



Microchip 433MHz PCB Antenna Testing

Made by Jason Lin
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Antenna Measurement Report

Model	ATA8510
Antenna manufacturer	Microchip
Applicant	Microchip 6 F., No. 24-2, Gongye E. 4th Rd., East Dist., Hsinchu City 30077, Taiwan
Manufacturer	Microchip 6 F., No. 24-2, Gongye E. 4th Rd., East Dist., Hsinchu City 30077, Taiwan
Antenna Type	PCB Loop Antenna
Max. Antenna Gain	-1.8dBi

Contents

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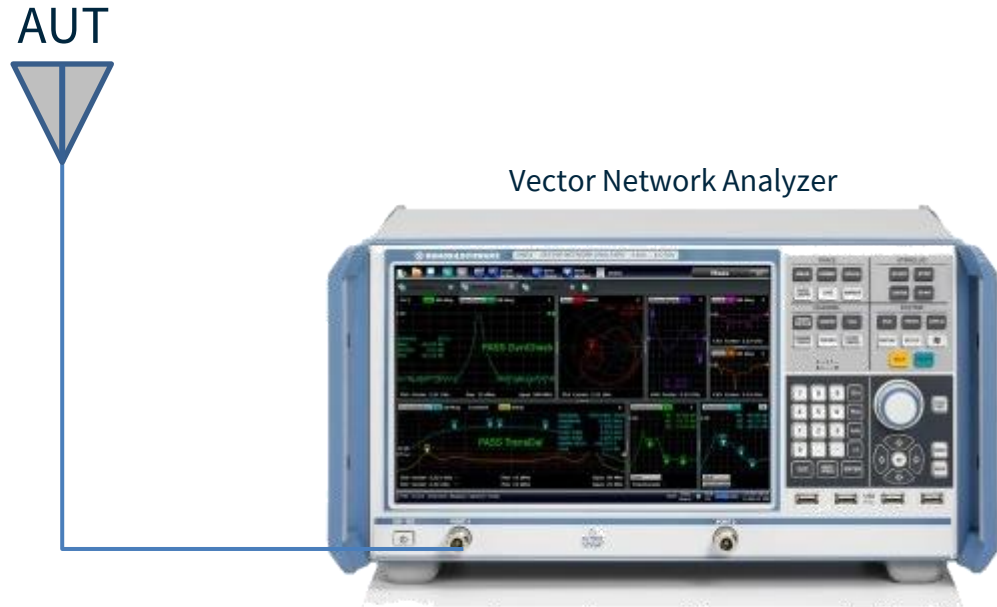
Summary Antenna Testing Result

		410MHz 410-430 MHz	433MHz 430-435 MHz	450MHz 450-470 MHz
Return Loss max for the freq. band	Free Space	-2.8	-12.2	-13.5
	On GND	-3.1	-10.3	-7.2
VSWR max for the freq. band	Free Space	6.3	1.6	1.5
	On GND	5.7	1.9	2.6
Efficiency avg. for the freq. band	Free Space	15.25	22.54	9.26
	On GND	7.25	14.06	4.53
Avg. Gain avg. for the freq. band	Free Space	-8.45	-6.47	-10.38
	On GND	-11.77	-8.53	-13.70
Peak Gain for Gtotal	Free Space	-1.60	-1.8	-2.63
	On GND	-4.61	-4.19	-6.88



