becker
nachrichtentechnik

FDMX2

De-Multiplexer for Broadcast and Navigation Signals with Resistive DC Loads Dual (AM/FM/DAB3), DAB3, DVB-T, GNSS, SAT (SDARS)

Features

- de-multiplexer for broadcast bands
- DC loads in each channel
- optical indication of phantom voltage
- direct fakra connection to (DUT)

Applications

- AM, FM, DAB, DVB-T, SDARS
- GNSS: GPS, GLONASS, GALILEO
- automotive infotainment test
- R&D
- production

At a Glance

FDMX2 from Becker Nachrichtentechnik is a compact de-multiplexer unit as table top unit in 50 Ohm technology. The FDMX2 splits the broadcast bands into the individual sections and makes them available at 6 RF ports. The ports have coded Fakra connectors, that have become standard in automobile infotainment, for the direct connection to the device under test (DUT). All outputs have integrated DC loads for the emulation of active antennas. Thus the DUT has the full RF and DC environment for ready to use operation in laboratories.
The presences of phantom voltages coming from the DUT are indicated by LEDs on the front side of the FDMX2.
With help of the FDMX2 cost efficient solutions for multi signal distribution in R&D and factory buildings can be realized using only one common coaxial cable for transmission of all broadcast and GNSS signals to the test setups.

Special Features

The FDMX2 unit enables plug and play solution for the RF connection of car infotainment components. FDMX2 has dual ports for “analogue ”AM/FM” and digital “DAB3” radio signals, one separate port for digital radio DAB3 signals, one port for digital television DVB-T signals, one port for satellite navigation signals GNSS (GPS, GALILEO, GLONASS) and one port for satellite radio signals SAT (SDARS, XM radio). All RF ports features resistive DC loads for the phantom supplies in the DUTs.
A Fakra cable set with cable length 1 m for all RF connectors are part of the product package.

Rugged Design

The FDMX2 unit is built in a milled aluminium case to give best shielding for avoiding EMI influences caused by radio signals coming from the environment. The RF connector for the multi signal input is N female.

