Nokia 400G ZR/ZR+ -10dBm & 0dBm pluggable coherent modules

Nokia 7250 IXR, 7730 SXR, 7750 SR, and 7950 XRS Router-Compatible Coherent Optics

Relentless demand for increased capacity at a lower cost per bit is compelling network operators to continuously upgrade and optimize their IP-optical network designs. Nokia Coherent Routing utilizes a new generation of digital coherent optics (DCOs) that can be installed in compact pluggable form factors, such as QSFP56-DD, enabling routers to connect directly over DWDM wavelengths.

Nokia offers a full range of 400G coherent optics for IP platforms

400G ZR is a standardized, interoperable 400G coherent interface specification available in the router-pluggable QSFP-DD format. Developed by the Optical Internetworking Forum (OIF) and released in March 2020, 400ZR is profile-optimized for high-density access and point-to-point DCI applications. It can deliver 400 Gb/s up to 40 km over a single dark fiber span without external amplification. With external amplification, it supports up to 64-channel WDM in the C-band over distances up to 120 km.

400G ZR+ -10dBm expands the applications for router-pluggable coherent optics in QSFP-DD format. It offers enhanced optical performance compared to 400ZR by utilizing high-gain forward error correction (FEC), flexible 100G–400G line rates, and support for extended reaches through multiple modulation types (16QAM, 8QAM, and QPSK). In

400G/16QAM mode, depending on optical link characteristics, 400ZR+ can achieve distances up to 600 km with external amplification. Even greater distances are possible when operating at sub-rates below 400G using QPSK or 8QAM modulation. Additionally, 400ZR+ can traverse a limited number of reconfigurable optical add-drop multiplexer (ROADM) nodes, enabling efficient router bypass when necessary.

400G ZR+ 0dBm supports line rates from 100 to 400 Gb/s using QPSK, 8QAM, and 16QAM modulation. With its higher launch power, it achieves reaches up to 750 km and can traverse multiple ROADM hops. These 400G ZR+ 0dBm modules are optimal for metro/regional edge and core networks, serving as pluggable router interfaces to facilitate IP-optical integration.

400G ZR+ 0dBm w/ToF integrates a Tunable Optical Filter (ToF) to support colorless Add/Drop applications. This 400G ZR+ 0dBm w/ToF also supports 100-400Gb/s line rates using QPSK, 8QAM, and 16QAM modulation. 400G ZR+ 0dBm w/ToF are ideal for metro/regional edge and core networks, either as a pluggable router interface to enable IP-optical integration in Nokia 7250 IXR, 7750 SR and 7950 XRS router families

Routers optimized for coherent optics

To successfully integrate router-pluggable coherent optics, router hardware designs must be optimized to meet the additional heat dissipation requirements and support flexible deployment options for 400G ZR, 400G ZR+ -10dBm & 0dBm optics.

While 400G ZR, 400G ZR+ -10dBm & 0dBm router pluggable coherent optics can be equipped in the same QSFP-DD cages as 400GE short-reach gray optics, their power consumption and heat dissipation are much higher. The thermal design of 400G-capable line cards is a critical scaling factor because it determines a router's ability to efficiently cool interface ports with pluggable 400G coherent optics. Nokia IP platforms have been designed and engineered with coherent optical pluggable deployments in mind, supporting a wide range of applications and topologies.

Operating environment

- Temperature: 0-75°C (32°F to 167°F)
- Relative humidity: 5% to 95%

Table 1. Nokia 400G Coherent tunable DWDM part numbers

Part Number	Description	Interface
3HE16564AA	QSFP56-DD - 400G ZR 0/70C	400GBase-ZR
3HE16565AA	QSFP56-DD - 400G ZR+ 0/70C	400GBase-ZR+
3HE18360AA	QSFP56-DD - 400G ZR+ 0dBm 0/70C	400GBase-ZR+
3HE18358AA	QSFP56-DD - 400G ZR+ 0dBm w/ToF 0/75C	400GBase-ZR+

