Cambium Networks™

PTP 820F Licensed Microwave Radio

Split-Mount Multi-Core Aggregation Node

Specifications

RADIO

- Standard power: 6-38 GHz, 71-76, 81-86 GHz
- High power: 6-11 GHz

Support RFU

- RFU-D – High-capacity MultiCore radio
- RFU-D-HP – High-capacity, high-power MultiCore radio
- RFU-E – High capacity E-band radio
- RFU-S – High-capacity radio

Radio Interface

- Two combo Radio interfaces
- An additional interface that can be configured as a radio interface or a 2.5 GbE interface*

Radio Configuration

- 1+0, 3 x 1+0, 2 x 2+0, 2x 2+0 + 1+0, 1+1 HSB*, 2+2 HSB*
- 2+0 Multi-Carrier ABC

Radio Features

- Multi-Carrier Adaptive Bandwidth Control (MC-ABC)
- High Spectral Efficiency: BPSK to 4096 QAM w/ ACM
- Channel Bandwidth: 6-38 GHz: up to 112 MHz; E-band: up to 500 MHz
- XPIC
- Diversity: 1+0 SD (BBC)
- Field Replaceable Diplexers/ Field Replaceable Channel Filters

ETHERNET

Ethernet Interfaces

- 4 x 1 GbE combo interface (RJ-45/SFP)
- Management Interface - 2 x 10/100 Base-T (RJ-45)
- 1 x 2.5/1 Gbps combo interface (RJ-45/SFP)*

Ethernet Features

- MTU – 9600 Bytes
- Quality of Service
  - Multiple Classification criteria (VLAN ID, p-bits, IPv4, DSCP, IPv6 TC, MPLS EXP)
  - 8 priority queues
  - Deep buffering (configurable up to 64 Mbit per queue)
  - WRED
  - P-bit marking/remarking
- 4K VLANs
- VLAN add/remove/translate
- MSTP, ERP (ITU-T G.8032)
- Frame Cut Through – controlled latency and PDV for delay sensitive applications
- Header De-Duplication – Capacity boosting by eliminating inefficiency in all layers (L2, MPLS, L3, L4, Tunneling – GTP for LTE, GRE)
- Y.1731 Ethernet OAM
- Y.1731 Ethernet Bandwidth Notification (ETH-BN)

TDM

- 16 x E1/DS1
- XC capacity – 256 VCs
- Timing options – Loop timing, system clock, recovered clock
- 1+1 / 1:1 Path protection

MANAGEMENT

SNMP

REST

SDN Support:

- NETCONF/YANG

SYNCHRONIZATION

Synchronization Distribution

- Sync Distribution over any traffic interface
- Sync-E (ITU-T G.8261, G.8262)
- SSM/ESMC Support for ring/mesh applications (ITU-T G.8264)
- SyncE Regenerator mode, providing PRC grade (ITU-T G.811) performance for smart pipe applications*

IEEE-1588

- Optimized Transport for reduced PDV
- IEEE-1588 TC*
- IEEE-1588 BC*

STANDARD

MEF

- Carrier Ethernet 2.0 (CE 2.0)

Supported Ethernet Standards

- 10/100/1000base-T/X (IEEE 802.3)
- Ethernet VLANs (IEEE 802.3ac)
- Virtual LAN (VLAN, IEEE 802.1Q)
- Class of service (IEEE 802.1p)
- Provider bridges (Q-in-Q – IEEE 802.1ad)
- Link aggregation (IEEE 802.3ad)
- Auto MDI/MDIX for 1000baseT
- RFC 1349: IPv4 TOS

- RFC 2474: IPv4 DSCP
- RFC 2460: IPv6 Traffic Classes

Supported TDM standards

- ITU-T G.703, G.736, G.775, G.823, G.824, G.828, ITU-T I.432, ETSI ETS 300 147, ETS 300 417

TDM Pseudowire Standards

- SAToP-RFC 4553

Security

- Secured protocols (HTTPS, SNMPV3, SSH, SFTP)
- Radius authentication and authorization
- TACACS+ authentication and authorization (session-based)

Standards Compliance

- Radio Spectral Efficiency: EN 302 217-2-2
- EMC: EN 301 489-1, EN 301 489-4, FCC 47 CFR, part 15, class B (US)
- Safety: EN 60950-1, IEC 60950-1, UL 60950-1, CSA-C22.2 No.60950-1, EN 60950-22, UL 60950-22, CSA C22.2.60950-22
- Ingress Protection:
  - RFU-D: IP67
  - RFU-D-HP: IP67
  - RFU-E: IP67
  - RFU-S: IP67
- Storage: ETSI EN 300 019-1-1 Class 1.2
- Transportation: ETSI EN 300 019-1-2 Class 2.3

TECHNICAL SPECIFICATION

Mechanical Specifications

- IDU – 44mm(H), 482mm(W), 165mm(D), 2.4 kg; 1.73”(H), 19”(W), 6.5”(D), 5.3 lbs
- RFU-D – 230mm(H), 233mm(W), 98mm(D), 6.5kg; 9.05”(H), 9.17”(W), 3.85”(D), 14.33 lbs. (includes diplexer unit)
- RFU-D-HP– 319mm(H), 286mm(W), 107mm(D), 12kg; 12.56”(H), 11.26”(W), 4.21”(D), 26.5 lbs. (includes diplexer or OCU unit)
- RFU-S – 217mm(H), 210mm(W), 85mm(D), 4kg; 8.54(H), 8.27”(W), 3.35”(D), 8.82 lbs.
- RFU-E – 220mm(H),198mm (W), 75 mm(D), 3kg; 8.66”(H), 7.8”(W), 3”(D), 6.6 lbs.

Environmental Specifications

- IDU: -5°C to +55°C (-25°C to +65°C extended); +23°F to +131°F (+5°F to +140°F extended);
- RFU: -33°C to +55°C (-45°C to +60°C extended); -27°F to +131°F (-49°F to +140˚F extended)

Power Input Specifications

- IDU Standard Input: -48 VDC
- IDU DC Input range: -40 to -60 VDC
- Dual-feed power support

Power Consumption Specifications

- IDU: 48W maximum
- RFU-D: 75W
- RFU-D-HP: 130W/180W
- RFU-S: 43W
- RFU-E: 43 W

*- Available in future release

Specifications

TRANSMIT POWER of RFU-D (dBm)

	Frequency (GHz)										
Modulation	**6**	**7**	**8**	**11**	**13**	**15**	**18**	**23**	**26**	**28-32**	**38**
BPSK	28	28	28	28	24	24	22	20	21	18	19
QPSK	28	28	28	28	24	24	22	20	21	18	19
8 QAM	28	28	28	28	24	24	22	20	21	18	18
16 QAM	28	27	27	28	23	24	22	20	20	17	18
32 QAM	28	27	26	28	23	24	22	20	19	16	17
64 QAM	28	26	26	27	23	24	22	20	19	16	17
128 QAM	27	26	26	26	22	24	22	20	19	16	17
256 QAM	27	26	26	26	21	22	20	20	17	14	16
512 QAM	27	25	24	26	21	22	20	20	17	14	14
1024 QAM	25	24	24	25	20	20	20	18	16	13	13
2048 QAM	25	23	22	24	20	20	18	17	15	12	12
4096 QAM	23	21	20	22	18	18	16	–	–	–	–

