



Technické parametry



Mikrovlnné spoje RAY - svazek 2

16. května 2013
verze 1.0

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Seznam dokumentace

Uživatelské manuály

- **Mikrovlnný spoj RAY¹**
Uživatelský manuál RAY11, RAY17, RAY24
- **Mikrovlnný spoj RAY²**
Uživatelský Manuál RAY10
- **Mikrovlnný spoj RAY - svazek 2**
Technické parametry

Specifikace

- **RAY10, 11, 17³** – Leták A3
- **RAY10⁴** – Datasheet A4
- **RAY11⁵** – Datasheet A4
- **RAY17⁶** – Datasheet A4

¹ <http://www.racom.eu/cz/products/m/ray17/index.html>

² <http://www.racom.eu/cz/products/m/ray/index.html>

³ http://www.racom.eu/download/hw/ray/free/cz/00_letaky/leaflet_RAY_en.pdf

⁴ http://www.racom.eu/download/hw/ray/free/cz/00_letaky/datasheet_RAY10cz.pdf

⁵ http://www.racom.eu/download/hw/ray/free/cz/00_letaky/datasheet_RAY11cz.pdf

⁶ http://www.racom.eu/download/hw/ray/free/cz/00_letaky/datasheet_RAY17cz.pdf

1. Frekvenční rozsahy jednotek RAY

Typ	Licenční pásma				ISM pásma	
	RAY10		RAY11		RAY17	RAY24
Rozsah frekvencí	A	10.30 - 10.59 GHz	A,B	10.70 – 11.70 GHz	17.10 – 17.30 GHz	24.00 – 24.25 GHz
	B	10.15 - 10.65 GHz	C,D	10.50 – 10.68 GHz		

Sub-pásma	Lower [GHz]	Upper [GHz]	Lower [GHz]	Upper [GHz]	sub-pásma se nepoužívají	
A	10.30-10.42 RAY10-LA	10.47-10.59 RAY10-UA	10.70-10.96 RAY11-LA	11.20-11.45 RAY11-UA	RAY17	RAY24
B	10.15-10.30 RAY10-LB	10.50-10.65 RAY10-UB	10.96-11.20 RAY11-LB	11.45-11.70 RAY11-UB		
C			10.5000-10.5425 RAY11-LC	10.5915-10.6335 RAY11-UC		
D			10.5425-10.5845 RAY11-LD	10.6335-10.6755 RAY11-UD		

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1.1. Duplexní rozestupy

Duplexní rozestupy kanálů L a U

RAY10	
Sub-pásma	
A	Všechny kombinace kanálů
B	Všechny kombinace kanálů

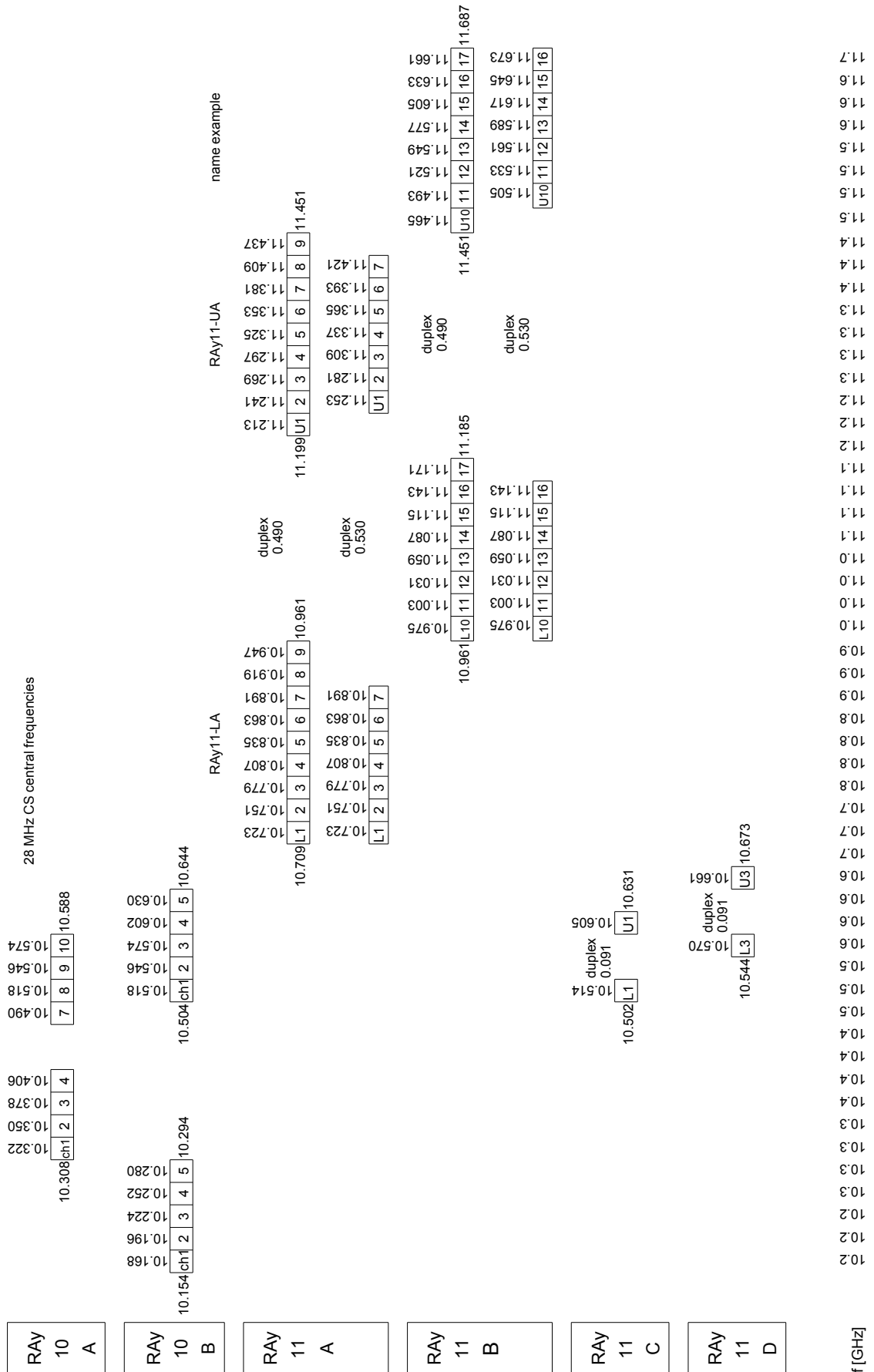
RAY11	
Sub-pásma	Duplexní rozestupy [MHz]
A, B	490, 530
C,D	91

