

HARDWARE DESIGN MATERCLASSES

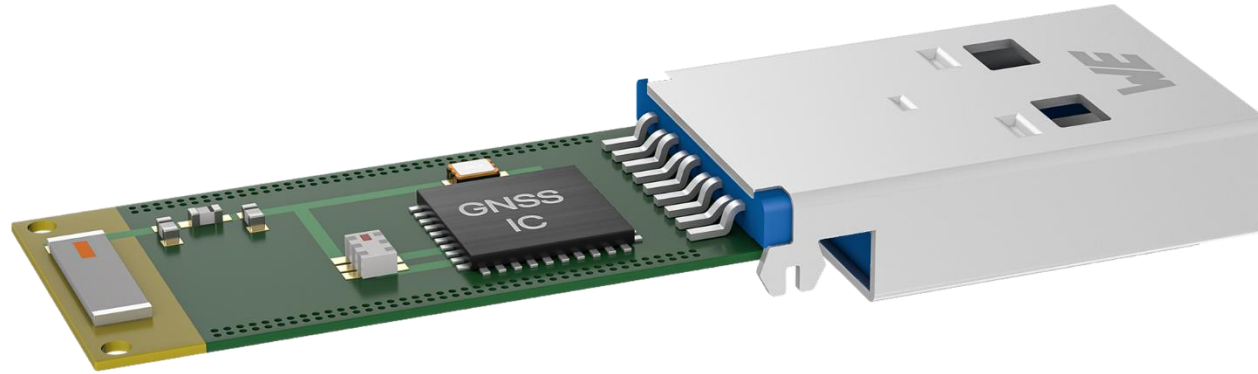
Piotr Gierwiatowski

EXTERNAL

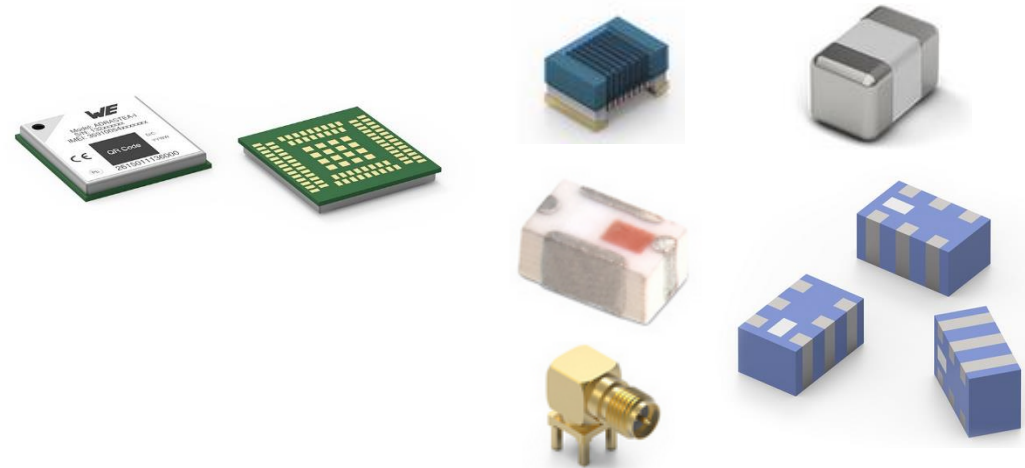
WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