TRANSMIT POWER of RFU-D-HP (dBm)

dBm	Frequency (GHz)			
Modulation	**6**	**7**	**8**	**11**
BPSK	38	38	37	36
QPSK	37	37	37	36
8 QAM	37	37	37	36
16 QAM	37	37	37	35
32 QAM	37	37	37	35
64 QAM	36	36	35	34
128 QAM	36	35	35	33
256 QAM	35	34	33	32
512 QAM	34	33	33	32
1024 QAM	33	32	32	31
2048 QAM	33	31	31	31
4096 QAM	31	29	29	29

TRANSMIT POWER of RFU-S (dBm)

	Frequency (GHz)										
Modulation	**6**	**7**	**8**	**11**	**13**	**15**	**18**	**23**	**26**	**28-32**	**38**
BPSK	28	27	27	28	27	24	23	24	23	18	18
QPSK	28	27	27	28	27	24	23	24	23	18	18
8 QAM	28	27	27	28	27	24	23	24	23	18	18
16 QAM	28	27	27	28	27	24	23	24	23	17	17
32 QAM	27	27	26	28	26	24	23	24	23	16	16
64 QAM	27	26	26	27	24	23	23	23	23	16	16
128 QAM	27	26	26	27	24	23	22	23	23	16	16

	Frequency (GHz)										
Modulation	**6**	**7**	**8**	**11**	**13**	**15**	**18**	**23**	**26**	**28-32**	**38**
256 QAM	27	26	26	27	24	22	22	22	21	14	14
512 QAM	25	25	25	27	24	22	22	22	21	14	14
1024 QAM	25	24	24	25	22	20	19	21	20	13	13
2048 QAM	23	23	24	24	21	20	17	20	18	12	12
4096 QAM	21	21	22	22	19	18	15	–	–	–	–

TRANSMIT POWER of RFU-E (dBm)

	Channel Size (MHz)			
Modulation	**62.5**	**125**	**250**	**500**
BPSK	18	18	18	15
QPSK	18	18	18	15
8 QAM	18	18	16	11
16 QAM	17	17	15	10
32 QAM	17	17	15	10
64 QAM	16	16	14	9
128 QAM	16	16	14	–
256 QAM	15	15	13	–
512 QAM	14	14	–	–
1024 QAM	13	–	–	–

RECEIVE SENSITIVITY of RFU-D and RFU-S – ETSI (dBm @BER=10-6)

Frequency (GHz)	Channel Size	6	7-8	10	11	13	15	18	23	24	26	28-31	32	38
BPSK	14 MHz	-91.5	-91.0	-90.5	-91.5	-90.5	-89.5	-91.0	-90.0	-89.5	-89.5	-89.5	-89.0	-89.0
QPSK		-90.5	-90.0	-89.5	-90.5	-89.5	-88.5	-90.0	-89.0	-88.5	-88.5	-88.5	-88.0	-88.0
8 PSK		-84.5	-84.0	-83.5	-85.5	-83.5	-82.5	-84.0	-83.0	-82.5	-82.5	-82.5	-82.0	-82.0
16 QAM		-83.5	-83.0	-82.5	-83.5	-82.5	-81.5	-83.0	-82.0	-81.5	-81.5	-81.5	-81.0	-81.0
32 QAM		-80.5	-79.5	-79.5	-80.5	-79.0	-78.5	-79.5	-79.0	-78.5	-78.5	-78.0	-78.0	-77.5
64 QAM		-77.5	-76.5	-76.5	-77.0	-76.0	-75.5	-76.5	-76.0	-75.5	-75.5	-75.0	-75.0	-74.5
128 QAM		-74.0	-73.5	-73.0	-74.0	-73.0	-72.0	-73.5	-72.5	-72.0	-72.0	-72.0	-71.5	-71.5
256 QAM		-71.5	-70.5	-70.5	-71.0	-70.0	-69.5	-70.5	-69.5	-69.0	-69.5	-69.0	-69.0	-68.5
512 QAM		-68.5	-68.0	-67.5	-68.5	-67.5	-66.5	-68.0	-67.0	-66.5	-66.5	-66.5	-66.0	-66.0
1024 QAM Strong		-65.5	-65.0	-64.5	-65.5	-64.5	-63.5	-65.0	-64.0	-63.5	-63.5	-63.5	-63.0	-63.0
1024 QAM Light		-65.0	-64.0	-64.0	-64.5	-63.5	-63.0	-64.0	-63.5	-63.0	-63.0	-62.5	-62.5	-62.0
BPSK	28 MHz	-88.5	-88.0	-87.5	-88.5	-87.5	-86.5	-88.0	-87.0	-86.5	-86.5	-86.5	-86.0	-86.0
QPSK		-87.5	-87.0	-86.5	-87.5	-86.5	-85.5	-87.0	-86.0	-85.5	-85.5	-85.5	-85.0	-85.0
8 PSK		-83.0	-82.5	-82.0	-83.0	-82.0	-81.0	-82.5	-81.5	-81.0	-81.0	-81.0	-80.5	-80.5
16 QAM		-81.0	-80.5	-80.0	-81.0	-79.5	-79.0	-80.5	-79.5	-79.0	-79	-79.0	-78.5	-78.0
32 QAM		-77.5	-77.0	-76.5	-77.5	-76.0	-75.5	-77.0	-76.0	-75.5	-75.5	-75.5	-75.0	-74.5
64 QAM		-74.5	-74.0	-73.5	-74.5	-73.0	-72.5	-74.0	-73.0	-72.5	-72.5	-72.5	-72.0	-71.5
128 QAM		-71.5	-70.5	-70.5	-71.0	-70.0	-69.5	-70.5	-69.5	-69.0	-69.5	-69.0	-69.0	-68.5
256 QAM		-68.5	-67.5	-67.5	-68.0	-67.0	-66.5	-67.5	-66.5	-66.0	-66.5	-66.0	-66.0	-65.5
512 QAM		-66.0	-65.0	-65.0	-66.0	-64.5	-64.0	-65.0	-64.5	-64.0	-64.0	-63.5	-63.5	-63.0
1024 QAM Strong		-63.0	-62.5	-62.0	-63.0	-61.5	-61.0	-62.5	-61.5	-61.0	-61.0	-61.0	-60.5	-60.0
1024 QAM Light		-62.0	-61.5	-61.0	-62.0	-60.5	-60.0	-61.5	-60.5	-60.0	-60.0	-60.0	-59.5	-59.0
2048 QAM		-58.5	-58.0	-57.5	-58.5	-57.0	-56.5	-58.0	-57.0	-56.5	-56.5	-56.5	-56.0	-55.5
4096 QAM		-55.5	-55.0	-54.5	-55.5	-54.0	-53.5	-55.0	–	–	–	–	–	–