RAY17			
Volitelný duplexní rozestup			
Šířka kanálu	minimum	default	maximum
[MHz]	[MHz]	[MHz]	[MHz]
3.5	60	73.5	192.5
7	60	73.5	192.5
14	65	87.5	185.5
28	70	87.5	171.5
40	70	73.5	157.5
56	85	87.5	143.5

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1.2. Přehled frekvencí 10 GHz a 11 GHz, pro CS 28 MHz

10 GHz and 11 GHz bands overview

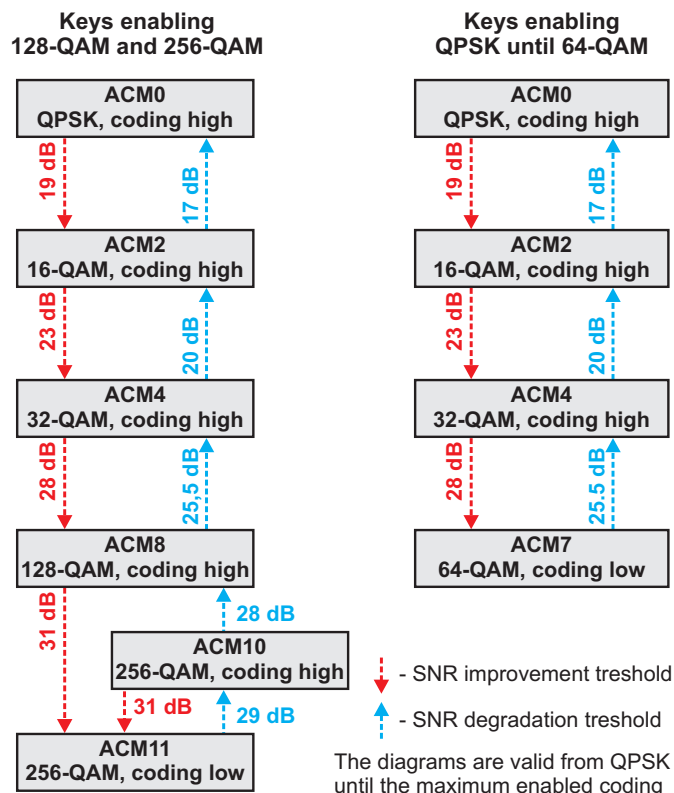


2. RAY10

2.1. Modulace a přenosové rychlosti

RAY10		User data rate [Mbps]		
Modulation / CS	Coding strenght	7 MHz	14 MHz	28 MHz
		ACCP	ACCP	ACCP
QPSK	High	8.5	17.7	36.8
QPSK	Low	9.9	19.9	41.4
16 QAM	High	17.3	34.6	72.1
16 QAM	Low	19.4	38.8	80.9
32 QAM	High	22.3	44.6	92.8
32 QAM	Low	24.6	49.1	102.4
64 QAM	High	28.3	57.8	120.5
64 QAM	Low	28.8	62.3	129.8
128 QAM	High		69.8	145.3
128 QAM	Low		73.4	155.5
256 QAM	High		79.3	166.4
256 QAM	Low		80.3	170.7

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Obr. 2.1: Stavový diagram přepínání ACM podle SNR

2.2. Rádiové parametry

RAY10		Channel spacing 7 MHz; limits for ACCP/CCDP					
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection*	Adjacent channel Selectivity*	Blocking
			RSS	SNR	1 dB	1 dB	± 17.5 MHz
					declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	
QPSK	12 /H	8.5	-96	7.5	-11 / -23	17 / 0	30 / 20
QPSK	12 /L	9.9	-93	8.5	-14 / -23	15 / 0	31 / 20
16 QAM	24 /H	17.3	-88	13.5	-17 / -30	14 / 3	24 / 20
16 QAM	24 /L	19.4	-87	14.5	-19 / -30	14 / 3	23 / 20
32 QAM	30 /H	22.3	-83	17.5	-22 / -33	12 / 2	22 / 20
32 QAM	30 /L	24.6	-82	18.5	-24 / -33	11 / 2	20 / 20
64 QAM	36 /H	28.3	-80	20.0	-24 / -33	11 / 2	20 / 20
64 QAM	36 /L	28.8	-79	20.5	-25 / -33	10 / 2	20 / 20

* Guaranteed values and according limits for specifications of disturbance attenuation are shown for lucidity in the same form as the parameter of Blocking. It is therefore a ratio of I / C (signal disturbance output / useful signal output), expressed in logarithmic units.

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Courses of Fig.4, Fig.5, Fig.6 spectrum masks are part of ETSI EN 302 217-2-2 V1.3.1 standard (2009-04).

RAY10 Channel spacing 14 MHz; limits for ACCP/CDDP							
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection*	Adjacent ch. Selectivity*	Blocking
			RSS	SNR	1 dB	1 dB	± 17.5 MHz
					declared / limit	declared / limit	declared / limit
<i>[-]</i>	<i>[Mbps]</i>		<i>[dBm]</i>	<i>[dB]</i>	<i>[dB]</i>	<i>[dB]</i>	<i>[dB]</i>
QPSK	24 /H	17.7	-92	7.5	-12 / -23	16 / 0	42 / 20
QPSK	24 /L	19.9	-90	8.5	-14 / -23	15 / 0	41 / 20
16 QAM	48 /H	34.6	-85	13.5	-17 / -30	14 / 3	34 / 20
16 QAM	48 /L	38.8	-83	14.5	-19 / -30	13 / 3	31 / 20
32 QAM	60 /H	44.6	-81	17.5	-22 / -33	12 / 5	30 / 20
32 QAM	60 /L	49.1	-79	18.5	-24 / -33	11 / 5	28 / 20
64 QAM	72 /H	57.8	-78	20.0	-24 / -33	11 / 2	27 / 20
64 QAM	72 /L	62.3	-76	21.5	-26 / -33	10 / 2	27 / 20
128 QAM	84 /H	69.8	-75	23.5	-28 / -33	8 / 2	27 / 20
128 QAM	84 /L	73.4	-73	24.5	-31 / -33	5 / 2	26 / 20
256 QAM	96 /H	79.3	-71	26.0	-31 / -33	5 / 2	26 / 20
256 QAM	96 /L	80.3	-69.5	26.5	-33 / -33	3 / 2	26 / 20