COMMUNICATION SOLUTIONS

When integrated or trace antenna is not enough

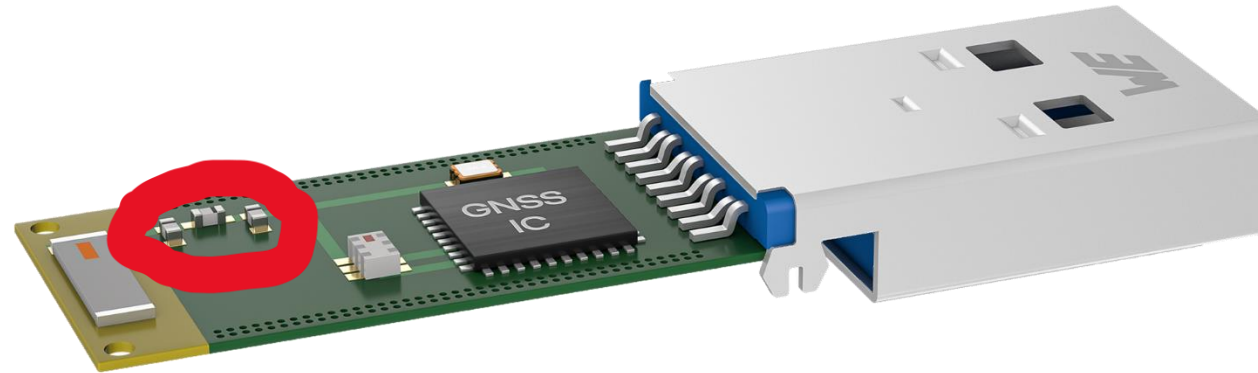


- Complete solution available:
 - Communication modules
 - RF components (coils, capacitors)
 - RF LTCC filters and Baluns
 - RF connectors
 - Service to match the antenna in customer's app
 - Shielding and directivity materials



