CriticalPoint™ Version 3 / Next Generation Public Safety Solution

Public Safety VHF/UHF Bi-directional Amplifier and Battery Backup Unit

Public Safety Standards Compliance

- Complies with IFC / NFPA / UL2524 3rd revision
- FCC Class A: **PX8RX14V3-A** / Class B**: PX8RX14V3-B**
- UL 2524 Standard Certified – SGS Certificate:
  - BDA: **SGSNA/25/GZ/00025X**
  - BBU: **SGSNA/23/GZ/00235X**
- ISED (IC) Class A: **11919A-RX14V3A** / Class B: **11919A-RX14V3B**
- UL50E Type 4 / NEMA 4 enclosure for BDA / BBU

Bi-directional Amplifier

- Supports P25 P1/P2, digital and conventional analog communications simultaneously
- Supports single band VHF, single band UHF, or dual band VHF/UHF configurations in one chassis.
- Flexible Duplexed and Simplex configurations available
- Up to 32 narrow band filter pairs for VHF (Class A) or UHF (Class A)
- Channelized Auto Level Control (ALC) supported (Class A)
- Channelized uplink squelch supported (Class A)
- Uplink PA shutdown during no traffic periods to minimize noise being introduced to the network (Class A)
- Built-in mandatory isolation test to prevent BDA oscillation
- Auto shutdown with alarm upon oscillation detection
- Web based GUI for intelligent configuration, SNMP V1/V2/V3 supported
- Integrated Battery Charger Unit, Comba BBU V3 supported
- NFPA / IFC / UL 2524 compliant dry contact alarms, with LED displays
- External Comba Annunciator Panel V1 and V3 supported

Battery Backup Unit

- Optional dedicated Battery Backup Solution for V3/NG platform
- Supports Lithium Iron Phosphate (LiFePO4) batteries
- Up to 12 hours backup power with 30AH battery option for <120W Load
- Up to 24 hours backup power with 60AH battery option for <120W Load
- Up to 24 hours backup power with 100AH battery option for <200W Load
- Provides connections for EPO (Emergency Power Off) switch
- Provides AC convenience outlet inside BBU

RF Specifications - BDA

		VHF	UHF
Passband (Downlink / Uplink) Certified by FCC / ISED	MHz	FCC: 150.05 – 173.4 ISED (IC): 138 – 144, 148 - 174	FCC: 406 - 420, 421 – 430, 450 - 512 ISED (IC): 406.1 - 430, 450 – 470
Total Output Power, Uplink	dBm	24 (including duplexers / filters)	27 (including duplexers / filters)
Total Output Power, Downlink	dBm	24 (including duplexers / filters)	30 (including duplexers / filters)
Maximum System Gain (Uplink / Downlink)	dB	85 (including duplexers / filters)	85 (including duplexers / filters)
Gain Adjustment Range (1dB step) **	dB	30	30
Pass Band Ripple, p-p (Uplink / Downlink)	dB	4 (including duplexers / filters)	4 (including duplexers / filters)
Uplink Noise Figure	dB	<9 (Max gain including duplexers / filters)	
Intermodulation	dBm	FCC/ISED (IC) Compliance	FCC/ISED (IC) Compliance
Spurious	dBm	FCC/ISED (IC) Compliance	FCC/ISED (IC) Compliance
Max. RF Input Level without AGC (DL&UL)	dBm	-44 (w/o duplexers / filters)	-45 (w/o duplexers / filters)
Max. RF Input Level without Damage (DL&UL)	dBm	0 (w/o duplexers / filters)	0 (w/o duplexers / filters)
Max. RF Input Level without Overdrive (DL&UL)	dBm	-10 (w/o duplexers / filters)	-10 (w/o duplexers / filters)
Input VSWR		≤ 2	≤ 2
Impedance	Ω	50	50

RF Specifications - Filters

Class A Filtering Specifications			
Number of Filters			32 pairs per band
Filter Passband Definition			3dB
Filter Bandwidth		KHz	12.5/25/75
	Bandwidth (kHz)	Delay(μs)*	Out-of-Band Suppression
Filters	12.5	≤48	≥ 60dBc @ filter edge +/- 30KHz
	25	≤30	≥ 60dBc @ filter edge +/- 50KHz
	75	≤18	≥ 60dBc @ filter edge +/- 130KHz
	75 LD	≤15	≥ 60dBc @ filter edge +/- 200KHz

