

Eclipse Connect

ETSI Datasheet

Cost-Effective Carrier Ethernet and Mixed-Mode Data Transport

Harris Stratex has made it easier for network operators to meet demanding broadband requirements for establishing high-speed wireless transport of native Carrier Ethernet data.

Eclipse Connect provides a simple and cost-effective solution for establishing wireless connections that support programmable and scalable link throughputs up to 360 Mbit/s of full duplex native Ethernet data, with optional side-by-side support for up to 20 channels of native E1 TDM traffic to support legacy voice applications.

Professional Grade

Eclipse Connect delivers professional-grade RF performance and reliability to support system availabilities that can exceed 99.999%, with guaranteed throughput available all of the time.

Carrier Ethernet

Eclipse Connect supports high-efficiency transport of Carrier Ethernet, with extremely low latency. The Eclipse Connect IDUs include an intelligent Layer 2 Ethernet switch to support advanced QoS and traffic controls, as well as port-based RMON performance statistics.

Mixed Mode

In addition to the native Ethernet transport, Eclipse Connect also supports native wayside TDM traffic, enabling software selection of between 1 and 20x E1 channels, without the need for external adapters or proprietary emulation methods.

Capacity Expansion

Eclipse Connect enables you to grow your link capacity without hardware changes, through simple downloadable software keys. Depending upon the IDU selected, you can start with as little as 10 Mbit/s and then progressively increase the link speed of up to 360 Mbit/s of Layer 2 throughput.

Cost-Effective Options

Eclipse Connect includes a choice of indoor and outdoor units so that you can select the system that will meet your current and future capacity needs, while also fitting with your available budget.

Quick and Easy

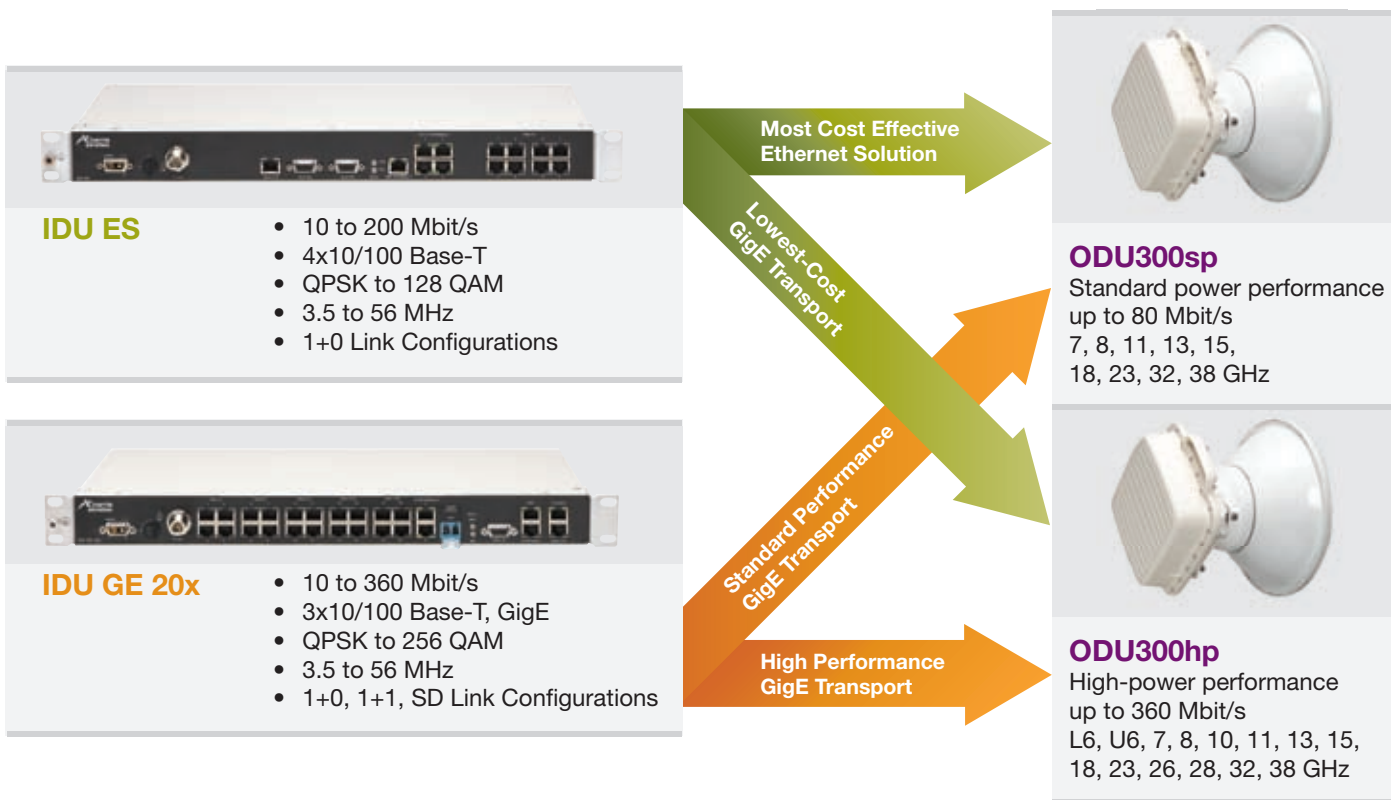
Eclipse Connect is designed to be easily installed with a minimum of radio experience. A split-mount architecture includes a compact indoor unit and a hardened outdoor unit which is directly mounted to an external antenna, all connected with a low-cost flexible coaxial cable.