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RAY10 Channel spacing 28 MHz; limits for ACCP/CDDP							
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection*	Adjacent ch. Selectivity*	Blocking
			RSS	SNR	1 dB	1 dB	± 17.5 MHz
					declared / limit	declared / limit	declared / limit
<i>[-]</i>	<i>[Mbps]</i>		<i>[dBm]</i>	<i>[dB]</i>	<i>[dB]</i>	<i>[dB]</i>	<i>[dB]</i>
QPSK	50 /H	36.8	-89	7.5	-12 / -23	20 / 0	62 / 30
QPSK	50 /L	41.4	-87	8.5	-14 / -23	18 / 0	57 / 30
16 QAM	100 /H	72.1	-82	13.5	-17 / -30	18 / 3	52.5 / 30
16 QAM	100 /L	80.9	-80	14.5	-19 / -30	16 / 3	52.5 / 30
32 QAM	125 /H	92.8	-78	17.5	-22 / -33	16 / 5	52.5 / 30
32 QAM	125 /L	102.4	-76	18.5	-24 / -33	15 / 5	50 / 30
64 QAM	150 /H	120.5	-75	20.0	-24 / -35	15 / 5	46 / 30
64 QAM	150 /L	129.8	-73	21.5	-26 / -35	13 / 5	46 / 30
128 QAM	175 /H	145.3	-72	23.5	-28 / -35	11 / 5	43 / 30
128 QAM	175 /L	155.5	-70	25.0	-31 / -35	8 / 5	43 / 30
256 QAM	200 /H	166.4	-69	26.0	-31 / -35	8 / 5	40.5 / 30
256 QAM	200 /L	170.7	-67	26.5	-33 / -35	5 / 5	37 / 30

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2.3. Jmenovité frekvence, pásmo CZ

RAy10 – LA		Nominal Lower channel frequency Band 10.301 – 10.420 GHz Channel size [MHz], Channel number, Frequency [MHz]			
7 MHz		14 MHz		28 MHz	
RAy Channel	f [MHz]	RAy Channel	f [MHz]	RAy Channel	f [MHz]
0AA	10308.0	0A	10308		
1AA	10311.5	1A	10315		
1AB	10318.5			1	10322
1BA	10325.5	1B	10329		
1BB	10332.5				
2AA	10339.5	2A	10343		
2AB	10346.5			2	10350
2BA	10353.5	2B	10357		
2BB	10360.5				
3AA	10367.5	3A	10371		
3AB	10374.5			3	10378
3BA	10381.5	3B	10385		
3BB	10388.5				
4AA	10395.5	4A	10399		
4AB	10402.5			4	10406
4BA	10409.5	4B	10413		
4BB	10416.5				
RAy10 – UA		Nominal Upper channel frequency Band 10.476 – 10.588 GHz Channel size [MHz], Channel number, Frequency [MHz]			
7 MHz		14 MHz		28 MHz	
RAy Channel	f [MHz]	RAy Channel	f [MHz]	RAy Channel	f [MHz]
7AA	10479.5	7A	10483		
7AB	10486.5			7	10490
7BA	10493.5	7B	10497		
7BB	10500.5				
8AA	10507.5	8A	10511		
8AB	10514.5			8	10518
8BA	10521.5	8B	10525		
8BB	10528.5				
9AA	10535.5	9A	10539		
9AB	10542.5			9	10546
9BA	10549.5	9B	10553		
9BB	10556.5				
10AA	10563.5	10A	10567		
10AB	10570.5			10	10574
10BA	10577.5	10B	10581		
10BB	10584.5				

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2.4. Jmenovité frekvence, pásmo EU

RAY10 – LB			Nominal Lower channel frequency Band 10.154 – 10.294 GHz Channel size [MHz], Channel number, Frequency [MHz]									
7 MHz			14 MHz				28 MHz					
CEPT	RAY Ch.	f [MHz]	CEPT	RAY Ch.	f [MHz]	RAY Ch.	f [MHz]	CEPT	RAY Ch.	f [MHz]	RAY Ch.	f [MHz]
L1	L1a	10157.5	L1	L1a	10161							
L2	L2a	10164.5				L1c	10168	L1	L1a	10168		
L3	L3a	10171.5	L2	L2a	10175						L1c	10175
L4	L4a	10178.5				L2c	10182				L1e	10182
L5	L5a	10185.5	L3	L3a	10189						L1g	10189
L6	L6a	10192.5				L3c	10196	L2	L2a	10196		
L7	L7a	10199.5	L4	L4a	10203						L2c	10203
L8	L8a	10206.5				L4c	10210				L2e	10210
L9	L9a	10213.5	L5	L5a	10217						L2g	10217
L10	L10a	10220.5				L5c	10224	L3	L3a	10224		
L11	L11a	10227.5	L6	L6a	10231						L3c	10231
L12	L12a	10234.5				L6c	10238				L3e	10238
L13	L13a	10241.5	L7	L7a	10245						L3g	10245
L14	L14a	10248.5				L7c	10252	L4	L4a	10252		
L15	L15a	10255.5	L8	L8a	10259						L4c	10259
L16	L16a	10262.5				L8c	10266				L4e	10266
L17	L17a	10269.5	L9	L9a	10273						L4g	10273
L18	L18a	10276.5				L9c	10280	L5	L5a	10280		
L19	L19a	10283.5	L10	L10a	10287							
L20	L20a	10290.5										

RAY10 – UB			Nominal Upper channel frequency Band 10.504 – 10.644 GHz Channel size [MHz], Channel number, Frequency [MHz]									
7 MHz			14 MHz				28 MHz					
CEPT	RAY Ch.	f [MHz]	CEPT	RAY Ch.	f [MHz]	RAY Ch.	f [MHz]	CEPT	RAY Ch.	f [MHz]	RAY Ch.	f [MHz]
U1	U1a	10507.5	U1	U1a	10511							
U2	U2a	10514.5				U1c	10518	U1	U1a	10518		
U3	U3a	10521.5	U2	U2a	10525						U1c	10525
U4	U4a	10528.5				U2c	10532				U1e	10532
U5	U5a	10535.5	U3	U3a	10539						U1g	10539
U6	U6a	10542.5				U3c	10546	U2	U2a	10546		
U7	U7a	10549.5	U4	U4a	10553						U2c	10553
U8	U8a	10556.5				U4c	10560				U2e	10560
U9	U9a	10563.5	U5	U5a	10567						U2g	10567
U10	U10a	10570.5				U5c	10574	U3	U3a	10574		
U11	U11a	10577.5	U6	U6a	10581						U3c	10581
U12	U12a	10584.5				U6c	10588				U3e	10588
U13	U13a	10591.5	U7	U7a	10595						U3g	10595
U14	U14a	10598.5				U7c	10602	U4	U4a	10602		
U15	U15a	10605.5	U8	U8a	10609						U4c	10609
U16	U16a	10612.5				U8c	10616				U4e	10616
U17	U17a	10619.5	U9	U9a	10623						U4g	10623
U18	U18a	10626.5				U9c	10630	U5	U5a	10630		
U19	U19a	10633.5	U10	U10a	10637							
U20	U20a	10640.5										

