



ECLIPSE



Eclipse E300 ETSI Platform Datasheet

Eclipse Powers Wireless Backhaul Networks

Eclipse combines all PDH, SDH and Ethernet point-to-point wireless applications into a single product platform to dramatically reduce the total cost of using wireless backhaul, and change the way networks are planned, deployed and maintained.

Eclipse is the leading wireless backhaul solution available, combining a number of compelling features:

- **Software Defined.** A highly scalable, software-driven architecture gives operators total control over their networks, so they can adapt to changing conditions and anticipate future needs.
- **Optimized Wireless Nodes.** The Eclipse nodal solution supports multiple outdoor units (ODUs) with built-in traffic routing, add-and-drop, aggregation and concentration, and selectable traffic interfaces, including E1, E3, STM1 and 10/100 Base-T and Gigabit Ethernet.
- **Efficient Terminal Options.** Eclipse supports a number of simple, application-specific Indoor Units to provide cost-efficient terminal solutions for the transport of E1, STM1 and Ethernet data.
- **Scalable Capacity Architecture.** Only pay for the capacity you need today. Super-PDH™ capacity migration enables smooth network upgrades and expansion at minimal cost and service disruption.
- **High-Speed Data Transport.** Eclipse 'Liquid Bandwidth' supports high-speed Ethernet plus TDM traffic over a single radio channel, configurable bandwidth assignment up to 311 Mbps with low latency, built-in Layer 2 operation, service differentiation and QoS features.
- **Control and Intelligence.** The Eclipse software suite enables advanced network control and intelligence through a suite of Java-based Local and Network Management tools.

Eclipse incorporates the latest technology to deliver a solution optimized to provide wireless connectivity for enterprise, broadband fixed wireless access and mobile backhaul networks.



Eclipse Nodal Wireless Solution

System Parameters

Eclipse has it covered, whatever your wireless application.

- 5 to 38 GHz,
- PDH, SDH and Ethernet,
- QPSK to 256 QAM,
- 4x E1 to 2x STM1.

An array of flexible configuration choices, including optional diversity and XPIC co-channel support application.

Secure and reliable operation in licensed frequency bands, with full compliance to applicable ETSI and ITU Standards.

Eclipse designs are hardened for maximum survivability, in any and all installation environments..

Accelerated lifetime testing ensures reliable operation over the full 15 year equipment lifetime.

Java-based Portal local management software and ProVision Element Management system, are specifically designed to provide exceptional control for Eclipse wireless nodal networks.

Eclipse standard features include adaptive equalization, and forward error correction with interleaving, for superior performance in the most demanding propagation conditions.

General									
Operating Frequency Range								5 to 38 GHz	
Digital Line Rate								2.048 Mbps (E1) 34.368 Mbps (E3) 155.52 Mbps (STM1)	
Capacity Range Options	4x, 5x, 8x, 10x, 16x, 20x, 32x, 40x, 48x, 52x, 64x, 75x E1 1x, 2x, 3x, 4x, 8x E3 1x, 2x STM1								
Modulation Options								QPSK, 16, 32, 64, 128, 256 QAM	
Error Correction								FEC, Reed Solomon Decoding	
Adaptive Equalisation (except for IDUsp)								24 tap T/2 equalizer	
Radio Path Protection Options									
Non Protected, 1+0								5 - 38 GHz	
Protected Hot Standby, 1+1								5 - 38 GHz	
Space Diversity, 1+1								5 - 15 GHz	
Frequency Diversity, 1+1								5 - 15 GHz	
Dual Path, Non-Protected, 2+0	XPIC Optional							5 - 38 GHz	
Dual Path, Protected, 2+2	XPIC Optional							5 - 38 GHz	
Standards Compliance									
EMC	INU/INUe						EN 301 489-1, EN 301 489-4 (EN 55022 Class A)		
	IDU						EN 301 489-1, EN 301 489-4 (EN 55022 Class B)		
Operation							ODUs		
Operation	INU/INUe/IDU						ETS 300 019, Class 4.1		
Storage							ETS 300 019, Class 3.2		
Transportation							ETS 300 019, Class 1.2		
Safety							ETS 300 019, Class 2.3		
Radio Frequency							IEC 60950-1/EN 60950-1		
Water Ingress	ODU						EN 302 217 Classes 2, 4 & 5B IEC 60529 (IPX6)		
Environmental									
Operating Temperature	INU/INUe/IDU	Guaranteed	-5° to +45° C (23° to +113° F)						
	ODU	Guaranteed	-33° to +55° C (-27° to +131° F)						
	ODU	Extended ^[1]	-50° to +65° C (-58° to +149° F)						
Humidity	INU/INUe/IDU	Guaranteed	0 to 95%, non-condensing						
	ODU	Guaranteed	0 to 100%						
Altitude		Guaranteed	4,500 meters (15,000 ft)						
Fault and Configuration Management									
Protocol								SNMP v2	
Interface, electrical								Ethernet 10/100 Base-T or RS232	
Interface, physical								RJ-45	
Local/remote Configuration and Support Tool								Eclipse Portal	
Performance Monitoring								To ITU-T Rec. G.826	
Routing Protocols supported								Static and dynamic routing, RIP I, RIP II, OSPF	
Network Management								Stratex Networks ProVision	
Engineering Orderwire	Via optional VoIP handset or external RS-422 Digital Orderwire Unit (eg: Ardash)								
Emission Designator									
Bandwidth	3.5MHz	7MHz	13.75MHz	14MHz	27.5MHz	28MHz	55MHz	56MHz	
Emission Designator	QPSK QAM	3M50G7W N/A	7M00G7W 7M00D7W	13M75G7W 13M75D7W	14M0G7W 14M0D7W	27M5G7W 27M5D7W	28M0G7W 28M0D7W	N/A 55M0D7W	N/A 56M0D7W
Dispersive Fade Margin (DFM)									
		Gross Bit Rate Mbps ^[2]	Modulation Options		Symbol Rate Mbaud	DFM IDUsp	DFM IDU 20x/155o/ES	DFM RAC 30/3X/40	
Capacity/Modulation	4xE1	9.4	QPSK (16 QAM)		4.7 (2.4)	74.5			
	5xE1	11.5	QPSK (16 QAM)		5.8 (2.9)		76 (78)	76 (78)	
	8xE1	18.8	QPSK (16 QAM)		9.4 (4.7)	71.5			
	10xE1	22.8	QPSK (16 QAM)		11.4 (5.7)		72 (74)	72 (74)	
	16xE1/1xE3	37.6	QPSK (16 QAM / 64 QAM)		18.8 (9.4)	68.5	71 (75 / 67)	71 (75 / 67)	
	20xE1	44.9	QPSK (16 QAM)		22.5 (11.2)		69 (67)	69 (67)	
	32xE1/2xE3	75.2	16 QAM (64 QAM)		18.8 (11.9)			64 (64)	
	40xE1	88.9	16 QAM		22.2		58	58	
	48xE1/3xE3	106.8	32 QAM		21.4			58	
	52xE1	116.6	32 QAM		23.3		54	54	
	64xE1	142.4	64 QAM		23.7		52	52	
	75xE1	167.8	128 QAM (16 QAM / 64 QAM)		24 (42 / 28)		49 (52 / 52)	49 (52 / 52)	
	1xE3	37.6	QPSK (16 QAM)		18.8 (9.4)			71 (75)	
	2xE3	75.2	16 QAM (64 QAM)		18.8 (12.5)			67 (61)	
	3xE3	112.8	32 QAM		22.6			55	
	4xE3	150.4	128 QAM		21.5			51	
	1xSTM1	167.0	128 QAM (16 QAM / 64 QAM)		23.9(41.8 / 27.8)		49 (52 / 52)	49 (52 / 52)	
	2xSTM1	334.0	128 QAM (256 QAM)		47.8 (41.8)			42 (40)	

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

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

[2] Gross bit rate includes usable customer payload plus radio overhead for FEC, NMS, AUX traffic, etc.



