Patterson Group

Fire Systems Division

Bi-Directional Amplifier (BDA) System

Signal Boosting Solution designed to enhance in-building radio frequency (RF) Signal Coverage for Public Safety Radios

Submittal Data For:

Johnsonville Elementary School - Addition

BDA

18495 NC-27

Cameron, NC 28326

Harnett County, North Carolina

229 Carthage Street, Sanford, N.C. 27330 • (P)(919) 776-2403 • (F)(919) 718-6091

Project Name: Johnsonville Elementary School - Addition - Rev: [1]

BDA 800MHz - EQUIPMENT LIST

Part Number	Description	Quantity
HONBDA-D-S33B	PS 800 MHz, Class B,2W / +33dBm, DC. NFPA compliant, UL2524 2nd Edition Listed HONEYWELL Digital BDA	1
HONBDA-BTTY-100100	BBU with built-in annunciator, 100AH, 24VDC, batteries included. NFPA compliant, UL2524 2nd Edition Listed HONEYWELL BBU	1
BDA-ICA12-JPLLR-1K	1000' Plenum Red Cable 1/2"" Aluminum,RFS ICA12-50JPLLR	1
HONBDA-BTTY-ANN-4	BBU External Annunciator without dry contacts. NFPA compliant, UL2524 2nd Edition (Listing Pending) HONEYWELL Annunciator	1
BDA-FA-763869-2-1	DAS Antenna, Fiberglass 763-869MHz, 4 dBi	2
BDA-YDA763869-14-1	Donor Antenna, Yagi Directional 763-869MHz, 14 dBi	1
BDA-P8AX09-6G-N/FF	Coaxial surge protector, UL listed	1
BDA-DC6-W2	RF DIRECTIONAL COUPLER, 698-2690 MHz, 6dB, 300W	1
BDA-NATTEN-0505	ATTENUATOR, 5W, 5dB, N TYPE CONNECTORS	2
BDA-NATTEN-0510	ATTENUATOR, 5W, 10dB, N TYPE CONNECTORS	2
BDA-NATTEN-0520	ATTENUATOR, 5W, 20dB, N TYPE CONNECTORS	2
BDA-SVC1-DESIGN	Project Design	120
BDA-WPK-ATBC40_01	Weatherproofing Silicone Coldshrink for EOL Assembly, 9.8	2

BDA-NM-RG8-13-NM	Coaxial Cable Jumper NM-NM 1/4"" Superflex, Outdoor UV, 48"" long	2
BDA-GNDKIT1	Coaxial Cable Grounding Kit	1
BDA-NM-ICA12-JPLLR	N(m) connector for RFS ICA12-50JPLLR (1/2	10

PS 700 + PS 800
DIGITAL SIGNAL BOOSTERS

HONBDA-A
HONBDA-D

Product Features

- Supports Public Safety 700 & 800 MHz in single or dual band versions
- FirstNet Band 14 available
- Channel Selective, software programmable or adjustable bandwidths
- Fully digital signal boosters, FPGA based
- US and Canada 700MHz band compatible, software adjustable
- Auto diagnostic
- Automatic gain control per band, per channel, per time slot
- Oscillation detection with alarm and auto-shutdown
- Antenna Isolation measurement feature
- Antenna Isolation alarm
- Built-in input and output spectrum analyzer
- Weatherproof enclosure, IP67/NEMA4X
- NFPA compliant with dry contact alarms
- PS700 and PS800 High capacity versions (64 channels)
- Uplink and downlink squelch, per channel and per time slot on channel selective mode
- User adjustable gain control, UL and DL independent, per band, per channel and per time slot on channel selective mode
- Country of Origin: USA
- 3-year warranty
- UL2524 2nd Edition Listing with SGS, Nationally Recognized Testing Laboratory (NRTL) approved by OSHA for UL2524
- IFC 2015, 2018, 2021 Edition
- NFPA 72 2013 Edition, NFPA 1221 2016 2019 Edition

Applications

- For P25 Phase I & Phase II, DMR, NXDN and Conventional systems.
- Indoor coverage: buildings, schools, hospitals, casinos, tunnels, metro stations.
- Outdoor coverage: oil rigs, stadiums, dense urban areas, rural areas.

Specification	Value
Type	Single and Dual Band Digital Signal Boosters
Frequency range	758-775 / 788-805 MHz or 764-776 / 794-806 MHz (software adjustable) & 806-824 / 851-869MHz
Passband BW. min	Channel Selective (150KHz, 100Khz, 75KHz, 62.5KHz, 50KHz, 37.5KHz, 25KHz and 12.5KHz) or 100KHz to full band (depends of configuration)
Number of Passband	PS700 + FirstNet Class B: 1 FirstNet + 1 BWA PS700 + FirstNet Class A: 32 channel filters + 1 FirstNet + 1 BWA PS700 + FirstNet High Capacity: 64 filters + 1 FirstNet PS800 Class B: 2 BWA PS800 Class A: 32 channel filters + 2 BWA PS800 + High Capacity: 64 filters PS700 + FirstNet + PS800: Class B: 2 BWA per band PS700 + FirstNet + PS800: Class A: 32 channel filters + 2 BWA per band
Channel Filter Options	150KHz, 100Khz, 75KHz, 62.5KHz, 50KHz, 37.5KHz, 25KHz and 12.5KHz
BWA Filters	Adjustable from 100KHz to fullband in step in steps of 50KHz
Gain, maximum	85 dB
Passband ripple	+/- 2.0 dB
Gain, manual control	30dB range, digitally controlled in 1dB steps, per link, per band

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BATTERY BACKUP SYSTEMS

HONBDA-BTTY-100xxx

Product Features

- NFPA Compliant
- Up to 24 hour version
- AC Input, 24 Volt DC Output
- NEMA-4 Rated BBU Enclosure
- Up to 4 Annunciators may be connected to one BBU
- Tamper Proof with Lock and Key Accessibility
- Flush Wall Mounted Annunciators
- IFC & NFPA compliance; UL2524 2nd Edition
- Country of Origin: USA
- 3-year warranty (excluding batteries)
- Common Battery Backup Systems to support BDA, Fiber DAS Master/Remote

Specification	Value
Type	Battery Backup Unit
Input	120 VAC 50/60 Hz
Size	24 x 20 x 10 in

Specifications	**BTTY-100050**
Storage capacity	100W / 12hs
Annunciator	AC Power Normal AC Power Failure Battery Capacity <30% Battery Charger Fail Donor Antenna Disconnection Donor Antenna Malfunction RF Emitter Fail System Component Fail
Max Load	270 W (contact Honeywell for battery duration at different loads)
Batteries	Included
BDA Annunciator	Built in, port for additional external annunciators
Weight (batteries included)	150lbs

Specifications	**BTTY-100100**
Storage capacity	100 W / 24 hs or 200 W / 12 hs
Annunciator	AC Power Normal AC Power Failure Battery Capacity <30% Battery Charger Fail Donor Antenna Disconnection Donor Antenna Malfunction RF Emitter Fail System Component Fail
Max Load	270 W (contact Honeywell for battery duration at different loads)

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BATTERY BACKUP SYSTEMS

HONBDA-BTTY-100xxx

Batteries	Included
BDA Annunciator	Built in, port for additional external annunciators
Weight (batteries included)	210lbs

Specifications	**BTTY-100050N**
Storage capacity	100W / 12hs
Annunciator	AC Power Normal
	AC Power Failure
	Battery Capacity <30%
	Battery Charger Fail
	Donor Antenna Disconnection
	Donor Antenna Malfunction
	RF Emitter Fail
	System Component Fail
Max Load	270 W (contact Honeywell for battery duration at different loads)
Batteries	Not Included
BDA Annunciator	Built in, port for additional external annunciators
Weight	30lbs

Specifications	**BTTY-100100N**
Storage capacity	100 W / 24 hs or 200 W / 12 hs
Annunciator	AC Power Normal
	AC Power Failure
	Battery Capacity <30%
	Battery Charger Fail
	Donor Antenna Disconnection
	Donor Antenna Malfunction
	RF Emitter Fail
	System Component Fail
Max Load	270 W (contact Honeywell for battery duration at different loads)
Batteries	Not Included
BDA Annunciator	Built in, port for additional external annunciators
Weight	72lbs

Battery Models	Description
BDA-BTTY-12-1	Replacement Battery for 55AH BBU, single unit (2 batteries required)
BDA-BTTY-24-1	Replacement Battery for 100AH BBU, single unit (2 batteries required)

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EXTERNAL ANNUNCIATOR

HONBDA-BTTY-ANN-3

Product Features

- NFPA Compliant
- NEMA 4 Enclosure
- LED alarm indicators
- Form C alarm relays
- Works with BBU models
- Quick connection with BBUs
- IFC & NFPA compliance; UL2524 2nd Edition (Listing Pending)
- Country of Origin: USA
- 3-year warranty

RoHS 2002/95/EC

Specification	Value
Type	External Annunciator for BBU
Alarm Display	8 LED's
Alarms Displayed	AC Power Normal
	AC Fail - Batt Active
	Battery Capacity < 30%
	Battery Charger Fail
	Donor Antenna Disconnect
	Donor Antenna Malfunction
	RF Emitter Fail
	System Component Fail
Audible Alarm	Yes
Mute button for Audible Alarm	Yes
Maximum number of Annunciator	4
Relays	Form C Dry Contacts
Quantity of Relays	8
BBU interconnection	CAT 5/6
Conduit connector	Yes
Enclosure Rating	NEMA 4
Color	Red
Temperature Range	0 to 50 C
Dimensions	340 x 265 x105 mm • 13.3 x 10.4 x 4.1 in
Weight	3 kg • 6.6 lbs

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PS 700 + PS 800
DIGITAL SIGNAL BOOSTERS

HONBDA-A
HONBDA-D

Antenna isolation	Max Gain + 20dB
Composite output power, DL	+33dBm or +27dBm (depending on configuration) per band
Composite output power, UL	+27dBm
IMD	< -13dBm
Noise figure	9.0dB max
Group delay	Channel Selective 150KHz, 11.5µS Channel Selective 100KHz, 13.5µS Channel Selective 75KHz, 16.0µS Channel Selective 62.5KHz, 18.0µS Channel Selective 50KHz, 21.0µS Channel Selective 37.5KHz, 25.5µS Channel Selective 25KHz, 35.0µS Channel Selective 12.5KHz, 61.5µS or Band Selective: 3.5 to 6.5µS, depending on BWA
Maximum input power, no damage	+5dBm (UL) +5dBm (DL)
Maximum input power, normal operation	0dBm (UL) 0dBm (DL)
Connectors	N(f) as standard
RF Input/Output impedance	50Ω
Uplink squelch function	Yes, user selectable, to avoid UL noise when no carriers present, per band, per time slot and per channel (on channel selective mode)
Self diagnostic platform	Microprocessor based
Alarms	Yes, amplifiers status, power amplifiers status, power supply failure, temperature, AGC, RF overload, donor antenna failure, VSWR Indoor.
Local management and supervising	Local access via USB
RoHS compliance	Yes
Power Supply	AC 110 VAC, 50/60 Hz or DC +24VDC & -48VDC (depending on configuration)
Power consumption	80W in dual band, 62W in single band
Housing	IP67 / NEMA4X
Temperature range	-13° to 131° F • -25° to +55° C
Cooling	Natural convection
Weight	52.9 lbs • 24 kg
Dimension	17.7 x 17.3 x 5.1 in • 450 x 440 x 130 mm
Mounting	Wall or pole mounting (Rack mounting option available)
MTBF	250000 hours

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PS 700 + PS 800
DIGITAL SIGNAL BOOSTERS

