Final Report
Miniaturized Multi-band-Antenna
GEDC-Cartiza

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Antenna Element Design
Initial Antenna Configuration
Return Loss

Graph showing return loss in dB against frequency in GHz.
Radiation pattern (1.2 GHz)

Directivity: 6.257dBi
Polarzn. Loss: 0.000dB
Material Loss: Not Known
Mismatch: -357.476mDB
Gain: 5.900dBi
Ant Eff: 92.098%
Rad Eff: 100.000%
Frequency: 1.20Hz

Scale: Linear: -∞ to 0dB-directivity
Contour at: -3 dB-directivity
Radiation pattern (1.4 GHz)

Directivity: 6.362 dB
Polarization loss: 0.000 dB
Material loss: Not known
Mismatch: -235.687 dB
Gain: 6.126 dB

Scale: Linear: $\infty$ to 0 dB
Contour at: -3 dB
Frequency: 1.4 GHz
Ant Eff: 94.718%
Rad Eff: 100.000%
A compact antenna element

- Configuration

Previous

Improved
Return loss

Previous
(Bandwidth=35%)

Improved
(Bandwidth=42%)
Multi-band Array of Antenna Design
8-Element Antenna Array

- Configuration

110 mm

855 mm
Radiation patterns - No Radome

At 1.7 GHz
(Directivity=15.0 dBi)
**Radiation patterns - No Radome**

At 2.1 GHz

(Directivity=15.6 dBi)
- Radiation patterns - No Radome

At 2.5 GHz
(Directivity=15.4 dBi)
8-Element Antenna Array with Radome

- Configuration

Radome Thickness = 2.2 mm

$\varepsilon_r = 4.5$
- Radiation patterns: With Radome

At 1.7 GHz
(Directivity=14.9 dBi)
Radiation patterns: With Radome

At 2.1 GHz
(Directivity=14.8 dBi)
- Radiation patterns: With Radome

At 2.5 GHz  
(Directivity=15.5 dBi)
2×4-Element Antenna Array for miniaturization

- Configuration

165 mm X 440 mm
(vs. 110 X 885 mm)
- Radiation patterns

At 1.7 GHz
(Directivity=13.8 dBi)
At 2.1 GHz
(Directivity=14.3 dBi)
At 2.5 GHz
(Directivity=14.5 dBi)
Result of the fabricated Antenna Array
Antenna Element

- Prototype
Antenna Element

- Measured return loss

Design Frequency: 1.71-2.5 GHz
Antenna Element

- Radiation patterns (to be measured)

At 1.7 GHz
Antenna Element

- Radiation patterns (to be measured)

At 2.1 GHz
Antenna Element

- Radiation patterns (to be measured)

At 2.1 GHz
1×8-Element Antenna Array

- Prototype
1×8-Element Antenna Array

- Measured return loss

Design Frequency: 1.71-2.5 GHz
1×8-Element Antenna Array

- Radiation patterns (to be measured)

At 1.7 GHz
1x8-Element Antenna Array

- Radiation patterns (to be measured)

At 2.1 GHz
1x8-Element Antenna Array

- Radiation patterns (to be measured)

At 2.5 GHz
2×4-Element Antenna Array

- Prototype
2×4-Element Antenna Array

- Measured return loss

Design Frequency: 1.71-2.5 GHz
2×4-Element Antenna Array

- Radiation patterns (to be measured)

At 1.7 GHz
2×4-Element Antenna Array

- Radiation patterns (to be measured)

At 2.1 GHz
2×4-Element Antenna Array

- Radiation patterns (to be measured)

At 2.5 GHz