Ready for Next-Generation Networks

Eclipse Connect can integrate easily into any E1, IP, or next-generation network. Scalability and high performance, with a low-cost entry point, is a combination that enables network designers to meet new and next-generation requirements using the same radio equipment.

Key Features Highlights

- Software-scalable link speeds from 10 to 360 Mbit/s, full duplex
- Ultra-low latency for VoIP and live video transport
- Integrated Layer 2 intelligent Ethernet switch
- Carrier-grade QoS policing and prioritization options (802.1p/q)
- Operation in all licensed frequency bands between 6 and 38 GHz
- Native 10/100 Base-T and Gigabit Ethernet transport
- Native wayside Nx E1 channels for mixed-mode operation
- Built-in TDM and Ethernet interfaces in a compact 1RU unit
- Hot Standby protection and Space Diversity configuration options
- Advanced split-mount architecture
- Quick and easy to install, commission and maintain



Hardware Complete

Both the IDU ES and GE 20x are hardware-complete with integrated Fast Ethernet/GigE and E1 ports with management and alarm status connections. Capacity upgrades are simply software enabled, and operational immediately.

Scalable Capacity Options

Entry-level configuration starts at 8xE1 ports for the IDU ES, and 20xE1 ports for the IDU GE. Licensed increments to 50, 100, 150, 200, and 360 Mbit/s full-duplex total capacity are assigned to the E1s and then to the Ethernet channel.

Configuration Options

Connect GE 20x can be deployed as an unprotected link, or hot-standby 1+1 using a second IDU GE where the 20x E1 ports and both Ethernet ports are input protected.

Comparative Features

General Characteristics	IDU ES	IDU GE 20x
Throughput capacities, scalable	10 to 200 Mbit/s	10 to 360 Mbit/s
Selectable channel bandwidths	3.5 to 55/56 MHz	3.5 to 55/56 MHz
Software configurable modulation settings	QPSK, 16QAM, 32QAM, 128QAM	QPSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM
Native Ethernet 10/100BT	4 ports, switched	3 ports, switched
Native Gigabit Ethernet 10/100/1000BT		3 ports, switched
Gigabit Ethernet 1000Base-X Optical (SFP)		Optional
Selectable NxE1 interfaces	Up to 8 channels	Up to 20 channels
Entry-level with Base license	8xE1	20xE1
Advanced Traffic management and control	✓	✓
NMS 10/100BT port	1 port	2 ports
Configurations		
1+0 Non-protected	✓	✓
1+1 Hot Standby		✓
Space diversity		✓
Compatible with INU/INUe	✓	✓
ODU Support		
ODU 300 sp (Standard Performance)	✓	✓
ODU 300 hp (High Performance)	✓	✓
ODU 300 ep (Extended Performance)	✓	✓

System Parameters

General Characteristics

Operating Frequency Range	6 to 38 GHz		
Capacity Range Options	5x, 10x, 16x, 20xE1 10 to 360 Mbit/s Ethernet		
Modulation Options	QPSK, 16, 32, 64, 128, 256 QAM		
Error Correction	FEC, Reed Solomon Decoding		
Adaptive Equalisation	24 tap T/2 equalizer		
Configuration Options	IDU ES, IDU GE 20x IDU GE 20x	Non Protected, 1+0 Protected MHSB (1+1), Protected Space Diversity	

