

## AMP51505925-TRX-K

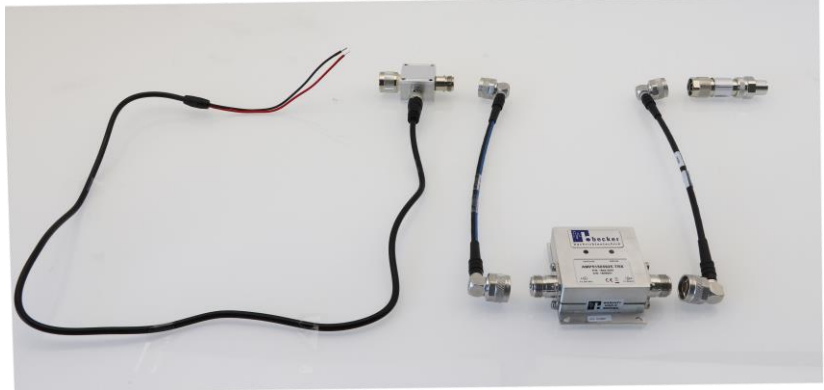
### Kit for 5 GHz Wi-Fi Coverage Extension using Radiating Cables

#### Features

- complete Wi-Fi extension set
- multiplies coverage area
- easy installation
- LED indicators
- extendable up to 5 radiating cable segments

#### Applications

- 5 GHz Wi-Fi radio coverage in rail and street tunnels
- high-bay warehouses
- office buildings
- Wi-Fi 802.11 a/g/n/ac/ax



#### At a Glance

More and more Wi-Fi installations migrate from 2.4 GHz to 5 GHz in order to benefit from increased bandwidth and less interference. In typical applications like high-bay warehouses, radiating cable is used as the preferred antenna type, as it achieves superior coverage of the Wi-Fi signal in complex environments, especially in the presence of arbitrary steel structures. However, the longitudinal attenuation of radiating cable at 5 GHz forces shorter cable lengths. This restriction is removed when using Becker's bidirectional Wi-Fi-booster, that allows to add multiple segments of radiating cable to the same Wi-Fi Access Point (AP). Using the Wi-Fi booster, the resulting cable run originating from a single Wi-Fi AP can even be longer than with 2.4 GHz without the booster. AMP51505925-TRX-K is a complete kit for a simple extension of Wi-Fi coverage via radiating cables.

#### Kit Content

The kit contains a DC Feeding Unit "DFU" for mounting on radiating cable heads, one Wi-Fi booster amplifier "AMP51505925-TRX", 2 pcs of RF cables to enable mounting the booster amplifier on the wall and a Termination Unit "TU" for mounting at the end of the radiating cable. The booster amplifier is phantom supplied with 24 V DC via the feeding unit DFU.

The Termination Unit blocks the phantom DC supply and terminates the last radiating cable segment with 50 ohms to avoid drops in coverage caused by standing waves.

#### DC Feeding Unit

The DC Feeding Unit DFU offers a DC feeding port for phantom supply the AMP51505925-TRX booster with 24 V. Up to 4 Wi-Fi boosters for a 5 radiating cable segment coverage can be fed with the DFU. The DC feeding unit is easy installable on the N female connector on radiating cable end at the feeding head.

#### Wi-Fi Booster AMP51505925-TRX

The Wi-Fi booster has a typical gain of 20 dB in RX and TX direction for the compensation of longitudinal loss of radiating cable segments. In practice the minimum power at any point in the radiating cable must be around 0 dBm for higher modulation schemes. Using the radiating cable RMC12-CH from Eupen, segments of approx.80 m length can be driven with one booster amplifier.

The first Wi-Fi booster must be introduced when the RF average power from the access point has decreased down to 0 dBm. For more detailed information please refer to the data sheet of AMP51505925-TRX.

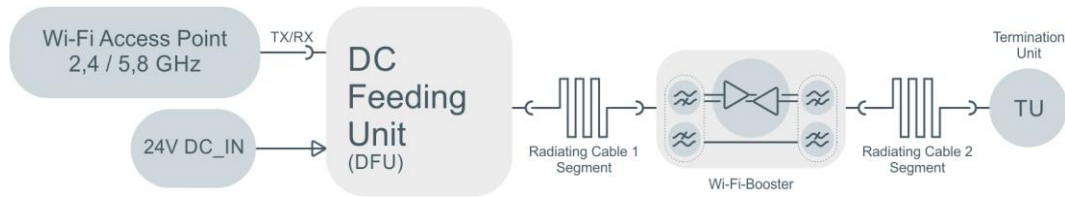
The kit contains two RF cables with 180° orientated N connectors with a length of 25 cm for mounting the booster amplifier on the wall are part of the kit.

