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January 5, 2012

**RECEIVED**  
JAN - 6 2012

**CONNECTICUT  
SITING COUNCIL**

Linda Roberts  
Executive Director  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap  
175 Dickinson Road, Glastonbury, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains twelve (12) wireless telecommunications antennas at the 167-foot level of the existing 180-foot tower at the above-referenced address. The tower is owned by SBA. The Council approved Cellco’s shared use of this tower in 2000. Cellco now intends to modify its installation by replacing all of its existing antennas with four (4) model LPA-80063/4CF cellular antennas; two (2) model APL868013-42T0 cellular antennas; three (3) model BXA-171085/8BF PCS antennas; and three (3) model BXA-70063/4CF LTE antennas, all at the same 167-foot level on the tower. Cellco also intends to install six (6) coax cable diplexers on its existing antenna platform. Attached behind Tab 1 are the specifications for the proposed replacement antennas and cable diplexers.



*Law Offices*

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ALBANY

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www.rc.com

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Richard J. Johnson, Town Manager for the Town of Glastonbury. A copy of this letter is also being sent to Randall Chapman and Beverly and Ronald Bronzi, the owners of the property on which the tower is located.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

# ROBINSON & COLE<sub>LLP</sub>

Linda Roberts  
January 5, 2012  
Page 2

1. The proposed modifications will not result in an increase in the overall height of the existing tower. Cellco's antennas and cable diplexers will be located at the 167-foot level on the existing 180-foot tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) power density levels at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for Cellco's modified facility is included behind Tab 2.

Also attached is a Structural Analysis confirming that the tower and foundation can support Cellco's proposed modifications. (See Tab 3).

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Richard J. Johnson, Glastonbury Town Manager  
Randall Chapman and Beverly and Ronald Bronzi  
Sandy M. Carter





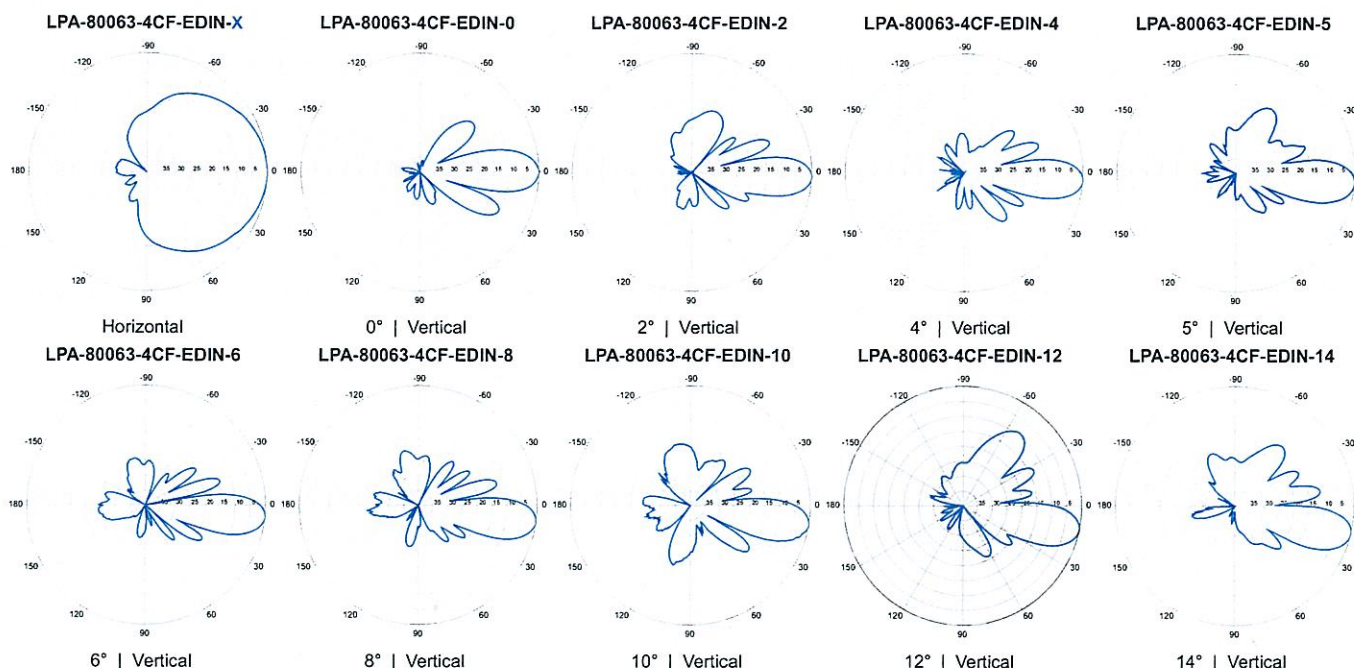
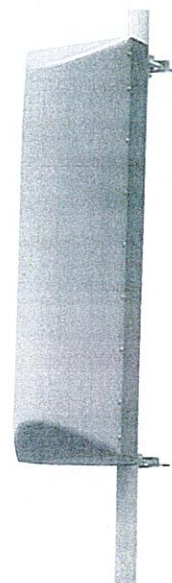
## LPA-80063-4CF-EDIN-X