RF Specification

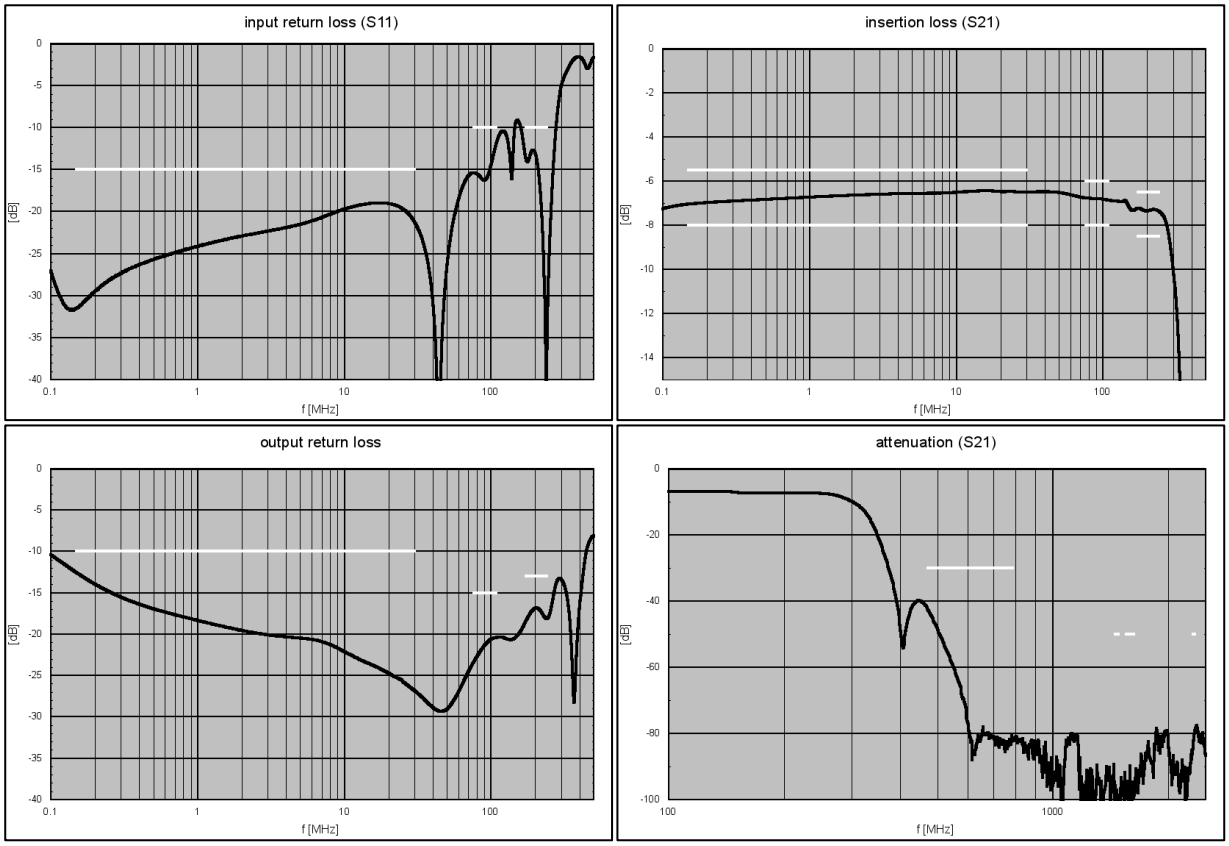
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z		50		Ohm	
RF COM port						
low frequency	f_{min}		50	150	kHz	
high frequency	f_{max}	2345	2700		MHz	
return loss	S_{11}		-12		dB	
RF input power	P_{in}			+10	dBm	
maximum DC Voltage	U_{DC}			20	V	
ESD discharge resistor	R_{ESD}		4.7		kΩ	
connector	X_{COM}		N female			
AM (Dual AM/FM/DAB)						
low frequency	f_{min}		50	150	kHz	
high frequency	f_{max}	30			MHz	
return loss	S_{22}		-17	-10	dB	
insertion loss	S_{21}	-8.0	-7.0	-5.5	dB	
FM (Dual AM/FM/DAB)						
low frequency	f_{min}			77	MHz	
high frequency	f_{max}	108			MHz	
return loss	S_{22}		-20	-15	dB	
insertion loss	S_{21}	-8.0	-7.0	-6.0	dB	
DAB (Dual AM/FM/DAB)						
low frequency	f_{min}			170	MHz	
high frequency	f_{max}	240			MHz	
return loss	S_{22}		-17	-13	dB	
insertion loss	S_{21}	-8.5	-7.5	-6.5	dB	
attenuations	a_{DVB-T}		-45	-30	dB	DVB-T (474 … 786 MHz)
	a_{GNSS}		-90	-50	dB	GNSS (1452 … 1625 MHz)
	a_{SAT}		-80	-50	dB	SAT (2320 … 2345 MHz)
RF input power	P_{RF}			+10	dBm	
DC load	I_{DC}	32	35	38	mA	U_{DC} = 8.5 V
	U_{DC}	0	8.5	10.0	V	R_L = 248 Ω, 400 mW max.
connector	$X_{AMFMDAB}$	Dual Fakra B plug (white, male)				
DAB						
low frequency	f_{min}			170	MHz	
high frequency	f_{max}	240			MHz	
return loss	S_{33}		-15	-9	dB	
insertion loss	S_{31}	-6.5	-5.0	-4.0	dB	
attenuations	a_{AMFM}		-50	-30	dB	AM/FM (0.15 … 108 MHz)
	a_{DVB-T}		-40	-30		DVB-T (474 … 786 MHz)
	a_{GNSS}		-90	-50		GNSS (1555 … 1625 MHz)
	a_{SAT}		-90	-50		SAT (2320 … 2345 MHz)
RF input power	P_{RF}			+10	dBm	
DC load	I_{DC}	32	35	38	mA	U_{DC} = 8.5 V
	U_{DC}	0	8.5	10	V	R_L = 248 Ω, 400 mW max.
connector	X_{DAB}	Fakra A plug (black, male)				