*Actual delay numbers are various according to firmware version

Class B Wide Band Filtering		
Number of Filters		5 (shared by VHF and UHF)
Filter Passband Definition		3dB
Filter Bandwidth	MHz	0.2 - 5
System Group Delay	μsec*	≤ 7
Out-of-Band Suppression	dBc	≥ 60 @ filter edge +/- 600KHz

*Actual delay numbers are various according to firmware version

Mechanical Specification - BDA

Dimensions, H x W x D (with bracket)	mm / in	760 x 650 x 375 / 30.0 x 25.7 x 14.8
Weight without filters	kg / lbs	41.8 / 92.2
Power Supply Input	VAC	100-240V / 50-60Hz / 4.5A Max
	VDC	+51.2V / 8A Max (Does NOT Support Negative DC Source)
DC Output Voltage to External Device, Nominal	VDC	+51.2VDC (1x), +28VDC (2x)
External Device Maximum Power Draw Supported	W	80
Maximum Charging Current	A	5
Power Consumption Single Band / Dual Band	W	<100 (Single Band), <120 (Dual Band)
Enclosure Cooling		Convection
Heat Dissipation	BTU/Hr	<535 (Dual Band, without load on 48V or 28V output)
Main RF Connectors		4 x Ports for Donor Side, 4 x Ports for Mobile Side
RF Connectors for Fiber DAS expansion		1 x UHF/VHF DL Coupling, 1 x UHF/VHF UL Coupling
Aux / Expansion Ports (SMA Connectors)		Redundancy Ports x 8
RF Test Port		NA
Dry Contact Alarm Visual Annunciation		10 LEDs (LED test supported)
Dry Contact Alarm Audible Annunciation		Buzzer (Mute supported)
Communication port		RJ45 (LAN, OMT)
Dry Contact Alarm Output		8
Annunciator Panel		1 x Built-in, 2 x External Comba Annunciator Panel V1/V3 Supported
External Alarm Input		5 (#5 is pre-configured for Door Open Alarm)
Reserved Knockouts		3/4-inch hole x 1, 1/2-inch hole x 3, 1-inch hole x2
Operating Temperature and Humidity	°F (°C)	-40 to 131 (-40 to +55), ≤ 95%
Environmental Class		UL50E Type 4 / NEMA 4
MTBF	Hr	100,000