Frequency (GHz)	Channel Size	6	7-8	10	11	13	15	18	23	24	26	28-31	32	38
BPSK	40 MHz	-87.0	-86.5	-86.0	-87.0	-86.0	-85.0	-86.5	-85.5	-85.0	-85.0	-85.0	-84.5	-84.5
QPSK		-86.0	-85.5	-85.0	-86.0	-85.0	-84.0	-85.5	-84.5	-84.0	-84.0	-84.0	-83.5	-83.5
8 PSK		-81.0	-80.5	-80.0	-81.0	-79.5	-79.0	-80.5	-79.5	-79.0	-79.0	-79.0	-78.5	-78.0
16 QAM		-79.5	-79.0	-78.5	-79.5	-78.0	-77.5	-79.0	-78.0	-77.5	-77.5	-77.5	-77.0	-76.5
32 QAM		-76.0	-75.0	-75.0	-75.5	-74.5	-74.0	-75.0	-74.0	-73.5	-74.0	-73.5	-73.5	-73.0
64 QAM		-73.0	-72.0	-72.0	-73.0	-71.5	-71.0	-72.0	-71.5	-71.0	-71.0	-70.5	-70.5	-70.0
128 QAM		-70.0	-69.0	-69.0	-70.0	-68.5	-68.0	-69.0	-68.5	-68.0	-68.0	-67.5	-67.5	-67.0
256 QAM		-67.0	-66.0	-66.0	-66.5	-65.5	-65.0	-66.0	-65.0	-64.5	-65.0	-64.5	-64.5	-64.0
512 QAM		-64.0	-63.5	-63.0	-64.0	-62.5	-62.0	-63.5	-62.5	-62.0	-62.0	-62.0	-61.5	-61.0
1024 QAM Strong		-61.5	-61.0	-60.5	-61.5	-60.0	-59.5	-61.0	-60.0	-59.5	-59.5	-59.5	-59.0	-58.5
1024 QAM Light		-60.5	-60.0	-59.5	-60.5	-59.5	-58.5	-60.0	-59.0	-58.5	-58.5	-58.5	-58.0	-58.0
2048 QAM		-58.0	-57.0	-57.0	-58.0	-56.5	-56.0	-57.0	-56.5	-56.0	-56.0	-55.5	-55.5	-55.0
4096 QAM		-55.0	-54.0	-54.0	-55.0	-53.5	-53.0	-54.0	–	–	–	–	–	–
BPSK	56 MHz	-85.5	-85.0	-84.5	-85.5	-84.0	-83.5	-85.0	-84.0	-83.5	-83.5	-83.5	-83.0	-82.5
QPSK		-84.5	-84.0	-83.5	-84.5	-83.0	-82.5	-84.0	-83.0	-82.5	-82.5	-82.5	-82.0	-81.5
8 PSK		-80.0	-79.0	-79.0	-79.5	-78.5	-78.0	-79.0	-78.0	-77.5	-78.0	-77.5	-77.5	-77.0
16 QAM		-77.5	-77.0	-76.5	-77.5	-76.0	-75.5	-77.0	-76.0	-75.5	-75.5	-75.5	-75.0	-74.5
32 QAM		-74.0	-73.0	-73.0	-73.5	-72.5	-72.0	-73.0	-72.0	-71.5	-72.0	-71.5	-71.5	-71.0
64 QAM		-70.5	-70.0	-69.5	-70.5	-69.5	-68.5	-70.0	-69.0	-68.5	-68.5	-68.5	-68.0	-68.0
128 QAM		-68.0	-67.0	-67.0	-67.5	-66.5	-66.0	-67.0	-66.0	-65.5	-66.0	-65.5	-65.5	-65.0
256 QAM		-64.5	-64.0	-63.5	-64.5	-63.5	-62.5	-64.0	-63.0	-62.5	-62.5	-62.5	-62.0	-62.0
512 QAM		-62.5	-62.0	-61.5	-62.5	-61.5	-60.5	-62.0	-61.0	-60.5	-60.5	-60.5	-60.0	-60.0
1024 QAM Strong		-59.0	-58.5	-58.0	-59.0	-58.0	-57.0	-58.5	-57.5	-57.0	-57.0	-57.0	-56.5	-56.5
1024 QAM Light		-58.0	-57.5	-57.0	-58.0	-57.0	-56.0	-57.5	-56.5	-56.0	-56.0	-56.0	-55.5	-55.5
2048 QAM		-55.5	-54.5	-54.5	-55.0	-54.0	-53.5	-54.5	-53.5	-53.0	-53.5	-53.0	-53.0	-52.5
4096 QAM		-52.5	-51.5	-51.5	-52.0	-51.0	-50.5	–	–	–	–	–	–	–
BPSK	80 MHz	-85.0	-85.0	-84.5	-85.5	-84.5	-83.5	-85.0	-84.0	-83.5	-83.5	-83.5	-83.0	-83.5
QPSK		-82.5	-82.5	-82.5	-83.0	-82.0	-81.5	-82.5	-81.5	-81.0	-81.5	-81.0	-81.0	-81.0
8 PSK		-79.0	-79.0	-78.5	-79.5	-78.5	-77.5	-79.0	-78.0	-77.5	-77.5	-77.5	-77.0	-77.5
16 QAM		-76.0	-76.0	-75.5	-76.5	-75.0	-74.5	-76.0	-75.0	-74.5	-74.5	-74.5	-74.0	-74.0
32 QAM		-72.5	-72.5	-72.0	-73.0	-71.5	-71.0	-72.5	-71.5	-71.0	-71.0	-71.0	-70.5	-70.5
64 QAM		-69.0	-69.0	-69.0	-70.0	-68.5	-68.0	-69.0	-68.5	-68.0	-68.0	-67.5	-67.5	-67.5
128 QAM		-66.5	-66.5	-66.0	-67.0	-66.0	-65.0	-66.5	-65.5	-65.0	-65.0	-65.0	-64.5	-65.0
256 QAM		-63.5	-63.5	-63.0	-64.0	-63.0	-62.0	-63.5	-62.5	-62.0	-62.0	-62.0	-61.5	-62.0
512 QAM		-61.0	-61.0	-61.0	-62.0	-60.5	-60.0	-61.0	-60.5	-60.0	-60.0	-59.5	-59.5	-59.5
1024 QAM Strong		-58.0	-58.0	-57.5	-58.5	-57.5	-56.5	-58.0	-57.0	-56.5	-56.5	-56.5	-56.0	-56.5
1024 QAM Light		-57.0	-57.0	-57.0	-58.0	-56.5	-56.0	-57.0	-56.5	-56.0	-56.0	-55.5	-55.5	-55.5
2048 QAM		-54.5	-54.5	-54.5	-55.5	-54.0	-53.5	-54.5	-54.0	-53.5	-53.5	-53.0	-53.0	–
BPSK	112 MHz	-82.0	-81.5	-81.0	-82.0	-80.5	-80.0	-81.5	-80.5	-80.0	-80.0	-80.0	-79.5	-79.0
QPSK		-81.0	-80.5	-80.0	-81.0	-79.5	-79.0	-80.5	-79.5	-79.0	-79.0	-79.0	-78.5	-78.0
8 PSK		-76.5	-75.5	-75.5	-76.0	-75.0	-74.5	-75.5	-74.5	-74.0	-74.5	-74.0	-74.0	-73.5
16 QAM		-74.0	-73.5	-73.0	-74.0	-72.5	-72.0	-73.5	-72.5	-72.0	-72.0	-72.0	-71.5	-71.0
32 QAM		-70.5	-69.5	-69.5	-70.0	-69.0	-68.5	-69.5	-68.5	-68.0	-68.5	-68.0	-68.0	-67.5
64 QAM		-67.0	-66.5	-66.0	-67.0	-66.0	-65.0	-66.5	-65.5	-65.0	-65.0	-65.0	-64.5	-64.5
128 QAM		-64.5	-63.5	-63.5	-64.0	-63.0	-62.5	-63.5	-62.5	-62.0	-62.5	-62.0	-62.0	-61.5
256 QAM		-61.0	-60.5	-60.0	-61.0	-60.0	-59.0	-60.5	-59.5	-59.0	-59.0	-59.0	-58.5	-58.5