Ethernet and TDM Traffic Interfaces

		IDU ES	IDU GE 20x
Ethernet Traffic Interface	Interfaces (electrical)	4x 10/100 Base-T Fast Ethernet	3x 10/100/1000 Base-T Fast Ethernet
	Connectors (electrical)	4x 8-pin RJ45	3x 8-pin RJ45
	Interfaces (optical)		1x optical IEEE 802.3z 1000 Base-LX
	Connectors (optical)		1x LC (SFP)
	Frame size	64 - 1536 bytes	64 - 9600 bytes
E1 Wayside Traffic Interface	Ethernet transport channels	2	2
	Interfaces	8x 2.048 Mbit/s (E1)	20x 2.048 Mbit/s (E1)
	Line code	G703 HDB3	G703 HDB3
	Connectors	8x RJ45	20x RJ45
	Impedance (configurable)	75Ω unbalanced or 120Ω balanced	75Ω unbalanced or 120Ω balanced

Connect Ethernet Throughput Options

	Modulation Options	Channel Bandwidth Options	Nominal Data Throughput Range, Full Duplex	Actual Data Throughput Range, Full Duplex ^[1]
Connect 40	QPSK, 16 QAM	7, 14, 28 MHz	10 - 40 Mbit/s	10 - 41 Mbit/s
Connect 50	QPSK, 16/32/64 QAM	7, 14, 28 MHz	10 - 50 Mbit/s	10 - 65 Mbit/s
Connect 80	QPSK, 16 QAM	7, 14, 28 MHz	10 - 80 Mbit/s	10 - 82 Mbit/s
Connect 100	QPSK, 16/32/64 QAM	7, 14, 28 MHz	10 - 100 Mbit/s	10 - 106 Mbit/s
Connect 150	QPSK, 16/32/64/128 QAM	7, 14, 28, 56 MHz	10 - 150 Mbit/s	10 - 153 Mbit/s
Connect 200	QPSK, 16/32/64/128/256 QAM	7, 14, 28, 40, 56 MHz	10 - 200 Mbit/s	10 - 198 Mbit/s
Connect 360	QPSK, 16/32/64/128 QAM	7, 14, 28, 40, 56 MHz	10 - 360 Mbit/s	10 - 357 Mbit/s

IDU Auxiliary Functions and other Interfaces

Auxiliary Data Channel	IDU ES only	1x RS232 or RS422, 1.2 to 19.2 kbps async, or 64 kbps sync
Alarm I/O		2 - TTL inputs, 4 - Form C Relay outputs
NMS LAN interface	Type	10/100 Base-T Ethernet
Serial Maintenance Interface	Standard	Complies to TIA/EIA-561
IF Cable Connector		N-Type
Configuration memory, removable		Up to 128 Mbyte CompactFlash card (rear access)

General ODU Specifications

IDU-ODU IF Cable, recommended	CNT-300 Type, 50Ω - up to 150m (500ft) maximum cable length			
	CNT-400 Type, 50Ω - up to 300m (1,000ft) maximum cable length			
IF cable connector	N-Type			
AGC monitor point	BNC			
Transmit Power Tolerance	6 to 26 GHz	± 2 dB		
	28 to 38 GHz	± 3 dB		
Automatic Transmitter Power Control	Configurable over full available manual attenuation range			
Manual Transmitter Power Control range	QPSK	16QAM	32QAM	64QAM
	20 dB	18 dB	17.5 dB	17 dB
Receiver Overload, BER = 1x10 ⁻⁶				-22 dBm
Residual (Background) Bit Error Rate				Better than 10 ⁻¹³

Power Supply and Environmental

Power Supply	Input Voltage Range	-40.5 to -60.0 VDC		
	Power Consumption (nominal)	IDU ES/GE + ODU300hp	42W	
Operating Temperature	Indoor Unit	Guaranteed	-5° to +45° C (23° to +113° F)	
		Extended ^[2]	-5° to +55° C (23° to +131° F)	
	Outdoor Unit	Guaranteed	-33° to +55° C (-27° to +131° F)	
		Extended ^[2]	-50° to +65° C (-58° to +149° F)	
Weight and Dimensions	IDU GE 20x	44mm (1RU)x 482mm (19in) x 240mm (9.4in), 1.1 kg (2.5 lb)		
	IDU ES	44mm (1RU)x 482mm (19in) x 277mm (10.9in), 1.6 kg (3.5 lb)		
	ODU300sp, hp	287mm (11.3 in) x 287mm (11.3 in) x 119mm (4.7 in), 6.4 kg (14 lb)		