Test Setup S_{11} / VSWR / Return Loss

AUT



Vector Network Analyzer



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AUT Photo /
Block Diagram



Test Setup S_{11} / VSWR / Return Loss

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Vector Network Analyzer

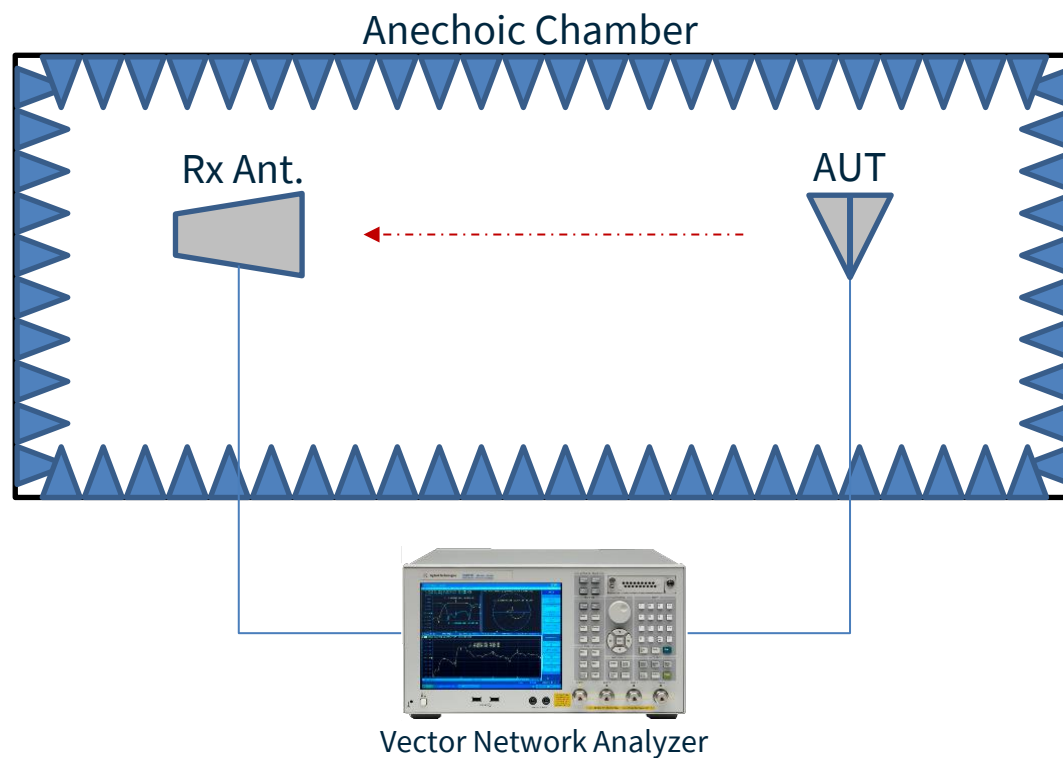


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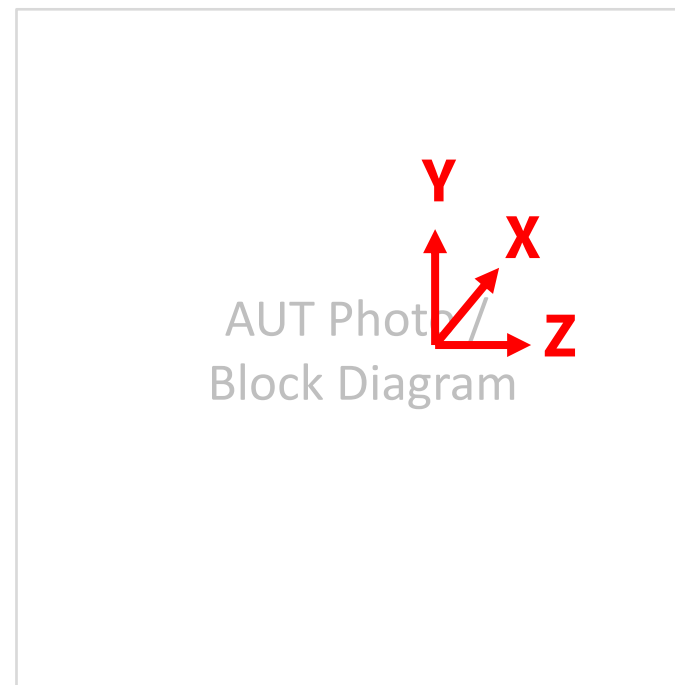
AUT Photo /
Block Diagram