Frequency (GHz)	Channel Size	6	7-8	10	11	13	15	18	23	24	26	28-31	32	38
512 QAM	112 MHz	-59.0	-58.5	-58.0	-59.0	-58.0	-57.0	-58.5	-57.5	-57.0	-57.0	-57.0	-56.5	-56.5
1024 QAM Strong		-55.5	-55.0	-54.5	-55.5	-54.5	-53.5	-55.0	-54.0	-53.5	-53.5	-53.5	-53.0	-53.0
1024 QAM Light		-54.5	-54.0	-53.5	-54.5	-53.5	-52.5	-54.0	-53.0	-52.5	-52.5	-52.5	-52.0	-52.0
2048 QAM		-52.0	-51.0	-51.0	-51.5	-50.5	-50.0	-51.0	-50.0	-49.5	-5.00	-49.5	-49.5	–

RECEIVE SENSITIVITY of RFU-D-HP – ETSI (dBm @BER=10-6)

Frequency (GHz)	Channel Size	6	7	8	11	Channel Size	6	7	8	11	Channel Size	6	7	8	11
BPSK	28 MHz	-91.6	-91.8	-91.2	-91.3	40 MHz	-90.3	-90.5	-89.9	-90.0	56 MHz	-88.8	-89.0	-88.4	-88.5
QPSK		-88.6	-88.8	-88.2	-88.3		-87.1	-87.3	-86.7	-86.8		-85.6	-85.8	-85.2	-85.3
8 PSK		-84.7	-84.9	-84.3	-84.4		-83.1	-83.3	-82.7	-82.8		-81.5	-81.7	-81.1	-81.2
16 QAM		-81.7	-81.9	-81.3	-81.4		-80.2	-80.4	-79.8	-79.9		-78.6	-78.8	-78.2	-78.3
32 QAM		-78.4	-78.6	-78.0	-78.1		-76.8	-77.0	-76.4	-76.5		-75.3	-75.5	-74.9	-75
64 QAM		-75.4	-75.6	-75.0	-75.1		-73.7	-73.9	-73.3	-73.4		-72.3	-72.5	-71.9	-72.0
128 QAM		-72.3	-72.5	-71.9	-72.0		-70.7	-70.9	-70.3	-70.4		-69.4	-69.6	-69.0	-69.1
256 QAM		-69.2	-69.4	-68.8	-68.9		-68.4	-68.6	-68.0	-68.1		-66.2	-66.4	-65.8	-65.9
512 QAM		-66.4	-66.6	-66.0	-66.1		-65.6	-65.8	-65.2	-65.3		-63.6	-63.8	-63.2	-63.3
1024 QAM Strong		-63.5	-63.7	-63.1	-63.2		-62.1	-62.3	-61.7	-61.8		-60.3	-60.5	-59.9	-60.0
1024 QAM Light		-62.8	-63.0	-62.4	-62.5		-61.4	-61.6	-61.0	-61.1		-59.4	-59.6	-59.0	-59.1
2048 QAM		-60.3	-60.5	-59.9	-60.0		-59.1	-59.3	-58.7	-58.8		-57.6	-57.8	-57.2	-57.3
4096 QAM		-56.3	-56.5	-55.9	-56.0		-56.0	-56.2	-55.6	-55.7		-53.7	-53.9	-53.3	-53.4

Frequency (GHz)	Channel Size	6	7	8	11	Channel Size	6	7	8	11
BPSK	80 MHz	-86.5	-86.7	-86.1	-86.2	112 MHz	-85.1	-85.3	-84.7	-84.8
QPSK		-84.2	-84.4	-83.8	-83.9		-82.7	-82.9	-82.3	-82.4
8 PSK		-80.5	-80.7	-80.1	-80.2		-78.7	-78.9	-78.3	-78.4
16 QAM		-77.5	-77.7	-77.1	-77.2		-75.8	-76.0	-75.4	-75.5
32 QAM		-74.1	-74.3	-73.7	-73.8		-72.4	-72.6	-72.0	-72.1
64 QAM		-71.2	-71.4	-70.8	-70.9		-69.4	-69.6	-69.0	-69.1
128 QAM		-68.2	-68.4	-67.8	-67.9		-66.5	-66.7	-66.1	-66.2
256 QAM		-65.5	-65.7	-65.1	-65.2		-63.5	-63.7	-63.1	-63.2
512 QAM		-62.8	-63.0	-62.4	-62.5		-61.1	-61.3	-60.7	-60.8
1024 QAM Strong		-59.6	-59.8	-59.2	-59.3		-58.1	-58.3	-57.7	-57.8
1024 QAM Light		-59.2	-59.4	-58.8	-58.9		-57.4	-57.6	-57.0	-57.1
2048 QAM		-56.3	-56.5	-55.9	-56.0		-54.8	-55.0	-54.4	-54.5

RECEIVE SENSITIVITY of RFU-E – ETSI (dBm @BER=10-6)

Channel Bandwidth (MHz)	62.5	125	250	500
BPSK	-83.0	-80.0	-77.0	-74.0
QPSK	-79.5	-76.5	-73.5	-70.5
8 QAM	-75.5	-72.5	-70.0	-67.0
16 QAM	-73.0	-69.5	-67.0	-64.0
32 QAM	-69.0	-66.0	-63.0	-60.0
64 QAM	-66.0	-63.0	-60.0	-57.0
128 QAM	-63.0	-60.0	-57.0	–
256 QAM	-59.5	-57.0	-54.0	–
512 QAM	-57.0	-54.0	–	–
1024 QAM	-54.0	–	–	–

RECEIVE SENSITIVITY of RFU-D and RFU-S – ANSI (dBm @BER=10-6)

