

PASSIVE AND ACTIVE RF COMPONENTS

RCD RADIOKOMUNIKACE



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CATALOGUE 2017/3



SUCCESSOR TO THE THRONE
OF TELEGRAFIA AND TESLA PARDUBICE
IN THE KINGDOM OF RADIOCOMMUNICATION

PROVIDER OF ITS OWN RADIO SOLUTION TO:

- ALL ROAD TUNNELS IN THE CZECH REPUBLIC
- ALL STATIONS OF PRAGUE METRO FOR EMERGENCY SERVICES AND MOBILE OPERATORS
- RADIO NETWORKS FOR SPECIAL FORCES OF THE CZECH POLICE
- DEVELOPMENT AND PRODUCTION OF CUSTOMIZED HIGH-FREQUENCY DEVICES
- LOCOMOTIVES IN TERRITORIES OF GERMANY, FRANCE AND THE BENELUX COUNTRIES

Company Profile

Name RCD Radiokomunikace spol. s r. o.
Address U Pošty 26, 533 52 Staré Hradiště
Region Pardubice, Czech Republic
Established 1993

Main Activities R&D of Radio Equipment and Solutions
Production and Turnkey Delivery
including Hotline Services 24 hours



Antennas of TETRAPOL Radio System



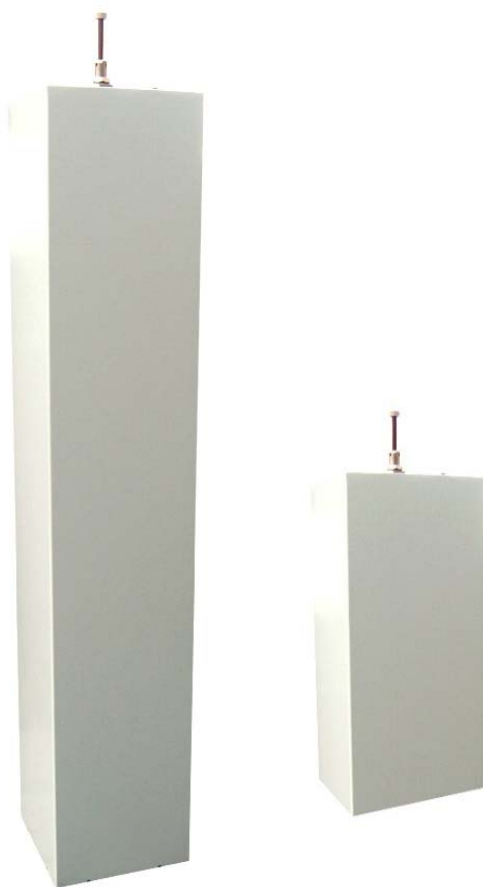
Road Tunnel Technology Assembling

RCD Radiokomunikace was established in 1993 and through its activities and results continues the long tradition of electronic production in Pardubice area.

RCD Radiokomunikace develops and produces customized high frequency solutions and equipment including antennas, filters, radio repeaters and radio accessories used especially by the Police and Fire Brigade working in emergencies.

RCD Radiokomunikace supplies turnkey radio solutions in underground areas, large buildings, road and railway tunnels and metros. The company is able to respond flexibly to special customer requirements on the 24-hours hotline base using components from its own development and production.

RCD Radiokomunikace is a holder of certificates: EN ISO 9001, EN ISO 14001, BS OHSAS 18001, ISO/IEC 27001. Company is also certified by National Security Authority of the Czech Republic for classification level secret.

DP 75 / 105
DP 100 / 105
DP 160 / 105
DP 300 / 105
DP 450 / 105
DP 900 / 105


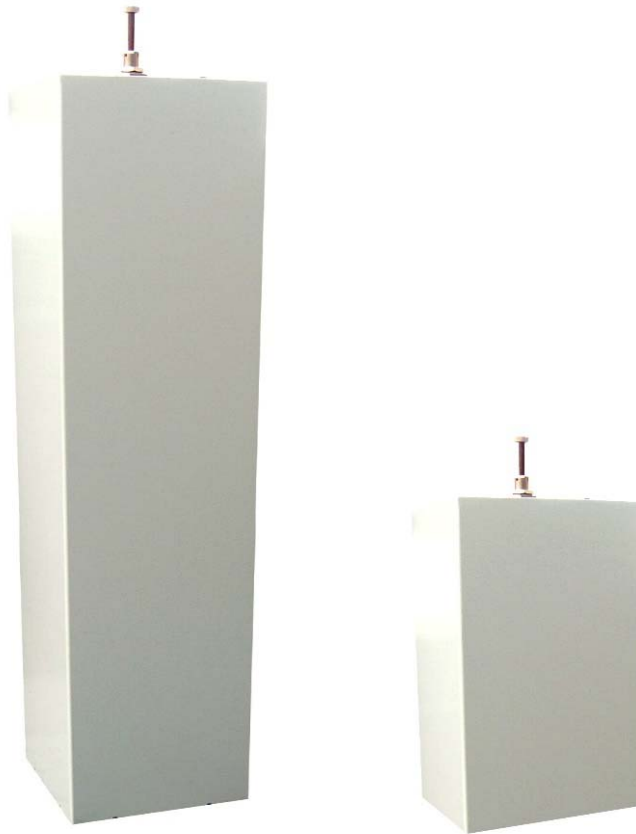
Description

DP xxx / 105 bandpass cavity filters are high selective quarter wave resonators. They are applicable to combiners or duplexers.

Bandpass filter is connected between antenna and transmitter or receiver for **suppression of interferences**.

Technical Specifications

Parameter	Value						Units
Type	DP 75 / 105	DP 100 / 105	DP 160 / 105	DP 300 / 105	DP 450 / 105	DP 900 / 105	
Frequency range	60 ÷ 90	70 ÷ 110	140 ÷ 180	300 ÷ 400	380 ÷ 500	780 ÷ 1000	MHz
Insertion loss	adjustable 0.5 ÷ 3						dB
Operating temperature	-40 ÷ +60						°C
Maximum input power / insertion loss	200 / 0.5 125 / 1 75 / 2						W / dB
Weight	6	5	3	2	2	1,5	kg
Dimensions w × h × d	105×1340×105	105×1170×105	105×610×105	105×320×105	105×270×105	105×200×105	mm
Connector type	N female						

DP 75 / 210
DP 100 / 210
DP 160 / 210
DP 300 / 210
DP 450 / 210


Description

DP xxx / 210 bandpass cavity filters are high selective quarter wave resonators. They are applicable to combiners or duplexers.

Bandpass filter is connected between antenna and transmitter or receiver for **suppression of interferences**.

Technical Specifications

Parameter	Value					Units
Type	DP 75 / 210	DP 100 / 210	DP 160 / 210	DP 300 / 210	DP 450 / 210	
Frequency range	60 ÷ 90	70 ÷ 110	140 ÷ 180	300 ÷ 400	380 ÷ 500	MHz
Insertion loss	adjustable 0.5 ÷ 3					dB
Operating temperature	-40 ÷ +60					°C
Maximum input power / insertion loss	500 / 0.5 350 / 1 200 / 2					W / dB
Weight	11	9	6	4	3	kg
Dimensions w × h × d	210×1925×210	210×1755×210	210×845×210	210×475×210	210×420×210	mm
Connector type	N female					



Electrical Specifications

Parameter	Value	Units
Operating frequency band	380 ÷ 470	MHz
Insertion loss	0.3	dB max
	0.2	dB typ
Rejected band	DC ÷ 170	MHz
Rejection	35	dB min
	40	dB typ
Return loss	18	dB min
	20	dB typ
Power handling per port	10	W CW
Impedance	50	Ω

Mechanical Specifications

Parameter	Value	Units
Outside finish	black matt, RAL 9005	
Dimensions	98 × 63 × 26	mm
Connectors type	2× N female	

Environmental Specifications

Parameter	Value	Units
Ingress protection	IP 65	
Operating temperature	-30 ÷ +75	°C



Description

XF 4308 bandpass filter in TETRAPOL RX band (380-385 MHz) consists of four helical resonators.