V-Pol | Log Periodic | 63° | 13.0 dBd

Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	
Frequency bands	806-960 MHz
Polarization	Vertical
Horizontal beamwidth	63°
Vertical beamwidth	15°
Gain	13.0 dBd (15.1 dBi)
Electrical downtilt (X)	0, 2, 4, 5, 6, 8, 10, 12, 14
Impedance	50Ω
VSWR	≤1.4:1
Upper sidelobe suppression (0°)	-15.7 dB
Front-to-back ratio (+/-30°)	-31.7 dB
Null fill	5% (-26.02 dB)
Input power	500 W
Lightning protection	Direct Ground
Connector(s)	1 Port / EDIN or NE / Female / Center (Back)
Mechanical Characteristics	
Dimensions Length x Width x Depth	1205 x 385 x 332 mm 47.4 x 15.2 x 13.1 in
Depth of antenna with z-bracket	372 mm 14.6 in
Weight without mounting brackets	9.1 kg 20 lbs
Survival wind speed	> 201 km/hr > 125 mph
Wind area	Front: 0.46 m <sup>2</sup> Side: 0.39 m <sup>2</sup> Front: 5.0 ft <sup>2</sup> Side: 4.2 ft <sup>2</sup>
Wind load @ 161 km/hr (100 mph)	Front: 660 N Side: 550 N Front: 149 lbf Side: 124 lbf
Mounting Options	
2-Point Mounting & Downtilt Bracket Kit (0-20°)	Part Number 21699999 Fits Pipe Diameter 50-102 mm 2.0-4.0 in Weight 5.4 kg 12 lbs
Lock-Down Brace	If the lock-down brace is used, the maximum diameter of the mounting pipe is 88.9 mm or 3.5 in.



Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.





Maximizer® Log Periodic Antenna, 806-894, 80deg, 14.1dBi, 1.2m, FET, 0deg

### Product Description

The Celwave® Maximizer series is a log periodic dipole array which uses a patented design to achieve a front-to-back ratio of 45 dB, the highest front-to-back ratio in the industry. Maximizers are available to cover ESMR, AMPS, PCS and DCS frequency ranges. They use RFS's patented monolithic CELLite® technology, which eliminates cable and soldered joints to reduce the possibility of inter-modulation products. The CELLite technology assures high reliability and excellent repeatability of electrical characteristics. The cellular Maximizers are available in 65°, 80° and 90° horizontal beamwidths and the PCS/DCS Maximizers are available in 65° and 90° horizontal beamwidths. Patent number 6,133,889.

### Features/Benefits

- 45 dB front-to-back ratio reduces co-channel interference.
- Monolithic construction reduces IM.
- No solder joints, high reliability.
- Surface treated components prevent galvanic corrosion.
- UV stabilized radome assures long life without radome deterioration due to UV exposure.



### Technical Specifications

#### Electrical Specifications

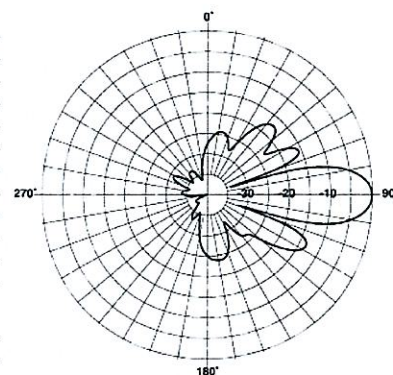
Frequency Range, MHz	806-894
Horizontal Beamwidth, deg	80
Vertical Beamwidth, deg	15
Electrical Downtilt, deg	0
Gain, dBi (dBd)	14.1 (12)
Front-To-Back Ratio, dB	45
Polarization	Vertical
VSWR	< 1.5:1
Impedance, Ohms	50
Maximum Power Input, W	500
Lightning Protection	Direct Ground
Connector Type	7-16 DIN Female

