

MESA-K-EVU— Evaluation Unit K-Band 22dBi Agile Beam Radar Aperture

Applications

- ◆ UAS Airborne Detect and Avoid
- ◆ Autonomous Vehicle Radar Vision
- ◆ Industrial & Agricultural Automation
- ◆ Perimeter Security & Surveillance



Features and Benefits

- ◆ Ultra Compact Size and Low Weight
- ◆ Easy Integration with Other Sensor Suites
- ◆ Integrated Beam Steering Controller
- ◆ Plug and Play (No Calibration Required)
- ◆ Simple Serial Command Structure
- ◆ Ultra Low Power Aperture Control
- ◆ Compatible with Pulsed & FMCW modes
- ◆ Ultra Fast Beam Transition < 1 uSec
- ◆ Up to 10 watt TX Power (Peak/Avg)

General Description - Metamaterial Electronically Scanning Array called MESA™ is a new architecture for forming and controlling a beam of radiating energy from a surface. This Evaluation Unit is an ideal platform for users to explore this disruptive technology in a wide range of applications requiring fast agile electronic beam steering without mechanical gimbals .

| Interfaces | |
|-----------------|-----------------------------------|
| DC Control I/O: | All through USB Type-C Connection |
| Sync/Standby | Discrete 3.3V TTL |
| Primary Control | USB 2.0 and CAN Serial |

| General SWAP and Environment | |
|------------------------------|--|
| Size | 22cm x 7.5cm x 2.5cm (< 415 cm ³) |
| Weight | < 800 grams |
| DC Power: | +7 to +28V ~6 watt (Standby <1W) |
| Op. Temp. | -40 to +75C (Storage -55 to +95C) |

| Aperture | |
|---------------|-------------------------------|
| Frequency | |
| Center Freq. | K-Band 24.0 to 24.5 GHz Std. |
| Bandwidth 3dB | 500 MHz min. (700MHz Typical) |

| Aperture - Continued | |
|---|--|
| Active Area | 12.8λ by 4λ |
| Edge Border | < 1.25 cm each side. |
| Antenna Parameters | |
| Realized Gain | 22dBi typical (on bore site) |
| Gain Roll off | 2.5dB Typ. Over FOV |
| Field of View | ±60° AZ, ±40° EL |
| Polarization | Horizontal (> 20 dB Cross Pol Iso.) |
| SLL Center <±45° | <-15dB max avg. all beams. |
| Load / Trans Time | <100uSec / <1 uSec |
| Beam Parameters— (Control Serial Theta/Phi Coordinates) | |
| AZ/EL (HPBW) | AZ 4° / EL 12° Typ. |
| Beam Pointing | Step 3° Typ. (Accuracy <1° Typical) Bore Sight Error 1° Typical |

Echodyne MESA™ Technology

Metamaterial Electronically Scanning Array

Echodyne's patented Metamaterial Electronically Scanning Array (MESA) represents a major breakthrough in radar technology – thinner, lighter, and lower cost than any other electronically scanning radar technology.

Unlike conventional mechanical apertures that steer a radar beam using motorized gimbals, Echodyne's MESA requires no moving parts to steer its beam. And unlike Phased Array radars or Active Electronically Scanning Array radars that require complicated and expensive transmit/receive modules - including phase shifters, amplifiers, circulators, and low noise amplifiers behind every single antenna element - MESA uses a vastly simpler metamaterials architecture. The net effect of this simplified architecture is dramatically lower cost, size, weight and power.

About Echodyne

Echodyne is reinventing the way the world uses radar by creating high performance electronically scanning radars with ultra-low C-SWAP (cost, size, weight, and power). Echodyne's patented Metamaterial Electronically Scanning Array (MESA) offers disruptive capabilities for existing radar applications, and enables new categories of radars never before thought possible such as small, lightweight radars for UAVs, robots, autonomous vehicles, and security that work well even when environmental conditions are less than ideal (e.g., in rain, snow, fog, dust, darkness, etc.). Echodyne is a privately held company backed by Bill Gates, Madrona Venture Group, Vulcan Capital, Lux Capital, and The Kresge Foundation, among others.

* Go to www.Echodyne.com for more information

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