400G ZR Technical specifications

Table 2. Nokia part number: 3HE16564AA - QSFP56-DD - 400GE ZR 0/70C -10dBm

3HE16564AA QSFP56-DD - 400G ZR 0/70C		
Parameter	**Unit**	**400G**
compatibility mode (config)		oif-400g-zr
Modulation format		400G 16QAM
breakout (config)		c1-400g
Buad Rate	Gbaud	59.844
FEC type/mode	FEC	cFEC
Transmitter optical characteristics	nm	1528.77 to 1563.86nm DWDM Grid
Center frequency THz	Thz	ITU 196.1 to 191.7 THz
Center frequency deviation (tuning accuracy) GHz	Ghz	+/- 1.8 GHz
Channel spacing GHz	GHz	100 GHZ Grid Supported with Min/Max Freq: 191.300000/196.100000 THZ 75 GHZ Grid Supported with Min/Max Freq: 191.300000/196.100000 THZ 50 GHZ Grid Supported with Min/Max Freq: 191.300000/196.100000 THZ 25 GHZ Grid Supported with Min/Max Freq: 191.275000/196.125000 THZ 12.5 GHZ Grid Supported with Min/Max Freq: 191.275000/196.125000 THZ 6.25 GHZ Grid Supported with Min/Max Freq: 191.275000/196.125000 THZ Fine Frequency Tuning is supported with a range from -6000 to 6000 MHZ and a resolution of 1 MHZ
Number of tunable channels		64 (75Ghz) or 48 (100Ghz)
Range of the adjustable optical power dBm		"-10 dBm to -6 dBm"
Default optical power dBm		"-10 dBm to -6 dBm"
Optical power adjustment precision dB		0,01
Max -10dB spectral width GHz	GHz	68 GHz
Max -3dB spectral width GHz	GHz	52 GHz
Optical power out of the TX port during tuning dBm	dBm	-20 dBm
TX In Band Optical Signal-to-Noise Ratio (IB OSNR) dB	dB	34dB
TX Out of Band Optical Signal-to-Noise Ratio (OB OSNR) dB	dB	23dB
Receiver OSNR sensitivity dB	dB	26 dB
Receiver optical power sensitivity dBm	dBm	-12 dBm
Overload power (total input power allowed on the RX port of the interface) dBm	dBm	0 dbm
CD tolerance ps/nm	ps/nm	2,400 ps/nm Chromatic Dispersion tolerance
CD penalty (referenced to OSNR) dB	dB	0.5 dB
PMD tolerance ps	ps	10 ps
PMD penalty (referenced to OSNR) dB	dB	0.5 dB
PDL tolerance dB	dB	2.0 dB
PDL penalty (referenced to OSNR) dB	dB	1.8 dB
SOP tolerance krad/s	krad/s	50 krad/s
SOP penalty (referenced to OSNR) dB	dB	0.5 dB

