M8HCT-A-EMB

Embedded Active antenna
L1: GPS, GLONASS, GALILEO, BEIDOU
L2: GPS L2C, GALILEO E5B, GLONASS L3OC
L5: GPS

Part #: 108-00076-01

Description

The M8HCT-A-EMB is Maxtena's latest high performance active embedded antenna de- signed for L1/L2/L5 GPS, GLONASS, Galileo, and Beidou bands. The antenna is designed for applications requiring greater accuracy than what L1 only antennas can provide. The antenna is built on proprietary Maxtena Helicore® technology. This technology provides exceptional pat- tern control, polarization purity and high efficiency in a very compact form factor. It is an embedded antenna design, featuring an SMA connector. This antenna has superior filtering performance and is rated for 50 V/m out of band interference. The M8HCT-A-EMB is ideal for UAV, UGV and high precision applications and is GNSS receiver agnostic.

Passive Antenna Performance (L2, B2, G2, G3, E5B)

Parameter	Specification
Frequency	1192-1231 MHz
Peak Efficiency	46%
Polarization	RHCP
Realized Gain	1.1 dB
Axial Ratio	Max 1.2 dB at the Zenith
VSWR	Max 2:1
Beamwidth	135˚

Passive Antenna Performance (L1, E1, B1, B1-2, G1)

Parameter	Specification
Frequency	1559-1606 MHz (L1, E1,
Peak Efficiency	49%
Polarization	RHCP
Realized Gain	0.5 dB
Axial Ratio	Max 0.9 dB at the Zenith
VSWR	Max 2:1
Beamwidth	125˚

Passive Antenna Performance (L5)

Parameter	Specification
Frequency	1164-1189 MHz (L5)
Peak Efficiency	40%
Polarization	RHCP
Realized Gain	0.5 dB
Axial Ratio	1.1 dB at the Zenith
VSWR	Max 1:1
Beamwidth	112˚

Features

- Quadrifilar helix antenna
- Concurrent GNSS reception on L1: GPS, GLONASS, Galileo, Beidou L2: GPS L2C, Galileo E5B, GLONASS L3OC and L5: GPS
- Small form factor
- Ground plane independent
- GIS, RTK and other high accuracy GNSS applications
- Low power consumption
- Low phase center variation over azimuth and elevation and among different samples
- Ultra-lightweight
- Automotive grade electronics

Applications:

- UAV/ Drones
- Unmanned Ground Vehicles (UGV).
- Unmanned Systems
- High Precision Navigation
- Military & Security
- Agriculture & FarmTech
- Handheld GNSS Devices

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RF Specifications

Parameter	
Conducted Gain	30 dB ±3 dB
Noise Figure	1.5 dB typical, 2 dB max
Voltage	3.0 to 5.0 V
Current	25 mA max
Out of Band Rejection	40 dBc
Group Delay Variation	Less than 5ns over GNSS bands
EMI Immunity Out of Band	30 V/m
ESD Circuit Protection	15 kv human body model air discharge

Mechanical Specifications

Parameter	Specification
Operating Temperature Range	-40 to +105˚C
Cabling and Connector	No cable, male SMA connector

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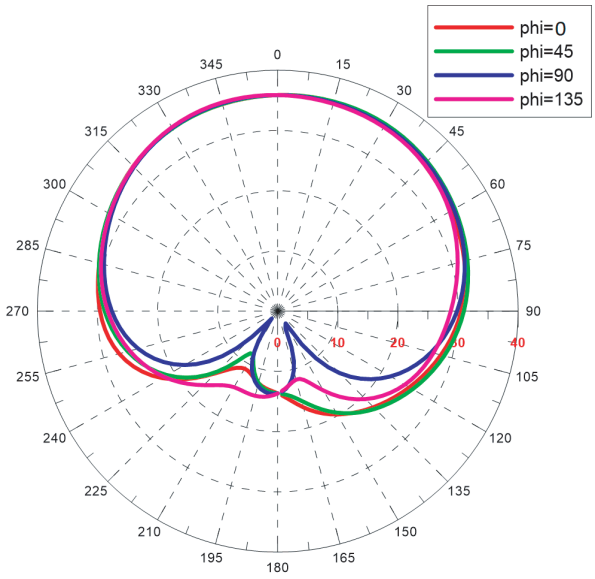
L2 band radiation patterns

Maxtena's M8HCT-A-EMB has unique features that make it the best option for high-accuracy GNSS applications.

