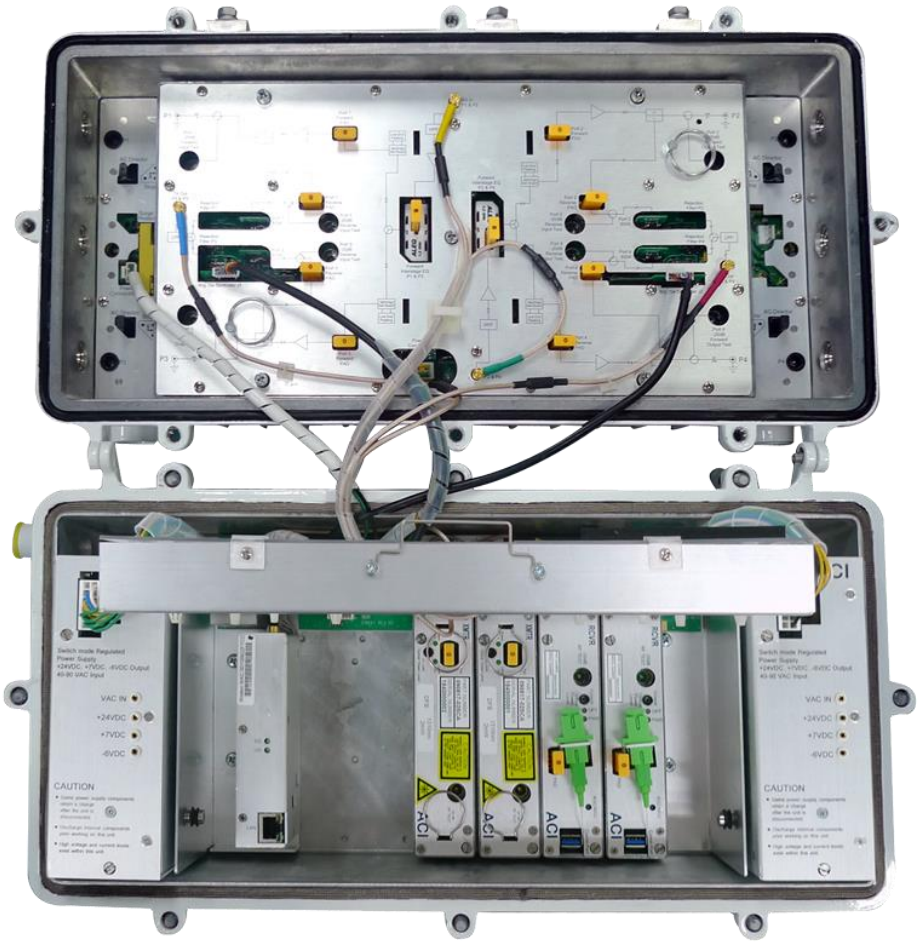


N5022 Optical Node

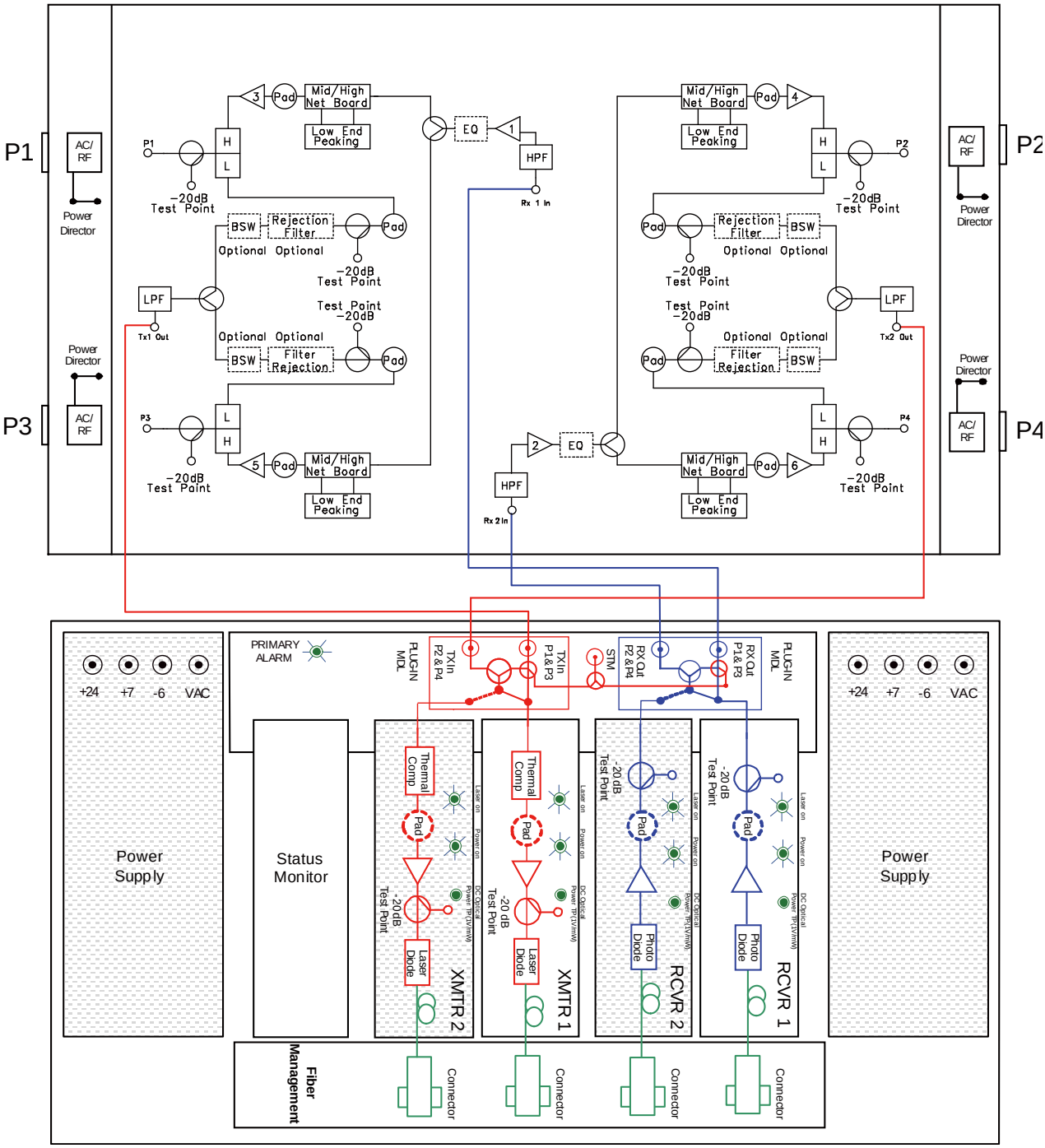
2x2 Fully Segmentable

The ACI Communications N5022 1.2GHz is a 4-output 2x2 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 two optical receivers and two optical transmitters.