Eclipse Terminal, Indoor Unit (IDU) Options

Eclipse Indoor Units provide a simple and economical solution for terminal configurations, where support for only one radio path is required. IDU options are available for software configurable transport of E1, STM1 and Ethernet traffic.



IDUsp 4x & 16x

Provides lowest-cost termination of standard PDH link capacities of 4, 8 and 16x E1 using QPSK modulation.

IDU 20x

Supports software scalable, enhanced PDH link capacities between 5 and 75x E1.

IDU 155o

SDH IDU that enables transport of a single STM1 channel using selectable 16, 64 or 128QAM modulation.

IDU ES

Combines 4x 10/100 Base-T Ethernet traffic and up to 8xE1 wayside channels, with programmable aggregate link speeds up to 200 Mbps.

General			
Configuration memory, removable ^[1]		Up to 128 Mbyte CompactFlash card (rear access)	
LED Indicators		2x Tri-state LEDs ('IDU Status', 'ODU Status')	
Line Interface, E1 electrical	<i>Standards Compliance</i>	Compliant to ITU-T Rec. G.703, G.823	
	<i>Line Code</i>	HDB3	
	<i>Impedance</i>	75Ω unbalanced or 120Ω balanced, configurable	
IF Cable Connector			N-Type
IF Interface Parameters		Tx	311 MHz, -8 to -12 dBm
		Rx	126 MHz, -8 to -27 dBm
Protection Connector (where available)			9 pin D-SUB
Auxiliary Data ^[1]	<i>Aux Data Channels</i>		1
	<i>Interface</i>		RS232 or RS422
	<i>Line Rate, configurable</i>		1.2 to 19.2 kbps, asynchronous
			64 kbps, synchronous
Alarm I/O ^[1]	<i>Connector type</i>		9 pin D-SUB
	<i>External Alarm Inputs</i>		2x TTL
	<i>External Alarm Outputs</i>		4x Form C Relay
	<i>Connector type</i>		15 pin D-SUB
NMS LAN interface	<i>Type</i>		10/100 Base-T Ethernet
	<i>Connector</i>		8-pin RJ45
Serial Maintenance Interface ^[1]	<i>Standard</i>		Complies to TIA/EIA-561
	<i>Speed</i>		1.2 to 115.2 kbps
	<i>Connector</i>		8-pin RJ45
Electrical	<i>Input Voltage Range</i>	IDUsp	-40.5 to -60.0 VDC
	<i>Power Consumption</i>	IDU 20x, IDU 155o, IDU ES	10W
			16W
	<i>Protection Circuit</i>		5A Slow-Blow Fuse
Mechanical	<i>Dimensions</i>	44mm (1RU)x 482mm (19in) x 277mm (10.9in)	
	<i>Weight</i>	1.6 kg (3.5 lb)	
IDU Standard Performance (sp) options		IDUsp 4x	IDUsp 16x
Capacity Options (configurable)		4x 2.048 Mbps (E1)	4, 8, 16x 2.048 Mbps (E1)
Modulation		QPSK	QPSK
Traffic Connectors		4x RJ45	16x RJ45
Configuration Options		Non Protected (1+0) only	Non Protected (1+0) Protected Hot Standby (1+1) ^[2]
IDU Super-PDH and SDH options		IDU 20x	IDU 155o
Capacity Options (configurable)		5, 10, 20, 40, 52, 64, 75x 2.048 Mbps (E1)	1x 155.52 Mbps (STM1)
Modulation Options (configurable)		QPSK, 16 to 128 QAM	16, 64, 128 QAM
Traffic Connectors		20x RJ45	SC ^[3]
Configuration Options		Non Protected (1+0) Protected Hot Standby (1+1) Protected Space Diversity (1+1)	Non Protected (1+0) Protected Hot Standby (1+1) Protected Space Diversity (1+1)
IDU Ethernet options		IDU ES ^[4]	
Capacity Options (configurable)		50, 100, 150, 200 Mbps	
Modulation Options (configurable)		QPSK, 16, 32, 64, 128 QAM	
Ethernet Traffic Interface	<i>Interfaces</i>	4x 10/100 Base-T Fast Ethernet	
	<i>Connectors</i>	4x 8-pin RJ45	
	<i>Frame size</i>	64 - 1536 bytes	
	<i>Ethernet transport channels</i>	2	
	<i>Throughput capacity, per channel</i>	2 - 98 Mbps, 2 Mbps increments	
Wayside Traffic Channels	<i>Interfaces</i>	8x 2.048 Mbps (E1)	
	<i>Connectors</i>	8x RJ45	
Configuration Options		Non Protected (1+0)	

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

[1] Not available for IDUsp 4x/16x.

[2] IDU 1+1 protection does not support hitless switching or diversity configurations.

[3] For IDU 155o optical interface specifications refer to the Optical Interface Parameters under Transparent DAC Options.

[4] For more detailed Ethernet specifications refer to Eclipse Connect ES Datasheet.

Eclipse Node Intelligent Node Unit (INU) Common Units

The Eclipse Intelligent Node Unit (INU) and Extended INU (INUe) provide optimized wireless nodal networking, supporting multiple radio paths from a single unit. Each node consists of a standard chassis equipped with common cards listed below. Additional hot-swappable Radio (RAC) and Data Access (DAC) Cards are added to provide required node functionality.



Node Controller Card (NCC)

Provides node management and control, primary DC power, and interfaces for Portal and NMS. A removable Compact Flash card holds configuration data and software License.



Node Protection Card (NPC)

Provides redundancy for the NCC control and DC power supply functions for higher reliability nodes.



Fan Card (FAN)

The FAN module includes two long-life axial fans to provide forced air cooling. One FAN is fitted in the INU; two FANs in the INUe.



Auxiliary Services Card (AUX)

The AUX card provides user configurable auxiliary data channels and alarm input/output (I/O) options. One or more AUX cards can be fitted to a node.

IDC, Indoor Chassis 1RU		
Dedicated plug-in card slots		2 (NCC, FAN)
Universal plug-in card slots		4
Maximum number of ODUs supported		3
Dimensions (including mounting brackets)		44mm (1RU) x 482mm (19in) x 282.5mm (11.1in)
Weight	Empty	2.6 kg (5.8 lb)

IDCe, Extended Indoor Chassis 2RU		
Dedicated plug-in card slots		4 (NCC, NPC, 2x FAN)
Universal plug-in card slots		9
Maximum number of ODUs supported		6
Dimensions (including mounting brackets)		88mm (2RU) x 482mm (19in) x 282.5mm (11.1in)
Weight	Empty	4.8 kg (10.6 lb)

NCC, Node Controller Card		
NMS LAN interface	Type	4-port 10/100 Base-T Hub
	Connector	4x 8-pin RJ45
Serial Maintenance Interface	Standard	Complies to TIA/EIA-561
	Speed	1200 bps to 115.2 kbps
	Connector	8-pin RJ45
Configuration memory, removable		Up to 128 Mbyte CompactFlash card (on-board)
Electrical	DC Supply input range	-40.5 to -60 VDC
	DC Fuse type and rating	25A fast-acting ceramic body cartridge
	Over voltage protection	< -70 VDC
	Under voltage protection	-32 VDC
	DC connector	2-pin DSUB power type
Power consumption (including DC/DC efficiency)		< 4W
LED Indicators		2x Tri-state ('Test', 'Status')
Dimensions (including front panel and rear connector)		22mm (0.5RU) x 260mm (10.2in) x 268mm (10.6in)
Weight		0.6 kg (1.35 lb)

