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

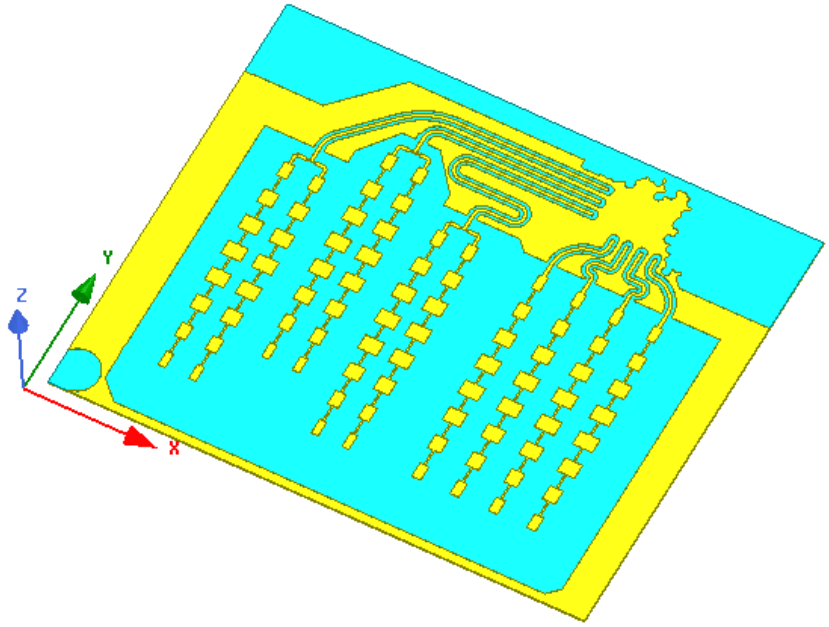
Question. The feedback results show that the ground beating problem may be mainly affected by the sidelobe near 50° .

Optimization objective: To optimize the ground side lobe, especially the side lobe near 50°

Transmitting antenna: 8×2 microstrip array

Receiving antenna: 8×1Microstrip 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°

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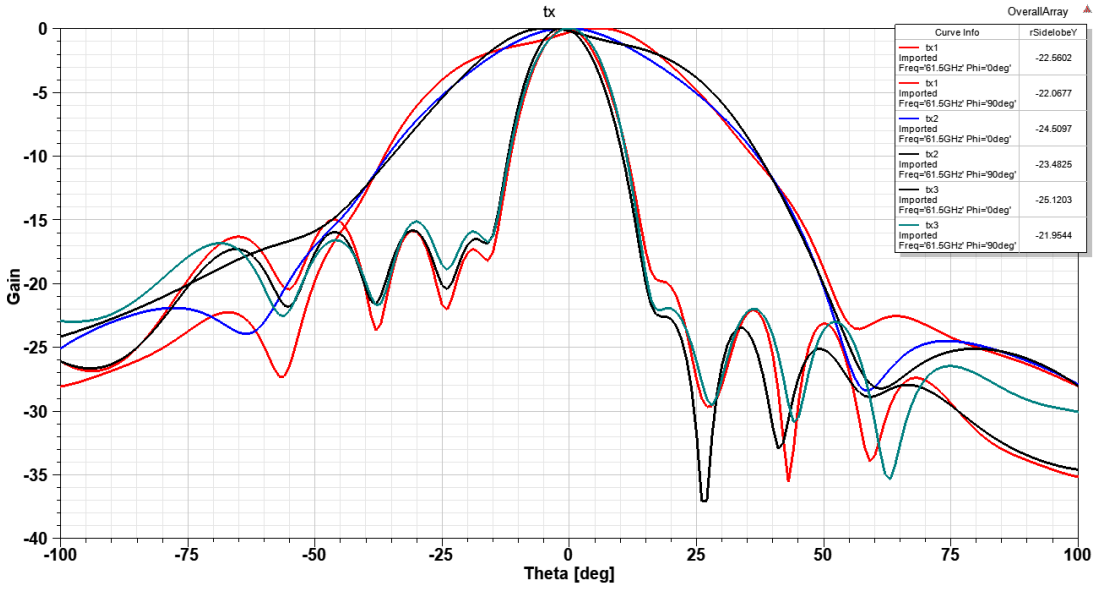
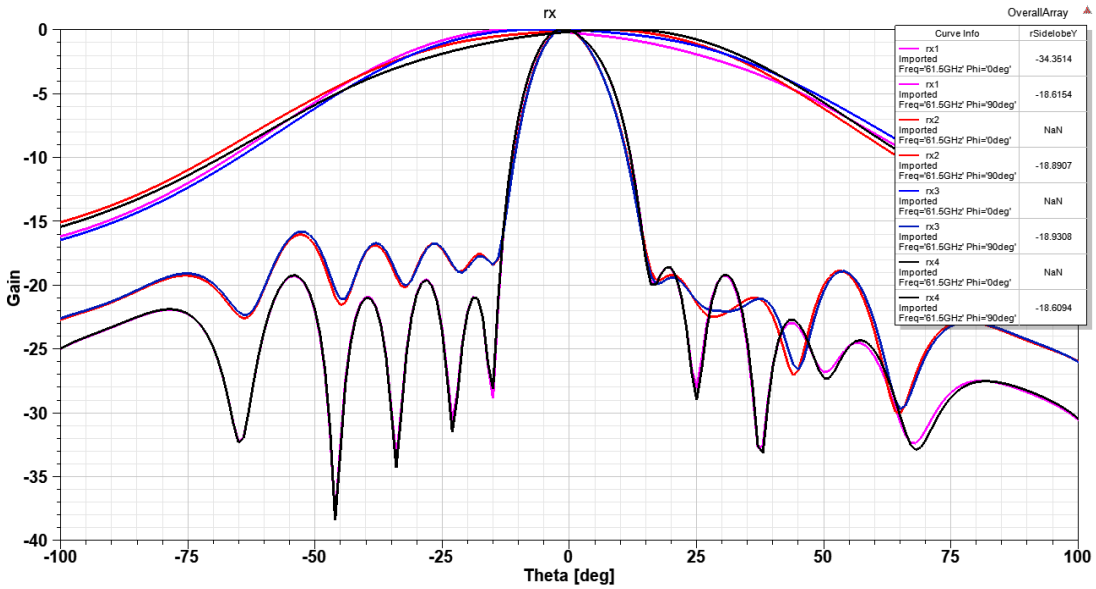