COMMUNICATION MODULE INPUT/OUTPUT

When integrated or trace antenna is not enough



- Complete solution available:
 - Service to match the antenna in customer's app



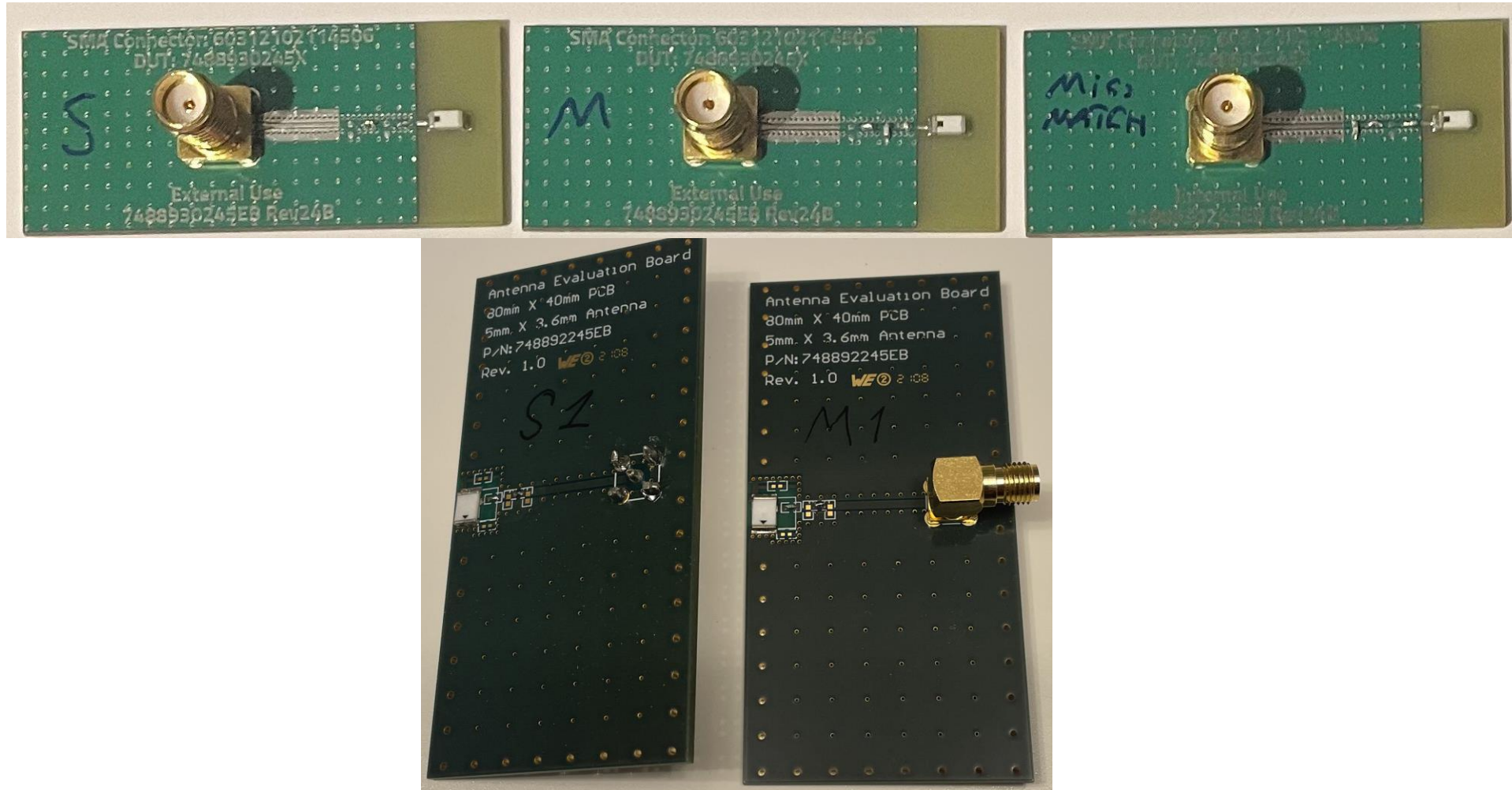
COMMUNICATION ANTENNAS

When intrgrated or trace antenna is not enough

Order Code	Data-sheet	Simu-lation	Downloads	Status	Frequency Range	G _{peak} (dBi)	VSWR	Frequency Range 2	G _{peak,2} (dBi)	VSWR ₁	Z (Ω)	Size	Type
7488910043	SPEC		10 FILES	Active	423-443 MHz	-4	2	–	–	–	50	25 x 5 mm	Electrical Antenna
7488918022	SPEC		10 FILES	Active	700-960 MHz	2.1	4	1710-2690 MHz	5.5	4	50	40 x 6 mm	Electrical Antenna
74889100921	SPEC		9 FILES	New	860-960 MHz	-0.7	2	–	–	2	50	11 x 5.1 mm	Electrical Antenna
7488910092	SPEC		10 FILES	Active	868-960 MHz	-0.7	2.5	–	–	–	50	11 x 5.1 mm	Electrical Antenna
7488910915	SPEC		10 FILES	Active	902-928 MHz	0.5	3	–	–	–	50	5.2 x 3.7 mm	Magnetic Antenna
7488920157	SPEC		10 FILES	Active	1550-1600 MHz	3.4	2	–	–	–	50	5.2 x 3.7 mm	Magnetic Antenna
7488915724	SPEC		11 FILES	Active	1570-1580 MHz	0.69	2.5	2400-2500 MHz	0.97	2	50	3.2 x 1.7 mm	Magnetic Antenna
7488912455	SPEC		10 FILES	Active	2400-2500 MHz	1	2.2	4900-5875 MHz	-1.5	2.2	50	8.5 x 1.6 mm	Electrical Antenna
7488920245	SPEC		10 FILES	Active	2400-2500 MHz	1.3	2	–	–	–	50	7.6 x 3.5 mm	Electrical Antenna
7488960245	SPEC		10 FILES	Active	2400-2500 MHz	3	2.5	–	–	–	50	5.2 x 3.7 mm	Magnetic Antenna
7488922455	SPEC		10 FILES	Active	2400-2500 MHz	3	2	5000-6000 MHz	3.3	2	50	5.2 x 3.7 mm	Magnetic Antenna

