

# Microwave Path Data Sheet

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## COMSEARCH

19700 Janelia Farm Boulevard, Ashburn, VA, 20147  
(703)726-5824 [www.comsearch.com](http://www.comsearch.com)

PCN Date: 05/18/2011

Job Number: 101117COMSSL07

| Administrative Information    | CA-SFO0432C CA                           | CA-SJC0072A CA                           |
|-------------------------------|------------------------------------------|------------------------------------------|
| City/County                   | San Jose/Santa Clara                     | San Jose/Santa Clara                     |
| Status / License Basis        | Engineering Proposal / PRIMARY OPERATION | Engineering Proposal / PRIMARY OPERATION |
| Call Sign                     | WQLY752                                  | WQMM242                                  |
| Licensee Code                 | CLESP3                                   | CLESP3                                   |
| Licensee Name                 | Clearwire Spectrum Holdings III, LL      | Clearwire Spectrum Holdings III, LL      |
| Radio Service / Station Class | MG -- Microwave Industrial/Business Pool | FXO -- Fixed                             |

### Site Information

|                                  |                  |                  |
|----------------------------------|------------------|------------------|
| Latitude (NAD 83)                | 37 °19' 2.8" N   | 37 °24' 2.4" N   |
| Longitude (NAD 83)               | 121 °56' 51.1" W | 121 °56' 26.3" W |
| Ground Elevation (m/ft-AMSL)     | 44.10 / 144.7    | 4.60 / 15.1      |
| Antenna Structure Registration # |                  |                  |
| Path Azimuth (°)                 | 3.778            | 183.782          |
| Path Length (km / miles)         | 9.257 / 5.752    |                  |

### Transmit Antenna

|                                    |                     |                    |
|------------------------------------|---------------------|--------------------|
| Manufacturer                       | RB1160              | RB1160             |
| Model                              | RADIO WAVES, INC    | RADIO WAVES, INC   |
| Gain(dBi) / Beamwidth(°) / Tilt(°) | HP2-18              | HP2-18             |
| Centerline (m / ft - AGL)          | 38.6 / 2.00 / -0.45 | 38.6 / 2.00 / 0.39 |
|                                    | 49.38 / 162.0       | 21.34 / 70.0       |

### Receive Antenna

Same As Transmit

|                            |
|----------------------------|
| Manufacturer               |
| Model                      |
| Gain (dBi) / Beamwidth (°) |
| Centerline (m / ft - AGL)  |

### Diversity Receive Antenna

|                            |
|----------------------------|
| Manufacturer               |
| Model                      |
| Gain (dBi) / Beamwidth (°) |
| Centerline (m / ft - AGL)  |

### Radio Information

|                                  |                             |                             |
|----------------------------------|-----------------------------|-----------------------------|
| Manufacturer                     | TEMO93                      | TEMO93                      |
| Model                            | DRAGONWAVE INC              | DRAGONWAVE INC              |
| Model Description                | 18HC50HFC171V04             | 18HC50HFC171V04             |
| Emission Designator / Modulation | Horizon Compact             | Horizon Compact             |
| Loading                          | 45M8D7W 32 QAM              | 45M8D7W 32 QAM              |
| Stability (%)                    | 1 CH DIG 171000.000         | 1 CH DIG 171000.000         |
|                                  | 0.001                       | 0.001                       |
|                                  | Nominal Coordinated Maximum | Nominal Coordinated Maximum |
| Power (dBm)                      | 22.0                        | 22.0                        |
| Received Level (dBm)             | -38.0                       | -38.0                       |
| EIRP (dBm)                       | 60.6                        | 60.6                        |
| Fixed Loss: Tx / Common (dB)     | 0.0 / 0.0                   | 0.0 / 0.0                   |
| Free Space Loss (dB)             |                             | 137.2                       |

|                            |                |                |
|----------------------------|----------------|----------------|
| Transmit Frequencies (MHz) | 17865.0000V(3) | 19425.0000V(3) |
|----------------------------|----------------|----------------|