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
DVB-T						
low frequency	f_{min}			470	MHz	
high frequency	f_{max}	790			MHz	
return loss	S_{44}		-12	-8	dB	
insertion loss	S_{41}	-2.5	-1.0	-0.5	dB	
attenuation	a_{AMFM}		-70	-60	dB	AM/FM (0.15…108 MHz)
	a_{DAB3}		-35	-30	dB	DAB3 (174…228 MHz)
	a_{GNSS}		-45	-40	dB	GNSS (1555…1625 MHz)
	a_{SAT}		-55	-40	dB	SAT (2320…2345 MH)
RF input power	P_{RF}			+10	dBm	
DC load	I_{DC}	32	35	38	mA	U_{DC} = 8.5 V
	U_{DC}	0	8.5	10.0	V	R_L = 248Ω, 400mW max.
connector	X_{DVB-T}	Fakra E plug (green, male)				
GNSS						
low frequency	f_{min}			1555	MHz	
high frequency	f_{max}	1625			MHz	
return loss	S_{55}		-17	-10	dB	
insertion loss	S_{51}	-2.0	-1.0	-0.1	dB	
attenuation	a_{AMFM}		-90	-75	dB	AM/FM (0.15 … 108 MHz)
	a_{DAB3}		-90	-75	dB	DAB3 (174 … 228 MHz)
	a_{DVB-T}		-35	-30	dB	DVB-T (474 … 786 MHz)
	a_{SAT}		-30	-20	dB	SAT (2320 … 2345 MH)
RF input power	P_{RF}			+10	dBm	
DC load	I_{DC}	27	30	33	mA	U_{DC} = 5 V
	U_{DC}	0	5	9	V	RL = 165 Ω, 500 mW max.
connector	X_{GNSS}	Fakra C plug (blue, male)				
SAT (SDARS)						
low frequency	f_{min}			2320	MHz	
high frequency	f_{max}	2345			MHz	
return loss	S_{66}		-12	-8	dB	
insertion loss	S_{61}	-3.0	-2.0	-0.5	dB	
attenuation	a_{800M}		-90	-75	dB	≤ 786 MHz
	A_{GNSS}		-20	-15	dB	GNSS (1555 … 1625 MHz)
RF input power	P_{RF}			+10	dBm	
DC load[2]	I_{DC}	47	50	53	mA	U_{DC} = 5 V
	U_{DC}	0	5	7	V	R_L = 100 Ω, 500mW max.
connector		Fakra F plug (brown, male)				