#### Termination Unit

The Termination Unit (TU) has a DC block to avoid DC current flow from phantom voltage across the 50 ohms termination. The termination must be installed at the end of the last radiating cable segment. It is required to avoid standing waves in the radiating cable.

## Principle Block Diagram

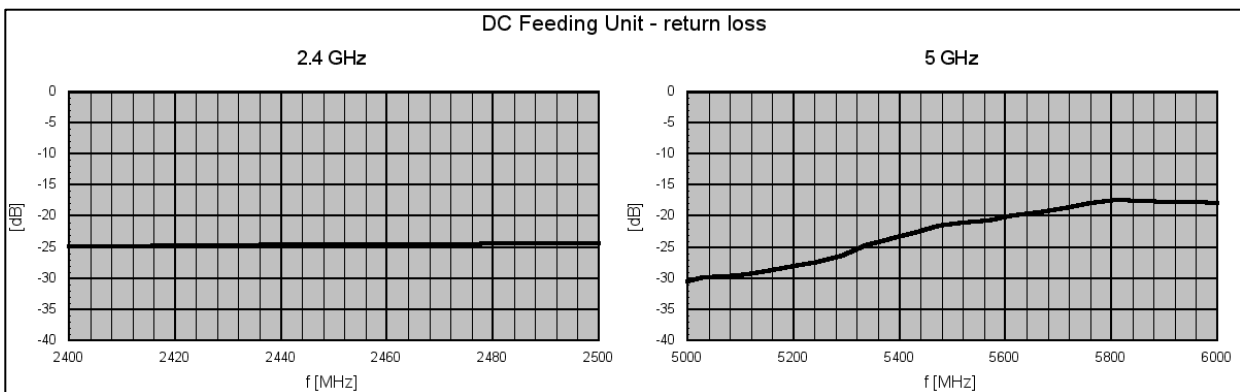
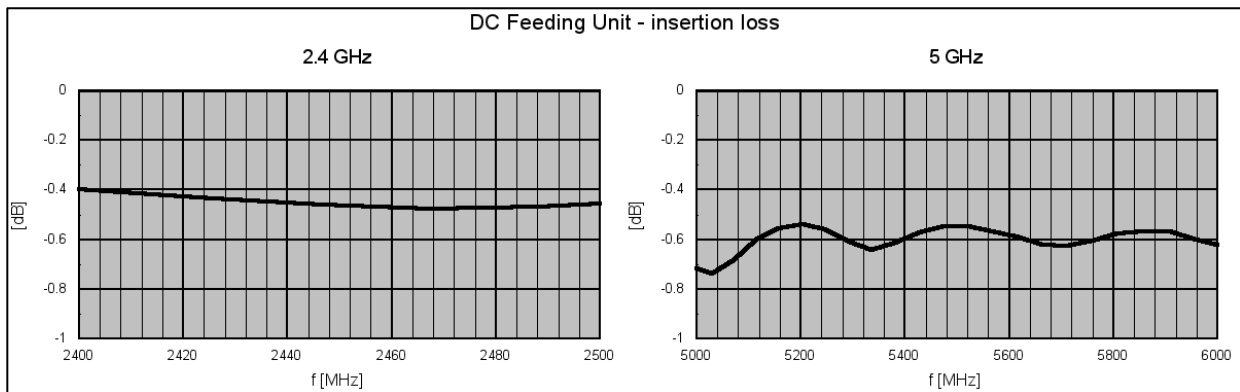
The block diagram shows a principal setup for a simple 5 GHz Wi-Fi coverage extension using the kit.



## RF Specification (DFU, DC Feeding Unit)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	$Z_{in} / Z_{out}$		50		$\Omega$	
frequency range	$\Delta f$	2400		2500	MHz	
insertion loss	$S_{21}, S_{12}$		-0.5		dB	
frequency range	$\Delta f$	5000		6000	MHz	
insertion loss	$S_{21}, S_{12}$		-0.6		dB	
return loss	$S_{11}, S_{22}$		-23		dB	
RF-DC isolation	$S_{RFDC}$		-33		dB	
RF power	$P_{RF}$			+30	dBm	CW
DC current	$I_{DC}$			500	mA	DC port
DC voltage	$U_{DC}$			30	V	DC port
DC cable length	$l_{DC}$		1		m	
dimensions	WxHxD	approx. 32 x 32 x 24			mm	without connectors
weight	m		140		g	
operating temp. range	$T_o$	0		+50	$^{\circ}C$	
storage temp. range	$T_s$	-40		+70	$^{\circ}C$	
RF connectors	$X_{RF}$	N male / N female				
DC connectors	$X_{DC}$	cable lug				