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Job Number 101117COMSSL07

| Administrative Information    | CA-SFO1000A CA                           | CA-SFO0383A CA                           |
|-------------------------------|------------------------------------------|------------------------------------------|
| City/County                   | Fremont/Alameda                          | Fremont/Alameda                          |
| Status / License Basis        | Engineering Proposal / PRIMARY OPERATION | Engineering Proposal / PRIMARY OPERATION |
| Call Sign                     | WQND415                                  | WQML542                                  |
| Licensee Code                 | CLESP3                                   | CLESP3                                   |
| Licensee Name                 | Clearwire Spectrum Holdings III, LL      | Clearwire Spectrum Holdings III, LL      |
| Radio Service / Station Class | MG -- Microwave Industrial/Business Pool | FXO -- Fixed                             |

### Site Information

|                                  |                  |                  |
|----------------------------------|------------------|------------------|
| Latitude (NAD 83)                | 37 °31' 50.7" N  | 37 °30' 38.5" N  |
| Longitude (NAD 83)               | 121 °58' 14.6" W | 121 °57' 55.1" W |
| Ground Elevation (m/ft-AMSL)     | 10.00 / 32.8     | 8.00 / 26.2      |
| Antenna Structure Registration # |                  |                  |
| Path Azimuth (°)                 | 167.858          | 347.861          |
| Path Length (km / miles)         | 2.277 / 1.415    |                  |

### Transmit Antenna

|                                    |                    |                     |
|------------------------------------|--------------------|---------------------|
| Manufacturer                       | 87204A             | 87204A              |
| Model                              | ANDREW CORPORATION | ANDREW CORPORATION  |
| Gain(dBi) / Beamwidth(°) / Tilt(°) | VHLP2-18B          | VHLP2-18B           |
| Centerline (m / ft - AGL)          | 38.9 / 2.10 / 0.11 | 38.9 / 2.10 / -0.13 |
|                                    | 26.21 / 86.0       | 32.92 / 108.0       |

### Receive Antenna

Same As Transmit

Manufacturer  
Model  
Gain (dBi) / Beamwidth (°)  
Centerline (m / ft - AGL)

### Diversity Receive Antenna

Manufacturer  
Model  
Gain (dBi) / Beamwidth (°)  
Centerline (m / ft - AGL)

### Radio Information

|                                  |                             |                             |
|----------------------------------|-----------------------------|-----------------------------|
| Manufacturer                     | TEMR29                      | TEMR29                      |
| Model                            | DRAGONWAVE INC              | DRAGONWAVE INC              |
| Model Description                | 18HD50HFC364V02             | 18HD50HFC364V02             |
| Emission Designator / Modulation | HORIZON DUO                 | HORIZON DUO                 |
| Loading                          | 47M1D7W 256 QAM             | 47M1D7W 256 QAM             |
| Stability (%)                    | 1 CH DIG 364000.000         | 1 CH DIG 364000.000         |
|                                  | 0.001                       | 0.001                       |
|                                  | Nominal Coordinated Maximum | Nominal Coordinated Maximum |
| Power (dBm)                      | 12.0                        | 12.0                        |
| Received Level (dBm)             | -35.3                       | -35.3                       |
| EIRP (dBm)                       | 50.9                        | 50.9                        |
| Fixed Loss: Tx / Common (dB)     | 0.0 / 0.0                   | 0.0 / 0.0                   |
| Free Space Loss (dB)             |                             | 125.1                       |

