

UNIKÁTNÍ MIKROVLNNÉ SPOJE

RAY

80 GHz

RAY3-80 je dalším členem rodiny vysokorychlostních mikrovlnných p-t-p spojů pro nejnáročnější podmínky. Design vychází z koncepce dlouhodobě ověřené v pásmech 10, 17, 18 a 24 GHz, dochází však k podstatnému navýšení rychlosti z 1 Gb/s na 10 Gb/s.



PŘEDNOSTI

- Minimální spotřeba 35 – 45W
- Kompaktní rozměry, hmotnost 2,8 kg
- 1× ETH, 1× SFP+, PoE, DC
- Wifi management, mobilní aplikace

PARAMETRY

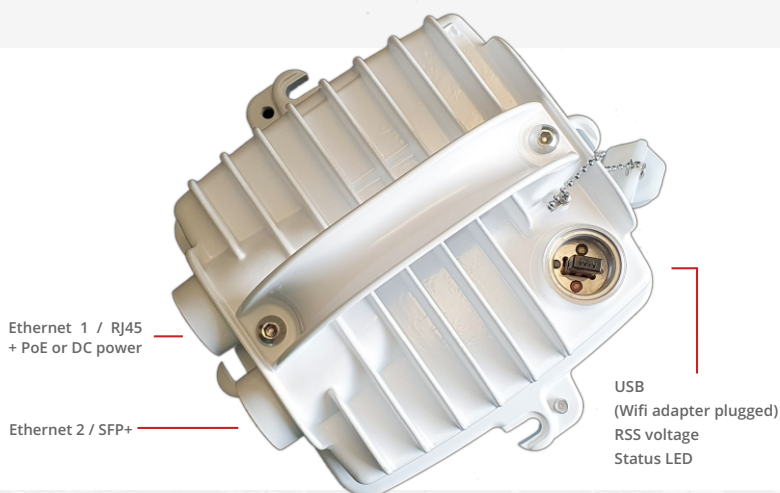
- 10 Gb/s FDD
- 250 MHz – 2 GHz kanály
- 2PSK – 256QAM
- -6 až +20 dBm

VYUŽITÍ SPEKTRA

- Flexibilní duplexní odstup
- Úzké kanály
- Vestavěný analyzátor spektra
- Optimální využití pásma

SPOLEHLIVOST

- Vysoká citlivost, Hitless ACMB a ATPC
- Ochrana proti přepětí 4 kV, ESD 8 kV
- Každá jednotka testována v klimatické komoře
- MTBF > 100 let, vyrobeno v ČR



RACOM

www.racom.eu

TECHNICKÉ PARAMETRY

Radio parameters		RAY3-80	
Frequency range	71 – 86 GHz (E-band)		
	Lower (unit L) 71.000 – 76.000 GHz	Upper (unit U) 81.000 – 86.000 GHz	
Type of duplex traffic	FDD (Frequency division duplex)		
Speed (each direction)	up to 10 Gb/s		
Channel bandwidth	250, 500, 750, 1000, 1250, 1500, 1750, 2000 MHz (62.5 and 125 MHz only available for ACMB)		
Duplex spacing	flexible; typ 10 GHz, min 5 GHz, max 15 GHz		
Modulations	2PSK, 4PSK, 8PSK, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM		
ACMB	Hitless - including bandwidth reduction to 1/2 or 1/4 and stronger FEC (together with RF Output power regulation increases the system gain by up to 35.5 dB)		
FEC	LDPC		
Sensitivity, BER 10 ⁻⁶	-85 dBm (25 Mb/s) -76 dBm (200 Mb/s)	-68 dBm (1 Gb/s) -59 dBm (4 Gb/s)	-53 dBm (7 Gb/s) -46.5 dBm (10 Gb/s)
RF Output power	-6 to +20 dBm (+17 dBm @ 32QAM; +16 dBm @ 64QAM; +14 dBm @ 128QAM; +13 dBm @ 256QAM)		
ATPC	Yes (range 26 dB)		
Range with different antennas			
Speed	1 Gb/s	4 Gb/s	10 Gb/s
Availability	99.95% / 99.99%	99.95% / 99.99%	99.95% / 99.99%
Antenna 38 - 40 cm (47 dBi)	7.8 km / 3.8 km	5.9 km / 2.9 km	2.5 km / 1.3 km
Antenna 65 - 68 cm (51 dBi)	10.0 km / 4.7 km	7.9 km / 3.4 km	3.8 km / 1.9 km
Ethernet (user data & management)			
RJ45	1 Gb Eth. 10/100/1000BASE-T Auto MDI/MDIX		
SFP (user exchangeable)	10 Gb Eth. SFP+ slot for 1000/2500/5000/10000 BASE-T; 1000/10000 BASE-SX; 1000/10000 BASE-LX (power max. 3 W)		
Throughput L1 (RFC 2544)	10000 Mb/s (64-128 B frames); 9512 Mb/s (1518 B frames)		
Latency L1 @ 10 Gb/s (RFC 2544, one way)	12.9 µs (64 B frames); 23.5 µs (1518 B frames)		
MTU (max packet length)	10240 Bytes		
Synchronization	Synchronous Ethernet; PTP (transparent for IEEE-1588v2)		
Electrical			
Primary power	PoE active IEEE 802.3bt (POE++); PoE passive 37– 60 VDC; DC 37 – 60 VDC; floating		
Power consumption (typ.)	35 W @ channel ≤ 500 MHz; 37 W @ 1000 MHz; 42 W @ 2000 MHz; max 45 W (with SFP+)		
System interfaces			
USB	USB 2.0, Host A; USB / WiFi; USB / ETH		
RSS voltage	Two contact sockets		
Indication LED	System status (multicolor)		
System button	Default settings, Configuration restore from internal backup		
Environmental			
Ingress Protection	IP66		
MTBF (Mean Time Between Failure)	> 1 000 000 hours (> 114 years) projected		
Operating temperature	- 30 to + 55°C (ETSI EN 300019-1-4, class 4.1.)		
Operating humidity	5 to 95% non-condensing		
Surge immunity	4 kV (EN 61000-4-5)		
ESD resistance	8 kV (EN 61000-4-2)		
Mechanical			
Design & Mounting	FOD (Full Outdoor), direct mounting to antenna		
Unit types	Specific units for Lower (L) and Upper (U) part of the band		
Casing	Rugged die-cast aluminium		
Size	H×W×D: 160×245×245 mm (6.3×9.6×9.6 in)		
Weight	2.8 kg (6.1 lbs)		
Diagnostics & Monitoring			
Real time monitoring	RSS, MSE, BER		
Diagnostic tools	Spectrum analyzer, Pinger		
History charts	Temperature, Power voltage, RSS, MSE, BER, Data rate, RF Output power		
Statistics	RMON counters for all interfaces		
Antenna alignment	RSS voltage, Smartphone app (RayTools), Web		
SNMP	SNMP v2c including configurable TRAPs		
Security			
Management	Web (HTTP, HTTPS), CLI (SSH, Telnet), Smartphone app (RayTools)		
Access accounts	3 levels (Guest, Admin, Super)		
WiFi	Passphrase; HW/SW enable/disable; active only during air-link loss		
Standards			
Approvals	CE (RED), FCC*, IC*		

* Pending
Technical parameters are subject to change without prior notification. For more details see [User manuals](#).

