

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

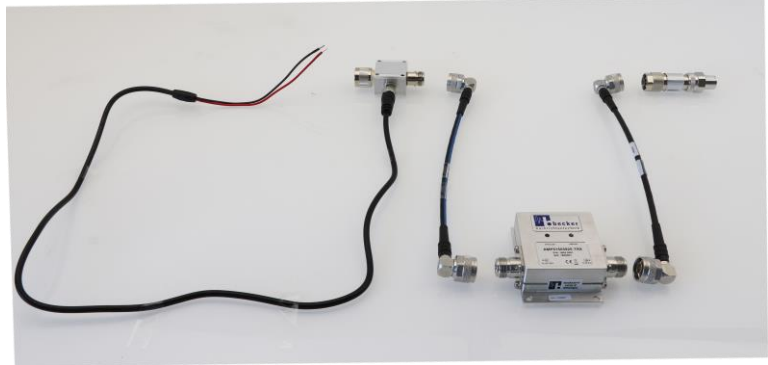


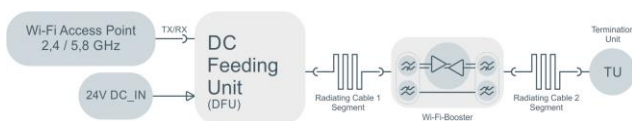
Photo shows WiFi Booster Module for installation between radiating cable segments

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 ware houses, 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 bidirection 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.

Block Diagram

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

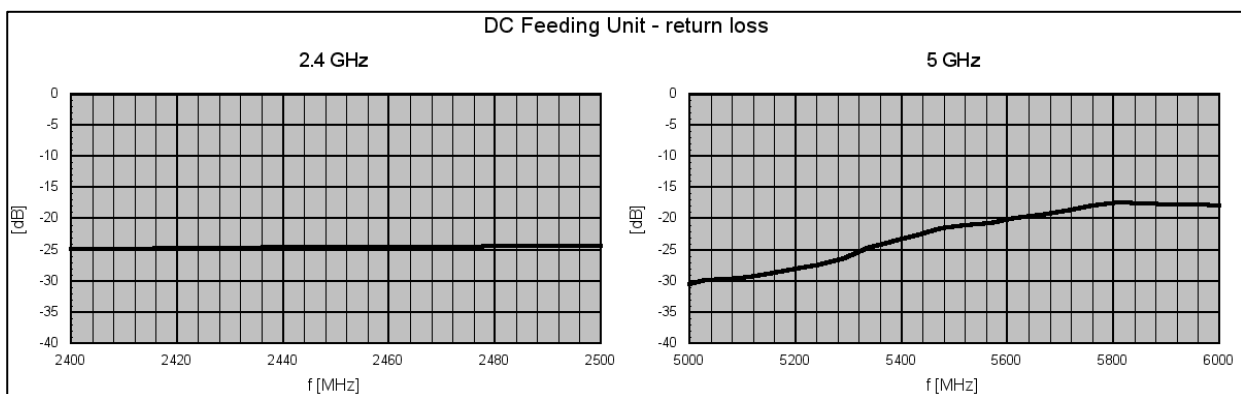
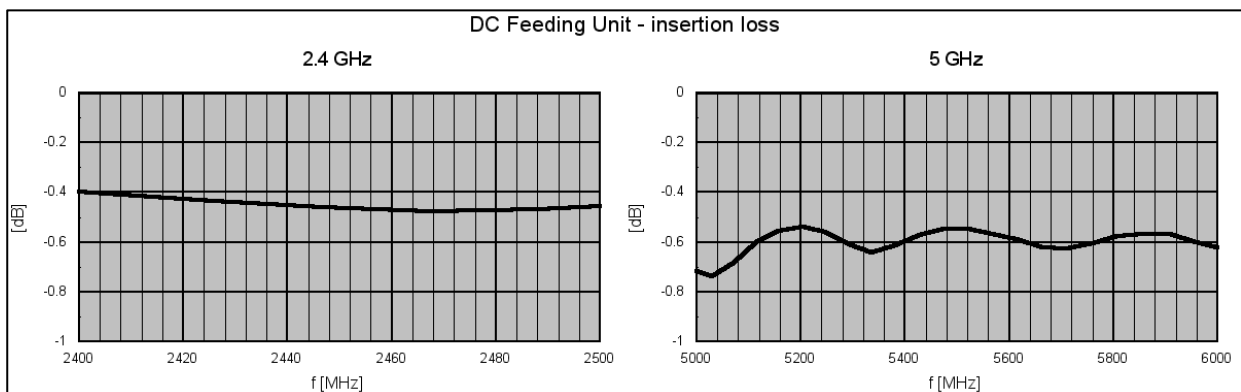
Termination Unit

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.

RF Specification (DFU, DC Feeding Unit)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z_{in} / Z_{out}		50		Ω	
frequency range	Δf	2400		2500	MHz	
insertion loss	S_{21}, S_{12}		-0.5		dB	
frequency range	Δf	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-Parameter



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	
Wi-Fi 5.8 RX mode						
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% TX_{IN} to 90% RX_{OUT}
TX/RX slew rate	$t_{10/90\%}$		100		ns	
Wi-Fi 5.8 TX mode						
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% TX_{IN} to 90% TX_{OUT}
RX/TX slew rate	$t_{10/90\%}$		100		ns	
Wi-Fi 2.4						
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	

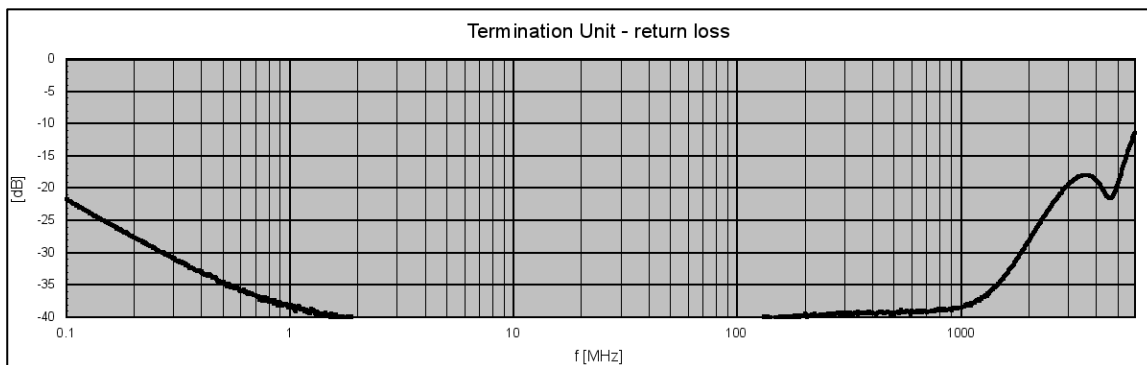
*1: measured with output level of 2 x +7 dBm,

*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	Δf	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-Parameter

Ordering Information

ordering information	Designation	P/N:	Description
WiFi Booster Amplifier Kit	AMP-51505925-TRX-K	1802.5011.1	
Parts of delivery	amount		
	1 pce	AMP51505925-TRX	1802.5001.1
	1 pce	DFU	1802.5031.1
	1 pce	TU	1802.5021.1
	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