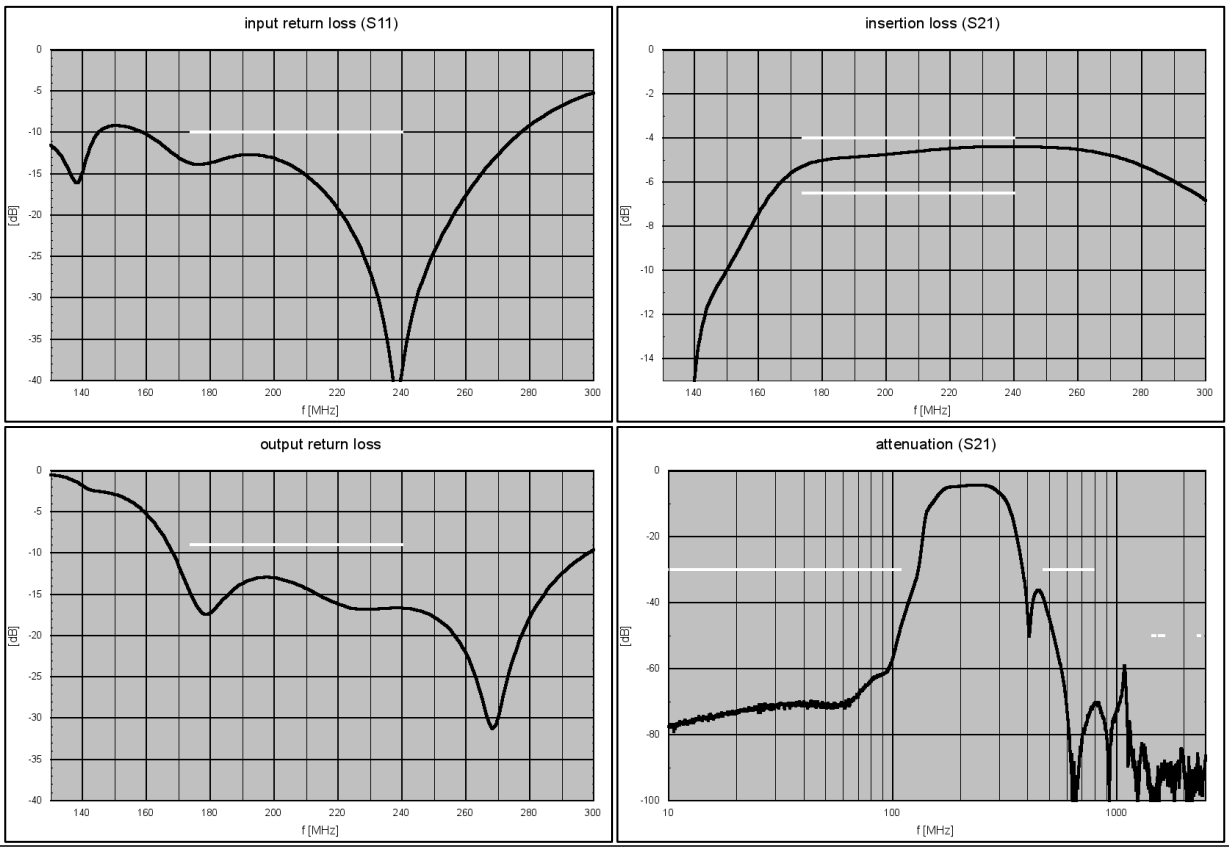
Common Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
dimensions	W x H x D	approx. 154 x 37 x 93			mm	without connectors
weight	m		0.7		kg	
operating temp. range	T_o	+5		+40	°C	housing surface
storage temp. range	T_s	-40		+70	°C	
ordering information	FDMX2		P/N: 1809.6003.1			Fakra cable set is part of product package

