

# Antenna scheme design

According to the measured results of the initial version of MR62, if the antenna side lobe to the ground is reduced by more than 8dB, it is expected to solve the problem of ground hitting

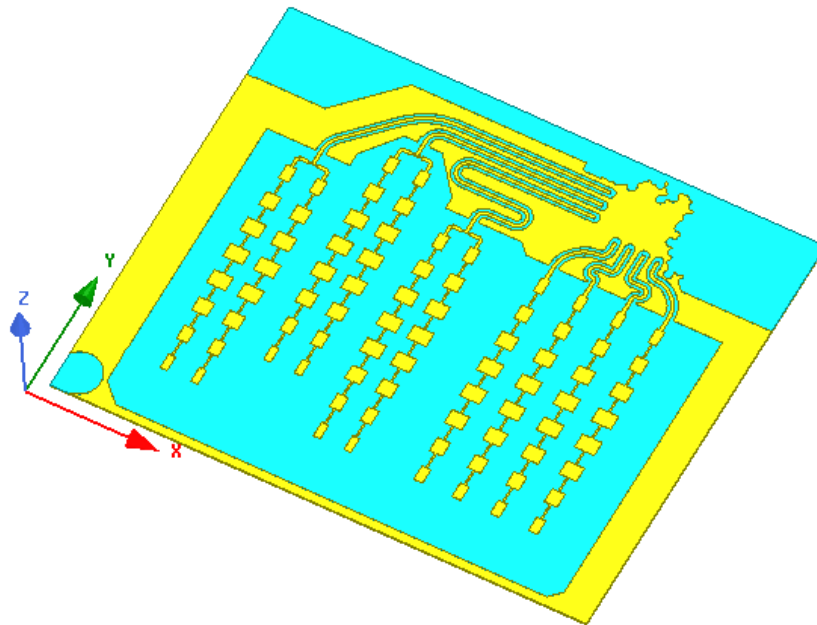
Question. The feedback results show that the ground beating problem may be mainly affected by the sidelobe near  $50^\circ$ .

Optimization objective: To optimize the ground side lobe, especially the side lobe near  $50^\circ$

Transmitting antenna:  $8 \times 2$  microstrip array

Receiving antenna:  $8 \times 1$  Microstrip string feeder array, wide beam

The antenna port matches to 50ohm



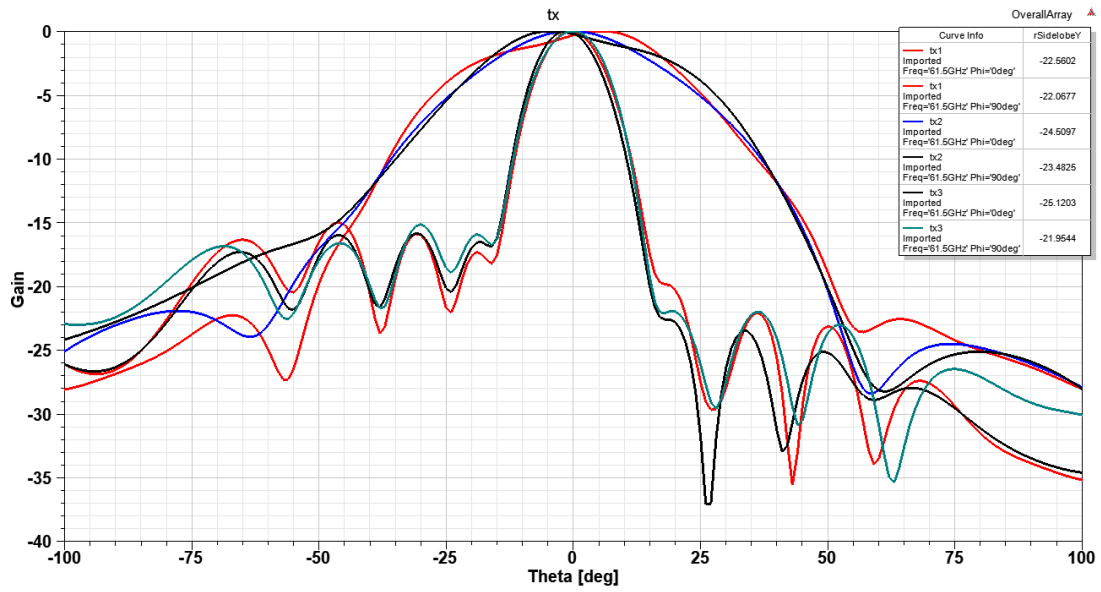
Picture1 The optimized transceiver antenna structure