## S-Parameters



**RF Specification (Wi-Fi Booster AMP51505925-TRX)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	$Z_{in} / Z_{out}$		50		Ohm	
Wi-Fi frequency ranges	$F_{2.4}$	2400		2480	MHz	bypassed
	$F_{5.8}$	5150		5925	MHz	
<b>Wi-Fi 5.8 RX mode</b>						
gain	$S_{12}$		20		dB	
noise figure	NF		3.5		dB	
input power	$P_{RX}$			-30	dBm	limited by TX detection
OIP3	$OIP3^{*1}$		+22		dBm	
TX/RX switching delay	$t_{TX/RX}$		250		ns	90% $T_{XIN}$ to 90% $RXOUT$
TX/RX slew rate	$t_{10/90\%}$		100		ns	
<b>Wi-Fi 5.8 TX mode</b>						
linear gain	$S_{21}$		20		dB	
1 dB compression	$P_{1dB}$		+28		dBm	
OIP3	$OIP3^{*2}$		+35		dBm	
TX detection threshold	$P_{THRES}$		-15		dBm	$P_{IN}$ , average
RX/TX switching delay	$t_{TX/RX}$		400		ns	10% $T_{XIN}$ to 90% $T_{XOUT}$
RX/TX slew rate	$t_{10/90\%}$		100		ns	
<b>Wi-Fi 2.4</b>						
insertion loss	$S_{21}$		-4	-6	dB	@ 2500 MHz, bi-directional
RF connectors	$X_{RF}$		N female			
supply voltage	$U_{PHTM}$	12		28	V	phantom supply
supply current	$I_{PHTM}$		90		mA	@ 24 V, RX (idle)
supply current	$I_{PHTM}$			200	mA	@ 24 V, 100% TX
power consumption	$P_{DC}$		1.7		W	RX (idle)
			4.8		W	100% TX
DC Bypass current	$I_{BYP}$			1.35	A	cascading AMP51505925-TRX
dimensions	$W \times H \times D$	approx. 59 x 28 x 78			mm	without connectors
weight	m		240		g	
operating temp. range	$T_o$	0		+50	°C	
storage temp. range	$T_s$	-40		+70	°C	

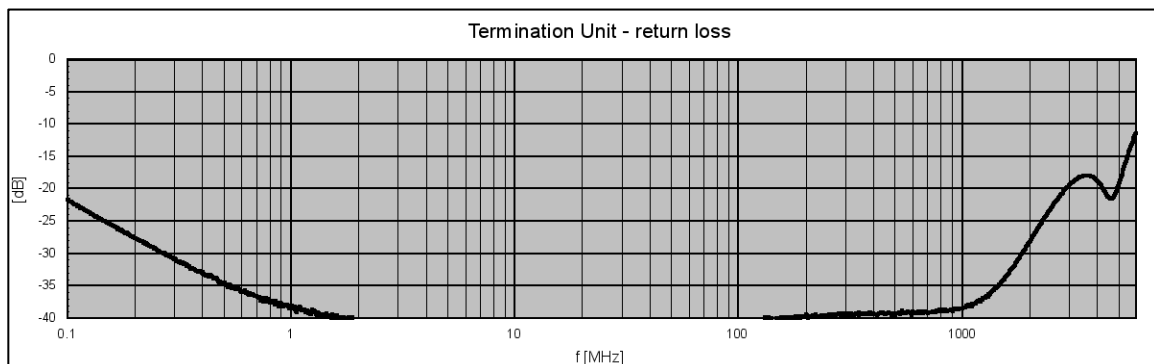
\*1: measured with output level of 2 x +7 dBm,

\*2: measured with output level of 2 x +20 dBm,

OIP3 test frequencies: 5250 / 5350 MHz, 5450 / 5550 MHz, 5725 / 5825 MHz

**RF Specification (TU, Termination Unit)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	$Z_{in} / Z_{out}$		50		Ohm	
frequency range	$\Delta f$	10		6000	MHz	
return loss	$S_{11}, S_{22}$		-17		dB	
RF power	$P_{RF}$			+33	dBm	CW
DC voltage	$U_{DC}$			50	V	
dimensions	$D \times L$	approx. 18 x 75			mm	
weight	m		100		g	
operating temp. range	$T_o$	0		+50	°C	
storage temp. range	$T_s$	-40		+70	°C	

