Tri Plus Grupa
Alloyfusion v3
Antenna Measurements
01/07/2024
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LTE MAIN ANTENNA SUMMARY

LTE Main Antenna	Low Bands	High Bands
Frequency (MHz)	699 - 894	1710 – 2200
Return Loss (dB)	-14.2 – -3.9	-6.5 – -1.5
Efficiency (dB)	-2.7 – -5.4	-2.6 – -5.4
Gain, MAX (dBi)	0.75	0.43

LTE DIV ANTENNA SUMMARY

LTE Main Antenna	Low Bands	High Bands
Frequency (MHz)	699 - 894	1710 – 2200
Return Loss (dB)	-6.7 – -3.2	-6.4 – -2.2
Efficiency (dB)	-4.8 – -7.5	-3.8 – -7.4
Gain, MAX (dBi)	- 2.73	- 2.18

WiFi BTANTENNA SUMMARY

BT WiFi Antenna	2.4 GHz Band	5 GHz Band
Frequency (MHz)	2400 – 2485	5160 – 5885
Return Loss (dB)	-9.4 – -8.9	-5.0 – -3.5
Efficiency (dB)	-2.9 – -3.1	-1.8 – -3.1
Gain, MAX (dBi)	2.45	2.79

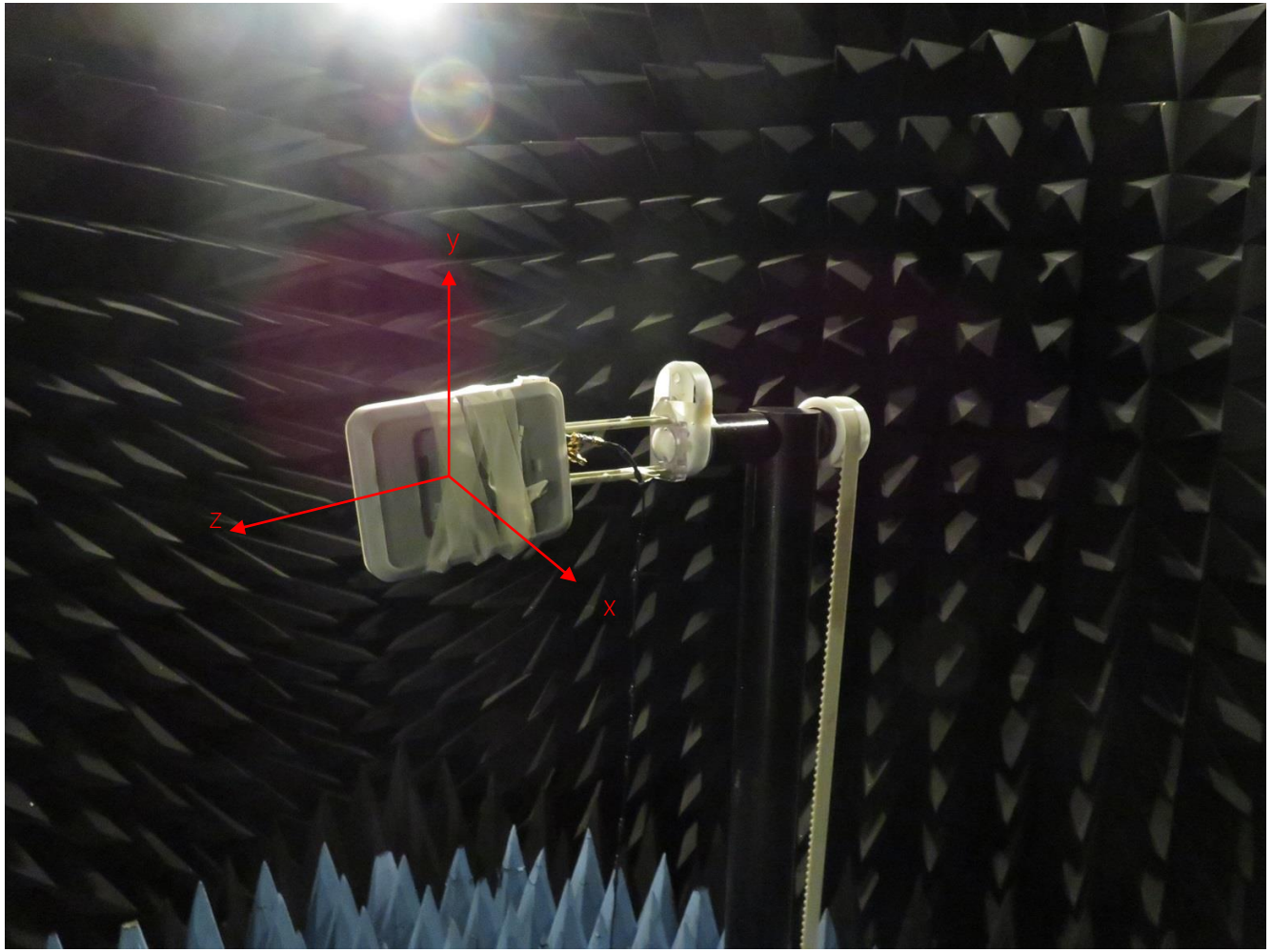
THREAD ANTENNA SUMMARY

Thread Antenna	2.4 GHz Band
Frequency (MHz)	2400 – 2485
Return Loss (dB)	-10.5 – -7.8
Efficiency (dB)	-2.1 – -2.9
Gain, MAX (dBi)	2.58

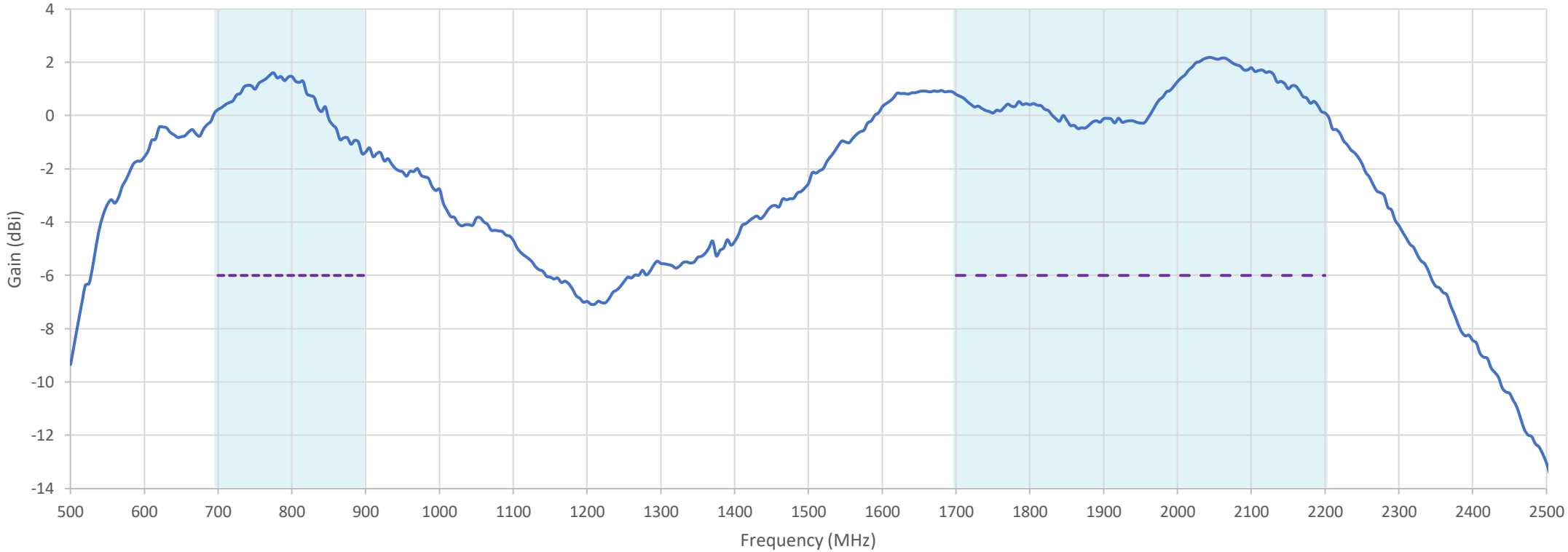
Z-WAVE ANTENNA SUMMARY

Z-WAVE Antenna	916 MHz Band
Frequency (MHz)	916
Return Loss (dB)	-15.6
Efficiency (dB)	-3.4
Gain, MAX (dBi)	-0.99 @ 916 MHz