Frequency (GHz)	Channel Size	6	7-8	10	11	13	15	18	23	24	26	28-31	32	38
BPSK	20 MHz	-91.5	-91.5	-91.0	-92.0	-91.0	-90.0	-91.5	-90.5	-87.0	-90.0	-90.0	-89.5	-89.0
QPSK		-88.5	-88.5	-88.5	-89.5	-88.0	-87.5	-88.5	-88.0	-84.0	-87.5	-87.0	-87.0	-86.5
8 PSK		-83.5	-83.5	-83.0	-84.0	-83.0	-82.0	-83.5	-82.5	-79.0	-82.0	-82.0	-81.5	-81.0
16 QAM		-82.0	-82.0	-81.5	-82.5	-81.5	-80.5	-82.0	-81.0	-77.5	-80.5	-80.5	-80.0	-79.5
32 QAM		-78.0	-78.0	-78.0	-79.0	-77.5	-77.0	-78.0	-77.5	-73.5	-77.0	-76.5	-76.5	-76.0
64 QAM		-75.5	-75.5	-75.0	-76.0	-75.0	-74.0	-75.5	-74.5	-71.0	-74.0	-74.0	-73.5	-73.0
128 QAM		-72.5	-72.5	-72.0	-73.0	-71.5	-71.0	-72.5	-71.5	-68.0	-71.0	-71.0	-70.5	-70.0
256 QAM		-69.0	-69.0	-69.0	-70.0	-68.5	-68.0	-69.0	-68.5	-64.5	-68.0	-67.5	-67.5	-67.0
512 QAM		-67.0	-67.0	-66.5	-67.5	-66.0	-65.5	-67.0	-66.0	-62.5	-65.5	-65.5	-65.0	-64.5
1024 QAM Strong		-64.0	-64.0	-64.0	-65.0	-63.5	-63.0	-64.0	-63.5	-59.5	-63.0	-62.5	-62.5	-62.0
1024 QAM Light		-63.0	-63.0	-63.0	-64.0	-62.5	-62.0	-63.0	-62.5	-58.5	-62.0	-61.5	-61.5	-61.0
BPSK	25 MHz	-88.5	-87.5	-87.5	-88.0	-87.0	-86.5	-87.5	-86.5	-83.0	-86.5	-86.0	-86.0	-85.0
QPSK		-87.5	-86.5	-86.5	-87.0	-86.0	-85.5	-86.5	-85.5	-82.0	-85.5	-85.0	-85.0	-84.0
8 PSK		-82.5	-82.0	-81.5	-82.5	-81.5	-80.5	-82.0	-81.0	-77.5	-80.5	-80.5	-80.0	-79.5
16 QAM		-80.5	-80.0	-79.5	-80.5	-79.5	-78.5	-80.0	-79.0	-75.5	-78.5	-78.5	-78.0	-77.5
32 QAM		-77.5	-77.0	-76.5	-77.5	-76.0	-75.5	-77.0	-76.0	-72.5	-75.5	-75.5	-75.0	-74.5
64 QAM		-74.5	-74.0	-73.5	-74.5	-73.5	-72.5	-74.0	-73.0	-69.5	-72.5	-72.5	-72.0	-71.5
128 QAM		-71.5	-71.0	-70.5	-71.5	-70.5	-69.5	-71.0	-70.0	-66.5	-69.5	-69.5	-69.0	-68.5
256 QAM		-68.5	-67.5	-67.5	-68.5	-67.0	-66.5	-67.5	-67.0	-63.0	-66.5	-66.0	-66.0	-65.5
512 QAM		-66.0	-65.0	-65.0	-66.0	-64.5	-64.0	-65.0	-64.5	-60.5	-64.0	-63.5	-63.5	-63.0
1024 QAM Strong		-63.0	-62.5	-62.0	-63.0	-61.5	-61.0	-62.5	-61.5	-58.0	-61.0	-61.0	-60.5	-60.0
1024 QAM Light		-62.5	-61.5	-61.5	-62.5	-61.0	-60.5	-61.5	-61.0	-57.0	-60.5	-60.0	-60.0	-59.5
2048 QAM		-58.5	-58.0	-57.5	-58.5	-57.0	-56.5	-58.0	-57.0	-53.5	-56.5	-56.5	-56.0	-55.5
4096 QAM		-55.5	-55.0	-54.5	-55.5	-54.0	-53.5	-55.0	–	–	–	–	–	–
BPSK	30 MHz	-88.5	-88.0	-87.5	-88.5	-87.0	-86.5	-88.0	-87.0	-83.5	-86.5	-86.5	-86.5	-86.0
QPSK		-87.5	-87.0	-86.5	-87.5	-86.0	-85.5	-87.0	-86.0	-82.5	-85.5	-85.5	-85.5	-85.0
8 PSK		-82.5	-81.5	-81.5	-82.5	-81.0	-80.5	-81.5	-81.0	-77.0	-80.5	-80.0	-80.0	-79.5
16 QAM		-81.0	-80.0	-80.0	-80.5	-79.5	-79.0	-80.0	-79.0	-75.5	-79.0	-78.5	-78.5	-78.0
32 QAM		-77.0	-76.5	-76.0	-77.0	-76.0	-75.0	-76.5	-75.5	-72.0	-75.0	-75.0	-75.0	-74.5
64 QAM		-74.5	-73.5	-73.5	-74.0	-73.0	-72.5	-73.5	-72.5	-69.0	-72.5	-72.0	-72.0	-71.5
128 QAM		-71.0	-70.5	-70.0	-71.0	-70.0	-69.0	-70.5	-69.5	-66.0	-69.0	-69.0	-69.0	-68.5
256 QAM		-68.0	-67.5	-67.0	-68.0	-67.0	-66.0	-67.5	-66.5	-63.0	-66.0	-66.0	-66.0	-65.5
512 QAM		-66.0	-65.5	-65.0	-66.0	-64.5	-64.0	-65.5	-64.5	-61.0	-64.0	-64.0	-64.0	-63.5
1024 QAM Strong		-63.0	-62.0	-62.0	-62.5	-61.5	-61.0	-62.0	-61.0	-57.5	-61.0	-60.5	-60.5	-60.0
1024 QAM Light		-62.0	-61.0	-61.0	-62.0	-60.5	-60.0	-61.0	-60.5	-56.5	-60.0	-59.5	-59.5	-59.0
2048 QAM		-58.0	-57.5	-57.0	-58.0	-56.5	-56.0	-57.5	-56.5	-53.0	-56.0	-56.0	-56.0	-55.5
4096 QAM		-55.0	-54.5	-54.0	-55.0	-53.5	-53.0	-54.5	–	–	–	–	–	–
BPSK	40 MHz	-87.0	-86.5	-86.0	-87.0	-86.0	-85.0	-86.5	-85.5	-82.0	-85.0	-85.0	-85.0	-84.5
QPSK		-86.0	-85.5	-85.0	-86.0	-85.0	-84.0	-85.5	-84.5	-81.0	-84.0	-84.0	-84.0	-83.5
8 PSK		-81.0	-80.5	-80.0	-81.0	-79.5	-79.0	-80.5	-79.5	-76.0	-79.0	-79.0	-79.0	-78.5
16 QAM		-79.5	-79.0	-78.5	-79.5	-78.0	-77.5	-79.0	-78.0	-74.5	-77.5	-77.5	-77.5	-77.0
32 QAM		-76.0	-75.0	-75.0	-75.5	-74.5	-74.0	-75.0	-74.0	-70.5	-74.0	-73.5	-73.5	-73.0
64 QAM		-73.0	-72.0	-72.0	-73.0	-71.5	-71.0	-72.0	-71.5	-67.5	-71.0	-70.5	-70.5	-70.0
128 QAM		-70.0	-69.0	-69.0	-70.0	-68.5	-68.0	-69.0	-68.5	-64.5	-68.0	-67.5	-67.5	-67.0