Electrical Specifications

Parameter	Value	Units
Frequency range	380 ÷ 385	MHz
Bandwidth	5	MHz
Insertion loss	3.0	dB max
	2.5	dB typ
Stopband attenuation	40	dB min
Input power	50	W
Impedance	50	Ω
VSWR	< 1.3	

Mechanical Specifications

Parameter	Value	Units
Dimensions w × h × d	95 × 70 × 55	mm
Weight	375	g
Connectors type	SMA female	

Environmental Specifications

Parameter	Value	Units
Ingress protection	IP 40	
Operating temperature	-30 ÷ +75	°C



Description

XF 4309 bandpass filter in TETRAPOL TX band (390-395 MHz) consists of four helical resonators.

Electrical Specifications

Parameter	Value	Units
Frequency range	390 ÷ 395	MHz
Bandwidth	5	MHz
Insertion loss	3.0	dB max
	2.5	dB typ
Stopband attenuation	40	dB min
Input power	50	W
Impedance	50	Ω
VSWR	< 1.3	

Mechanical Specifications

Parameter	Value	Units
Dimensions w × h × d	95 × 70 × 55	mm
Weight	375	g
Connectors type	SMA female	

Environmental Specifications

Parameter	Value	Units
Ingress protection	IP 40	
Operating temperature	-30 ÷ +75	°C



Description

XA 2012 splitter is designed for two-way symmetric splitting of radio signal or combining of two signals into common output. Splitter is applicable to coaxial cable distribution systems of radio networks inside large buildings, tunnels, metro, railway stations, airport terminals etc.

It works in broad frequency range. Input and outputs are adjusted for impedance 50 ohm.

Technical Specifications

Parameter	Value	Units
Frequency range	75 ÷ 870	MHz
Splitting ratio	1 : 2	
Split loss	3.5	dB
VSWR for "C" port	< 1.4	
Maximum input power	40	W
Isolation	20	dB
Impedance	50	Ω
Dimensions w × h × d	269 × 132 × 33	mm
Weight	0.55	kg
Connectors type	N female	

Description

XA 2001, XA 2002 and XA 2003 power symmetric splitters enable coupling of 2, 3 or 4 antennas.

Features

- creating of special antenna radiation pattern
- excellent matching
- high operating power
- good corrosion resistance and weather resistance
- easy mounting

Assembly:

Splitter can be mounted on vertical or horizontal support of diameter from 40 to 110 mm.

Mounting accessories:

Stainless steel strapping 11 mm × L *) cm; ordering number 177-944 including clip.

*) Depends on diameter of support.



XA 2001



XA 2002



XA 2003

Technical Specifications

Parameter	Value			Units
	XA 2001	XA 2002	XA 2003	
Type	XA 2001	XA 2002	XA 2003	
Frequency band	380 ÷ 400			MHz
Splitting ratio	1 : 2	1 : 3	1 : 4	
Maximum input power	1000	1000	500	W
Split loss	3.0 (+0.3 ÷ -0.1)	4.8 (+0.3 ÷ -0.1)	6.0 (+0.3 ÷ -0.1)	dB
VSWR	< 1.1			
Impedance	50			Ω
Material	chromated aluminium alloy, silvered brass			
Dimensions w × h × d	255 × 85 × 40	255 × 85 × 65	270 × 85 × 65	mm
Weight	0.9	1	1.2	kg
Connectors type	7/16 female			



Description

XA 2300 splitter is designed for branching or two-way asymmetric splitting of radio signal. It works in broad frequency range. IN and OUT ports can be interchanged.

Technical Specifications

Parameter		Value	Units
Frequency range		10 ÷ 1200	MHz
Insertion loss		0.4	dB max
Coupling	+15 ÷ +35 °C	40,0 (+1.0 ÷ -1.8)	dB
	-25 ÷ +55 °C	40,0 (+1.4 ÷ -2.2)	dB
VSWR		< 1.4	
Maximum input power	continual operation CW	80	W
Impedance		50	Ω
Dimensions w × h × d		92 × 80 × 30	mm
Weight		0.185	kg
Connectors type		N female	



Description

XA 2307 splitter is designed for two-way asymmetric splitting of radio signal. It works in broad frequency range. IN and OUT ports can be interchanged.

Technical Specifications

Parameter	Value	Units
Frequency range	0 ÷ 1860	MHz
Insertion loss	1.5 ± 0.4	dB
Coupling	11.2 ± 0.8	dB
VSWR	< 1.8	
Maximum input power	continual operation CW	20
	pulse operation PW	50
Impedance	50	Ω
Dimensions w × h × d	92 × 80 × 30	mm
Weight	0.2	kg
Connectors type	N female	



Description

XA 2309 splitter is designed for branching or two-way asymmetric splitting of radio signal. It works in broad frequency range. IN and OUT ports can be interchanged.

Technical Specifications

Parameter		Value	Units
Frequency range		0 ÷ 1860	MHz
Insertion loss		max. 0.35	dB
Coupling	+15 ÷ +35 °C	40,0 (+1.0 ÷ -1.8)	dB
	-25 ÷ +55 °C	40,0 (+1.4 ÷ -2.2)	dB
VSWR		< 1.4	
Maximum input power	continual operation CW	20	W
Impedance		50	Ω
Dimensions w × h × d		92 × 80 × 30	mm
Weight		0.185	kg
Connectors type	IN, OUT	N female, N male	
	CPL	BNC female	



Description

Two- or three-way symmetric splitter or combiner.

Splitter is applicable to coaxial cable distribution systems of radio networks inside large buildings, tunnels, metro, railway stations, airport terminals etc.

It works in broad frequency range. Input and outputs are adjusted for impedance of 50 Ω.

Technical Specifications

Parameter	Value		Units
Type	XF 1500	XF 1501	
Frequency range	380 ÷ 960		MHz
Splitting ratio	1 : 3	1 : 2	
Split loss	4.9	3.1	dB
VSWR	< 1.2		
Maximum input power	50		W
Impedance	50		Ω
Material	aluminium alloy, microwave substrate		
Dimensions w × h × d	118 × 231 × 45	118 × 219 × 45	mm
Weight	0.80	0.78	kg
Connectors type	N female		



Description

XA 2301 and XA 2302 power broadband directional couplers are designed for branching or asymmetric splitting of transmitted power.

The devices are applicable to coaxial cable distribution systems of radio networks inside large buildings, tunnels, metro, railway stations, airport terminals etc.

