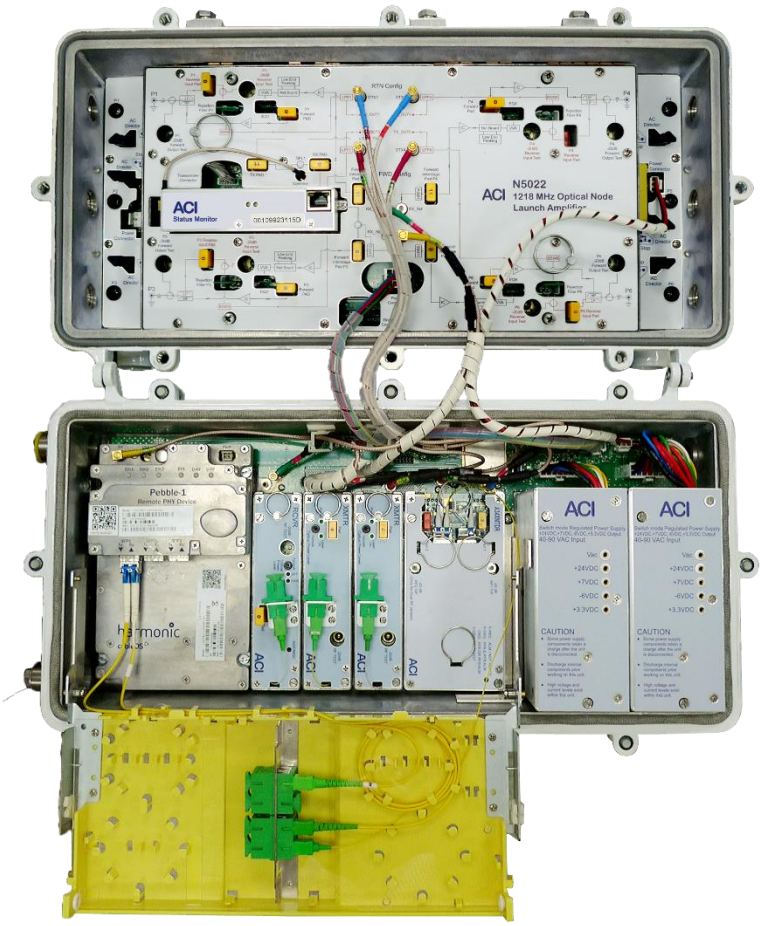


N5022 Optical Node

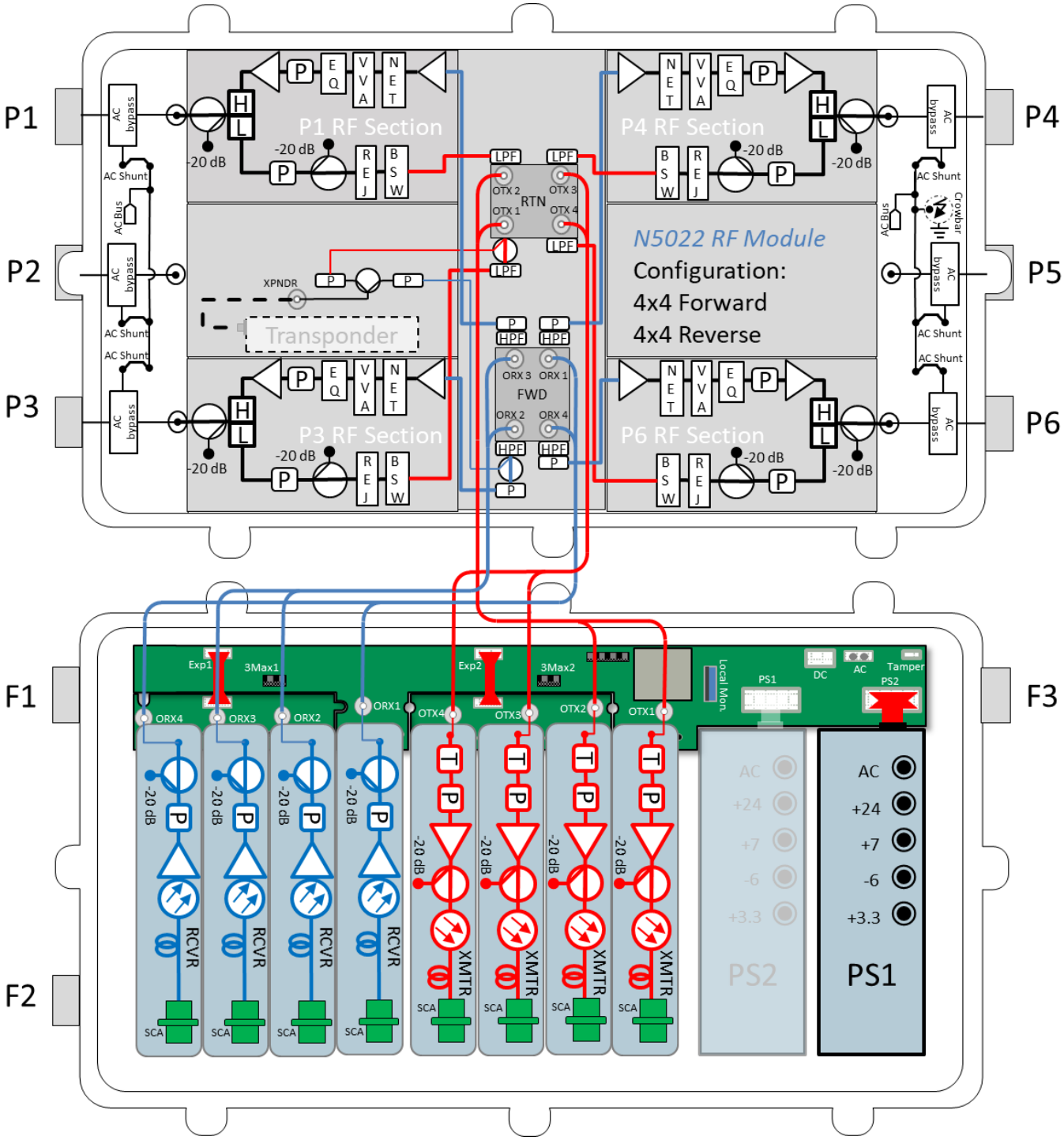
4x4 Fully Segmentable

The N5022 1.2 GHz is a 4-output 4x4 fully segmentable optical node that is capable of providing up to 59.1 dBmV output at 1218 MHz with an optical input range from -8 dBm to +2 dBm. The node can have up to four optical receivers and four optical transmitters. Replacing conventional analog optical modules, two Remote PHY modules can be integrated into the node to provide high speed full digital optical link for better RF signal quality to meet high-order QAM modulation and data transmission rate as required by DOCSIS 3.1 standard.

