

|                                               |                                                |          |           |
|-----------------------------------------------|------------------------------------------------|----------|-----------|
| Specification No.<br>CAF94505                 | Description<br>Internal Multi-Band PCB Antenna |          |           |
| Customer<br><b>General (Standard Product)</b> | Date<br>28 <sup>th</sup> Oct 2003              | Rev<br>A | Reference |

## Specification for Centurion Internal Multi-Band PCB Antenna Centurion P/N: CAF94505



**Specification is subject to change without notice**

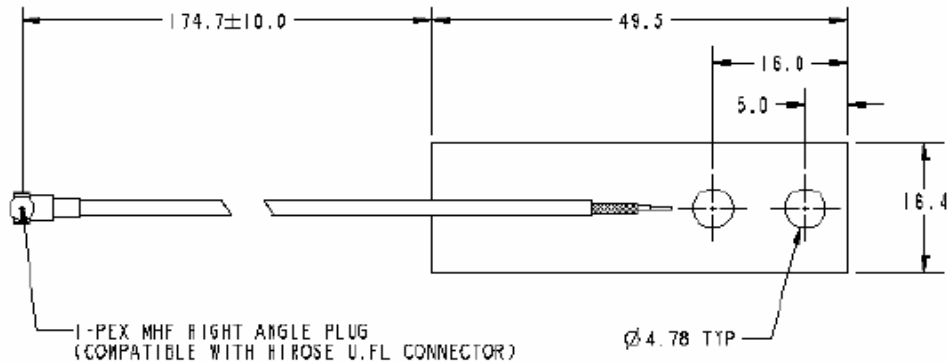
| Rev. | Issue Date                | Changes | Initiator | Approval | Approval |
|------|---------------------------|---------|-----------|----------|----------|
| A    | 28 <sup>th</sup> Oct 2003 | Initial | CS Por    | CS Por   | EL Kua   |
|      |                           |         |           |          |          |
|      |                           |         |           |          |          |

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|                                               |                                                       |          |           |
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Print for CAF94505



| CENTURION<br>PART NO. | FREQUENCY<br>RANGE           |
|-----------------------|------------------------------|
| CAF94505              | 2.4-2.5 GHz<br>4.9-5.825 GHz |

| LET                                                                                                                                                                                                                                                                                                                                                  | REVISIONS   | DATE  | CK | APP | SCALE: 1.500                                 | TOL. UNLESS NOTED                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------|----|-----|----------------------------------------------|-------------------------------------|
| D1                                                                                                                                                                                                                                                                                                                                                   | FIRST ISSUE | 04/03 | ~  | RL  | DR:RL CI:                                    | ± 0.30<br>± 0.13<br>ANGULAR = ± 30° |
| D2                                                                                                                                                                                                                                                                                                                                                   | UPDATE      | 06/03 | ~  | RL  | <b>CENTURION WIRELESS TECHNOLOGIES, INC.</b> |                                     |
| D3                                                                                                                                                                                                                                                                                                                                                   | UPDATE      | 07/03 | ~  | RL  | INTERNAL PCB WLAN ANTENNA, U.FL              |                                     |
| D4                                                                                                                                                                                                                                                                                                                                                   | UPDATE      | 08/03 | ~  | RL  | MATERIAL: N/A                                |                                     |
|                                                                                                                                                                                                                                                                                                                                                      |             |       |    |     | DATE: 4/28/03                                | DWG. NO.: CAF94505                  |
|                                                                                                                                                                                                                                                                                                                                                      |             |       |    |     | PG. 1/3                                      | REV D4                              |
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DIMENSIONS ARE IN MILLIMETERS  
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## Electrical performance

| General Information                |  |                  |                                          |
|------------------------------------|--|------------------|------------------------------------------|
| Customer:                          |  | Standard Product |                                          |
| Date:                              |  | 10-24-03         |                                          |
| Location:                          |  | Westminster      |                                          |
| Frequency Band, MHz<br>(Dual Band) |  | Multiband WLAN   |                                          |
| Antenna Type:                      |  |                  |                                          |
| Input Connection:                  |  | U.FL connector   |                                          |
| Prepared by: MZ                    |  | File:            | PROT 4905-02 Internal WLAN Remeasure.txt |
| Comments:                          |  |                  |                                          |