Fault and Configuration Management

Protocol supported	SNMP v2, Static and dynamic routing, RIP I, RIP II, OSPF
Local/remote Configuration and Support Tool	Eclipse Portal
Performance Monitoring	To ITU-T Rec. G.826
Network Management	Harris Stratex Networks ProVision or NetBoss
Engineering Orderwire	Optional VoIP handset

Ethernet Standards Compliance

Ethernet	IEEE 802.3u
Framing	IPv4 and IPv6, IEEE 802.3d
Flow Control	IEEE 802.3x
VLAN	IEEE 802.1q
QoS	Port based, IEEE 802.1p, Diffserv (RFC 2474)
RMON	RFC 1757

[1] Actual throughput available for data transport will be reduced proportionally when wayside E1 channels are used.

[2] Over full Extended Operating Temperature Eclipse may be subject to reduced performance. Contact Harris Stratex Networks for more details.

For additional specifications please refer to the main Eclipse Platform Datasheet.

All specifications are typical values unless otherwise stated, and are subject to change without notice.

ODU General Specifications

System RF Specifications	L6/U6 GHz	7/8 GHz	10 GHz	11 GHz	13 GHz	15 GHz	18 GHz	23 GHz	26 GHz	28 GHz	32 GHz	38 GHz
Frequency Range, GHz	5.925 - 6.425 6.425 - 7.11	7.125 - 7.9 7.725 - 8.5	10.0 - 10.68	10.7 - 11.7	12.75 - 13.25	14.4 - 15.35	17.7 - 19.7	21.2 - 23.632	24.52 - 26.483	27.5 - 29.5	31.8 - 33.4	37.0 - 39.46
T-R Spacings supported, MHz	252.04 340	150, 154, 161, 168, 175, 196, 245 119, 126, 151, 614, 208, 266, 300, 310, 311.32, 305.56	91, 230, 143.5, 350	490, 530	266	315, 420, 490, 644, 728	1010, 1092.5	1008, 1200, 1232	1008	1008	812	1260

Antenna Interface

Waveguide Type	R70 (WR137)	R84 (WR112)	R100 (WR90)	R100 (WR90)	R120 (WR75)	R140 (WR62)	R220 (WR42)	R220 (WR42)	R220 (WR42)	R320 (WR28)	R320 (WR28)	R320 (WR28)
Flange Type	UDR70	UDR84	UDR100	UDR100	UBR120	UBR140	UBR220	UBR220	UBR220	UBR320	UBR320	UBR320
Mating Flange Type	PDR70 or CDR70	PDR84 or CDR84	PDR100 or CDR100	PDR100 or CDR100	PBR120 or CDR120	PBR140 or CBR140	PBR220	PBR220	PBR220	PBR320	PBR320	PBR320

ODU300sp RF Performance Specifications

Transmitter Performance

Power Output (nominal)	QPSK 16 QAM	25.0 dBm 23.0 dBm		22.5 dBm 20.5 dBm	20.0 dBm 18.0 dBm	19.0 dBm 17.0 dBm	17.0 dBm 15.0 dBm	17.0 dBm 15.0 dBm			15.0 dBm 13.0 dBm	15.0 dBm 13.0 dBm
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Receiver Threshold [1]

10 Mbit/s, 5xE1	7 MHz	QPSK		-91.5 dBm	-91.0 dBm	-91.0 dBm	-91.0 dBm	-90.5 dBm	-90.5 dBm		-90.0 dBm	-88.5 dBm
20 Mbit/s, 10xE1	13.75 / 14 MHz	QPSK		-88.5 dBm	-88.0 dBm	-88.0 dBm	-88.0 dBm	-87.5 dBm	-87.5 dBm		-86.5 dBm	-86.0 dBm
20 Mbit/s, 10xE1	7 MHz	16 QAM		-84.5 dBm	-84.0 dBm	-84.0 dBm	-84.0 dBm	-83.5 dBm	-83.5 dBm		-82.0 dBm	-81.5 dBm
40 Mbit/s, 20xE1	27.5 / 28 MHz	QPSK		-85.5 dBm	-85.0 dBm	-85.0 dBm	-85.0 dBm	-84.5 dBm	-84.5 dBm		-83.5 dBm	-83.0 dBm
40 Mbit/s, 20xE1	13.75 / 14 MHz	16 QAM		-81.5 dBm	-81.0 dBm	-81.0 dBm	-81.0 dBm	-80.5 dBm	-80.5 dBm		-79.0 dBm	-78.5 dBm
50 Mbit/s	27.5 / 28 MHz	16 QAM		-79.5 dBm	-79.0 dBm	-79.0 dBm	-79.0 dBm	-78.5 dBm	-78.5 dBm		-77.0 dBm	-76.5 dBm
80 Mbit/s	27.5 / 28 MHz	16 QAM		-78.5 dBm	-78.0 dBm	-78.0 dBm	-78.0 dBm	-77.5 dBm	-77.5 dBm		-76.0 dBm	-75.5 dBm