NPC, Node Protection Card		
Electrical	DC Supply input range	-40.5 to -60 VDC
	DC Fuse type and rating	25A fast-acting ceramic body cartridge
	Over voltage protection	< -70 VDC
	Under voltage protection	-32 VDC
	DC connector type	2-pin DSUB power type
Power consumption (including DC/DC efficiency)		< 4W
LED Indicators		2x Tri-state ('Protect', 'Status')
Dimensions (including front panel and rear connector)		22mm (0.5RU) x 130mm (5.1in) x 268mm (10.6in)
Weight		0.4 kg (0.88 lb)

FAN, Fan Card		
Fans		2
LED Indicators		1x Red LED ('Fault')
Power consumption		< 2W
Dimensions (including front panel and rear connector)		44mm (1RU) x 40mm (1.6in) x 264mm (10.4in)
Weight		0.23 kg (0.5 lb)

AUX, Auxiliary Services Card		
Aux Data Channels		3
Interface		RS232 or RS422
Line Rate	Asynchronous	1.2 to 19.2 kbps
	Synchronous	64 kbps
Aux Data Connector		High Density DSUB26
External Alarm Inputs	TTL Inputs	Up to 6 ^[1]
	TTL input thresholds	0.8V min low, 2.0V min high
	Form C Relays (NC)	Up to 4 ^[1]
External Alarm Outputs		High Density DSUB15
Alarms Connector		1x Tri-state ('Status')
LED Indicators		< 3W
Power consumption		< 3W
Dimensions (including front panel and rear connector)		22mm (0.5RU) x 130mm (5.1in) x 268mm (10.6in)
Weight		0.35 kg (0.77 lb)

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

[1] For applications requiring additional alarm inputs or outputs, multiple AUX cards can be installed if free INU/INUe slots are available.

Optional stand-alone Alarm Interface Unit is available. Contact Stratex Networks for further details.



Radio Access Card (RAC)

RAC 30

Supports software configurable capacities up to 75x E1, 3x E3 or 1x STM1, modulations from QPSK to 128 QAM and bandwidths up to 30 MHz. Compatible with all ODU300 types (sp/hp/ep).



RAC 3X

Supports capacity options requiring channel bandwidths greater than 30 MHz, with modulations up to 256 QAM, including higher capacities up to 2x STM1 or 8x E3. Compatible with ODU300hp and ep.



RAC 40

Provides co-channel operation with cross-pole interference cancellation (XPIC), for selected capacity options with bandwidths up to 30 MHz and modulations to 128 QAM. Compatible with ODU300 hp and ep.



RACs provide the conversion of TDM and Ethernet traffic for interfacing between the node and an ODU. Functions include modulation/demodulation, FEC, adaptive equalization, IF conversion, IF loopback and automatic protection switching for hot standby, diversity and ring configurations.

General		
IF connector		SMA ^[1]
IF interface	<i>Transmit</i> <i>Receive</i>	311 MHz, -8.0 to -12.0 dBm 126 MHz, -8 to -27 dBm
LED Indicators		2x Tri-state ('Online', 'Status')
Dimensions (including front panel and rear connector)		22mm (0.5RU) x 130mm (5.1in) x 268mm (10.6in)
Weight		< 0.38 kg (0.84 lb)
Secondary Lightning protection		Gas tube, 150V
RAC 30		
ODUs supported		ODU300sp, hp, ep
Capacities supported		5, 10, 20, 32, 40, 52, 64, 75x E1, 1-4x E3, 1x STM1
Modulations supported		QPSK, 16, 32, 64, 128QAM
Power consumption		8W
RAC 3X (>30Mbaud)		
ODUs supported		ODU300hp, ep
Capacities supported		64, 75x E1, 5-8x E3, 1-2x STM1
Modulations supported		16, 64, 128, 256QAM
Power consumption		< 6.5W
RAC 40 with XPIC		
ODUs supported		ODU300hp, ep
Capacities supported		64, 75x E1, 1x STM1
Modulations supported		64, 128QAM
XPIC Improvement		20 dB
XPIC connectors		2x SMB
Power consumption		12W

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

[1] RAC Installation Kit includes 3 meter jumper cable, SMA to N-type.

Data Access Card (DAC)

DACs provide customer traffic access for full termination of payload traffic or partial add and drop node configurations. DACs provide transparent mapping or optional multiplexing of TDM or Ethernet data from the INU backplane, and are independent of link or node capacity.

General		
LED Indicators		1x Tri-state ('Status')
Power consumption (nominal)		< 3W
Dimensions (including front panel and rear connector)		22mm (0.5RU) x 130mm (5.1in) x 268mm (10.6in)
Weight (nominal)		< 0.34 kg (0.74 lb)

Data Access Card (DAC) (continued)

DAC NxE1

DAC options provide either 4x E1 or 16x E1 interfaces per card.



DAC 3xE3M

A configurable multi-function DAC, providing three transparent E3 interfaces, two E13 interfaces (multiplexing 16xE1 to 1xE3 on the front interface), or two E3 channels for video/ATM applications (E3 carried over concatenated 17xE1) per card.



DAC NxSTM1

SDH DAC options provide one or two optical 155 Mbps interfaces, or two 155 Mbps electrical interfaces.



DAC 1x155oM

SDH Multiplexer DAC which maps up to 63x E1 circuits to/from the INU TDM Bus to an STM1 optical customer interface.



DAC ES

Provides 4x 100 Base-T Fast Ethernet interfaces, with configurable aggregate throughput capacity from 6 to 152 Mbps.



DAC GE

Provides 3x 1000 Base-T and one optical IEEE 802.3z 1000 Base-LX Gigabit Ethernet interfaces, with configurable aggregate throughput capacity up to 311 Mbps.



Transparent DAC Options

Interface, configurable	DAC 4x	Electrical	1 to 4x 2.048 Mbps (E1)	
	DAC 16x	Electrical	1 to 16x 2.048 Mbps (E1)	
	DAC 3xE3M	Electrical	1 to 3x 34.368 Mbps (E3)	
	DAC 155o	Optical	1x 155.52 Mbps (STM1)	
	DAC 2x155o	Optical	1 or 2x 155.52 Mbps (STM1)	
	DAC 2x155e	Electrical	1 or 2x 155.52 Mbps (STM1)	
Electrical interface parameters	Standards Compliance	E1, E3	Compliant to ITU-T Rec. G.703, G.823	
		STM1	Compliant to ITU-T Rec. G.703, G.825	
		Line code	E1, E3	HDB3
		Connectors	STM1	CMI
		DAC 4x	RJ45	
		DAC 16x	48 pin mini-RJ21	
		DAC 3xE3M	Slimline BNC	
		DAC 2x155e	BNC	
Optical interface parameters	Standards Compliance	Impedance	E1	75Ω unbalanced or 120Ω balanced, configurable
			E3, STM1	75Ω unbalanced
			STM1	Compliant to ITU-T Rec. G.957, G.825
				Short Range S-1.1
	Optical interface	Connectors	SC	
		Tx Output Center Wavelength, λ _c	1261 to 1310 nm	
		Tx Average Optical Output Power, P _o	-15 to -8 dBm	
		Rx Input Operating Center Wavelength, λ _c	1100 to 1600 nm	
		Rx Sensitivity, P _{in}	-34 dBm	
		Rx Input Power Saturation, P _{in}	-7 dBm	