Technical Specifications

Parameter	Value		Units
	XA 2301	XA 2302	
Type	XA 2301	XA 2302	
Frequency range	380 ÷ 470 870 ÷ 960		MHz
Maximum power	400		W
Insertion loss	1	0.4	dB
Coupling	7 ± 1	10 ± 1	dB
VSWR	typ. < 1.4	typ. < 1.3	
Impedance	50		Ω
Dimensions w × h × d	190 × 57 × 40	183 × 57 × 40	mm
Weight	0.3	0.26	kg
Connectors type	N female		



Electrical Specifications

Parameter	Value		Units
Passband frequencies	140 ÷ 170	380 ÷ 425	MHz
Insertion loss in main/coupled line (including coupling loss)	3.5	4.0	dB max
Unbalance	± 0.3	± 0.5	dB max
Isolation	20	18	dB max
Return loss, all ports	18		dB min
	20		dB typ
Power handling	50		W CW
3 rd PIM at 2×43 dBm	-110		dBc
Impedance	50		Ω

Mechanical Specifications

Parameter	Value	Units
Outside finish	black matt, RAL 9005	
Dimensions	98 × 63 × 26	mm
Connectors type	3× N female	

Environmental Specifications

Parameter	Value	Units
Ingress protection	IP 65	
Operating temperature	-30 ÷ +75	°C



General Specifications

Type	XA 2316
Colour	silver
Material	aluminium
Connectors type	N female

Electrical Specifications

Parameter	Value	Units
Operating frequency band	130 ÷ 174	MHz
Average CW power	125	W
Impedance	50	Ω
Coupling	3.3	dB max
Isolation	20	dB min
Return loss	21	dB min
VSWR	< 1.2	
Phase balance	90 ± 3.5	°
Operating temperature	-20 ÷ +70	°C

Mechanical Specifications

Parameter	Value	Units
Weight	156	g
Width	62	mm
Height	77	mm
Depth	21	mm



General Specifications

Type	XA 2317
Colour	silver
Material	aluminium
Connectors type	N female

Electrical Specifications

Parameter	Value	Units
Operating frequency band	800 ÷ 1000	MHz
Average CW power	125	W
Impedance	50	Ω
Coupling	3.3	dB max
Isolation	26	dB min
Return loss	23	dB min
VSWR	< 1.15	
Phase balance	90 ± 2.0	°
Operating temperature	-20 ÷ +70	°C

Mechanical Specifications

Parameter	Value	Units
Weight	156	g
Width	62	mm
Height	77	mm
Depth	21	mm



General Specifications

Type	XA 2322
Colour	silver
Material	aluminium
Connectors type	N female

Electrical Specifications

Parameter	Value	Units
Operating frequency band	350 ÷ 520	MHz
Average CW power	125	W
Impedance	50	Ω
Coupling	3.2	dB max
Isolation	27	dB min
Return loss	25	dB min
VSWR	< 1.12	
Phase balance	90 ± 3.0	°
Operating temperature	-20 ÷ +70	°C

Mechanical Specifications

Parameter	Value	Units
Weight	156	g
Width	62	mm
Height	77	mm
Depth	21	mm



General Specifications

Type	XA 2325
Colour	silver
Material	aluminium
Connectors type	N female

Electrical Specifications

Parameter	Value	Units
Operating frequency band	150 ÷ 1000	MHz
Average CW power	125	W
Impedance	50	Ω
Coupling	4.5	dB max
Isolation	20	dB min
Return loss	21	dB min
VSWR	< 1.2	
Phase balance	90 ± 3	°
Operating temperature	-20 ÷ +70	°C

Mechanical Specifications

Parameter	Value	Units
Weight	418	g
Width	130	mm
Height	110	mm
Depth	21	mm



Description

XA 2323 outdoor 3×3 hybrid matrix is designed to combine 3 input to 3 output ports in the 698-2700 MHz range.

Electrical Specifications

Parameter		Value	Units
Input ports (I/P)		3	#
Output ports (O/P)		3	#
Operating frequency band		698 ÷ 2700	MHz
Insertion loss	any I/P to any O/P	5.6	dB max
VSWR	at any port	1.25 : 1	max
Isolation		26	dB min
Power handling, c.w.		300	W max
Passive intermodulation	3 rd order at 2×43 dBm	≤ -160	dBc
Impedance		50	Ω

Mechanical Specifications

Parameter		Value	Units
Colour		grey (powdering)	
Dimensions (excl. connectors)		302 × 138 × 39	mm max
Connectors type		DIN 7/16 female	

Environmental Specifications

Parameter		Value	Units
Ingress protection		IP 40	
Operating temperature		-45 ÷ +75	°C



Description

XA 2324 outdoor 4x4 hybrid matrix is designed to combine 4 input to 4 output ports in the 698-2700 MHz range.

Electrical Specifications

Parameter	Value	Units
Input ports (I/P)	4	#
Output ports (O/P)	4	#
Operating frequency band	698 ÷ 2700	MHz
Insertion loss	any I/P to any O/P	6.9
		dB max
VSWR	at any port	1.25 : 1
		max
Isolation		26
		dB min
Power handling, c.w.		300
		W max
Passive intermodulation	3 rd order at 2x43 dBm	≤ -160
		dBc
Impedance		50
		Ω

Mechanical Specifications

Colour	grey (powdering)	
Dimensions (excl. connectors)	220 × 104 × 61.5	mm
Connectors type	DIN 7/16 female	

Environmental Specifications

Ingress protection	IP 67	
Operating temperature	-45 ÷ +75	°C

Description

DH 80 / 4R duplexer is symmetric 4-cavity duplexer.

Heavy-duty mechanical construction allows use in both base radios and mobile radios.



Technical Specification

Parameter	Value				Units
Frequency range	65 ÷ 78				MHz
Duplex spacing	4 ÷ 13				MHz
Bandwidth	0.25	0.5	0.75	1.0	MHz
Insertion loss max.	1.0	1.0	1.0	1.0	dB
Isolation min.	60	55	45	40	dB
Maximum input power	25 (50)				W
Impedance	50				Ω
VSWR	< 1.3				
Weight	1.3 ÷ 1.4				kg
Dimensions w × h × d	202 × 145 × 38				mm
Connectors type	N, BNC, TNC – female *)				

*) According to customer's requirement.



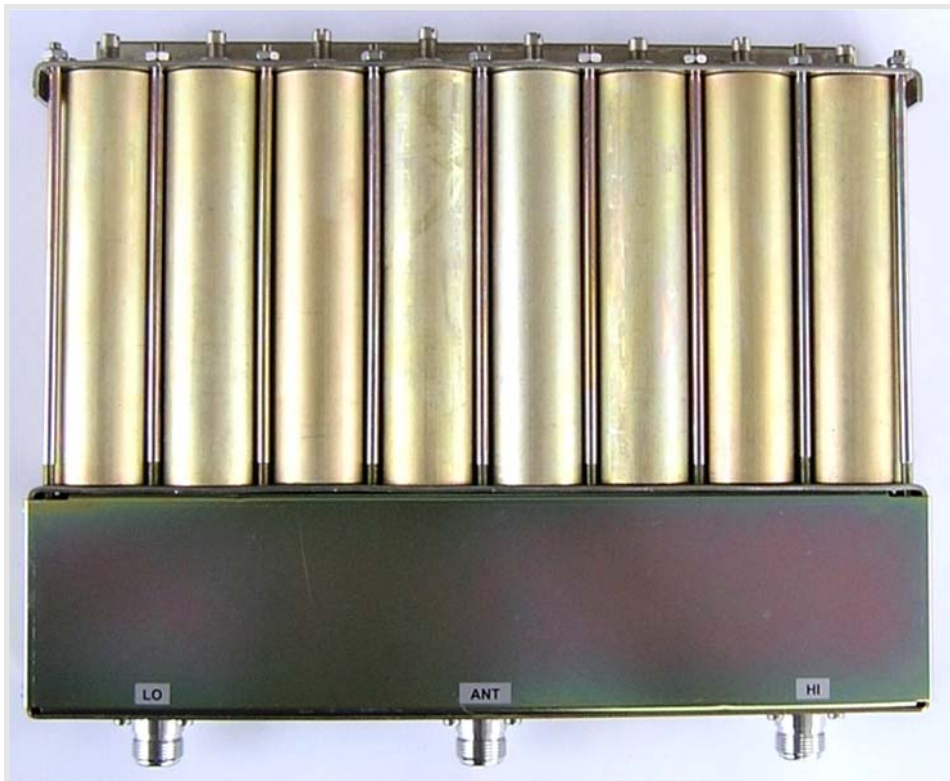
Description

DH 80 / 6R duplexer is symmetric 6-cavity duplexer. Heavy-duty mechanical construction allows use in both base radios and mobile radios.