Frequency (GHz)	Channel Size	6	7-8	10	11	13	15	18	23	24	26	28-31	32	38
256 QAM	40 MHz	-67.0	-66.0	-66.0	-66.5	-65.5	-65.0	-66.0	-65.0	-61.5	-65.0	-64.5	-64.5	-64.0
512 QAM		-64.0	-63.5	-63.0	-64.0	-62.5	-62.0	-63.5	-62.5	-59.0	-62.0	-62.0	-62.0	-61.5
1024 QAM Strong		-61.5	-61.0	-60.5	-61.5	-60.0	-59.5	-61.0	-60.0	-56.5	-59.5	-59.5	-59.5	-59.0
1024 QAM Light		-60.5	-60.0	-59.5	-60.5	-59.5	-58.5	-60.0	-59.0	-55.5	-58.5	-58.5	-58.5	-58.0
2048 QAM		-58.0	-57.0	-57.0	-58.0	-56.5	-56.0	-57.0	-56.5	-52.5	-56.0	-55.5	-55.5	-55.0
4096 QAM		-55.0	-54.0	-54.0	-55.0	-53.5	-53.0	-54.0	–	–	–	–	–	–
BPSK	50 MHz	-86.5	-85.5	-85.5	-86.0	-85.0	-84.5	-85.5	-84.5	-81.0	-84.5	-84.0	-84.0	-83.5
QPSK		-85.5	-84.5	-84.5	-85.0	-84.0	-83.5	-84.5	-83.5	-80.0	-83.5	-83.0	-83.0	-82.5
8 PSK		-80.0	-79.5	-79.0	-80.0	-79.0	-78.0	-79.5	-78.5	-75.0	-78.0	-78.0	-78.0	-77.5
16 QAM		-78.5	-77.5	-77.5	-78.0	-77.0	-76.5	-77.5	-76.5	-73.0	-76.5	-76.0	-76.0	-75.5
32 QAM		-74.5	-74.0	-73.5	-74.5	-73.5	-72.5	-74.0	-73.0	-69.5	-72.5	-72.5	-72.5	-72v
64 QAM		-71.5	-70.5	-70.5	-71.5	-70.0	-69.5	-70.5	-70.0	-66.0	-69.5	-69.0	-69.0	-68.5
128 QAM		-68.5	-68.0	-67.5	-68.5	-67.5	-66.5	-68.0	-67.0	-63.5	-66.5	-66.5	-66.5	-66.0
256 QAM		-66.0	-65.0	-65.0	-66.0	-64.5	-64.0	-65.0	-64.5	-60.5	-64.0	-63.5	-63.5	-63.0
512 QAM		-63.5	-63.0	-62.5	-63.5	-62.0	-61.5	-63.0	-62.0	-58.5	-61.5	-61.5	-61.5	-61.0
1024 QAM Strong		-60.0	-59.5	-59.0	-60.0	-58.5	-58.0	-59.5	-58.5	-55.0	-58.0	-58.0	-58.0	-57.5
1024 QAM Light		-59.0	-58.0	-58.0	-59.0	-57.5	-57.0	-58.0	-57.5	-53.5	-57.0	-56.5	-56.5	-56.0
2048 QAM		-57.0	-56.0	-56.0	-56.5	-55.5	-55.0	-56.0	-55.0	-51.5	-55.0	-54.5	-54.5	-54.0
4096 QAM		-54.0	-53.0	-53.0	-53.5	-52.5	-52.0	–	–	–	–	–	–	–
BPSK	60 MHz	-86.0	-85.0	-84.5	-85.5	-84.0	-83.5	-85.0	-84.0	-83.5	-83.5	-83.5	-83.0	-82.5
QPSK		-85.0	-84.0	-83.5	-84.5	-83.0	-82.5	-84.0	-83.0	-82.5	-82.5	-82.5	-82.0	-81.5
8 PSK		-80.5	-79.0	-79.0	-79.5	-78.5	-78.0	-79.0	-78.0	-77.5	-78.0	-77.5	-77.5	-77.0
16 QAM		-78.0	-77.0	-76.5	-77.5	-76.0	-75.5	-77.0	-76.0	-75.5	-75.5	-75.5	-75.0	-74.5
32 QAM		-74.5	-73.0	-73.0	-73.5	-72.5	-72.0	-73.0	-72.0	-71.5	-72.0	-71.5	-71.5	-71.0
64 QAM		-71.5	-70.0	-69.5	-70.5	-69.5	-68.5	-70.0	-69.0	-68.5	-68.5	-68.5	-68.0	-68.0
128 QAM		-69.0	-67.0	-67.0	-67.5	-66.5	-66.0	-67.0	-66.0	-65.5	-66.0	-65.5	-65.5	-65.0
256 QAM		-65.5	-64.0	-63.5	-64.5	-63.5	-62.5	-64.0	-63.0	-62.5	-62.5	-62.5	-62.0	-62.0
512 QAM		-63.5	-62.0	-61.5	-62.5	-61.5	-60.5	-62.0	-61.0	-60.5	-60.5	-60.5	-60.0	-60.0
1024 QAM Strong		-60.0	-58.5	-58.0	-59.0	-58.0	-57.0	-58.5	-57.5	-57.0	-57.0	-57.0	-56.5	-56.5
1024 QAM Light		-59.0	-57.5	-57.0	-58.0	-57.0	-56.0	-57.5	-56.5	-56.0	-56.0	-56.0	-55.5	-55.5
2048 QAM		-56.5	-54.5	-54.5	-55.0	-54.0	-53.5	-54.5	-53.5	-53.0	-53.5	-53.0	-53.0	-52.5
4096 QAM		-53.5	-51.5	-51.5	-52.0	-51.0	-50.5	–	–	–	–	–	–	–
BPSK	80 MHz	-85.0	-85.0	-84.5	-85.5	-84.5	-83.5	-85.0	-84.0	-83.5	-83.5	-83.5	-83.0	-83.5
QPSK		-82.5	-82.5	-82.5	-83.0	-82.0	-81.5	-82.5	-81.5	-81.0	-81.5	-81.0	-81.0	-81.0
8 PSK		-79.0	-79.0	-78.5	-79.5	-78.5	-77.5	-79.0	-78.0	-77.5	-77.5	-77.5	-77.0	-77.5
16 QAM		-76.0	-76.0	-75.5	-76.5	-75.0	-74.5	-76.0	-75.0	-74.5	-74.5	-74.5	-74.0	-74.0
32 QAM		-72.5	-72.5	-72.0	-73.0	-71.5	-71.0	-72.5	-71.5	-71.0	-71.0	-71.0	-70.5	-70.5
64 QAM		-69.0	-69.0	-69.0	-70.0	-68.5	-68.0	-69.0	-68.5	-68.0	-68.0	-67.5	-67.5	-67.5
128 QAM		-66.5	-66.5	-66.0	-67.0	-66.0	-65.0	-66.5	-65.5	-65.0	-65.0	-65.0	-64.5	-65.0
256 QAM		-63.5	-63.5	-63.0	-64.0	-63.0	-62.0	-63.5	-62.5	-62.0	-62.0	-62.0	-61.5	-62.0
512 QAM		-61.0	-61.0	-61.0	-62.0	-60.5	-60.0	-61.0	-60.5	-60.0	-60.0	-59.5	-59.5	-59.5
1024 QAM Strong		-58.0	-58.0	-57.5	-58.5	-57.5	-56.5	-58.0	-57.0	-56.5	-56.5	-56.5	-56.0	-56.5
1024 QAM Light		-57.0	-57.0	-57.0	-58.0	-56.5	-56.0	-57.0	-56.5	-56.0	-56.0	-55.5	-55.5	-55.5
2048 QAM		-54.5	-54.5	-54.5	-55.5	-54.0	-53.5	-54.5	-54.0	-53.5	-53.5	-53.0	-53.0	–