SDH Multiplexer DAC Options

Interface	Optical	DAC 155oM	1x 155.52 Mbps (STM1)
Functionality			1x STM1 (Interface) to 63x E1 (TDM Bus) Mux
Optical interface type (hot-swappable SFP)	Standard		Long Range L1.1
	Optional		Intermediate Range (IR)
	Connectors		LC
Optical interface parameters		Short Range S1.1	Long Range L1.1
		Tx Output Center Wavelength, λ _c	1261 to 1360 nm
		Tx Average Optical Output Power, P _o	-15 to -8 dBm
		Rx Input Operating Center Wavelength, λ _c	1260 to 1600 nm
		Rx Sensitivity, P _{in}	-34 dBm
		Rx Input Power Saturation, P _{in}	0 dBm
Timing modes, configurable		Maximum Range	15 km
		Loop Time (Clock recovered from received STM1)	40 km
			Local Reference Clock (XO)

Ethernet DAC Options ^[1]

	DAC ES	DAC GE
Transport channels	2	2
Throughput capacity, per channel	2 - 98 Mbps, 2 Mbps increments	155 or 311 Mbps
Electrical Traffic Interface	4x 10/100baseT Fast Ethernet	3x 10/100/1000baseT Fast Ethernet
Connectors	4x 8-pin RJ45	3x 8-pin RJ45
Optical Traffic Interface		1x optical IEEE 802.3z 1000BASE-LX
Connectors		1x LC (SFP)
Optical interface parameters		Tx Output Center Wavelength, λ _c
		Tx Average Optical Output Power, P _o
		Rx Input Operating Center Wavelength, λ _c
		Rx Sensitivity, P _{in}
		Rx Input Power Saturation, P _{in}
LED Indicators	1x Tri-state ('Status')	1x Tri-state ('Status')
Frame size	64 - 1532 bytes	64 - 9600 bytes

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

[1] For more detailed Ethernet specifications refer to Eclipse Liquid Bandwidth Ethernet Brochure.

Eclipse Outdoor Units

Eclipse ODUs are compact, fully environmentally sealed units that are entirely independent of link capacity and payload. Wideband diplexers also provide a wide tuning range via software to increase flexibility and minimize sparing.

ODU options are available with differing maximum capacity and RF performance specifications. All ODUs are designed to mount directly to the antenna, and connect to the INU/IDU by a single coaxial cable.

ODU300sp

Delivers *Standard Performance* operation with both QPSK and 16 QAM modulation and scalable capacity up to 40xE1 in licensed frequency bands from 7 to 38 GHz.



ODU300hp

Delivers *High Performance* operation with QPSK to 256 QAM modulation and scalable capacity up to 75xE1, 8xE3 or 2xSTM1, in licensed frequency bands from 7 to 38 GHz.



ODU300ep

Delivers *Extended Performance* operation with QPSK to 256 QAM modulation and scalable capacity up to 75xE1, 8xE3 or 2xSTM1, in licensed frequency bands from 5 to 23 GHz.



General ODU Specifications

General	ODU300 sp	ODU300 hp	ODU300 ep
Frequency Band options	7, 8, 11, 13, 15, 18, 23, 38 GHz	7, 8, 11, 13, 15, 18, 23, 26, 28, 38 GHz	5, L6, U6, 7, 8, 10, 11, 13, 15, 18, 23 GHz
Capacity support	4, 5, 8, 10, 16, 20, 32, 40xE1	5, 10, 16, 20, 27, 32, 40, 48, 52, 64, 75, 106xE1 1, 2, 3, 4, 8xE3 1 to 2x STM1	5, 10, 16, 20, 27, 32, 40, 48, 52, 64, 75, 106xE1 1, 2, 3, 4, 8xE3 1 to 2x STM1
Modulation support	QPSK, 16 QAM	QPSK, 16, 32, 64, 128, 256 QAM	QPSK, 16, 32, 64, 128, 256 QAM
IF Specifications			
Intermediate Frequency	Transmit Receive		311 MHz 126 MHz
INU/IDU to ODU IF Cable, recommended	CNT-300 Type CNT-400 Type	0.3 inch/copper braid/solid copper centre conductor, 50Ω Maximum IF Cable length 150 meters (500 ft)	0.4 inch/copper braid/copper clad aluminum centre conductor, 50Ω Maximum IF Cable length 300 meters (1,000 ft)
ODU Interfaces			
IF cable connector			N-Type BNC
AGC monitor point			Coax, 7/16 DIN F
Antenna port Interface	5 GHz 6-38 GHz	Standard EIA rectangular waveguide, refer to ODU System specifications	Vertical (standard) or Horizontal
Polarisation, field selectable			Remote mount via coax connection
Antenna Mounting	5 GHz, standard 6-38 GHz, standard 6-38 GHz, optional	Proprietary direct mount for antenna diameters 0.3 to 1.8m (1 to 6ft) Remote mount for antenna diameters >1.8m (>6ft) Remote mount via flex/elliptical waveguide	
General Transmitter Specifications			
Transmit Power Tolerance	5 to 26 GHz 28 to 38 GHz		± 2 dB ± 3 dB
Transmitter Source			Synthesized
Frequency Stability			± 10 ppm
Manual Transmitter Power Control range		ODU300sp, hp	ODU300ep
	QPSK	20 dB	30 dB
	16 QAM	18 dB	26 dB
	32 QAM	17.5 dB	25.5 dB
	64 QAM	17 dB	25 dB
	128 QAM	16 dB	24 dB
	256 QAM	14 dB	22 dB
	Resolution		0.1 dB steps
	Accuracy		± 2 dB
Automatic Transmitter Power Control	Range Resolution / Speed	Configurable over full available manual attenuation range	0.1 dB steps / 6 dB per second
Transmitter Mute			> 50 dB
Channel Selection		By software control within tuning range of ODU	
Synthesizer Resolution			0.25 MHz
General Receiver Specifications			
Receiver Source			Synthesized
Frequency Stability			± 10 ppm
Receiver Overload	BER = 1x10 ⁻⁶		-22 dBm
Residual (Background) Bit Error Rate			Better than 10 ⁻¹³
RSSI Accuracy ^[1]	-40 to -70 dBm, 0 to +35oC -25 to -85 dBm, -33 to +55oC		± 2 dB ± 4 dB
Additional Protection Losses			
	Frequency Band	Main Channel	Protection Channel
Splitter option	5 GHz / 6 to 18 GHz / 21 to 26 GHz / 38 GHz	3.5 dB / 3.6 dB / 3.8 dB / 4 dB	3.5 dB / 3.6 dB / 3.8 dB / 4 dB
Coupler option	5 GHz / 6 to 18 GHz / 21 to 26 GHz / 38 GHz	1.5 dB / 1.6 dB / 1.8 dB / 2 dB	6.4 dB / 6.6 dB / 6.8 dB / 7 dB
Electrical			
Power Consumption	ODU300sp ODU300hp ODU300ep		30W max 40W max 50W max
Mechanical			
Size (H x W x D), weight	ODU300sp, hp ODU300ep	287mm (11.3 in) x 287mm (11.3 in) x 119mm (4.7 in), 6.4 kg (14 lb) 287mm (11.3 in) x 287mm (11.3 in) x 175mm (6.9 in), 8.3 kg (18.7 lb)	
	ODU Protection Splitter/Coupler, 5 to 8GHz	600mm (11.2 in) x 250mm (11.2 in) x 105mm (6.4 in), 8.5 kg (18.7 lb)	
Weight, max	ODU Protection Splitter/Coupler, 11 to 38GHz	600mm (11.2 in) x 250mm (11.2 in) x 105mm (6.4 in), 6.8 kg (15 lb)	

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

[1] RSSI accuracy is only valid when there is no unwanted signal or potential interferer present within ±28MHz of the RX frequency.