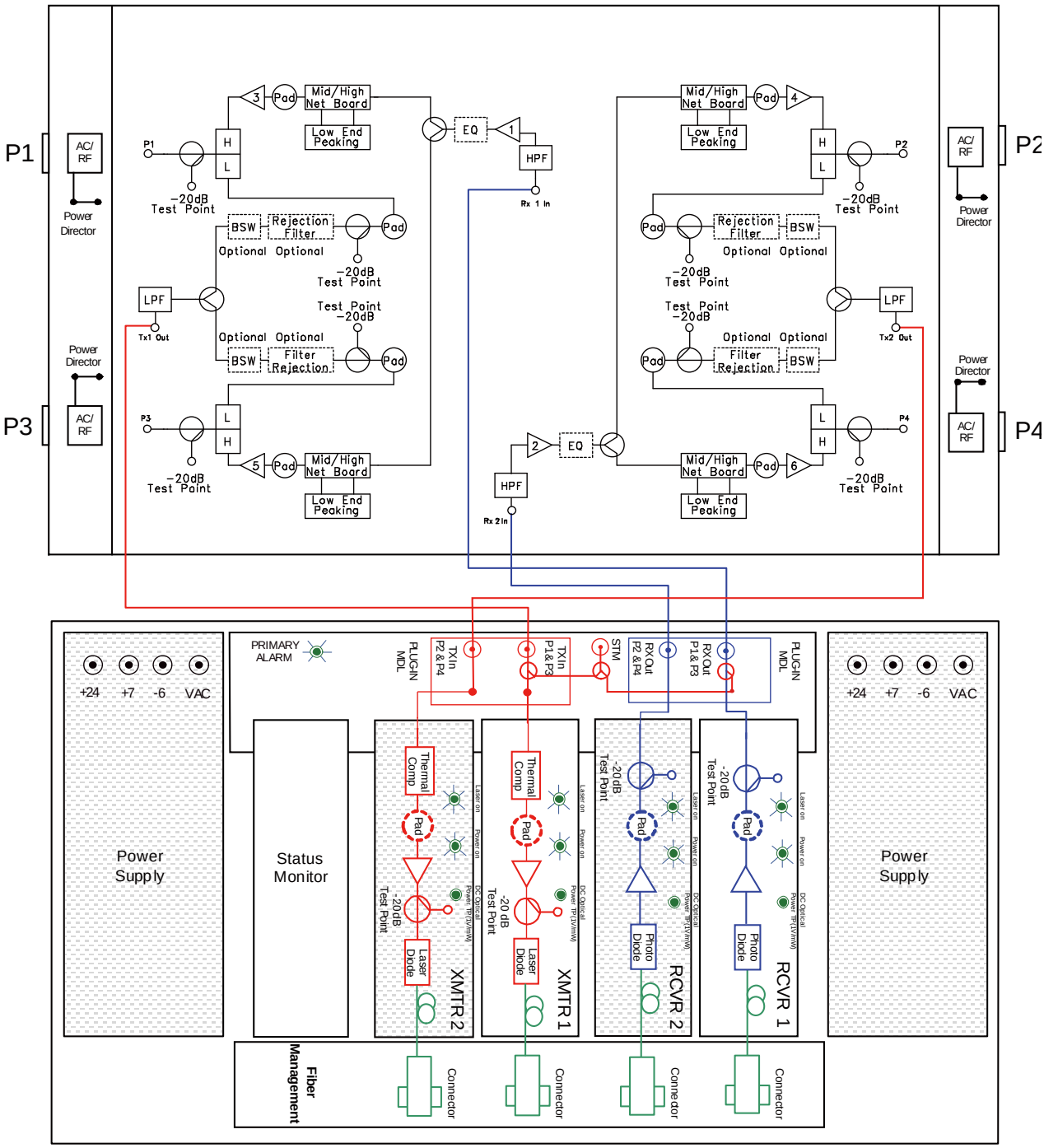
Features

- Four driven output ports
- Compact size for a 2x2 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
- Now with Digital return Transmitters
- FP, DFB and CWDM transmitters available
- Redundant receiver & Transmitter (optional 1:4 only)
- 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
- Standard push on “F” connectors can be used on all test points

Block Diagrams



N5022 Block Diagram (Non-Segmented Optical Node 1218Hz)



N5022 Block Diagram (Forward and Reverse Segmented Optical Node 1218 MHz)

Specifications

ACI			N5022 4-Output Forward and Reverse 2x2 Segmentable Optical Node 1218 MHz				
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			
Configuration			1:4	1:2 (X2)			
Gain - feeder	@ 1218 MHz	dB	36.3	40.3			
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 / 8.4 / 12.2 / 14.5 / 17 / 21.1				
Operational optical input range		dBm	-8 to +2				Recommended optical input level 0 dBm
Station Output Levels with a -3 dBm optical input							
Distribution out	@105 / 550 / 750 / 870 / 1002 / 1218 MHz	dBmV	38.0 / 46.4 / 50.2 / 52.5 / 55 / 59.1				
Station Noise Figure - values for RF portion of node only. Complete values dependent on optical link.							
			* No slope	21.1 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	38.0 / 46.4 / 50.2 / 52.5 / 55 / 59.1				
		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)	
Gain	Minimum	dB	*10.0	6.0	*for one TX Configuration
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		
Reverse - Noise Figure					
Configuration			4:1	2:1 (X2)	
Station Noise Figure (w/ EQ)		dB	16.5	12.0	
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	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)	
Power requirements	Worst case	W	67.8	87.5	
AC Voltage					
Input ranges		VAC	40 - 90		
Current Draw					
@ 40 VAC	Maximum	A	1.9	2.1	
@ 50 VAC	Maximum	A	1.6	1.9	
@ 60 VAC	Maximum	A	1.4	1.6	
@ 70 VAC	Maximum	A	1.3	1. 5	
@ 80 VAC	Maximum	A	1.1	1.4	
@ 90 VAC	Maximum	A	1.0	1.2	
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)	9.56 x 16.39 x 9.59 (24.28 x 41.62 x 24.35)		
Weight		lbs. (kg)	22.03 (10.00)		