Features

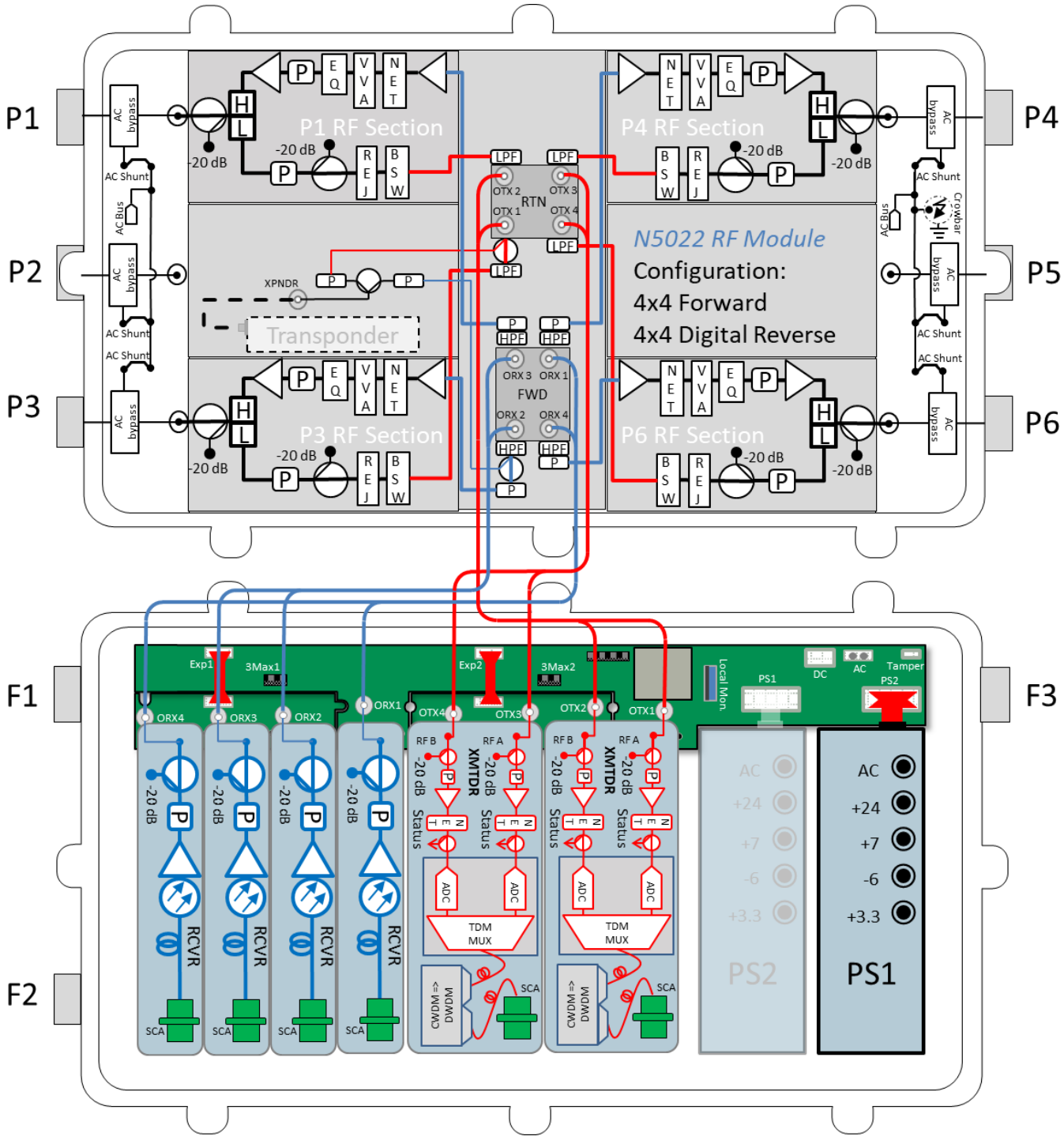
- Four driven output ports
- Compact size for a 4x4 segmentable node
- -20.0 dB directional coupler test points
- 15 amp power passing
- Plug-in bridger switching for managing the reverse path @ 0, -3.0, -6.0, -12.0 dB and open with active status monitoring (optional)
- Standard push on “F” connectors can be used on all test points
- FP, DFB, CWDM, DWDM & Digital return transmitters available
- Remote PHY module is available for digital fiber link (option)
- Redundant receiver & Transmitter (optional for 1:4 or 2:2 configurations)
- Plug-in forward and reverse configuration modules allows for easy field reconfiguration to add or remove segmentation as needed
- 85% efficient 40/90 VAC switch-mode power supply with built-in Triac surge protection