**Transmit Frequencies (MHz)** 19525.0000H(5) 19625.0000H(7) 17965.0000H(5) 18065.0000H(7)

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Job Number 101117COMSSL07

| Administrative Information    | CA-SFO0301C CA                           | CA-SFO0308A CA                           |
|-------------------------------|------------------------------------------|------------------------------------------|
| City/County                   | Hayward/Alameda                          | Hayward/Alameda                          |
| Status / License Basis        | Engineering Proposal / PRIMARY OPERATION | Engineering Proposal / PRIMARY OPERATION |
| Call Sign                     | WQLY340                                  | WQML528                                  |
| Licensee Code                 | CLESP3                                   | CLESP3                                   |
| Licensee Name                 | Clearwire Spectrum Holdings III, LL      | Clearwire Spectrum Holdings III, LL      |
| Radio Service / Station Class | MG -- Microwave Industrial/Business Pool | FXO -- Fixed                             |

### Site Information

|                                  |                 |                 |
|----------------------------------|-----------------|-----------------|
| Latitude (NAD 83)                | 37 °37' 59.7" N | 37 °37' 11.6" N |
| Longitude (NAD 83)               | 122 °5' 16.6" W | 122 °5' 56.4" W |
| Ground Elevation (m/ft-AMSL)     | 10.60 / 34.8    | 3.40 / 11.2     |
| Antenna Structure Registration # |                 |                 |
| Path Azimuth (°)                 | 213.353         | 33.346          |
| Path Length (km / miles)         | 1.775 / 1.103   |                 |

### Transmit Antenna

|                                    |                     |                    |
|------------------------------------|---------------------|--------------------|
| Manufacturer                       | 80014A              | 80014A             |
| Model                              | ANDREW CORPORATION  | ANDREW CORPORATION |
| Gain(dBi) / Beamwidth(°) / Tilt(°) | VHLP1-23A           | VHLP1-23A          |
| Centerline (m / ft - AGL)          | 35.3 / 3.00 / -0.19 | 35.3 / 3.00 / 0.18 |
|                                    | 19.81 / 65.0        | 21.34 / 70.0       |

### Receive Antenna

Same As Transmit

Manufacturer  
Model  
Gain (dBi) / Beamwidth (°)  
Centerline (m / ft - AGL)

### Diversity Receive Antenna

Manufacturer  
Model  
Gain (dBi) / Beamwidth (°)  
Centerline (m / ft - AGL)

### Radio Information

|                                  |                             |                             |
|----------------------------------|-----------------------------|-----------------------------|
| Manufacturer                     | TEMR36                      | TEMR36                      |
| Model                            | DRAGONWAVE INC              | DRAGONWAVE INC              |
| Model Description                | 23HD50HFC364V02             | 23HD50HFC364V02             |
| Emission Designator / Modulation | HORIZON DUO                 | HORIZON DUO                 |
| Loading                          | 47M1D7W 256 QAM             | 47M1D7W 256 QAM             |
| Stability (%)                    | 1 CH DIG 364000.000         | 1 CH DIG 364000.000         |
|                                  | 0.001                       | 0.001                       |
|                                  | Nominal Coordinated Maximum | Nominal Coordinated Maximum |
| Power (dBm)                      | 15.5                        | 15.5                        |
| Received Level (dBm)             | -38.2                       | -38.2                       |
| EIRP (dBm)                       | 50.8                        | 50.8                        |
| Fixed Loss: Tx / Common (dB)     | 0.0 / 0.0                   | 0.0 / 0.0                   |
| Free Space Loss (dB)             |                             | 124.3                       |