Technical Specifications

Parameter	Value							Units
	60 ÷ 90				60 ÷ 85			
Frequency range	60 ÷ 90				60 ÷ 85			MHz
Duplex spacing	3				4 ÷ 6.5			MHz
Bandwidth	0.25	0.5	0.75	1	0.5	1	1.5	MHz
Insertion loss max.	1,5	1.5	1.7	1.9	1.3	1.5	1.7	dB
Isolation min.	75	70	65	60	70	65	60	dB
Maximum input power	25 (50)							W
Impedance	50							Ω
VSWR	< 1.35				< 1.3			
Weight	1.7 ÷ 1.8							kg
Dimensions w × h × d	210 × 203 × 38							mm
Connectors type	N, BNC, TNC – female *)							

*) According to customer's requirement.



Description

DH 80 / 8R duplexer is symmetric 8-cavity duplexer. Heavy-duty mechanical construction allows use in both base radios and mobile radios.

Technical Specifications

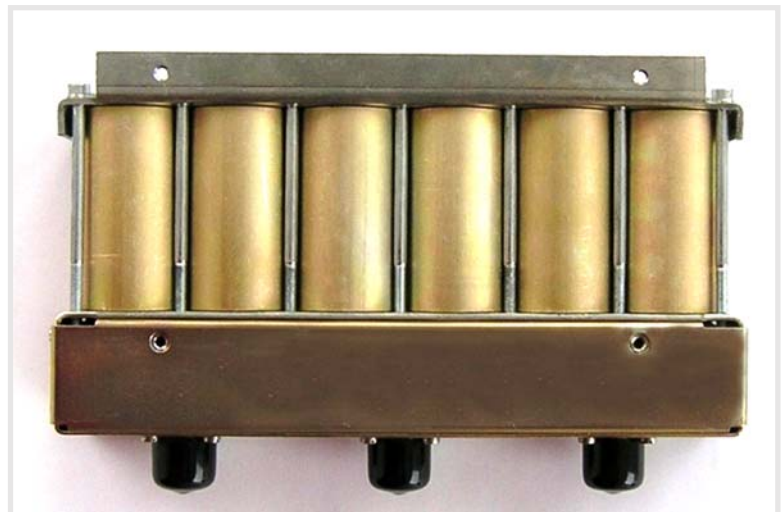
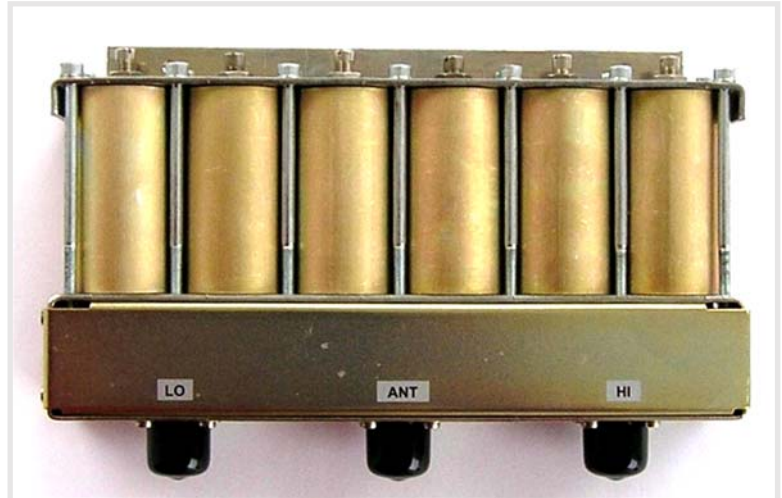
Parameter	Value							Units
Frequency range	70 ÷ 90				70 ÷ 85			MHz
Duplex spacing	3				4 ÷ 6.5			MHz
Bandwidth	0.25	0.5	0.75	1	0.5	1	1.5	MHz
Insertion loss max.	1.5	1.5	1.7	1.9	1.3	1.5	1.7	dB
Isolation min.	80	75	70	65	85	75	70	dB
Maximum input power	45 (-30 ÷ +50 °C), 35 (-30 ÷ +70 °C)							W
Impedance	50							Ω
VSWR	< 1.35				< 1.3			
Weight	1.7 ÷ 1.8							kg
Dimensions w × h × d	275 × 225 × 38							mm
Connectors type	N, BNC, TNC, (SMA) – female *)							

*) According to customer's requirement.

Description

DH 160 / 6R duplexer is symmetric 6-cavity duplexer.

Heavy-duty mechanical construction allows use in both base radios and mobile radios.



Technical Specifications

Parameter	Value			Units
Frequency range	140 ÷ 175			MHz
Duplex spacing	4.5 ÷ 6.5			MHz
Bandwidth	0.5	1	1.5	MHz
Insertion loss max.	1.3	1.5	1.7	dB
Isolation min.	70	65	60	dB
Maximum input power	25 (50)			W
Impedance	50			Ω
VSWR	< 1.3			
Weight	1.1 ÷ 1.2			kg
Dimensions w × h × d	210 × 130 × 38			mm
Connectors type	N, BNC, TNC – female *)			

*) According to customer's requirement.



Description

DH 160 / 8R duplexer is symmetric 8-cavity duplexer. Heavy-duty mechanical construction allows use in both base radios and mobile radios.