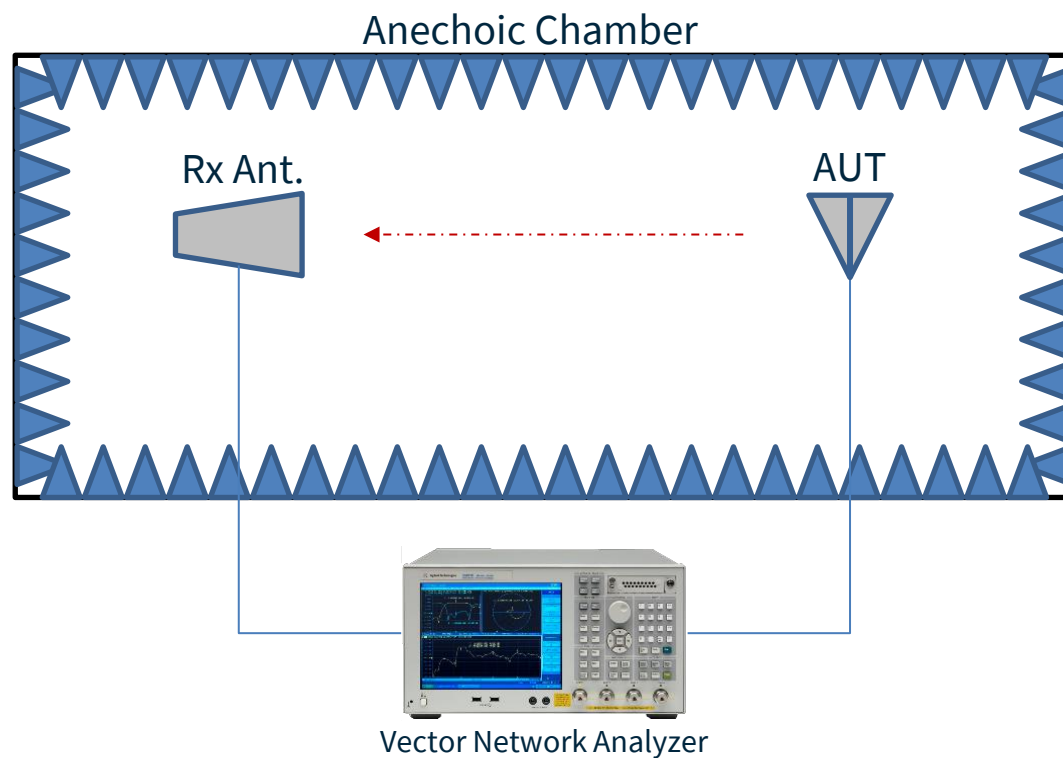
Test Setup Radiation Performance



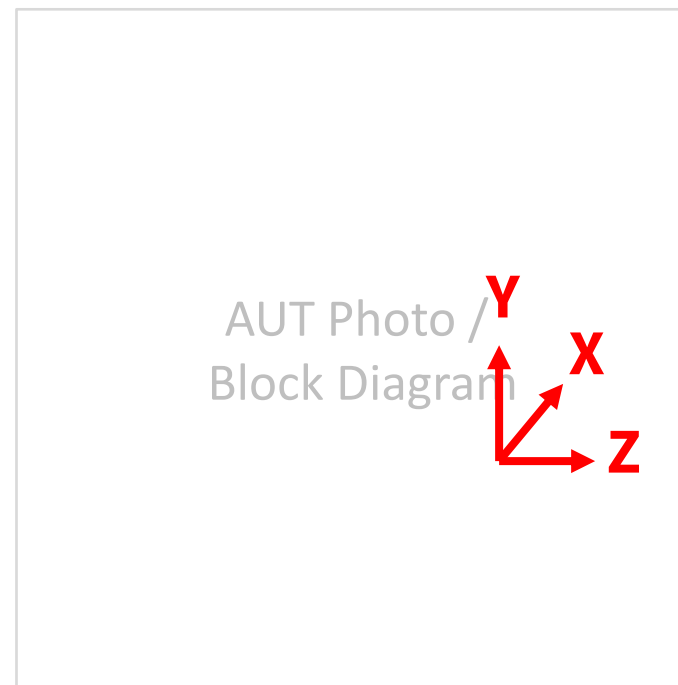
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Test Setup Radiation Performance