Block Diagrams

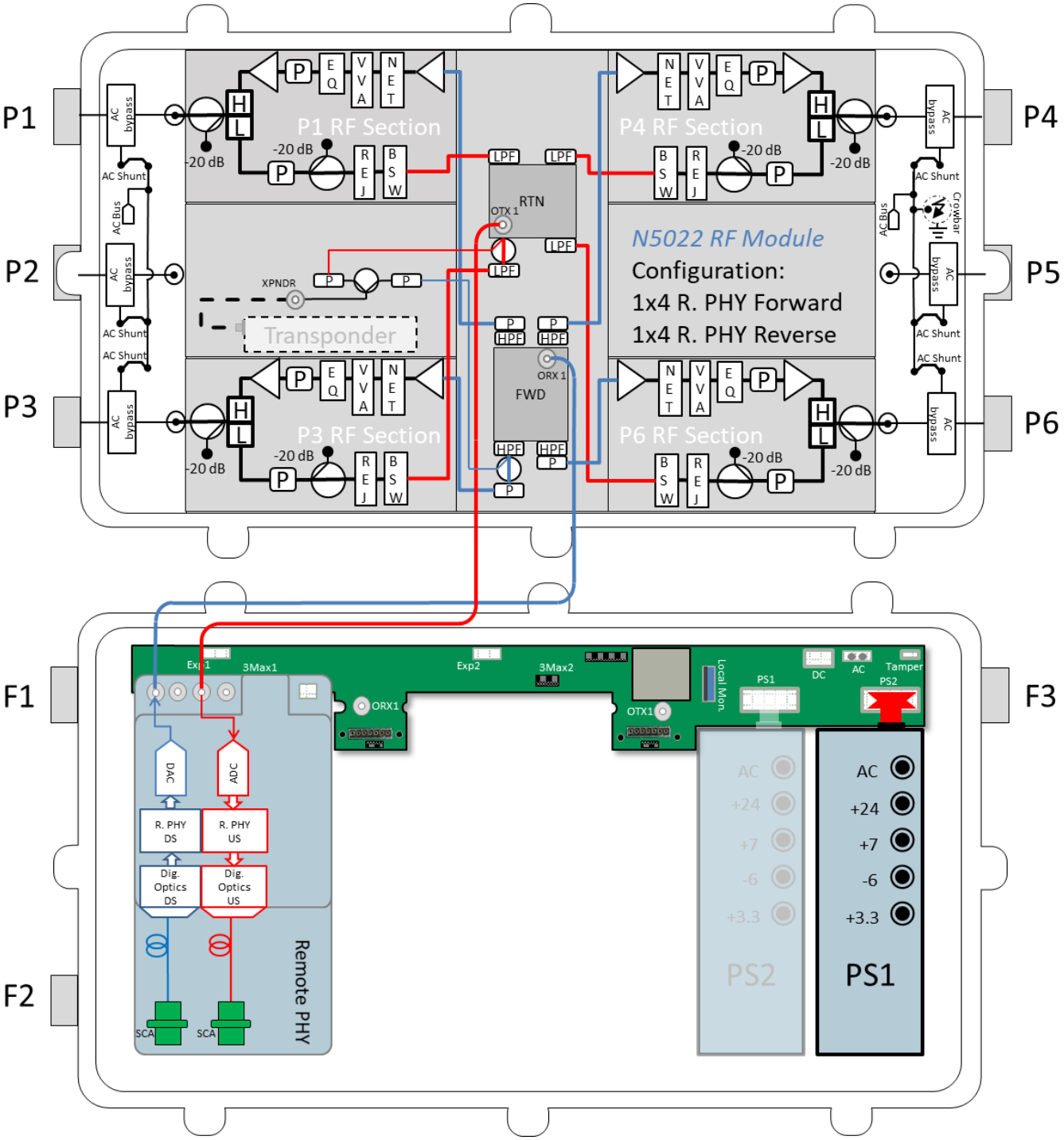


N5022 Block Diagram (4x4 Optical Node 1218Hz)

Analog Transmitters



N5022 Block Diagram (4x4 Optical Node 1218Hz)
Digital Return Transmitters



N5022 Block Diagram (4x4 Optical Node 1218Hz)
Remote PHY Module

Specifications 42/53

ACI			N5022 4-Output 1218 MHz Forward and Reverse 4x4 Segmentable Optical Node				
STATION PARAMETERS							
	CONDITIONS	UNITS	SPECIFICATION				NOTES
Housing passband		MHz	5 to 1218				
Input current capacity	Any port, worst case	Amperes	15				
Frequency range		MHz	5 - 10	11-750	751-1002	1003-1218	
Hum modulation	Time domain @ rated current above	-dBc	55	70	65	60	
Station passband		MHz	53 to 1218				
Return loss- Ports 1 to 4	Worst case	-dB	16.5				Typical 18.0
Frequency range		MHz	53-870		871-1002	1003-1218	
Port to Port Isolation	Typical	-dB	70		60	50	
Test Points							
Test point type	Directional coupler	N / A	DC				
Test point level(s)		-dB	20.0				
Test point accuracy	Forward TP	±dB	0.5				
Frequency range	Reverse TP	MHz	5 to 42				
Test point accuracy	Reverse TP	±dB	0.5				
Frequency Range							
Station passband		MHz	53 to 1218				
Station flatness - feeder out		±dB	0.75				
Station Gain							
			Minimum		Minimum	Minimum	
Configuration			1:4		1:2 (X2)	1:1(x4)	
Gain - feeder	@ 1218 MHz	dB	40		40	40	
Gain control type		N / A	Plug-in pads				
Gain control range		dB	15.0				
Gain control steps	Pad value steps	dB	0.5				
Station Slope							
Slope control type	Linear equalizers	N / A	Plug-in Equalizers				
Slope control range		dB	-12.0 to 13.0				
Slope control steps	Equalizer value steps	dB	1.0 linear steps				
Operational Specifications							
Operational level - feeders	@ 1218 MHz	dBmV	59.1				
Operational slope	@53 / 550 / 750 / 870 / 1002 / 1218 MHz	dB	0 / 8.4 / 12.2 / 14.5 / 17 / 21				
Operational optical input range		dBm	-8 to +2				Recommended input level 0 dBm
Station Output Levels with a -8 dBm optical input							
Distribution out	@53 / 550 / 750 / 870 / 1002 / 1218 MHz	dBmV	38 / 47 / 50 / 53 / 55 / 59				
Station Noise Figure - values for RF portion of node only. Complete values dependent on optical link.							
			* No slope		21.0 dB slope		* LEQ1= 0 dB
Noise figure (NF)	@ 53 MHz	dB	9.5		16.0		
Noise figure (NF)	@ 550 MHz	dB	9.5		11.0		
Noise figure (NF)	@ 1002 MHz	dB	9.5		11.0		
Noise figure (NF)	@ 1218 MHz	dB	9.5		11.0		
Station Distortions - values for RF Portion of node only. Complete values dependent on optical link.							
550 MHz analog channel loading, 79 channels + 660 MHz digital channel loading 256 QAM at -6 dBc relative to its associated visual carrier							
Reference levels	@53 / 550 / 750 / 870 / 1002 / 1218 MHz	dBmV	38 / 47 / 50 / 53 / 55 / 59				
		N / A	Worst Case		Typical		
Composite Triple Beat (CTB)		-dBc	70		72		
Cross Modulation (XMOD)		-dBc	64		66		
Composite Second Order (CSO -)	(Vc +0.75 & -1.25 MHz only)	-dBc	69		71		
Composite Second Order (CSO +)	(Vc +1.25 MHz only)	-dBc	69		71		
CIN		-dBc	65		67		
Station Group Delay							
Group delay	Channel 2 (std)	nSec / 3.58 MHz	30				Typical 25
Group delay	Channel 3	nSec / 3.58 MHz	16				
Group delay	Channel 4	nSec / 3.58 MHz	10				
Group delay	Channel 5 & >	nSec / 3.58 MHz	3				