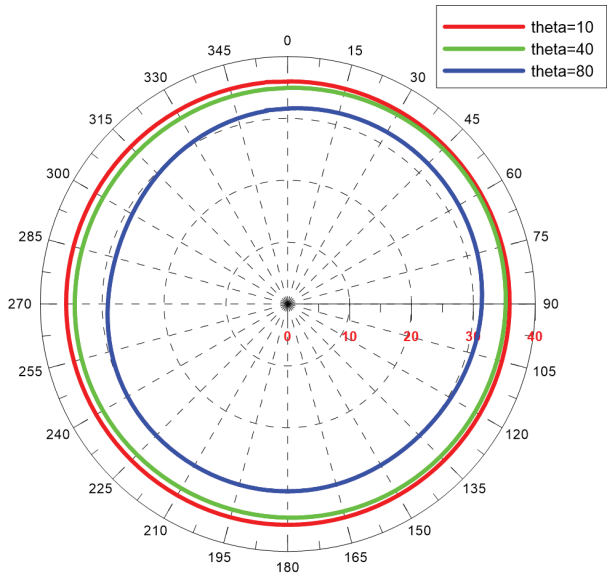
1. Low axial ratio not only at the zenith, but also in other elevation angles ensures multipath error is mitigated.
2. Full hemispherical coverage is achieved by an exceptionally large 3 dB beamwidth, ensuring full view of sky and satellites in lower elevation angles.
3. Highly symmetric radiation pattern guarantees there will be no direction of weak reception or blind spots.

RHCP Realized Gain [dBic] - Elevation Cuts



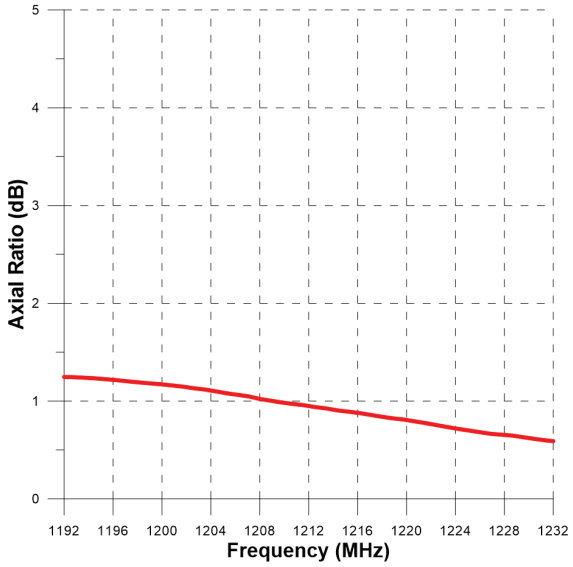
A 135 degree beamwidth ensures excellent hemispherical coverage.