MEASUREMENT VECTORS

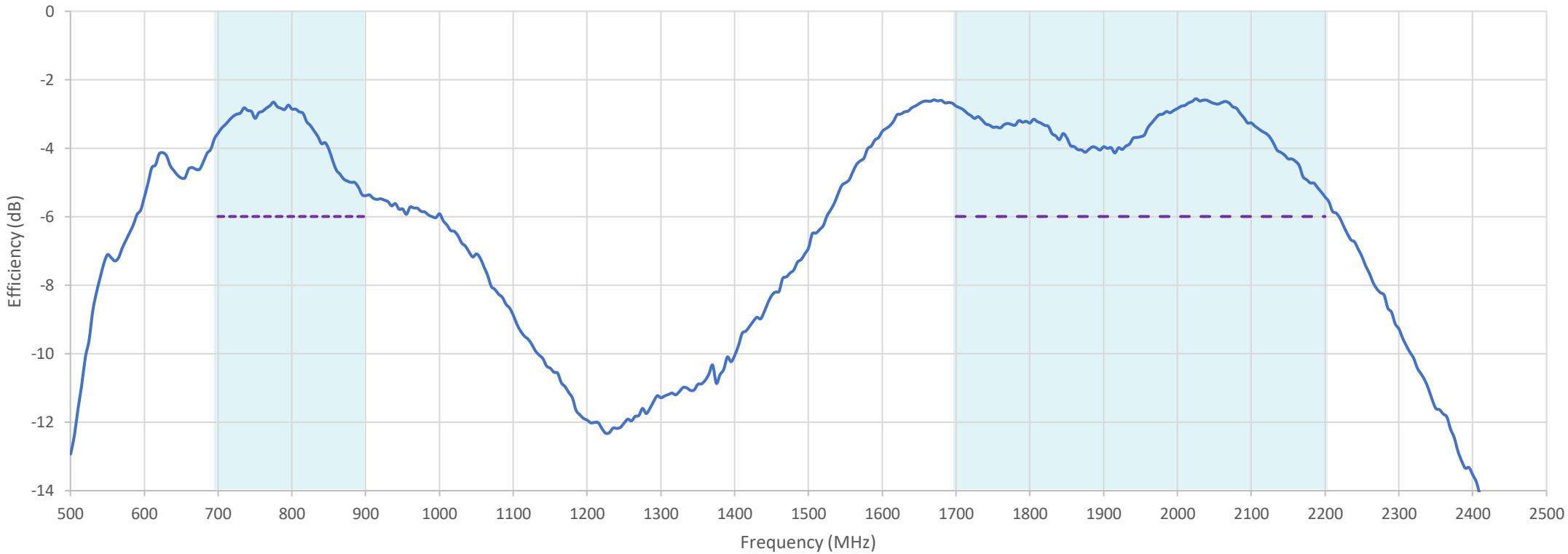


LTE MAIN MEASURED GAIN



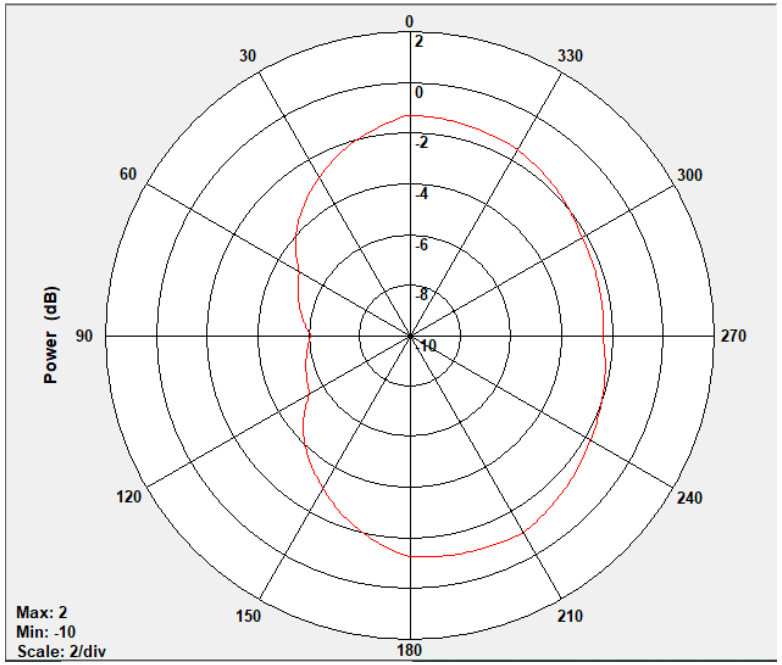
Shown: LTE frequencies 699 – 894 MHz and 1710 MHz – 2200 MHz

LTE MAIN MEASURED EFFICIENCY



Shown: LTE frequencies 699 – 894 MHz and 1710 MHz – 2200 MHz

LTE MAIN ANTENNA 2D PATTERNS, 775MHz



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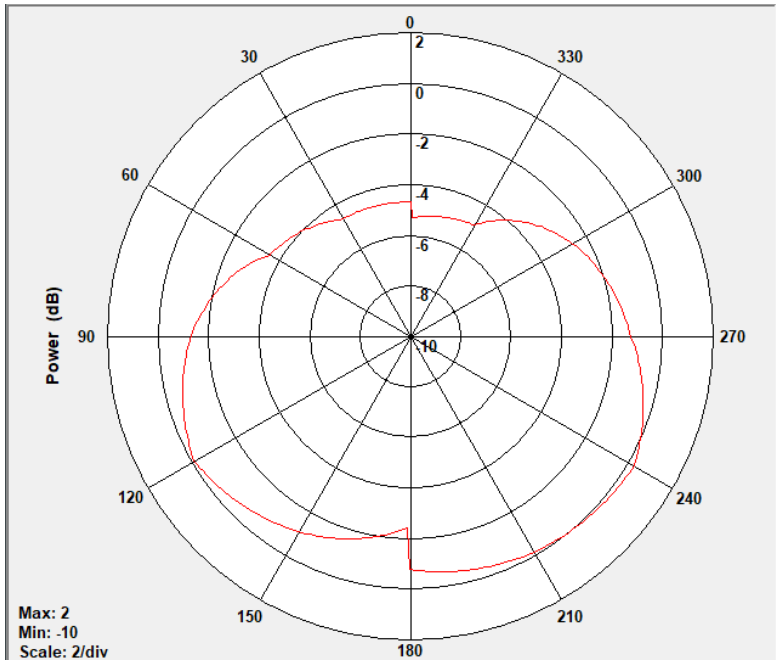

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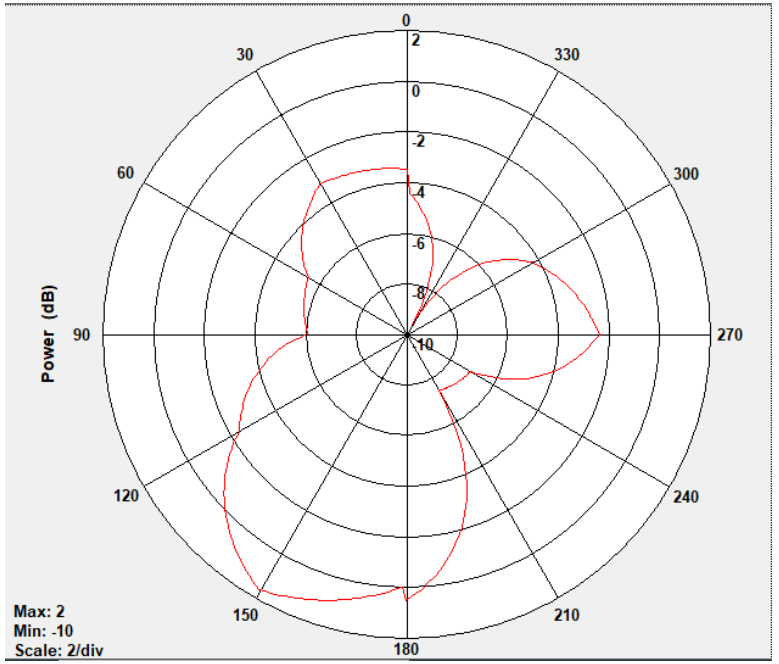
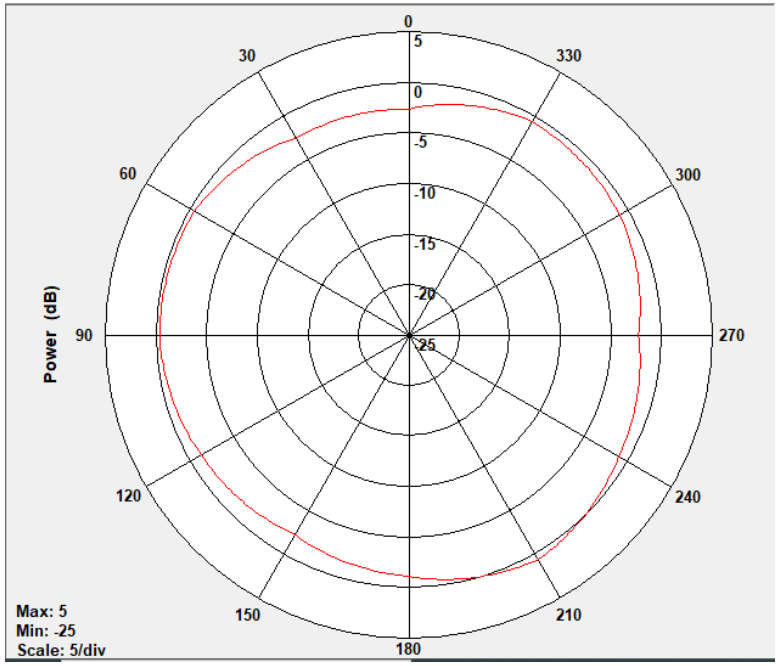


Phi 90 (YZ-plane)

LTE MAIN ANTENNA 2D PATTERNS, 1785MHz



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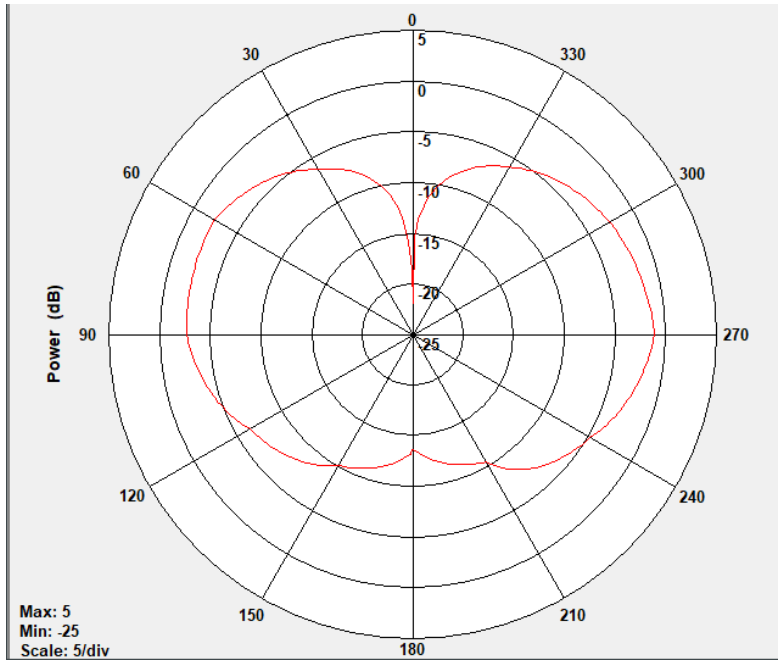