Technical Specifications

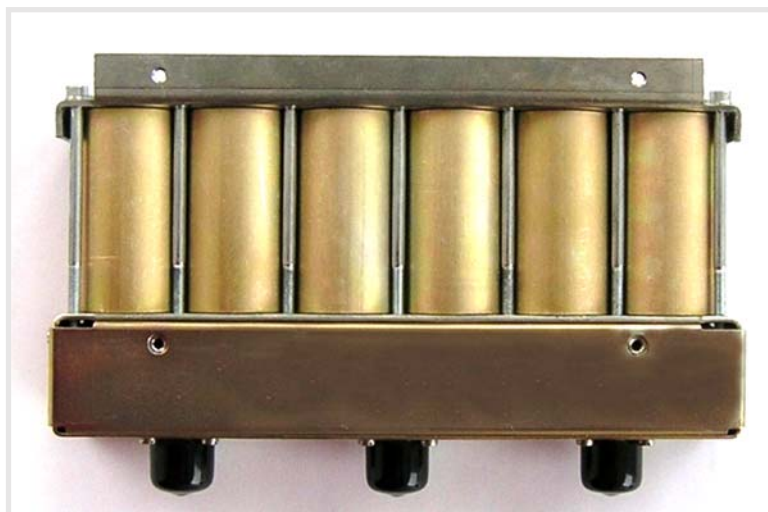
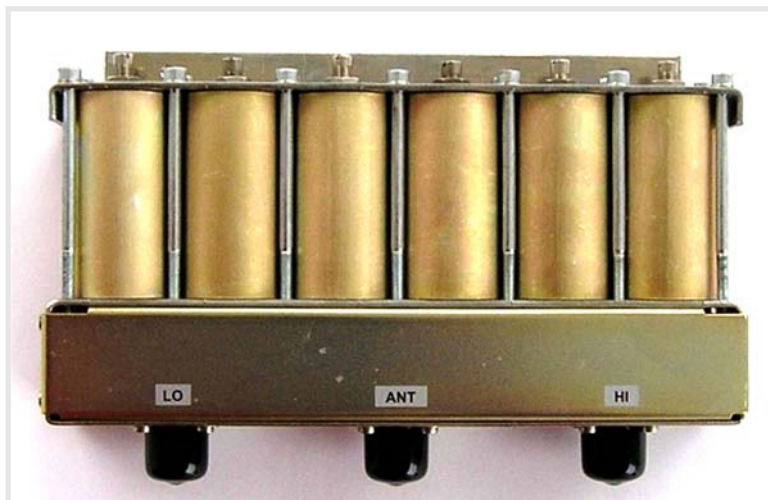
Parameter	Value			Units
Frequency range	140 ÷ 175			MHz
Duplex spacing	4.5 ÷ 6.5			MHz
Bandwidth	1	1.5	2	MHz
Insertion loss max.	1.4	1.5	1.7	dB
Isolation min.	75	70	65	dB
Maximum input power	25 (50)			W
Impedance	50			Ω
VSWR	< 1.3			
Weight	1.6 ÷ 1.8			kg
Dimensions w × h × d	275 × 130 × 38			mm
Connectors type	N, BNC, TNC – female *)			

*) According to customer's requirement.

Description

DH 300 / 6R duplexer is symmetric 6-cavity duplexer.

Heavy-duty mechanical construction allows use in both base radios and mobile radios.



Technical Specifications

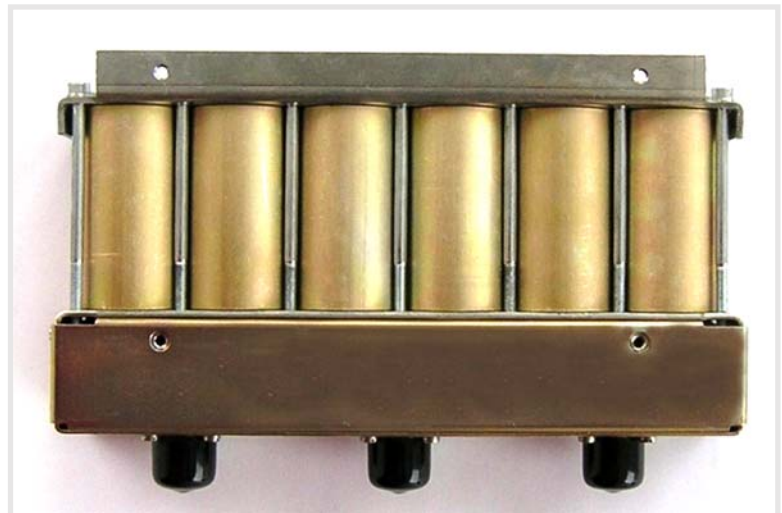
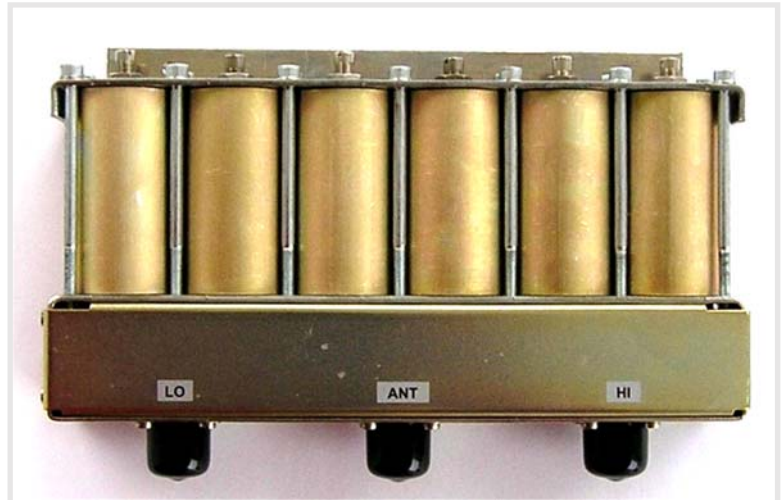
Parameter	Value			Units
Frequency range	300 ÷ 360			MHz
Duplex spacing	36			MHz
Bandwidth	1	2	5	MHz
Insertion loss max.	0.8		0.9	dB
Isolation min.	90		75	dB
Maximum input power	25 (50)			W
Impedance	50			Ω
VSWR	< 1.5			
Weight	1.1 ÷ 1.2			kg
Dimensions w × h × d	210 × 130 × 38			mm
Connectors type	N, BNC, TNC – female *)			

*) According to customer's requirement.

Description

DH 450 / 6R duplexer is symmetric 6-cavity duplexer.

Heavy-duty mechanical construction allows use in both base radios and mobile radios.



Technical Specifications

Parameter	Value				Units
Frequency range	400 ÷ 470				MHz
Duplex spacing	6.5 ÷ 8.5	8.5 ÷ 15			MHz
Bandwidth	0.5	0.5	1	2	MHz
Insertion loss max.	1.9	1.3	1.5	1.9	dB
Isolation min.	65	70	65	60	dB
Maximum input power	25 (50)				W
Impedance	50				Ω
VSWR	< 1.3				
Weight	1.1 ÷ 1.2				kg
Dimensions w × h × d	210 × 130 × 38				mm
Connectors type	N, BNC, TNC – female *)				

*) According to customer's requirement.



Description

DH 450 / 8R duplexer is symmetric 8-cavity duplexer. Heavy-duty mechanical construction allows use in both base radios and mobile radios.

Technical Specifications

Parameter	Value				Units
Frequency range	400 ÷ 470				MHz
Duplex spacing	6.5 ÷ 8.5	8.5 ÷ 15			MHz
Bandwidth	1	2	3	4	MHz
Insertion loss max.	1.9	1.3	1.5	1.9	dB
Isolation min.	75	75	65	60	dB
Maximum input power	45 (-30 ÷ +50 °C), 30 (-30 ÷ +70 °C)				W
Impedance	50				Ω
VSWR	< 1.3				
Weight	1.6 ÷ 1.7				kg
Dimensions w × h × d	275 × 162 × 38				mm
Connectors type	N, BNC, TNC, (SMA) – female *)				

*) According to customer's requirement.

Description

XF 4014 indoor duplexer is designed to combine one DL and one UL band of HLS service into the common port. The duplexer features with low insertion loss and high isolation.