HONBDA-A
HONBDA-D

Configurations	CLASS A			
Bands	**+33 dBm AC**	**+33 dBm DC**	**+27 dBm AC**	**+27 dBm DC**
700 + FirstNet	HONBDA-A-733A	HONBDA-D-733A	HONBDA-A-727A	HONBDA-D-727A
800 MHz	HONBDA-A-S33A	HONBDA-D-S33A	HONBDA-A-S27A	HONBDA-D-S27A
800 + 700 + FirstNet	HONBDA-A-7S33A	HONBDA-D-7S33A	HONBDA-A-7S27A	HONBDA-D-7S27A
700MHz High Capacity	HONBDA-A-733AH	HONBDA-D-733AH	HONBDA-A-727AH	HONBDA-D-727AH
800MHz High Capacity	HONBDA-A-S33AH	HONBDA-D-S33AH	HONBDA-A-S27AH	HONBDA-D-S27AH

Configurations	CLASS B			
Bands	**+33 dBm AC**	**+33 dBm DC**	**+27 dBm AC**	**+27 dBm DC**
700 + FirstNet	HONBDA-A-733B	HONBDA-D-733B	–	–
800 MHz	HONBDA-A-S33B	HONBDA-D-S33B	–	–
800 + 700 + FirstNet	HONBDA-A-7S33B	HONBDA-D-7S33B	HONBDA-A-7S27B	HONBDA-D-7S27B

Upgrade License PN	DESCRIPTION
BDA-LIC-S33B-S33A	Digital 700/800 BDA Upgrade License - Single Band 2W Class B to Single Band 2W Class A
BDA-LIC-D33B-D33A	Digital 700/800 BDA Upgrade License - Dual Band 2W Class B to Dual Band 2W Class A
BDA-LIC-S33B-D33B	Digital 700/800 BDA Upgrade License - Single Band 2W Class B to Dual Band 2W Class B
BDA-LIC-S33A-D33A	Digital 700/800 BDA Upgrade License - Single Band 2W Class A to Dual Band 2W Class A
BDA-LIC-S33B-D33A	Digital 700/800 BDA Upgrade License - Single Band 2W Class B to Dual Band 2W Class A
BDA-LIC-S27A-S33A	Digital 700/800 BDA Upgrade License - Single Band 0.5W Class A to Single Band 2W Class A
BDA-LIC-D27A-D33A	Digital 700/800 BDA Upgrade License - Dual Band 0.5W Class A to Dual Band 2W Class A
BDA-LIC-S27A-D27A	Digital 700/800 BDA Upgrade License - Single Band 0.5W Class A to Dual Band 0.5W Class A
BDA-LIC-S27A-D33A	Digital 700/800 BDA Upgrade License - Single Band 0.5W Class A to Dual Band 2W Class A
BDA-LIC-D27B-D33B	Digital 700/800 BDA Upgrade License - Dual Band 0.5W Class B to Dual Band 2W Class B
BDA-LIC-D27B-D27A	Digital 700/800 BDA Upgrade License - Dual Band 0.5W Class B to Dual Band 0.5W Class A
BDA-LIC-D27B-D33A	Digital 700/800 BDA Upgrade License - Dual Band 0.5W Class B to Dual Band 2W Class A

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WARNING: This is NOT a CONSUMER device. It is designed for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MUST have an FCC LICENCE or express consent of an FCC Licensee to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of $100,000 for each continuing violation.

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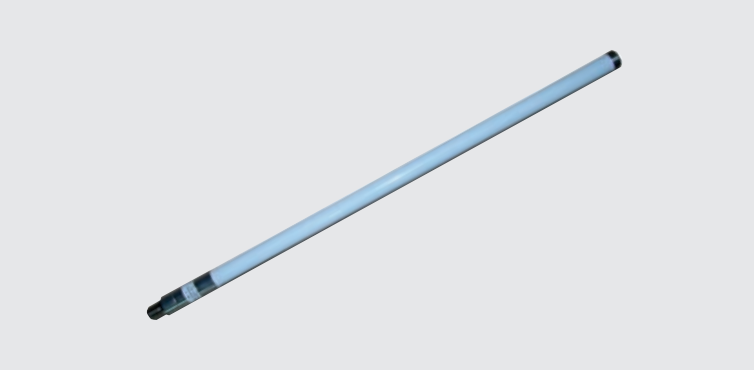
FIBER GLASS OMNI ANTENNA
450 - 470 MHz

BDA-FA-450470-2-1

Product Features

- 450 - 470 MHz
- Omni Directional Antenna
- Max Power 50W
- Fiberglass



Electric Specifications	Value
Frequency Range	450-470MHz
Polarization Type	Vertical
Gain	2.15dBi
3dB Beam-Width. H-Plan	360°
3dB Beam-Width. E-Plan	80°
VSWR	≤1.9
Input Impedance	50Ω
Max Input Power	50W
Lightning Protection	DC Grounded

Mechanical Specifications	Value
Connector Type	N-Type Male
Dimensions H*W*D (mm)	Φ22*430 (mm)
Radome Material	Fiberglass
Radome Color	white
Operating Temperature Rang	-40ºC/+60ºC
Support Pole Diameter	φ30-φ60(mm)
Rated Wind Velocity	60m/s

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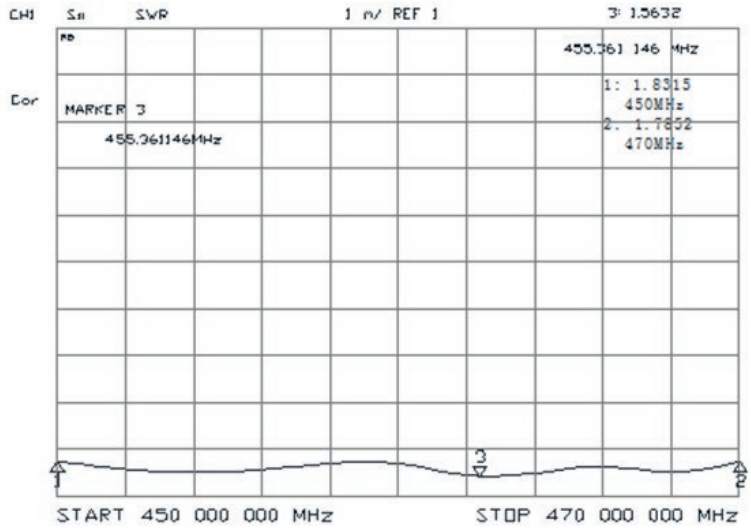
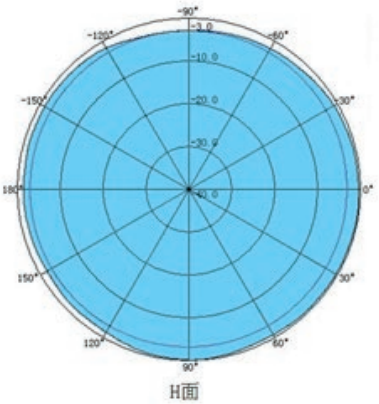
FIBER GLASS OMNI ANTENNA
450 - 470 MHz

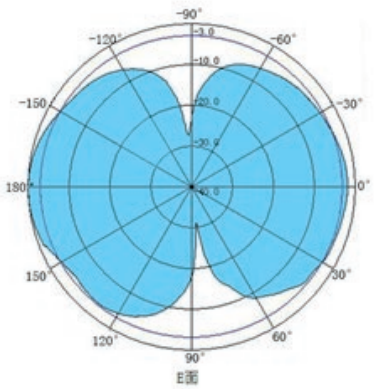
BDA-FA-450470-2-1

VSWR:



Radiation Pattern:





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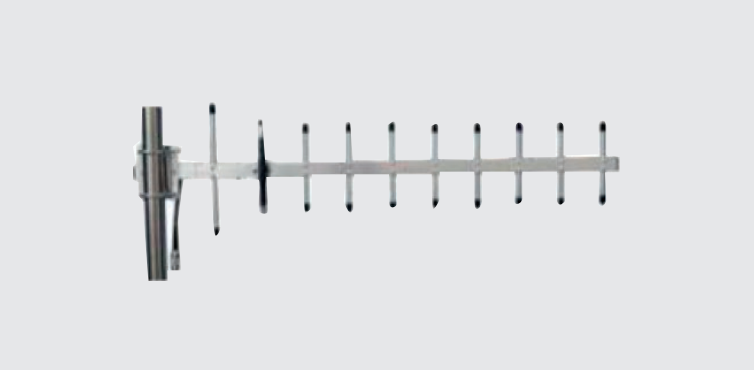
OUTDOOR YAGI ANTENNA
698-869 MHz

BDA-YDA763869-14-1

Product Features

- PS700 & PS800 full band
- High Directivity
- Max Power 100W



Electrical Specifications	Value
Frequency Range	698-869 MHz
F/B Ratio	＞18 dB
Gain	14 dBi
VSWR	≤1.5
Radiation	Direction
Polarization	Vertical or Horizontal
Horizontal Beamwidth	40°
Vertical Beamwidth	32°
Input Impedance	50 Ω
Max. Input Power	100 W
Lightning Protection	DC Ground
Cable Type	RG58U
Cable Length	30cm
Mount way	Pole
Diameter of Installation Pole	Ø30~Ø50mm

Mechanical Specifications	Value
Connector	N Female
Dimensions	1100x230x45mm
Weight	0.90 kg
Color	White
Radome Material	Aluminum Alloy
Operating Temperature	-40°C to +65 °C

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RADIO FREQUENCY SYSTEMS
The Clear Choice®

1/2" ClearFill®Line Aluminum Plenum-Rated Air-Dielectric Coaxial Cable for In-Building Applications

ClearFill®Line 1/2" low-loss air dielectric cable, Plenum-rated, CMP

FEATURES / BENEFITS

- **Supports Multiple RF Signals**
- **Complete Shielding**
  The solid outer conductor of the ClearFill®Line coaxial cable creates a continuous RFI/EMI shield that minimizes system interference.
- **Outstanding Intermodulation Performance**
  RFS coaxial cable's solid inner and outer conductors virtually eliminate intermods. Intermodulation performance is also confirmed with state-of-the-art equipment at the RFS factory.
- **Wide Range of Applications**
  Typical areas of application are feedlines for plenum-space installations within occupied buildings or structures but also suitable for outdoor use due to jacket UV rating.