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3. RAY11

3.1. Modulace a přenosové rychlosti

RAy11 Modulation / CS	User data rate [Mbps]							
	3.5 MHz	7 MHz	14 MHz	28 (30) MHz		40 MHz	56 MHz	56-A MHz
	ACCP	ACCP	ACCP	ACCP	ACAP	ACCP	ACCP	ACCP
QPSK	4.9	8.5	19.9	36.8	38.3	50.1	72.9	85.8
16-QAM	9.6	17.2	38.8	80.9	84.1	110.0	160.2	169.9
32-QAM	12.1	22.1	49.1	102.4	106.4	139.2	202.7	206.2
64-QAM	14.3	29.7	62.3	129.8	135.0	176.5	256.9	268.1
128-QAM	17.1	34.7	73.6	155.5	161.7	211.4	303.7	309.0
256-QAM	19.7	39.7	81.2	170.7	177.5	232.1	337.7	358.9

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3.2. Rádiové parametry

RAy11 Channel spacing 3.5 MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
QPSK	6	4.9	-97	9.5	15 / 23	12 / 19	-14 / 0	-16 / -4
16-QAM	12	9.6	-90	15.0	22 / 30	20 / 26.5	-13 / -3	-15 / -7
32-QAM	15	12.1	-87	18.5	24 / 30	22 / 26.5	-12 / -3	-14 / -7
64-QAM	18	14.3	-84	20.5	29 / 30	26 / 26.5	-11 / -3	-12 / -7
128-QAM	21	17.1	-83	23.5	30 / 30	28 / 26.5	-9 / -3	-8 / -7
256-QAM	24	19.7	-81	26.0	33 / 30	31 / 26.5	-5 / -3	-7 / -7

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RAy11 Channel spacing 7 MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
QPSK	12	8.5	-95	8.5	15 / 23	12 / 19	-20 / 0	-22 / -4
16-QAM	24	17.2	-88	15.0	22 / 30	20 / 26.5	-18 / -3	-19 / -7
32-QAM	30	22.1	-85	18.5	24 / 37	22 / 33	-16 / -2	-18 / -6
64-QAM	36	29.7	-81	21.5	29 / 37	26 / 33	-14 / -2	-16 / -6
128-QAM	42	34.7	-78	25.0	32 / 37	30 / 33	-12 / -2	-14 / -6
256-QAM	49	39.7	-77	26.0	33 / 37	31 / 33	-10 / -2	-12 / -6

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RAy11 Channel spacing 14 MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
QPSK	24	19.9	-93	8.5	14 / 23	12 / 19	-21 / 0	-23 / -4
16-QAM	48	38.8	-86	15.0	20 / 30	18 / 26.5	-19 / -3	-21 / -7
32-QAM	60	49.1	-82	18.5	26 / 33	23 / 29	-17 / -5	-19 / -9
64-QAM	72	62.3	-79	21.5	28 / 37	26 / 33	-14 / -2	-17 / -6
128-QAM	84	73.6	-75	25.0	30 / 37	28 / 33	-12 / -2	-14 / -6
256-QAM	96	81.2	-72	28.0	33 / 37	31 / 33	-10 / -2	-12 / -6

RAY11 Channel spacing 28(30) MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	
QPSK	50	36.8	-91	7.5	12 / 23	10 / 19	-21 / 0	-23 / -4
16-QAM	100	80.9	-83	15.0	20 / 30	18 / 26.5	-18 / -3	-20 / -7
32-QAM	125	102.4	-79	18.5	24 / 33	22 / 29	-16 / -5	-19 / -9
64-QAM	150	129.8	-76	21.5	28 / 35	26 / 32	-12 / -5	-15 / -8
128QAM	175	155.5	-72	25.0	30 / 35	28 / 32	-9 / -5	-12 / -8
256-QAM	200	170.7	-70	26.5	33 / 35	31 / 32	-6 / -5	-9 / -8

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RAY11 Channel spacing 28(30) MHz; ACAP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	
QPSK	52	38.3	-89.5	7.5	12 / 23	10 / 19	-15 / 0	-17 / -4
16-QAM	104	84.1	-82.5	15.0	20 / 30	18 / 26.5	-12 / -3	-14 / -7
32-QAM	130	106.4	-78.5	18.5	24 / 37	22 / 33	-10 / 3	-13 / -1
64-QAM	156	135.0	-75.5	21.5	28 / 37	26 / 33	-6 / 3	-9 / -1
128QAM	182	161.7	-71.5	25.0	30 / 37	28 / 33	-3 / 3	-6 / -1
256-QAM	208	177.5	-69.5	26.5	33 / 41	31 / 38	0 / 10	-3 / 7

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RAy11 Channel spacing 40 MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
					1 dB	3 dB	1 dB	3 dB
			RSS	SNR	declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
QPSK.	68	50.1	-88	7.5	12 / 33	10 / 29	-22 / -4	-24 / -8
16-QAM	136	110.0	-81	15.0	19 / 33	17 / 29	-18 / -4	-21 / -8
32-QAM	170	139.2	-77	18.5	24 / 33	21 / 29	-16 / -4	-19 / -8
64-QAM	204	176.5	-74	21.5	27 / 33	25 / 39	-14 / -4	-16 / -8
128QAM	238	211.4	-70	25.0	30 / 37	28 / 33	-10 / -4	-12 / -8
256-QAM	272	232.1	-68	26.5	33 / 37	30 / 33	-8 / -4	-10 / -8

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RAy11 Channel spacing 56 MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
					1 dB	3 dB	1 dB	3 dB
			RSS	SNR	declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
QPSK	99	72.9	-87	7.5	12 / 23	10 / 19	-26 / 0	-28 / -4
16-QAM	198	160.2	-80	15.0	19 / 30	17 / 26.5	-19 / -3	-21 / -7
32-QAM	247.5	202.7	-76	18.5	24 / 33	22 / 29	-15 / -5	-17 / -9
64-QAM	297	256.9	-73	21.5	27 / 35	25 / 32	-14 / -5	-16 / -8
128QAM	346.5	303.7	-69	25.0	30 / 35	28 / 32	-10 / -5	-12 / -8
256-QAM	396	337.7	-67	26.5	33 / 35	30 / 32	-8 / -5	-10 / -8