REVERSE SPECTRUM:

	CONDITIONS	UNITS	SPECIFICATIONS			NOTES
Reverse - General						
Station passband		MHz	5 to 42			
Station flatness		±dB	1.0			
Bridger switch control (optional)		-dB	0, 3.0, 6.0, 12.0 & open			
Port to Port Isolation	Typical	-dB	65			
Reverse - Station Gain (RF section only)						
Configuration			4:1	2:1 (X2)	1:1 (X4)	
Gain	Minimum	dB	6.0	6.0	6.0	
Gain control type		N / A	Plug-in pads			
Gain control steps	Pad value steps	dB	0.5			
Reverse - Station Input Levels						
RF station input to node for 40 dBmV @ Laser TP	Minimum	dBmV	17.0			
Reverse - Noise Figure						
Configuration			4:1	2:1 (X2)	1:1 (X4)	
Station Noise Figure (w/ EQ)		dB	16.5	12.0	9.0	
Reverse - Station Distortions @ 23 dBmV						
Composite Second Order (CSO)	6 NTSC channel loading	-dBc	75			
Composite Triple Beat (CTB)	6 NTSC channel loading	-dBc	80			
Cross Modulation (XMOD)	6 NTSC channel loading	-dBc	80			
Noise-to-Power Ratio (NPR)	Noise loading	dB	Typical >40.0 / 13.0			@ 10.0 dB optical loss (6.0 dB fiber +4.0 dB flat loss) @ -51 dBmV/Hz
Reverse - Station Group Delay						
Group delay	5 MHz	nSec / 1.5 MHz	36			
Group delay	7 MHz	nSec / 1.5 MHz	16			
Group delay	10 MHz	nSec / 1.5 MHz	4			
Group delay	35 MHz	nSec / 1.5 MHz	10			
Group delay	38.5 MHz	nSec / 1.5 MHz	25			
Power Requirements:						
Station configuration (Over temperature range of -40°F to +140°F (-40°C to +60°C) @ 90 VAC)			1X4 (1RX & 1TX)	2X2 (2RX & 2TX)	4x4 (4RX &4TX)	
Power requirements	Worst case	W	67.8	87.5	96.8	
AC Voltage						
Input ranges		VAC	40 - 90			
Current Draw						
@ 40 VAC	Maximum	A	1.9	2.1	2.3	
@ 50 VAC	Maximum	A	1.6	1.9	2.1	
@ 60 VAC	Maximum	A	1.4	1.6	1.8	
@ 70 VAC	Maximum	A	1.3	1. 5	1.7	
@ 80 VAC	Maximum	A	1.1	1.4	1.6	
@ 90 VAC	Maximum	A	1.0	1.2	1.4	
Environmental						
Operating temperature		°F (°C)	-40 to +140 (-40 to +60)			
RF output stability over temperature		±dB	0.5			
Physical						
Dimensions (H X W X D)		In. (cm)	8.44 x 20.22 x 10.73 (21.45 x 51.35 x 27.25)			
Weight		lbs. (kg)	22.0 (10.00)			