Electrical Specifications

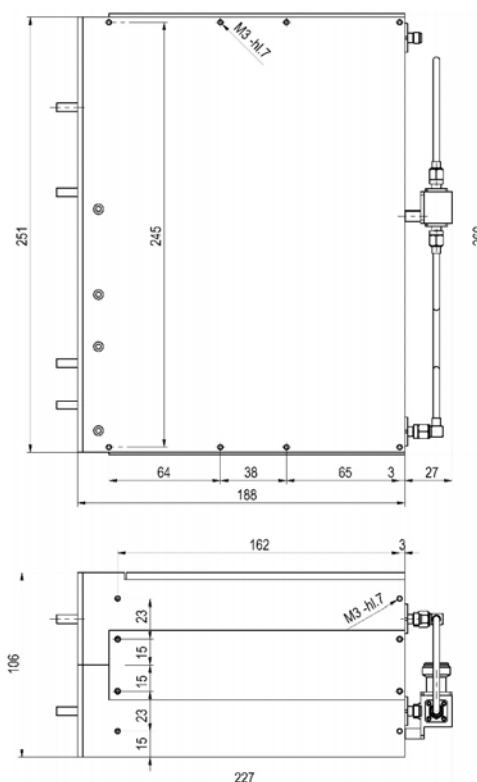
Parameter		Value		Units
Operating frequency band	Port 1, DL	146 ÷ 148		MHz
	Port 2, UL	151 ÷ 153.8		MHz
	COM	146 ÷ 148 & 151 ÷ 153.8		MHz
Insertion loss	Port 1 ↔ COM	2.2		dB max
	Port 2 ↔ COM	2.2		dB max
Return loss		21		dB min
Rejections Port 1 ↔ COM	158.06, 164.77	65		dB min
	171.525	35		dB min
	173.025	61		dB min
Rejections Port 2 ↔ COM	158.06	59		dB min
	<164.7; 173>	65		dB min
Isolation	Port 1 ↔ Port 2	65		dB min
Power handling, c.w.	per port	10		W max
PIM (5 th order)	@ 2× 30 dBm	-150		dBc max
Impedance		50		Ω

Mechanical Specifications

Parameter	Value	
Weight	5860 g	
Dimensions	260 × 227 × 106 mm	
Connectors type	Port 1, 2	SMA female
	COM	N female

Environmental Specifications

Parameter	Value	
Ingress protection	IP 40	
Temperature range	Operation	+5 ÷ +55 °C
	Transportation	-40 ÷ +85 °C
Humidity	95 %, non-condensing	





Description

XF 4039 duplexer consists of coaxial cavity resonators. Duplexer construction is designed so that separate filters can be retuned without mechanical interventions within frequency band 380 to 460 MHz. It is also possible to integrate power monitor to duplexer.

Technical Specifications

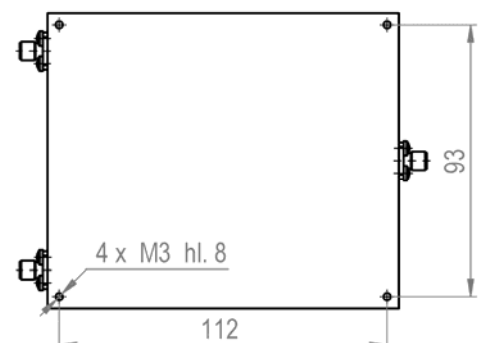
Parameter	Value	Units
Frequency range	380 ÷ 460	MHz
Bandwidth	5 (380 ÷ 385, 390 ÷ 395, 415 ÷ 420, ...)	MHz
Duplex spacing	10	MHz
Insertion loss	3.0	dB max
	2.4	dB typ
Passband ripple	1.5	dB max
	1.0	dB typ
Stopband attenuation	55	dB min
	60	dB typ
Isolation	73	dB min
Input power	50	W
Impedance	50	Ω
VSWR	< 1.25	

Mechanical Specifications

Weight	1168	g
Dimensions	120 × 101 × 60	mm
Connectors type	SMA female / N female (according to customer's requirement)	

Environmental Specifications

Ingress protection	IP 40	
Operating temperature	-30 ÷ +75	°C





Description

XF 4045A duplexer is a 6-resonators duplexer designed primarily for UIC railway communication. The duplexer is temperature compensated and operates at broad temperature range.

Technical Specifications

Parameter	Value	Units
Frequency range (LOW)	456.8 ÷ 458.8	MHz
Frequency range (HIGH)	466.8 ÷ 468.8	MHz
Insertion loss	1.5	dB
Stopband attenuation	70	dB
VSWR	< 1.35	
Maximum input power	22	W
Impedance	50	Ω
Operating temperature	-25 ÷ +75	$^{\circ}\text{C}$
Storage temperature	-40 ÷ +75	$^{\circ}\text{C}$
Dimensions w × h × d	154 × 68 × 27	mm
Weight	0.4	kg
Connectors type	SMA female	

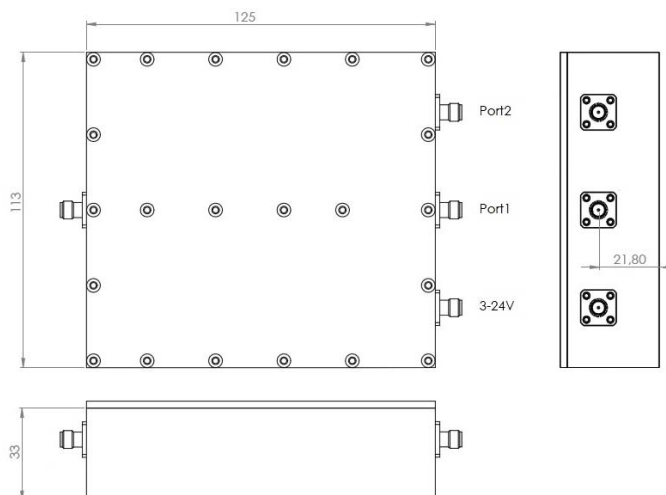
Test Specifications

Produced according the Standard	EN 50 155
Shock and vibration tests according the Standard	EN 61 373



Features

- Excellent temperature stability
- Optionally cross switching or RX/TX ports, 3.3÷24 V operate voltage
- Guaranteed less than -1.5 dB insertion loss with switches in wide temperature range
- Guaranteed more than 70 dB stopband isolation without switches
- Guaranteed more than 65 dB stopband isolation with switches



Electrical Specifications

Characteristic	Conditions	Specified			Units
		Min.	Typ.	Max.	
Frequency range Rx	Port F1/F2 or Port F2/F1	457		459	MHz
Frequency range Tx	Port F2/F1 or Port F1/F2	467		469	MHz
Insertion loss COM – F1/F2			1.3	1.5	dB
Insertion loss COM – F2/F1			1.3	1.5	dB
Passband ripple in Rx band			0.5	0.7	dB
Passband ripple in Tx band			0.5	0.7	dB
Stopband isolation		65	70		dB
VSWR	All ports	1.30	1.23		
Switching voltage	From PortF1/F2 / Port F2/F1 to Port F2/F1 / Port F1/F2		3.3	24	V
Current consumption			30	50	mA

Mechanical Specifications

Dimensions		125 x 113 x 33	mm
Connectors type	TX, RX	SMA female	
	COM	SMA female	

Environmental Specifications

Ingress protection	IP 40	
Operating temperature	-40 ÷ +80	°C



Description

XF4051 duplexer is designed to combine TETRAPOL TX and RX bands into the common port.