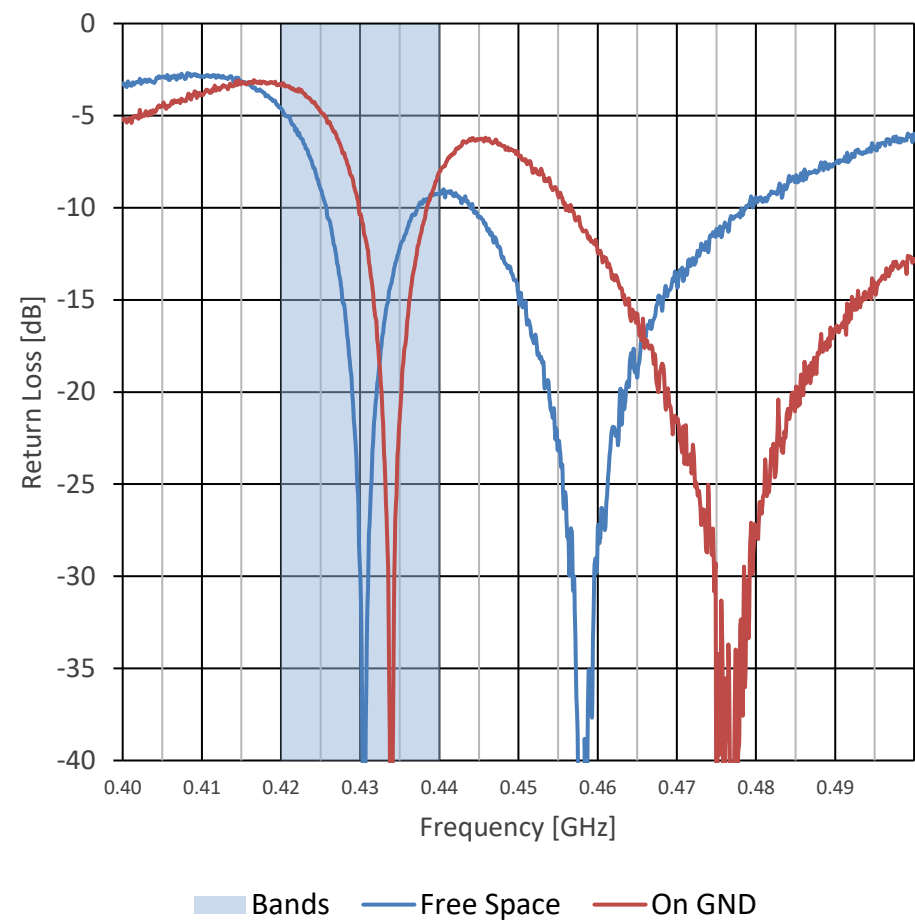


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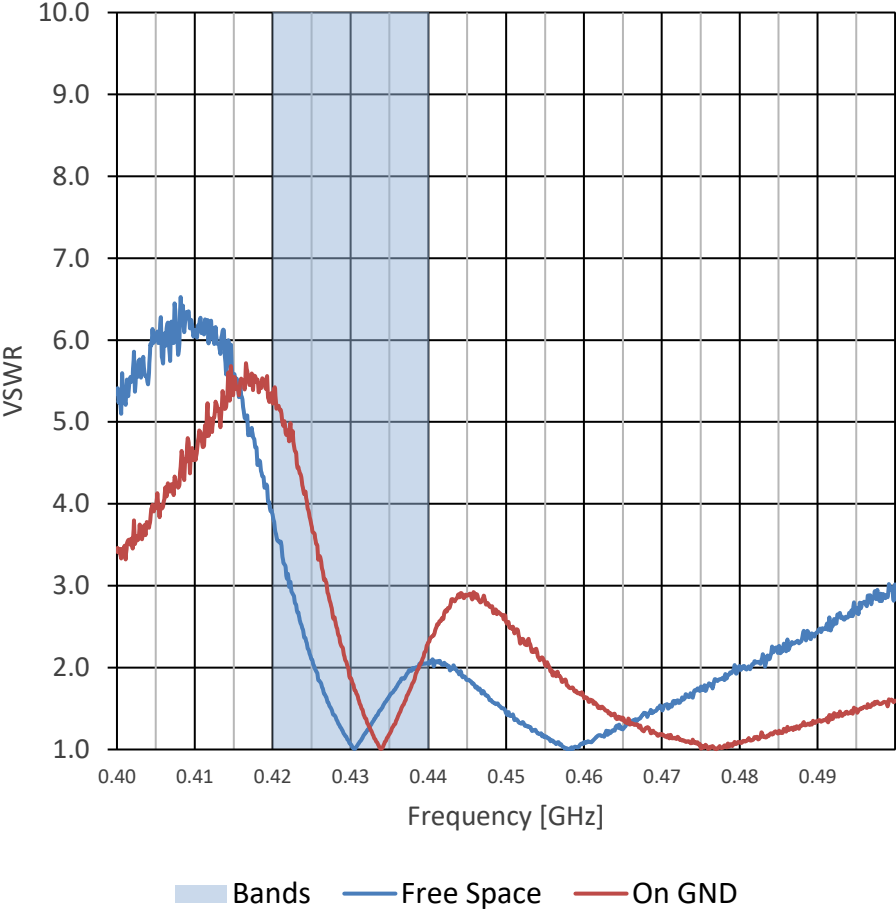
433MHz Antenna Testing