Specifications 85/105

ACI			N5022 4-Output 1218 MHz Forward and Reverse 4x4 Segmentable Optical Node				
STATION PARAMETERS							
	CONDITIONS	UNITS	SPECIFICATION				NOTES
Housing passband		MHz	5 to 1218				
Input current capacity	Any port, worst case	Amperes	15				
Frequency range		MHz	5 - 10	11-750	751-1002	1003-1218	
Hum modulation	Time domain @ rated current above	-dBc	55	70	65	60	
Station passband		MHz	105 to 1218				
Return loss- Ports 1 to 4	Worst case	-dB	16.5				Typical 18.0
Frequency range		MHz	105-870	871-1002	1003-1218		
Port to Port Isolation	Typical	-dB	70	60	50		
Test Points							
Test point type	Directional coupler	N / A	DC				
Test point level(s)		-dB	20.0				
Test point accuracy	Forward TP	±dB	0.5				
Frequency range	Reverse TP	MHz	5 to 83				
Test point accuracy	Reverse TP	±dB	0.5				
Frequency Range							
Station passband		MHz	105 to 1218				
Station flatness - feeder out		±dB	0.75				
Station Gain							
			Minimum	Minimum	Minimum		
Configuration			1:4	1:2 (X2)	1:1(x4)		
Gain - feeder	@ 1218 MHz	dB	40	40	40		
Gain control type		N / A	Plug-in pads				
Gain control range		dB	15.0				
Gain control steps	Pad value steps	dB	0.5				
Station Slope							
Slope control type	Linear equalizers	N / A	Plug-in Equalizers				
Slope control range		dB	-12.0 to 13.0				
Slope control steps	Equalizer value steps	dB	1.0 linear steps				
Operational Specifications							
Operational level - feeders	@ 1218 MHz	dBmV	59.1				
Operational slope	@105 / 550 / 750 / 870 / 1002 / 1218 MHz	dB	0 / 7.4 / 11.2 / 13.5 / 16 / 20				
Operational optical input range		dBm	-8 to +2				Recommended input level 0 dBm
Station Output Levels with a -8 dBm optical input							
Distribution out	@105 / 550 / 750 / 870 / 1002 / 1218 MHz	dBmV	39 / 47 / 50 / 53 / 55 / 59				
Station Noise Figure - values for RF portion of node only. Complete values dependent on optical link.							
			* No slope	20.0 dB slope			* LEQ1= 0 dB
Noise figure (NF)	@ 105 MHz	dB	9.5	16.0			
Noise figure (NF)	@ 550 MHz	dB	9.5	11.0			
Noise figure (NF)	@ 1002 MHz	dB	9.5	11.0			
Noise figure (NF)	@ 1218 MHz	dB	9.5	11.0			
Station Distortions - values for RF Portion of node only. Complete values dependent on optical link.							
550 MHz analog channel loading, 74 channels + 660 MHz digital channel loading, 256 QAM at -6 dBc relative to its associated visual carrier							
Reference levels	@105 / 550 / 750 / 870 / 1002 / 1218 MHz	dBmV	39 / 47 / 50 / 53 / 55 / 59				
		N / A	Worst Case	Typical			
Composite Triple Beat (CTB)		-dBc	70	72			
Cross Modulation (XMOD)		-dBc	64	66			
Composite Second Order (CSO -)	(Vc +0.75 & -1.25 MHz only)	-dBc	69	71			
Composite Second Order (CSO +)	(Vc +1.25 MHz only)	-dBc	69	71			
CIN		-dBc	65	67			
Station Group Delay							
Group delay	Channel 2 (std)	nSec / 3.58 MHz	30				Typical 25
Group delay	Channel 3	nSec / 3.58 MHz	16				
Group delay	Channel 4	nSec / 3.58 MHz	10				
Group delay	Channel 5 & >	nSec / 3.58 MHz	3				

REVERSE SPECTRUM:

	CONDITIONS	UNITS	SPECIFICATIONS			NOTES
Reverse - General						
Station passband		MHz	5 to 85			
Station flatness		±dB	1.0			
Bridger switch control (optional)		-dB	0, 3.0, 6.0, 12.0 & open			
Port to Port Isolation	Typical	-dB	65			
Reverse - Station Gain (RF section only)						
Configuration			4:1	2:1(X2)	1:1(x4)	
Gain	Minimum	dB	6.0	6.0	6.0	
Gain control type		N / A	Plug-in pads			
Gain control steps	Pad value steps	dB	0.5			
Reverse - Station Input Levels						
RF station input to node for 40 dBmV @ Laser TP	Minimum	dBmV	17.0			
Reverse - Noise Figure						
Configuration			4:1	2:1 (X2)	1:1(x4)	
Station Noise Figure (w/ EQ)		dB	16.5	12.0	9	
Reverse - Station Distortions @ 23 dBmV						
Composite Second Order (CSO)	12 NTSC channel loading	-dBc	75			
Composite Triple Beat (CTB)	12 NTSC channel loading	-dBc	80			
Cross Modulation (XMOD)	12 NTSC channel loading	-dBc	80			
Noise-to-Power Ratio (NPR)	Noise loading	dB	Typical >40.0 / 13.0			@ 10.0 dB optical loss (6.0 dB fiber +4.0 dB flat loss) @ -51 dBmV/Hz
Reverse - Station Group Delay						
Group delay	5 MHz	nSec / 1.5 MHz	36			
Group delay	7 MHz	nSec / 1.5 MHz	16			
Group delay	10 MHz	nSec / 1.5 MHz	4			
Group delay	80.5 MHz	nSec / 1.5 MHz	10			
Group delay	83.5 MHz	nSec / 1.5 MHz	25			
Power Requirements:						
Station configuration (Over temperature range of -40°F to +140°F (-40°C to +60°C) @ 90 VAC)			1X4 (1RX & 1TX)	2X2 (2RX & 2TX)	4x4 (4RX&4TX)	
Power requirements	Worst case	W	67.8	87.5	96.8	
AC Voltage						
Input ranges		VAC	40 - 90			
Current Draw						
@ 40 VAC	Maximum	A	1.9	2.1	2.3	
@ 50 VAC	Maximum	A	1.6	1.9	2.1	
@ 60 VAC	Maximum	A	1.4	1.6	1.8	
@ 70 VAC	Maximum	A	1.3	1. 5	1.7	
@ 80 VAC	Maximum	A	1.1	1.4	1.6	
@ 90 VAC	Maximum	A	1.0	1.2	1.4	
Environmental						
Operating temperature		°F (°C)	-40 to +140 (-40 to +60)			
RF output stability over temperature		±dB	0.5			
Physical						
Dimensions (H X W X D)		In. (cm)	8.44 x 20.22 x 10.73 (21.45 x 51.35 x 27.25)			
Weight		lbs. (kg)	22.0 (10.00)			