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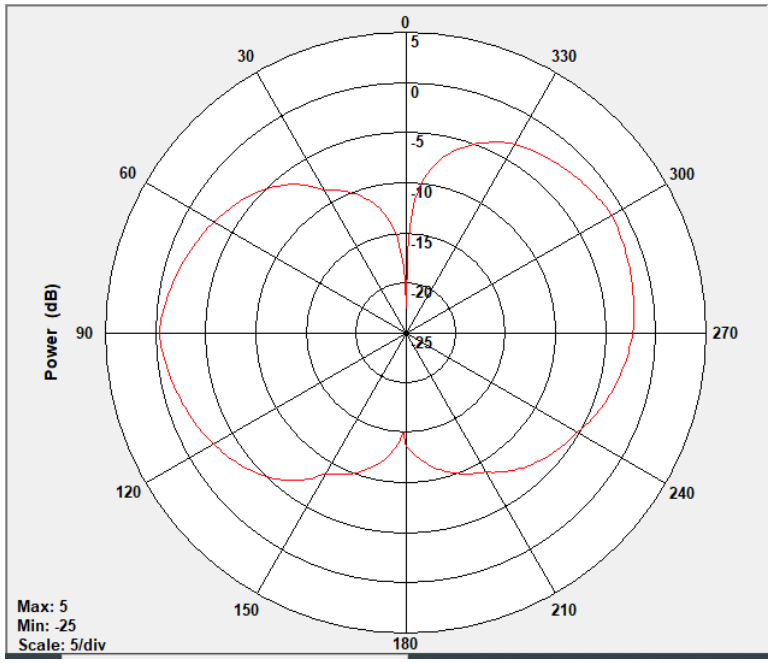

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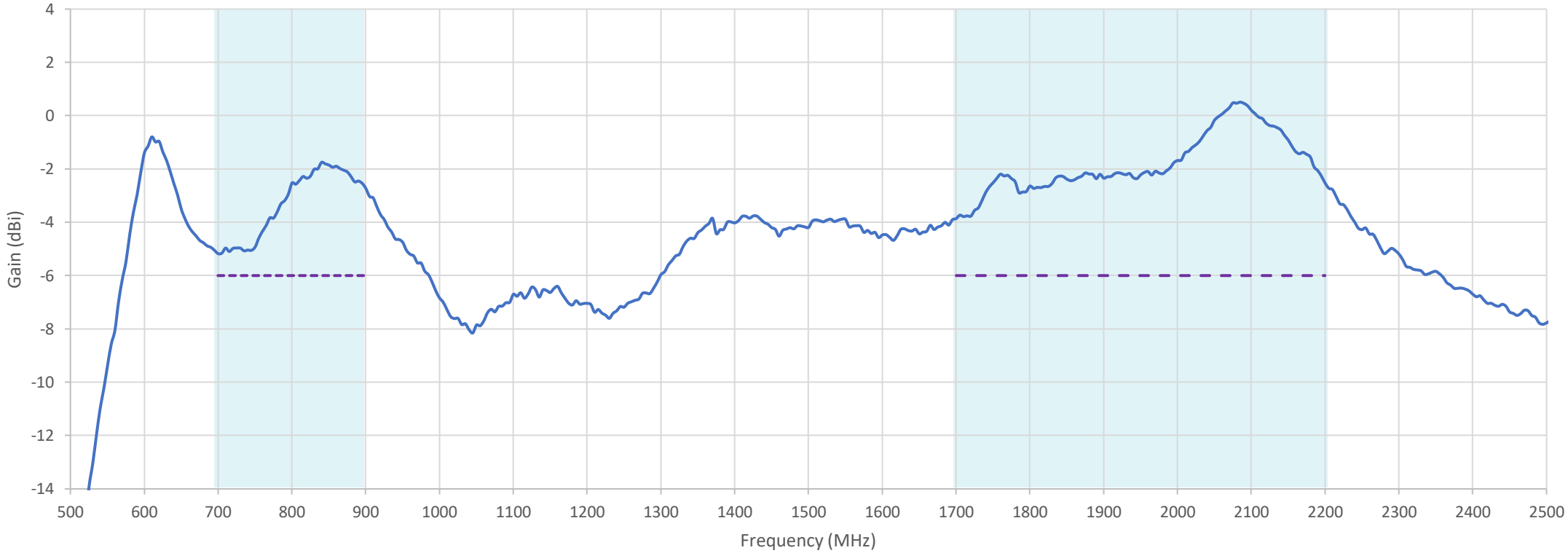
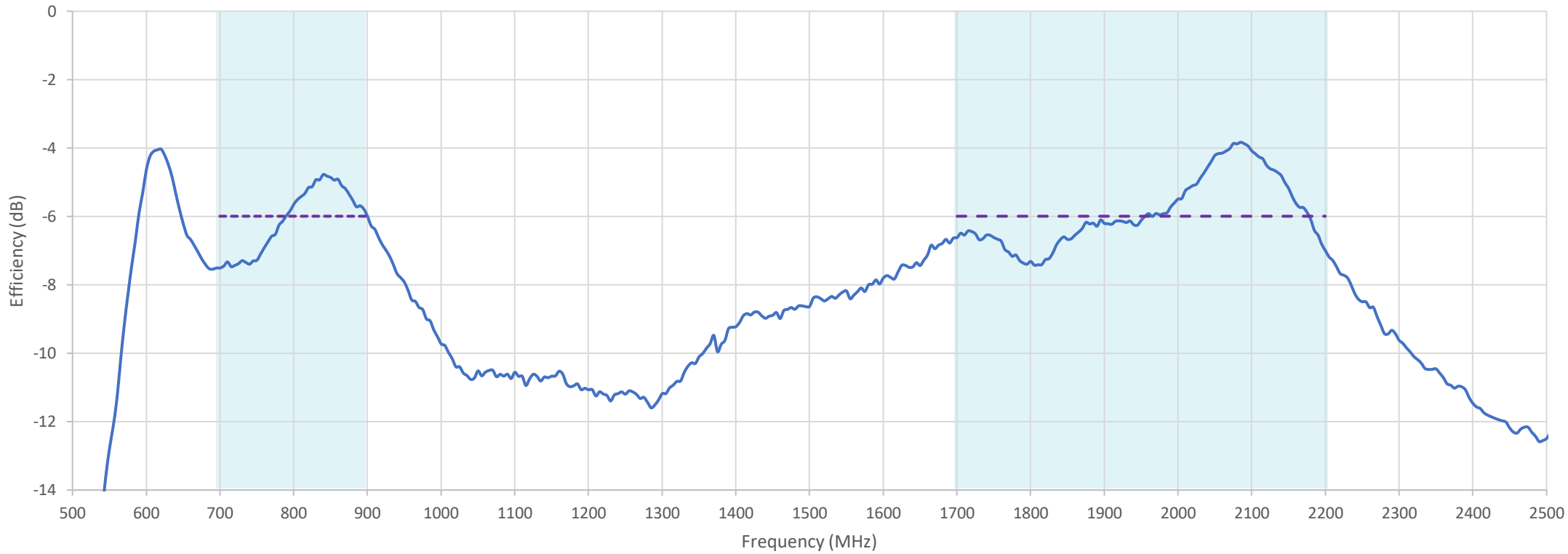
LTE DIV MEASURED GAIN



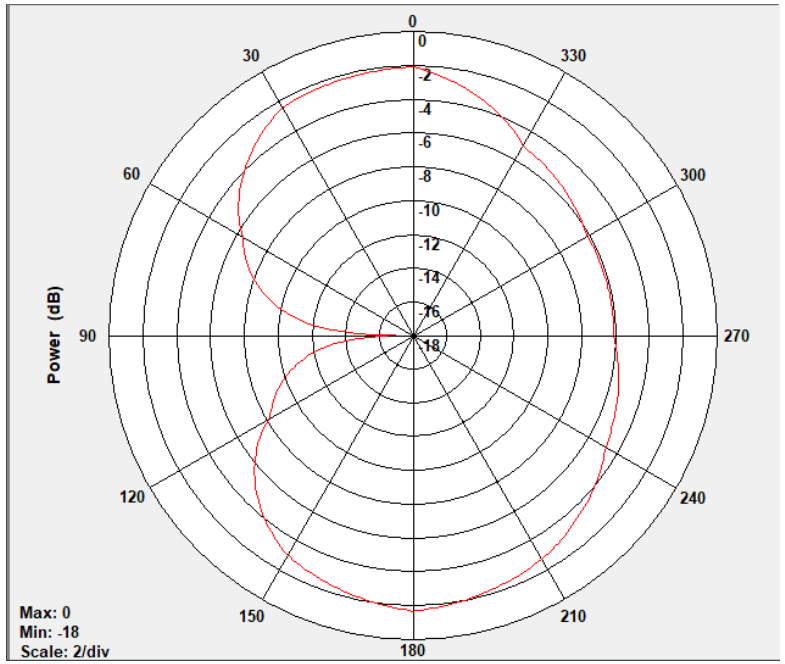
Shown: LTE frequencies 699 – 894 MHz and 1710 MHz – 2200 MHz