RECEIVE SENSITIVITY of RFU-D-HP – ANSI (dBm @BER=10-6)

Frequency (GHz)	Channel Size	6	7	8	11	Channel Size	6	7	8	11	Channel Size	6	7	8	11
BPSK		-93.0	-93.2	-92.6	-92.7		-92.1	-92.3	-91.7	-91.8		-91.4	-91.6	-91.0	-91.1
QPSK		-90.1	-90.3	-89.7	-89.8		-89.1	-89.3	-88.7	-88.8		-88.4	-88.6	-88.0	-88.1
8 PSK		-86.1	-86.3	-85.7	-85.8		-85.1	-85.3	-84.7	-84.8		-84.4	-84.6	-84.0	-84.1
16 QAM		-83.2	-83.4	-82.8	-82.9		-82.2	-82.4	-81.8	-81.9		-81.4	-81.6	-81.0	-81.1
32 QAM		-79.8	-80.0	-79.4	-79.5		-78.9	-79.1	-78.5	-78.6		-78.1	-78.3	-77.7	-77.8
64 QAM		-76.6	-76.8	-76.2	-76.3		-75.8	-76.0	-75.4	-75.5		-75.0	-75.2	-74.6	-74.7
128 QAM	20 MHz	-73.6	-73.8	-73.2	-73.3	25 MHz	-72.7	-72.9	-72.3	-72.4	30 MHz	-72.0	-72.2	-71.6	-71.7
256 QAM		-70.5	-70.7	-70.1	-70.2		-69.6	-69.8	-69.2	-69.3		-68.8	-69.0	-68.4	-68.5
512 QAM		-67.7	-67.9	-67.3	-67.4		-66.7	-66.9	-66.3	-66.4		-66.5	-66.7	-66.1	-66.2
1024 QAM Strong		-64.8	-65.0	-64.4	-64.5		-63.8	-64.0	-63.4	-63.5		-63.2	-63.4	-62.8	-62.9
1024 QAM Light		-64.1	-64.3	-63.7	-63.8		-62.9	-63.1	-62.5	-62.6		-62.4	-62.6	-62.0	-62.1
2048 QAM		-61.6	-61.8	-61.2	-61.3		-60.8	-61.0	-60.4	-60.5		-59.9	-60.1	-59.5	-59.6
4096 QAM		–	–	–	–		-56.7	-56.9	-56.3	-56.4		-56.2	-56.4	-55.8	-55.9
BPSK		-90.3	-90.5	-89.9	-90.0		-89.3	-89.5	-88.9	-89.0		-88.5	-88.7	-88.1	-88.2
QPSK		-87.1	-87.3	-86.7	-86.8		-86.4	-86.6	-86.0	-86.1		-85.3	-85.5	-84.9	-85.0
8 PSK		-83.1	-83.3	-82.7	-82.8		-82.1	-82.3	-81.7	-81.8		-81.5	-81.7	-81.1	-81.2
16 QAM		-80.2	-80.4	-79.8	-79.9		-79.2	-79.4	-78.8	-78.9		-78.3	-78.5	-77.9	-78.0
32 QAM		-76.8	-77.0	-76.4	-76.5		-76.2	-76.4	-75.8	-75.9		-75.0	-75.2	-74.6	-74.7
64 QAM		-73.7	-73.9	-73.3	-73.4		-72.8	-73.0	-72.4	-72.5		-71.9	-72.1	-71.5	-71.6
128 QAM	40 MHz	-70.7	-70.9	-70.3	-70.4	50 MHz	-70.3	-70.5	-69.9	-70.0	60 MHz	-69.1	-69.3	-68.7	-68.8
256 QAM		-68.4	-68.6	-68.0	-68.1		-66.7	-66.9	-66.3	-66.4		-65.9	-66.1	-65.5	-65.6
512 QAM		-65.6	-65.8	-65.2	-65.3		-64.2	-64.4	-63.8	-63.9		-63.4	-63.6	-63.0	-63.1
1024 QAM Strong		-62.1	-62.3	-61.7	-61.8		-60.8	-61.0	-60.4	-60.5		-60.1	-60.3	-59.7	-59.8
1024 QAM Light		-61.4	-61.6	-61.0	-61.1		-60.0	-60.2	-59.6	-59.7		-59.3	-59.5	-58.9	-59.0
2048 QAM		-59.1	-59.3	-58.7	-58.8		-57.7	-57.9	-57.3	-57.4		-57.0	-57.2	-56.6	-56.7
4096 QAM		-56.0	-56.2	-55.6	-55.7		-54.2	-54.4	-53.8	-53.9		-53.2	-53.4	-52.8	-52.9
BPSK		-86.5	-86.7	-86.1	-86.2										
QPSK		-84.2	-84.4	-83.8	-83.9										
8 PSK		-80.5	-80.7	-80.1	-80.2										
16 QAM		-77.5	-77.7	-77.1	-77.2										
32 QAM		-74.1	-74.3	-73.7	-73.8										
64 QAM	80 MHz	-71.2	-71.4	-70.8	-70.9										
128 QAM		-68.2	-68.4	-67.8	-67.9										
256 QAM		-65.5	-65.7	-65.1	-65.2										
512 QAM		-62.8	-63.0	-62.4	-62.5										
1024 QAM Strong		-59.6	-59.8	-59.2	-59.3										
1024 QAM Light		-59.2	-59.4	-58.8	-58.9										
2048 QAM		-56.3	-56.5	-55.9	-56.0										

RECEIVE SENSITIVITY of RFU-E – ANSI (dBm @BER=10-6)

Channel Bandwidth (MHz)	62.5	125	250	500
BPSK	-83.0	-80.0	-77.0	-74.0
QPSK	-79.5	-76.5	-73.5	-70.5
8 QAM	-75.5	-72.5	-70.0	-67.0
16 QAM	-73.0	-69.5	-67.0	-64.0
32 QAM	-69.0	-66.0	-63.0	-60.0
64 QAM	-66.0	-63.0	-60.0	-57.0
128 QAM	-63.0	-60.0	-57.0	–
256 QAM	-59.5	-57.0	-54.0	–
512 QAM	-57.0	-54.0	–	–
1024 QAM	-54.0	–	–	–