Specifications Remote PHY

ACI						N5022 4-Output 1218 MHz Forward and Reverse 4x4 Segmentable Optical Node
REMOTE PHY MODULE (OPTIONAL)						
	CONDITIONS	UNITS	SPECIFICATIONS			NOTES
General Requirements			Min.	Typical	Max.	
Specification Support			PHY3.1, DRFI Annex D, MHAv2			
Number of RF ports			1xDS, 2x US			
DS:US SG ratio			1:1 or 1:2			
RF ports impedance		Ohm	75			
Number of RF channels						
DOCSIS 3.0 DS channels						
Annex A (8MHz channel)		Channel			120	
Annex B/C (6MHz channel)		Channel			158	
DOCSIS 3.0 US channels/port		Channel			12	
ATDMA		Channel			12	
SCDMA		Channel			4	
ATDMA+SCDMA		Channel			8+4	
DOCSIS 3.1 DS channels (OFDM)	Bandwidth of 24MHz to 192MHz bandwidth per channel	Channel			6	
DOCSIS 3.1 US channels (OFDMA)/port	Bandwidth of 6.4MHz to 96MHz per channel	Channel			2	
DS RF Performances						
DS Spectrum Range for SC-QAM		MHz	54		1006	
DS Spectrum Range for OFDM		MHz	108		1218	
Carrier Frequency Resolution		Hz			312.5	
DS RF Port Return Loss		dB	16			
DS RF Power Level	For 158 SC-QAMs loaded, +22dB for composite power level	dBmV/ 6MHz	20	22	24	
For less than 158 SC-QAM		dBmV/ 6MHz	PLa158+ceil(3*LOG2(158/N'))			PL^{a}_{158} – power level per channel for 158 loaded D3.0 SC-QAM channels for active RF chain
Flatness over entire DS spectrum range		dB			1 dB	From min to max power
US RF Performances / per port						
US Spectrum Range for SC-QAM		MHz	5		85	
US Spectrum Range for OFDMA		MHz	5		204	
US Input RF Power Level	For 6.4MHz channel	dBmV/ch	-2		23	
US Attenuation Control	Programmable	dB	0		31.5	
Average US Composite Signal Power		dB			15	
Instantaneous US Composite Power		dB			20	
US Flatness 5-204MHz		dB			2	
US RF port Return Loss (15MHz - 204MHz)		dB	16			Min 12dB from 5 to 15MHz
DS to US Isolation		dB	60			
Physical / Powering						
Power Consumption	2 US ports, no SFP modules	W			26	
Dimensions (D x W x H)		mm	184 x 115 x 45			

Ordering Matrix

N5022 4x4 Optical Node Configuration Sheet

Customer: _____

Created By: _____ Order Date: _____

ORDERING MATRIX **January 25, 2021**

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
PART NUMBER	**5**	**N**																

3 [ ]

BASE CONFIGURATION

A = FWD 1x4 REV 4x1 Nonsegmented
1 Transmitter installed
1 Receiver installed
TX and RX redundancy capable

B =FWD 1X4 REV 4X1 Nonsegmented with optics redundancy
2 Transmitters installed (TX1 & 2 Need to be the same type)
2 Receiver installed

C = FWD 2X2 REV 2X2 Forward & Return segmented
2 Transmitters installed
2 Receivers installed
TX or RX redundancy capable

D = FWD 2X2 REV 2X2 Forward & Return segmented with optics redundancy
4 Transmitters installed (TX1 & 2 and TX 3 & 4 Need to be the same type)
4 Receivers installed

E = FWD 2+2 REV 2+2 Forward & Return segmented
3 Transmitters installed
3 Receivers installed
TX1 & RX1 redundancy capable with TX2 & RX2

F = FWD 2+2 REV 2+2 Forward & Return segmented with optics redundancy
4 Transmitters installed (TX1 & 2 Need to be the same type)
4 Receivers installed

G = FWD 4X4 REV 4X4 Forward & Return segmented
4 Transmitters installed
4 Receivers installed
Not TX or RX redundancy capable

H = FWD 1X4 REV 4X1 Nonsegmented with Digital Return
1 Digital Transmitter installed
1 Receiver installed
TX and RX redundancy capable

J = FWD 2X2 REV 2X2 Forward & Return segmented with Digital return
1 Digital Transmitter (Dual RF) installed
2 Receiver installed

K = FWD 4X4 REV 4X4 Forward & Return segmented with Digital Return
2 Digital Transmitters (Dual RF) installed
4 Receivers installed

L = FWD 1X4 REV 4X1 Nonsegmented
1 Remote PHY 1x1 module installed (1 DS + 1US)
1 uplink 10GBE SFP submodule installed

M = FWD 2X2 REV 2X2 Forward & Return Segmented
1 Remote PHY 2x2 module installed (2 DS + 2 US)
1 uplink 10GBE SFP submodule installed

N = FWD 4X4 REV4X4 Forward & Return Segmented
2 Remote PHY(2x2) module installed (4 DS + 4 US)
2 uplink 10GBE SFP submodule installed

P = FWD 1X4 REV 2X2 Forward Nonsegmented& Return Segmented
1 Remote PHY(1x2) module installed (1 DS + 2 US)
1 uplink 10GBE SFP submodule installed

Q = FWD 1X4 REV 4X1 Nonsegmented Digital RPD with FWD analog RF overlay
1 Remote PHY 1x1 module installed (1 DS + 1US)
1 Receiver installed
1 uplink 10GBE SFP submodule installed

R = FWD 2X2 REV 2X2 Forward & Return segmented Digital RPD with FWD analog RF overlay
1 Remote PHY 2x2 module installed (2 DS + 2 US)
2 Receiver installed
1 uplink 10GBE SFP submodule installed

4 [ ] **Connector Split**

DIPLEX FREQUENCY SPLIT & OPTICAL CONNECTOR TYPE

SC/APC	SC/UPC	FC/APC	FC/UPC
4 = 42/53	A = 42/53	E = 42/53	J = 42/53
5 = 55/70	B = 55/70	F = 55/70	K = 55/70
6 = 65/85	C = 65/85	G = 65/85	L = 65/85
8 = 85/105	D = 85/105	H = 85/105	M = 85/105

TYPE DFB CWDM 4.0, 5.0 & 6.0 mW
W4 = Uncooled 1551 nm DFB CWDM (4.0 mW)
W5 = Uncooled 1551 nm DFB CWDM (5.0 mW)
N5 = Uncooled 1591 nm DFB CWDM (5.0 mW)
T5 = Uncooled 1611 nm DFB CWDM (5.0 mW)
A6 = Uncooled 1471 nm DFB CWDM (6.0 mW)
G6 = Uncooled 1491 nm DFB CWDM (6.0 mW)