LTE DIV MEASURED EFFICIENCY



Shown: LTE frequencies 699 – 894 MHz and 1710 MHz – 2200 MHz

LTE DIV ANTENNA 2D PATTERNS, 840MHz



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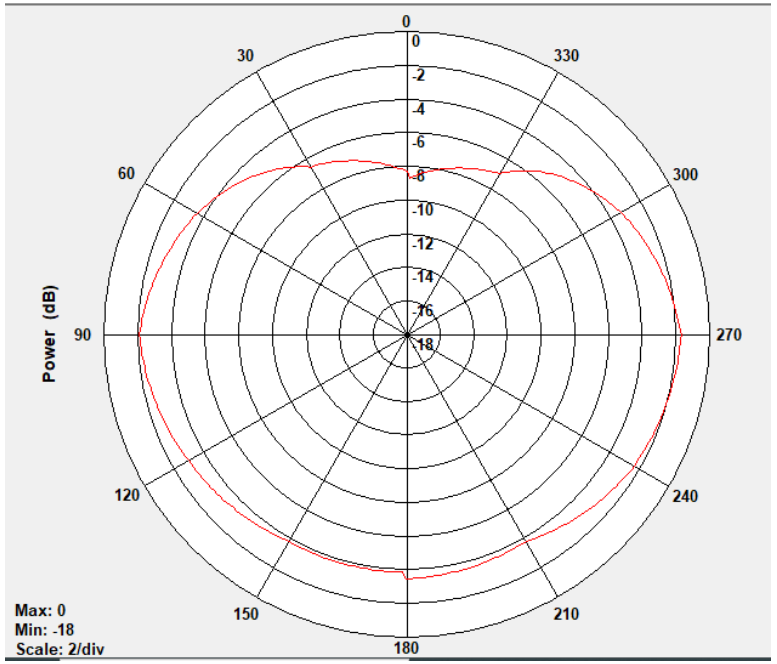

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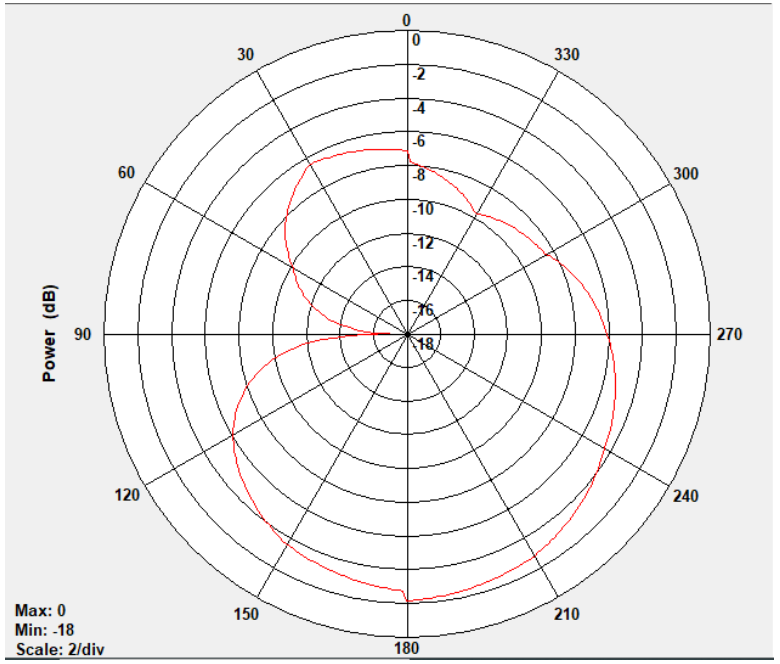

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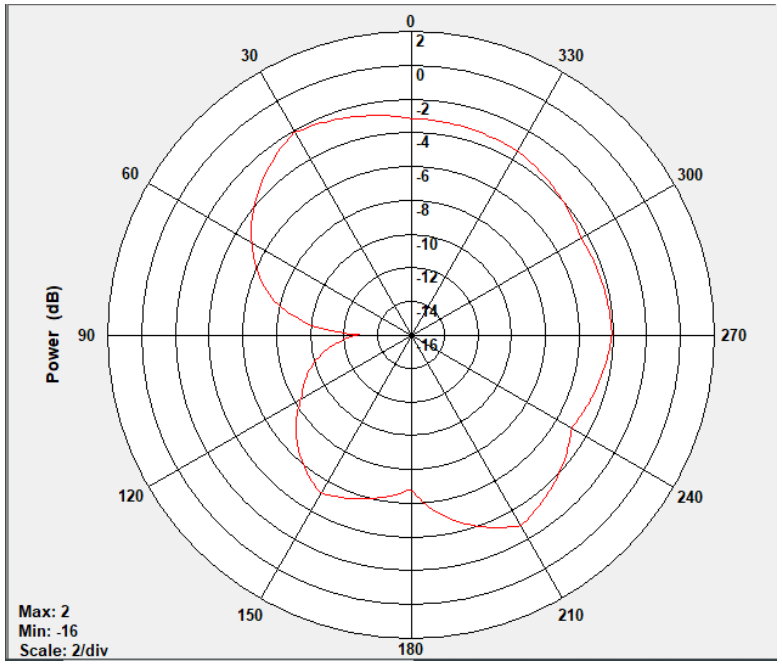
LTE DIV ANTENNA 2D PATTERNS, 2085MHz



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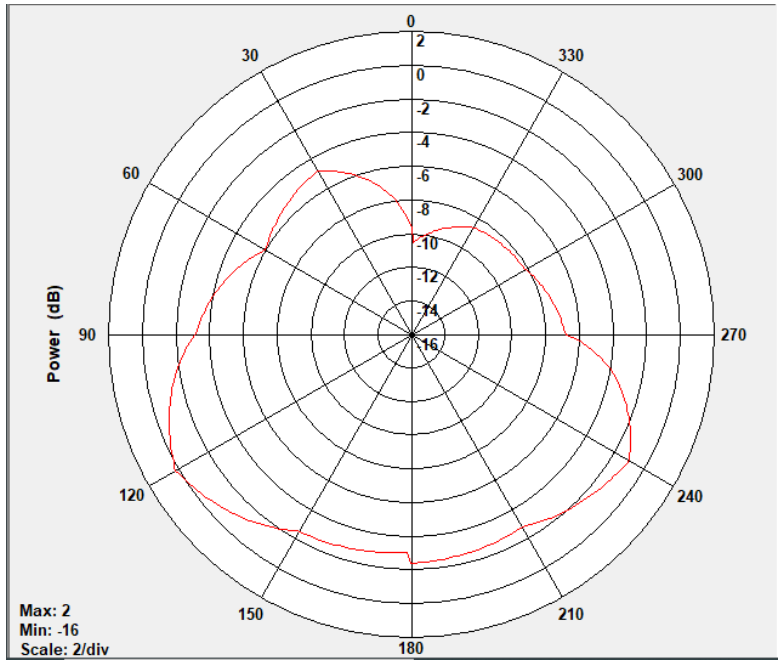

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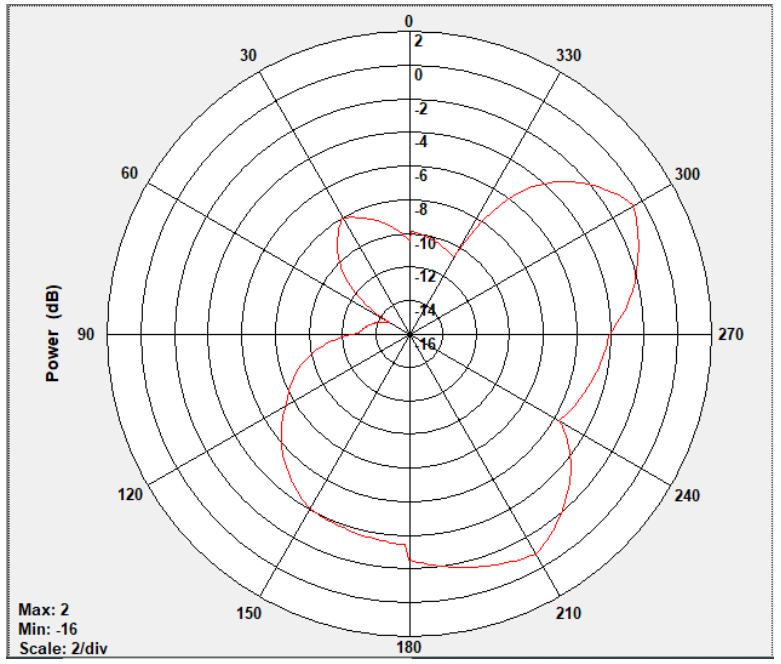
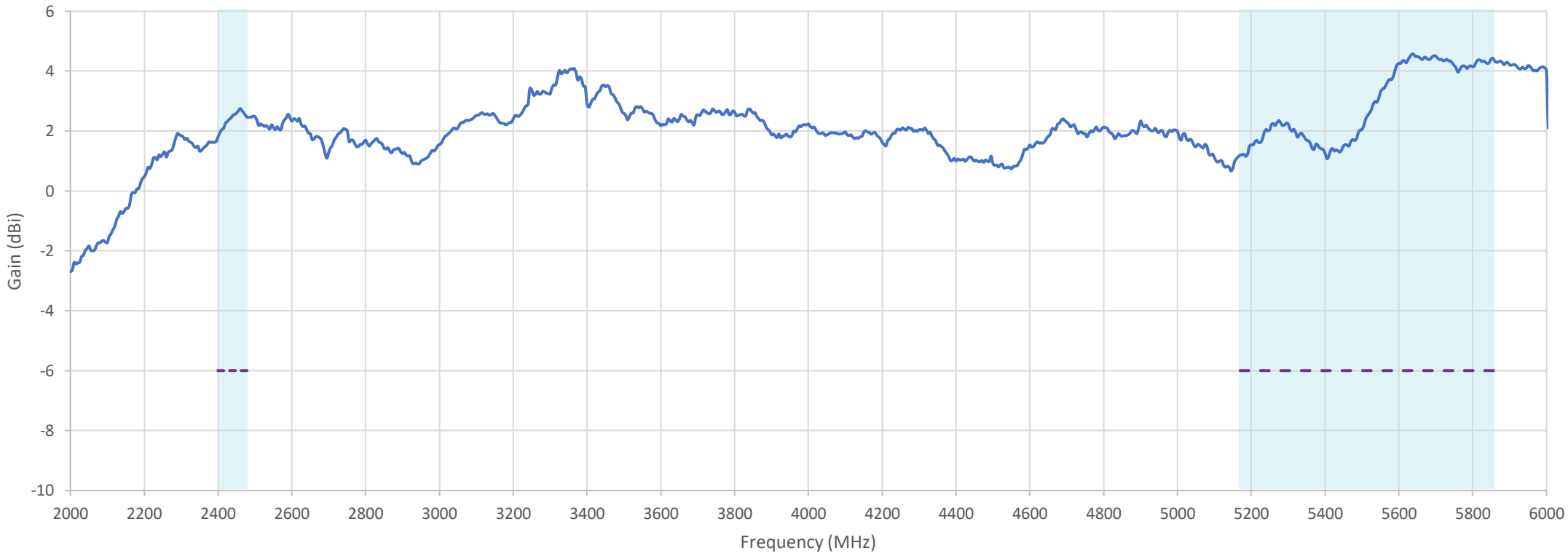