Technical Features

APPLICATIONS		
Applications		Suitable for plenum in-building/public safety or outdoor usage
STRUCTURE		
Cable Type		Air-Dielectric, Corrugated
Size		1/2"
Inner Conductor	mm (in)	4.8 (0.19) Copper-Clad Aluminum Wire
Dielectric	mm (in)	11.8 (0.464) Extruded Polyethylene
Outer Conductor	mm (in)	13.8 (0.54) Corrugated Aluminum
Jacket	mm (in)	15.93 (0.627) Plenum Rated / Color Red UV rated to ASTM G155
ELECTRICAL SPECIFICATIONS		
Impedance	Ω	50 +/- 1
Maximum Frequency	GHz	6.0
Velocity	%	91.0
Capacitance	pF/m (pF/ft)	75 (22.86)
Inductance	µH/m (µH/ft)	0.19 (0.058)
Peak Power Rating	kW	40.0
RF Peak Voltage	Volts	2000.0
Jacket Spark	Volt RMS	8000.0
Inner Conductor dc Resistance	Ω/1000 m (Ω/1000 ft)	1.48 (0.45)
Outer Conductor dc Resistance	Ω/1000 m (Ω/1000 ft)	2.29 (0.7)
Return Loss (VSWR) Performance		19 (1.25) @ 450-960 MHz 19 (1.25) @ 1395-1432 MHz 19 (1.25) @ 1700-2155 MHz 19 (1.25) @ 2300-2500 MHz
Temperature & Power		High Power Rating
MECHANICAL SPECIFICATIONS		
Cable Weight, Nominal	kg/m (lb/ft)	0.19 (0.13)
Minimum Bending Radius, Single Bend	mm (in)	76 (3)
Minimum Bending Radius, Repeated Bends	mm (in)	127 (5)
Bending Moment	Nm (lb*ft)	5.4
Tensile Strength	N (lb)	549 (150)
Recommended / Maximum Clamp Spacing	m (ft)	0.5 / 0.9 (1.8 / 3)
Crush Strength	kg/mm (lb/ln)	0.893 (50)

RADIO FREQUENCY SYSTEMS
The Clear Choice®

1/2" ClearFill®Line Aluminum Plenum-Rated Air-Dielectric Coaxial Cable for In-Building Applications

ATTENUATION AND POWER RATING

Frequency MHz	Attenuation dB/100m	Attenuation dB/100ft	Power kW
0.5	0.16	0.05	40.00
1	0.23	0.071	32.80
1.5	0.28	0.087	26.80
2	0.33	0.101	23.20
10	0.74	0.226	10.30
20	1.06	0.322	7.22
30	1.30	0.395	5.89
50	1.68	0.514	4.55
88	2.25	0.687	3.40
100	2.41	0.734	3.18
108	2.51	0.764	3.05
150	2.98	0.907	2.57
174	3.22	0.98	2.38
200	3.46	1.05	2.21
300	4.29	1.31	1.79
400	5.00	1.52	1.53
450	5.32	1.62	1.44
500	5.63	1.72	1.36
512	5.71	1.74	1.34
600	6.22	1.90	1.23
700	6.76	2.06	1.14
750	7.02	2.14	1.09
800	7.28	2.22	1.06
824	7.40	2.25	1.04
894	7.74	2.36	0.993
900	7.76	2.37	0.99
925	7.88	2.40	0.976
960	8.05	2.45	0.955
1000	8.23	2.51	0.934
1250	9.32	2.84	0.826
1400	9.93	3.03	0.776
1500	10.30	3.15	0.749
1700	11.10	3.38	0.695
1800	11.50	3.49	0.671
2000	12.20	3.71	0.634
2100	12.50	3.81	0.619
2200	12.80	3.92	0.605
2300	13.20	4.02	0.587
2400	13.50	4.12	0.574
2500	13.80	4.22	0.562
2600	14.20	4.31	0.546
2700	14.50	4.41	0.535
3000	15.40	4.69	0.505
3500	16.90	5.14	0.461
3600	17.10	5.22	0.456
4000	18.30	5.56	0.427
4500	19.60	5.97	0.399
5000	20.90	6.36	0.376
5500	22.10	6.74	0.356
6000	23.30	7.11	0.339

Attenuation at 20°C (68°F) cable temperature; tolerance +/- 5% max.; Mean power rating at 40°C (104°F) ambient temperature

TESTING AND ENVIRONMENTAL

Fire Performance	Flame Retardant, Plenum-rated, CMP
Regulatory Compliance	NEC Article 800 Communication Circuits ETL Listed to UL444 Canadian CSA C.22.2/FT6
Installation Temperature	-20 to 60 (-4 to 140) °C(°F)
Storage Temperature	-40 to 85 (-40 to 185) °C(°F)
Operation Temperature	-40 to 85 (-40 to 185) °C(°F)

External Document Links

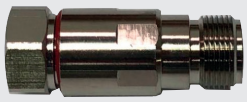
Notes

N(f) CONNECTOR
0 - 3GHz

NF-ICA12-50JPLLR

Product Features

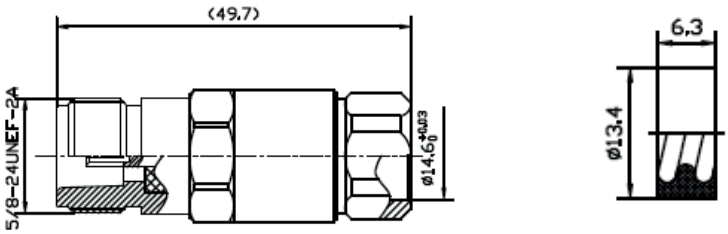
- N female connector
- For 1/2 " cable



Electrical Specifications	Value	
Impedance	50Ω	
Frequency range	0～3GHz	
Withstand Voltage	500V rms	
VSWR	Straight	≤ 1.15
	Rigth Angle	≤ 1.25
Contact resistance	center contact	≤ 1mΩ
	outer contact	≤ 1mΩ
Insulation resistance	≥5000MΩ	

Mechanical Specifications	Value
Temperature range	-65°C～+165°C
Durability(matings)	＞500

Material Specifications	Value
Body	Brass Nickel Plated
Center conductor	Brass Gold or silver plated
Crimping suite	Copper alloy Nickel plated
O-ring sealing	6146 silastic
Insulator	PTFE



Honeywell

N (m) CONNECTOR
0 - 3GHz

NM-ICA12-50JPLLR

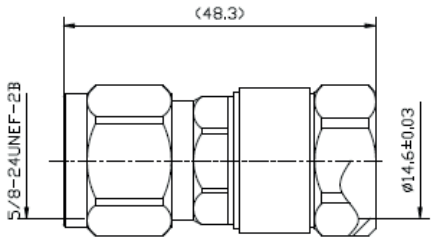
Product Features

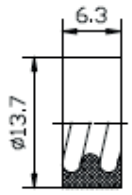
- N male connector
- For 1/2 " cable

Electrical Specifications	Value	
Impedance	50Ω	
Frequency range	0～3GHz	
Working Voltage	1500V max	
Withstand Voltage	2500V rms	
VSWR	Straight	≤ 1.2
	Rigth Angle	≤ 1.3
Contact resistance	center contact	≤ 1mΩ
	outer contact	≤ 1mΩ
Insulation resistance	≥5000MΩ	

Mechanical Specifications	Value
Temperature range	-35°C～+155°C
Durability(matings)	＞500

Material Specifications	Value
Body	Brass Tri-Metal or nickel
Center conductor	Phosphor Bronze Gold or silver plated
Coupling nut	Brass Nickel
Gasket	Silicone Rubber
Insulator	PTFE





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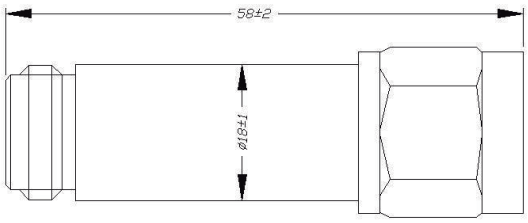
RF COAXIAL FIXED ATTENUATORS
DC - 3000 MHz

BDA-NATTEN-05xx

Product Features

- Passive devices designed in a coaxial configuration
- Nominal impedance is 50 ohms
- Power level 5W
- N male type connectors as standard, other types available upon request

Specification	0503	0505	0510	0515	0520	0530
Attenuation value	3	5	10	15	20	30
Frequency band	DC - 3000 MHz					
Input power	5W					
Coolant	Natural convection					
Type	In-line, coaxial					
Impedance	50 Ω					
VSWR	1.20:1 min					
Connector	N(m)					
Tempearture range	-22º to 149º F -35º to +65º C					
MTBF	>1,000,000 hours					
Weight	0.22 lbs • 0.10 kg					
Environmental	IP60					
Operating position	Any					



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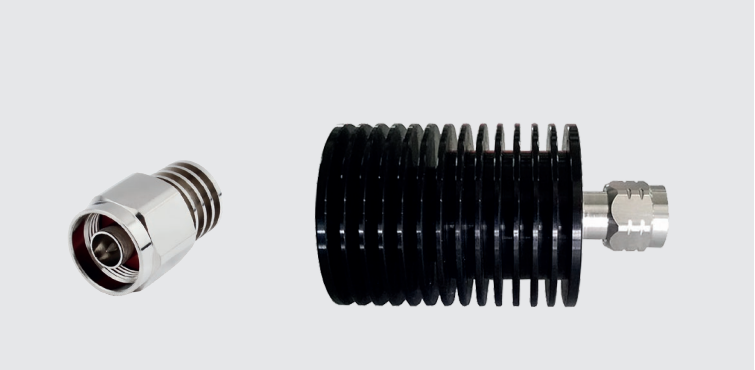
RF LOADS / TERMINATIONS
DC - 3000 MHz

BDA-LD-xx

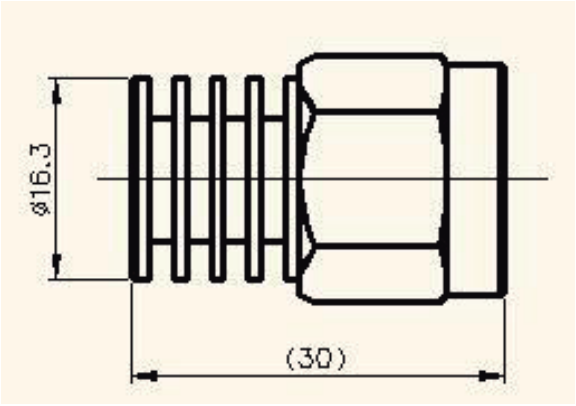
Product Features

- Passive devices designed in a coaxial configuration
- Nominal impedance is 50 ohms
- Power levels 5W and 50W
- N male type connectors as standard, other types available upon request

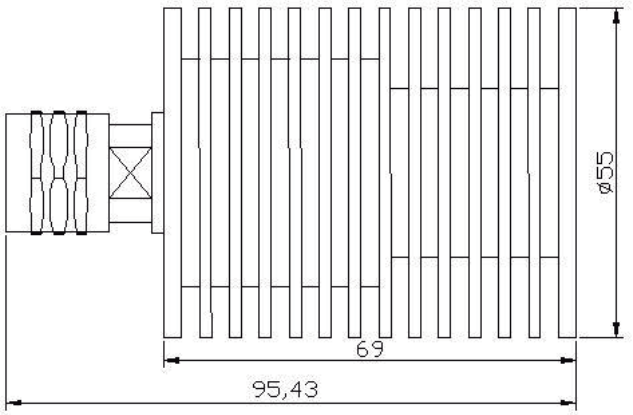


Specification	BDA-LD-05	BDA-LD-50
Frequency band	DC-3GHz	DC-3GHz
Input power	5W, CW	50W, CW
Coolant	Natural convection	Natural convection
Type	In-line, coaxial	In-line, coaxial
Impedance	50 Ω	50 Ω
VSWR	1.2:1 min	1.2:1 min
Connector	N(m)	N(m)
Tempearture range	-22º to 149º F -30º to +65º C	-22º to 149º F -30º to +65º C
MTBF	>1,000,000 hours	>500,000 hours
Weight	0.17 lbs • 0.08 kg	1.1 lbs • 0.5 kg
Operating position	Any	Any

BDA-LD-05



BDA-LD-50



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N MALE TO N FEMALE ADAPTER
0 - 6GHz

BDA-NMRA-NFRA

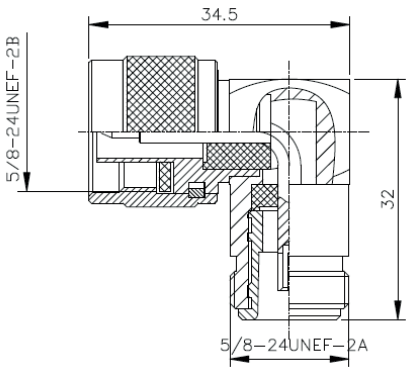
Product Features

- N female to N male adapter
- Right Angle 90º

Electrical Specifications	Value	
Impedance	50Ω	
Frequency range	0～6GHz	
Withstand Voltage	500V rms	
VSWR	Rigth Angle	≤ 1.25
Contact resistance	center contact	≤ 1mΩ
	outer contact	≤ 1mΩ
Insulation resistance	≥5000MΩ	