400G ZR+ -10dBm Technical specifications

Table 3. Nokia part number: 3HE16565AA - QSFP56-DD - 400G ZR+ 0/70C -10dBm

Parameter	Unit Speed	3HE16565AA - QSFP56-DD - 400G ZR+ 0/70C					
		400G			300G	200G	100G
compatibility mode (config)		oif-400g-zr	open-zrp-ofec1	open-zrp-ofec2	Long Haul	Long Haul	Long haul
Modulation format		400G 16QAM	400G 16QAM	400G 16QAM	300G 8QAM	200G QPSK	100G QPSK
breakout (config)		c1-400g	c1-400g	c1-400g	c3-100g	c2-100g	c1-100g
Buad Rate	Gbaud	59.844	60.139	60.139	60.139	60.139	30.069
FEC type/mode	FEC	cFEC	oFEC	oFEC	oFEC	oFEC	oFEC
Transmitter optical characteristics	nm	1528.77 to 1563.86nm DWDM Grid	1528.77 to 1563.86nm DWDM Grid	1528.77 to 1563.86nm DWDM Grid	1528.77 to 1563.86nm DWDM Grid	1528.77 to 1563.86nm DWDM Grid	1528.77 to 1563.86nm DWDM Grid
Center frequency THz	Thz	ITU 196.1 to 191.7 THz	ITU 196.1 to 191.7 THz	ITU 196.1 to 191.7 THz	ITU 196.1 to 191.7 THz	ITU 196.1 to 191.7 THz	ITU 196.1 to 191.7 THz
Center frequency deviation (tuning accuracy) GHz	Ghz	+/- 1.8 GHz	+/- 1.8 GHz	+/- 1.8 GHz	+/- 1.8 GHz	+/- 1.8 GHz	+/- 1.8 GHz
Channel spacing GHz	GHz	100 GHZ Grid Supported with Min/Max Freq: 191.300000/196.100000 THZ 75 GHZ Grid Supported with Min/Max Freq: 191.300000/196.100000 THZ 50 GHZ Grid Supported with Min/Max Freq: 191.300000/196.100000 THZ 25 GHZ Grid Supported with Min/Max Freq: 191.275000/196.125000 THZ 12.5 GHZ Grid Supported with Min/Max Freq: 191.275000/196.125000 THZ 6.25 GHZ Grid Supported with Min/Max Freq: 191.275000/196.125000 THZ Fine Frequency Tuning is supported with a range from -6000 to 6000 MHZ and a resolution of 1 MHZ					
Number of tunable channels		64 (75Ghz) or 48 (100Ghz)	64 (75Ghz) or 48 (100Ghz)	64 (75Ghz) or 48 (100Ghz)	64 (75Ghz) or 48 (100Ghz)	64 (75Ghz) or 48 (100Ghz)	64 (75Ghz) or 48 (100Ghz)
Range of the adjustable optical power dBm		"-10 dBm to -6 dBm"	"-10 dBm to -6 dBm"	"-10 dBm to -6 dBm"	"-10 dBm to -6 dBm"	"-10 dBm to -6 dBm"	"-10 dBm to -6 dBm"
Default optical power dBm		"-10 dBm to -6 dBm"	"-10 dBm to -6 dBm"	"-10 dBm to -6 dBm"	"-10 dBm to -6 dBm"	"-10 dBm to -6 dBm"	"-10 dBm to -6 dBm"
Optical power adjustment precision dB		0,01	0,01	0,01	0,01	0,01	0,01
Max -10dB spectral width GHz	GHz	68 GHz	65 GHz	65 GHz	65 GHz	65 GHz	65 GHz
Max -3dB spectral width GHz	GHz	52 GHz	60 GHz	60 GHz	60 GHz	60 GHz	60 GHz

Parameter	Unit Speed	3HE16565AA - QSFP56-DD - 400G ZR+ 0/70C					
		400G			300G	200G	100G
Optical power out of the TX port during tuning dBm	dBm	-20 dBm	-20 dBm	-20 dBm	-20 dBm	-20 dBm	-20 dBm
TX In Band Optical Signal-to-Noise Ratio (IB OSNR) dB	dB	34dB	34dB	34dB	34dB	34dB	34dB
TX Out of Band Optical Signal-to-Noise Ratio (OB OSNR) dB	dB	23dB	23dB	23dB	23dB	23dB	23dB
Receiver OSNR sensitivity dB	dB	26 dB	24 dB	24 dB	24 dB	24 dB	24 dB
Receiver optical power sensitivity dBm	dBm	-12 dBm	-12 dBm	-12 dBm	-12 dBm	-12 dBm	-12 dBm
Overload power (total input power allowed on the RX port of the interface) dBm	dBm	0 dbm	0 dbm	0 dbm	0 dbm	0 dbm	0 dbm
CD tolerance ps/nm	ps/nm	2,400 ps/nm Chromatic Dispersion tolerance	20,000 ps/nm Chromatic Dispersion tolerance	Low PMD, Low Pwr Consump-tion, CD = 13000ps/nm	50,000 ps/nm Chromatic Dispersion tolerance	80,000 ps/nm Chromatic Dispersion tolerance	100,000 ps/nm Chromatic Dispersion tolerance
CD penalty (referenced to OSNR) dB	dB	0.5 dB	0.5 dB	0.5 dB	0.5 dB	0.5 dB	0.5 dB
PMD tolerance ps	ps	10 ps	15 ps	15 ps	15 ps	15 ps	15 ps
PMD penalty (referenced to OSNR) dB	dB	0.5 dB	0.5 dB	0.5 dB	0.5 dB	0.5 dB	0.5 dB
PDL tolerance dB	dB	2.0 dB	3.5 dB	3.5 dB	3.5 dB	3.5 dB	3.5 dB
PDL penalty (referenced to OSNR) dB	dB	1.8 dB	1.8 dB	1.8 dB	1.8 dB	1.8 dB	1.8 dB
SOP tolerance krad/s	krad/s	50 krad/s	50 krad/s	50 krad/s	50 krad/s	50 krad/s	50 krad/s
SOP penalty (refer-enced to OSNR) dB	dB	0.5 dB	0.5 dB	0.5 dB	0.5 dB	0.5 dB	0.5 dB