Return Loss 433MHz



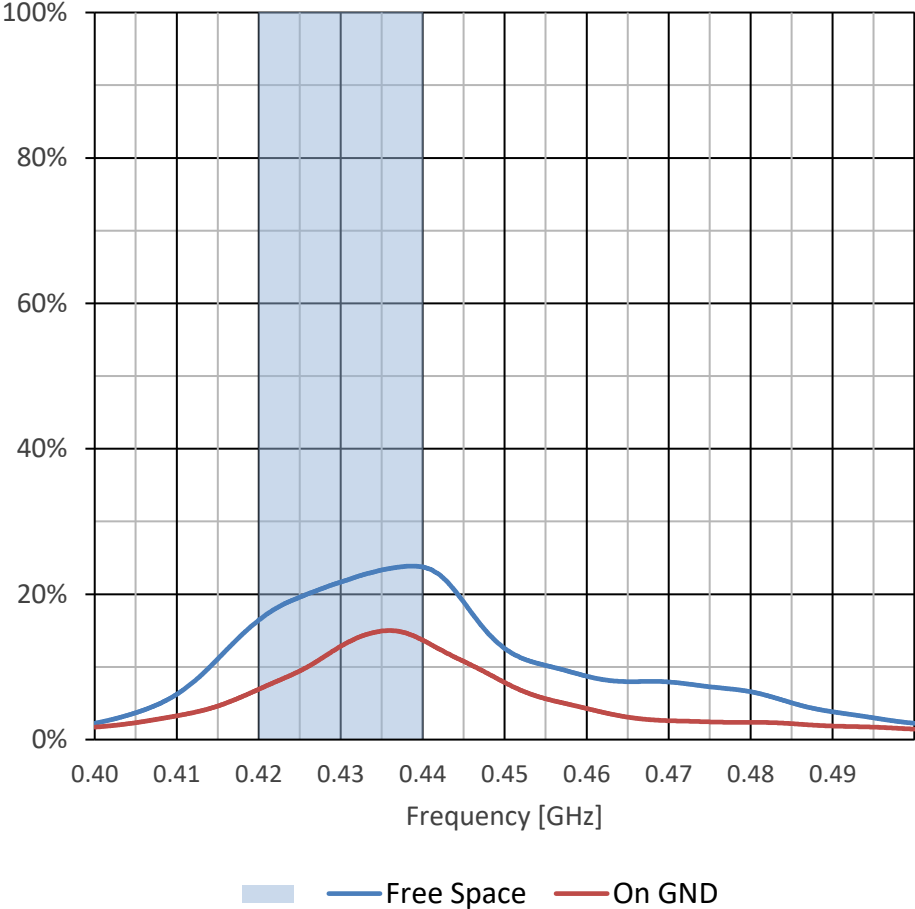
	Free Space			On GND		
Band	Max	Mean	Min	Max	Mean	Min
410MHz 410-430 MHz	-2.8	-7.1	-29.6	-3.1	-4.4	-10.4
433MHz 430-435 MHz	-12.2	-21.8	-51.0	-10.3	-21.3	-50.5
450MHz 450-470 MHz	-13.5	-22.5	-53.2	-7.2	-12.9	-22.3

VSWR 433MHz



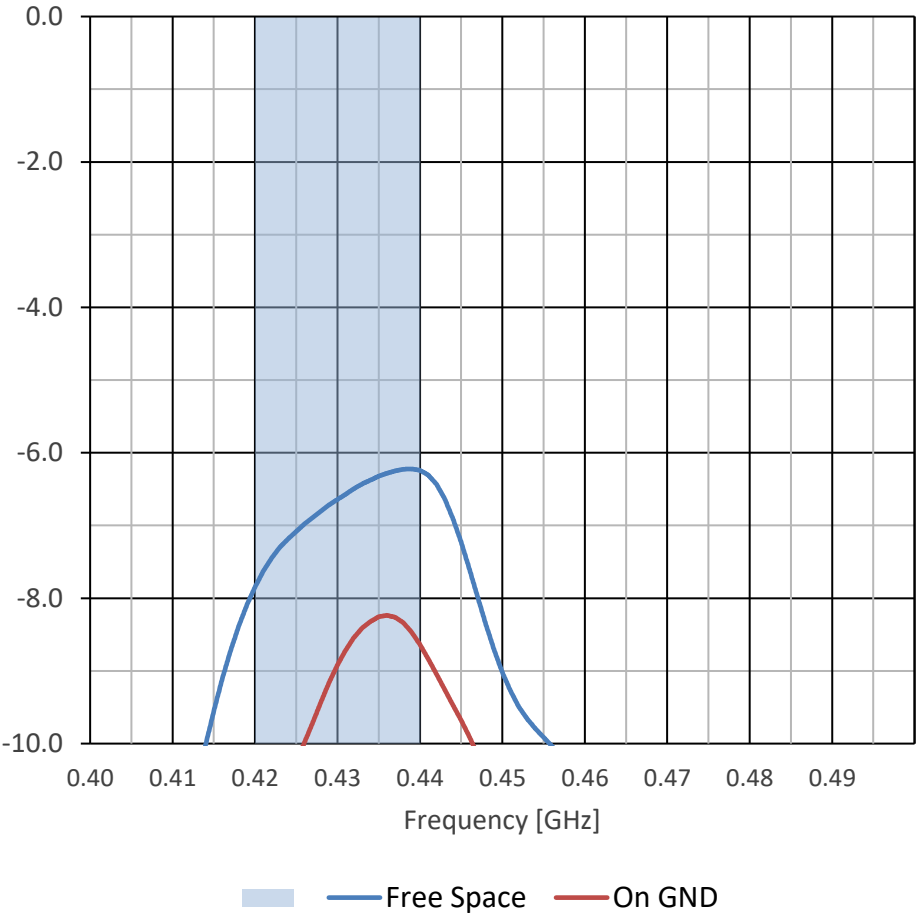
	Free Space			On GND		
Band	Max	Mean	Min	Max	Mean	Min
410MHz 410-430 MHz	6.27	3.81	1.07	5.72	4.49	1.87
433MHz 430-435 MHz	1.65	1.29	1.01	1.87	1.33	1.01
450MHz 450-470 MHz	1.54	1.24	1.01	2.56	1.73	1.17