ETHERNET THROUGHPUT

		Ethernet Throughput (Mbps)				Ethernet Throughput (Mbps)		
Modulation	**Channel Size**	**No Compression**	**L2 Compression**	**Multi-Layer Compression**	**Channel Size**	**No Compression**	**L2 Compression**	**Multi-Layer Compression**
BPSK	14 MHz	9	9-10	10-29	25 MHz	17	17-19	18-54
QPSK		19	19-22	20-62		35	35-40	37-112
8 PSK		29	29-33	30-93		52	53-60	55-168
16 QAM		40	40-45	42-128		71	72-81	75-229
32 QAM		53	53-60	55-169		94	95-107	99-302
64 QAM		65	65-74	68-208		116	117-132	121-372
128 QAM		78	79-89	82-251		139	141-159	147-448
256 QAM		89	90-102	94-287		159	160-181	167-511
512 QAM		98	99-112	103-316		175	177-200	184-564
1024 QAM Strong		104	105-119	109-335		186	188-213	196-599
1024 QAM Light		111	111-126	116-355		198	199-226	208-636
2048 QAM		115	116-131	121-370		212	214-242	223-682
4096 QAM		-	-	-		230	232-262	241-739
BPSK	20 MHz	13	13-15	14-42	28 MHz	19	19-22	20-62
QPSK		27	28-31	29-88		40	40-45	42-128
8 PSK		41	41-47	43-132		59	60-68	62-191
16 QAM		56	57-64	59-180		81	82-93	85-261
32 QAM		74	75-85	78-238		107	108-122	112-344
64 QAM		91	92-104	96-293		132	133-150	138-424
128 QAM		110	111-126	116-354		159	160-181	167-510
256 QAM		125	126-142	131-401		181	182-206	190-580
512 QAM		136	137-156	143-438		199	201-227	209-640
1024 QAM Strong		145	146-165	152-466		212	214-242	223-681
1024 QAM Light		154	155-176	162-495		225	227-257	236-723
2048 QAM		164	165-187	172-528		241	243-275	253-775
4096 QAM		180	181-205	189-578		261	263-298	274-839
BPSK	30 MHz	20	21-23	22-66	40 MHz	28	28-32	29-90
QPSK		42	42-48	44-135		57	57-65	60-183
8 PSK		61	62-70	64-197		85	86-97	89-273

		Ethernet Throughput (Mbps)				Ethernet Throughput (Mbps)		
Modulation	Channel Size	No Compression	L2 Compression	Multi-Layer Compression	Channel Size	No Compression	L2 Compression	Multi-Layer Compression
16 QAM	30 MHz	86	87-98	90-277	40 MHz	116	117-132	121-372
32 QAM		113	114-129	119-364		152	154-174	160-490
64 QAM		140	141-159	147-449		187	189-214	197-602
128 QAM		168	169-192	176-540		226	228-258	238-728
256 QAM		193	195-220	203-621		243	245-278	256-782
512 QAM		206	208-235	216-662		267	269-304	280-857
1024 QAM Strong		225	226-256	236-722		302	305-345	318-972
1024 QAM Light		238	240-271	250-764		321	324-366	337-1032
2048 QAM		260	262-296	273-834		347	350-396	365-1116
4096 QAM		276	279-315	290-888		364	367-415	382-1170
BPSK	50 MHz	36	36-41	37-114	56 MHz	40	40-46	42-129
QPSK		69	70-79	73-223		81	82-93	86-262
8 PSK		108	108-123	113-346		121	122-138	127-390
16 QAM		146	147-166	153-469		165	166-188	173-531
32 QAM		183	185-209	193-589		217	219-248	228-698
64 QAM		237	239-270	249-761		267	269-305	280-858
128 QAM		276	278-315	290-888		323	325-368	339-1037
256 QAM		327	330-374	344-1052		369	372-421	388-1186
512 QAM		355	358-405	373-1142		401	404-457	421-1288
1024 QAM Strong		387	390-441	406-1242		436	439-497	458-1400
1024 QAM Light		411	414-468	431-1320		462	466-528	486-1486
2048 QAM		443	446-505	465-1423		487	491-555	511-1565
4096 QAM		459	463-524	482-1476		510	514-582	536-1639
BPSK	60 MHz	42	43-48	44-136	62.5 MHz	41	42-47	44-133
QPSK		86	86-98	90-276		92	93-105	97-296
8 PSK		125	126-143	131-402		137	138-157	144-441
16 QAM		174	175-198	182-558		186	187-212	195-598
32 QAM		229	230-261	240-734		244	246-278	256-783
64 QAM		281	283-320	295-902		297	299-339	312-955
128 QAM		339	342-387	356-1090		357	360-407	375-1147
256 QAM		391	394-447	411-1258		407	410-464	428-1308
512 QAM		421	424-480	442-1353		447	451-510	470-1437
1024 QAM Strong		458	461-522	481-1471		498	502-568	523-1600
1024 QAM Light		486	490-555	511-1563		-	-	-
2048 QAM		527	531-601	553-1667		-	-	-
4096 QAM		542	547-619	570-1671		-	-	-
BPSK	80 MHz	56	56-64	59-180	112 MHz	81	82-93	86-262
QPSK		113	114-129	119-363		164	165-187	172-527
8 PSK		160	161-183	168-515		244	246-278	256-784
16 QAM		228	230-260	240-733		331	334-378	348-1065
32 QAM		300	302-342	315-963		436	439-497	458-1401

		Ethernet Throughput (Mbps)				Ethernet Throughput (Mbps)		
Modulation	**Channel Size**	**No Compression**	**L2 Compression**	**Multi-Layer Compression**	**Channel Size**	**No Compression**	**L2 Compression**	**Multi-Layer Compression**
64 QAM	80 MHz	367	369-418	385-1178	112 MHz	535	539-610	562-1669
128 QAM		433	436-494	455-1392		646	651-737	679-1695
256 QAM		499	503-569	524-1603		739	745-843	776-1716
512 QAM		548	552-625	576-1672		802	809-915	843-1730
1024 QAM Strong		596	601-680	626-1683		870	877-993	914-1745
1024 QAM Light		633	638-722	665-1692		924	931-1054	970-1758
2048 QAM		670	675-764	703-1699		997	1004-1137	1047-1774
4096 QAM		731	737-834	768-1714		1031	1039-1176	1083-1781
BPSK	125 MHz	88	89-101	93-284	250 MHz	178	179-203	187-572
QPSK		186	187-212	195-596		372	375-425	391-1196
8 PSK		275	278-314	289-885		552	556-630	580-1672
16 QAM		374	377-427	393-1202		750	755-855	787-1718
32 QAM		492	496-561	517-1582		985	993-1124	1035-1771
64 QAM		604	609-689	634-1685		1209	1218-1379	1270-1822
128 QAM		727	733-829	764-1712		1455	1467-1609	1528-1878
256 QAM		827	834-944	869-1735		1632	1644-1737	1714-1918
512 QAM		911	918-1039	957-1755		-	-	-
1024 QAM Strong		997	1005-1138	1048-1774		-	-	-
BPSK	500 MHz	357	360-408	375-1148				
QPSK		745	751-850	783-1716				
8 PSK		1105	1113-1260	1160-1799				
16 QAM		1500	1512-1642	1575-1888				
32 QAM		1972	1974-1923	1974-1923				
64 QAM		1974	1974-1923	1974-1923				