| Electrical Performance Summary: VSWR (:1.0) |                |      |  |  |
|---------------------------------------------|----------------|------|--|--|
| Specification                               |                |      |  |  |
| Measurement Configuration                   | Data           |      |  |  |
|                                             | Freq.<br>(GHz) | VSWR |  |  |
|                                             | 2400           | 1.6  |  |  |
|                                             | 2450           | 1.2  |  |  |
|                                             | 2500           | 1.2  |  |  |
|                                             | 4900           | 1.2  |  |  |
|                                             | 4997.5         | 1.1  |  |  |
|                                             | 5095           | 1.3  |  |  |
|                                             | 5192.5         | 1.5  |  |  |
|                                             | 5290           | 1.5  |  |  |
|                                             | 5387.5         | 1.5  |  |  |
|                                             | 5485           | 1.3  |  |  |
| -                                           | 5582.5         | 1.1  |  |  |
| -                                           | 5680           | 1.5  |  |  |
| -                                           | 5777.5         | 1.7  |  |  |
| -                                           | 5875           | 1.8  |  |  |

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|                                               |                                                |          |           |
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| Customer<br><b>General (Standard Product)</b> | Date<br>28 <sup>th</sup> Oct 2003              | Rev<br>A | Reference |

| Electrical Performance Summary: Average Gain (dBi) |                |         |                    |                     |
|----------------------------------------------------|----------------|---------|--------------------|---------------------|
| Specification:                                     | Unspecified    |         |                    |                     |
| Measurement Configuration                          | Data           |         |                    |                     |
|                                                    | Freq.<br>(MHz) | Azimuth | Elevation<br>Phi=0 | Elevation<br>Phi=90 |
|                                                    | 2400           | -0.1    | -3.4               | -2.4                |
|                                                    | 2450           | 1.1     | -3.4               | -2.5                |
|                                                    | 2500           | 2.3     | -3.7               | -2.5                |
|                                                    | 4900           | 1.3     | -2.4               | -3.1                |
|                                                    | 4997.5         | 1.1     | -2.4               | -3.2                |
|                                                    | 5095           | 0.7     | -2.8               | -3.5                |
|                                                    | 5192.5         | 1.3     | -2.3               | -3.1                |
|                                                    | 5290           | 1.8     | -1.9               | -2.7                |
| -                                                  | 5387.5         | 1.9     | -1.4               | -2.3                |
| -                                                  | 5485           | 1.9     | -1.3               | -2.3                |
| -                                                  | 5582.5         | 1.3     | -2                 | -2.9                |
| -                                                  | 5680           | 1       | -2.2               | -3.2                |
| -                                                  | 5777.5         | 0.7     | -2.5               | -3.5                |
| -                                                  | 5875           | 0.8     | -2.5               | -3.7                |

