68 | 30.95 | 27.16 | 24.36 | 18.00 |
| | 5m | 18.77 | 18.93 | 17.66 | 17.27 | 14.64 | 12.21 | 7.86 |
| With 30*30cm Ground Plane | 30cm | 40.31 | 43.60 | 59.54 | 65.97 | 60.41 | 59.58 | 51.82 |
| | 1m | 35.44 | 38.33 | 49.07 | 53.79 | 48.66 | 47.17 | 39.51 |
| | 2m | 29.47 | 31.88 | 37.22 | 40.18 | 35.73 | 33.12 | 25.62 |
| | 3m | 24.52 | 26.52 | 28.23 | 30.01 | 26.23 | 23.45 | 16.92 |
| | 5m | 16.96 | 18.34 | 16.25 | 16.75 | 14.14 | 11.75 | 7.39 |
| Average Gain (dBi) | | | | | | | | |
| Free Space | 30cm | -3.51 | -3.47 | -1.89 | -1.67 | -2.04 | -2.08 | -2.59 |
| | 1m | -4.07 | -4.03 | -2.73 | -2.56 | -2.98 | -3.13 | -3.51 |
| | 2m | -4.87 | -4.83 | -3.93 | -3.83 | -4.32 | -4.63 | -5.65 |
| | 3m | -5.67 | -5.63 | -5.13 | -5.09 | -5.66 | -6.13 | -7.45 |
| | 5m | -7.27 | -7.23 | -7.53 | -7.63 | -8.34 | -9.13 | -11.05 |
| With 30*30cm Ground Plane | 30cm | -3.95 | -3.61 | -2.25 | -1.81 | -2.19 | -2.25 | -2.86 |
| | 1m | -4.51 | -4.17 | -3.09 | -2.69 | -3.13 | -3.26 | -4.03 |
| | 2m | -5.31 | -4.97 | -4.29 | -3.96 | -4.47 | -4.80 | -5.92 |
| | 3m | -6.11 | -5.77 | -5.49 | -5.23 | -5.81 | -6.30 | -7.72 |
| | 5m | -7.71 | -7.37 | -7.89 | -7.76 | -8.50 | -9.30 | -11.32 |

All specifications subject to change without notice.

| Peak Gain (dBi) | | | | | | | | |
|------------------------------|------|-------------------|------|------|-------|-------|-------|-------|
| Free Space | 30cm | 5.32 | 4.66 | 5.82 | 4.92 | 4.92 | 4.29 | 3.52 |
| | 1m | 4.76 | 4.10 | 4.98 | 4.01 | 4.01 | 3.24 | 4.01 |
| | 2m | 3.96 | 3.30 | 3.78 | 2.71 | 2.71 | 1.74 | 0.46 |
| | 3m | 3.16 | 2.50 | 2.58 | 1.41 | 1.41 | 0.24 | -1.34 |
| | 5m | 1.56 | 0.90 | 0.18 | -1.19 | -1.19 | -2.76 | -4.94 |
| With 30*30cm Ground Plane | 30cm | 3.70 | 4.66 | 6.29 | 5.30 | 5.30 | 6.35 | 6.13 |
| | 1m | 3.14 | 4.10 | 5.45 | 4.39 | 4.39 | 5.30 | 4.87 |
| | 2m | 2.34 | 3.30 | 4.25 | 3.09 | 3.09 | 3.80 | 3.07 |
| | 3m | 1.54 | 2.50 | 3.05 | 1.86 | 1.79 | 2.30 | 1.27 |
| | 5m | -0.06 | 0.90 | 0.65 | -0.54 | -0.81 | -0.70 | -2.33 |
| V.S.W.R | | | | | | | | |
| Free Space | | < 3 | | | | | | |
| With Ground Plane | | < 3 | | | | | | |
| Return Loss (dB) | | | | | | | | |
| Free Space | | < -6 | | | | | | |
| With 30*30cm Ground Plane | | < -6 | | | | | | |
| Impedance (Ω) | | 50 | | | | | | |
| Polarization | | Linear | | | | | | |
| Cable / Length | | SNC-200 / 1 meter | | | | | | |
| Connector | | SMA (Male) | | | | | | |

All specifications subject to change without notice.