ODU300hp RF Performance Specifications

Transmitter Performance

Power Output (nominal)	QPSK	28.5 dBm	28.5 dBm	26.0 dBm	24.0 dBm	23.0 dBm	22.0 dBm	19.5 dBm	19.5 dBm	15.5 dBm	15.0 dBm	18.0 dBm	17.5 dBm
	16 QAM	26.5 dBm	26.5 dBm	24.0 dBm	22.0 dBm	21.0 dBm	20.0 dBm	17.5 dBm	17.5 dBm	13.5 dBm	13.0 dBm	16.0 dBm	15.5 dBm
	32 QAM	26.0 dBm	26.0 dBm	23.5 dBm	21.5 dBm	20.5 dBm	19.5 dBm	17.0 dBm	17.0 dBm	13.0 dBm	12.5 dBm	15.5 dBm	15.0 dBm
	64 QAM	25.5 dBm	25.5 dBm	23.0 dBm	21.0 dBm	20.0 dBm	19.0 dBm	16.5 dBm	16.5 dBm	12.5 dBm	12.0 dBm	15.0 dBm	14.5 dBm
	128 QAM	24.5 dBm	24.5 dBm	22.0 dBm	20.0 dBm	19.0 dBm	18.0 dBm	15.5 dBm	15.5 dBm	11.5 dBm	11.0 dBm	14.0 dBm	13.5 dBm
	256 QAM	22.5 dBm	22.5 dBm	20.0 dBm	18.0 dBm	17.0 dBm	16.0 dBm	13.5 dBm	13.5 dBm	9.5 dBm	9.0 dBm	12.0 dBm	11.5 dBm

Receiver Threshold [1]

