



HARTWIG

RF TECHNOLOGY

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RF - Modules for Communication and Research covering KHz ---> GHz

Preamplifiers, LNA, Broadband Amplifiers, EMC – Probe - Amplifiers

Typ	Frequency Range	Gain dB	Nf (dB)	Ub/Volt	Ib/mA	Size w/o Connector mm, extra Informations	RF - Connector	price
LNA 2	140 – 150 MHz	Typ. 20	0,7	12 - 15	80	55x74x30	N - female	110 €
LNA 2 / R	140 – 150 MHz Relay	Typ. 20	0,8	12 - 15	<200	55x74x30 tested with 400 W wether proof	N - female	135 €
LNA 70 SMA	432 – 440 MHz	Typ. 15	0,9	12 - 15	80	55x74x30	SMA - female	on Request
LNA 70 N	432 - 440 MHz	Typ. 15	0,9	12 - 15	80	55x74x30	N - female	„
LNA 23 / N	1250 – 1300 MHz	Typ. 15	0,7	12 - 15	60	55x55x30	N - female	„
								„
LNA 13 / N	2320 – 2400 MHz	15	0,7	12 - 15	60	55x55x30	N - female	. „
LNA 9 / SMA	3400 MHz	16	<0,9	12 - 15	20	55x55x30	SMA - female	114 €
LNA 6 / SMA	5760 MHz	13	<1,0	12 - 15	20	55x55x30	SMA - female	114 €
LNA 3 / SMA	10368 MHz	13	0,9	12 - 15	20	37x55x30	SMA - female	on request
EMC 1 - Stage	5 KHz - > 500 MHz	20	3-4	12 - 15	50	37x55x30 ideal as preamp for short wave	SMA - female	59 €
EMC 2 - Stage	5 KHz - > 500 MHz	40	3-4	12 - 15	70	37x55x30	SMA - female	72 €
Broad Band	50 – 2000 MHz	20	0,5 - 3	12 - 15	80	„ with PGA - 103+	SMA - female	63 €
Broad Band	50 – 2000 MHz	20	0,5 - 3	12 - 15	80	85x60x95 „ wether proof housing	N - female	on request

Filter with Helical, Coils or Stripline

Type	Frequency Range	Loss dB	Bauart	Size w/o Connector mm	RF - Connector	Price
Bandpass Filter	140 – 150 MHz		Neosid 2 x adjustable with variable C max. 200 mW	55x37x30	SMA - female	40 €
„	140 – 150 MHz		Neosid 3 x adjustable with variable C max. 200 mW	„	SMA - female	46 €
„	430 – 440 MHz		Toko 2 x Helical tunable ~ 10 MHz max. 200 mW	„	SMA - female	40 €
„	1200 – 1300 MHz		Toko 2 x Helix tunable max. 200 mW	„	SMA - female	42 €
„	2300 – 2400 MHz		Neosid 2 x Helix tunable 100 MHz max. 200 mW	„	SMA - female	42 €
„	5,7 GHz	Datasheet	Tuned to HamRadio section 5760 MHz > 20 Watt ?!	Industrial product, surplus	SMA - female	42 €

Mixer passiv

Frequency Range	Loss dB	Ub/Volt	Ib/mA	Size w/o Connector mm	RF - Connector	Price
DC – 500 7 dBm Lo ADE				37x55x30	SMA - female	44 €
1,5 – 4,5 GHz 13 dBm Lo HMC				„	„	50 €
4,5 – 9 GHz 13 dBm Lo HMC				„	„	50 €
5,0 – 12 GHz 13 dBm Lo HMC				„	„	50 €

Frequency Multiplier

Type	Frequency Range	Loss dB	Size w/o Connector mm	RF - Connector	Price
HMC			55x37x30	SMA - female	On request

Switch, VCO and ATV – Mini TX

Type	Frequency Range	Loss dB	Ub/Volt	Ib / mA	Size w/o Connector mm	RF - Connector	Price
HMC 6-2W	DC – 6 GHz	<1,5	12		37x55x30	SMA - female	59 €
Type	Frequency Range	Level	12				
VCO 2,7 or ATV-TX	2,7 – 4,6 GHz / or FBAS Modulat.	10 dBm	12		37x55x30	SMA - female	50 € / 59 €
VCO 4,7 or ATV-TX	4,7 – 5,9 GHz / or FBAS Modulat.	10 dBm	12		37x55x30	SMA - female	50 € / 59 €