**S-Parameters**

## Ordering Information

ordering information	Designation	P/N:	Description	
Wi-Fi Booster Amplifier Kit	AMP-51505925-TRX-K	1802.5011.1		
Parts of delivery	amount			
	1 pce	AMP51505925-TRX	1802.5001.1	Wi-Fi Booster Amplifier Module
	1 pce	DFU	1802.5031.1	DC Feeding Unit
	1 pce	TU	1802.5021.1	Termination Unit
	2 pcs	NN-25-180	1202.0717.1	RF cable N connector 180°

## Appearances



DFU, DC Feeding Unit

AMP51505925-TRX,  
Wi-Fi Booster

NN-25-180, RF cables



TU, Termination Unit

## Installation Examples



DFU mounted on radiating cable



Wi-Fi Booster mounted on wall



TU mounted on radiating cable

**Related Products**

Product	Description	P/N
AMP20002000042	10 W Power Amplifier Module, 2000 MHz ... 20 GHz Module with external heat sink	2301.5111.1
AMP20002000042L	10 W Power Amplifier Module, 2000 MHz ... 20 GHz Module for mounting on external heat sink	2301.5101.1
AMP101800030	1 W Ultra-Wideband Linear Amplifier Module, 10 ... 18000 MHz	2106.5001.x
AMP17001300038	6 W Power Amplifier Module, 1700 ... 13000 MHz Module with external heat sink	2004.5111.1
AMP17001300038L	6 W Power Amplifier Module, 1700 ... 13000 MHz Module for mounting on external heat sink	2004.5011.1
AMP300600040	10 W Power Amplifier Module, 300 ... 6000 MHz Module with external heat sink	1801.5101.1
AMP300600040L	10 W Power Amplifier Module, 300 ... 6000 MHz Module for mounting on external heat sink	1801.5001.1
AMP01600017B	50 mW Wideband Amplifier, 100 kHz ... 6000 MHz	1604.5001.2
AMP51505925-TRX	Wi-Fi TX/RX Booster Amplifier for Radiating Cables	1802.5001.1
AMP51505925-TRX-K	Kit for 5 GHz Wi-Fi Coverage Extension using Radiating Cables	1802.5011.1
AMP20280035B	4.5 W Wideband Amplifier Module, 20 ... 2800 MHz	1209.5201.x
AMP5270026	400 mW High Dynamic Amplifier Module, 5 ... 2700 MHz	1005.5201.x
AMP5220031	1 W High Dynamic Amplifier Module, 5 ... 2200 MHz	1005.5101.x
AMP5170033	2 W Amplifier Module 5 ... 1700 MHz	1401.5011.1
AMP50130036	4 W High Linearity, Full Redundant, UHF Wideband Amplifier, 50...1300 MHz Module with heat sink	1602.5001.4
AMP50130036L	4 W High Linearity, Full Redundant, UHF Wideband Amplifier, 50...1300 MHz Module for mounting in external heat sink	1602.5001.5
AMP590033	2 W Booster Amplifier Module 5 ... 900 MHz Module with heat sink	0901.5011.x
AMP590033L	2 W Booster Amplifier Module 5 ... 900 MHz Module for mounting in external heat sink	0901.5011.x
AMP590033H	2 W Amplifier Module 5 ... 900 MHz Module with heat sink	0901.5001.x
AMP590033HL	2 W Amplifier Module 5 ... 900 MHz Module for mounting in external heat sink	0901.5001.x
LNA1080014	400 mW Low Noise Amplifier Module 10 ... 800 MHz	0901.5501.x
AMP3060036	4 W Ultra High Linearity, Full Redundant, Wideband Amplifier Module 30 ... 600 MHz with heat sink	1602.5001.1
AMP3060036L	4 W Ultra High Linearity, Full Redundant, Wideband Amplifier Module 30 ... 600 MHz for mounting on heat sink	1602.5001.2
AMP1053045	30 W Linear Power Amplifier Module 10 ... 530 MHz	1908.5001.1
AMP17024048L	60 W DAB Linear Power Amplifier Module 170 ... 240 MHz Module for mounting on external heat sink	2104.5001.4
AMP17024048	60 W DAB Linear Power Amplifier Module 170 ... 240 MHz Module with external heat sink	2104.5101.4
AMP7610849L	80 W FM Linear Power Amplifier Module 76 ... 108 MHz Module for mounting on external heat sink	2104.5001.3
AMP7610849	80 W FM Linear Power Amplifier Module 76 ... 108 MHz Module with external heat sink	2104.5101.3
AMP018032	1.3 W High Linearity Amplifier Module 100 kHz...80 MHz	1002.5701.x

Note: Sorted descending by upper limit frequency.

All modules with P/N extension with ".x" are available with horizontal or vertical orientated DC power connector.