Phi 90 (YZ-plane)

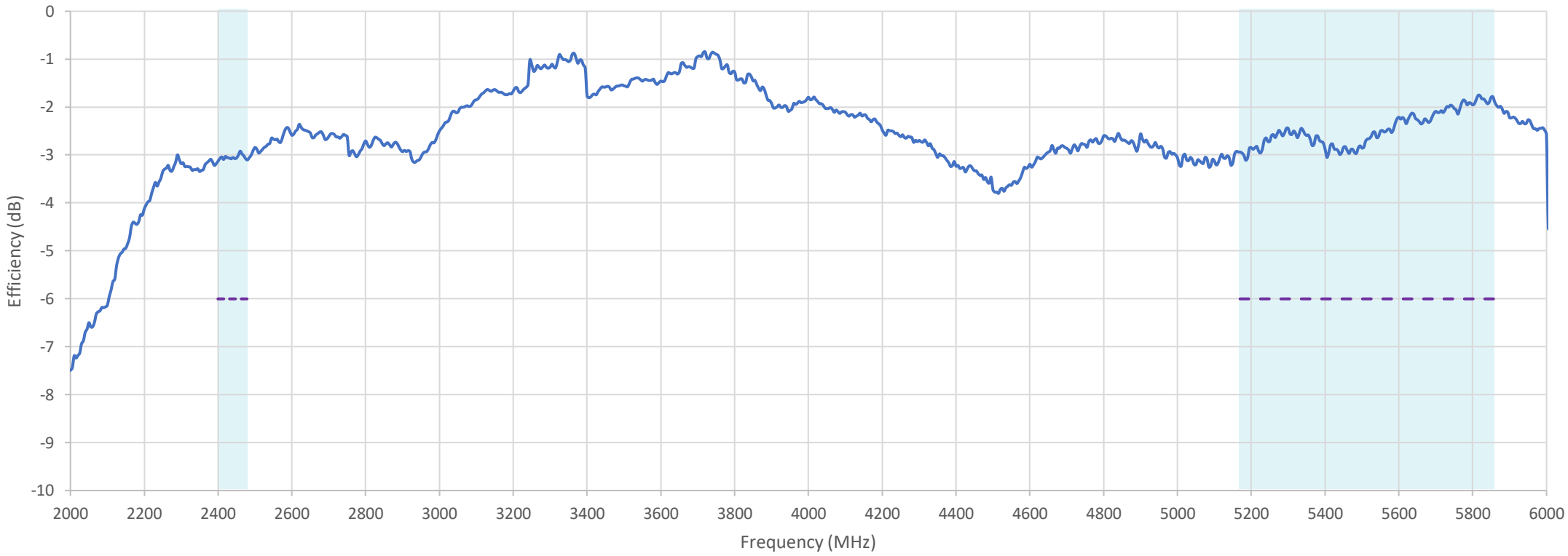
WiFi MEASURED GAIN



Shown: 2.4GHz and 5GHz WiFi bands

WiFi Antenna — 2.4GHz Band — 5GHz Band

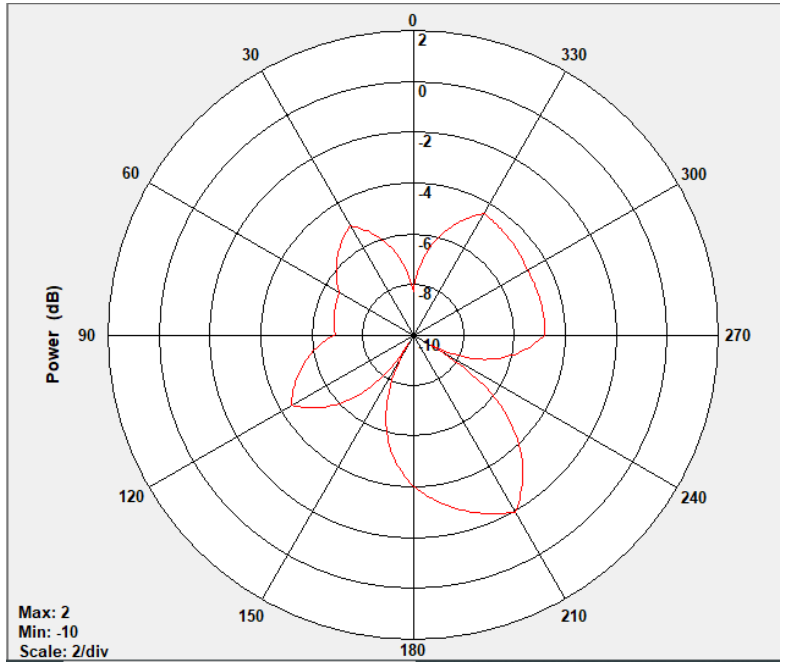
WiFi MEASURED EFFICIENCY



Shown: 2.4GHz and 5GHz WiFi bands

WiFi Antenna — 2.4GHz Band — 5GHz Band

WiFi ANTENNA 2D PATTERNS, 2460MHz



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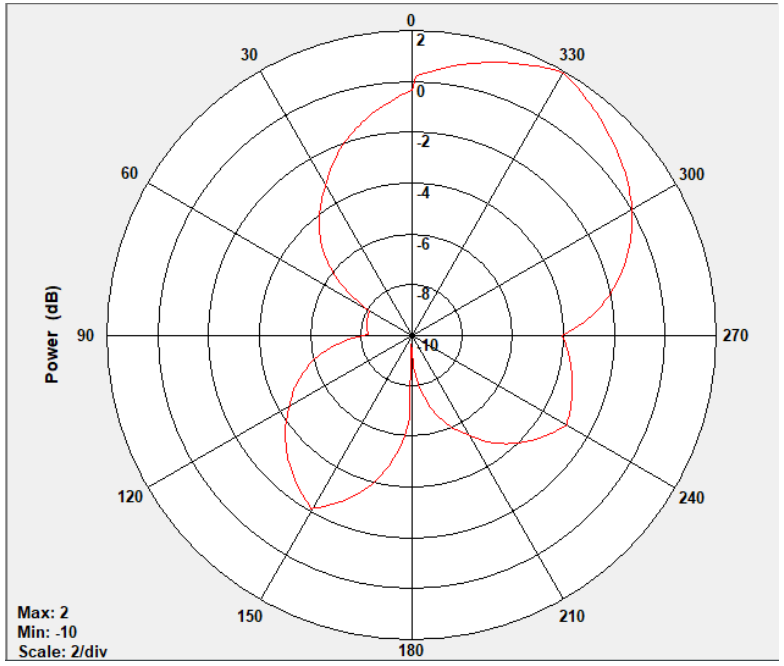