Mechanical Specifications	Value
Temperature range	-65°C～+165°C
Durability(matings)	＞500

Material Specifications	Value
Body	Brass Nickel Plated
Center conductor	Brass Gold plated
Crimping suite	Copper alloy Nickel plated
O-ring sealing	6146 silastic
Insulator	PTFE



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GROUNDING KIT
FOR 1/2" COAXIAL CABLE, 500mm

BDA-GNDKIT1

Product Features

- For 1/2" RF Cable
- Copper cable
- PVC Jacket

Product Structure Grounding Kit	Value
Cable Kit	Copper, for 1/2"
Rivet	Copper
Locking Bail Material	Stainless steel
Grounding Cable	16 mm2 Copper wire & PVC, Black
Cable Lug	Tin-Plated Copper(1 hole M8)

Product Structure Hardware	Value
Hexagon Screw	A2 Stainless Steel, M8X25mm
Nut	A2 Stainless Steel, M8
Spring Washer	A2 Stainless Steel, M8
Washer	A2 Stainless Steel, M8

General Specifications	Value
Cable Type	Corrugated
Cable Size	1/2" & 1/2" Low Loss
Lug Type	One-hole lug
Lug Attachment	Factory attached

Cable Specifications	Value
Bonding Conductor Length	500mm
Bonding Conductor Material	Copper
Bonding Conductor Wire Size	16 mm2
Bonding Conductor Jacketing Material	PVC

Electrical Specifications	Value
Current Handling	Tested to withstand 100,000 amps peak current surge
Current Handling Test Method	MIL-STD-1757
Grounding, Bonding and Shielding Test Method	MIL-STD-188-124A
Lightning Protection Test Method	IEC 1024-1

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Honeywell

GROUNDING KIT
FOR 1/2" COAXIAL CABLE, 500mm

BDA-GNDKIT1

Environment Specifications	Value
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +80°C
Immersion Depth	1 m
Immersion Test Mating	Mated
Immersion Test Method	IEC 60529:2001, IP68
Blowing Rain Test Method	MIL-STD-810, Method 506
Corrosion Test Method	MIL-STD-1344, Method 1001
Freezing Rain/Icing Test Method	MIL-STD-810, Method 521
Humidity Test Method	MIL-STD-1344, Method 1002
UV Resistance Test Method	MIL-STD-810, Method 505
Vibration Test Method	IEC 60068-2-6:2007

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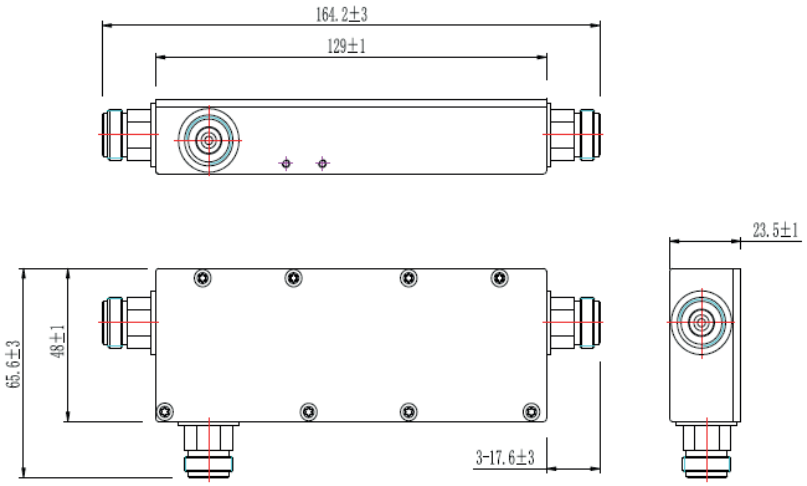
HIGH POWER DIRECTIONAL COUPLER
698 - 2690 MHz

BDA-DCxx-W2

Product Applications

Fiplex RSA Series of RF Directional Couplers are passive devices designed to provide unequal power distribution to the output ports.
Due to the internal configuration, this devices have a low VSWR value in all ports (less than 1.3:1, based on 50 ohms characteristic impedance) and low incidental insertion loss. Standard coupling values are 6dB, 10dB, 15dB, 20dB and 30dB, other power ratios available upon request.

Specification	Value				
Product Number	DC6-W2	DC10-W2	DC15-W2	DC20-W2	DC30-W2
Coupling(dB)	6	10	15	20	30
Accuracy(dB)	±0.8	±1.0	±1.2	±1.2	±1.5
Insertion Loss(dB)	≤1.75	≤0.80	≤0.50	≤0.40	≤0.40
Isolation	≥26	≥28	≥32	≥35	≥45
Freq	698 - 2690 MHz				
VSWR	≤1.25				
Power Rating	300W (average Per Port)				
Impedance	50 ohm				
Connector	N-female				
Color	Red-plated				
Operating Temperature	-25°C to +75°C				
Weight	0.38 kg				



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THE FUTURE IS WHAT WE MAKE IT

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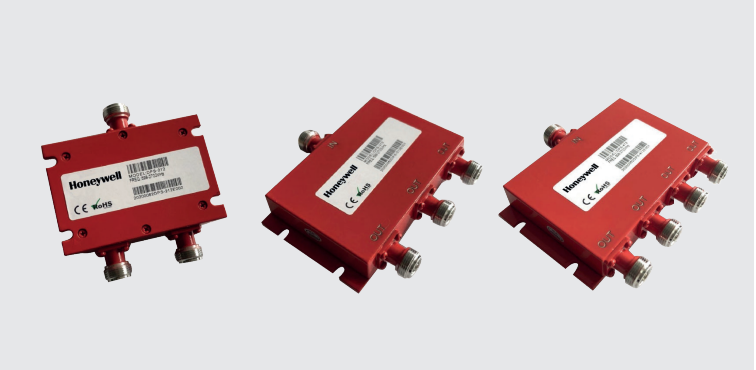
BROADBAND POWER SPLITTERS
698 - 2700 MHz

BDA-PSx-W2

Product Features

- Passive devices designed in a multistage Wilkinson configuration
- Low insertion loss
- Low VSWR ripple
- Two, three and four output ports models available as standard,
others available upon request
- Power input is 50W as splitter, and 1W as combiner, other values
are available upon request



Specification	BDA-PS2-W2	BDA-PS3-W2	BDA-PS4-W2
Type	Broadband power splitters	Broadband power splitters	Broadband power splitters
Frequency range	698 – 2700 MHz	698 – 2700 MHz	698 – 2700 MHz
Number of ways	2	3	4
Split Loss	3 dB	4.8 dB	6 dB
Insertion loss	< 0.5 dB	< 0.7 dB	< 0.7 dB
Power Raiting	50 W Average per port	50 W Average per port	50 W Average per port
VSWR	<=1.25 : 1	<=1.3 : 1	<=1.3 : 1
Isolation between output ports	20 dB min	18 dB min	18dB min
Connectors	N(f)	N(f)	N(f)
Temperature range, storage	-40º to 158º F	-40º to 158º F	-40º to 158º F
	-40º to +70º C	-40º to +70º C	-40º to +70º C
Temperature range, operation	-22º to 149º F	-22º to 149º F	-22º to 149º F
	-30º to +65º C	-30º to +65º C	-30º to +65º C
Environmental	IP60	IP60	IP60
Dimension	2.4 x 3.4 x 0.8 inches	2.7 x 4.8 x 0.88 inches	2.7 x 4.8 x 0.88 inches
	62 x 88 x 22 mm	122 x 71 x 22 mm	71 x 122 x 22 mm
Weight	0.5 lbs • 0.24 kg	0.7 lbs • 0.34 kg	0.79 lbs • 0.36 kg

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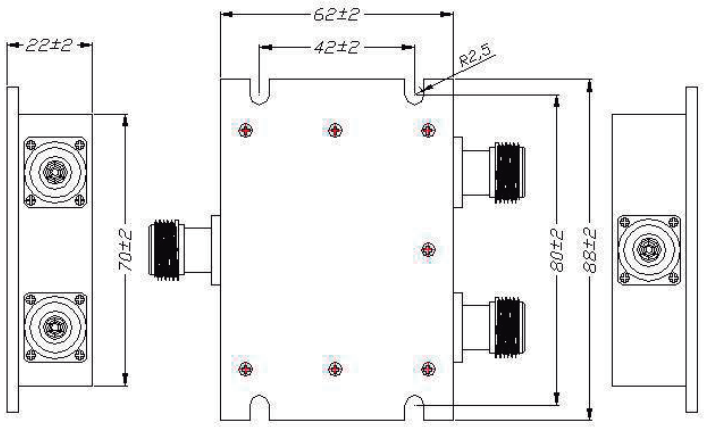
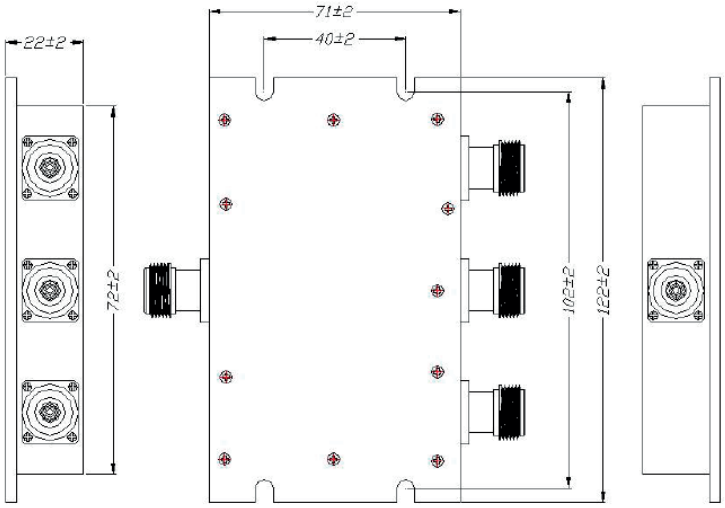
BROADBAND POWER SPLITTERS
698 - 2700 MHz

BDA-PSx-W2

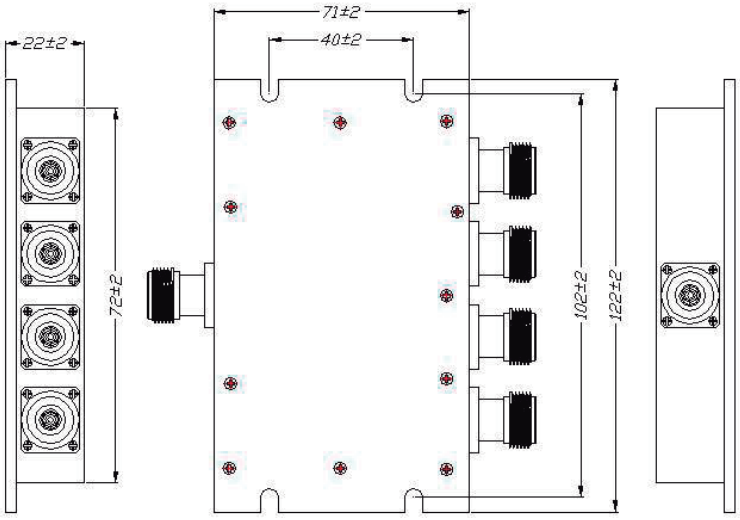
BDA-PS2-W2



BDA-PS3-W2



BDA-PS4-W2



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BROADBAND 3dB HYBRID
700 - 2700 MHz