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RAy11 Channel spacing 56-A MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
					1 dB	3 dB	1 dB	3 dB
			RSS	SNR	declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
QPSK	99	85.8	-85	10.0	13 / 23	11 / 19	-24 / 0	-26 / -4
16-QAM	198	169.9	-78	16.0	20 / 30	18 / 26.5	-18 / -3	-20 / -7
32-QAM	247.5	206.2	-74	19.0	25 / 33	23 / 29	-14 / -5	-15 / -9
64-QAM	297	268.1	-70	22.5	29 / 35	26 / 32	-9 / -5	-11 / -8
128QAM	346.5	309.0	-67	25.5	32 / 35	29 / 32	-8 / -5	-10 / -8
256-QAM	396	358.9	-64	27.5	35 / 35	32 / 32	-7 / -5	-8 / -8

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3.3. Jmenovité frekvence, duplex 490 MHz

RAY11 – LA , RAY11 – LB		Lower band, TX channel nominal frequencies Band 10.709 – 11.185 GHz, duplex frequency 490 MHz						
Channel size	7 MHz		14 MHz		28 MHz		56 MHz	
	Ch.No	f [MHz]	Ch.No	f [MHz]	Ch.No	f [MHz]	Ch.No	f [MHz]
RAY11 – LA	L1	10712.5	L1	10716.0				
	L2	10719.5			L1	10723		
	L3	10726.5	L2	10730.0				
	L4	10733.5					L1	10737
	L5	10740.5	L3	10744.0				
	L6	10747.5			L2	10751		
	L7	10754.5	L4	10758.0				
	L8	10761.5					L2	10765
	L9	10768.5	L5	10772.0				
	L10	10775.5			L3	10779		
	L11	10782.5	L6	10786.0				
	L12	10789.5					L3	10793
	L13	10796.5	L7	10800.0				
	L14	10803.5			L4	10807		
	L15	10810.5	L8	10814.0				
	L16	10817.5					L4	10821
	L17	10824.5	L9	10828.0				
	L18	10831.5			L5	10835		
	L19	10838.5	L10	10842.0				
	L20	10845.5					L5	10849
	L21	10852.5	L11	10856.0				
	L22	10859.5			L6	10863		
	L23	10866.5	L12	10870.0				
	L24	10873.5					L6	10877
	L25	10880.5	L13	10884.0				
	L26	10887.5			L7	10891		
	L27	10894.5	L14	10898.0				
	L28	10901.5					L7	10905
	L29	10908.5	L15	10912.0				
	L30	10915.5			L8	10919		
	L31	10922.5	L16	10926.0				
	L32	10929.5					L8	10933
	L33	10936.5	L17	10940.0				
	L34	10943.5			L9	10947		
	L35	10950.5	L18	10954.0				
	L36	10957.5						
RAY11 – LB	L37	10964.5	L19	10968.0				
	L38	10971.5			L10	10975		
	L39	10978.5	L20	10982.0				
	L40	10985.5					L10	10989
	L41	10992.5	L21	10996.0				
	L42	10999.5			L11	11003		
	L43	11006.5	L22	11010.0				
	L44	11013.5					L11	11017
	L45	11020.5	L23	11024.0				
	L46	11027.5			L12	11031		
	L47	11034.5	L24	11038.0				
	L48	11041.5					L12	11045
	L49	11048.5	L25	11052.0				
	L50	11055.5			L13	11059		
	L51	11062.5	L26	11066.0				
	L52	11069.5					L13	11073
	L53	11076.5	L27	11080.0				
	L54	11083.5			L14	11087		
	L55	11090.5	L28	11094.0				
	L56	11097.5					L14	11101
	L57	11104.5	L29	11108.0				
	L58	11111.5			L15	11115		
	L59	11118.5	L30	11122.0				
	L60	11125.5					L15	11129
	L61	11132.5	L31	11136.0				
	L62	11139.5			L16	11143		
	L63	11146.5	L32	11150.0				
	L64	11153.5					L16	11157
	L65	11160.5	L33	11164.0				
	L66	11167.5			L17	11171		
	L67	11174.5	L34	11178.0				
	L68	11181.5						

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RAy11 – UA , RAY11 – UB		Nominal Upper channel frequency Band 11.199 – 11.687 GHz, duplex frequency 490 MHz						
Channel size	7 MHz		14 MHz		28 MHz		56 MHz	
	Ch.No	f [MHz]	Ch.No	f [MHz]	Ch.No	f [MHz]	Ch.No	f [MHz]
RAY11 – UA	U1	11202.5	U1	11206.0				
	U2	11209.5			U1	11213		
	U3	11216.5	U2	11220.0				
	U4	11223.5					U1	11227
	U5	11230.5	U3	11234.0				
	U6	11237.5			U2	11241		
	U7	11244.5	U4	11248.0				
	U8	11251.5					U2	11255
	U9	11258.5	U5	11262.0				
	U10	11265.5			U3	11269		
	U11	11272.5	U6	11276.0				
	U12	11279.5					U3	11283
	U13	11286.5	U7	11290.0				
	U14	11293.5			U4	11297		
	U15	11300.5	U8	11304.0				
	U16	11307.5					U4	11311
	U17	11314.5	U9	11318.0				
	U18	11321.5			U5	11325		
	U19	11328.5	U10	11332.0				
	U20	11335.5					U5	11339
	U21	11342.5	U11	11346.0				
	U22	11349.5			U6	11353		
	U23	11356.5	U12	11360.0				
	U24	11363.5					U6	11367
	U25	11370.5	U13	11374.0				
	U26	11377.5			U7	11381		
	U27	11384.5	U14	11388.0				
	U28	11391.5					U7	11395
	U29	11398.5	U15	11402.0				
	U30	11405.5			U8	11409		
	U31	11412.5	U16	11416.0				
	U32	11419.5					U8	11423
	U33	11426.5	U17	11430.0				
	U34	11433.5			U9	11437		
	U35	11440.5	U18	11444.0				
	U36	11447.5						
RAY11 – UB	U37	11454.5	U19	11458.0				
	U38	11461.5			U10	11465		
	U39	11468.5	U20	11472.0				
	U40	11475.5					U10	11479
	U41	11482.5	U21	11486.0				
	U42	11489.5			U11	11493		
	U43	11496.5	U22	11500.0				
	U44	11503.5					U11	11507
	U45	11510.5	U23	11514.0				
	U46	11517.5			U12	11521		
	U47	11524.5	U24	11528.0				
	U48	11531.5					U12	11535
	U49	11538.5	U25	11542.0				
	U50	11545.5			U13	11549		
	U51	11552.5	U26	11556.0				
	U52	11559.5					U13	11563
	U53	11566.5	U27	11570.0				
	U54	11573.5			U14	11577		
	U55	11580.5	U28	11584.0				
	U56	11587.5					U14	11591
	U57	11594.5	U29	11598.0				
	U58	11601.5			U15	11605		
	U59	11608.5	U30	11612.0				
	U60	11615.5					U15	11619
	U61	11622.5	U31	11626.0				
	U62	11629.5			U16	11633		
	U63	11636.5	U32	11640.0				
	U64	11643.5					U16	11647
	U65	11650.5	U33	11654.0				
	U66	11657.5			U17	11661		
	U67	11664.5	U34	11668.0				
	U68	11671.5						

