

A photograph of two dolphins leaping from the ocean surface. The dolphins are captured in mid-air, their bodies arched as they move from left to right. The background features a bright sunset or sunrise with a glowing sun low on the horizon, casting a warm orange and yellow light across the sky and the water. The sky is filled with soft, wispy clouds. The overall scene conveys a sense of motion, grace, and natural beauty.

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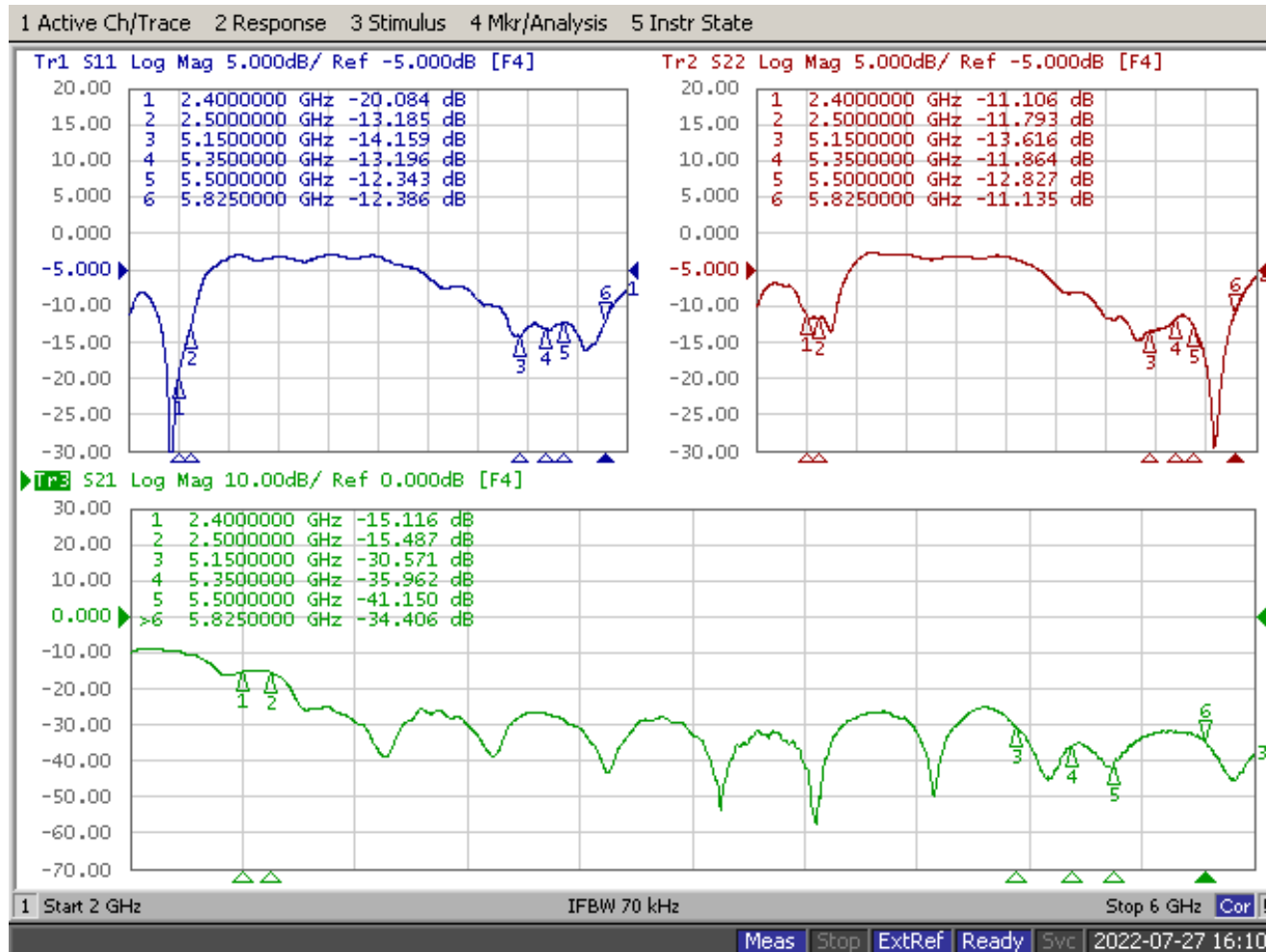
# Innovative Antenna Solutions