RHCP Realized Gain [dBic] - Azimuth Cuts

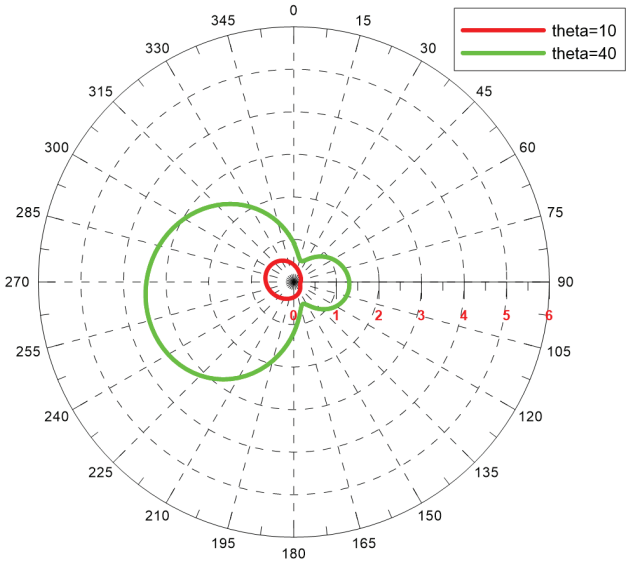


Symmetric coverage even in low elevation enhances accuracy.

Axial Ratio [dB] - Zenith



Axial Ratio [dB] - Azimuth Cuts



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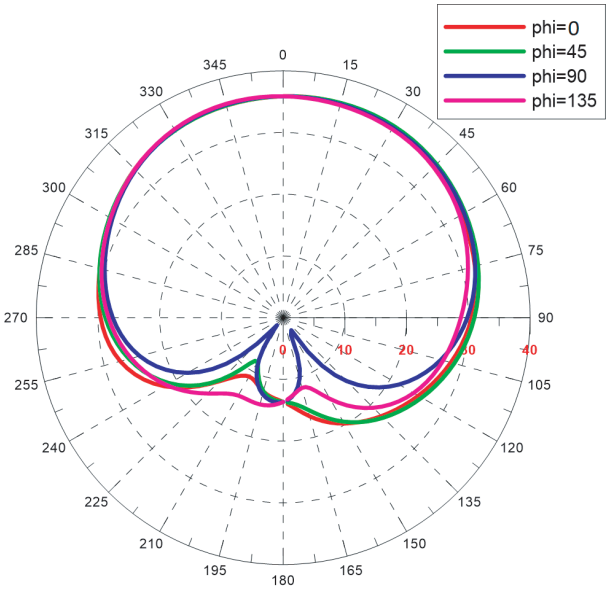
L1 band radiation patterns

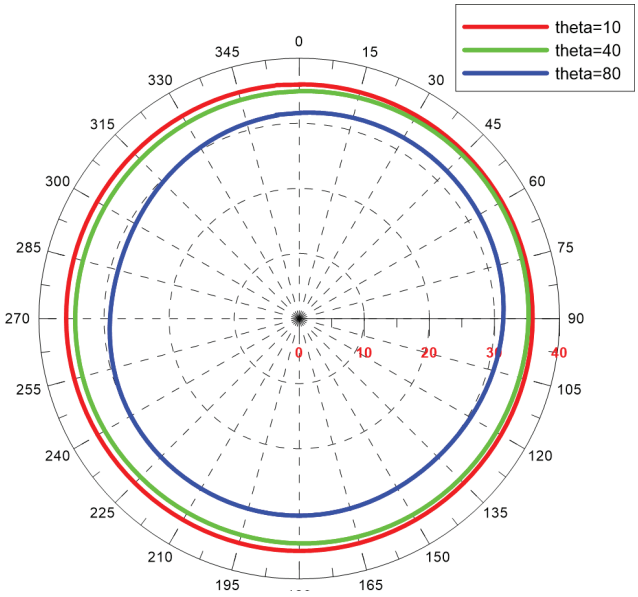
Maxtena's M8HCT-A-EMB uses patented Helicore technology which results in minimal dependence on frequency and features a wide beamwidth, low axial ratio and radiation pattern symmetry across all desired frequencies in L1, L2 and L5 bands.