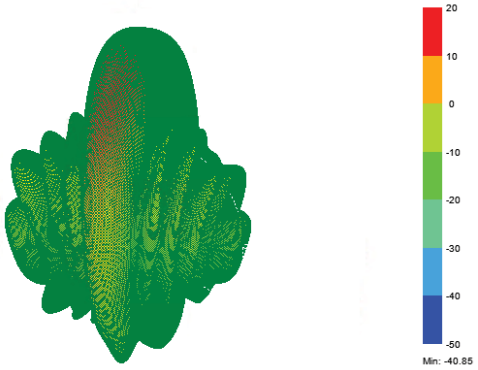
Picture 2 Characteristics of transmitting antenna pattern



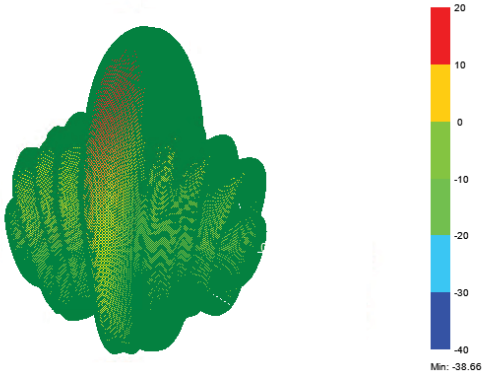
Picture 3 Receiving antenna pattern characteristics