Mechanical Specification - Battery Backup Unit

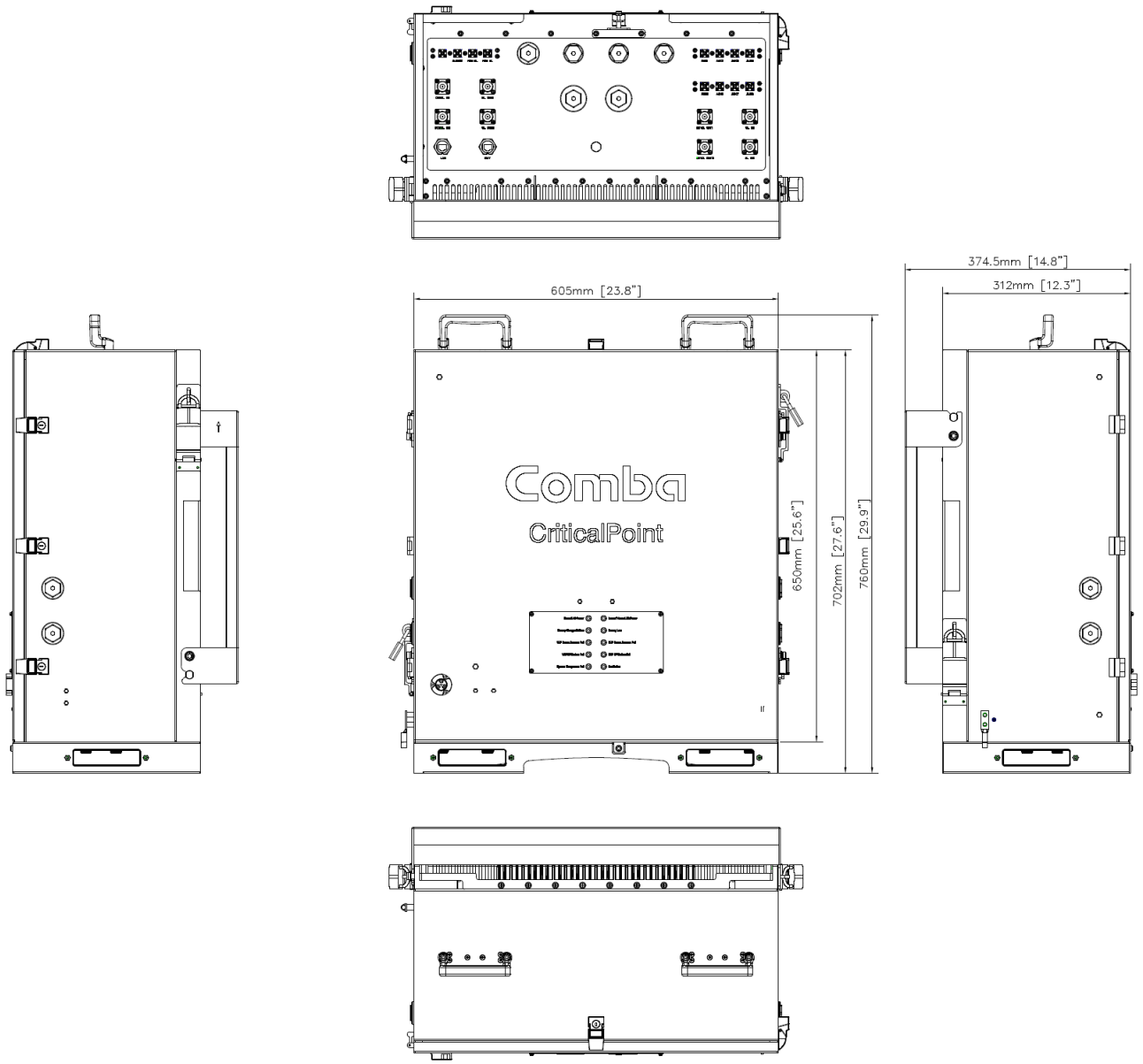
Dimensions, H x W x D	mm / in	605 x 500 x 272.9 / 23.8 x 19.7 x 10.7
Weight (without battery)	Kg / lbs	26 / 57.3
Reserved Knockouts		3/4-inch hole x 4, 1/2-inch hole x 6
Heat Dissipation	BTU/Hr	<100 (with 30AH, 60AH, or 100AH battery)
Operating Temperature and Humidity	°F (°C)	32 to 104 (0 to 40), ≤ 95%
Enclosure Environmental Class		UL50E Type 4 / NEMA 4
MTBF	Hr	100,000