Electrical Specifications

Parameter		Value		Units
Operating frequency band	Ports	TX	RX	
	Bands	390 ÷ 395	380 ÷ 385	MHz
	COM	380 ÷ 385 & 390 ÷ 395		MHz
Insertion loss	TX → COM	1.5		dB max
	COM → RX		1.5	dB max
Insertion loss variation (p-p)		± 0.5		dB max
Return loss	At any port	15		dB min
Isolation	TX ↔ RX	60	60	dB min
Rejection in	DC÷330 MHz & 445÷1000 MHz	TX ↔ COM		80
	DC÷320 MHz & 430÷1000 MHz	COM ↔ RX		
Power handling, c.w.	per TX port	20	1	W max
Impedance		50		Ω

Mechanical Specifications

Dimensions		185 × 175 × 75	mm
Connectors type	TX, RX	N female	
	COM	N female	

Environmental Specifications

Ingress protection		IP 40	
Temperature range	Operation	-20 ÷ +70	°C
	Transportation	-40 ÷ +85	°C
Humidity		95 %, non-condensing	



Electrical Specifications

Parameter	Value		Units
Passband frequencies	140 ÷ 170	380 ÷ 425	MHz
Insertion loss	0.3	0.5	dB max
	0.15	0.3	dB typ
Ripple p-p	0.15	0.2	dB max
Other band rejection	40	40	dB min
	45	45	dB typ
Power handling per port	50		W CW
3 rd PIM at 2×43 dBm	-120		dBc typ
Impedance	50		Ω

Mechanical Specifications

Parameter	Value	Units
Outside finish	black matt, RAL 9005	
Dimensions	120.5 × 118 × 26	mm
Connectors type	3× N female	

Environmental Specifications

Parameter	Value	Units
Ingress protection	IP 65	
Operating temperature	-30 ÷ +75	°C



Description

XF 4217 indoor triplexer is designed to combine LTE800 & EGSM900, GSM1800 and UMTS2100 bands into the common port.

Electrical Specifications

Parameter		Value			Units
Operating frequency band	Ports	1	2	3	
	Bands	790 – 960	1710 – 1885	1920 – 2170	MHz
	COM	790 – 960 & 1710 – 1885 & 1920 – 2170			MHz
Insertion loss	any Port to COM	0.5			dB max
VSWR	any Port	1.3 : 1			max
Isolation	Port i to Port j, i=1,2,3, i≠j	65			dB min
Power handling	c.w.	100			W max
	peak	1000			W max
Passive intermodulation	at 2x 43 dBm	-150 ¹⁾			dBc max
Impedance		50			Ohm

Note:

1) PIM of the 5th order is ≤ -160 dBc

Mechanical Specifications

Parameter	Value	Units
Weight	1.6	kg
Dimensions (excl. connectors)	192 × 162 × 48	mm
Outside finish	black paint	
Connectors type	DIN 7/16 female	
Connector positions	Ports 1, 2 & 3 in the 192×48 mm face, COM in the opposite face	

Environmental Specifications

Parameter	Value	Units
Ingress protection	IP 40	
Operating temperature	-25 ÷ +65	°C

Description

BF 108 combiner is designed to combine LTE800 & EGSM900, GSM1800, UMTS2100 and LTE2600 bands of three operators to three output ports. Equipped with 4.3-10 connectors, it features with low insertion loss, high isolation and low PIM interference.



Electrical Specifications

Parameter	Value				Units	
Number of input ports (I/P)	12				#	
Marking	Operator 1	#1 698-960	#1 1710-1880	#1 1920-2170	#1 2500-2690	
	Operator 2	#2 698-960	#2 1710-1880	#2 1920-2170	#2 2500-2690	
	Operator 3	#3 698-960	#3 1710-1880	#3 1920-2170	#3 2500-2690	
Operating frequency bands	698 – 960	1710 – 1880	1920 – 2170	2500 – 2690	MHz	
Number of output ports (COM)	3				#	
Marking	OUT #1	OUT #2	OUT #3			
Operating frequency bands	698 – 960 & 1710 – 1880 & 1920 – 2170 & 2500 – 2690				MHz	
Insertion loss	any I/P to any COM	6.5			dB max	
Return loss	at any port	14			dB min	
Isolation	between any two I/P in different bands	65			dB min	
	between any two I/P in the same band	30			dB min	
Power handling	per I/P	100 ¹⁾			W c.w. max	
	aggregate	300			W c.w. max	
Passive intermodulation	3 rd order with 2x 43 dBm	-150 ²⁾			dBc max	
Impedance	50				Ohm	

Notes:

- 1) Operating band 790-960 MHz is composed of 791-862 MHz and 880-960 MHz sub-bands. The corresponding ports can operate higher power, when aggregate operating power per operator does not exceed 300 Watts.
- 2) When a particular operator sub-band is narrower than half of TX to RX channel spacing than PIM products of the 3rd order can be avoided. In such a case PIM < -160 dBc at the respected operator input port.

Mechanical Specifications

Parameter	Value
Connectors type	4.3-10 female
Dimensions	19", 3 HU
Weight	15.1 kg

Environmental Specifications

Operating temperature	-25 ÷ +65 °C
Ingress protection	IP 40



Technical Specifications

Parameter	Value	Units
Frequency range	DC ÷ 3	GHz
VSWR	< 1.30	
Attenuation	1 GHz: 30 ± 1	dB
Maximum power	20	W
Impedance	50	Ω
Dimensions	Size with connectors	96 mm
	Size without connectors	51 mm
	Diameter	∅ 50 mm
Weight	250	g
Connectors type	N male / N female	

XA 3203

XA 3204

XA 3205



Description

High-frequency **passive attenuator** with frequency-dependent attenuation and low value of 3rd passive intermodulation for frequency band 800 to 2100 MHz. Attenuator is suitable for decrease in power in antenna feeder and for PIM optimization.

General Specifications

Type	XA 3203	XA 3204	XA 3205	
Colour		black		
Material		aluminium		
Connectors type		N female / N female		

Technical Specifications

Parameter	Value			Units	
Frequency range	800 ÷ 2100			MHz	
Attenuation	800 MHz band	2.9	5.9	8.9	dB
	900 MHz band	3.1	6.3	9.4	dB
	2100 MHz band	5.0	9.9	14.9	dB
3 rd PIM	-140 (2× +43 dBm), typ. -145 (2× +43 dBm)			dBc	
Maximum power	10			W	
Impedance	50			Ω	
VSWR	< 1.1				
Ingress protection	IP 20				

Mechanical Specifications

Parameter	Value			Units
Weight	230	350	470	g
Dimensions w × h × d	114 × 64 × 26			mm

XL 3001
XL 3002
XL 3004
XL 3005
XL 3006


XL 3001



XL 3004



XL 3006

Technical Specifications

Parameter	Value					Units
Type	XL 3001	XL 3002	XL 3004	XL 3005	XL 3006	
Frequency range	DC ÷ 4				DC ÷ 1	GHz
VSWR	1 GHz: < 1.05 2 GHz: < 1.10 3 GHz: < 1.30 4 GHz: < 1.40				1 GHz: < 1.10	
Maximum power	20		10		2	W
Impedance	50					Ω
Material	aluminium, stainless steel					
Size with connector	70	62	65	57	39	mm
Size without connector	43	43	38	38	–	mm
Diameter	∅ 50	∅ 50	∅ 40	∅ 40	∅ 22	mm
Weight	230		125		35	g
Connector type	N male	N female	N male	N female	N male	