3D Polar Plot

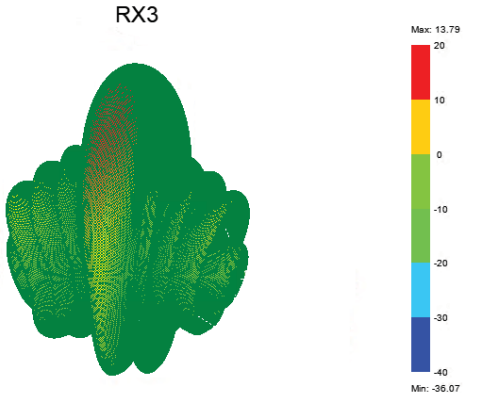
RX1



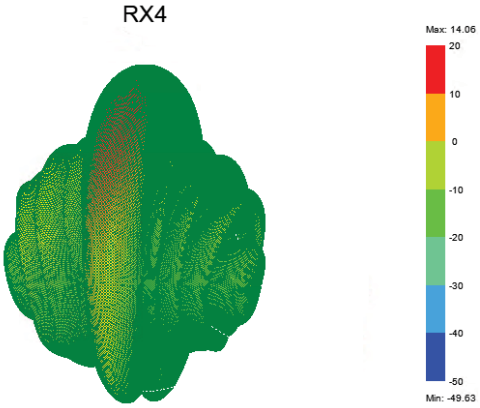
RX2



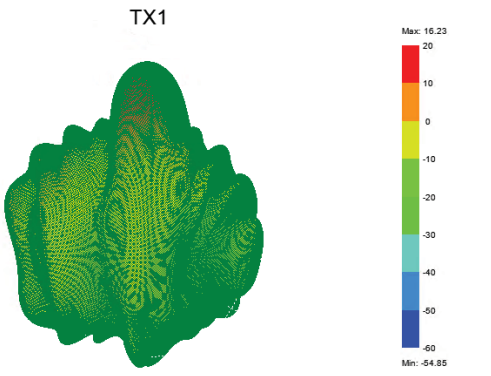
RX3



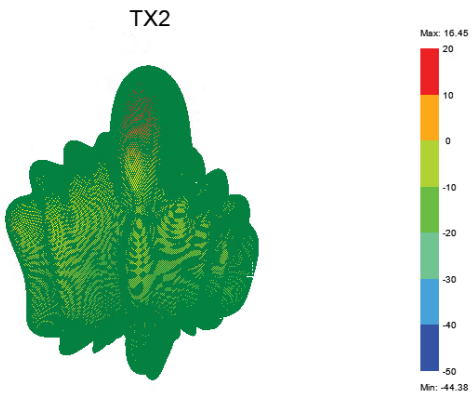
RX4



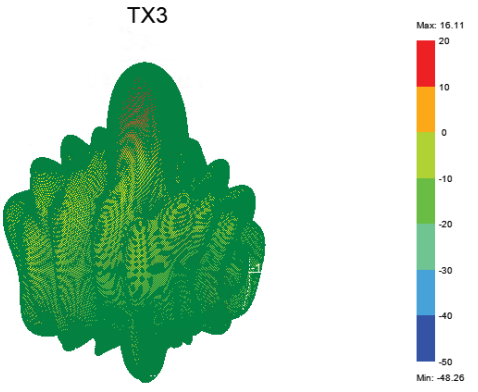
TX1



TX2

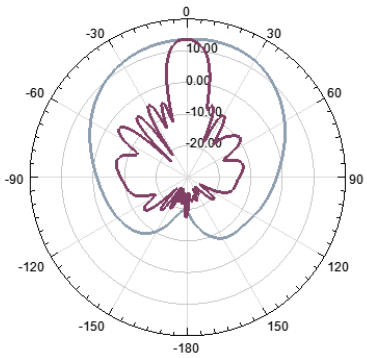


TX3



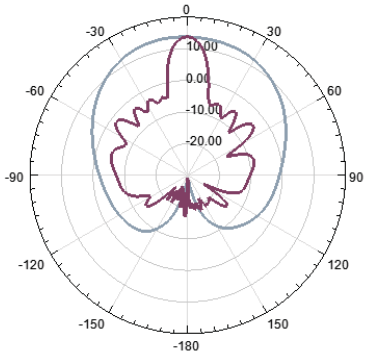
Radiation Pattern

Gain Plot - RX1



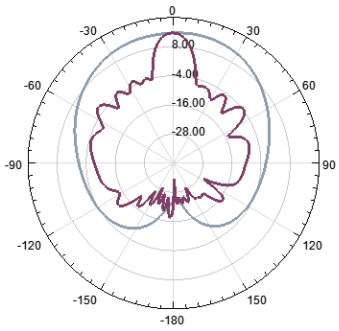
Curve Info	max
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='0deg'	13.8123
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='90deg'	13.6486

Gain Plot - RX2



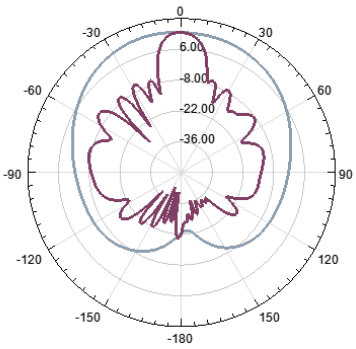
Curve Info	max
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='0deg'	13.8086
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='90deg'	13.7350

Gain Plot - RX3



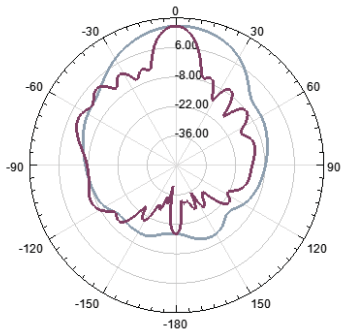
Curve Info	max
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='0deg'	13.7870
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='90deg'	13.6389

Gain Plot - RX4



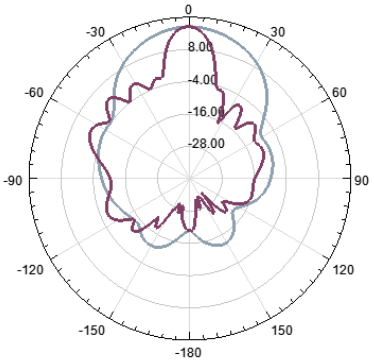
Curve Info	max
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='0deg'	13.9403
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='90deg'	13.6905