BDA-HC3-W2

Product Features

- Guaranteed PIM Compliance
- Wide Frequency Band Covering 700-2700MHz
- Low Insertion Loss
- Low VSWR
- High Isolation
- Indoor/ Outdoor Using IP65
- Available with Type N, 7/16DIN or 4.3/10 Connectors

Specification	Value
Coupling	3 dB
Insertion Loss	≤0.65
Isolation	>=23
Freq	700-2700MHz
VSWR	≤1.25
PIM Rating	-153dBc@2x43dBm
Power Rating	300W (average Per Port)
Impedance	50 ohm
Connector	N-female
Color	Red
Operating Temperature	-25°C to +75°C
Weight	0.60 kg

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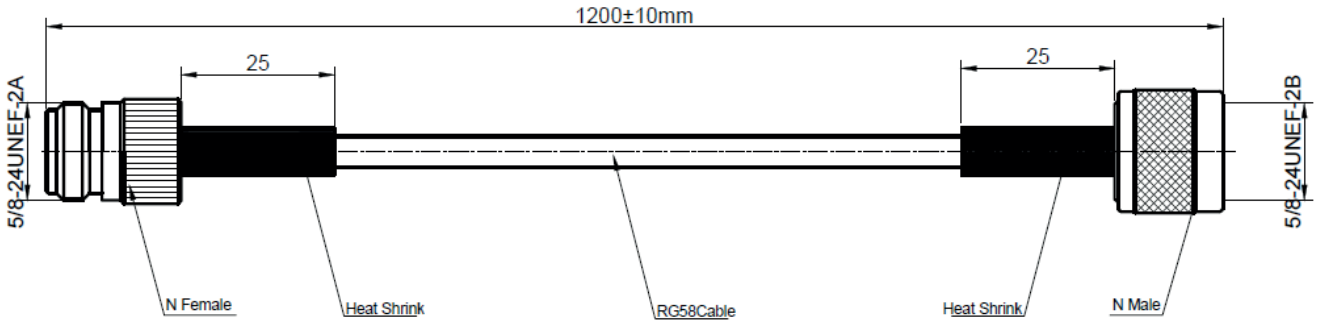
JUMPER RG58 CABLE
N female and N male

BDA-NM-RG58-12-NF

Product Features

- Low VSWR
- Low Insertion Loss
- Robust Design

Specification	Value
Connector	N Male - N Female
Type of Cable	RG58
Length of cable	48 Inch
Center conductor material	Phosphore bronze - Gold plating & Brass - Gold plating
Insulator material	PTFE
Body connector material	Brass - Nickel Plating
Impedance	50 Ohms
Frequency range	0 - 6 GHz
VSWR	1.15 (0-3GHZ)



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JUMPER RN-400 CABLE
N female and N male

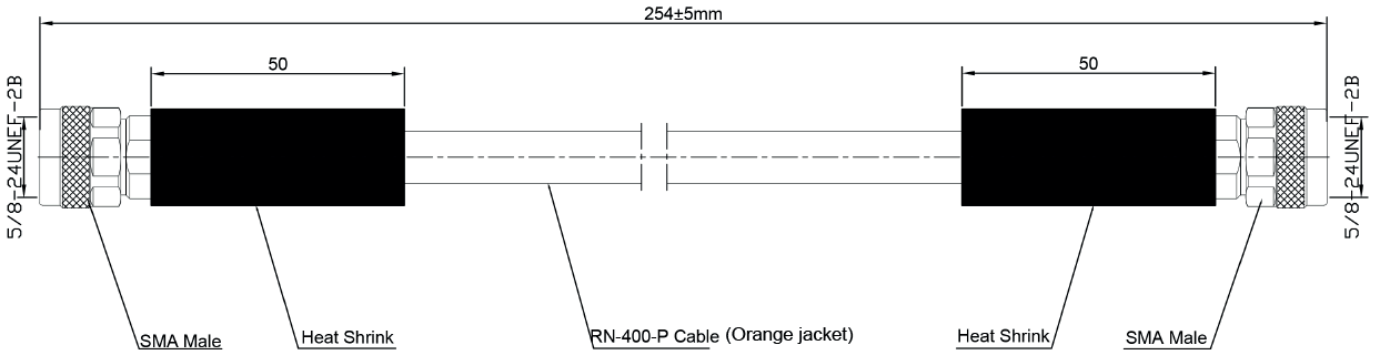
BDA-NM-RN4P-03-NM
BDA-NM-RN4P-05-NM
BDA-NM-RN4P-10-NM

Product Features

- Low VSWR
- Low Insertion Loss
- Robust Design

Specification	03-NM	05-NM	10-NM
Connector	N Male both ends	N Male both ends	N Male both ends
Type of Cable	RN-400-P	RN-400-P	RN-400-P
Length of cable	10 Inch	18 Inch	37 Inch
Center conductor material	Brass - Gold Plating	Brass - Gold Plating	Brass-Gold Plating
Insulator material	PTFE	PTFE	PTFE
Body connector material	Brass - Nickel Plating	Brass - Nickel Plating	Brass-Nickel Plat.
IMmpedance	50 Ohms	50 Ohms	50 Ohms
Frequency range	0 - 6 GHz	0 - 6 GHz	0 - 6 GHz
VSWR	1.15 (0-3GHZ)	1.15 (0-3GHZ)	1.15 (0-3GHZ)

NM-RN400P-03-NM



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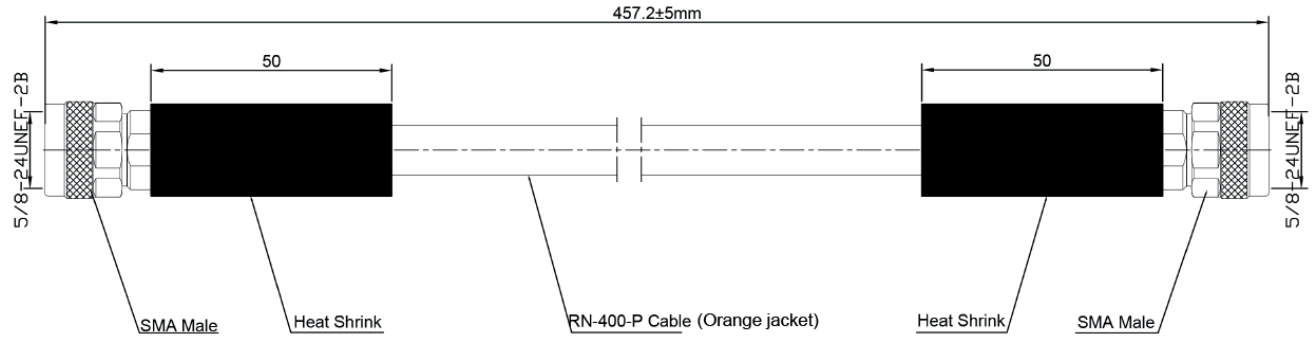
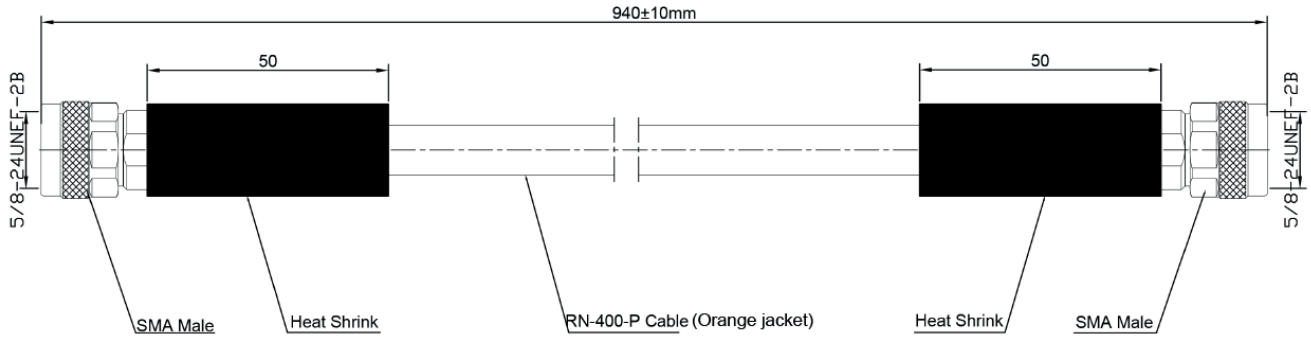
JUMPER RN-400 CABLE
N female and N male

BDA-NM-RN4P-03-NM
BDA-NM-RN4P-05-NM
BDA-NM-RN4P-10-NM

NM-RN400P-05-NM



NM-RN400P-10-NM



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JUMPER RG58
N male and N male

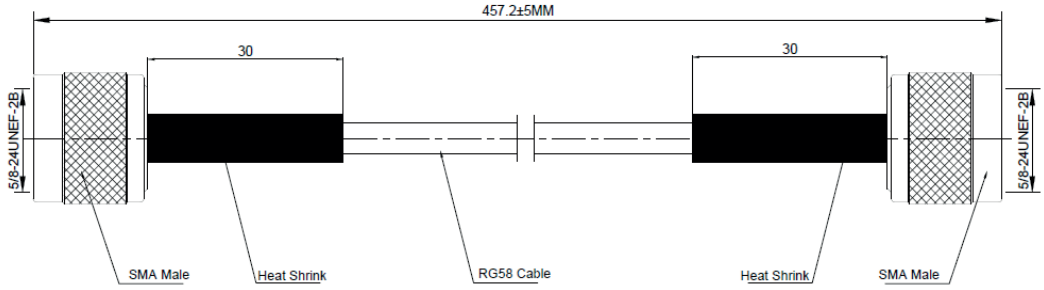
BDA-NM-RG58-05-NM
BDA-NM-RG58-10-NM

Product Features

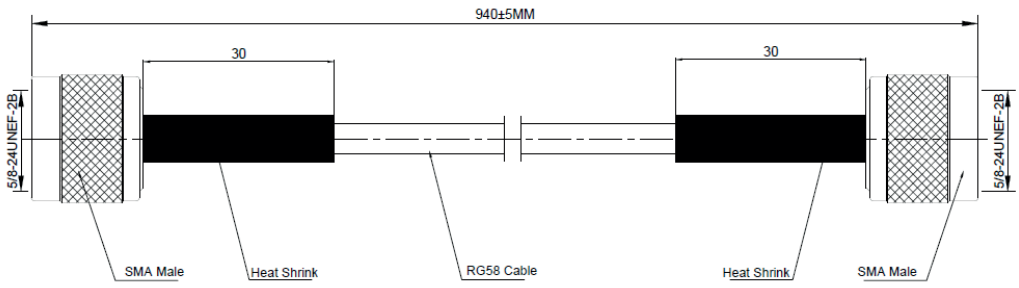
- Low VSWR
- Low Insertion Loss
- Robust Design

Specification	05-NM	10-NM
Connector	N Male both ends	N Male both ends
Type of Cable	RG58	RG58
Length of cable	18 Inch	37 Inch
Center conductor material	Brass - Gold Plating	Brass-Gold Plating
Insulator material	PTFE	PTFE
Body connector material	Brass - Nickel Plating	Brass-Nickel Plat.
IMmpedance	50 Ohms	50 Ohms
Frequency range	0 - 6 GHz	0 - 6 GHz
VSWR	1.15 (0-3GHZ)	1.15 (0-3GHZ)