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3.4. Jmenovité frekvence, duplex 530 MHz

Channel size		Nominal Lower channel frequency Band 10.709 – 11.157 GHz, duplex frequency 530 MHz							
		7 MHz		14 MHz		28 MHz		56 MHz	
		Ch.No	f [MHz]	Ch.No	f [MHz]	Ch.No	f [MHz]	Ch.No	f [MHz]
RAY11 – LA	L1		10712.5	L1	10716.0				
	L2		10719.5			L1	10723		
	L3		10726.5	L2	10730.0				
	L4		10733.5					L1	10737
	L5		10740.5	L3	10744.0				
	L6		10747.5			L2	10751		
	L7		10754.5	L4	10758.0				
	L8		10761.5					L2	10765
	L9		10768.5	L5	10772.0				
	L10		10775.5			L3	10779		
	L11		10782.5	L6	10786.0				
	L12		10789.5					L3	10793
	L13		10796.5	L7	10800.0				
	L14		10803.5			L4	10807		
	L15		10810.5	L8	10814.0				
	L16		10817.5					L4	10821
	L17		10824.5	L9	10828.0				
	L18		10831.5			L5	10835		
	L19		10838.5	L10	10842.0				
	L20		10845.5					L5	10849
	L21		10852.5	L11	10856.0				
	L22		10859.5			L6	10863		
	L23		10866.5	L12	10870.0				
	L24		10873.5					L6	10877
	L25		10880.5	L13	10884.0				
	L26		10887.5			L7	10891		
	L27		10894.5	L14	10898.0				
	L28		10901.5						
RAY11 – LB	L37		10964.5	L19	10968.0				
	L38		10971.5			L10	10975		
	L39		10978.5	L20	10982.0				
	L40		10985.5					L10	10989
	L41		10992.5	L21	10996.0				
	L42		10999.5			L11	11003		
	L43		11006.5	L22	11010.0				
	L44		11013.5					L11	11017
	L45		11020.5	L23	11024.0				
	L46		11027.5			L12	11031		
	L47		11034.5	L24	11038.0				
	L48		11041.5					L12	11045
	L49		11048.5	L25	11052.0				
	L50		11055.5			L13	11059		
	L51		11062.5	L26	11066.0				
	L52		11069.5					L13	11073
	L53		11076.5	L27	11080.0				
	L54		11083.5			L14	11087		
	L55		11090.5	L28	11094.0				
	L56		11097.5					L14	11101
	L57		11104.5	L29	11108.0				
	L58		11111.5			L15	11115		
	L59		11118.5	L30	11122.0				
	L60		11125.5					L15	11129
	L61		11132.5	L31	11136.0				
	L62		11139.5			L16	11143		
	L63		11146.5	L32	11150.0				
	L64		11153.5						

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RAy11 – UA , RAY11 – UB		Nominal Upper channel frequency Band 11.239 – 11.687 GHz, duplex frequency 530 MHz						
Channel size	7 MHz		14 MHz		28 MHz		56 MHz	
	Ch.No	f [MHz]	Ch.No	f [MHz]	Ch.No	f [MHz]	Ch.No	f [MHz]
RAY11 – UA	U1	11242.5	U1	11246.0				
	U2	11249.5			U1	11253		
	U3	11256.5	U2	11260.0				
	U4	11263.5					U1	11267
	U5	11270.5	U3	11274.0				
	U6	11277.5			U2	11281		
	U7	11284.5	U4	11288.0				
	U8	11291.5					U2	11295
	U9	11298.5	U5	11302.0				
	U10	11305.5			U3	11309		
	U11	11312.5	U6	11316.0				
	U12	11319.5					U3	11323
	U13	11326.5	U7	11330.0				
	U14	11333.5			U4	11337		
	U15	11340.5	U8	11344.0				
	U16	11347.5					U4	11351
	U17	11354.5	U9	11358.0				
	U18	11361.5			U5	11365		
	U19	11368.5	U10	11372.0				
	U20	11375.5					U5	11379
	U21	11382.5	U11	11386.0				
	U22	11389.5			U6	11393		
	U23	11396.5	U12	11400.0				
	U24	11403.5					U6	11407
	U25	11410.5	U13	11414.0				
	U26	11417.5			U7	11421		
	U27	11424.5	U14	11428.0				
	U28	11431.5						

RAY11 – UB	U37	11494.5	U19	11498.0				
	U38	11501.5			U10	11505		
	U39	11508.5	U20	11512.0				
	U40	11515.5					U10	11519
	U41	11522.5	U21	11526.0				
	U42	11529.5			U11	11533		
	U43	11536.5	U22	11540.0				
	U44	11543.5					U11	11547
	U45	11550.5	U23	11554.0				
	U46	11557.5			U12	11561		
	U47	11564.5	U24	11568.0				
	U48	11571.5					U12	11575
	U49	11578.5	U25	11582.0				
	U50	11585.5			U13	11589		
	U51	11592.5	U26	11596.0				
	U52	11599.5					U13	11603
	U53	11606.5	U27	11610.0				
	U54	11613.5			U14	11617		
	U55	11620.5	U28	11624.0				
	U56	11627.5					U14	11631
	U57	11634.5	U29	11638.0				
	U58	11641.5			U15	11645		
	U59	11648.5	U30	11652.0				
	U60	11655.5					U15	11659
	U61	11662.5	U31	11666.0				
	U62	11669.5			U16	11673		
	U63	11676.5	U32	11680.0				
	U64	11683.5						

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4. RAY17

4.1. Modulace a přenosové rychlosti

RAY17		User data rate [Mbps]					
Modulation / CS	3.5 MHz	7 MHz	14 MHz	28 (30)	40 MHz	56 MHz	56-A MHz
	ACCP	ACCP	ACCP	ACCP	ACCP	ACCP	ACCP
QPSK	4.9	8.5	19.9	36.8	50.1	72.9	85.9
16-QAM	9.6	17.2	38.8	80.9	110.0	160.2	169.9
32-QAM	12.1	22.1	49.1	102.4	139.2	202.7	206.2
64-QAM	14.3	29.7	62.3	129.8	176.5	256.9	268.1
128-QAM		34.7	73.6	155.5	211.4	303.7	309.0
256-QAM			81.2	170.7	232.1	337.7	358.9

ver. 2.0

4.2. Rádiové parametry

RAY17		Channel spacing 3.5 MHz; ACCP operation						
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	
QPSK	6	4.9	-96	10.0	15 / 23	12 / 19	-14 / 0	-16 / -4
16-QAM	12	9.6	-89	15.5	21 / 30	18 / 26.5	-13 / -3	-15 / -7
32-QAM	15	12.1	-85	20.0	25 / 30	22 / 26.5	-12 / -3	-14 / -7
64-QAM	18	14.3	-82	23.5	26 / 30	23 / 26.5	-10 / -3	-12 / -7