#### Mechanical Specifications

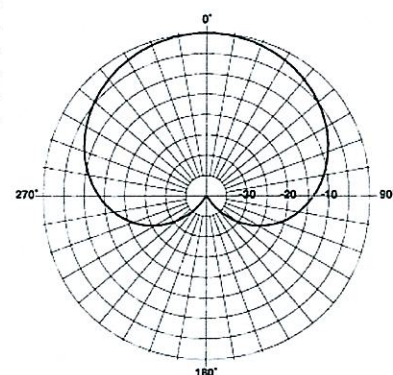
Dimensions - HxWxD, mm (in)	1219 x 152 x 203 (48 x 6 x 8)
Weight w/o Mtg Hardware, kg (lb)	2.8 (6.32)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	200 (125)
Max Wind Loading Area, m <sup>2</sup> (ft <sup>2</sup> )	0.307 (3.3)
Maximum Thrust @ Rated Wind, N (lbf)	916 (206)
Wind Load - Side @ Rated Wind, N (lbf)	743 (167)
Radome Material	UV Stabilized High Impact ABS
Shipping Weight, kg (lb)	7.9 (17.5)
Packing Dimensions, HxWxD, mm (in)	1270 x 305 x 203 (50 x 12 x 8)

#### Ordering Information

Mounting Hardware	APM21-3
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Vertical Pattern



Horizontal Pattern

### Other Documentation

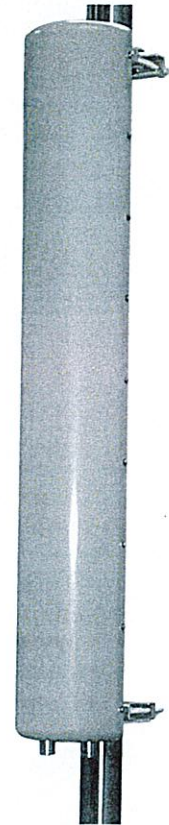


## BXA-171085-8BF-EDIN-X

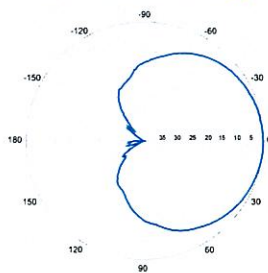
Replace "X" with desired electrical downtilt.

X-Pol | FET Panel | 85° | 16.4 dBi

Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	88°	85°	80°
Vertical beamwidth	7°	7°	7°
Gain	13.5 dBd / 15.6 dBi	13.9 dBd / 16.0 dBi	14.3 dBd / 16.4 dBi
Electrical downtilt (X)	0, 2, 4		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back isolation	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Bottom		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1232 x 154 x 105 mm	48.5 x 6.1 x 4.1 in	
Depth with l-brackets	133 mm	5.2 in	
Weight without mounting brackets	4.8 kg	10.5 lbs	
Survival wind speed	296 km/hr	184 mph	
Wind area	Front: 0.19 m <sup>2</sup> Side: 0.14 m <sup>2</sup>	Front: 2.0 ft <sup>2</sup> Side: 1.5 ft <sup>2</sup>	
Wind load @ 161 km/hr (100 mph)	Front: 281 N Side: 223 N	Front: 63 lbf Side: 50 lbf	
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171085-8BF-EDIN-X-FP		

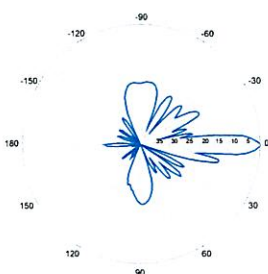


BXA-171085-8BF-EDIN-X



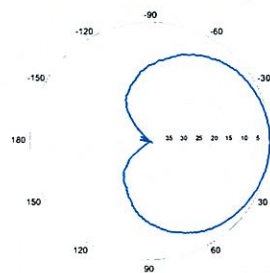
Horizontal | 1710-1880 MHz

BXA-171085-8BF-EDIN-0



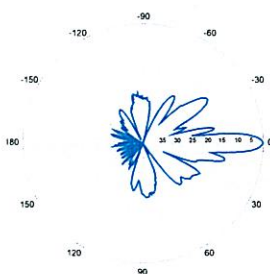
0° | Vertical | 1710-1880 MHz

BXA-171085-8BF-EDIN-X



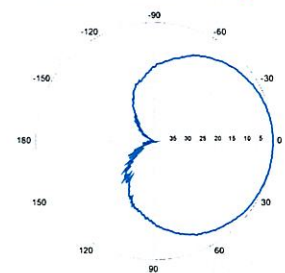
Horizontal | 1850-1990 MHz

BXA-171085-8BF-EDIN-0



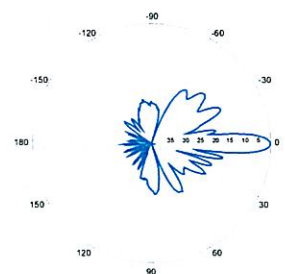
0° | Vertical | 1850-1990 MHz

BXA-171085-8BF-EDIN-X



Horizontal | 1920-2170 MHz

BXA-171085-8BF-EDIN-0



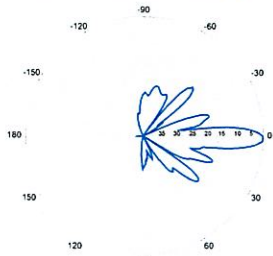
0° | Vertical | 1920-2170 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