## antenna parameter

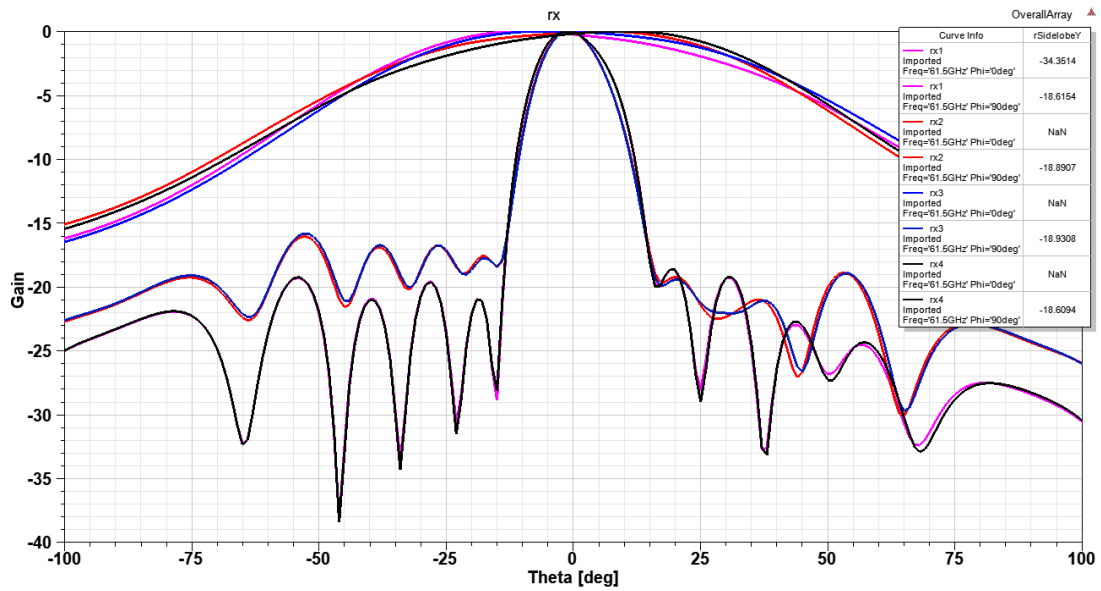
The directional characteristics of the transmitting antenna are shown in Figure 2, and those of the receiving antenna are shown in Figure 3. The radiation characteristics of the transmitting/receiving antenna are given in Table 1.

Table 1 Radiation characteristics of transmitting/receiving antennas

Mode	transmitting antenna		receiving antenna	
Number of elements	9 × 2		9 × 1	
gain	16.5dBi		14.06 dBi	
Minor level	\	-22dB(R)	\	-18dB(R)
beamwidth(-6dB)	azimuth plane	Cross level	azimuth plane	Cross level
	55°	18°	101°	18°



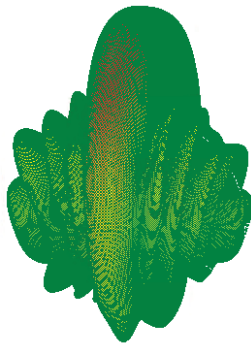
Picture 2 Characteristics of transmitting antenna pattern



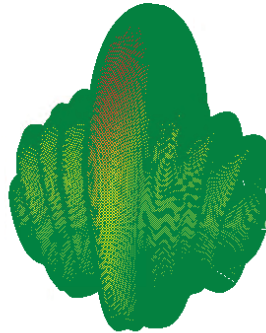
Picture 3 Receiving antenna pattern characteristics