Power Amplifier

Type	Frequency Range	P 1	P 2 Power	Ub / Volt	Ib / mA	Size w/o Connector	Price
EMC	0,01 KHz-1300 MHz		1 Watt	12		37x74x30 mm	93 €
70 cm FM	430 – 440 MHz	400 mW	14 – 15 W FM only!	12	„special offer with heat sink“	55x148x30 mm	140 €
S - Band	3,4 – 3,6 GHz						
C - Band	5,6 – 5,8 GHz	100 mW	15 Watt Saturation	13,5	Milled Alu - Housing	165x83x28 mm	on request
	5,6 - 5,8 GHz	250 mW	> 30 Watt Saturation	13,5	„	„	on request
		~300 mW	> 50 Watt Saturation	13,5	„	„	on request
X - Band	10,2 – 10,5 GHz						

Amplifiers for other Frequency Ranges, or Amplifiers for EMV - Measurement and higher Power Levels on Request

BIAS – T, Splitter and Aecessories

Type	Frequeny Range	Ub/Volt	Ib/mA	Sice w/o Connector mm	RF - Connector	Quality	Preis
BIAS - T	~ 10 GHz	12	< 100 mA	37x55x30	SMA - female	Amateur/Semiprof	67 €
BIAS - T	> 3 GHz	12	> 300 mA	55x55x30		Amateur	76 €
BIAS - T	> 3 GHz	12	> 300 mA	55x55x30	N - male / N - female	Professional	193 €
Splitter	Frequency Range	-----			SMA - female		
Splitter 1	> 3 GHz 3 dB						
Splitter 2							

Up - Converter / Transmit Mixer / ATV / DATV also for



Type	Frequency Range and Modes	Power Input Level	P 2 Output	Oscillator extern	Ub / Volt	I b / mA	Size w/o Co	Preis
TX - Mix 400	z.B. >100 MHz up to 430 – 450 MHz FM / DVB -T	max. 1 W adjustable	<10 mW digital 50mW FM	Typ. 13 dBm	12 – 15 V		74x37x30	113 €
TX - Mix 1200	z.B. >150 MHz up to 1250 MHz FM / DVB -T	max. 1 W „	<10 mW digital 50 mW FM	Typ. 13 dBm	12 – 15 V		74x37x30	113 €
TX - Mix 2400	z.B. >900 MHz up to 2400 MHz FM / DVB -T	Max. 1 W „	<10 mW digital 40 mW FM	Typ. 13 dBm	12 – 15 V		74x37x30	120 €
TX- Mix 2400	as above but narrow band, no tune!	„	„	„	„		74x37x30	105 €

Transmit - Mixer/Uplink to 2.4 GHz Narrowband



Low cost, but high quality mixer to generate a 13 cm signal, to get qrv on the satellite RX - frequency. It is up to you to use any IF between 140 MHz and >500 MHz, all filtering is sufficient to get a very clean 13 cm signal. Your IF - signal may be up to 1 Watt on any frequency, an internal potentiometer allows exact adjustment of mixer output.

IF - Signal power should be as low as possible as it will be heard several km when the whole RF - boxes not built "watertight"!!

Lo - power should be 20 mW (13 dBm) for best conversion loss and IMD. Here is a good one: www.df9np.de or others on Ebay