RHCP Realized Gain [dBic] - Elevation Cuts



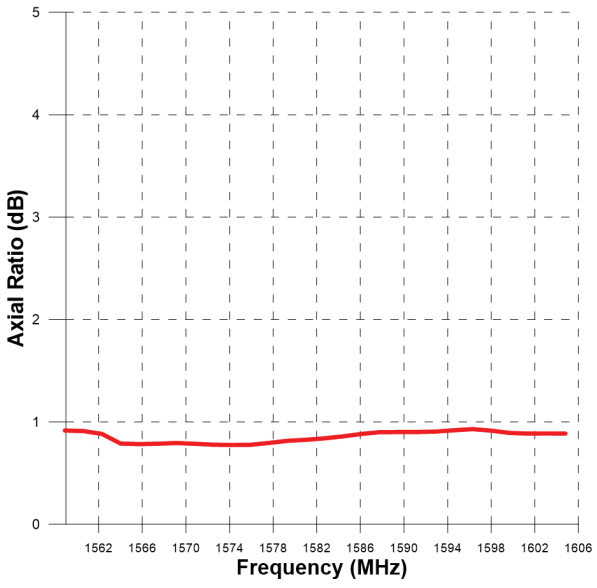
A 125 degree beamwidth ensures excellent hemispherical coverage.

RHCP Realized Gain [dBic] - Azimuth Cuts

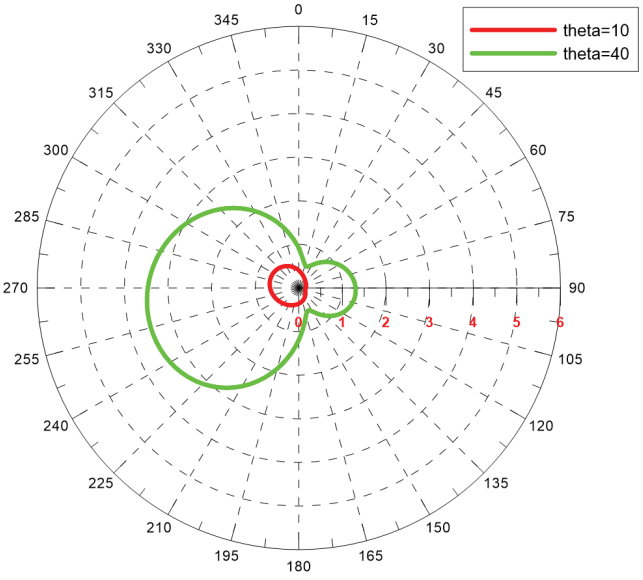


Symmetric coverage even in low elevation enhances accuracy.

Axial Ratio [dB] - Zenith



Axial Ratio [dB] - Azimuth Cuts



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L5 band radiation patterns

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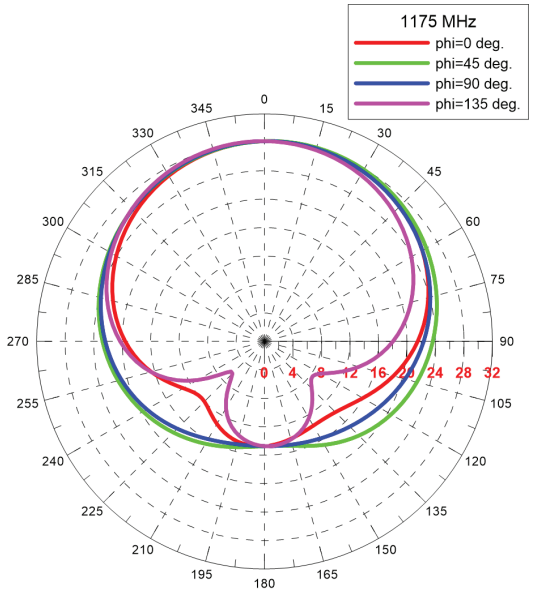
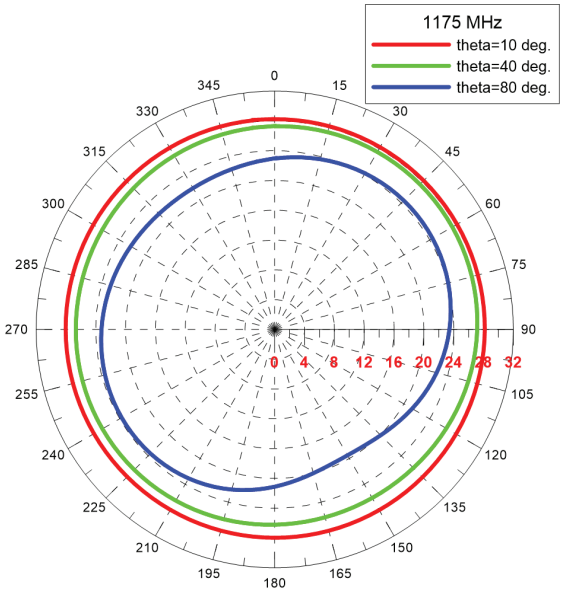
RHCP Realized Gain [dBic] - Elevation Cuts