**BXA-171085-8BF-EDIN-X**

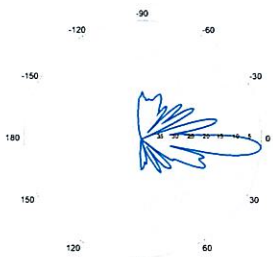
X-Pol | FET Panel | 85° | 16.4 dBi

**BXA-171085-8BF-EDIN-2**



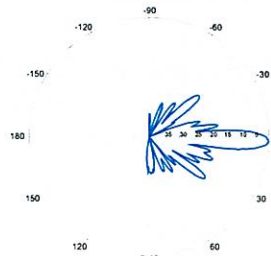
2° | Vertical | 1710-1880 MHz

**BXA-171085-8BF-EDIN-4**



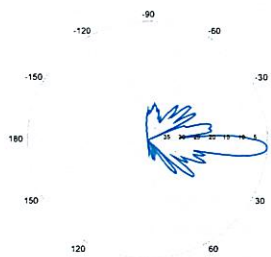
4° | Vertical | 1710-1880 MHz

**BXA-171085-8BF-EDIN-2**



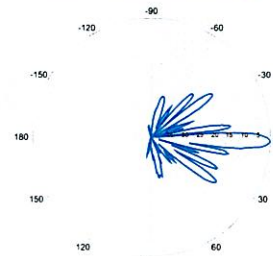
2° | Vertical | 1850-1990 MHz

**BXA-171085-8BF-EDIN-4**



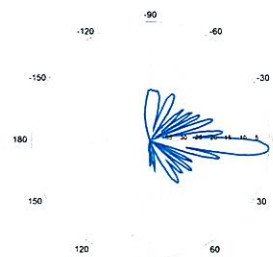
4° | Vertical | 1850-1990 MHz

**BXA-171085-8BF-EDIN-2**



2° | Vertical | 1920-2170 MHz

**BXA-171085-8BF-EDIN-4**



4° | Vertical | 1920-2170 MHz

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## BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

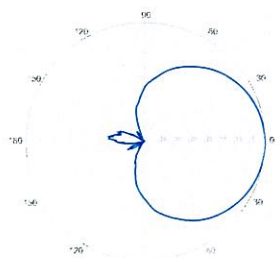
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz			
Frequency bands	696-806 MHz		806-900 MHz	
Polarization	±45°			
Horizontal beamwidth	65°		63°	
Vertical beamwidth	13°		11°	
Gain	14.0 dBd (16.1 dBi)		14.5 dBd (16.6 dBi)	
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10			
Impedance	50Ω			
VSWR	≤1.35:1			
Upper sidelobe suppression (0°)	-18.3 dB		-18.2 dB	
Front-to-back ratio (+/-30°)	-33.4 dB		-36.3 dB	
Null fill	5% (-26.02 dB)			
Isolation between ports	< -25 dB			
Input power with EDIN connectors	500 W			
Input power with NE connectors	300 W			
Lightning protection	Direct Ground			
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)			
Mechanical Characteristics				
Dimensions Length x Width x Depth	1804 x 285 x 132 mm		71.0 x 11.2 x 5.2 in	
Depth with z-brackets	172 mm		6.8 in	
Weight without mounting brackets	7.9 kg		17 lbs	
Survival wind speed	> 201 km/hr		> 125 mph	
Wind area	Front: 0.51 m <sup>2</sup>	Side: 0.24 m <sup>2</sup>	Front: 5.5 ft <sup>2</sup>	Side: 2.6 ft <sup>2</sup>
Wind load @ 161 km/hr (100 mph)	Front: 759 N	Side: 391 N	Front: 169 lbf	Side: 89 lbf
Mounting Options	Part Number	Fits Pipe Diameter		Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in		6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP			

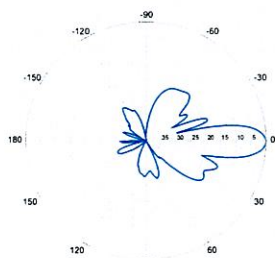


BXA-70063-6CF-EDIN-X



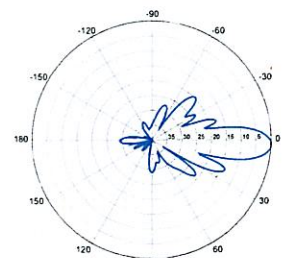
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

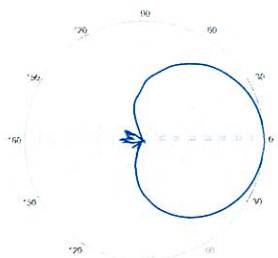


0° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-2



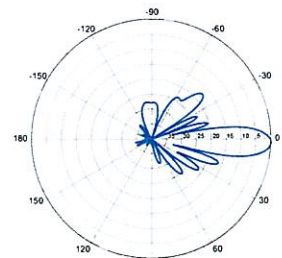
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