Gain Plot - TX1



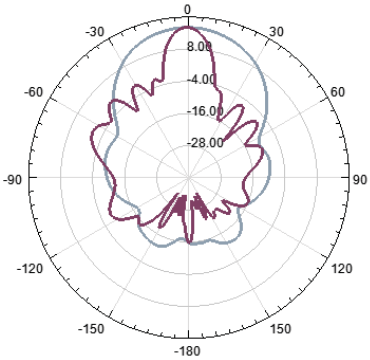
Curve Info	max
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='0deg'	16.2079
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='90deg'	16.1903

Gain Plot - TX2

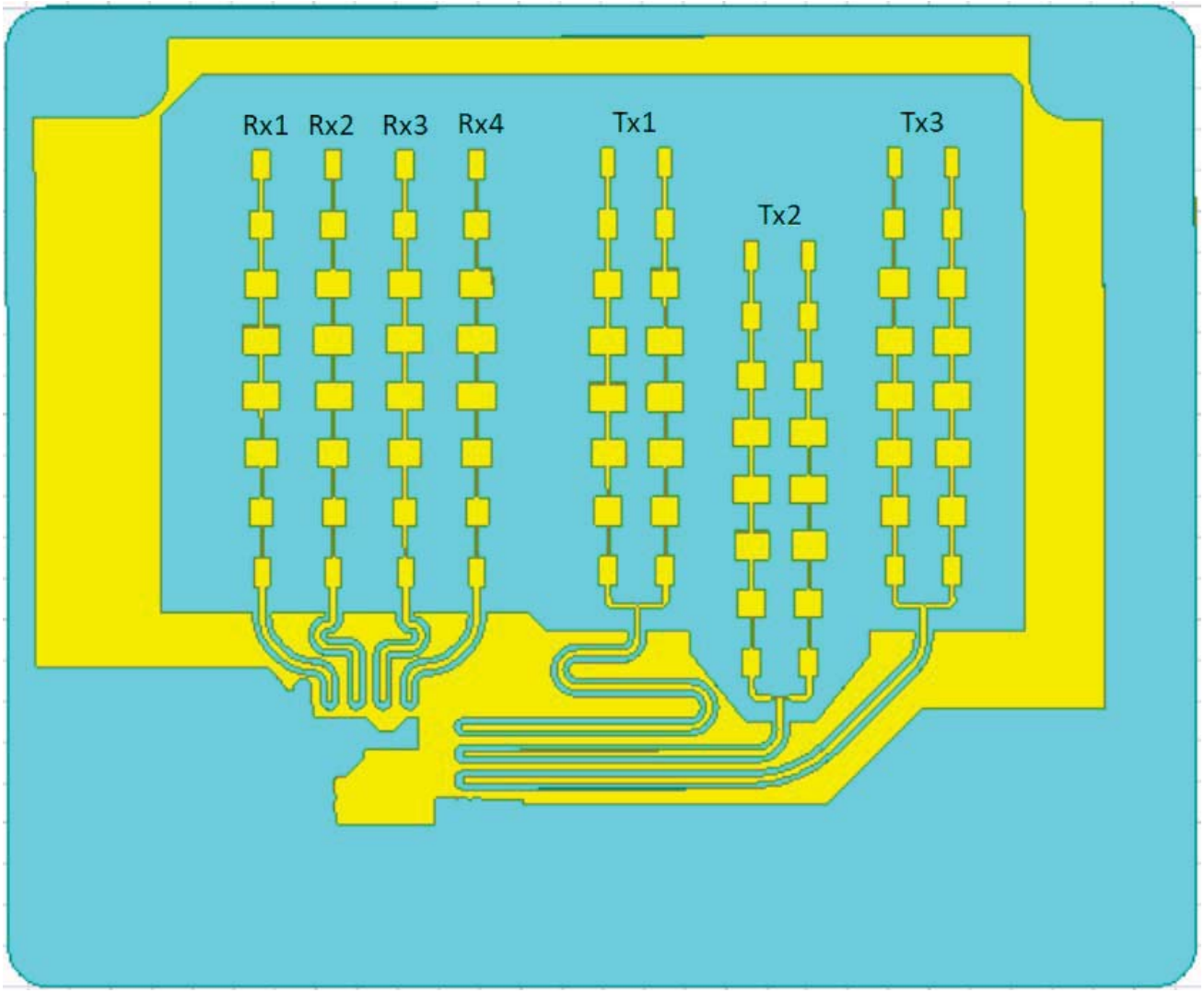


Curve Info	max
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='0deg'	16.4221
dB(GainTotal) Setup1 : LastAdaptive Freq='61.5GHz' Phi='90deg'	16.4375

Gain Plot - TX3



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


Rx1
Rx2
Rx3
Rx4
Tx1
Tx2
Tx3