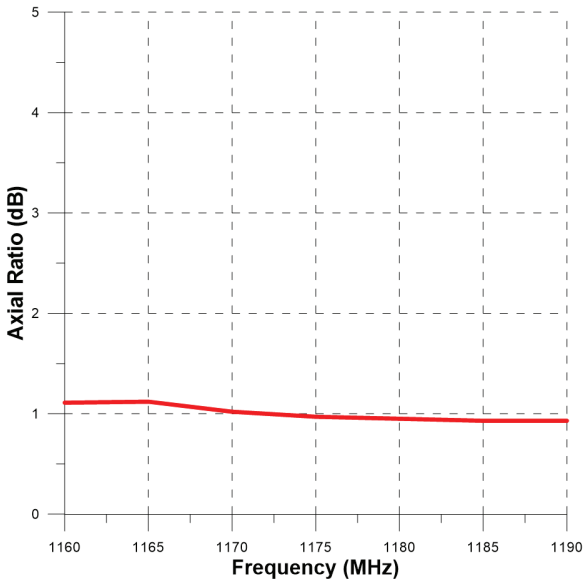
A 125 degree beamwidth ensures excellent hemispherical coverage.

RHCP Realized Gain [dBic] - Azimuth Cuts

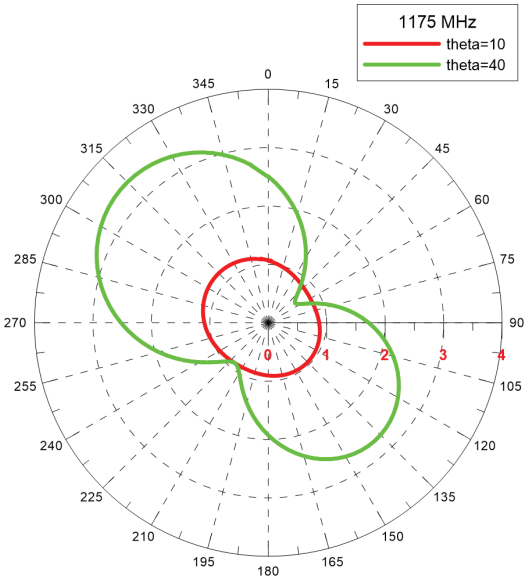


Symmetric coverage even in low elevation enhances accuracy.

Axial Ratio [dB] - Zenith



Axial Ratio [dB] - Azimuth Cuts



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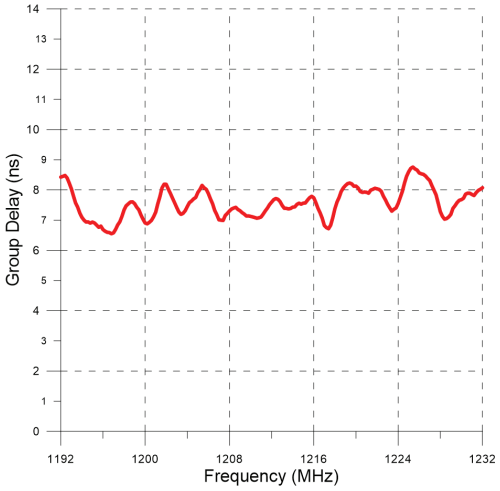
Excellent Group Delay Variation