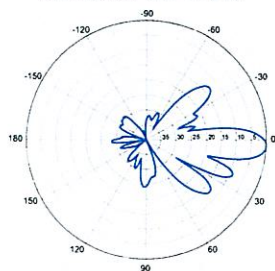
2° | Vertical | 850 MHz

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**BXA-70063-6CF-EDIN-X**

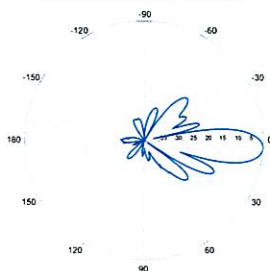
X-Pol | FET Panel | 63° | 14.5 dBd

**BXA-70063-6CF-EDIN-3**



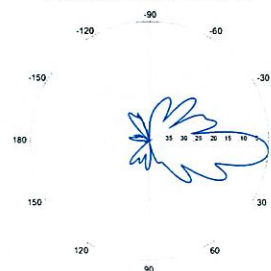
3° | Vertical | 750 MHz

**BXA-70063-6CF-EDIN-4**

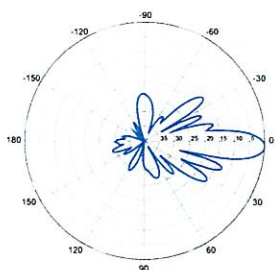


4° | Vertical | 750 MHz

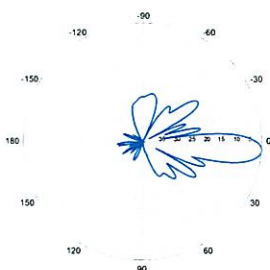
**BXA-70063-6CF-EDIN-5**



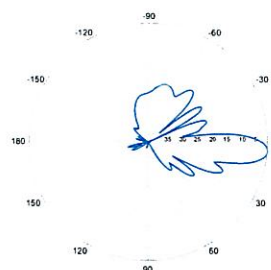
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

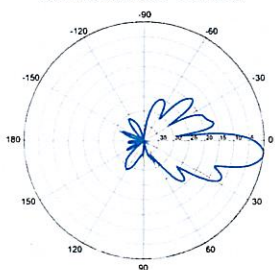


4° | Vertical | 850 MHz



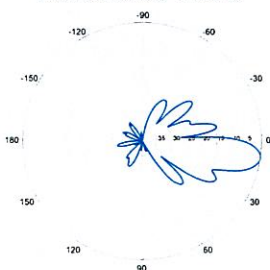
5° | Vertical | 850 MHz

**BXA-70063-6CF-EDIN-6**



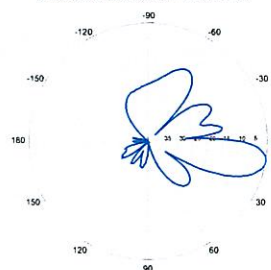
6° | Vertical | 750 MHz

**BXA-70063-6CF-EDIN-8**

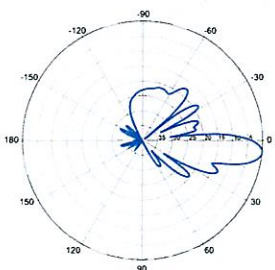


8° | Vertical | 750 MHz

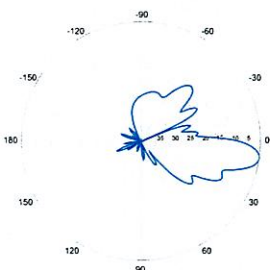
**BXA-70063-6CF-EDIN-10**



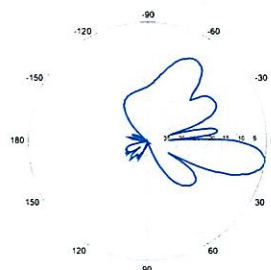
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

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## ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

## Product Description

The ShareLite FD9R6004 Series of diplexers are designed to enable feeder sharing between systems in the 698-960 MHz range and in the 1710-2200 MHz range. The diplexer is equipped with in-line connector placement so it can be installed in the BTS cabinet or at the tower top. This is especially valuable in crowded sites or when the feeders are not easily accessible. Due to its wideband design, the FD9R6004 Series can accommodate many combining solutions between 698-960 MHz and 1710-2200 MHz systems such as LTE 700 MHz, Cellular 800 MHz with PCS, GSM900 with GSM1800, or GSM900 with UMTS. This diplexer features a highly selective filter. It provides a high level of isolation between ports, while keeping the insertion loss on both paths at an extremely low level. The FD9R6004 diplexers are available with various DC pass options, helpful in configurations with or without the Tower Mount Amplifiers installed.