ODU300sp RF Specifications

System				7 GHz	8 GHz	11 GHz	13 GHz	15 GHz	18 GHz	23 GHz	38 GHz	
Frequency Range, GHz				7.125 - 7.9	7.725 - 8.5	10.7 - 11.7	12.75 - 13.25	14.4 - 15.35	17.7 - 19.7	21.2 - 23.632	37.0 - 39.46	
T-R Spacings supported, MHz				154, 161, 245	119, 126, 151.614, 266, 311.32	490, 530	266	315, 420, 490, 644, 728	1010, 1092.5	1008, 1200, 1232	1260	
Maximum Tuning Range (dependent upon T-R spacing), MHz				56	140	165	84	245	380	370	340	
Antenna Interface												
Waveguide Type				R84 (WR112)	R84 (WR112)	R100 (WR90)	R120 (WR75)	R140 (WR62)	R220 (WR42)	R220 (WR42)	R320 (WR28)	
Flange Type				UDR84	UDR84	UDR100	UBR120	UBR140	UBR220	UBR220	UBR320	
Mating Flange Type				PDR84 or CDR84	PDR84 or CDR84	PDR100 or CDR100	PBR120 or CDR120	PBR140 or CBR140	PBR220	PBR220	PBR320	
System Gain ^[1]												
System Gain at 10 ⁻⁶ BER				4xE1 7 MHz QPSK	117.0 dB	117.0 dB	114.0 dB	111.5 dB	110.5 dB	108.0 dB	108.0 dB	104.5 dB
				5xE1 7 MHz QPSK	116.5 dB	116.5 dB	113.5 dB	111.0 dB	110.0 dB	107.5 dB	107.5 dB	103.5 dB
				8xE1 13.75 / 14 MHz QPSK	114.5 dB	114.5 dB	111.5 dB	109.0 dB	108.0 dB	105.5 dB	105.5 dB	101.5 dB
				10xE1 13.75 / 14 MHz QPSK	113.5 dB	113.5 dB	110.5 dB	108.0 dB	107.0 dB	104.5 dB	104.5 dB	101.0 dB
				16xE1, 1xE3 27.5 / 28 MHz QPSK	111.5 dB	111.5 dB	108.5 dB	106.0 dB	105.0 dB	102.5 dB	102.5 dB	99.0 dB
				20xE1 27.5 / 28 MHz QPSK	110.5 dB	110.5 dB	107.5 dB	105.0 dB	104.0 dB	101.5 dB	101.5 dB	98.0 dB
				8xE1 7 MHz 16QAM	108.5 dB	108.5 dB	105.5 dB	103.0 dB	102.0 dB	99.5 dB	99.5 dB	95.5 dB
				10xE1 7 MHz 16QAM	107.5 dB	107.5 dB	104.5 dB	102.0 dB	101.0 dB	98.5 dB	98.5 dB	94.5 dB
				16xE1, 1xE3 13.75 / 14 MHz 16 QAM	105.5 dB	105.5 dB	102.5 dB	100.0 dB	99.0 dB	96.5 dB	96.5 dB	92.5 dB
				20xE1 13.75 / 14 MHz 16 QAM	104.5 dB	104.5 dB	101.5 dB	99.0 dB	98.0 dB	95.5 dB	95.5 dB	91.5 dB
				32xE1, 2xE3 27.5 / 28 MHz 16 QAM	102.5 dB	102.5 dB	99.5 dB	97.0 dB	96.0 dB	93.5 dB	93.5 dB	89.5 dB
				40xE1 27.5 / 28 MHz 16 QAM	101.5 dB	101.5 dB	98.5 dB	96.0 dB	95.0 dB	92.5 dB	92.5 dB	88.5 dB
Transmitter Specifications												
Power Output, nominal				QPSK	25.0 dBm	25.0 dBm	22.5 dBm	20.0 dBm	19.0 dBm	17.0 dBm	17.0 dBm	15.0 dBm
				16 QAM	23.0 dBm	23.0 dBm	20.5 dBm	18.0 dBm	17.0 dBm	15.0 dBm	15.0 dBm	13.0 dBm
Receiver Specifications ^[1]												
Threshold at 10 ⁻⁶ BER				4xE1 7 MHz QPSK	-92.0 dBm	-92.0 dBm	-91.5 dBm	-91.5 dBm	-91.5 dBm	-91.0 dBm	-91.0 dBm	-89.5 dBm
				5xE1 7 MHz QPSK	-91.5 dBm	-91.5 dBm	-91.0 dBm	-91.0 dBm	-91.0 dBm	-90.5 dBm	-90.5 dBm	-88.5 dBm
				8xE1 13.75 / 14 MHz QPSK	-89.5 dBm	-89.5 dBm	-89.0 dBm	-89.0 dBm	-89.0 dBm	-88.5 dBm	-88.5 dBm	-86.5 dBm
				10xE1 13.75 / 14 MHz QPSK	-88.5 dBm	-88.5 dBm	-88.0 dBm	-88.0 dBm	-88.0 dBm	-87.5 dBm	-87.5 dBm	-86.0 dBm
				16xE1, 1xE3 27.5 / 28 MHz QPSK	-86.5 dBm	-86.5 dBm	-86.0 dBm	-86.0 dBm	-86.0 dBm	-85.5 dBm	-85.5 dBm	-84.0 dBm
				20xE1 27.5 / 28 MHz QPSK	-85.5 dBm	-85.5 dBm	-85.0 dBm	-85.0 dBm	-85.0 dBm	-84.5 dBm	-84.5 dBm	-83.0 dBm
				8xE1 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	-82.5 dBm
				10xE1 7 MHz 16 QAM	-84.5 dBm	-84.5 dBm	-84.0 dBm	-84.0 dBm	-84.0 dBm	-83.5 dBm	-83.5 dBm	-81.5 dBm
				16xE1, 1xE3 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	-79.5 dBm
				20xE1 13.75 / 14 MHz 16 QAM	-81.5 dBm	-81.5 dBm	-81.0 dBm	-81.0 dBm	-81.0 dBm	-80.5 dBm	-80.5 dBm	-78.5 dBm
				32xE1, 2xE3 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	-76.5 dBm
				40xE1 27.5 / 28 MHz 16 QAM	-78.5 dBm	-78.5 dBm	-78.0 dBm	-78.0 dBm	-78.0 dBm	-77.5 dBm	-77.5 dBm	-75.5 dBm

All specifications are referenced to the ODU antenna flange, and are typical values unless otherwise stated, and are subject to change without notice.

For Guaranteed values (over time and operational range) subtract 2 dB from Power Output, add 2dB to Threshold values, and subtract 4dB from System Gain values.

[1] System Gain & Rx Threshold values are for BER=10⁻⁶. Values for BER=10⁻³ are improved by 1dB.