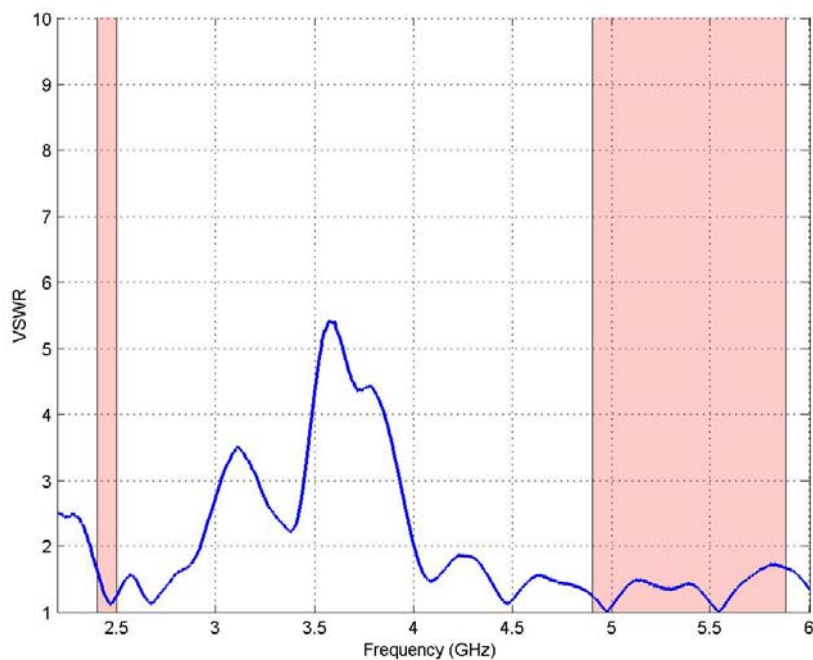
| Electrical Performance Summary: Peak Gain (dBi) |                |         |                    |                     |
|-------------------------------------------------|----------------|---------|--------------------|---------------------|
| Specification                                   |                |         |                    |                     |
| Measurement Configuration                       | Data           |         |                    |                     |
|                                                 | Freq.<br>(MHz) | Azimuth | Elevation<br>Phi=0 | Elevation<br>Phi=90 |
|                                                 | 2400           | 2.6     | -0.5               | 0.6                 |
|                                                 | 2450           | 3.8     | -0.4               | 0.3                 |
|                                                 | 2500           | 3.9     | -0.1               | 0.3                 |
|                                                 | 4900           | 4.7     | 2.1                | 1.4                 |
|                                                 | 4997.5         | 4.6     | 2.2                | 1.2                 |
|                                                 | 5095           | 4.2     | 2                  | 0.8                 |
|                                                 | 5192.5         | 4.7     | 2.4                | 1.1                 |
|                                                 | 5290           | 5.1     | 3.1                | 1.7                 |
|                                                 | 5387.5         | 5.3     | 3.6                | 2                   |
|                                                 | 5485           | 5.5     | 3.6                | 2.3                 |
|                                                 | 5582.5         | 4.9     | 3.1                | 1.5                 |
|                                                 | 5680           | 4.7     | 2.8                | 1.5                 |
|                                                 | 5777.5         | 4.4     | 2.3                | 1.1                 |
|                                                 | 5875           | 4.5     | 2                  | 1.2                 |

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| Customer<br><b>General (Standard Product)</b> | Date<br>28 <sup>th</sup> Oct 2003                     | Rev<br>A | Reference |

### VSWR Performance

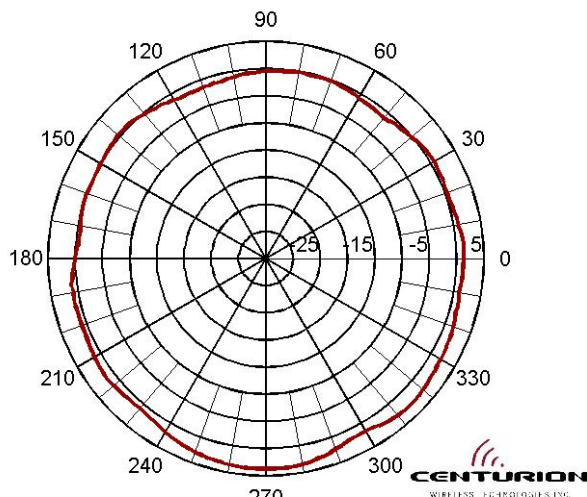


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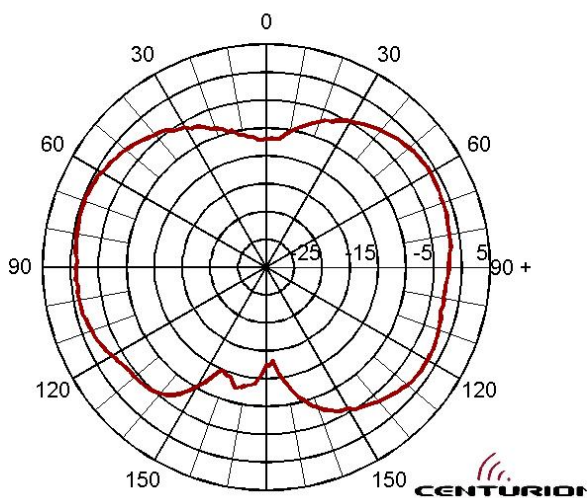
**Azimuth Cut, 2450 MHz**



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— Max. Gain = 3.8 dBi; Avg. Gain = 1.1 dBi; P to P Ripple = 5.3