General Specifications

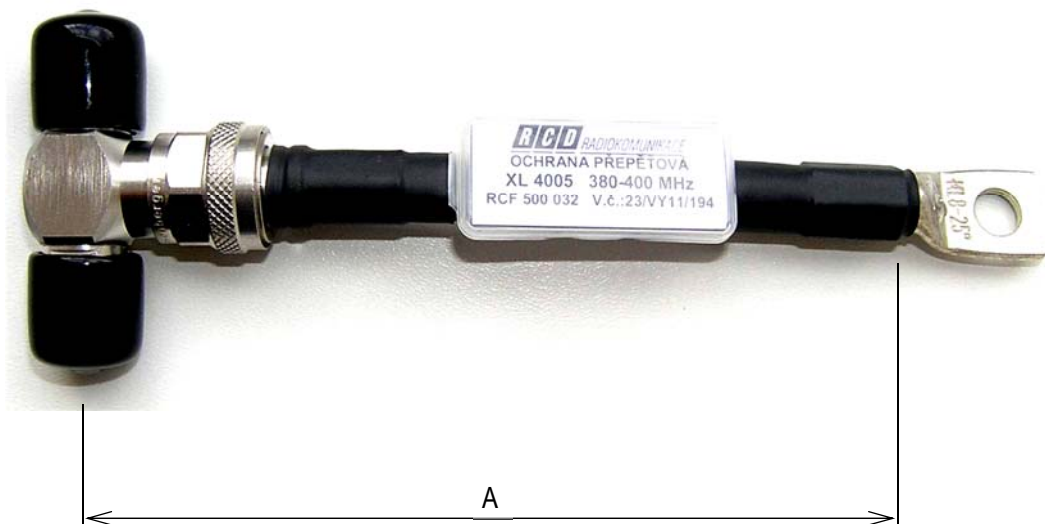
Type	XL 3007
Device type	termination load
Colour	black
Material	aluminium, stainless steel
Connector type	7/16 female

Technical Specifications

Parameter	Value	Units
Frequency band	698 ÷ 2700	MHz
3 rd PIM	-160 (2× +43 dBm)	dBc
Maximum power	10	W
Impedance	50	Ω
VSWR	< 1.3	
Ingress protection	IP 20	

Mechanical Specifications

Parameter	Value	Units
Weight	780	g
Length	122	mm
Diameter	∅ 60	mm



Technical Specifications

Parameter	Value	Units
Frequency band	380 ÷ 400	MHz
Impedance	50	Ω
Size "A"	$\lambda/4 (f_0)$	
VSWR	bandwidth 6.3 % from center frequency f_0	≤ 1.05
	bandwidth 12 % from center frequency f_0	≤ 1.10
	bandwidth 18 % from center frequency f_0	≤ 1.15
Maximum insertion loss	0.15	dB
Nominal current	50	kA
Connectors type	N female	

f_0 – center frequency of band

Note:

Surge protection must be located as close to the device.

Surge protection must be grounded in accordance with applicable standards.

Description

The detector provides control of the forward and reflected power ratio. If VSWR exceeds 2.5:1, the alarm occurs. For proper operation, it is important to keep correct direction of the detector connection between the radio (RF IN connector) and the antenna (RF OUT connector).



Technical Specifications

Parameter	Value	Units
Operating frequency band	119 – 136	MHz
Insertion loss	0.2	dB max
Return loss	21	dB min
Power handling, c.w.	43	dBm max
Impedance	50	Ω
Power supply	12	V DC
Dimensions	107 × 60 × 70	mm
Connectors	RF IN / OUT	N female / N female
	power supply, alarm output	Binder 4 pin

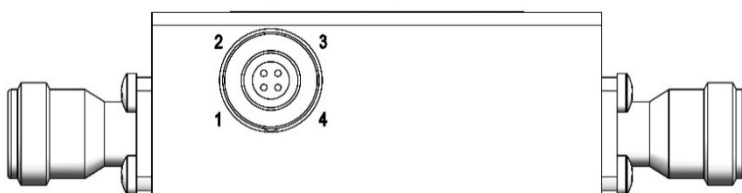
Typical Parameters valid for frequency band 119–136 MHz

Parameter	Value	Units
Functional range of RF levels	0.5 – 30 *)	W
Insertion loss	0.05	dB
Return loss	30	dB
Parameters of alarm output	open collector	
	max. voltage	32 V
	max. current	10 mA
	VSWR OK	log. 1
	VSWR FAIL	log. 0
Fail VSWR alarm level	VSWR \geq 2.5	
Power consumption at 12 V	25 – 30	mA

Note:

*) Alarm output is not working for the input power below 0.5 W.
Input power over 30 W is not enabled for a given configuration.

Binder Connector Pin Description



- Pin 1 +12 V
- Pin 2 GND
- Pin 3 alarm output (open collector)
- Pin 4 unconnected



Electrical Specifications

Parameter	Value	Units	
Frequency range	100 ÷ 1500	MHz	
Gain (at 400 MHz)	20	dB	
Noise figure	< 1.8	dB	
Impedance IN/OUT	50	Ω	
Output power at 1 dB compression	+17.5	dBm	
Output IP3	+20	dBm	
Power supply	DC voltage	12	V
	DC current	35	mA

Mechanical Specifications

Parameter	Value	Units
Dimensions (without connectors)	39 × 30 × 12	mm
Connectors type	SMA female	

Environmental Specifications

Parameter	Value	Units
Operating temperature	-20 ÷ +55	°C

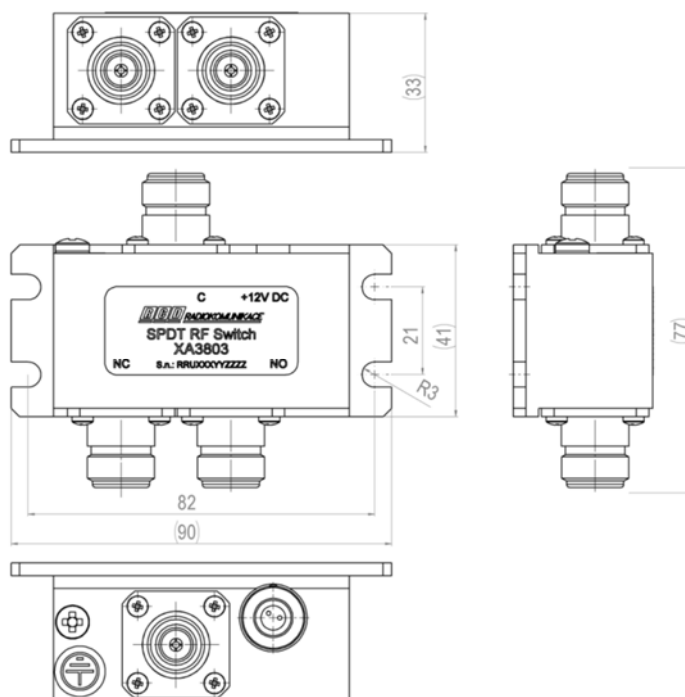


Electrical Specifications

Parameter	Value	Units
Operating frequency range	10 ÷ 500	MHz
Transmission loss	0.2	dB max
	0.1	dB typ
Maximum carried power	30	W max
Isolation	75	dB min
VSWR	< 1.1	
Impedance	Input ON	50
	Input OFF	open
Control	12 / 15	V DC / mA
Standards	according DIN EN 50155	

Mechanical Specifications

Parameter	Value
Dimensions	90 × 77 × 33 mm
Connectors type	N female
Switch control connector	Binder female socket, ordering number 09-0404-00-02 (Pin1: GND, Pin2: +12V)



Environmental Specifications

Parameter	Value
Ingress protection	IP 54
Operating temperature	-30 ÷ +75 °C



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