NM-RG58-05-NM



NM-RG58-10-NM



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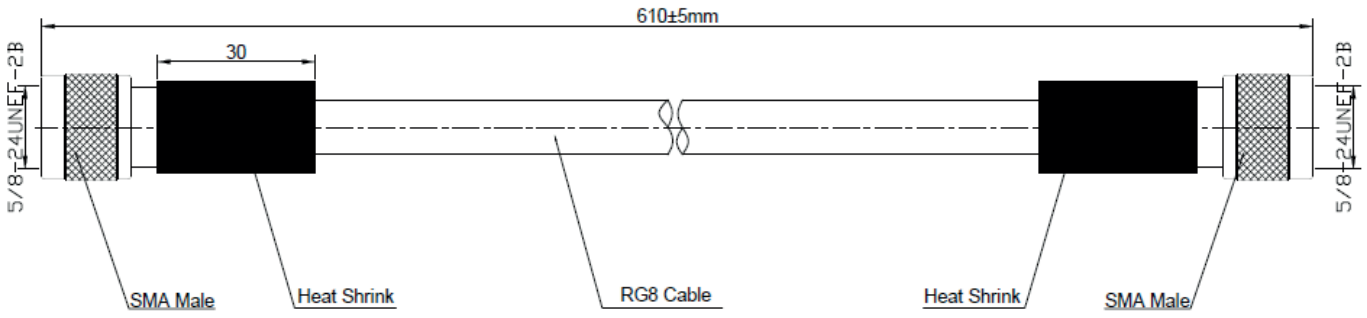
JUMPER RG8
N male and N male

BDA-NM-RG8-08-NM

Product Features

- Low VSWR
- Low Insertion Loss
- Robust Design

Specification	Value
Connector	N Male both ends
Type of Cable	RG8
Length of cable	24 Inch
Center conductor material	Brass - Gold Plating
Insulator material	PTFE
Body connector material	Brass - Nickel Plating
IMmpedance	50 Ohms
Frequency range	0 - 6 GHz
VSWR	1.15 (0-3GHZ)



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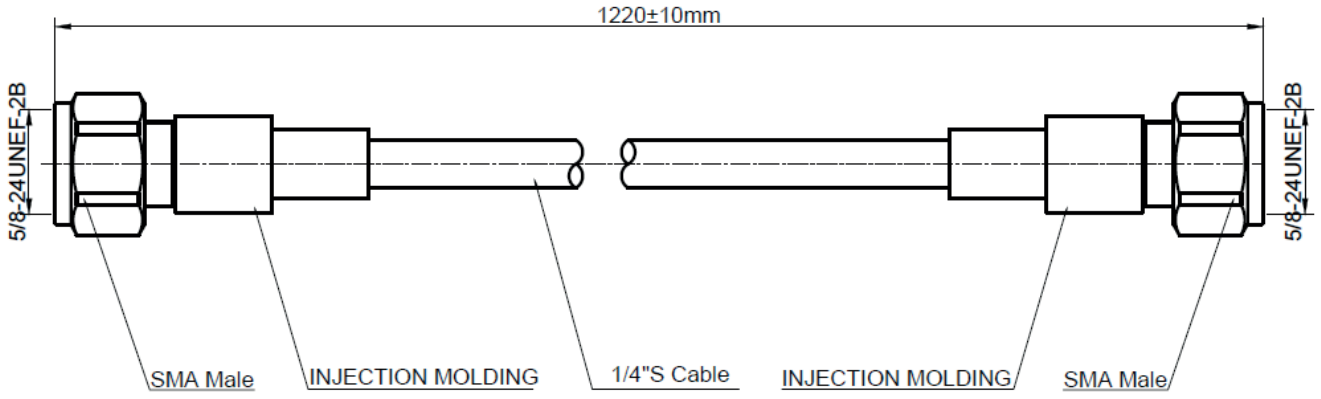
JUMPER 1/4" S
N male and N male

BDA-NM-RG8-13-NM

Product Features

- Low VSWR
- Low Insertion Loss
- Robust Design

Specification	Value
Connector	N Male both ends
Type of Cable	1/4" SUPERFLEX
Length of cable	48 Inch
Center conductor material	Brass - Silver Plating
Insulator material	PTFE
Body connector material	Brass - Ternary alloy plating
IMmpedance	50 Ohms
Frequency range	0 - 6 GHz
VSWR	1.2 (0-3.8GHZ)
PIM	<= -160DBC@1800MHZ



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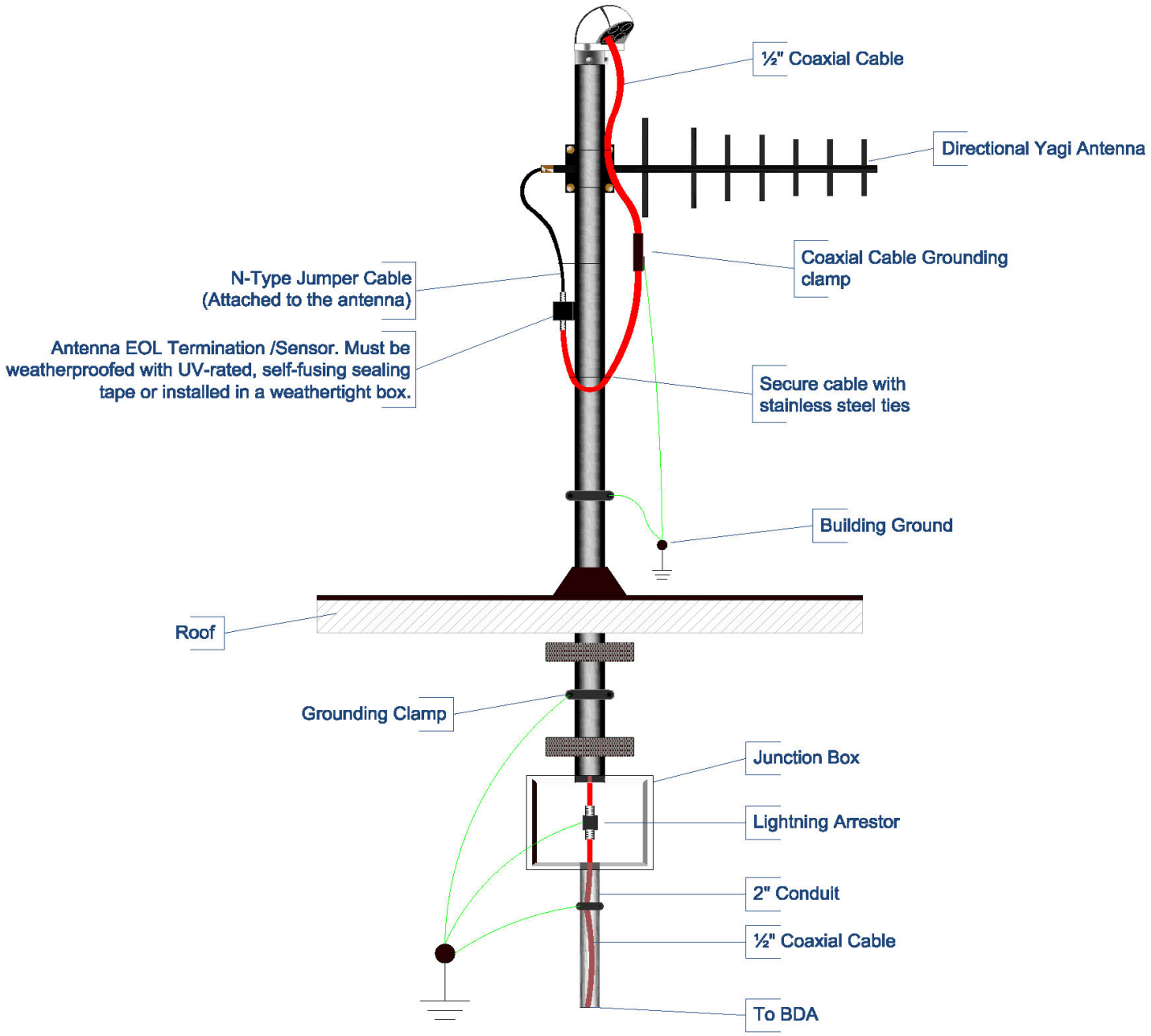


Typical Donor Antenna Mounting

Patterson Group
Fire Systems Division

Battery Calculations

Honeywell Models: PS700 + PS800; NFBDA-A, NFBDA-D

Rated DC Supply Voltage:	24V
Maximum Battery Current Draw*:	2.5A
Rated Battery Run Time:	24Hrs
Power Consumption over 24Hr:	2.5A x 24Hrs = 60Ah
Rated Battery Capacity:	75Ah (2 x 12V / 75Ah Batteries)
Battery Derating Factor:	20%
Derated Battery Capacity:	60Ah
Capacity Required for 24-Hr Operation:	60Ah

- Tested under full load on all UL and DL amplifiers*

UL-2524 listed for 24-hour battery operation with two 75Ah SLA batteries. UL File UTMH.S36080

229 Carthage Street, Sanford, N.C. 27330 • (P) (919) 776-2403 • (F) (919) 718-6091

1.0 Fire Alarm Control Panel Programming - BDA Monitoring Points

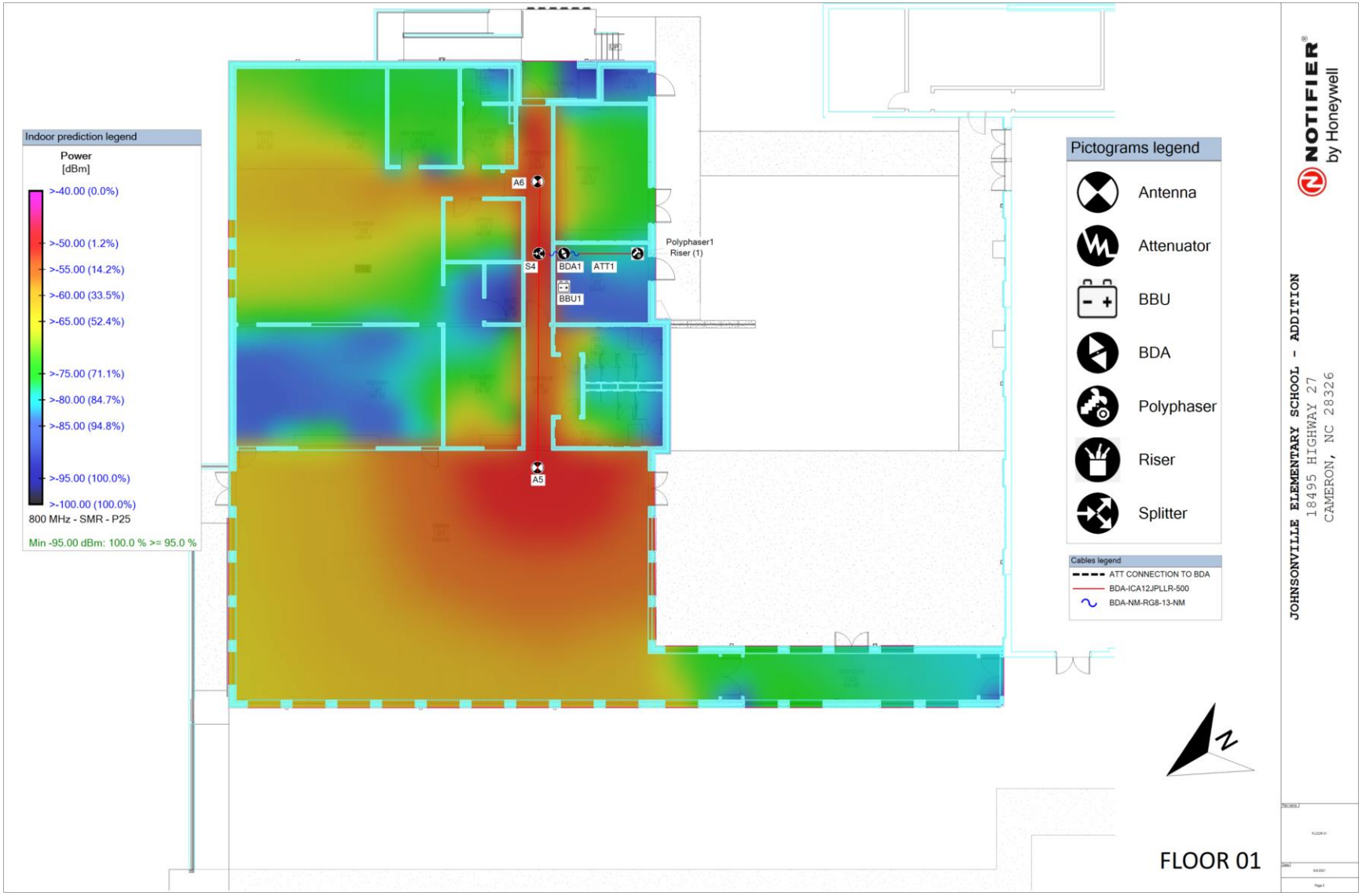
Six (6) fire panel address points are required for BDA equipment monitoring.