400G ZR+ 0dBm Technical specifications

Table 4. Nokia part number: 3HE18360AA – QSFP-DD 400G ZR+ 0/70C 0dBm

Parameter	Unit	3HE18360AA QSFP-DD 400G ZR+ 0dBm								
		400G		4x100G		300G	200G		100G	
compatibility mode (config)		metro or open-zrp-ofec1	long haul or open-zrp-ofec2	metro or open-zrp-ofec1	long haul or open-zrp-ofec2	metro or open-zrp-ofec1	metro or open-zrp-ofec1	long haul or open-zrp-ofec2	long haul or open-zrp-ofec2	access
Spectral Shaping & Phase Optimization		off	on	off	on	off	off	on	off	off
Modulation format		400G 16QAM	400G 16QAM	400G 16QAM	400G 16QAM	300G 8QAM	200G QPSK	200G QPSK	100G QPSK	100G dQPSK
breakout (config)		c1-400g	c1-400g	c4-100g	c4-100g	c3-100g	c2-100g-aui2	c2-100g-aui2	c1-100g-aui2	c1-100g-aui2
Baud Rate	Gbaud	60.13	60.13	60.13	60.13	60.13	60.13	60.13	30.07	27.95
Signal Spectral Width at 3dB down from Peak	GHz	~48	~60	~48	~60	~48	~48	~60	~38	~36
Signal Spectral Width at 10dB down from Peak	GHz	~78	~70	~78	~70	~78	~78	~70	~55	~42
Signal Spectral Width - Min Tx Spectral excursion	GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz
Channel spacing GHz	GHz	100 GHZ Grid Supported with Min/Max Freq: 191.300000/196.100000 THZ 75 GHZ Grid Supported with Min/Max Freq: 191.300000/196.100000 THZ 50 GHZ Grid Supported with Min/Max Freq: 191.300000/196.100000 THZ 25 GHZ Grid Supported with Min/Max Freq: 191.275000/196.125000 THZ 12.5 GHZ Grid Supported with Min/Max Freq: 191.275000/196.125000 THZ 6.25 GHZ Grid Supported with Min/Max Freq: 191.275000/196.125000 THZ Fine Frequency Tuning is supported with a range from -6000 to 6000 MHZ and a resolution of 1 MHZ								
Number of tunable channels		64 (75Ghz) or 48 (100Ghz)	64 (75Ghz) or 48 (100Ghz)	64 (75Ghz) or 48 (100Ghz)	64 (75Ghz) or 48 (100Ghz)	64 (75Ghz) or 48 (100Ghz)	64 (75Ghz) or 48 (100Ghz)			
Signal Spectral Width - Max Tx Spectral excursion	GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz

Parameter	Unit	3HE18360AA QSFP-DD 400G ZR+ 0dBm								
		400G		4x100G		300G	200G		100G	
Roll off parame-ter of the Tx pulse shaping filter (Assume a raised-cosine filter)	β	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Single or Dual Polarization		dual	dual	dual	dual	dual	dual	dual	dual	dual
Number of subcarriers		single	single	single	single	single	single	single	single	single
Inband Transmit OSNR (dB)	dB	34	34	34	34	34	34	34	34	34
Out of Band Transmit OSNR (dB)	dB	23	23	23	23	23	23	23	23	23
Minimum configurable Transmit power	dBm	-6	-6	-6	-6	-6	-6	-6	-6	-6
Maximum configurable Transmit power	dBm	1	1	1	1	1	1	1	1	1
Minimum configurable Frequency	GHz	191.275	191.275	191.275	191.275	191.275	191.275	191.275	191.275	191.275
Maximum configurable Frequency	GHz	196.125	196.125	196.125	196.125	196.125	196.125	196.125	196.125	196.125
Configurable Frequency Resolution	GHz	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ
Minimum Receive OSNR	dB	23.5	23.5	23.5	23.5	20	15	15	12	12
Pre FEC BER required to achieve 1E-15 post FEC BER		0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
FEC Type		OFEC	OFEC	OFEC	OFEC	OFEC	OFEC	OFEC	OFEC	SC-FEC
Minimum Grid Spacing (i.e., effective channel spectral band-width)	GHz	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25	6.25
Minimum Receiver Signal Power	dBm	-12	-12	-12	-12	-12	-12	-12	-12	-12

Parameter	Unit	3HE18360AA QSFP-DD 400G ZR+ 0dBm								
		400G		4x100G		300G	200G		100G	
Maximum Receiver Signal Power	dBm	0	0	0	0	0	0	0	0	0
Maximum allowed Chromatic Dispersion	ps/nm	20000	20000	20000	20000	26000	40000	40000	100000	270000
Chromatic Dispersion penalty for maximum compensation	dB	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Maximum allowed Polariza-tion Mode Dispersion	ps	20	20	20	20	25	25	25	30	30
Polariza-tion Mode Dispersion penalty for maximum compensation	dB	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Maximum allowed Polarization Dependent Loss	dB	4	4	4	4	4	4	4	4	4
Polarization Dependent Loss penalty for maximum compensation	dB	2	2	2	2	2	1.5	1.5	1.5	1.5
Polarization Dependent Loss penalty curve	dB	2dB OSNR penalty	2dB OSNR penalty	2dB OSNR penalty	2dB OSNR penalty	2dB OSNR penalty	1.5dB OSNR penalty	1.5dB OSNR penalty	1.5dB OSNR penalty	1.5dB OSNR penalty
Maximum allowed State of Polariza-tion change	krad/s	100	100	100	100	180	300	300	600	600
State of Polarization penalty for maximum tracking speed	dB	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Maximum Receiver Total Power	dBm	13	13	13	13	13	13	13	13	13
Power consumption	W	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5