| Category | | WiFi 1 | | | | | | |
|---------------------------|------|--------|-------|-------|--------|--------|--------|--------|
| Frequency (MHz) | | 2400 | 2450 | 2500 | 5150 | 5350 | 5750 | 5850 |
| Efficiency (%) | | | | | | | | |
| Free Space | 30cm | 70.47 | 70.63 | 78.70 | 65.31 | 56.23 | 50.93 | 50.23 |
| | 1m | 55.34 | 55.46 | 61.80 | 45.08 | 38.82 | 34.59 | 34.12 |
| | 2m | 39.17 | 39.26 | 43.75 | 26.55 | 22.86 | 19.91 | 19.63 |
| | 3m | 27.73 | 27.80 | 30.97 | 15.63 | 13.46 | 11.46 | 11.30 |
| | 5m | 13.90 | 13.93 | 15.52 | 5.42 | 4.67 | 3.79 | 3.74 |
| With 30*30cm Ground Plane | 30cm | 60.67 | 63.68 | 65.77 | 69.18 | 57.28 | 51.64 | 49.43 |
| | 1m | 47.64 | 52.12 | 51.64 | 44.87 | 40.64 | 34.99 | 30.62 |
| | 2m | 33.73 | 35.40 | 36.56 | 28.12 | 23.28 | 20.18 | 19.32 |
| | 3m | 23.88 | 25.06 | 25.88 | 16.56 | 13.71 | 11.61 | 11.12 |
| | 5m | 11.97 | 12.56 | 12.97 | 5.74 | 4.75 | 3.85 | 3.68 |
| Average Gain (dBi) | | | | | | | | |
| Free Space | 30cm | -1.52 | -1.51 | -1.04 | -1.85 | -2.50 | -2.93 | -2.99 |
| | 1m | -2.57 | -2.56 | -2.09 | -3.46 | -4.11 | -4.61 | -4.67 |
| | 2m | -4.07 | -4.06 | -3.59 | -5.76 | -6.41 | -7.01 | -7.07 |
| | 3m | -5.57 | -5.56 | -5.09 | -8.06 | -8.71 | -9.41 | -9.47 |
| | 5m | -8.57 | -8.56 | -8.09 | -12.66 | -13.31 | -14.21 | -14.27 |
| With 30*30cm Ground Plane | 30cm | -2.17 | -1.96 | -1.82 | -1.60 | -2.42 | -2.87 | -3.06 |
| | 1m | -3.22 | -2.83 | -2.87 | -3.48 | -3.91 | -4.56 | -5.14 |
| | 2m | -4.72 | -4.51 | -4.37 | -5.51 | -6.33 | -6.95 | -7.14 |
| | 3m | -6.22 | -6.01 | -5.87 | -7.81 | -8.63 | -9.35 | -9.54 |
| | 5m | -9.22 | -9.01 | -8.87 | -12.41 | -13.23 | -14.15 | -14.34 |

All specifications subject to change without notice.

| Peak Gain (dBi) | | | | | | | | |
|------------------------------|------|-------------------|-------|-------|--------|-------|-------|-------|
| Free Space | 30cm | 3.70 | 3.58 | 4.55 | 4.59 | 5.84 | 2.65 | 3.53 |
| | 1m | 2.65 | 2.53 | 3.50 | 2.98 | 4.59 | 0.97 | 1.85 |
| | 2m | 1.15 | 1.03 | 2.00 | 0.68 | 1.93 | -1.43 | -0.55 |
| | 3m | -0.35 | -0.47 | 0.50 | -1.62 | -0.37 | -3.83 | -2.95 |
| | 5m | -3.35 | -3.47 | -2.50 | -6.22 | -4.97 | -8.63 | -7.75 |
| With 30*30cm Ground Plane | 30cm | 6.56 | 6.21 | 6.19 | 7.26 | 6.81 | 7.09 | 6.33 |
| | 1m | 5.51 | 5.20 | 5.14 | 5.38 | 4.92 | 5.06 | 4.64 |
| | 2m | 4.01 | 3.66 | 3.64 | 3.35 | 2.90 | 3.01 | 2.25 |
| | 3m | 2.51 | 2.16 | 2.14 | 1.05 | 0.60 | 0.61 | -0.15 |
| | 5m | -0.49 | -0.84 | -0.86 | -3.55 | -4.00 | -4.19 | -4.95 |
| V.S.W.R | | | | | | | | |
| Free Space | | < 2 | | | | | | |
| With 30*30cm Ground Plane | | < 2 | | | < 2.32 | | | |
| Return Loss (dB) | | | | | | | | |
| Free Space | | < -10 | | | | | | |
| With 30*30cm Ground Plane | | < -10 | | | < -8 | | | |
| Impedance (Ω) | | 50 | | | | | | |
| Polarization | | Linear | | | | | | |
| Cable / Length | | SNC-200 / 1 meter | | | | | | |
| Connector | | SMA (Female) | | | | | | |