Specification - Battery

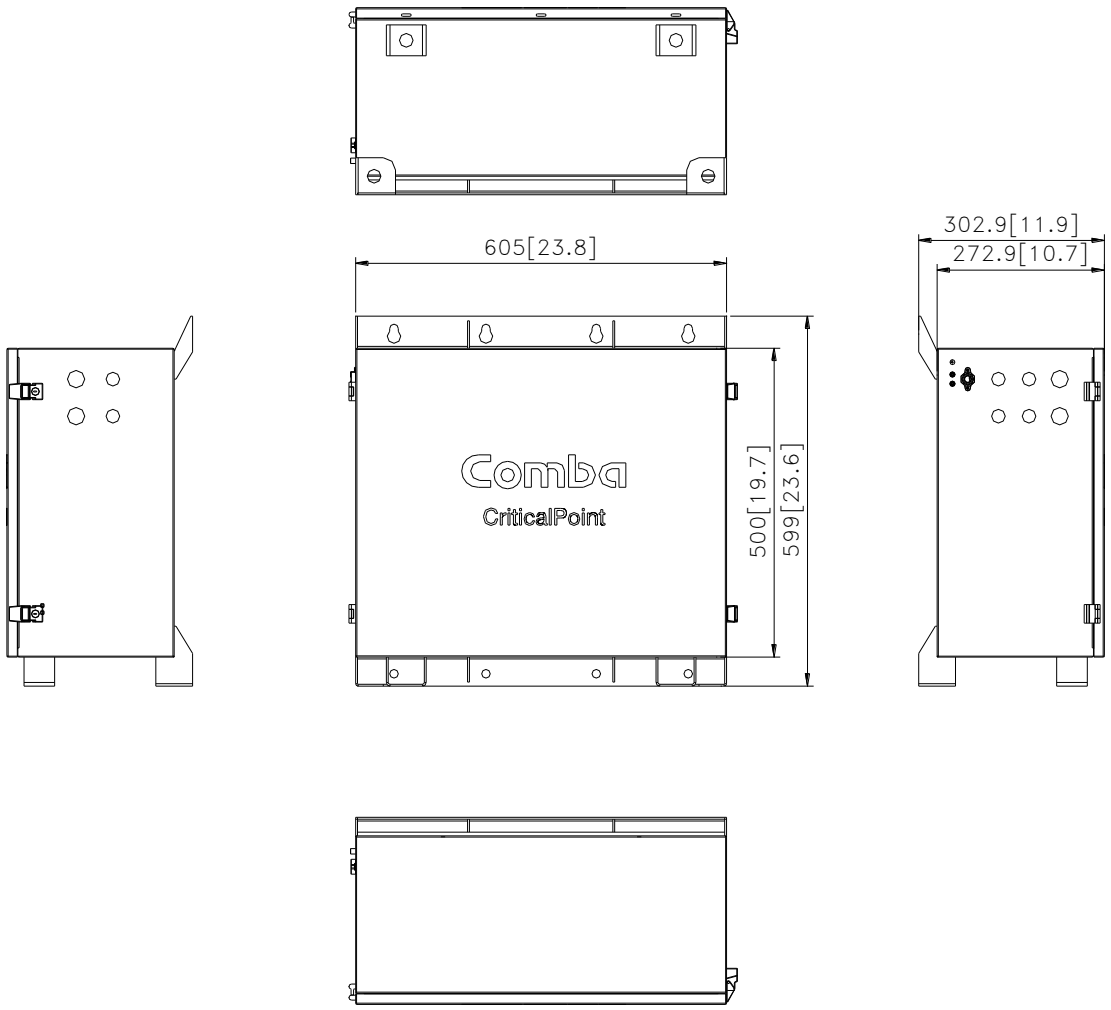
Battery Type		(Lithium Iron Phosphate) LiFePO4		
System Required Quantity	pcs	1	1	1
Capacity, Discharge @ 0.33C	AH	30	60	100
Nominal Voltage	VDC	51.2	51.2	51.2
Charging@2A, from 30%	Hour	10.5	21	35
Backup Hours		48.1 * 30 / Load	48.1 * 60 / Load	48.1 * 100 / Load
Battery Weight	lb(kg)	52.9 (24)	79.8 (36.2)	123.5 (56)
Battery Electrolyte Counts		0.456 Gallons / 4.6 lbs	0.913 Gallons / 9.1 lbs	1.758 Gallons / 17.6 lbs
BMS Comm. Port		Serial port (RS485)		

*Typical specifications at room temperature

Outline Drawing



VHF/UHF BDA V3 NG



BBU V3 NG

Part Numbers

VHF/UHF BDA V3 NG

UHF Single Band	
RX04V3-AP0-SA	UHF Single Band BDA V3, Class A/B, AC/DC, 30dBm DL, 27dBm UL, Filter Type = SA
RX04V3-AP0-1A	UHF Single Band BDA V3, Class A/B, AC/DC, 30dBm DL, 27dBm UL, Filter Type = 1A
RX04V3-AP0-1B	UHF Single Band BDA V3, Class A/B, AC/DC, 30dBm DL, 27dBm UL, Filter Type = 1B
RX04V3-AP0-1X	UHF Single Band BDA V3, Class A/B, AC/DC, 30dBm DL, 27dBm UL, Filter Type = 1X
RX04V3-AP0-2A	UHF Single Band BDA V3, Class A/B, AC/DC, 30dBm DL, 27dBm UL, Filter Type = 2A
RX04V3-AP0-2B	UHF Single Band BDA V3, Class A/B, AC/DC, 30dBm DL, 27dBm UL, Filter Type = 2B
RX04V3-AP0-2X	UHF Single Band BDA V3, Class A/B, AC/DC, 30dBm DL, 27dBm UL, Filter Type = 2X
RX04V3-AP0-3A	UHF Single Band BDA V3, Class A/B, AC/DC, 30dBm DL, 27dBm UL, Filter Type = 3A
VHF Single Band	
RX01V3-AP0-SA	VHF Single Band BDA V3, Class A/B, AC/DC, 24dBm DL, 24dBm UL, Filter Type = SA
RX01V3-AP0-2A	VHF Single Band BDA V3, Class A/B, AC/DC, 24dBm DL, 24dBm UL, Filter Type = 2A
RX01V3-AP0-3A	VHF Single Band BDA V3, Class A/B, AC/DC, 24dBm DL, 24dBm UL, Filter Type = 3A
RX01V3-AP0-4A	VHF Single Band BDA V3, Class A/B, AC/DC, 24dBm DL, 24dBm UL, Filter Type = 4A
VHF and UHF Dual Band	
RX14V3-AP0-VSAUSA	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: SA, SA
RX14V3-AP0-VSAU1A	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: SA, 1A
RX14V3-AP0-VSAU1B	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: SA, 1B
RX14V3-AP0-VSAU1X	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: SA, 1X
RX14V3-AP0-VSAU2A	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: SA, 2A
RX14V3-AP0-VSAU2B	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: SA, 2B
RX14V3-AP0-VSAU2X	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: SA, 2X
RX14V3-AP0-VSAU3A	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: SA, 3A
RX14V3-AP0-V2AUSA	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: 2A, SA
RX14V3-AP0-V2AU1A	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: 2A, 1A
RX14V3-AP0-V2AU1B	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: 2A, 1B
RX14V3-AP0-V2AU1X	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: 2A, 1X
RX14V3-AP0-V2AU2A	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: 2A, 2A
RX14V3-AP0-V2AU2B	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: 2A, 2B
RX14V3-AP0-V2AU2X	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: 2A, 2X
RX14V3-AP0-V2AU3A	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: 2A, 3A
RX14V3-AP0-V3BU1A	VHF&UHF Dual Band BDA V3, Class A/B, AC/DC, VHF/UHF: 24/30dBm DL, 24/27dBm UL, VHF/UHF Filter Type: 3B, 1A