Efficiency Antenna Testing



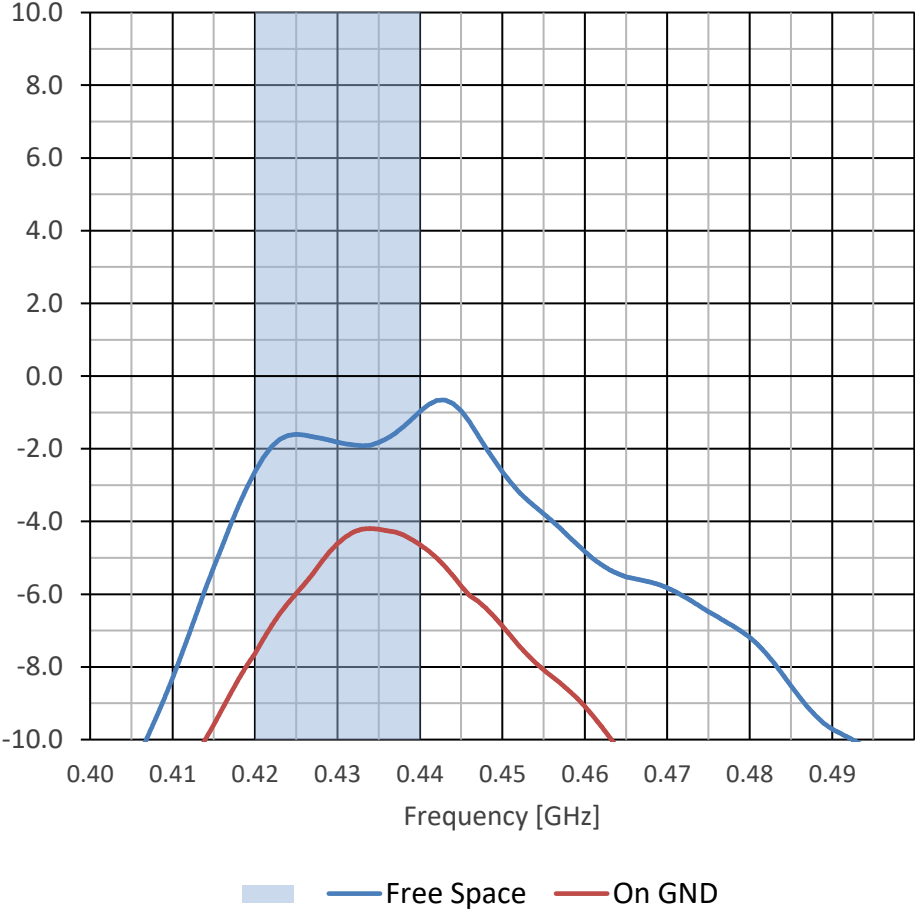
	Free Space			On GND		
Band	Max	Mean	Min	Max	Mean	Min
410MHz 410-430 MHz	21.7%	15.2%	6.2%	12.8%	7.3%	3.3%
433MHz 430-435 MHz	23.3%	22.5%	21.7%	14.9%	14.1%	12.8%
450MHz 450-470 MHz	12.5%	9.3%	7.9%	7.9%	4.5%	2.6%

Average Gain Antenna Testing



	Free Space			On GND		
Band	Max	Mean	Min	Max	Mean	Min
410MHz 410-430 MHz	-6.6 dB	-8.5 dB	-12.0 dB	-8.9 dB	-11.8 dB	-14.9 dB
433MHz 430-435 MHz	-6.3 dB	-6.5 dB	-6.6 dB	-8.3 dB	-8.5 dB	-8.9 dB
450MHz 450-470 MHz	-9.0 dB	-10.4 dB	-11.0 dB	-11.1 dB	-13.7 dB	-15.9 dB