**Elevation Cut, Phi=0, 2450 MHz**



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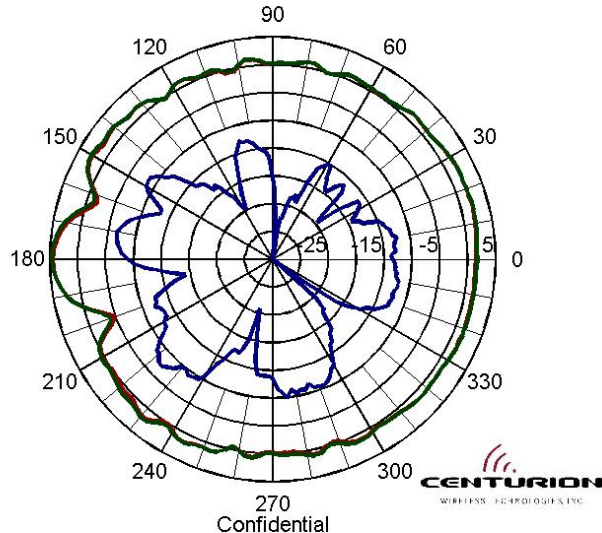
— Max. Gain = -0.4 dBi; Avg. Gain = -3.7 dBi

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| Customer<br><b>General (Standard Product)</b> | Date<br>28 <sup>th</sup> Oct 2003                     | Rev<br>A | Reference |

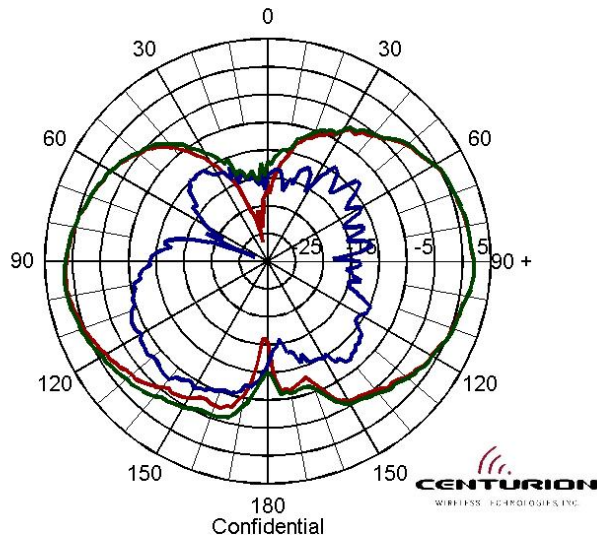
**CAF94505 Internal WLAN**  
**Azimuth Cut, 4900 MHz**



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|   |                                                                           |
|---|---------------------------------------------------------------------------|
| — | Theta Pol Max. Gain = 4.5 dBi; Avg. Gain = 1.1 dBi; P to P Ripple = 9.3   |
| — | Phi Pol Max. Gain = -6.6 dBi; Avg. Gain = -12.9 dBi; P to P Ripple = 28.4 |
| — | Total Power Max. Gain = 4.7 dBi; Avg. Gain = 1.3 dBi; P to P Ripple = 8.8 |

**CAF94505 Internal WLAN**  
**Elevation Cut, Phi=0, 4900 MHz**



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|   |                                                       |
|---|-------------------------------------------------------|
| — | Theta Pol Max. Gain = 2.0 dBi; Avg. Gain = -2.8 dBi   |
| — | Phi Pol Max. Gain = -7.4 dBi; Avg. Gain = -13.7 dBi   |
| — | Total Power Max. Gain = 2.1 dBi; Avg. Gain = -2.4 dBi |