Battery Backup Unit V3 NG

BBU Part Numbers	Battery Type	Capacity	Backup Hours
BBUV3-LFP48030	Lithium iron phosphate	30AH	>12H for 110W
BBUV3-LFP48060	Lithium iron phosphate	60AH	>24H for 110W, 12H for 220W
BBUV3-LFP48100	Lithium iron phosphate	100AH	>48H for 110W, 24H for 220W

Filter Configuration Detail - UHF

Filter Type	Number of Windows	Filter Passband	Filter Guardband	Window to Window Guardband
SA	N/A	Filters pass entire downlink passband or uplink passband for simplex units	N/A	N/A
1A	1	< 2.0MHz in 450-470MHz < 1.0MHz in 470-512MHz	≥ 3.0 MHz in 450-470 MHz or ≥ 2.0 MHz in 470-512 MHz	N/A
1B	1	< 2.5MHz in 450-470MHz < 1.5MHz in 470-512MHz	≥ 2.5 MHz in 450-470 MHz or ≥ 1.5 MHz in 470-512 MHz	N/A
1X	1	1 Window Customized Bandwidth, Confirm with Comba		
2A	2	Each window meets: < 2.0MHz in 450-470MHz or < 1.0MHz in 470-512MHz	Each window meets: ≥ 3.0 MHz in 450-470 MHz or ≥ 2.0 MHz in 470-512 MHz	> 3.0 MHz in 450-470 MHz or > 2.0 MHz in 470-512 MHz
2B	2	Each window meets: < 2.5MHz in 450-470MHz or < 1.5MHz in 470-512MHz	Each window meets: ≥ 2.5 MHz in 450-470 MHz or ≥ 1.5 MHz in 470-512 MHz	> 2.5 MHz in 450-470 MHz or > 1.5 MHz in 470-512 MHz
2X	2	2 Window Customized Bandwidth, Confirm with Comba		
3A	3	3 Window Customized Bandwidth, Confirm with Comba		

Filter Configuration Detail - VHF

Filter Type	Description	Filter Limitation
SA	Simplex	Comba still provides filters to cover all channels, and additionally to provide rejections outside of these channels
2A	1 DL Window + 1 UL Window Duplexed	≤ 3.5MHz for passband for either DL window or UL window and ≥ 1.5MHz guard band between the DL and UL filters *Comba can provide duplexed configuration for filter passband is ≥ 3.5MHz or ≥ 1.5MHz in the guard band for some markets. New PN is still under development, and these cases will be still quoted as 2A from the Comba portal before the new PN is released.
3A	2 DL Windows + 1 UL Window or 1 DL Window + 2 UL Windows Duplexed	Customized Bandwidth, Confirm with Comba
4A	2 DL Windows + 2 UL Windows Duplexed	Customized Bandwidth, Confirm with Comba