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ODU300hp RF Specifications

System		7 GHz	8 GHz	11 GHz	13 GHz	15 GHz	18 GHz	23 GHz	26 GHz	28 GHz	38 GHz			
Frequency Range, GHz		7.125 - 7.9	7.725 - 8.5	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	37.0 - 39.46			
T-R Spacings supported, MHz		154, 161, 245	119, 126, 151.614, 266, 311.32	490, 530	266	315, 420, 490, 644, 728	1010, 1092.5	1008, 1200, 1232	1008	1008	1260			
Maximum Tuning Range (dependent upon T-R spacing), MHz		56	140	165	84	245	380	370	360	360	340			
Antenna Interface														
Waveguide Type		R84 (WR112)	R84 (WR112)	R100 (WR90)	R120 (WR75)	R140 (WR62)	R220 (WR42)	R220 (WR42)	R220 (WR42)	R320 (WR28)	R320 (WR28)			
Flange Type		UDR84	UDR84	UDR100	UBR120	UBR140	UBR220	UBR220	UBR220	UBR320	UBR320			
Mating Flange Type		PDR84 or CDR84	PDR84 or CDR84	PDR100 or CDR100	PBR120 or CDR120	PBR140 or CBR140	PBR220	PBR220	PBR220	PBR320	PBR320			
System Gain ^[1]														
System Gain at 10 ⁻⁶ BER		5xE1	7 MHz	QPSK	120.5 dB	120.5 dB	115.5 dB	114.5 dB	113.5 dB	110.5 dB	110.5 dB	105.5 dB	104.0 dB	106.0 dB
		10xE1	13.75 / 14 MHz	QPSK	117.5 dB	117.5 dB	113.0 dB	112.0 dB	110.5 dB	108.0 dB	107.5 dB	102.5 dB	101.5 dB	103.5 dB
		16xE1, 1xE3	27.5 / 28 MHz	QPSK	115.5 dB	115.5 dB	111.0 dB	110.0 dB	108.5 dB	106.0 dB	105.5 dB	100.5 dB	99.5 dB	101.5 dB
		20xE1	27.5 / 28 MHz	QPSK	114.5 dB	114.5 dB	110.0 dB	109.0 dB	107.5 dB	105.0 dB	104.5 dB	99.5 dB	98.5 dB	100.5 dB
		10xE1	7 MHz	16QAM	112.0 dB	112.0 dB	107.0 dB	106.0 dB	105.0 dB	102.0 dB	102.0 dB	97.0 dB	95.5 dB	97.5 dB
		16xE1, 1xE3	13.75 / 14 MHz	16 QAM	109.5 dB	109.5 dB	105.0 dB	104.0 dB	102.5 dB	100.0 dB	99.5 dB	94.5 dB	93.0 dB	95.0 dB
		16xE1, 1xE3	7 MHz	64 QAM	104.0 dB	104.0 dB	99.5 dB	98.5 dB	97.0 dB	94.5 dB	94.0 dB	89.0 dB	87.5 dB	89.5 dB
		20xE1	13.75 / 14 MHz	16 QAM	109.0 dB	109.0 dB	104.0 dB	103.0 dB	102.0 dB	99.0 dB	99.0 dB	94.0 dB	92.5 dB	94.5 dB
		27xE1	13.75 / 14 MHz	32 QAM	104.5 dB	104.5 dB	99.5 dB	98.5 dB	97.5 dB	94.5 dB	94.5 dB	89.5 dB	88.0 dB	90.0 dB
		32xE1, 2xE3	27.5 / 28 MHz	16 QAM	107.0 dB	107.0 dB	102.0 dB	101.0 dB	100.0 dB	97.0 dB	97.0 dB	92.0 dB	90.5 dB	92.5 dB
		32xE1, 2xE3	13.75 / 14 MHz	64 QAM	101.0 dB	101.0 dB	96.5 dB	95.5 dB	94.0 dB	91.5 dB	91.0 dB	86.0 dB	84.5 dB	86.5 dB
		40xE1	27.5 / 28 MHz	16 QAM	106.0 dB	106.0 dB	101.0 dB	100.0 dB	99.0 dB	96.0 dB	96.0 dB	91.0 dB	89.5 dB	91.5 dB
		48xE1, 3xE3	27.5 / 28 MHz	32 QAM	102.5 dB	102.5 dB	97.5 dB	96.5 dB	95.5 dB	92.5 dB	92.5 dB	87.5 dB	86.0 dB	88.0 dB
		52xE1	27.5 / 28 MHz	32 QAM	102.0 dB	102.0 dB	97.0 dB	96.0 dB	95.0 dB	92.0 dB	92.0 dB	87.0 dB	85.5 dB	87.5 dB
		64xE1	27.5 / 28 MHz	64 QAM	97.0 dB	97.0 dB	92.5 dB	91.5 dB	90.0 dB	87.5 dB	87.0 dB	82.0 dB	80.5 dB	82.5 dB
		75xE1, 4xE3, 1xSTM1	55 / 56 MHz	16 QAM						93.0 dB	93.0 dB	88.0 dB	86.5 dB	88.5 dB
		75xE1, 4xE3, 1xSTM1	40 MHz	64 QAM			95.0 dB							
		75xE1, 4xE3, 1xSTM1	27.5 / 28 MHz	128 QAM	94.0 dB	94.0 dB	89.5 dB	88.5 dB	87.0 dB	84.5 dB	84.0 dB	67.5 dB	66.0 dB	79.0 dB
		106xE1	55 / 56 MHz	64 QAM						88.0 dB	87.5 dB	82.0 dB	81.0 dB	83.0 dB
		8xE3, 2xSTM1	55 / 56 MHz	128 QAM						81.0 dB	80.5 dB	75.5 dB	73.5 dB	75.5 dB
		2xSTM1	50 MHz	256 QAM							76.5 dB			
Transmitter Specifications														
Power Output, nominal				QPSK	28.5 dBm	28.5 dBm	24.0 dBm	23.0 dBm	22.0 dBm	19.5 dBm	19.5 dBm	15.5 dBm	15.0 dBm	17.5 dBm
				16 QAM	26.5 dBm	26.5 dBm	22.0 dBm	21.0 dBm	20.0 dBm	17.5 dBm	17.5 dBm	13.5 dBm	13.0 dBm	15.5 dBm
				32 QAM	26.0 dBm	26.0 dBm	21.5 dBm	20.5 dBm	19.5 dBm	17.0 dBm	17.0 dBm	13.0 dBm	12.5 dBm	15.0 dBm
				64 QAM ^[1]	25.5 dBm	25.5 dBm	21.0 dBm	20.0 dBm	19.0 dBm	16.5 dBm	16.5 dBm	12.5 dBm	12.0 dBm	14.5 dBm
				128 QAM	24.5 dBm	24.5 dBm	20.0 dBm	19.0 dBm	18.0 dBm	15.5 dBm	15.5 dBm	11.5 dBm	11.0 dBm	13.5 dBm
				256 QAM								13.5 dBm		
Receiver Specifications ^[2]														
Threshold at 10 ⁻⁶ BER		5xE1	7 MHz	QPSK	-92.0 dBm	-92.0 dBm	-91.5 dBm	-91.5 dBm	-91.5 dBm	-91.0 dBm	-91.0 dBm	-90.0 dBm	-89.0 dBm	-88.5 dBm
		10xE1	13.75 / 14 MHz	QPSK	-89.0 dBm	-89.0 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
		16xE1, 1xE3	27.5 / 28 MHz	QPSK	-87.0 dBm	-87.0 dBm	-87.0 dBm	-87.0 dBm	-86.5 dBm	-86.5 dBm	-86.0 dBm	-85.0 dBm	-84.5 dBm	-84.0 dBm
		20xE1	27.5 / 28 MHz	QPSK	-86.0 dBm	-86.0 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
		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
		16xE1, 1xE3	13.75 / 14 MHz	16 QAM	-83.0 dBm	-83.0 dBm	-83.0 dBm	-83.0 dBm	-82.5 dBm	-82.5 dBm	-82.0 dBm	-81.0 dBm	-80.0 dBm	-79.5 dBm
		16xE1, 1xE3	7 MHz	64 QAM	-78.5 dBm	-78.5 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
		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
		27xE1	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
		32xE1, 2xE3	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
		32xE1, 2xE3	13.75 / 14 MHz	64 QAM	-75.5 dBm	-75.5 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
		40xE1	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
		48xE1, 3xE3	27.5 / 28 MHz	32 QAM	-76.5 dBm	-76.5 dBm	-76.0 dBm	-76.0 dBm	-76.0 dBm	-75.5 dBm	-75.5 dBm	-74.5 dBm	-73.5 dBm	-73.0 dBm
		52xE1	27.5 / 28 MHz	32 QAM	-76.0 dBm	-76.0 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
		64xE1	27.5 / 28 MHz	64 QAM	-72.5 dBm	-72.5 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
		75xE1, 4xE3, 1xSTM1	55 / 56 MHz	16 QAM						-75.5 dBm	-75.5 dBm	-74.5 dBm	-73.5 dBm	-73.0 dBm
		75xE1, 4xE3, 1xSTM1	40 MHz	64 QAM			-74.0 dBm							
		75xE1, 4xE3, 1xSTM1	27.5 / 28 MHz	128 QAM	-69.5 dBm	-69.5 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
		106xE1	55 / 56 MHz	64 QAM						-71.5 dBm	-71.0 dBm	-69.5 dBm	-69.0 dBm	-68.5 dBm
		8xE3, 2xSTM1	55 / 56 MHz	128 QAM						-65.5 dBm	-65.0 dBm	-64.0 dBm	-62.5 dBm	-62.0 dBm
		2xSTM1	50 MHz	256 QAM							-63.0 dBm			

All specifications are referenced to the ODU antenna flange, and are typical values unless otherwise stated, and are subject to change without notice.