All specifications subject to change without notice.

| Category | | WiFi 2 | | | | | | |
|---------------------------|------|--------|-------|-------|--------|--------|--------|--------|
| Frequency (MHz) | | 2400 | 2450 | 2500 | 5150 | 5350 | 5750 | 5850 |
| Efficiency (%) | | | | | | | | |
| Free Space | 30cm | 57.54 | 60.81 | 71.29 | 66.07 | 56.23 | 58.88 | 51.17 |
| | 1m | 45.19 | 47.75 | 55.98 | 45.60 | 38.82 | 39.99 | 34.75 |
| | 2m | 31.99 | 33.81 | 39.63 | 26.85 | 22.86 | 23.01 | 20.00 |
| | 3m | 22.65 | 23.93 | 28.05 | 15.81 | 13.46 | 13.24 | 11.51 |
| | 5m | 11.35 | 11.99 | 14.06 | 5.48 | 4.67 | 4.39 | 3.81 |
| With 30*30cm Ground Plane | 30cm | 57.81 | 62.95 | 65.77 | 66.83 | 56.36 | 57.94 | 56.62 |
| | 1m | 45.39 | 49.43 | 51.64 | 43.75 | 39.08 | 39.45 | 33.57 |
| | 2m | 32.14 | 34.99 | 36.56 | 27.16 | 22.91 | 22.65 | 22.13 |
| | 3m | 22.75 | 24.77 | 25.88 | 16.00 | 13.49 | 13.03 | 12.74 |
| | 5m | 11.40 | 12.42 | 12.97 | 5.55 | 4.68 | 4.32 | 4.22 |
| Average Gain (dBi) | | | | | | | | |
| Free Space | 30cm | -2.40 | -2.16 | -1.47 | -1.80 | -2.50 | -2.30 | -2.91 |
| | 1m | -3.45 | -3.21 | -2.52 | -3.41 | -4.11 | -3.98 | -4.59 |
| | 2m | -4.95 | -4.71 | -4.02 | -5.71 | -6.41 | -6.38 | -6.99 |
| | 3m | -6.45 | -6.21 | -5.52 | -8.01 | -8.71 | -8.78 | -9.39 |
| | 5m | -9.45 | -9.21 | -8.52 | -12.61 | -13.31 | -13.58 | -14.19 |
| With 30*30cm Ground Plane | 30cm | -2.38 | -2.01 | -1.82 | -1.75 | -2.49 | -2.37 | -2.47 |
| | 1m | -3.43 | -3.06 | -2.87 | -3.59 | -4.08 | -4.04 | -4.74 |
| | 2m | -4.93 | -4.56 | -4.37 | -5.66 | -6.40 | -6.45 | -6.55 |
| | 3m | -6.43 | -6.06 | -5.87 | -7.96 | -8.70 | -8.85 | -8.95 |
| | 5m | -9.43 | -9.06 | -8.87 | -12.56 | -13.30 | -13.65 | -13.75 |

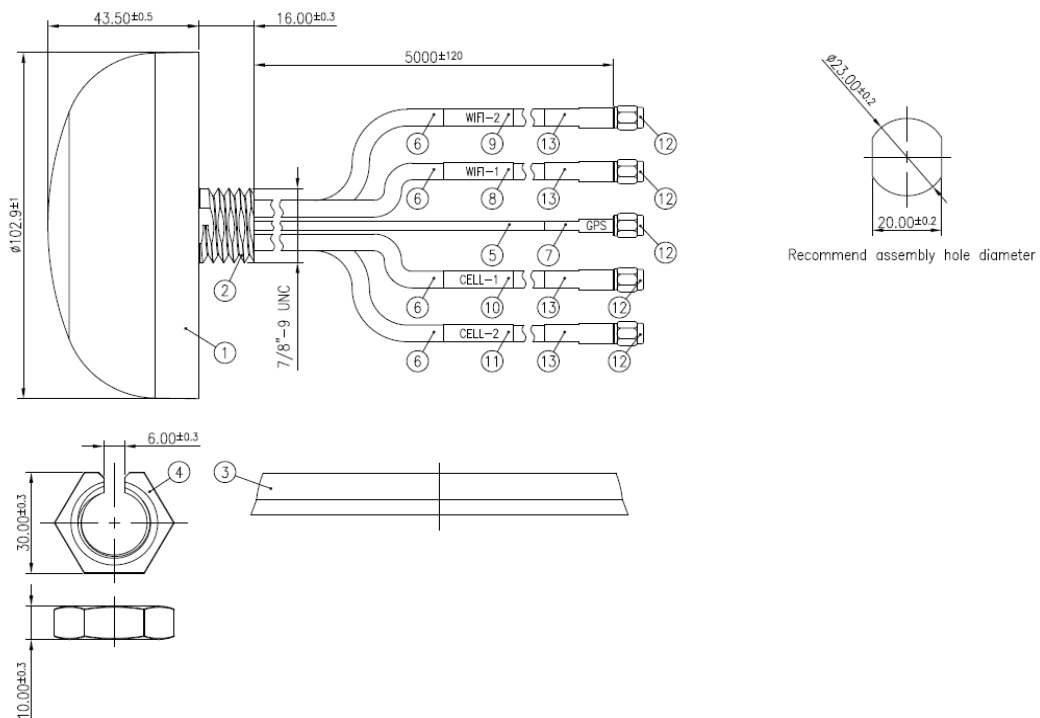
All specifications subject to change without notice.