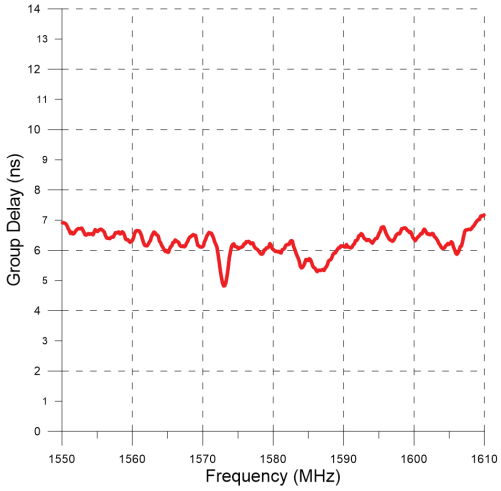
Using GPS signal carrier phase to increase accuracy in GNSS applications has been proven reliable and has made mm-level accuracy possible. However, in resolving carrier phase ambiguity, it is necessary to make sure carrier phase is received and measured accurately and that the effect of antenna and receiver on carrier phase is minimized. Maxtena's M8HCT-A-EMB has a flat response over all GNSS bands that it covers and has minimal group delay variation over frequency.

Filtering and LNA Performance

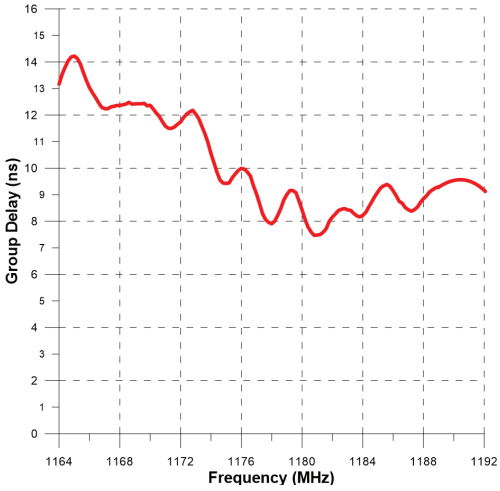
Maxtena's M8HCT-A-EMB antenna has a flat response over the L1, L2 and L5 GNSS bands, with less than 1 dB variation over each band. The superior out-of-band rejection ensures minimal interference.



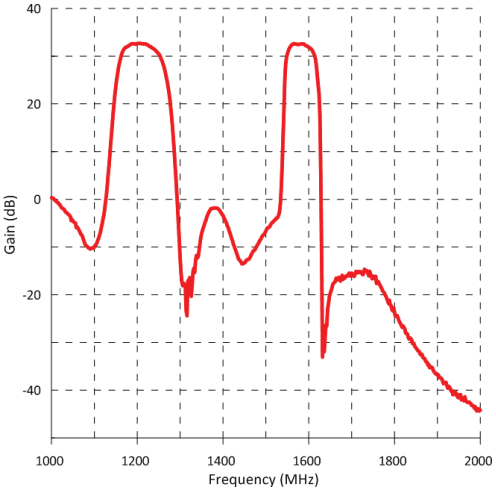
< 2 ns group delay variation over L2-band.



< 2 ns group delay variation over L1-band.



< 2 ns group delay variation over L5-band.



Flat conducted gain response.