## Features/Benefits

- LTE ready design
- Extremely Low Insertion Loss
- High level of Rejection between bands – Protection against interferences
- Extremely High Power Handling Capability
- Integrated DC block/bypass versions available
- Very compact & small size design – Easy installation and reduced tower load
- In-line long-neck connectors for easy connection & waterproofing
- Exceptional reliability & environmental protection (IP 67)
- Equipped with 1 \* Breathable Vent – Prevent any humidity inside the product
- Mounting hardware for Wall and Pole mount provided (P/N SEM2-1A)
- Grounding already provided through the mounting bracket
- Kit available for easy dual mount

## Technical Specifications

Product Type	Diplexer/Cross Band Coupler
Frequency Range 1, MHz	698-960
Frequency Range 2, MHz	1710-2200
Application	LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS
Configuration	Sharelite Single diplexer, outdoor, DC pass in the 1710-2170MHz path, with mounting hardware SEM2-1A
Mounting	Wall Mounting: With 4 screws (maximum 6mm diameter); Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
Return Loss All Ports Min/Typ, dB	19/23
Power Handling Continuous, Max, W	1250 at common port; 750 in low frequency path & 500 in high frequency path
Power Handling Peak, Max, W	15000 in low frequency path & 8000 in high frequency path
Impedance, Ohms	50
Insertion Loss, Path 1, dB	0.07 typ.
Insertion Loss, Path 2, dB	0.13 typ.
Rejection Between Bands Min/Typ, dB	58/64@698-960MHz; 60/70@1710-2200MHz
IMP Level at the COM Port, Typ, dBm	-112 @ 2x43
DC Pass in Low Frequency Path	No
DC Pass in High Frequency Path	Yes
Temperature Range, °C (°F)	-40 to +60 (-40 to +140)
Environmental	ETSI 300-019-2-4 Class 4.1E
Ingress Protection	IP 67
Lightning Protection	EN/IEC61000-4-5 Level 4
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	1.2 (2.6)
Shipping Weight, kg (lb)	3.2 (7) for 2 * single units in 1 * box, 9.8 (21.6) for 6 * units = 3 * Boxes in 1 * overwrap
Dimensions, H x W x D, mm (in)	147 x 164 x 37 (5.8 x 6.5 x 1.5)
Shipping Dimensions, H x W x D, mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 2 * Single Units in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 6 * units = 3 * Boxes in 1 * overwrap
Volume, L	0.43
Housing	Aluminum

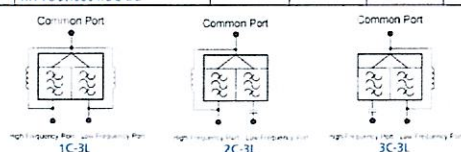
## Notes

## ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path




## Other Documentation

FD9R6004/2C-3L Installation Instructions: [Wideband\\_Diplexer\\_Installation\\_Rev5.pdf](#)

Selection Guide Diplexer 698-960 / 1710-2200MHz					
	Model Number	Full DC Pass	DC Pass High Band	DC Pass Low Band	Mounting Hardware Included
Single	FD9R6004/1C-3L				X
	FD9R6004/2C-3L				X
	FD9R6004/3C-3L				X
Dual	KIT-FD9R6004/1C-DL				X
	KIT-FD9R6004/2C-DL				X
	KIT-FD9R6004/3C-DL				X



The FD9R6004 Series is upgradeable to a Dual Diplexer kit by means of 2 diplexers and mounting hardware kits SEM2-1A and SEM2-3

Mounting Hardware and Ground Cable Ordering Information		
Model Number	Description	
SEM2-1A	Mounting Hardware, Pole mount ø40-110mm (Included with the Single and Dual Diplexer) Wall Screws M6 (Not included with the product)	
SEM2-3	Assembly kit for 2 pcs of FD9R6004/xC-3L (Can be ordered separately but included with the Dual Diplexer Kit)	
CA020-2	Ground Cable, 2m, includes lugs (Optional)	
CA030-2	Ground Cable, 2m, includes lugs (Optional)	
SEM6	Mounting Hardware for 6 Diplexers, Tower Base (Optional)	



General		Power	Density						
Site Name: East Glastonbury 2									
Tower Height: Verizon @ 167ft									
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total	
*VoiceStream	4	470	177	0.0216	1930	1.0000	2.16%		
*Pocket	3	631	147	0.0315	2130	1.0000	3.15%		
*Sprint	11	122	158	0.0193	1962.5	1.0000	1.93%		
*Cingular UMTS	1	500	137	0.0096	880	0.5867	1.63%		
*Cingular	4	296	137	0.0227	880	0.5867	3.87%		
*Cingular	2	427	137	0.0164	1900	1.0000	1.64%		
Verizon PCS	7	262	167	0.0236	1970	1.0000	2.36%		
Verizon Cellular	9	292	167	0.0339	869	0.5793	5.85%		
Verizon AWS	1	654	167	0.0084	2145	1.0000	0.84%		
Verizon 700	2	611	167	0.0158	698	0.4653	3.39%		
								26.82%	
* Source: Siting Council									