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RAY17		Channel spacing 7 MHz; ACCP operation						
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	
QPSK	12	8.5	-94	8.5	15 / 23	12 / 19	-20 / 0	-22 / -4
16-QAM	24	17.2	-87	15.0	22 / 30	20 / 26.5	-18 / -3	-19 / -7
32-QAM	30	22.1	-84	18.5	24 / 37	22 / 33	-16 / -2	-18 / -6
64-QAM	36	29.7	-80	21.5	29 / 37	26 / 33	-14 / -2	-16 / -6
128-QAM	42	34.7	-77	25.0	32 / 37	30 / 33	-12 / -2	-14 / -6

ver. 2.0

RAy17 Channel spacing 14 MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
QPSK	24	19.9	-92	8.5	14 / 23	12 / 19	-21 / 0	-23 / -4
16-QAM	48	38.8	-85	15.0	20 / 30	18 / 26.5	-19 / -3	-21 / -7
32-QAM	60	49.1	-81	18.5	26 / 33	23 / 29	-17 / -5	-19 / -9
64-QAM	72	62.3	-78	21.5	28 / 37	26 / 33	-14 / -2	-17 / -6
128-QAM	84	73.6	-74	25.0	30 / 37	28 / 33	-12 / -2	-14 / -6
256-QAM	96	81.2	-72	28.0	33 / 37	31 / 33	-10 / -2	-12 / -6

ver. 2.0

RAy17 Channel spacing 28 MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
QPSK	50	36.8	-90	7.5	12 / 23	10 / 19	-21 / 0	-23 / -4
16-QAM	100	80.9	-83	15.0	20 / 30	18 / 26.5	-18 / -3	-20 / -7
32-QAM	125	102.4	-79	18.5	24 / 33	22 / 29	-16 / -5	-19 / -9
64-QAM	150	129.8	-76	21.5	28 / 35	26 / 32	-12 / -5	-15 / -8
128QAM	175	155.5	-72	25.0	30 / 35	28 / 32	-9 / -5	-12 / -8
256-QAM	200	170.7	-69	26.5	33 / 35	31 / 32	-6 / -5	-9 / -8

ver. 2.0

RAy17 Channel spacing 40 MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
QPSK	68	50.1	-88	7.5	12 / 33	10 / 29	-22 / -4	-24 / -8
16-QAM	136	110.0	-81	15.0	19 / 33	17 / 29	-18 / -4	-21 / -8
32-QAM	170	139.2	-77	18.5	24 / 33	21 / 29	-16 / -4	-19 / -8
64-QAM	204	176.5	-74	21.5	27 / 33	25 / 39	-14 / -4	-16 / -8
128QAM	238	211.4	-70	25.0	30 / 37	28 / 33	-10 / -4	-12 / -8
256-QAM	272	232.1	-68	26.5	33 / 37	30 / 33	-8 / -4	-10 / -8

RAY17 Channel spacing 56 MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
QPSK	99	72.9	-87	7.5	12 / 23	10 / 19	-24 / 0	-26 / -4
16-QAM	198	160.2	-80	15.0	19 / 30	17 / 26.5	-18 / -3	-21 / -7
32-QAM	247.5	202.7	-76	18.5	24 / 33	22 / 29	-16 / -5	-19 / -9
64-QAM	297	256.9	-73	21.5	27 / 35	25 / 32	-14 / -5	-16 / -8
128QAM	346.5	303.7	-69	25.0	30 / 35	28 / 32	-10 / -5	-12 / -8
256-QAM	396	337.7	-66	26.5	33 / 35	30 / 32	-8 / -5	-10 / -8

RAY17 Channel spacing 56-A MHz; ACCP operation								
Modulation	Raw Bit Rate	User Bit Rate	RSS / SNR for BER 10 ⁻⁶		Co-channel rejection		Adjacent channel Selectivity	
			RSS	SNR	1 dB	3 dB	1 dB	3 dB
					declared / limit	declared / limit	declared / limit	declared / limit
[-]	[Mbps]	[dBm]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
QPSK	99	85.8	-85	10.0	13 / 23	11 / 19	-24 / 0	-26 / -4
16-QAM	198	169.9	-78	16.0	20 / 30	18 / 26.5	-18 / -3	-20 / -7
32-QAM	247.5	206.2	-74	19.0	25 / 33	23 / 29	-14 / -5	-15 / -9
64-QAM	297	268.1	-70	22.5	29 / 35	26 / 32	-9 / -5	-11 / -8
128QAM	346.5	309.0	-67	25.5	32 / 35	29 / 32	-8 / -5	-10 / -8
256-QAM	396	358.9	-64	27.5	35 / 35	32 / 32	-7 / -5	-8 / -8