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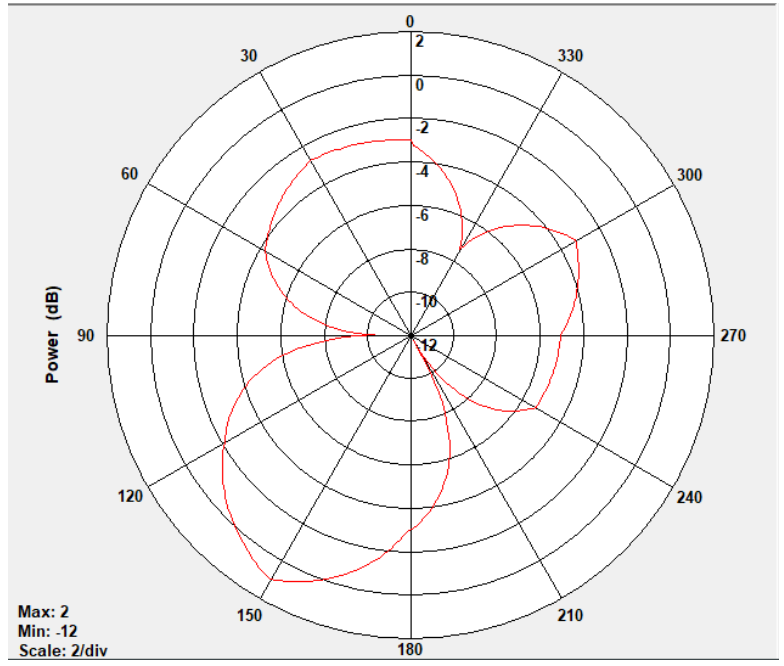
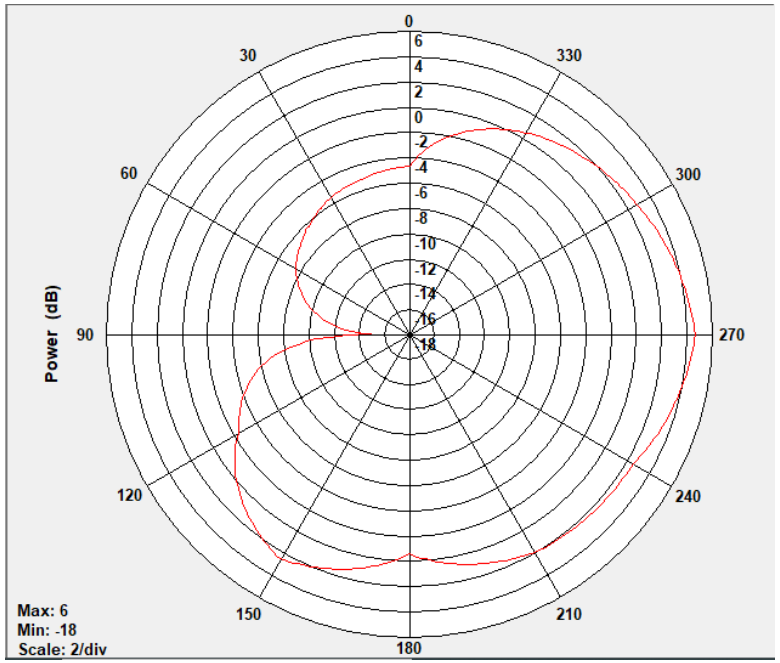
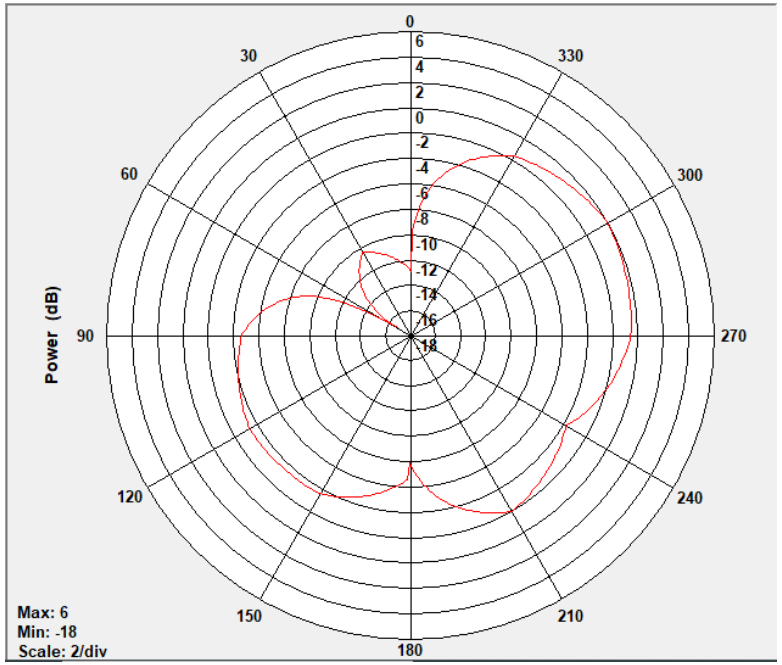


Phi 90 (YZ-plane)

WiFi ANTENNA 2D PATTERNS, 5635MHz



Theta 0 (XY-plane)



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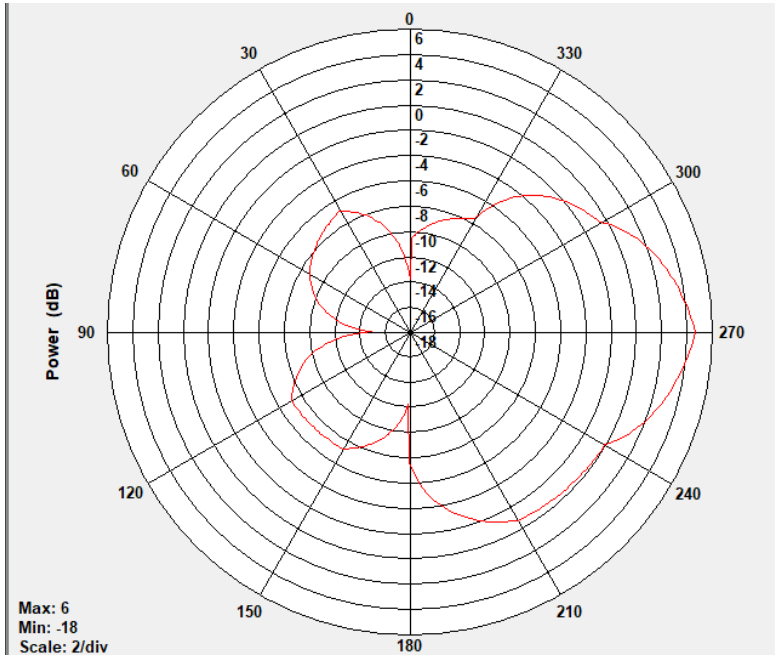
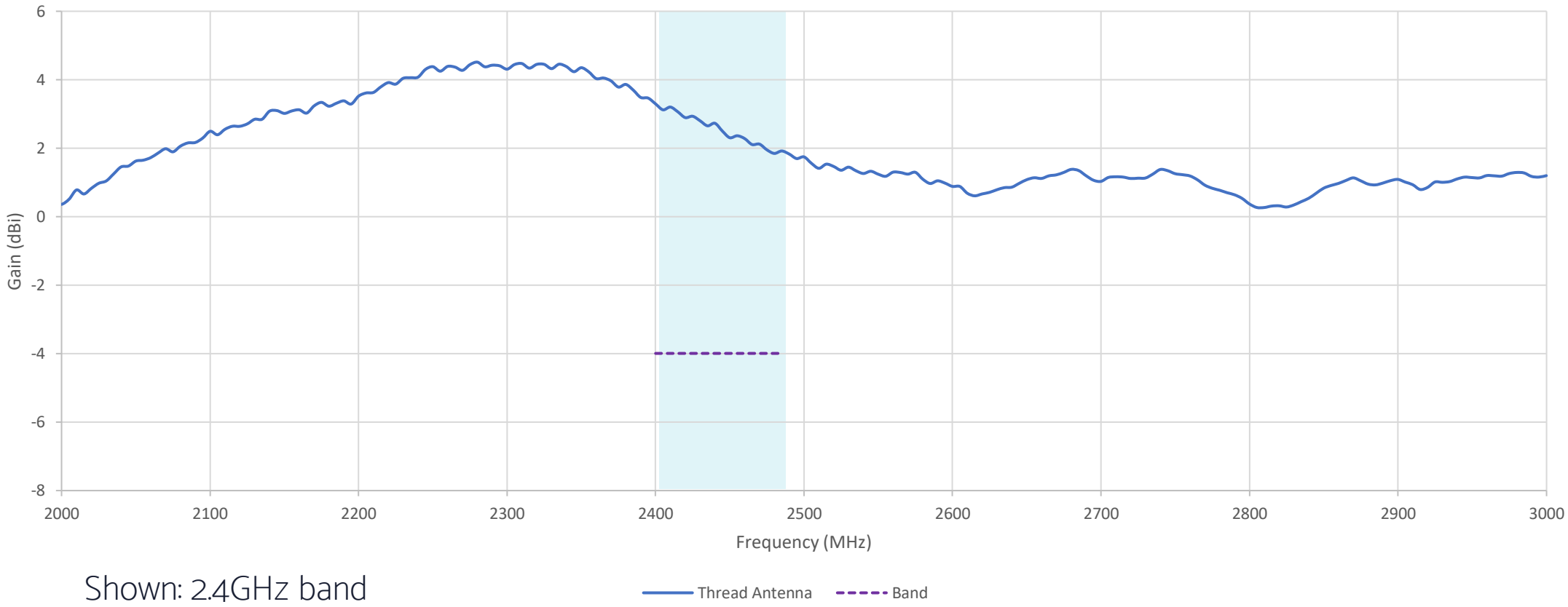