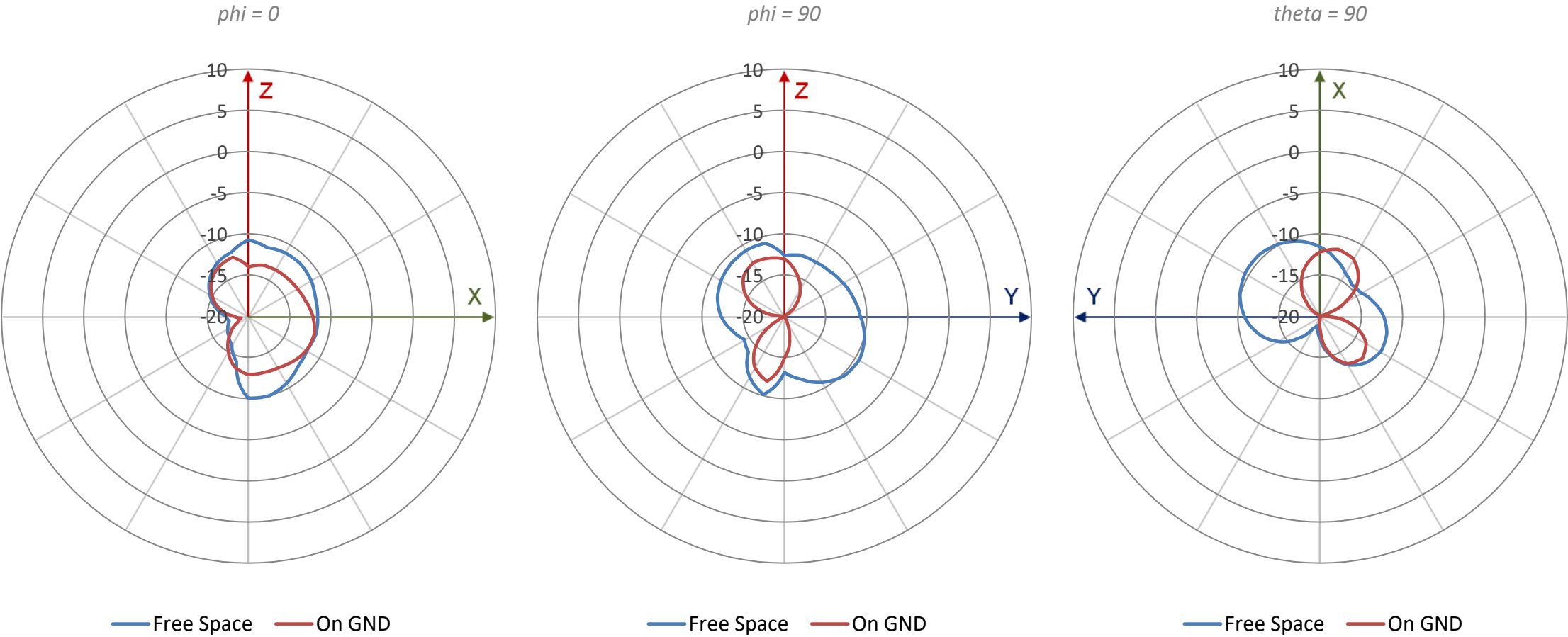
Peak Gain Antenna Testing for Gtotal



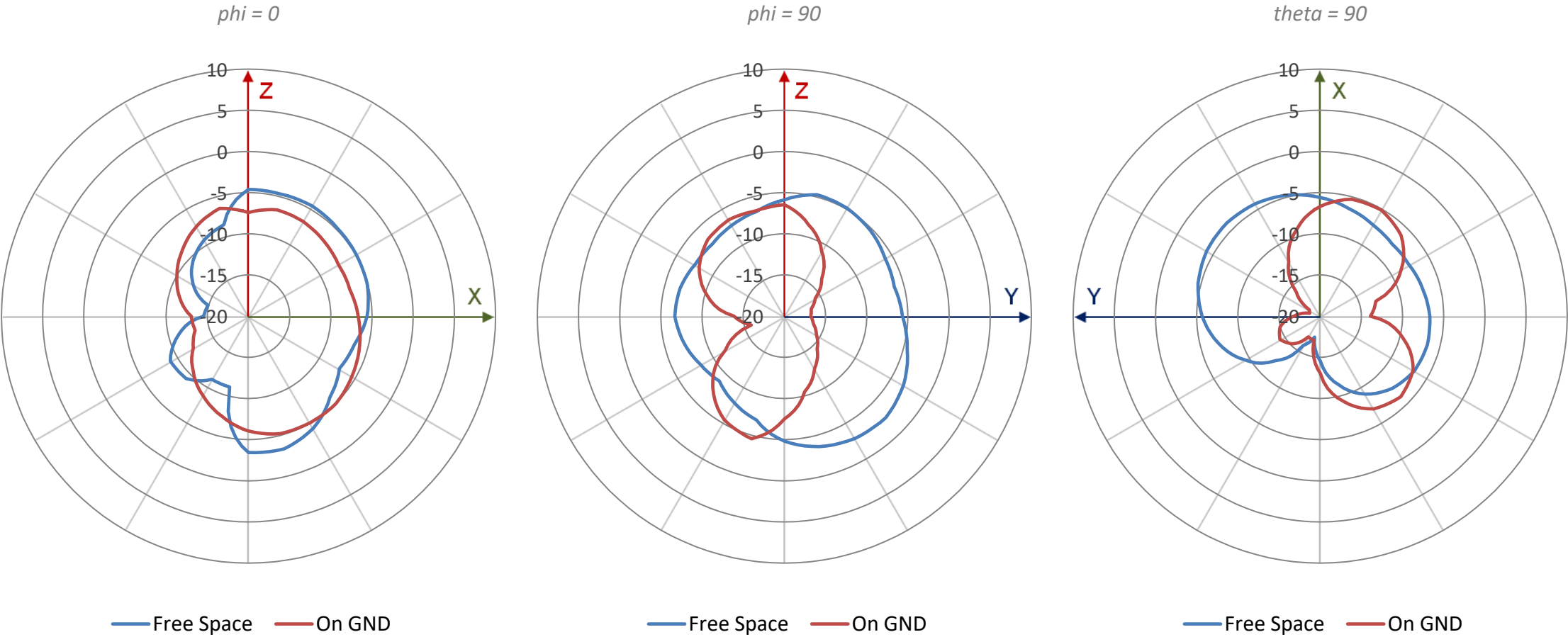
	Free Space			On GND		
Band	Max	Mean	Min	Max	Mean	Min
410MHz 410-430 MHz	-1.6 dBi	-3.6 dBi	-8.3 dBi	-4.6 dBi	-7.8 dBi	-11.3 dBi
433MHz 430-435 MHz	-1.8 dBi	-1.9 dBi	-1.9 dBi	-4.2 dBi	-4.3 dBi	-4.6 dBi
450MHz 450-470 MHz	-2.6 dBi	-4.6 dBi	-5.8 dBi	-6.9 dBi	-9.2 dBi	-11.7 dBi