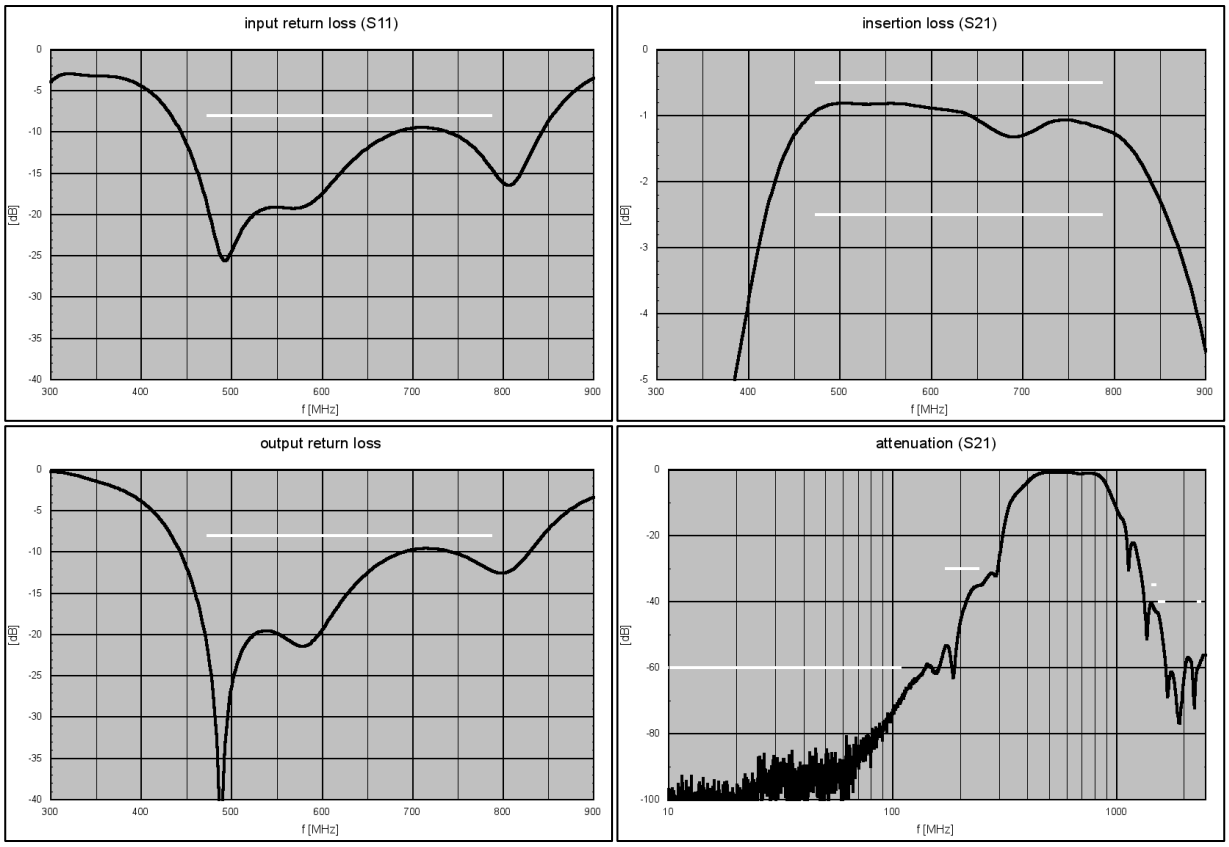
S-Parameters (typical responses)
AM/FM/DAB signal path