5 & 6 [ ][ ] **TRANSMITTER 1 - Primary 4X1, or Ports 1 & 3 for 2X2, Port 1 for 4X1**
7 & 8 [ ][ ] **TRANSMITTER 2 - Secondary 4X1 or Ports 2 & 4 for 2X2 or Port 2 for 4X1**
9 & 10 [ ][ ] **TRANSMITTER 3 - Secondary Ports 1 & 3 for 2X2 or Port 3 for 4X1**
11 & 12 [ ][ ] **TRANSMITTER 4 - Secondary Ports 2 & 4 for 2X2 or Port 4 for 4X1**

00 = NO TRANSMITTERS INSTALLED

DIGITAL TRANSMITTER OPTIONS FOR POSTIONS 5&6, 9&10:
DR= NON DWDM DIGITAL TRANSMITTER
DA=DWDM DIGITAL TRANSMITTER 80KM WITH 45MHz SINGLE RF INPUT
DB=DWDM DIGITAL TRANSMITTER 80KM WITH 45MHz DUAL RF INPUTS
DC=DWDM DIGITAL TRANSMITTER 80KM WITH 85MHz SINGLE RF INPUT
DD=DWDM DIGITAL TRANSMITTER 80KM WITH 85MHz DUAL RF INPUTS
DIGITAL TRANSMITTER MODULE LASER TYPE:
FILL IN POSITION 7&8 FOR DR#1, 11&12 FOR DR#2

REMOTE PHY MODULE ENTER "RP" FOR POSITIONS 5&6, 9&10
REMOTE PHY MODULE CONFIGURATIONS:
FILL IN POSITIONS 7&8 FOR RPD#1, 11&12 FOR RPD#2

ANALOG TRANSMITTER OPTIONS:
TYPE FP & DFB
00 = None
D0 = Uncooled 1310 nm 1.0 mW FP
H0 = Uncooled 1310 nm 2.0 mW FP W/ISOLATOR
J0 = Uncooled 1310 nm 1.0 mW DFB
R0 = Uncooled 1310 nm 2.0 mW DFB
B0 = Uncooled 1310 nm 3.0 mW DFB
C0 = Uncooled 1550 nm 2.0 mW DFB
Z0 = Uncooled 1550 nm 4.0 mW DFB
TYPE DFB CWDM 2.0 mW
A2 = Uncooled 1471 nm DFB CWDM (2.0 mW)
G2 = Uncooled 1491 nm DFB CWDM (2.0 mW)
V2 = Uncooled 1511 nm DFB CWDM (2.0 mW)
L2 = Uncooled 1531 nm DFB CWDM (2.0 mW)
W2 = Uncooled 1551 nm DFB CWDM (2.0 mW)
M2 = Uncooled 1571 nm DFB CWDM (2.0 mW)
N2 = Uncooled 1591 nm DFB CWDM (2.0 mW)
T2 = Uncooled 1611 nm DFB CWDM (2.0 mW)
TYPE DFB CWDM 3.0 mW
A3 = Uncooled 1471 nm DFB CWDM (3.0 mW)
G3 = Uncooled 1491 nm DFB CWDM (3.0 mW)
W3 = Uncooled 1551 nm DFB CWDM (3.0 mW)
N3 = Uncooled 1591 nm DFB CWDM (3.0 mW)
T3 = Uncooled 1611 nm DFB CWDM (3.0 mW)

TYPE DWDM: ITU Grid: C-Band, 100 GHz Spacing (10.0 mW)

19 = Channel 19 - 1562.23nm	35 = Channel 35 - 1549.32nm	51 = Channel 51 - 1536.61nm
20 = Channel 20 - 1561.42nm	36 = Channel 36 - 1548.52nm	52 = Channel 52 - 1535.82nm
21 = Channel 21 - 1560.61nm	37 = Channel 37 - 1547.72nm	53 = Channel 53 - 1535.04nm
22 = Channel 22 - 1559.79nm	38 = Channel 38 - 1546.92nm	54 = Channel 54 - 1534.25nm
23 = Channel 23 - 1558.98nm	39 = Channel 39 - 1546.12nm	55 = Channel 55 - 1533.47nm
24 = Channel 24 - 1558.17nm	40 = Channel 40 - 1545.32nm	56 = Channel 56 - 1532.68nm
25 = Channel 25 - 1557.36nm	41 = Channel 41 - 1544.53nm	57 = Channel 57 - 1531.90nm
26 = Channel 26 - 1556.56nm	42 = Channel 42 - 1543.73nm	58 = Channel 58 - 1531.12nm
27 = Channel 27 - 1555.75nm	43 = Channel 42 - 1542.94nm	59 = Channel 59 - 1530.33nm
28 = Channel 28 - 1554.94nm	44 = Channel 44 - 1542.14nm	60 = Channel 60 - 1529.55nm
29 = Channel 29 - 1554.13nm	45 = Channel 45 - 1541.35nm	61 = Channel 61 - 1528.77nm
30 = Channel 30 - 1553.33nm	46 = Channel 46 - 1540.56nm	62 = Channel 62 - 1527.99nm
31 = Channel 31 - 1552.52nm	47 = Channel 47 - 1539.77nm	63 = Channel 63 - 1527.22nm
32 = Channel 32 - 1551.72nm	48 = Channel 48 - 1538.98nm	64 = Channel 64 - 1526.44nm
33 = Channel 33 - 1550.92nm	49 = Channel 49 - 1538.19nm	
34 = Channel 34 - 1550.12nm	50 = Channel 50 - 1537.40nm	

TYPE DIGITAL RETURN TRANSMITTER
00 = DWDM Digital Transmitter base unit only, without DWDM SFP submodule
DWDM DIGITAL TRANSMITTER: ITU-T DWDM Grid: C-Band, 100 GHz Spacing
(refering to the above list of DWDM channel wavelengths)