**Transmit Frequencies (MHz)** 21825.0000V(1) 21975.0000V(4) 23025.0000V(1) 23175.0000V(4)

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|                                    |                                          |                                          |                                |
|------------------------------------|------------------------------------------|------------------------------------------|--------------------------------|
| <b>Administrative Information</b>  |                                          | <b>CA-SFO0432C CA</b>                    | <b>CA-SFO0449A CA</b>          |
| City/County                        | San Jose/Santa Clara                     | Campbell/Santa Clara                     |                                |
| Status / License Basis             | Engineering Proposal / PRIMARY OPERATION | Engineering Proposal / PRIMARY OPERATION |                                |
| Call Sign                          | WQLY752                                  | WQMM288                                  |                                |
| Licensee Code                      | CLESP3                                   | CLESP3                                   |                                |
| Licensee Name                      | Clearwire Spectrum Holdings III, LL      | Clearwire Spectrum Holdings III, LL      |                                |
| Radio Service / Station Class      | MG -- Microwave Industrial/Business Pool | FXO -- Fixed                             |                                |
| <b>Site Information</b>            |                                          |                                          |                                |
| Latitude (NAD 83)                  | 37 °19' 2.8" N                           | 37 °16' 51.0" N                          |                                |
| Longitude (NAD 83)                 | 121 °56' 51.1" W                         | 121 °57' 28.0" W                         |                                |
| Ground Elevation (m/ft-AMSL)       | 44.10 / 144.7                            | 63.10 / 207.0                            |                                |
| Antenna Structure Registration #   |                                          |                                          |                                |
| Path Azimuth (°)                   | 192.610                                  | 12.604                                   |                                |
| Path Length (km / miles)           | 4.164 / 2.587                            |                                          |                                |
| <b>Transmit Antenna</b>            |                                          |                                          |                                |
| Manufacturer                       | RD1150                                   | RD1150                                   |                                |
| Model                              | RADIO WAVES, INC                         | RADIO WAVES, INC                         |                                |
| Gain(dBi) / Beamwidth(°) / Tilt(°) | HP2-23                                   | HP2-23                                   |                                |
| Centerline (m / ft - AGL)          | 40.2 / 1.70 / -0.22                      | 40.2 / 1.70 / 0.19                       |                                |
|                                    | 49.38 / 162.0                            | 15.24 / 50.0                             |                                |
| <b>Receive Antenna</b>             |                                          | Same As Transmit                         |                                |
| Manufacturer                       |                                          |                                          |                                |
| Model                              |                                          |                                          |                                |
| Gain (dBi) / Beamwidth (°)         |                                          |                                          |                                |
| Centerline (m / ft - AGL)          |                                          |                                          |                                |
| <b>Diversity Receive Antenna</b>   |                                          |                                          |                                |
| Manufacturer                       |                                          |                                          |                                |
| Model                              |                                          |                                          |                                |
| Gain (dBi) / Beamwidth (°)         |                                          |                                          |                                |
| Centerline (m / ft - AGL)          |                                          |                                          |                                |
| <b>Radio Information</b>           |                                          |                                          |                                |
| Manufacturer                       | TEMQ54                                   | TEMQ54                                   |                                |
| Model                              | DRAGONWAVE INC                           | DRAGONWAVE INC                           |                                |
| Model Description                  | 23HD50HFC215V02                          | 23HD50HFC215V02                          |                                |
| Emission Designator / Modulation   | HORIZON DUO                              | HORIZON DUO                              |                                |
| Loading                            | 45M8D7W 64 QAM                           | 45M8D7W 64 QAM                           |                                |
| Stability (%)                      | 1 CH DIG 215000.000                      | 1 CH DIG 215000.000                      |                                |
|                                    | 0.001                                    | 0.001                                    |                                |
|                                    | Nominal Coordinated Maximum              | Nominal Coordinated Maximum              |                                |
| Power (dBm)                        | 10.0                                     | 10.0                                     |                                |
| Received Level (dBm)               | -41.3                                    | -41.3                                    |                                |
| EIRP (dBm)                         | 50.2                                     | 50.2                                     |                                |
| Fixed Loss: Tx / Common (dB)       | 0.0 / 0.0                                | 0.0 / 0.0                                |                                |
| Free Space Loss (dB)               |                                          | 131.7                                    |                                |
| <b>Transmit Frequencies (MHz)</b>  | 23325.0000H(7)                           | 23475.0000H(10)                          | 22125.0000H(7) 22275.0000H(10) |