4.3. Jmenovité frekvence.

Nominal Lower channel frequency Band 17.1 – 17.3 GHz Channel size [MHz], Channel number, Frequency [MHz]																									
3.5 MHz		7 MHz		14 MHz		28 MHz		40 MHz		56 MHz															
No.	f [MHz]	No.	f [MHz]	No.	f [MHz]	No.	f [MHz]	No.	f [MHz]	No.	f [MHz]														
basic		basic		optional	basic		optional	basic		optional	basic														
L1	17103.5	L1	17103.5																						
L2	17107.0			L2	17107	L2	17107																		
L3	17110.5	L3	17110.5			L3	17110.5																		
L4	17114.0			L4	17114	L4	17114.0	L4	17114																
L5	17117.5	L5	17117.5			L5	17117.5			L5	17117.5														
L6	17121.0			L6	17121	L6	17121			L6	17121.0	L6	17121												
L7	17124.5	L7	17124.5			L7	17124.5			L7	17124.5														
L8	17128.0			L8	17128	L8	17128.0			L8	17128.0	L8	17128												
L9	17131.5	L9	17131.5			L9	17131.5			L9	17131.5		L9	17131.5											
L10	17135.0			10	17135	10	17135			10	17135.0		10	17135.0											
L11	17138.5	11	17138.5			11	17138.5			11	17138.5		11	17138.5											
L12	17142.0			12	17142			12	17142			12	17142.0		12	17142.0									
L13	17145.5	13	17145.5			13	17145.5			13	17145.5		13	17145.5		13	17145.5								
L14	17149.0			14	17149	14	17149			14	17149.0		14	17149.0		14	17149.0								
L15	17152.5	15	17152.5			15	17152.5			15	17152.5		15	17152.5		15	17152.5								
L16	17156.0			16	17156			16	17156.0			16	17156.0		16	17156.0		16	17156.0						
L17	17159.5	17	17159.5			17	17159.5			17	17159.5		17	17159.5		17	17159.5		17	17159.5					
L18	17163.0			18	17163	18	17163			18	17163.0	18	17163					18	17163.0		18	17163.0			
L19	17166.5	19	17166.5			19	17166.5			19	17166.5		19	17166.5		19	17166.5		19	17166.5		19	17166.5		
L20	17170.0			20	17170			20	17170.0	20	17170			20	17170.0			20	17170.0		20	17170.0		20	17170.0
L21	17173.5	21	17173.5			21	17173.5			21	17173.5			21	17173.5			21	17173.5		21	17173.5		21	17173.5
L22	17177.0			22	17177	22	17177			22	17177.0			22	17177.0			22	17177.0		22	17177.0		22	17177.0
L23	17180.5	23	17180.5			23	17180.5			23	17180.5			23	17180.5			23	17180.5		23	17180.5		23	17180.5
L24	17184.0			24	17184			24	17184.0			24	17184.0	24	17184			24	17184.0		24	17184.0		24	17184.0
L25	17187.5	25	17187.5			25	17187.5			25	17187.5			25	17187.5			25	17187.5		25	17187.5		25	17187.5
L26	17191.0			26	17191	26	17191			26	17191.0			26	17191.0			26	17191.0		26	17191.0		26	17191.0
L27	17194.5	27	17194.5			27	17194.5			27	17194.5			27	17194.5			27	17194.5		27	17194.5		27	17194.5
L28	17198.0			28	17198			28	17198.0	28	17198			28	17198.0			28	17198.0		28	17198.0		28	17198.0
L29	17201.5	29	17201.5			29	17201.5			29	17201.5			29	17201.5			29	17201.5		29	17201.5		29	17201.5
L30	17205.0			30	17205	30	17205			30	17205.0	30	17205					30	17205.0		30	17205.0		30	17205.0
L31	17208.5	31	17208.5			31	17208.5			31	17208.5			31	17208.5			31	17208.5		31	17208.5		31	17208.5
L32	17212.0			32	17212			32	17212.0			32	17212.0					32	17212.0		32	17212.0		32	17212.0
L33	17215.5	33	17215.5			33	17215.5			33	17215.5			33	17215.5			33	17215.5		33	17215.5		33	17215.5
L34	17219.0			34	17219	34	17219																		
L35	17222.5	35	17222.5			35	17222.5																		
L36	17226.0			36	17226			36	17226.0																
L37	17229.5	37	17229.5																						
L38	17233.0			38	17233																				

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RAY17 Nominal Upper channel frequency Band 17.1 – 17.3 GHz Channel size [MHz], Channel number, Frequency [MHz]															
3.5 MHz		7 MHz			14 MHz			28 MHz			40 MHz			56 MHz	
No.	f [MHz]	No.	f [MHz]	No.	f [MHz]	No.	f [MHz]	No.	f [MHz]	No.	f [MHz]	No.	f [MHz]	No.	f [MHz]
basic		basic		optional		basic		optional		basic		optional		basic	
U19	17166.5			19	17166.5										
U20	17170.0	20	17170												
U21	17173.5			21	17173.5			21	17173.5						
U22	17177.0	22	17177					22	17177.0						
U23	17180.5			23	17180.5	23	17180.5								
U24	17184.0	24	17184					24	17184.0	24	17184.0				
U25	17187.5			25	17187.5			25	17187.5	25	17187.5				
U26	17191.0	26	17191					26	17191.0	26	17191.0	26	17191.0		
U27	17194.5			27	17194.5	27	17194.5			27	17194.5	27	17194.5		
U28	17198.0	28	17198					28	17198.0	28	17198.0	28	17198.0		
U29	17201.5			29	17201.5			29	17201.5	29	17201.5	29	17201.5		
U30	17205.0	30	17205					30	17205.0	30	17205.0	30	17205.0		
U31	17208.5			31	17208.5	31	17208.5			31	17208.5	31	17208.5		
U32	17212.0	32	17212					32	17212.0	32	17212.0	32	17212.0		
U33	17215.5			33	17215.5			33	17215.5	33	17215.5	33	17215.5	33	17215.5
U34	17219.0	34	17219					34	17219.0	34	17219.0	34	17219.0	34	17219.0
U35	17222.5			35	17222.5	35	17222.5			35	17222.5	35	17222.5		35
U36	17226.0	36	17226					36	17226.0	36	17226.0	36	17226.0		36
U37	17229.5			37	17229.5			37	17229.5	37	17229.5	37	17229.5		37
U38	17233.0	38	17233					38	17233.0	38	17233.0	38	17233.0		38
U39	17236.5			39	17236.5	39	17236.5			39	17236.5	39	17236.5		39
U40	17240.0	40	17240					40	17240.0	40	17240.0	40	17240.0		40
U41	17243.5			41	17243.5			41	17243.5	41	17243.5	41	17243.5		41
U42	17247.0	42	17247					42	17247.0	42	17247.0	42	17247.0		42
U43	17250.5			43	17250.5	43	17250.5			43	17250.5	43	17250.5		43
U44	17254.0	44	17254					44	17254.0	44	17254.0	44	17254.0		44
U45	17257.5			45	17257.5			45	17257.5			45	17257.5		45
U46	17261.0	46	17261					46	17261.0	46	17261.0	46	17261.0		46
U47	17264.5			47	17264.5	47	17264.5			47	17264.5	47	17264.5		47
U48	17268.0	48	17268					48	17268.0	48	17268.0	48	17268.0		48
U49	17271.5			49	17271.5			49	17271.5	49	17271.5	49	17271.5	49	17271.5
U50	17275.0	50	17275					50	17275.0	50	17275.0	50	17275.0		
U51	17278.5			51	17278.5	51	17278.5			51	17278.5	51	17278.5		
U52	17282.0	52	17282					52	17282.0	52	17282.0				
U53	17285.5			53	17285.5			53	17285.5	53	17285.5				
U54	17289.0	54	17289					54	17289.0						
U55	17292.5			55	17292.5	55	17292.5								
U56	17296.0	56	17296												

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Příloha A. Přehled revizí

Revize 1.0

2013-05-13

První vydání