A device programmed as a Supervisory type code must be reserved each of the following conditions:.

Monitoring Condition	Description
AC Power Loss	Primary AC power loss on the BDA will illuminate the LED associated with this point and transmit the supervisory condition to the Fire Alarm Control Panel.
Charger trouble	A trouble condition on the BDA battery charger will illuminate the LED associated with this point and transmit the supervisory condition to the Fire Alarm Control Panel.
Low Battery	A low battery condition on the BDA will illuminate the LED associated with this point and transmit the supervisory condition to the Fire Alarm Control Panel.
BDA trouble	A trouble condition on the BDA will illuminate the LED associated with this point and transmit the supervisory condition to the Fire Alarm Control Panel.
Antenna trouble	A trouble on a donor antenna or the DAS will illuminate the LED associated with this point and transmit the supervisory condition to the Fire Alarm Control Panel

A device programmed to monitor a trouble type condition must be reserved to monitor the following condition:

Monitoring Condition	Description
AUX Alarm	An off-normal condition on the AUX device will illuminate the LED associated with this point and transmit the trouble condition to the Fire Alarm Control Panel


Indoor prediction legend
Power
[dBm]
>-40.00 (0.0%)
>-50.00 (1.2%)
>-55.00 (14.2%)
>-60.00 (33.5%)
>-65.00 (52.4%)
>-75.00 (71.1%)
>-80.00 (84.7%)
>-85.00 (94.8%)
>-95.00 (100.0%)
>-100.00 (100.0%)
800 MHz - SMR - P25
Min -95.00 dBm: 100.0 % >= 95.0 %
A6
S4
BDA1
ATT1
BBU1
Polyphaser1
Riser (1)
A5
Pictograms legend
Antenna
Attenuator
BBU
BDA
Polyphaser
Riser
Splitter
Cables legend
ATT CONNECTION TO BDA
BDA-ICA12JPLLR-500
BDA-NM-RG8-13-NM
NOTIFIER
by Honeywell
JOHNSONVILLE ELEMENTARY SCHOOL - ADDITION
18495 HIGHWAY 27
CAMERON, NC 28326
FLOOR 01

JOHNSONVILLE ELEMENTARY SCHOOL - ADDITION

18495 HIGHWAY 27
CAMERON, NC 28326

Estimate number: F1392 Rev 1.0

TYPE: DISTRIBUTED ANTENNA SYSTEM DESIGN

DATE: 00/00/2022

DESIGN CRITERIA

ASSUMPTIONS:

- -70 dBm OR BETTER SIGNAL AVAILABLE AT THE PROPOSED DONOR ANTENNA LOCATION.
- AT LEAST 20DB GREATER THAN THE MAX. BDA GAIN OF ISOLATION BETWEEN INDOOR AND OUTDOOR ANTENNAS.
- 32 CHANNELS FOR 800MHz SYSTEM
- ALL EQUIPMENT AND CABLING CAN BE INSTALLED AS DESIGNED.
- FINAL ANTENNA LOCATIONS TO BE DETERMINED BY SYSTEM INTEGRATOR.
- INSTALLER TO HAVE A VARIETY OF ATTENUATORS ON HAND TO BALANCE SYSTEM DURING COMMISSIONING STAGE

NOTES

INSTALLATION SCOPE OF WORK SHALL COMPLY WITH ALL APPLICABLE LOCAL CODES AND AHJ REQUIREMENTS.

INSTALLER SHALL VERIFY THE REQUIRED FIRE SURVIVABILITY OF THE RISER(S) AND EQUIPMENT LOCATION(S).

BATTERY BACKUP IS PROVIDED. REFER TO BATTERY CALCULATION SHEET.

ALL PASSIVE DEVICES (DIRECTIONAL COUPLERS, SPLITTERS) ARE INSTALLED INSIDE JUNCTION BOXES WITH PROPER SPACING FOR CONNECTIONS, IF CABLE IS REQUIRED TO BE INSTALED IN A METAL RACEWAYS.

DONOR ANTENNA AND ALL POWERED EQUIPMENT SHALL BE CONNECTED TO THE BUILDING GROUNDING SYSTEM.

DONOR ANTENNA SHALL BE CONNECTED TO LIGHTNING PROTECTION SYSTEM (IF EXISTING IN THE BUILDING).

THE DESIGN WAS BASED ON SURVEY DATA (IF AVAILABLE) AND FAST RAY TRACING PREDICTION MODEL.

THE DESIGN SHALL BE REVIEWWED AND APPROVED BY A PROFESSIONAL ENGINEER, IF REQUIRED.

THE SYSTEM SHALL NOT BE POWERED UNTIL IT HAS BEEN APPROVED BY THE AHJ.

REVISIONS

VERSION 1.0: ORIGINAL, DATE: 05/02/2022

NOTIFIER by Honeywell

JOHNSONVILLE ELEMENTARY SCHOOL - ADDITION
18495 HIGHWAY 27
CAMERON, NC 28326

Cover Page

8.8.2021

Page 1

Legend

Donor Antenna, Yagi Directional
763-869MHz, 14dBi
BDA-YDA763869-14-1

Omni indoor 698-869MHz 3dBi, Low Profile
BDA-OIA-698869-3-1

RF DIRECTIONAL COUPLER, 698-2690 MHz, 300W
BDA-DCx-W2

POWER SPLITTER, 698-2700 MHz. Broadband power splitter, 2 way, 50W
BDA-PS2-W2

Coaxial RF Surge Protector, DC - 6GHz, 90W, IP67, 60 V Max
BDA-P8AX09-6G-N/FF

Coaxial Cable Jumper NM-NM 1/4" Superflex, Outdoor UV, 48" long
BDA-NM-RG8-13-NM

1/2in Plenum coax cable Rated/ Indoor/ Outdoor Usage/ Color Red
BDA-ICA12-JPLLR-1K

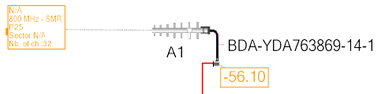
Coaxial Cable Grounding Kit
BDA-GNDKIT1

Weatherproofing Silicone Coldshrink for EOL Assembly, 9.8"L
BDA-WPK-ATBC40_01

800MHz BDA, class B,2W, DC
HONBDA-D-S33B

Battery Backup (BBU) 100AH, 24VDC
HONBDA-BTTY-100100

Remote annunciator without dry contacts (ANN1)
HONBDA-BTTY-ANN-4



A1 BDA-YDA763869-14-1 -56.10

Donor Antenna Azimuth:
136.43 Degrees
Distance to tower: 2.22
Miles

Grounding1
BDA-GNDKIT1

Coldshrink1
BDA-WPK-ATBC40_01

2

1

BDA-P8AX09-6G-N/FF Polyphaser1

HONBDA-D-S33B

BBU1 HONBDA-BTTY-100100

BDA1 -57.50 15.50 -4.80

ATT1
BDA-NATTEN-0520

S4
BDA-PS2-W2

A5 -9.30

A6 -8.88

ANN1
HONBDA-BTTY-ANN-4

Cables legend
ATT CONNECTION TO BDA
BDA-ICA12JPLLR-500
BDA-NM-RG8-13-NM

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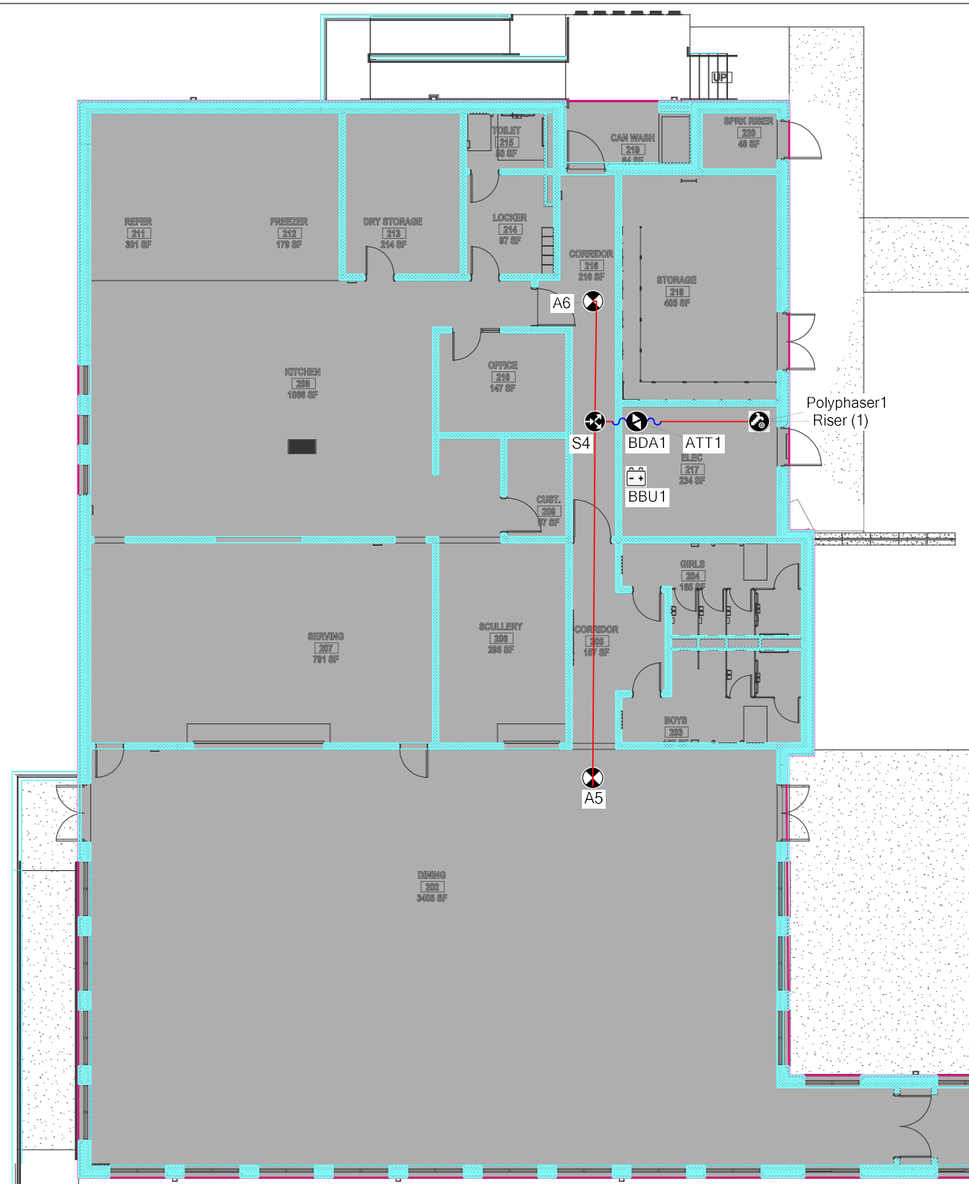
CAMERON, NC 28326