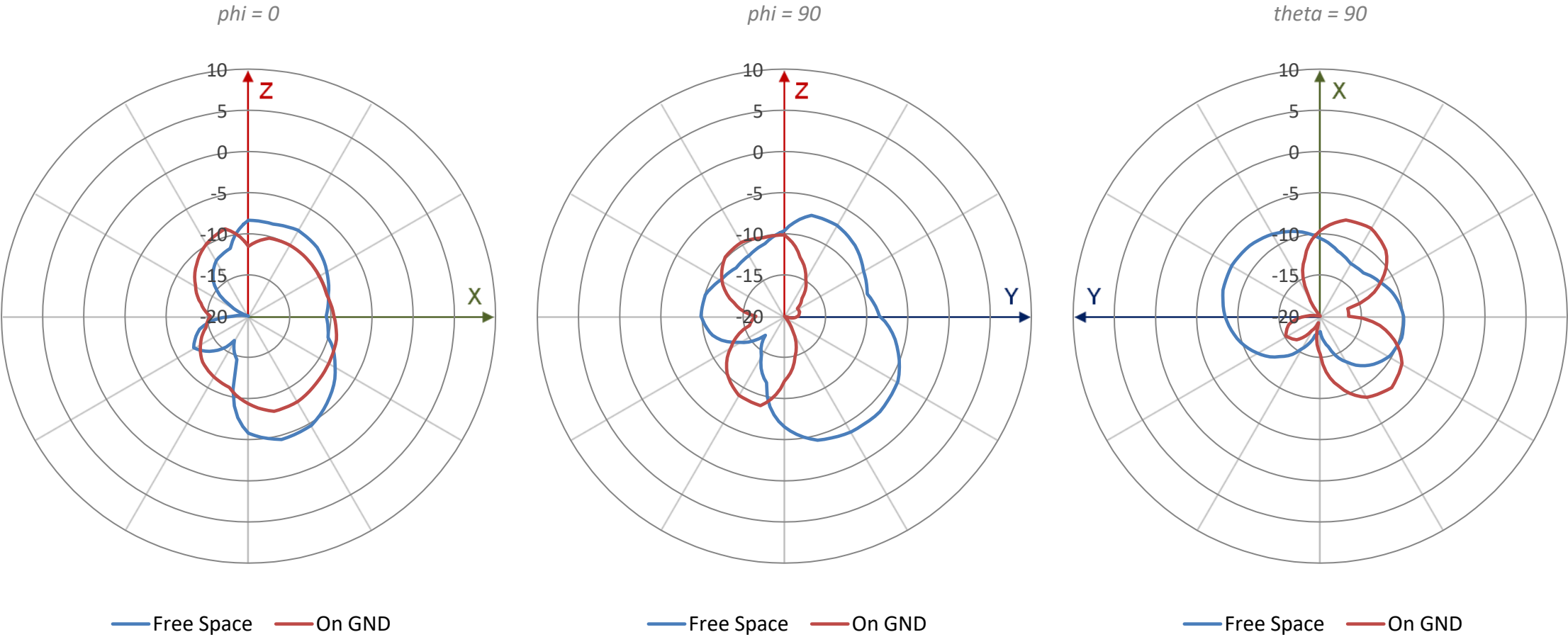
Radiation Pattern Antenna Testing @410MHz for Gtotal



Radiation Pattern Antenna Testing @433MHz for Gtotal



Radiation Pattern Antenna Testing @450MHz for Gtotal



Antenna Dimension

All the dimensions are in millimeter