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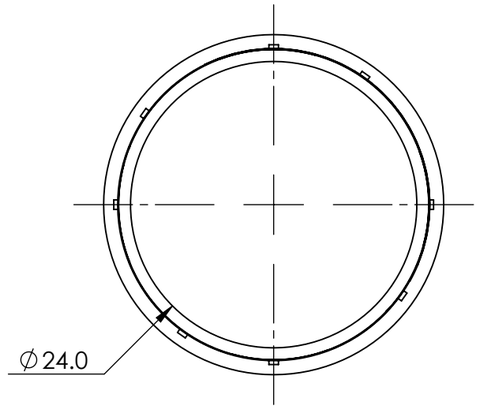
DRAWING REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	2021-03-11	QZ



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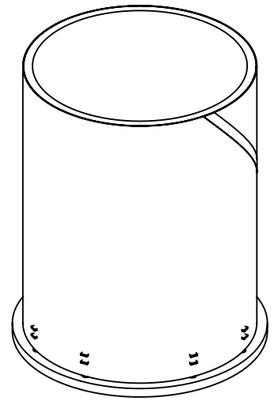

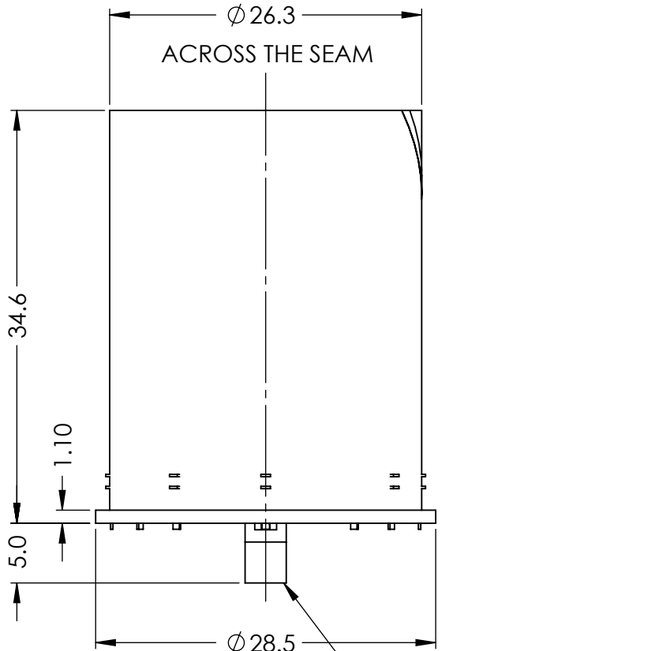

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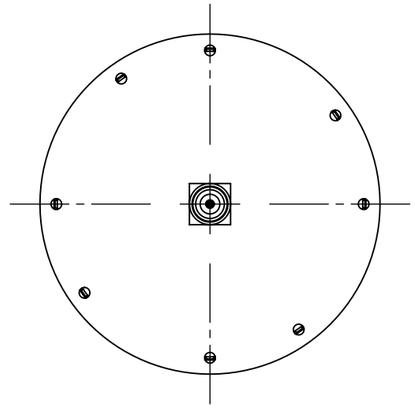

BOTTOM

ITEM 108-00076-01 REVISION HISTORY			
REV	DESCRIPTION	DATE	BY
A	INITIAL RELEASE	2021-03-11	QZ

		NAME	DATE
UNLESS OTHERWISE SPECIFIED:	DRAWN	QZ	2021-03-11
DIMENSIONS ARE IN MM TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± .5° BEND ± ONE PLACE DECIMAL ± 1.0 TWO PLACE DECIMAL ± .50	CHECKED	ZX	2021-03-15
	ENG APPR.	NPC	2021-03-18
	MFG APPR.		
	Q.A.		
INTERPRET GEOMETRIC TOLERANCING PER:	CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY.		
THIRD ANGLE PROJECTION			
DO NOT SCALE DRAWING			

MAXTENA, INC

TITLE: 108-00076-01 M8HCT-EMB

SIZE	DWG. NO.	REV
B	117-00412-01	A
CAGE CODE: 5KQH7	SCALE: NONE	SHEET 1 OF 1