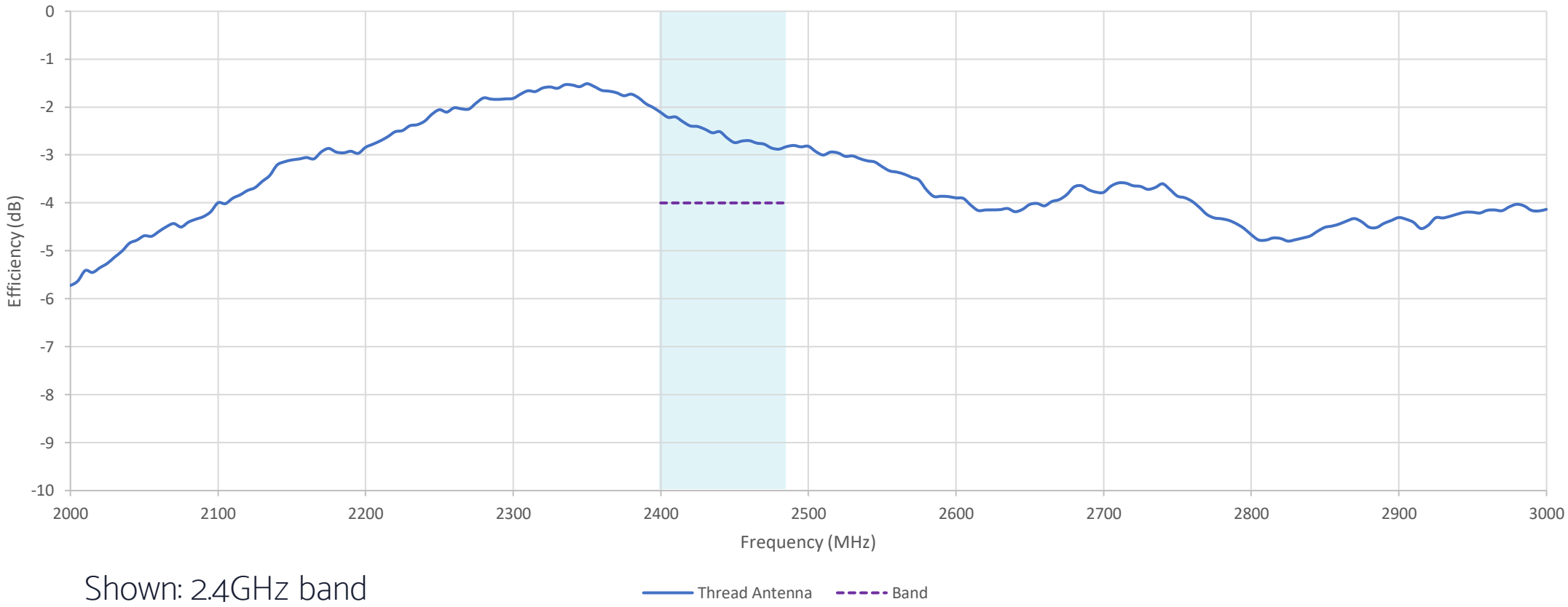
Phi 90 (YZ-plane)

THREAD MEASURED GAIN



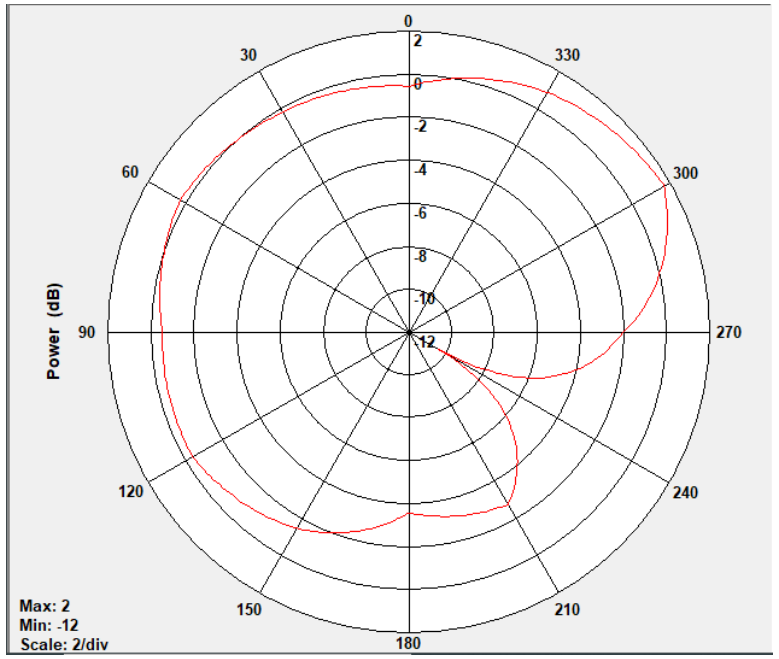
Shown: 2.4GHz band

THREAD MEASURED EFFICIENCY

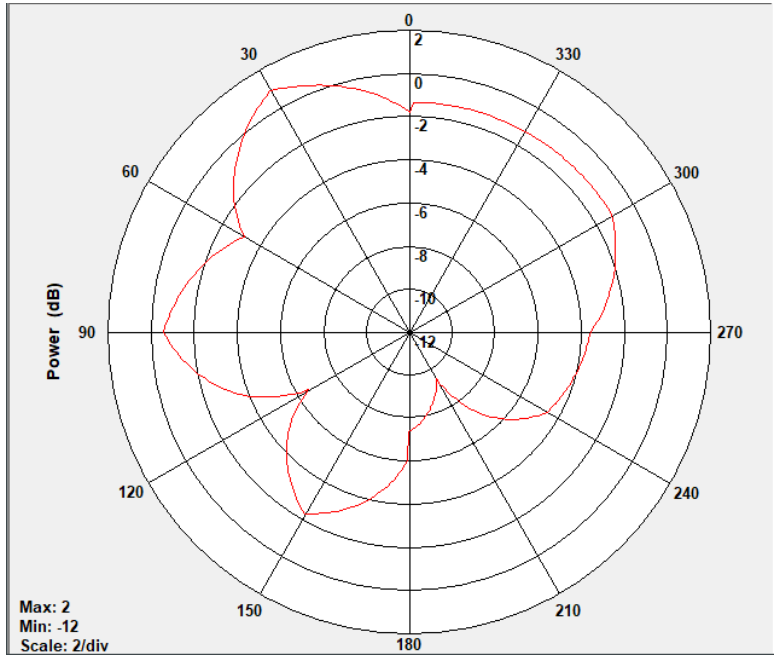


Shown: 2.4GHz band

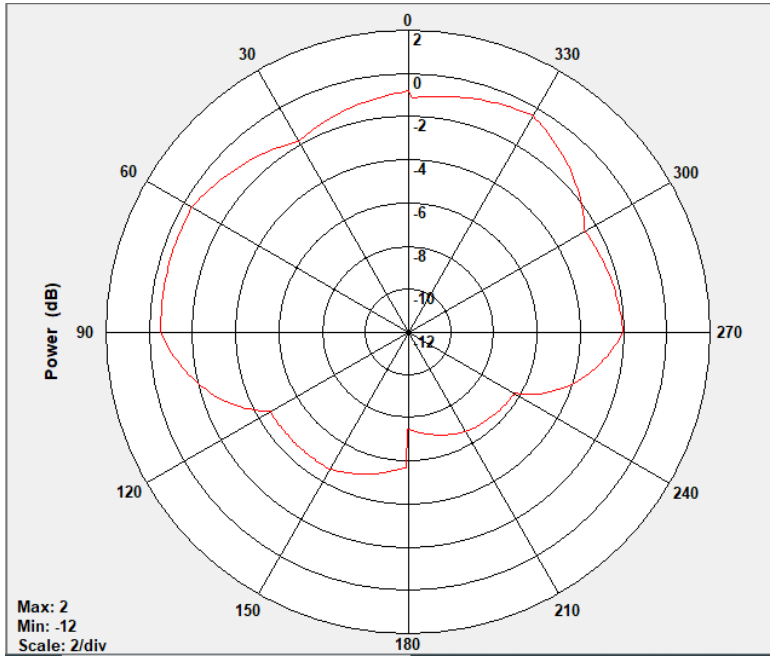
THREAD ANTENNA 2D PATTERNS, 2400MHz



Theta 0 (XY-plane)

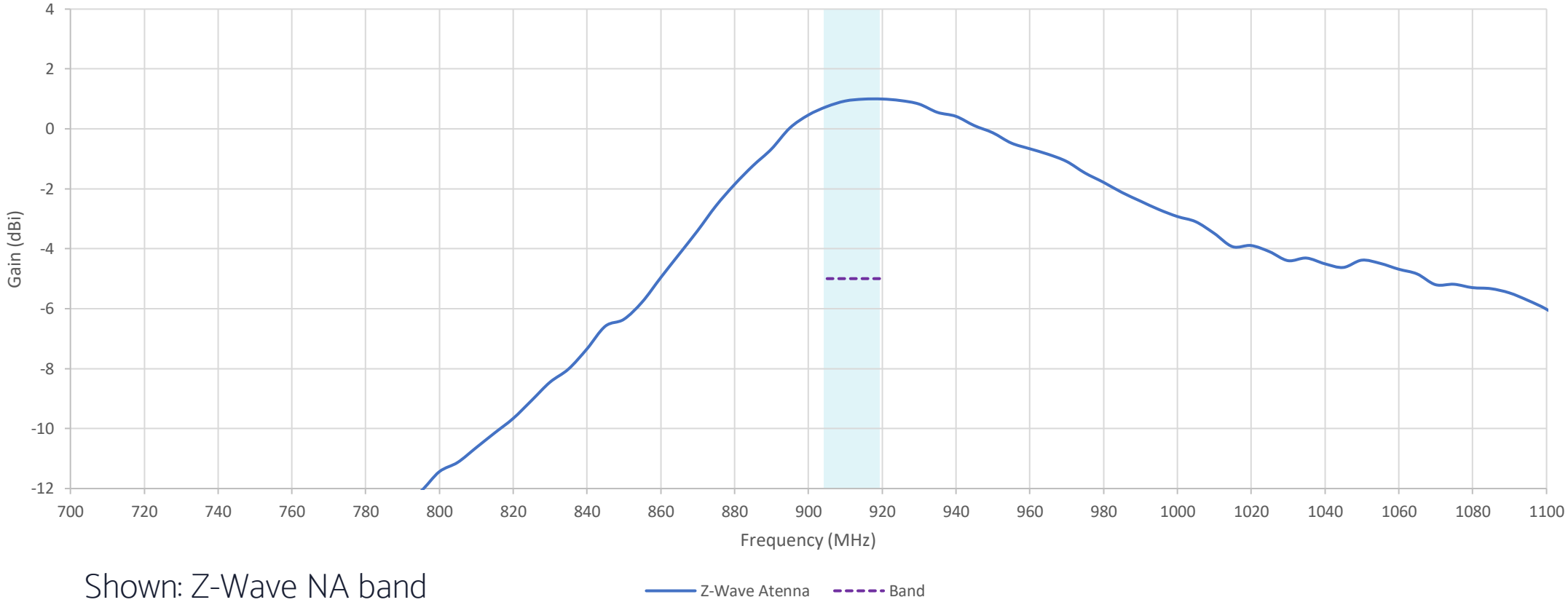


Phi 0 (ZX-plane)