| Peak Gain (dBi) | | | | | | | | |
|----------------------------|------|----------------------|-------|-------|--------|-------|-------|-------|
| Free Space | 30cm | 3.40 | 4.03 | 4.45 | 3.12 | 3.48 | 4.02 | 3.25 |
| | 1m | 2.35 | 2.98 | 3.40 | 1.51 | 2.33 | 2.34 | 1.57 |
| | 2m | 0.85 | 1.48 | 1.90 | -0.79 | -0.43 | -0.06 | -0.83 |
| | 3m | -0.65 | -0.02 | 0.40 | -3.09 | -2.73 | -2.46 | -3.23 |
| | 5m | -3.65 | -3.02 | -2.60 | -7.69 | -7.33 | -7.26 | -8.03 |
| With 30*30cm Ground Plane | 30cm | 3.48 | 4.12 | 4.68 | 6.33 | 4.82 | 4.93 | 5.26 |
| | 1m | 2.43 | 3.01 | 3.63 | 4.49 | 3.55 | 3.51 | 3.44 |
| | 2m | 0.93 | 1.57 | 2.13 | 2.42 | 0.91 | 0.85 | 1.18 |
| | 3m | -0.57 | 0.07 | 0.63 | 0.12 | -1.39 | -1.55 | -1.22 |
| | 5m | -3.57 | -2.93 | -2.37 | -4.48 | -5.99 | -6.35 | -6.02 |
| V.S.W.R | | | | | | | | |
| Free Space | | < 2 | | | | | | |
| With 30*30cm Ground Plane | | < 2 | | | < 2.32 | | | |
| Return Loss (dB) | | | | | | | | |
| Free Space | | < -10 | | | | | | |
| With 30*30cm Ground Plane | | < -10 | | | < -8 | | | |
| Impedance (Ω) | | 50 | | | | | | |
| Polarization | | Linear | | | | | | |
| Cable / Length | | SNC-200 / 1 meter | | | | | | |
| Connector | | SMA (Female) | | | | | | |
| Mechanical | | | | | | | | |
| Dimension (mm) | | φ 102.9(D) x 43.5(H) | | | | | | |
| Casing | | PC + PBT | | | | | | |
| Waterproof Resistant | | IP67 | | | | | | |
| Environmental Conditions | | | | | | | | |
| Operation Temperature (°C) | | -40 ~ +85 | | | | | | |
| Storage Temperature (°C) | | -40 ~ +85 | | | | | | |
| Humidity | | 95% Non-condensing | | | | | | |

All specifications subject to change without notice.

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V. Mechanical Drawing (Unit:mm):



Ordering Codes:

ADA-10-WXYZ

W = 0 (Nothing)
W = 1 (GPS)
W = 2 (GPS/GLONASS)
W = 3 (Full GNSS)

X = 0 (Nothing)
X = 1 (5G/LTE)
X = 2 (5G/LTE x 2)

**Example: ADA-10-0210 has the
configuration 5G/LTE x 2 + WIFI x 1**

Y = 0 (Nothing)
Y = 1 (WIFI 2.4/5-5.8)
Y = 2 (WIFI 2.4/5-5.8 x 2)

Z = 0 (Nothing)
Z = 1 (DSRC)
Z = 2 (430-450/TETRA)