Part Number Ordering Matrix

N5022 Configuration Sheet

Customer: _____

Created By: _____ Order Date: _____

ORDERING MATRIX **October 11, 2018**

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
PART NUMBER	3	H																			

3 [ ] **BASIC CONFIGURATION**

A = FWD 1:4 REV 4:1 nonsegmented
1 Transmitter installed, 1 Receiver installed
TX and RX redundancy capable

B = FWD 1:4 REV 2:1 (X2) Reverse segmented
2 Analog or 1 Digital Dual Transmitter installed, 1 Receiver installed
RX redundancy capable

C = FWD 1:2 (X2) REV 4:1 Forward segmented
1 Transmitter installed, 2 Receivers installed
TX redundancy capable

D = FWD 1:2 (2X) REV 2:1 (X2) Forward & Return segmented
2 Analog or 1 Digital Dual Transmitter installed, 2 Receivers installed
Not TX or RX redundancy capable

4 [ ] **DIPLEX FREQUENCY SPLIT**

Connector / Split	SC/APC	SC/UPC	FC/APC	FC/UPC
4 = 42/53	A = 42/53	F = 42/53	L = 42/53	
5 = 55/70	B = 55/70	G = 55/70	M = 55/70	
6 = 65/85	C = 65/85	H = 65/85	N = 65/85	
8 = 85/105	D = 85/105	J = 85/105	P = 85/105	
2 = 204/258	E = 204/258	K = 204/258	Q = 204/258	

5 & 6 [ ][ ] **ANALOG TRANSMITTER 1 - Primary 4:1 or Ports 1 & 3 for 2:1 (X2)**
DIGITAL TRANSMITTER ENTER "DR" FOR POSTIONS 5&6

7 & 8 [ ][ ] **ANALOG TRANSMITTER 2 - Secondary 4:1 or Ports 2 & 4 for 2:1 (X2)**
DIGITAL TRANSMITTER DUAL MODULE

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 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)

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

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

TYPE DIGITAL RETURN TRANSMITTER MODULE

00 = No Digital Return Transmitte

45 MHz

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

85 MHz

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

9 [ ] **RECEIVER REDUNDANCY (Basic configuration A or B only)**
0 = None
1 = Not redundant
2 = RX Redundant

10 [ ] **STATION SLOPE**
K = 21.1 dB @1218 MHz (Standard)

CWDM/DWDM Mux/DeMux or WDM
(For a 1X2 Mux or WDM use positions 13 & 15)

11 & 12 [ ][ ] **CWDM or DWDM DeMux Downstream Wavelength # 1**
13 & 14 [ ][ ] **CWDM or DWDM DeMux Downstream Wavelength # 2**
15 & 16 [ ][ ] **CWDM or DWDM Mux Upstream Wavelength #1**
17 & 18 [ ][ ] **CWDM or DWDM Mux Upstream Wavelength #2**

00 = None	AF = 1371 nm	AM = 1491 nm	AV = 1611 nm
AA = 1271 nm	AG = 1391 nm	AN = 1511 nm	AW = 1310 nm
AB = 1291 nm	AH = 1411 nm	AP = 1531 nm	AY = 1550 nm
AC = 1311 nm	AJ = 1431 nm	AR = 1551 nm	
AD = 1331 nm	AK = 1451 nm	AT = 1571 nm	
AE = 1351 nm	AL = 1471 nm	AU = 1591 nm	

DWDM O-Band: 1270nm to 1370nm (Downstream Only)
Z3 = 1290 nm Z4 = 1291 nm Z5 = 1293 nm Z6 = 1295 nm

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

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

19 [ ] **HOUSING TYPE**
P = Powder Coated

20 [ ] **STATUS MONITORING**
0 = None
D = Docsis HMS Transponder

21 [ ] **CUSTOM SPECIAL REQUEST**
0 = None
X = Determined by Product Management

ACI Communications, Inc.
23307 66th Avenue South
Kent, WA 98032

Rev D 10-09-2018