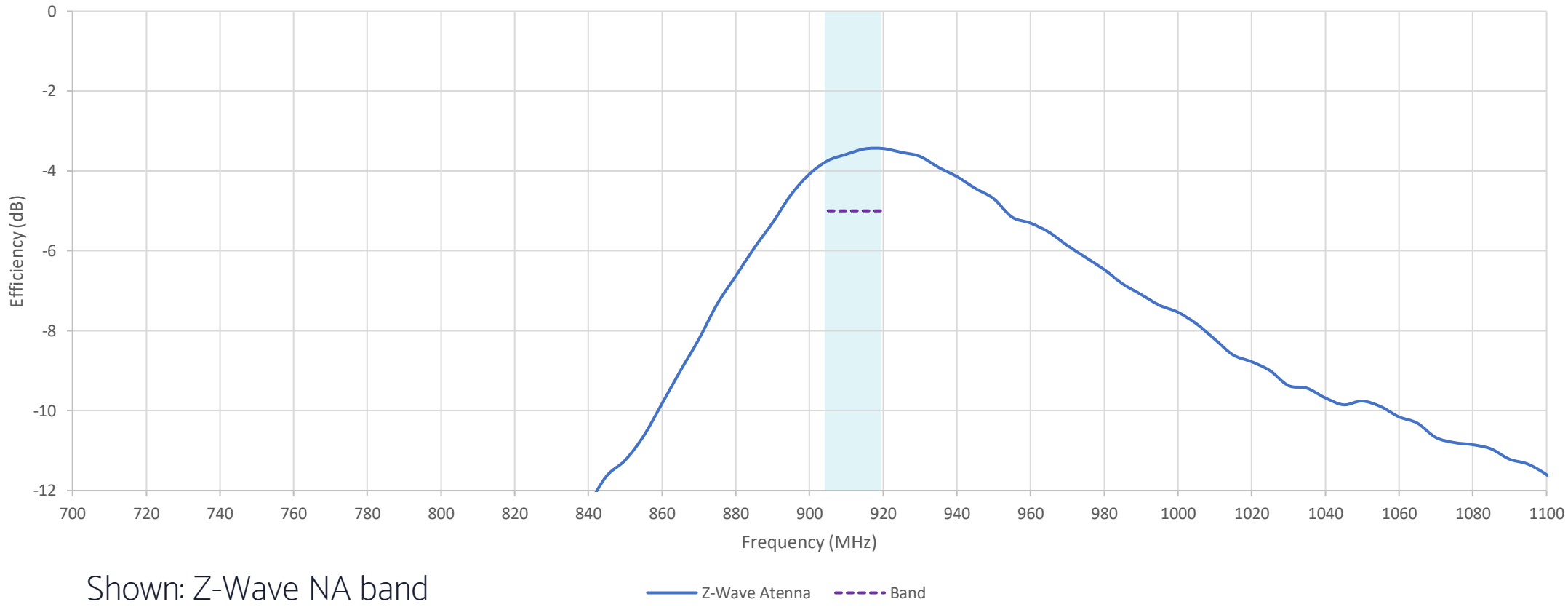
Phi 90 (YZ-plane)

Z-WAVE MEASURED GAIN



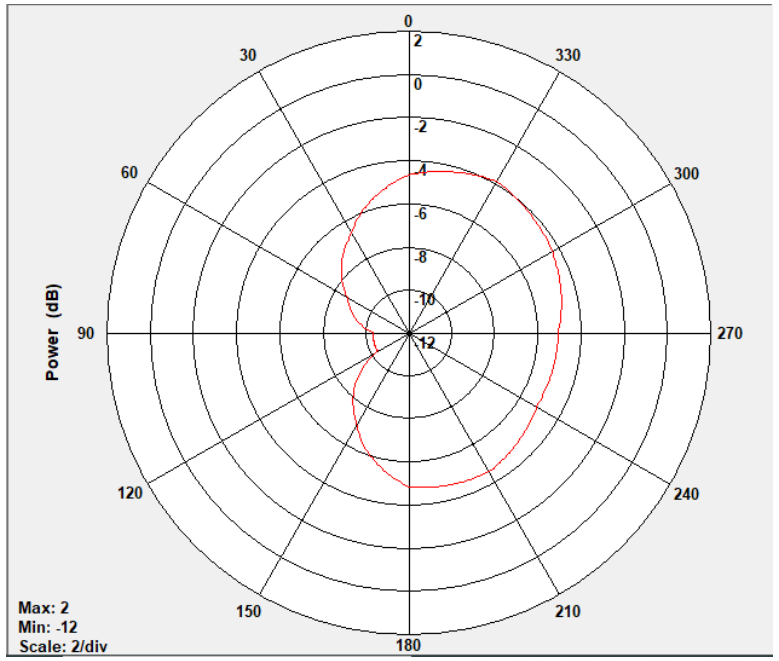
Shown: Z-Wave NA band

Z-WAVE MEASURED EFFICIENCY



Shown: Z-Wave NA band

Z-WAVE ANTENNA 2D PATTERNS, 916MHz



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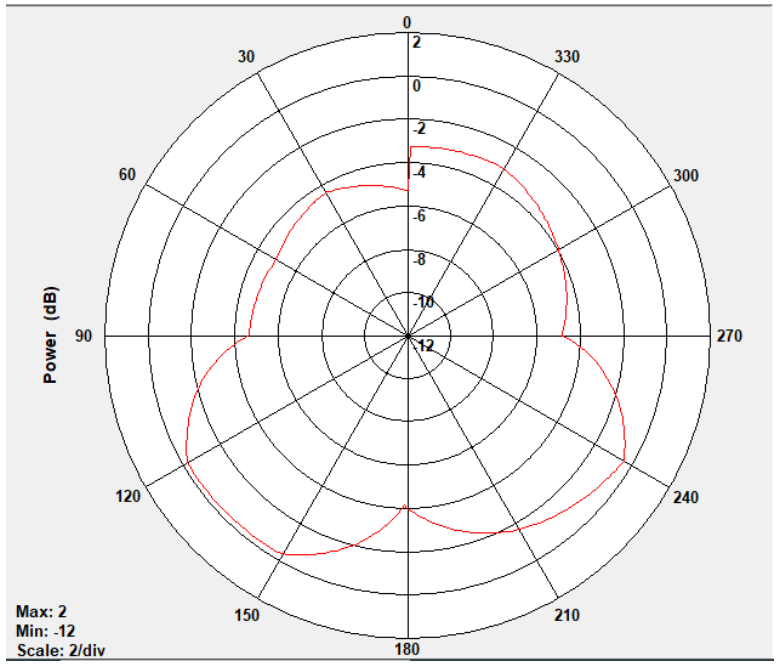

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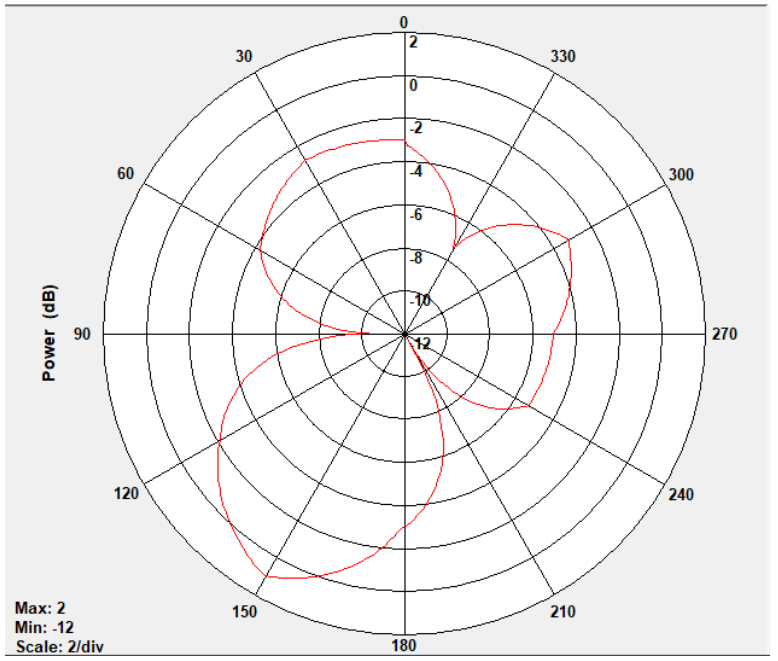

Phi 90 (YZ-plane)

GLOSSARY

- S11 (Reflection coefficient) – power reflected by impedance mismatch
- Radiation (rad.) efficiency - antenna efficiency excluding mismatch loss
- Total efficiency - antenna efficiency including mismatch loss
- System total efficiency - antenna efficiency including mismatch loss, including matching and losses from external matching network
- TRP (total radiated power) – power radiated from the antenna, including all losses
- EIRP (effective isotropic radiated power) – power radiated from the antenna to the strongest beam direction compared to isotropic radiator
- ERP (effective radiated power) power radiated from the antenna to the strongest beam direction compared to ideal half wavelength dipole. ERP (dB) = EIRP (dB) -2,15 dB
- TIS (total isotropic sensitivity) - total available receive performance of a device with a real antenna