400G ZR+ 0dBm with integrated tunable optical filter Technical specifications

Table 5. Nokia part number: 3HE18358AA – QSFP-DD - 400G ZR+ 0dBm w/ToF 0/75C

Parameter	Unit	3HE18358AA QSFP-DD - 400G ZR+ 0dBm w/ToF 0/75C								
		400G		4x100G		300G	200G		100G	
compatibility mode (config)		metro or open-zrp-ofec1	long haul or open-zrp-ofec2	metro or open-zrp-ofec1	long haul or open-zrp-ofec2	metro or open-zrp-ofec1	metro or open-zrp-ofec1	long haul or open-zrp-ofec2	access	long haul or open-zrp-ofec2
Spectral Shaping & Phase Optimization		off	on	off	on	off	off	on	off	off
Modulation format		400G 16QAM	400G 16QAM	400G 16QAM	400G 16QAM	300G 8QAM	200G QPSK	200G QPSK	100G QPSK	100G dQPSK
breakout (config)		c1-400g	c1-400g	c4-100g	c4-100g	c3-100g	c2-100g-aui2	c2-100g-aui2	c1-100g-aui2	c1-100g-aui2
Baud Rate	Gbaud	60.14	60.14	60.14	60.14	60.14	60.14	60.14	30.07	30.07
Signal Spectral Width at 3dB down from Peak	GHz	~48	~60	~48	~60	~48	~48	~60	~48	~48
Signal Spectral Width at 10dB down from Peak	GHz	~78	~70	~78	~70	~78	~78	~70	~78	~78
Signal Spectral Width - Min Tx Spectral excursion	GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz	- 1.5 GHz
Signal Spectral Width - Max Tx Spectral excursion	GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz	+ 1.5 GHz
Roll off parameter of the Tx pulse shaping filter (Assume a raised-cosine filter)	β	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Single or Dual Polarization		Dual	Dual	Dual	Dual	Dual	Dual	Dual	Dual	Dual

Parameter	Unit	3HE18358AA QSFP-DD - 400G ZR+ 0dBm w/ToF 0/75C								
		400G		4x100G		300G	200G		100G	
Number of subcarriers		single	single	single	single	single	single	single	single	single
Inband Transmit OSNR (dB)	dB	38	38	38	38	38	38	38	38	38
Out of Band Transmit OSNR (dB)	dB	38	38	38	38	38	38	38	38	38
Minimum configurable Transmit power	dBm	-9	-9	-9	-9	-9	-9	-9	-9	-9
Maximum configurable Transmit power	dBm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Minimum configurable Frequency	GHz	191.275	191.275	191.275	191.275	191.275	191.275	191.275	191.275	191.275
Maximum configurable Frequency	GHz	196.125	196.125	196.125	196.125	196.125	196.125	196.125	196.125	196.125
Configurable Frequency Resolution	GHz	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ	0.1 GHZ
Minimum Receive OSNR	dB	23	23	23	23	20.3	14.8	14.8	11.5	11.5
Pre FEC BER required to achieve 1E-15 post FEC BER		2.0e-2	2.0e-2	2.0e-2	2.0e-2	2.0e-2	2.0e-2	2.0e-2	2.0e-2	2.0e-2
FEC Type		OFEC	OFEC	OFEC	OFEC	OFEC	OFEC	OFEC	OFEC	OFEC
Minimum Grid Spacing (i.e., effective channel spectral bandwidth)	GHz	75 GHz	75 GHz	75 GHz	75 GHz	75 GHz	75 GHz	75 GHz	75 GHz	75 GHz
Minimum Receiver Signal Power	dBm	-12	-12	-12	-12	-15	-18	-18	-20	-20

Parameter	Unit	3HE18358AA QSFP-DD - 400G ZR+ 0dBm w/ToF 0/75C								
		400G		4x100G		300G	200G		100G	
Maximum Receiver Signal Power	dBm	0	0	0	0	0	0	0	0	0
Maximum allowed Chromatic Dispersion	ps/nm	20000	20000	20000	20000	50000	50000	50000	77000	77000
Chromatic Dispersion penalty for maximum compensation	dB	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Maximum allowed Polarization Mode Dispersion	ps	30	30	30	30	30	30	30	40	40
Polarization Mode Dispersion penalty for maximum compensation	dB	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Maximum allowed Polarization Dependent Loss	dB	6	6	6	6	6	6	6	6	6
Polarization Dependent Loss penalty for maximum compensation	dB	5	5	5	5	5	5	5	5	5
Maximum allowed State of Polarization change	krad/s	80	80	80	80	100	800	800	400	400
Maximum Inter-Channel Crosstalk at Receiver	dB	-40	-40	-40	-40	-40	-40	-40	-40	-40
Maximum Receiver Total Power	dBm	13	13	13	13	13	13	13	13	13
Power consumption	W	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5

About Nokia

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

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