19 = Channel 19	31 = Channel 31	43 = Channel 43	55 = Channel 55
20 = Channel 20	32 = Channel 32	44 = Channel 44	56 = Channel 56
21 = Channel 21	33 = Channel 33	45 = Channel 45	57 = Channel 57
22 = Channel 22	34 = Channel 34	46 = Channel 46	58 = Channel 58
23 = Channel 23	35 = Channel 35	47 = Channel 47	59 = Channel 59
24 = Channel 24	36 = Channel 36	48 = Channel 48	60 = Channel 60
25 = Channel 25	37 = Channel 37	49 = Channel 49	61 = Channel 61
26 = Channel 26	38 = Channel 38	50 = Channel 50	62 = Channel 62
27 = Channel 27	39 = Channel 39	51 = Channel 51	63 = Channel 63
28 = Channel 28	40 = Channel 40	52 = Channel 52	64 = Channel 64
29 = Channel 29	41 = Channel 41	53 = Channel 53	
30 = Channel 30	42 = Channel 42	54 = Channel 54	

Ordering Matrix (Continued)

NON DWDM DIGITAL TRANSMITTER OPTIONS:
00 = Base Unit only, without SFP submodule

45 MHz Single RF:
AA = Single RF, Single 1310 nm DFB, 40 km
AB = Single RF, Single 1471 nm CWDM, 80 km
AC = Single RF, Single 1491 nm CWDM, 80 km
AD = Single RF, Single 1511 nm CWDM, 80 km
AE = Single RF, Single 1531 nm CWDM, 80 km
AF = Single RF, Single 1551 nm CWDM, 80 km
AG = Single RF, Single 1571 nm CWDM, 80 km
AH = Single RF, Single 1591 nm CWDM, 80 km
AJ = Single RF, Single 1611 nm CWDM, 80 km

85 MHz Single RF:
EA = Single RF, Single 1310 nm DFB, 40 km
EB = Single RF, Single 1471 nm CWDM, 80 km
EC = Single RF, Single 1491 nm CWDM, 80 km
ED = Single RF, Single 1511 nm CWDM, 80 km
EE = Single RF, Single 1531 nm CWDM, 80 km
EF = Single RF, Single 1551 nm CWDM, 80 km
EG = Single RF, Single 1571 nm CWDM, 80 km
EH = Single RF, Single 1591 nm CWDM, 80 km
EJ = Single RF, Single 1611 nm CWDM, 80 km

45 MHz Dual RF:
AL = Dual RF, Single 1310 nm DFB, 40 km
A1 = Dual RF, Single 1471 nm CWDM, 80 km
A2 = Dual RF, Single 1491 nm CWDM, 80 km
A3 = Dual RF, Single 1511 nm CWDM, 80 km
A4 = Dual RF, Single 1531 nm CWDM, 80 km
A5 = Dual RF, Single 1551 nm CWDM, 80 km
A6 = Dual RF, Single 1571 nm CWDM, 80 km
A7 = Dual RF, Single 1591 nm CWDM, 80 km
A8 = Dual RF, Single 1611 nm CWDM, 80 km

85 MHz Dual RF:
EL = Dual RF, Single 1310 nm DFB, 40 km
E1 = Dual RF, Single 1471 nm CWDM, 80 km
E2 = Dual RF, Single 1491 nm CWDM, 80 km
E3 = Dual RF, Single 1511 nm CWDM, 80 km
E4 = Dual RF, Single 1531 nm CWDM, 80 km
E5 = Dual RF, Single 1551 nm CWDM, 80 km
E6 = Dual RF, Single 1571 nm CWDM, 80 km
E7 = Dual RF, Single 1591 nm CWDM, 80 km
E8 = Dual RF, Single 1611 nm CWDM, 80 km

TYPE REMOTE PHY MODULE CONFIGURATIONS
00= No Remote PHY Module
11= 1 Down Stream + 1 Up Stream (1x1 module) Base options L or Q
12= 1 Down Stream + 2 Up Stream (1x2 module) Base option P
22= 2 Down Stream + 2 UP Stream (2x2 module) Base options M, N or R

Mux/DeMux Module for CWDM, DWDM or WDM
(For a 1X2 Mux or WDM use position 13)

13 ☐ **MUX A -Use for 2X2, or ports 1 & 3 for 4X4**

14 ☐ **MUX B Ports 2 & 4 for 4X4 or 2X2, 2+2, With Optics Redundancy**
0 = None
A = FWD path 1291, 1293; REV path 1471, 1491 nm & common
B = FWD path 1290, 1295; REV path 1591, 1611 nm & common
C = FWD Path 1310, 1431; REV path 1451, 1551 nm & common
P = DWDM 1291/CWDM 1471 nm
W = WDM 1310/1550 nm

Future = _____λ1 _____λ2 _____λ3 _____λ4 (To be created as needed)

15 ☐ **SLOPE**

MHz	550	750	870	1002	1218
E=	8.3	12.2	14.5	17.0	21.0
T=	6.3	10.2	12.5	15.0	19.0

16 ☐ **HOUSING OPTIONS & POWER SUPPLY QUANTITY**
P = Complete Node - 1 Power Supply
K = Upgrade kit - 1 Power Supply
E = Complete Node - 2 Power Supplies
F = Upgrade kit - 2 Power Supplies

17 ☐ **STATUS MONITORING**
0 = None
D = DOCSIS HMS Transponder

18 ☐ **CUSTOM**
0 = None
X = Determined by Product Management

NOTES:

Example: 5NC4A2G20000A0EP00 :
2X2 Forward & Reverse segmented node, 2 Receivers, TX1: CWDM 1471nm 2mW, TX2: CWDM 1491nm 2mW, 1 Mux/Demux module DWDM1291/1293/ CWDM1471/1491nm, 1.2GHz/Slope 21dB, complete node with single power supply.

Example: **5NC4DB23000000EP00** :
2X2 Forward & Reverse segmented node, 2 Receivers, TX1&TX2: Digital Return 80KM DWDM Channel 23, 1558.98nm ,45MHz Dual RF inputs, TX3&TX4: Not installed, No Demux module , 1.2GHz/Slope 21dB, complete node with single power supply.

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