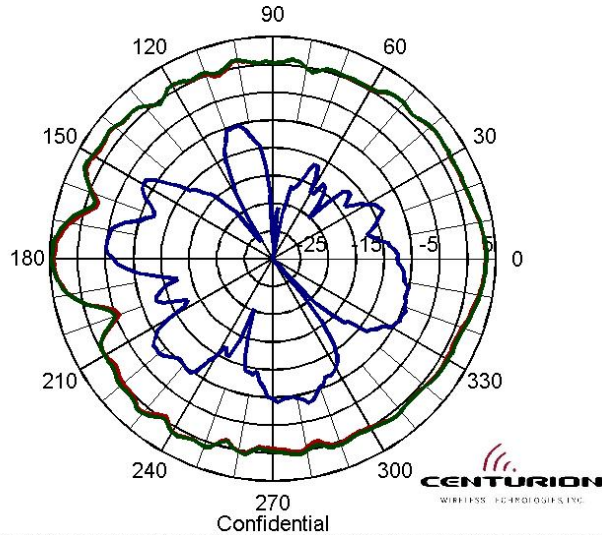
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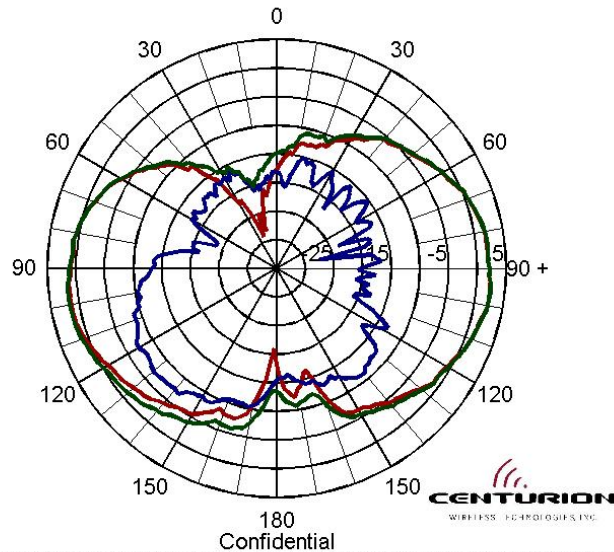
**CAF94505 Internal WLAN**  
**Azimuth Cut, 5192.5 MHz**



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|                                                                             |
|-----------------------------------------------------------------------------|
| — Theta Pol Max. Gain = 4.3 dBi; Avg. Gain = 1.1 dBi; P to P Ripple = 10.0  |
| — Phi Pol Max. Gain = -5.0 dBi; Avg. Gain = -12.0 dBi; P to P Ripple = 30.0 |
| — Total Power Max. Gain = 4.7 dBi; Avg. Gain = 1.3 dBi; P to P Ripple = 9.6 |

**CAF94505 Internal WLAN**  
**Elevation Cut, Phi=0, 5192.5 MHz**



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|                                                         |
|---------------------------------------------------------|
| — Theta Pol Max. Gain = 2.4 dBi; Avg. Gain = -2.7 dBi   |
| — Phi Pol Max. Gain = -7.0 dBi; Avg. Gain = -13.2 dBi   |
| — Total Power Max. Gain = 2.4 dBi; Avg. Gain = -2.3 dBi |

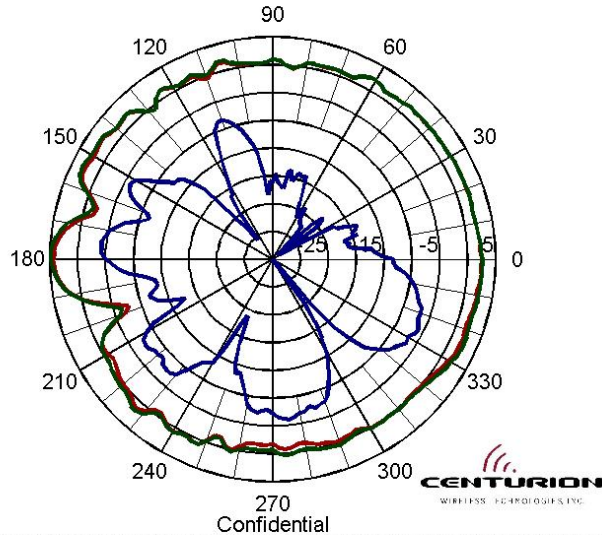
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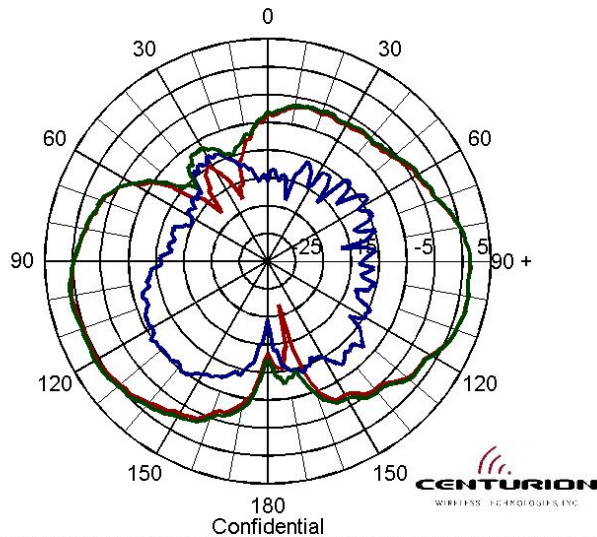
**CAF94505 Internal WLAN**  
**Azimuth Cut, 5582.5 MHz**