10 Mbit/s, 5xE1	7 MHz	QPSK	-92.0 dBm	-92.0 dBm	-91.5 dBm	-91.5 dBm	-91.5 dBm	-91.5 dBm	-91.0 dBm	-91.0 dBm	-90.0 dBm	-89.0 dBm	-89.0 dBm	-88.5 dBm
10 Mbit/s, 5xE1	3.5 MHz	16 QAM	-91.5 dBm	-91.5 dBm	-91.0 dBm	-91.5 dBm	-91.5 dBm	-91.0 dBm	-91.0 dBm	-90.5 dBm	-89.5 dBm	-89.0 dBm	-88.5 dBm	-88.5 dBm
20 Mbit/s, 10xE1	13.75 / 14 MHz	QPSK	-89.0 dBm	-89.0 dBm	-88.5 dBm	-89.0 dBm	-89.0 dBm	-88.5 dBm	-88.5 dBm	-88.0 dBm	-87.0 dBm	-86.5 dBm	-86.0 dBm	-86.0 dBm
20 Mbit/s, 10xE1	7 MHz	16 QAM	-85.5 dBm	-85.5 dBm	-85.0 dBm	-85.0 dBm	-85.0 dBm	-84.5 dBm	-84.5 dBm	-83.5 dBm	-82.5 dBm	-82.0 dBm	-82.0 dBm	
30 Mbit/s, 16XE1	7 MHz	64 QAM	-78.5 dBm	-78.5 dBm	-78.0 dBm	-78.5 dBm	-78.5 dBm	-78.0 dBm	-78.0 dBm	-77.5 dBm	-76.5 dBm	-75.5 dBm	-75.0 dBm	-75.0 dBm
40 Mbit/s, 20xE1	27.5 / 28 MHz	QPSK	-86.0 dBm	-86.0 dBm	-85.5 dBm	-86.0 dBm	-86.0 dBm	-85.5 dBm	-85.5 dBm	-85.0 dBm	-84.0 dBm	-83.5 dBm	-83.0 dBm	-83.0 dBm
40 Mbit/s, 20xE1	13.75 / 14 MHz	16 QAM	-82.5 dBm	-82.5 dBm	-82.0 dBm	-82.0 dBm	-82.0 dBm	-81.5 dBm	-81.5 dBm	-80.5 dBm	-79.5 dBm	-79.0 dBm	-79.0 dBm	
50 Mbit/s	27.5 / 28 MHz	16 QAM	-80.5 dBm	-80.5 dBm	-80.0 dBm	-80.0 dBm	-80.0 dBm	-79.5 dBm	-79.5 dBm	-78.5 dBm	-77.5 dBm	-77.0 dBm	-77.0 dBm	
50 Mbit/s	13.75 / 14 MHz	32 QAM	-78.5 dBm	-78.5 dBm	-78.0 dBm	-78.0 dBm	-78.0 dBm	-77.5 dBm	-77.5 dBm	-76.5 dBm	-75.5 dBm	-75.0 dBm	-75.0 dBm	
50 Mbit/s	13.75 / 14 MHz	64 QAM	-75.5 dBm	-75.5 dBm	-75.0 dBm	-75.5 dBm	-75.5 dBm	-75.0 dBm	-75.0 dBm	-74.5 dBm	-73.5 dBm	-72.5 dBm	-72.0 dBm	-72.0 dBm
80 Mbit/s	27.5 / 28 MHz	16 QAM	-79.5 dBm	-79.5 dBm	-79.0 dBm	-79.0 dBm	-79.0 dBm	-78.5 dBm	-78.5 dBm	-77.5 dBm	-76.5 dBm	-76.0 dBm	-76.0 dBm	
100 Mbit/s	27.5 / 28 MHz	32 QAM	-76.0 dBm	-76.0 dBm	-75.5 dBm	-75.5 dBm	-75.5 dBm	-75.5 dBm	-75.0 dBm	-75.0 dBm	-74.0 dBm	-73.0 dBm	-72.5 dBm	-72.5 dBm
130 Mbit/s	27.5 / 28 MHz	64 QAM	-72.5 dBm	-72.5 dBm	-72.0 dBm	-72.5 dBm	-72.5 dBm	-72.0 dBm	-72.0 dBm	-71.5 dBm	-70.5 dBm	-69.5 dBm	-69.0 dBm	-69.0 dBm
150 Mbit/s	55 / 56 MHz	16 QAM	-76.5 dBm	-76.5 dBm			-76.0 dBm	-76.0 dBm	-76.0 dBm	-75.5 dBm	-74.5 dBm	-73.5 dBm	-73.0 dBm	-73.0 dBm
150 Mbit/s	27.5 / 28 MHz	128 QAM	-69.5 dBm	-69.5 dBm	-69.0 dBm	-69.5 dBm	-69.5 dBm	-69.0 dBm	-69.0 dBm	-68.5 dBm	-67.5 dBm	-66.0 dBm	-65.5 dBm	-65.5 dBm
200 Mbit/s	55 / 56 MHz	64 QAM	-72.0 dBm	-72.0 dBm			-71.5 dBm	-71.5 dBm	-71.0 dBm	-71.0 dBm	-69.5 dBm	-68.5 dBm	-68.5 dBm	-68.0 dBm
200 Mbit/s	40 MHz	128 QAM	-68.5 dBm		-68.0 dBm	-68.0 dBm								
200 Mbit/s	27.5 / 28 MHz	256 QAM	-65.5 dBm	-65.5 dBm	-65.0 dBm	-65.0 dBm	-65.0 dBm	-65.0 dBm	-64.5 dBm	-64.5 dBm	-62.5 dBm	-61.5 dBm	-61.5 dBm	-60.5 dBm
250 Mbit/s	55 / 56 MHz	64 QAM	-68.5 dBm	-68.5 dBm			-68.5 dBm	-68.0 dBm	-68.0 dBm	-67.5 dBm	-66.0 dBm	-65.5 dBm	-65.0 dBm	-65.0 dBm
310 Mbit/s	55 / 56 MHz	128 QAM	-66.0 dBm	-66.0 dBm			-66.0 dBm	-65.5 dBm	-65.5 dBm	-65.0 dBm	-64.0 dBm	-62.5 dBm	-62.0 dBm	-62.0 dBm
360 Mbit/s	55 / 56 MHz	256 QAM	-62.5 dBm	-62.5 dBm			-62.5 dBm	-62.0 dBm	-62.0 dBm	-61.5 dBm	-60.5 dBm	-59.5 dBm	-59.5 dBm	-59.0 dBm

[1] System Gain and Rx Threshold values are for BER=10⁻⁶. Values for BER=10⁻⁹ are improved by 1dB. All specifications are typical values unless otherwise stated, and are subject to change without notice.

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