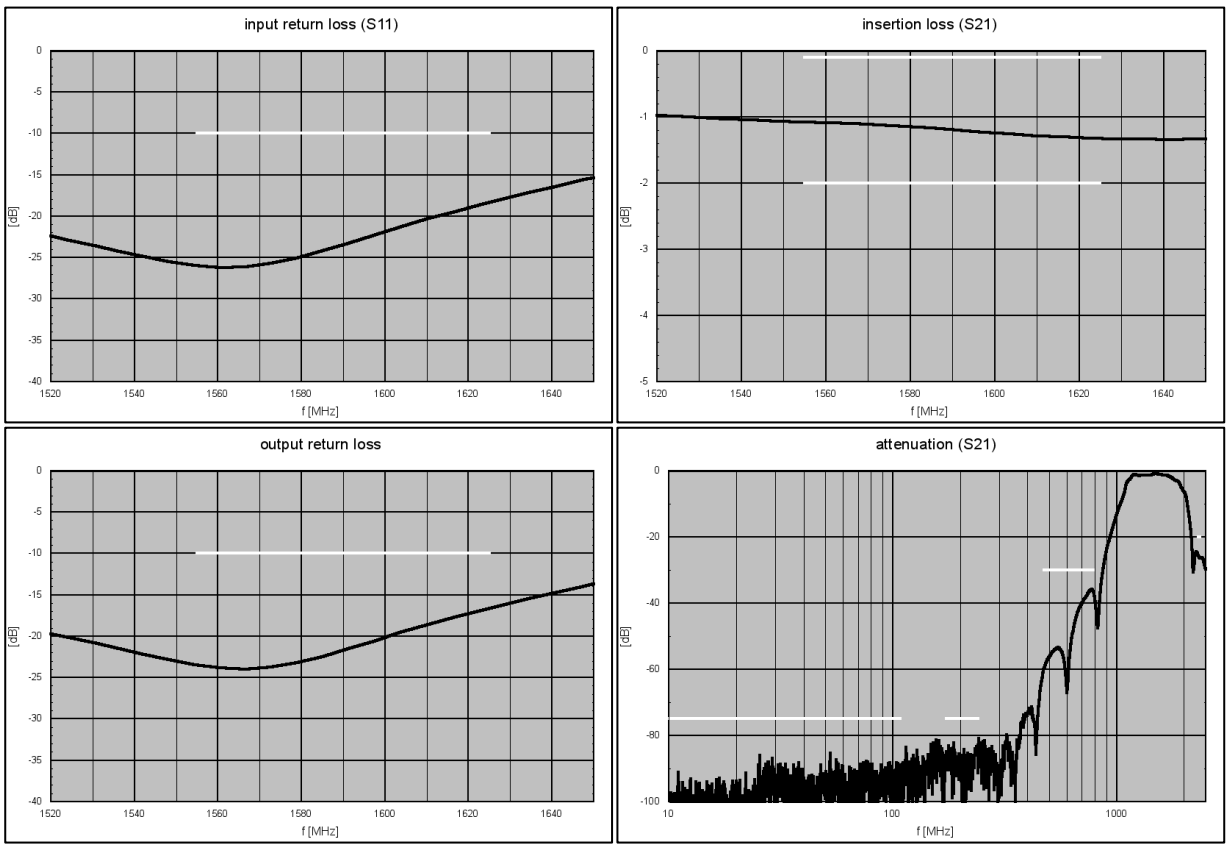
DAB signal path



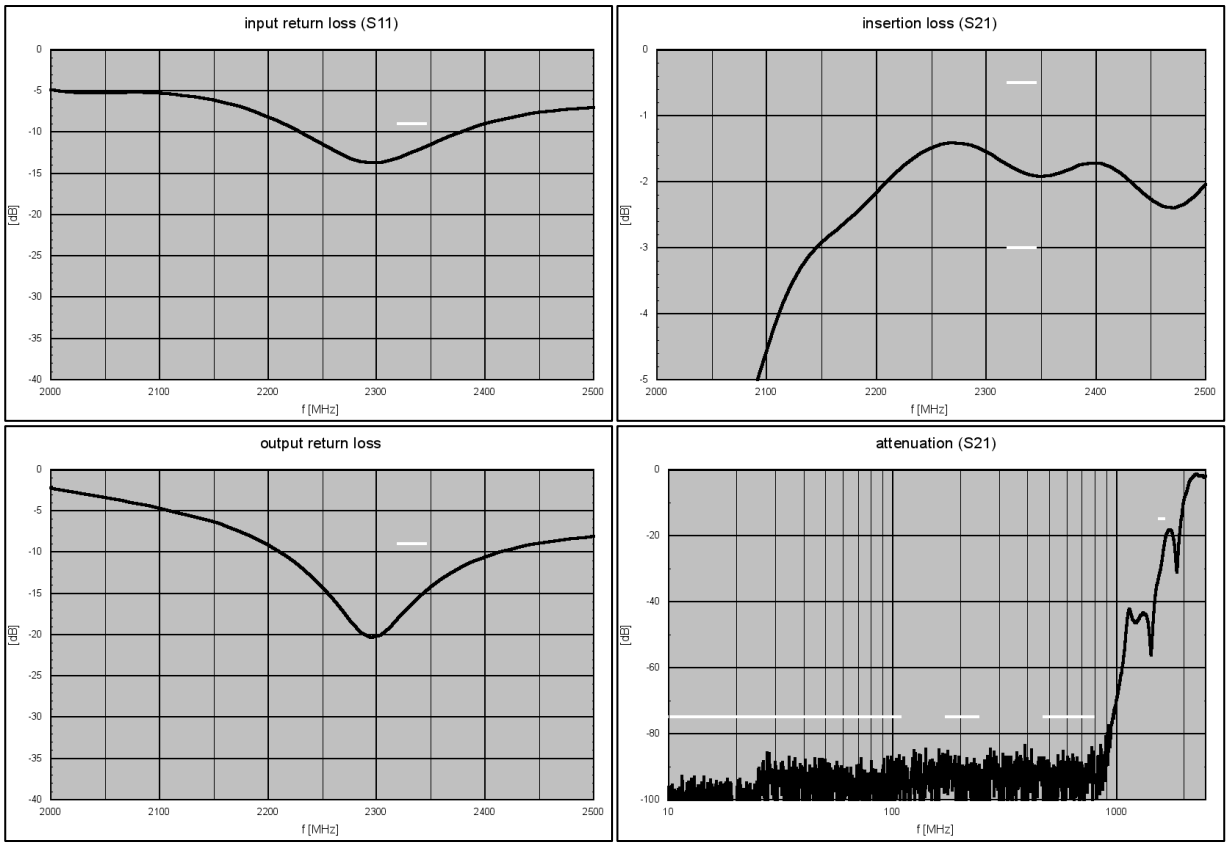
DVB-T signal path



GNSS signal path



SAT (SDARS) signal path

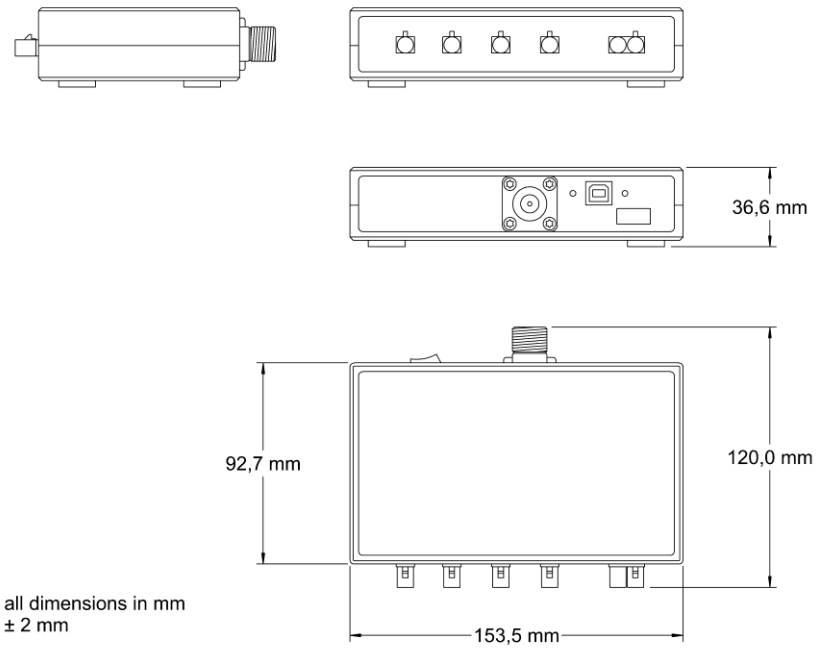


Appearances

Front side

Rear Side

Dimensions



Related Products

Product	Description	P/N
FDMX	De-Multiplexer for Broadcast and Navigation Signals with Resistive DC Loads. Dual (AM/FM), DAB3/DAB-L, DVB-T, GNSS, SAT (SDARS)	1310.6003.1
FDMX-PT	De-Multiplexer for Broadcast and Navigation Signals with Programmable DC Loads 0 … 300 mA. Dual (AM/FM), DAB3/DAB-L, DVB-T, GNSS, SAT (SDARS)	1310.6003.2
FDMX2	De-Multiplexer for Broadcast and Navigation Signals with Resistive DC Loads. Dual (AM/FM/DAB3), DVB-T, GNSS, SAT (SDARS)	1809.6003.1
FDMX2-PT	De-Multiplexer for Broadcast and Navigation Signals with Programmable DC Loads 0 … 300 mA. Dual (AM/FM/DAB3), DVB-T, GNSS, SAT (SDARS)	1809.6003.2
FDML	Dual Port Adapter for AM/FM and DAB3 Broadcast Signals with Resistive DC Loads	1310.6103.2
FDMX-CS	Fakra Cable Set, length 1 m. Includes 4 RF cables with 1 dual RF cable	1310.0107.1
FDMX-AA	AC/DC Wall Wart Power Adpater for USB	1310.0108.1