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**Structural Analysis for  
SBA Network Services, Inc.**

**176' Monopole Tower**

**SBA Site Name: Glastonbury  
SBA Site ID: CT02216-S  
Verizon Site Name: Glastonbury West**

**FDH Project Number 11-11338E S1**

**Analysis Results**

Tower Components	57.4%	Sufficient
Foundation	58.8%	Sufficient

Prepared By:

Joshua H. Carden, EI  
Project Engineer

Reviewed By:

Christopher M Murphy, PE  
President  
CT PE License No. 25842

FDH Engineering, Inc.  
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(919) 755-1012  
info@fdh-inc.com



November 30, 2011

*Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures*



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## EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the monopole located in Glastonbury, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F*. Information pertaining to the existing/proposed antenna loading, current tower geometry, geotechnical data, and member sizes was obtained from:

- ☐ Paul J. Ford & Co. (Job No. 29200-887) original design drawings dated June 19, 2000
- ☐ SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standard is 80 mph without ice and 38 mph with 1" radial ice. Ice is considered to increase in thickness with height.

## Conclusions

With the existing and proposed antennas from AT&T in place at 167 ft, the tower meets the requirements of the *TIA/EIA-222-F* standard provided the **Recommendation** listed below is satisfied. Furthermore, provided the foundation was designed and constructed to support the original design reactions (see Paul J. Ford & Co. Job No. 29200-887), the foundation should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

## Recommendation

To ensure the requirements of the *TIA/EIA-222-F* standard are met with the existing and proposed loading in place, we have the following recommendation:

1. The proposed loading will use the existing coax.



## APPURTENANCE LISTING

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

**Table 1 - Appurtenance Loading**

### Existing Loading:

Antenna Elevation (ft)	Description	Coax and Lines <sup>1</sup>	Carrier	Mount Elevation (ft)	Mount Type
177	(6) EMS RR90-17-02DP w/ Mount Pipe (12) MHAs	(12) 1-5/8"	T-Mobile	176	(3) T-Arms
167	(6) Antel WPA-80090/4CF w/ Mount Pipe (6) Decibel DB948F85T2E-M w/ Mount Pipe	(12) 1-5/8"	Verizon	167	Low Profile Platform
157	(12) Decibel DB980H90E-M w/ Mount Pipe	(12) 1-5/8"	Sprint	157	Low Profile Platform
147	(3) Kathrein 742 213 w/ Mount Pipe	(6) 1-5/8"	Pocket Communications	147	Flush mount
137	(6) Powerwave 7770.00 w/ Mount Pipe (6) Powerwave LGP21401 TMAs (6) Diplexers	(12) 1-5/8" <sup>2</sup>	AT&T	137	Low Profile Platform

1. Coax installed inside the pole shaft unless otherwise noted.

2. AT&T has (3) 1-5/8" coax installed outside the pole shaft in a single row.

### Proposed Loading:

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
167	(4) Antel LPA-80063/4CF w/ Mount Pipe (3) Antel BXA-70063/4CF W/ Mount Pipe (3) Antel BXA-171085/8BF w/ Mount Pipe (2) RFS APL868013 w/ Mount Pipe (6) FD9R6004/2C-3L Diplexers	(12) 1-5/8"	Verizon	167	Low Profile Platform

## RESULTS

The following yield strength of steel for individual members was used for analysis:

**Table 2 - Material Strength**

Member Type	Yield Strength
Tower Shaft Sections	65 ksi
Base Plate	50 ksi
Anchor Bolts	75 ksi

**Table 3** displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. *Note: Capacities up to 100% are considered acceptable.* **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information

**Table 3 - Summary of Working Percentage of Structural Components**

Section No.	Elevation ft	Component Type	Size	% Capacity	Pass Fail
L1	176 - 131.25	Pole	TP32.817x24x0.25	39.5	Pass
L2	131.25 - 86.5	Pole	TP41.133x31.4796x0.375	52.2	Pass
L3	86.5 - 42.75	Pole	TP49.002x39.3487x0.4375	57.2	Pass
L4	42.75 - 0	Pole	TP56.55x46.8957x0.5	57.4	Pass
		Anchor Bolts	(24) 2.25"Ø w/ BC = 64"Ø	47.0	Pass
		Base Plate	66" sq. x 3" thk. PL	42.9	Pass

**Table 4 - Maximum Base Reactions**

Base Reactions	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Axial	50 k	47 k
Shear	25 k	38 k
Moment	2,998 k-ft	5,100 k-ft

## GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

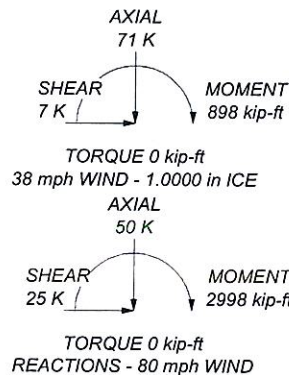
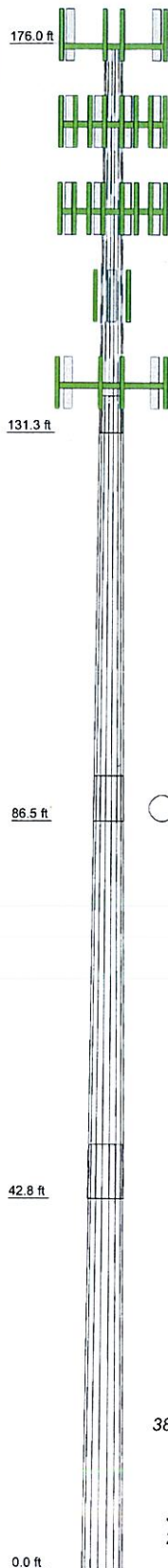
## LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.



## APPENDIX

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	44.75	18	0.2500	4.25	24.0000	32.8170		3.4
2	49.00	18	0.3750	5.25	31.4796	41.1330	A572-55	7.1
3	49.00	18	0.4375	6.25	39.3487	49.0020		10.1
4	49.00	18	0.5000	46.8957	56.5500			13.6
								34.2



## DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) RR90-17-02DP w/ Mount Pipe (T-Mobile)	176	APL868013 w/ Mount Pipe (Verizon)	167
(2) RR90-17-02DP w/ Mount Pipe (T-Mobile)	176	(2) FD9R6004/2C-3L diplexer (Verizon)	167
(2) RR90-17-02DP w/ Mount Pipe (T-Mobile)	176	(2) FD9R6004/2C-3L diplexer (Verizon)	167
(4) MHA (T-Mobile)	176	(2) FD9R6004/2C-3L diplexer (Verizon)	167
(4) MHA (T-Mobile)	176	(4) DB980H90E-M w/ Mount Pipe (Sprint)	157
(3) T-Arms (T-Mobile)	176	(4) DB980H90E-M w/ Mount Pipe (Sprint)	157
Low Profile Platform (Verizon)	167	(4) DB980H90E-M w/ Mount Pipe (Sprint)	157
(2) LPA-80063/4CF w/ Mount Pipe (Verizon)	167	Low Profile Platform (Sprint)	157
LPA-80063/4CF w/ Mount Pipe (Verizon)	167	742 213 w/ Mount Pipe (Pocket Communications)	147
LPA-80063/4CF w/ Mount Pipe (Verizon)	167	742 213 w/ Mount Pipe (Pocket Communications)	147
BXA-70063/4CF W/ Mount Pipe (Verizon)	167	742 213 w/ Mount Pipe (Pocket Communications)	147
BXA-70063/4CF W/ Mount Pipe (Verizon)	167	(2) 7770.00 W/Mount Pipe (ATTI)	137
BXA-70063/4CF W/ Mount Pipe (Verizon)	167	(2) 7770.00 W/Mount Pipe (ATTI)	137
BXA-70063/4CF W/ Mount Pipe (Verizon)	167	(2) 7770.00 W/Mount Pipe (ATTI)	137
BXA-171085/8BF w/ Mount Pipe (Verizon)	167	(2) LGP21401 TMA (ATTI)	137
BXA-171085/8BF w/ Mount Pipe (Verizon)	167	(2) LGP21401 TMA (ATTI)	137
BXA-171085/8BF w/ Mount Pipe (Verizon)	167	(2) LGP21401 TMA (ATTI)	137
BXA-171085/8BF w/ Mount Pipe (Verizon)	167	(2) Diplexers (ATTI)	137
BXA-171085/8BF w/ Mount Pipe (Verizon)	167	(2) Diplexers (ATTI)	137
BXA-171085/8BF w/ Mount Pipe (Verizon)	167	(2) Diplexers (ATTI)	137
APL868013 w/ Mount Pipe (Verizon)	167	Low Profile Platform (ATTI)	137

## MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

## TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 57.4%



**FDH Engineering, Inc.**

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Phone: (919) 755-1012  
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Job: **Glastonbury, CT - CT02216-S**

Project: **11-11338E S1**

Client: **SBA Network Services, Inc.** Drawn by: **Joshua Carden** App'd:

Code: **TIA/EIA-222-F** Date: **11/30/11** Scale: **NTS**

Path:  Dwg No. **E-1**

Tower Analysis