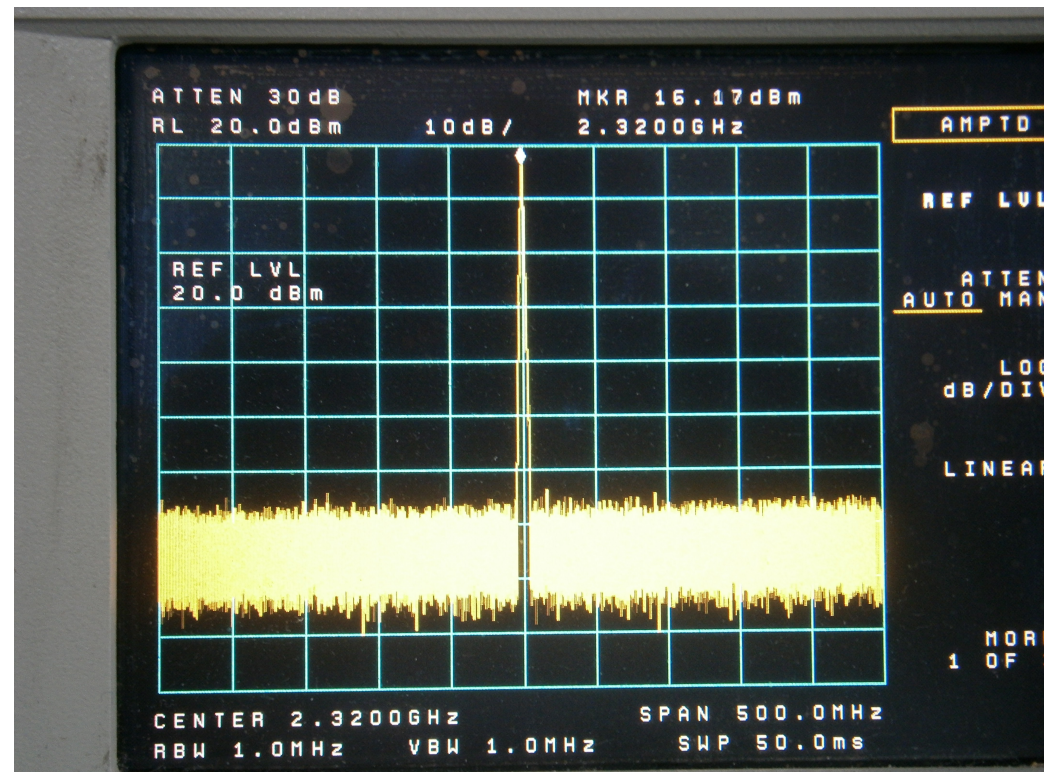
This mixer will fit to the high gain surplus / UMTS amplifiers available on Ebay and flea markets. Right now we are designing a decent power amplifier fitting to the mixer module. Our mixer for Uplink offers low spurious signals, all mixing products are suppressed better than 60 dB, keeps you free of any trouble with the authorities or other Ham Operators.

A broadband version also is available, at higher costs, tunable from 2.3 - 2.4 GHz. In this broader design we use Neosid Helical Filter instead SMT - SAW!

Technical informations

IF	140 - >500 MHz, max. 1 Watt, by 20 dB adjustable with internal pot
Output	2400 - 2450 MHz level typ. > 16 dBm / 40 mW
Power Supply	12 - 15 V DC max 130 mA Size 74 x 37 x 30 mm tin housing

This shows the output spectrum on 2320 MHz using 1 Watt for drive on 144 MHz. As one can see, all spurs suppressed better than 60 dB!! When using 430 MHz for instance, signal purity will be the same or even better.



Down - Converter for LNB ES'hail-2

Type	Frequency Range and Modes	Noise Figure	Gain	Oscillator extern	Ub / Volt	Ib / mA	Size w/o Co	Price
LNB Down - Convert	1129 --> 430 MHz others on request , with gain adjustment, with LNB-DC supply via Sat - cable	----	passiv	699 MHz	-----	----	74x37x30	95 €



Outdoor - Unit for ES'hail-2 2.4 GHz Uplink ready soon!

Complete setup with TX - Mixer, PLL - LO and ~ 20 Watt PA. Mounted in watertight housing, comes with clamps for masts up to 60 mm diameter. Simply mountable on the rear side of your dish or planar antenna.

On request means that a similar module might be ready developed, but not on sale right now. If you have any demands in a particular module please ask.

We are also able to do special designs, even for one piece.

Our offer addresses HamRadio operators and companies that implement our modules into their own designs.

This price list contains no taxes at all, members of the European Union need to pay the German VAT!

Shipment: Only 13 € for worldwide service with registered mail, buyer will be charged with extra fees if insurance is needed.