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|                                                                              |
|------------------------------------------------------------------------------|
| — Theta Pol Max. Gain = 4.4 dBi; Avg. Gain = 1.0 dBi; P to P Ripple = 12.2   |
| — Phi Pol Max. Gain = -4.0 dBi; Avg. Gain = -10.5 dBi; P to P Ripple = 31.0  |
| — Total Power Max. Gain = 4.9 dBi; Avg. Gain = 1.3 dBi; P to P Ripple = 11.3 |

**CAF94505 Internal WLAN**  
**Elevation Cut, Phi=90, 5582.5 MHz**



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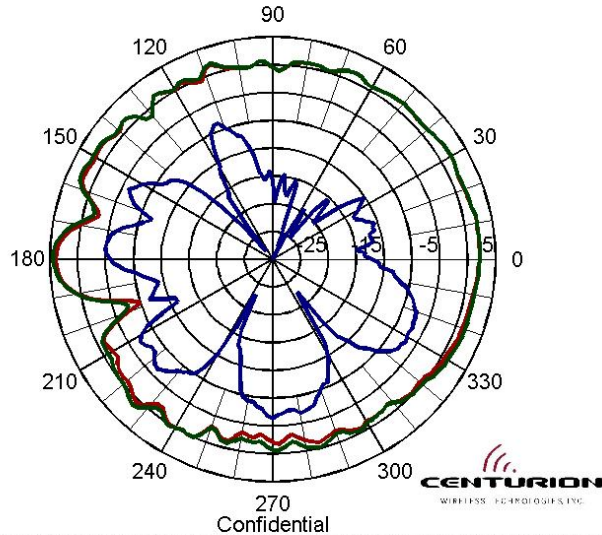
|                                                         |
|---------------------------------------------------------|
| — Theta Pol Max. Gain = 1.5 dBi; Avg. Gain = -3.2 dBi   |
| — Phi Pol Max. Gain = -9.6 dBi; Avg. Gain = -14.7 dBi   |
| — Total Power Max. Gain = 1.5 dBi; Avg. Gain = -2.9 dBi |

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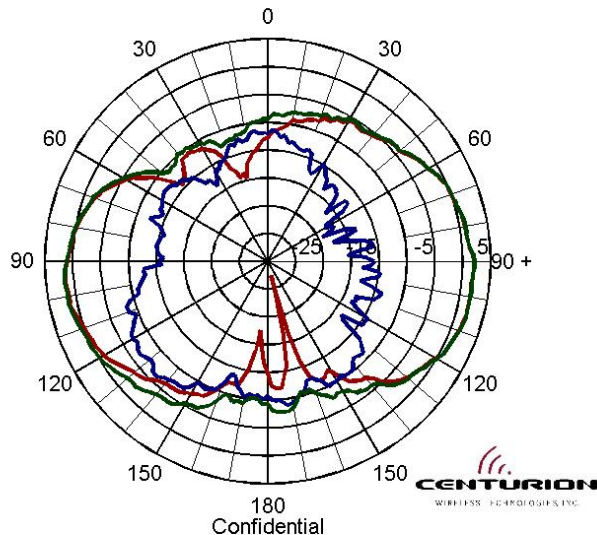
**CAF94505 Internal WLAN**  
**Azimuth Cut, 5875 MHz**



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|                                                                              |
|------------------------------------------------------------------------------|
| — Theta Pol Max. Gain = 4.0 dBi; Avg. Gain = 0.5 dBi; P to P Ripple = 14.1   |
| — Phi Pol Max. Gain = -4.9 dBi; Avg. Gain = -10.8 dBi; P to P Ripple = 30.1  |
| — Total Power Max. Gain = 4.5 dBi; Avg. Gain = 0.8 dBi; P to P Ripple = 12.3 |

**CAF94505 Internal WLAN**  
**Elevation Cut, Phi=0, 5875 MHz**



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|                                                         |
|---------------------------------------------------------|
| — Theta Pol Max. Gain = 2.0 dBi; Avg. Gain = -3.0 dBi   |
| — Phi Pol Max. Gain = -6.3 dBi; Avg. Gain = -12.1 dBi   |
| — Total Power Max. Gain = 2.0 dBi; Avg. Gain = -2.5 dBi |

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