COMMUNICATION ANTENNAS LIVE DEMO

When intrgrated or trace antenna is not enough

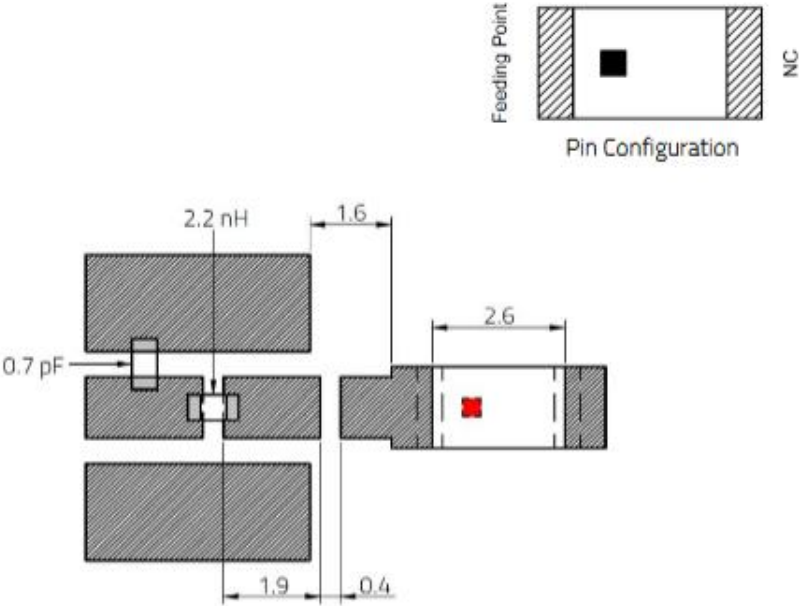


COMMUNICATION ANTENNAS LIVE DEMO

When intrgrated or trace antenna is not enough

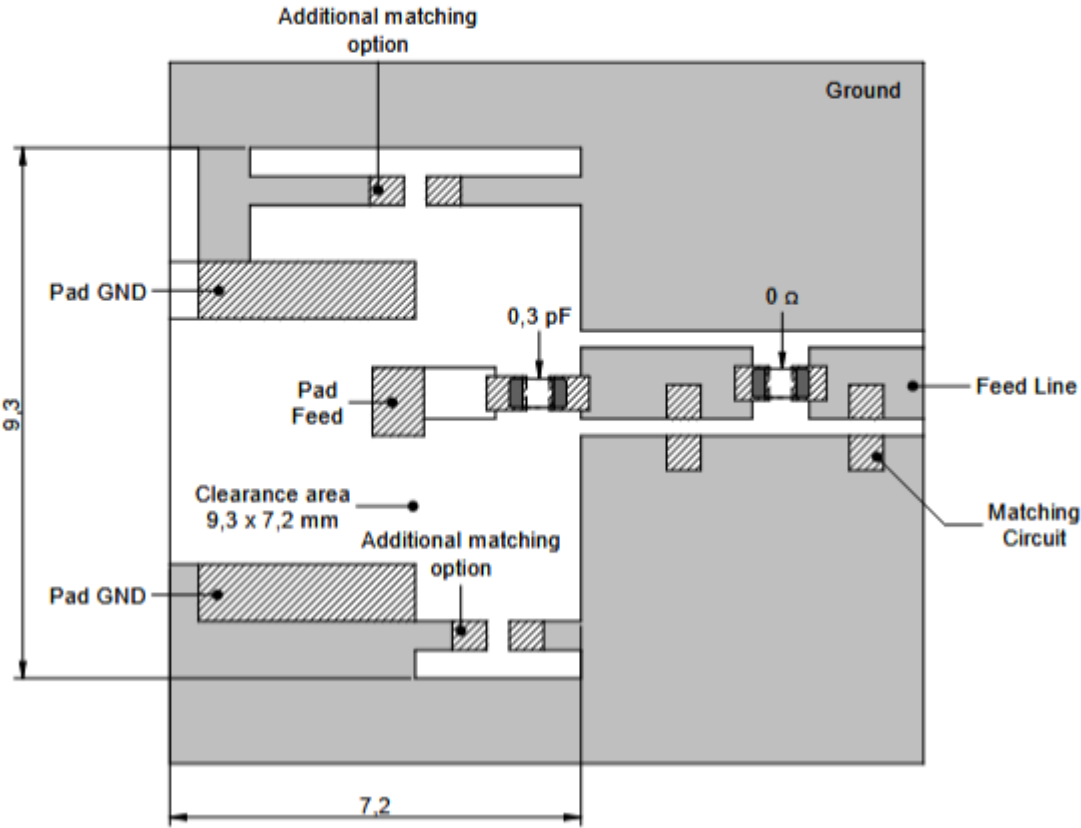
Recommended Matching Circuit: [mm]

With Matching Circuit:



Value	Series	Part Number
2.2 nH	WE-MK	7447840022G
0.7 pF	WCAP-CSRF	885392005019

Recommended Matching Circuit: [mm]



COMMUNICATION ANTENNAS LIVE DEMO

Impact of the enclosure and shielding solutions



COMMUNICATION ANTENNAS LIVE DEMO

Tips&Tricks with highly magnetic permability materials

Selection and Characteristics of WE-FSFS
(Flexible Sintered Ferrite Sheet)



The electromagnetic properties of the WE-FSFS materials are described by their relative¹ permeability curves:

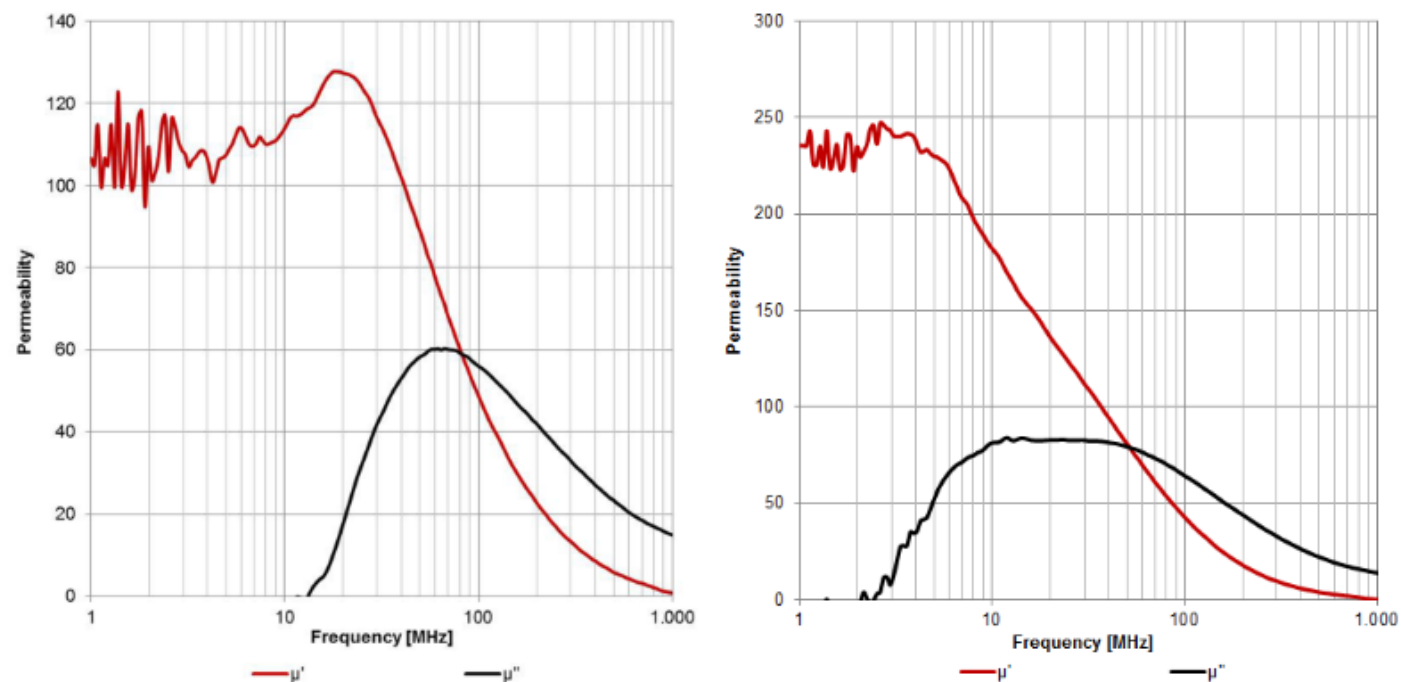


Figure 3: Relative permeability of 364 and 354 material

COMMUNICATION ANTENNAS LIVE DEMO

Tips&Tricks with highly magnetic permabilty materials

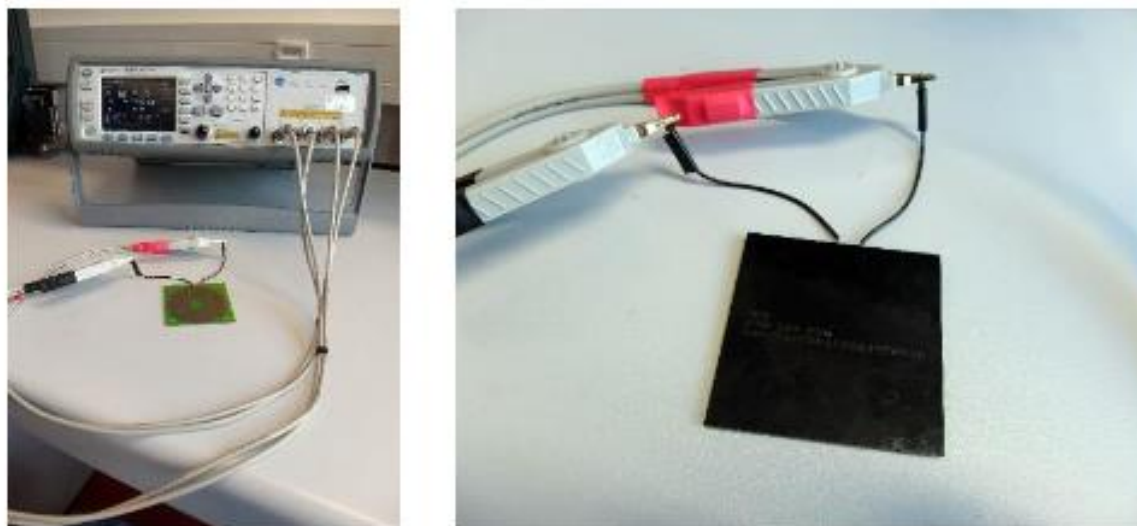
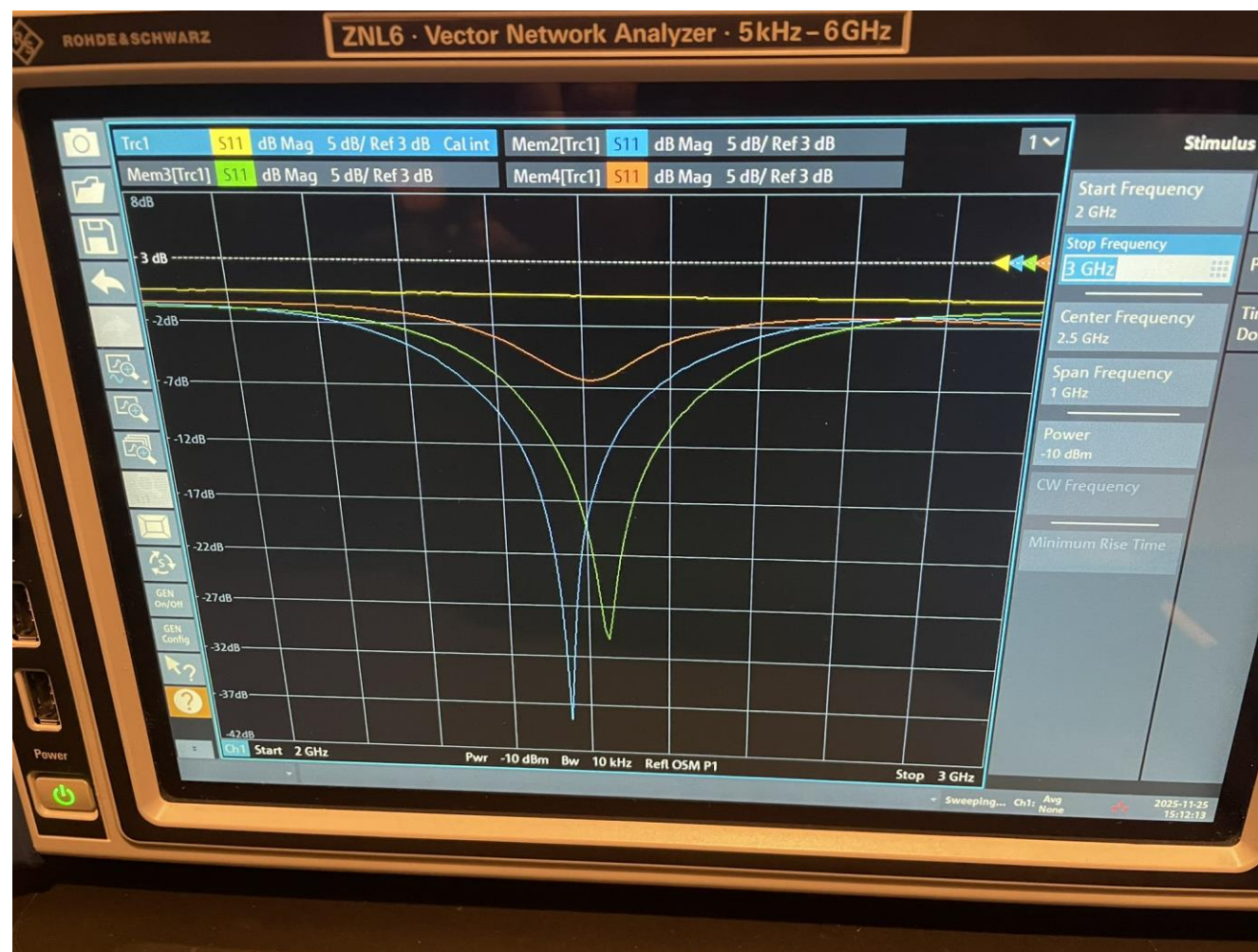


Figure 5: Measurement of inductance increase of a PCB coil

Results:	PCB coil	PCB coil + 0,1 mm WE-FSFS 354	PCB coil + 0,2 mm WE-FSFS 354	PCB coil + 0,3 mm WE-FSFS 354
Inductance (μH)	8,4	12,8	13,6	14,2

COMMUNICATION ANTENNAS LIVE DEMO

Live demo



QUESTIONS AND ANSWERS