Design plan

8.8.2021

Page 2

Indoor prediction legend



Pictograms legend

- Antenna
- Attenuator
- BBU
- BDA
- Polyphaser
- Riser
- Splitter

Cables legend

- ATT CONNECTION TO BDA
- BDA-ICA12JPLLR-500
- BDA-NM-RG8-13-NM

FLOOR 01

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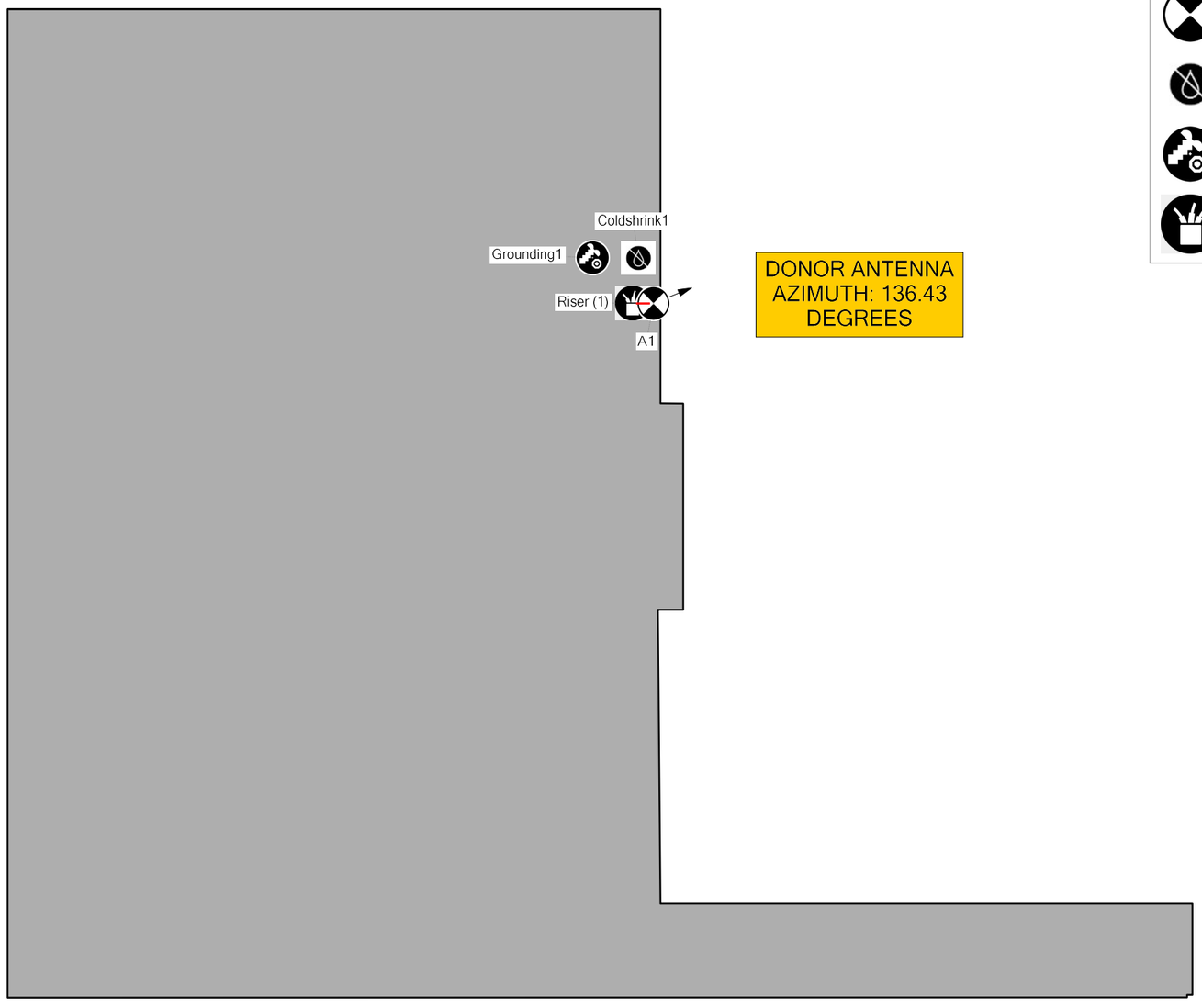
JOHNSONVILLE ELEMENTARY SCHOOL - ADDITION
18495 HIGHWAY 27
CAMERON, NC 28326

FLOOR 01

8.8.2021

Page 3



Pictograms legend

- Antenna
- Coldshrink
- Grounding
- Riser

N

ROOF

NOTIFIER by Honeywell

JOHNSONVILLE ELEMENTARY SCHOOL - ADDITION

18495 HIGHWAY 27

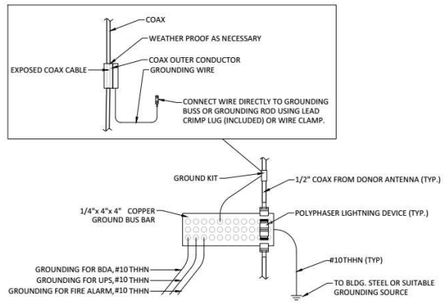
CAMERON, NC 28326

ROOF

8/8/2021

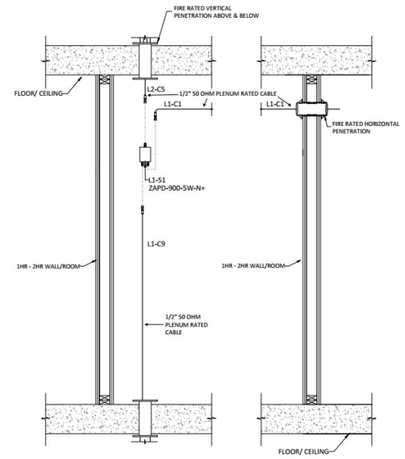
Page 4

Honeywell



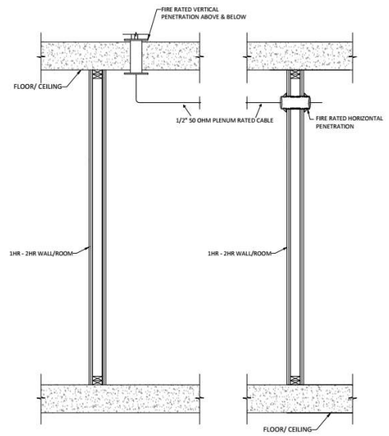
DETAIL
GROUNDING DETAIL

Honeywell



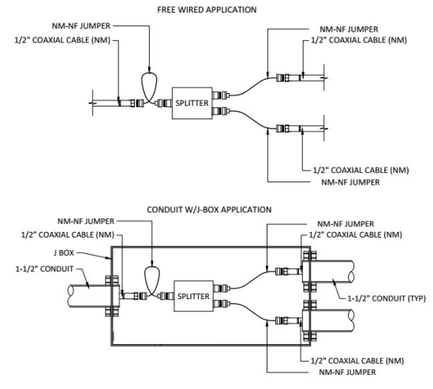
DETAIL 2
SLEEVE DETAIL FOR WALL AND FLOOR

Honeywell



DETAIL
SLEEVE DETAIL FOR WALL AND FLOOR

Honeywell



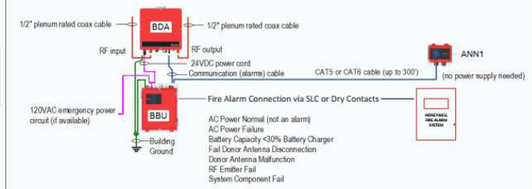
DETAIL 4
SPLITTER DETAIL

Grounding Typical Sleeve Detail

8.8.2021

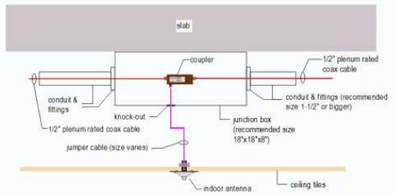
Detail #1

BDA/BBU Connection Diagram
(for more details refer to Datasheets and Manuals)



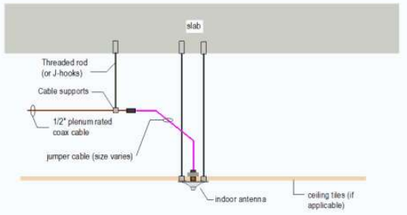
Detail #2

Indoor Antenna Mounting Detail - On the ceiling tile with J.Box and Conduit
(This is a representation only, for more details refer to Datasheets and Manuals)



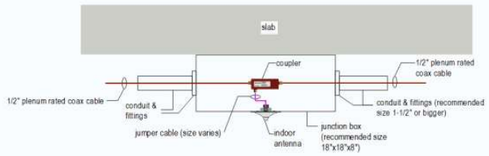
Detail #3

Indoor Antenna Mounting Detail - Free wire
(this is a representation only, for more details refer to Datasheets and Manuals)



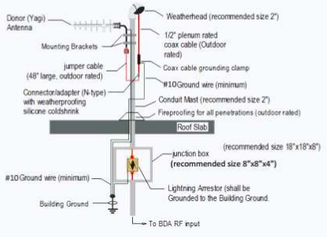
Detail #4

Indoor Antenna Mounting Detail - On the J.Box and conduits
(this is a representation only, for more details refer to Datasheets and Manuals)



Detail #5

Donor Antenna Mounting Detail
(this is a representation only, for more details refer to Datasheets and Manuals)



THESE ARE IMAGES OF THE ABOVE

Typical Mounting Details

8.8.2021

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FEDERAL COMMUNICATIONS COMMISSION

General Radiotelephone Operator License

Licensee: This is your radio authorization in sizes suitable for your wallet and for framing. Carefully cut the documents along the lines as indicated.

The Commission suggests that the wallet size version be laminated (or another similar document protection process) after signing. The Commission has found, under certain circumstances, laser print is subject to displacement.

PATTERSON, GREGORY C
2124 SOUTHERN RD
SANFORD, NC 27330

FCC Registration Number (FRN): 0028971406

Special Conditions / Endorsements

NONE

Grant Date	Effective Date	Print Date	Expiration Date
02-18-2020	02-18-2020	02-19-2020	

File Number	Serial Number	Date of Birth
0008979843	PG00065596	04-05-1994

THIS LICENSE IS NOT TRANSFERABLE

(Licensee's Signature)

FCC 605-FRC - May 2007

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Serial Number	Grant Date	Expiration Date	File Number	Print Date	Effective Date
PG00065596	02-18-2020		0008979843	02-19-2020	02-18-2020

Date of Birth
04-05-1994

FCC Registration Number (FRN)
0028971406

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THIS LICENSE IS NOT TRANSFERABLE

Special Conditions / Endorsements:
NONE

PATTERSON, GREGORY C
2124 SOUTHERN RD
SANFORD, NC 27330

General Radiotelephone Operator License

FCC 605-FRC - May 2007

(Licensee's Signature)
FEDERAL COMMUNICATIONS COMMISSION

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Hereby Certifies That

Cole Patterson

Patterson Group Services, Inc

completed the course and is certified on

Installation, Testing and Service of In-Building ERCES,
NOTIFIER Class B Public Safety Signal Boosters / BDA

January 2020

24 Professional Development Hour(s) (PDH)

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Radio Solutions, Inc (RSI)