# 3D Polar Plot

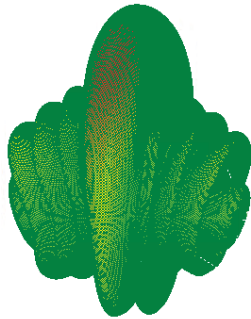
RX1



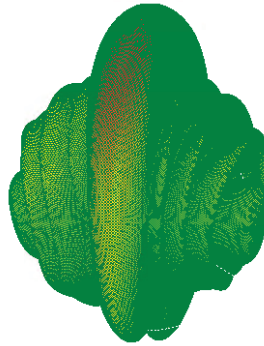
RX2



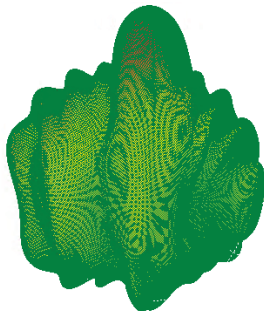
RX3



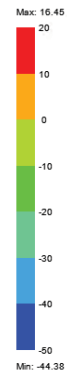
RX4



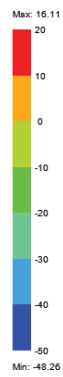
TX1



TX2

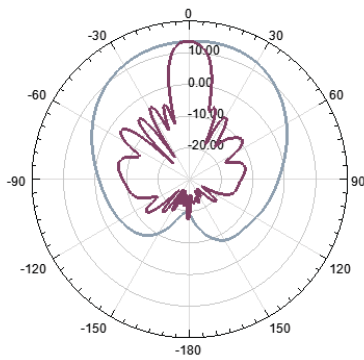


TX3



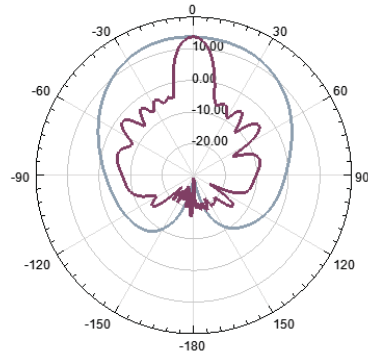
# Radiation Pattern

Gain Plot - RX1



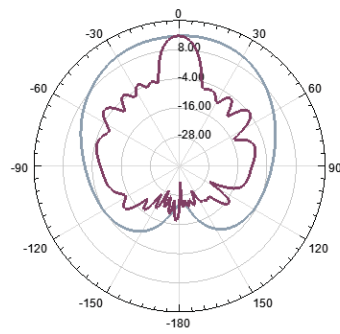
Curve Info	max
dB(GainTotal)	
Setup1 : LastAdaptive	13.8123
Freq=61.5GHz Phi=0deg'	
dB(GainTotal)	
Setup1 : LastAdaptive	13.6486
Freq=61.5GHz Phi=90deg'	

Gain Plot - RX2



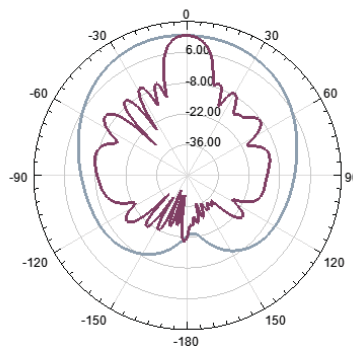
Curve Info	max
dB(GainTotal)	
Setup1 : LastAdaptive	13.8086
Freq=61.5GHz Phi=0deg'	
dB(GainTotal)	
Setup1 : LastAdaptive	13.7350
Freq=61.5GHz Phi=90deg'	

Gain Plot - RX3



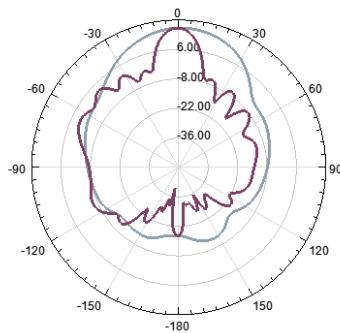
Curve Info	max
dB(GainTotal)	
Setup1 : LastAdaptive	13.7870
Freq=61.5GHz Phi=0deg'	
dB(GainTotal)	
Setup1 : LastAdaptive	13.6389
Freq=61.5GHz Phi=90deg'	

Gain Plot - RX4



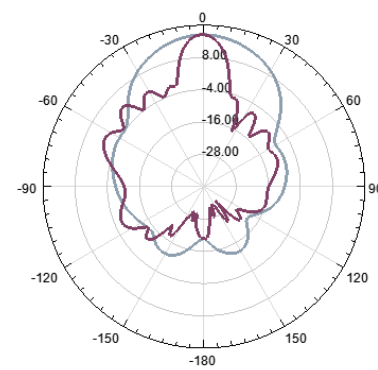
Curve Info	max
dB(GainTotal)	
Setup1 : LastAdaptive	13.9403
Freq=61.5GHz Phi=0deg'	
dB(GainTotal)	
Setup1 : LastAdaptive	13.6905
Freq=61.5GHz Phi=90deg'	

Gain Plot - TX1



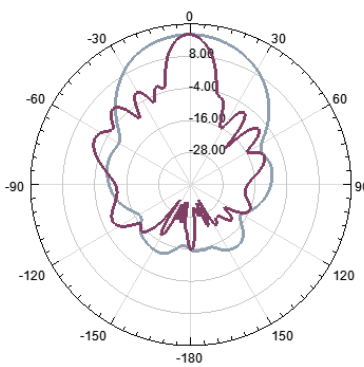
Curve Info	max
dB(GainTotal)	
Setup1 : LastAdaptive	16.2079
Freq=61.5GHz Phi=0deg'	
dB(GainTotal)	
Setup1 : LastAdaptive	16.1903
Freq=61.5GHz Phi=90deg'	

Gain Plot - TX2



Curve Info	max
dB(GainTotal)	
Setup1 : LastAdaptive	16.4221
Freq=61.5GHz Phi=0deg'	
dB(GainTotal)	
Setup1 : LastAdaptive	16.4375
Freq=61.5GHz Phi=90deg'	

Gain Plot - TX3



Curve Info	max
dB(GainTotal)	
Setup1 : LastAdaptive	16.0578
Freq=61.5GHz Phi=0deg'	
dB(GainTotal)	
Setup1 : LastAdaptive	16.1104
Freq=61.5GHz Phi=90deg'	