For Guaranteed values (over time and operational range) subtract 2 dB from Power Output, add 2dB to Threshold values, and subtract 4dB from System Gain values.

[1] Transmit Power Output values for 64xE1 64QAM will be reduced by 1dB from the 64QAM value indicated.

[2] System Gain & Rx Threshold values are for BER=10⁻⁶. Values for BER=10⁻³ are improved by 1dB.

ODU300ep RF Specifications

System			5 GHz ^[1]	L6 GHz	U6 GHz	7 GHz	8 GHz	10GHz ^[2]	11 GHz	13 GHz	15 GHz	18 GHz	23 GHz	
Frequency Range, GHz			4.4 - 5.0	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	
T-R Spacings supported, MHz			300, 312	252.04	340	154, 161, 245	119, 126, 151.614, 266, 311.32	91, 230, 143.5, 350	490, 530	266	315, 420, 490, 644, 728	1010, 1092.5	1008, 1200, 1232	
Maximum Tuning Range (dependent upon T-R spacing), MHz			56	56	56	56	140	165	165	84	245	380	370	
Antenna Interface														
Waveguide Type			N/A	R70 (WR137)	R70 (WR137)	R84 (WR112)	R84 (WR112)	R100 (WR90)	R100 (WR90)	R120 (WR75)	R140 (WR62)	R220 (WR42)	R220 (WR42)	
Flange Type			Coax	UDR70	UDR70	UDR84	UDR84	UDR100	UDR100	UDR120	UDR140	UDR220	UDR220	
Mating Flange Type			7/16 DIN F	PDR70 or CDR70	PDR70 or CDR70	PDR84 or CDR84	PDR84 or CDR84	PDR100 or CDR100	PDR100 or CDR100	PBR120 or CDR120	PBR140 or CBR140	PBR220	PBR220	
System Gain ^[3]														
System Gain at 10 ⁻⁶ BER														
	5xE1	7 MHz	QPSK	122.0 dB	122.5 dB	122.5 dB	122.5 dB	122.5 dB	117.5 dB	116.5 dB	119.5 dB	118.5 dB	112.5 dB	112.5 dB
	10xE1	13.75 / 14 MHz	QPSK	119.5 dB	119.5 dB	119.5 dB	119.5 dB	119.5 dB	114.5 dB	114.0 dB	117.0 dB	115.5 dB	110.0 dB	109.5 dB
	16xE1, 1xE3	27.5 / 28 MHz	QPSK	117.5 dB	117.5 dB	117.5 dB	117.5 dB	117.5 dB	112.5 dB	112.0 dB	115.0 dB	113.5 dB	108.0 dB	107.5 dB
	20xE1	27.5 / 28 MHz	QPSK	116.5 dB	116.5 dB	116.5 dB	116.5 dB	116.5 dB	111.5 dB	111.0 dB	114.0 dB	112.5 dB	107.0 dB	106.5 dB
	5xE1	3.5 MHz	16QAM	114.5 dB	114.5 dB	114.5 dB	114.5 dB	114.5 dB		109.0 dB	109.0 dB	108.0 dB	102.0 dB	102.0 dB
	10xE1	7 MHz	16QAM	111.5 dB	112.0 dB	112.0 dB	112.0 dB	112.0 dB	109.0 dB	106.0 dB	109.0 dB	108.0 dB	102.0 dB	102.0 dB
	16xE1, 1xE3	13.75 / 14 MHz	16 QAM	109.5 dB	109.5 dB	109.5 dB	109.5 dB	109.5 dB	106.5 dB	104.0 dB	107.0 dB	105.5 dB	100.0 dB	99.5 dB
	16xE1, 1xE3	7 MHz	64 QAM	104.0 dB	104.0 dB	104.0 dB	104.0 dB	104.0 dB	101.0 dB	98.5 dB	101.5 dB	100.0 dB	94.5 dB	94.0 dB
	20xE1	13.75 / 14 MHz	16 QAM	108.5 dB	109.0 dB	109.0 dB	109.0 dB	109.0 dB	106.0 dB	103.0 dB	106.0 dB	105.0 dB	99.0 dB	99.0 dB
	27xE1	13.75 / 14 MHz	32 QAM	104.0 dB	104.5 dB	104.5 dB	104.5 dB	104.5 dB	101.5 dB	98.5 dB	101.5 dB	100.5 dB	94.5 dB	94.5 dB
	32xE1, 2xE3	27.5 / 28 MHz	16 QAM	106.5 dB	107.0 dB	107.0 dB	107.0 dB	107.0 dB	104.0 dB	101.0 dB	104.0 dB	103.0 dB	97.0 dB	97.0 dB
	32xE1, 2xE3	13.75 / 14 MHz	64 QAM	101.0 dB	101.0 dB	101.0 dB	101.0 dB	101.0 dB	98.0 dB	95.5 dB	98.5 dB	97.0 dB	91.5 dB	91.0 dB
	40xE1	27.5 / 28 MHz	16 QAM	105.5 dB	106.0 dB	106.0 dB	106.0 dB	106.0 dB	103.0 dB	100.0 dB	103.0 dB	102.0 dB	96.0 dB	96.0 dB
	48xE1, 3xE3	27.5 / 28 MHz	32 QAM	102.0 dB	102.5 dB	102.5 dB	102.5 dB	102.5 dB	99.5 dB	96.5 dB	99.5 dB	98.5 dB	92.5 dB	92.5 dB
	52xE1	27.5 / 28 MHz	32 QAM	101.5 dB	102.0 dB	102.0 dB	102.0 dB	102.0 dB	99.0 dB	96.0 dB	99.0 dB	98.0 dB	92.0 dB	92.0 dB
	64xE1	27.5 / 28 MHz	64 QAM	98.0 dB	98.0 dB	98.0 dB	98.0 dB	98.0 dB	95.0 dB	92.5 dB	95.5 dB	94.0 dB	88.5 dB	88.0 dB
	75xE1, 4xE3, 1xSTM1	55 / 56 MHz	16 QAM										93.0 dB	93.0 dB
	75xE1, 4xE3, 1xSTM1	40 MHz	64 QAM	99.5 dB		99.5 dB			96.5 dB	94.0 dB				
	75xE1, 4xE3, 1xSTM1	27.5 / 28 MHz	128QAM	94.0 dB	94.0 dB	94.0 dB	94.0 dB	94.0 dB	91.0 dB	88.5 dB	91.5 dB	90.0 dB	84.5 dB	84.0 dB
	106xE1	55 / 56 MHz	64 QAM										88.0 dB	87.5 dB
	8xE3, 2xSTM1	55 / 56 MHz	128QAM										81.0 dB	80.5 dB
	2xSTM1	50 MHz	256QAM											78.5 dB
Transmitter Specifications														
Power Output, nominal			QPSK	30.5 dBm	30.5 dBm	30.5 dBm	30.5 dBm	30.5 dBm	26.0 dBm	25.0 dBm	28.0 dBm	27.0 dBm	21.5 dBm	21.5 dBm
			16 QAM	26.5 dBm	26.5 dBm	26.5 dBm	26.5 dBm	26.5 dBm	24.0 dBm	21.0 dBm	24.0 dBm	23.0 dBm	17.5 dBm	17.5 dBm
			32 QAM	26.0 dBm	26.0 dBm	26.0 dBm	26.0 dBm	26.0 dBm	23.5 dBm	20.5 dBm	23.5 dBm	22.5 dBm	17.0 dBm	17.0 dBm
			64 QAM	25.5 dBm	25.5 dBm	25.5 dBm	25.5 dBm	25.5 dBm	23.0 dBm	20.0 dBm	23.0 dBm	22.0 dBm	16.5 dBm	16.5 dBm
			128 QAM	24.5 dBm	24.5 dBm	24.5 dBm	24.5 dBm	24.5 dBm	22.0 dBm	19.0 dBm	22.0 dBm	21.0 dBm	15.5 dBm	15.5 dBm
			256 QAM											13.5 dBm
Receiver Specifications ^[3]														
Threshold at 10 ⁻⁶ BER														
	5xE1	7 MHz	QPSK	-91.5 dBm	-92.0 dBm	-92.0 dBm	-92.0 dBm	-92.0 dBm	-91.5 dBm	-91.5 dBm	-91.5 dBm	-91.5 dBm	-91.0 dBm	-91.0 dBm
	10xE1	13.75 / 14 MHz	QPSK	-89.0 dBm	-89.0 dBm	-89.0 dBm	-89.0 dBm	-89.0 dBm	-88.5 dBm	-89.0 dBm	-89.0 dBm	-88.5 dBm	-88.5 dBm	-88.0 dBm
	16xE1, 1xE3	27.5 / 28 MHz	QPSK	-87.0 dBm	-87.0 dBm	-87.0 dBm	-87.0 dBm	-87.0 dBm	-86.5 dBm	-87.0 dBm	-87.0 dBm	-86.5 dBm	-86.5 dBm	-86.0 dBm
	20xE1	27.5 / 28 MHz	QPSK	-86.0 dBm	-86.0 dBm	-86.0 dBm	-86.0 dBm	-86.0 dBm	-85.5 dBm	-86.0 dBm	-86.0 dBm	-85.5 dBm	-85.5 dBm	-85.0 dBm
	5xE1	3.5 MHz	16 QAM	-88.0 dBm	-88.0 dBm	-88.0 dBm	-88.0 dBm	-88.0 dBm		-88.0 dBm				
	10xE1	7 MHz	16 QAM	-85.0 dBm	-85.5 dBm	-85.5 dBm	-85.5 dBm	-85.5 dBm	-85.0 dBm	-85.0 dBm	-85.0 dBm	-85.0 dBm	-84.5 dBm	-84.5 dBm
	16xE1, 1xE3	13.75 / 14 MHz	16 QAM	-83.0 dBm	-83.0 dBm	-83.0 dBm	-83.0 dBm	-83.0 dBm	-82.5 dBm	-83.0 dBm	-83.0 dBm	-82.5 dBm	-82.5 dBm	-82.0 dBm
	16xE1, 1xE3	7 MHz	64 QAM	-78.5 dBm	-78.5 dBm	-78.5 dBm	-78.5 dBm	-78.5 dBm	-78.0 dBm	-78.5 dBm	-78.5 dBm	-78.0 dBm	-78.0 dBm	-77.5 dBm
	20xE1	13.75 / 14 MHz	16 QAM	-82.0 dBm	-82.5 dBm	-82.5 dBm	-82.5 dBm	-82.5 dBm	-82.0 dBm	-82.0 dBm	-82.0 dBm	-82.0 dBm	-81.5 dBm	-81.5 dBm
	27xE1	13.75 / 14 MHz	32 QAM	-78.0 dBm	-78.5 dBm	-78.5 dBm	-78.5 dBm	-78.5 dBm	-78.0 dBm	-78.0 dBm	-78.0 dBm	-78.0 dBm	-77.5 dBm	-77.5 dBm
	32xE1, 2xE3	27.5 / 28 MHz	16 QAM	-80.0 dBm	-80.5 dBm	-80.5 dBm	-80.5 dBm	-80.5 dBm	-80.0 dBm	-80.0 dBm	-80.0 dBm	-80.0 dBm	-79.5 dBm	-79.5 dBm
	32xE1, 2xE3	13.75 / 14 MHz	64 QAM	-75.5 dBm	-75.5 dBm	-75.5 dBm	-75.5 dBm	-75.5 dBm	-75.0 dBm	-75.5 dBm	-75.5 dBm	-75.0 dBm	-75.0 dBm	-74.5 dBm
	40xE1	27.5 / 28 MHz	16 QAM	-79.0 dBm	-79.5 dBm	-79.5 dBm	-79.5 dBm	-79.5 dBm	-79.0 dBm	-79.0 dBm	-79.0 dBm	-79.0 dBm	-78.5 dBm	-78.5 dBm
	48xE1, 3xE3	27.5 / 28 MHz	32 QAM	-76.0 dBm	-76.5 dBm	-76.5 dBm	-76.5 dBm	-76.5 dBm	-76.0 dBm	-76.0 dBm	-76.0 dBm	-76.0 dBm	-75.5 dBm	-75.5 dBm
	52xE1	27.5 / 28 MHz	32 QAM	-75.5 dBm	-76.0 dBm	-76.0 dBm	-76.0 dBm	-76.0 dBm	-75.5 dBm	-75.5 dBm	-75.5 dBm	-75.5 dBm	-75.0 dBm	-75.0 dBm
	64xE1	27.5 / 28 MHz	64 QAM	-72.5 dBm	-72.5 dBm	-72.5 dBm	-72.5 dBm	-72.5 dBm	-72.0 dBm	-72.5 dBm	-72.5 dBm	-72.0 dBm	-72.0 dBm	-71.5 dBm
	75xE1, 4xE3, 1xSTM1	55 / 56 MHz	16 QAM										-75.5 dBm	-75.5 dBm
	75xE1, 4xE3, 1xSTM1	40 MHz	64 QAM	-74.0 dBm		-74.0 dBm			-73.5 dBm	-74.0 dBm				
	75xE1, 4xE3, 1xSTM1	27.5 / 28 MHz	128QAM	-69.5 dBm	-69.5 dBm	-69.5 dBm	-69.5 dBm	-69.5 dBm	-69.0 dBm	-69.5 dBm	-69.5 dBm	-69.0 dBm	-69.0 dBm	-68.5 dBm
	106xE1	55 / 56 MHz	64 QAM										-71.5 dBm	-71.5 dBm
	8xE3, 2xSTM1	55 / 56 MHz	128QAM										-65.5 dBm	-65.0 dBm
	2xSTM1	50 MHz	256QAM											-63.0 dBm

All specifications are referenced to the ODU antenna flange, and are typical values unless otherwise stated, and are subject to change without notice.

For Guaranteed values (over time and operational range) subtract 2 dB from Power Output, add 2dB to Threshold values, and subtract 4dB from System Gain values.

[1] For switchable diplexer option, 5GHz system gain is reduced by 4 dB.

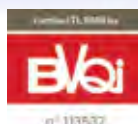
[2] 10GHz Power Output and System Gain specifications are reduced by 1.5dB, 1.5dB and 3.0dB respectively for 91MHz T-R option.



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