Mobile Devices | Wireless Infrastructure | **Embedded**

# Antenna Return Loss, Isolation, and ECC of the DB Antennas



W E ' R E M A K I N G W A V E S <sup>TM</sup>



Port1= DB1

Port2= DB2

## DB1-DB2

Freq (MHz)	ECC
2400	0.023026
2450	0.014588
2500	0.160982

## DB1-DB2

Freq (MHz)	ECC
5150	0.002862
5250	0.002189
5350	0.001921
5500	0.000985
5725	0.00696
5825	0.010795

# Antenna Gain and Efficiency



DB1	Freq (MHz)	Peak Gain (dBi)	Directivity (dBi)	Efficiency
	2400	4.471	6.393	64.25 %
	2450	3.978	6.067	61.81 %
	2500	3.422	5.580	60.84 %
	Average			62.30 %

DB2	Freq (MHz)	Peak Gain (dBi)	Directivity (dBi)	Efficiency
	2400	2.948	5.071	61.34 %
	2450	2.976	5.133	60.85 %
	2500	2.292	4.559	59.33 %
	Average			60.51 %

DB1	Freq (MHz)	Peak Gain (dBi)	Directivity (dBi)	Efficiency
	5150	3.136	5.412	59.21 %
	5250	3.208	5.569	58.06 %
	5350	2.361	4.848	56.41 %
	5500	3.937	6.124	60.43 %
	5725	3.684	6.132	56.90 %
	5825	3.481	5.966	56.44 %
	Average			57.91 %

DB2	Freq (MHz)	Peak Gain (dBi)	Directivity (dBi)	Efficiency
	5150	2.656	5.066	57.41 %
	5250	3.400	5.829	57.16 %
	5350	3.783	6.289	56.16 %
	5500	4.269	6.665	57.60 %
	5725	3.872	6.211	58.35 %
	5825	3.598	6.032	57.10 %
	Average			57.30 %

# DB (2.45 GHz) Antennas Horizontal and Vertical

## Correlated directional Gain



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	Degree		Gain (dBi)		Correlated Gain (dBi) - H-Pol
Frequency ( MHz)	Theta	Phi	DB1	DB2	
2400	16	176	2.72	-2.88	3.37
2450	17	177	2.31	-0.47	4.04
2500	17	177	2.16	0.56	4.41
	Degree		Gain (dBi)		Correlated Gain (dBi)-V-Pol
Frequency ( MHz)	Theta	Phi	DB1	DB2	
2400	86	98	2.14	0.39	4.32
2450	88	99	2.30	-0.15	4.17
2500	10	264	1.35	1.23	4.30

Worst Case

Worst Case

# DB (5 GHz) Antennas Horizontal and Vertical

## Correlated directional Gain



W E ' R E M A K I N G W A V E S ™

	Degree		Gain (dBi)		Correlated Gain (dBi) - H-Pol
Frequency ( MHz)	Theta	Phi	DB1	DB2	
5150	119	164	0.59	-2.25	2.30
5250	179	356	1.65	-3.21	2.57
5350	100	135	-0.18	-1.86	2.03
5500	19	223	-0.91	-2.71	1.25
5725	19	222	-0.72	-1.54	1.89
5825	17	227	-0.93	-1.66	1.72

	Degree		Gain (dBi)		Correlated Gain (dBi)-V-Pol
Frequency ( MHz)	Theta	Phi	DB1	DB2	
5150	98	8	0.19	-0.13	3.04
5250	96	356	0.83	0.52	3.69
5350	93	355	1.00	0.56	3.79
5500	93	7	1.18	1.66	4.43
5725	89	356	0.78	1.27	4.04
5825	89	353	1.13	0.92	4.04

Worst Case

# DB (2.45 GHz) Antennas Horizontal and Vertical

## Uncorrelated directional Gain



W E ' R E M A K I N G W A V E S ™

	Degree		Gain (dBi)		UnCorrelated Gain (dBi) - H-Pol
Frequency ( MHz)	Theta	Phi	DB1	DB2	
2400	16	176	2.72	-2.88	0.77
2450	17	177	2.31	-0.47	1.14
2500	17	177	2.16	0.56	1.43
	Degree		Gain (dBi)		UnCorrelated Gain (dBi)-V-Pol
Frequency ( MHz)	Theta	Phi	DB1	DB2	
2400	87	98	2.25	0.25	1.36
2450	88	98	2.33	-0.19	1.25
2500	10	264	1.35	1.23	1.29

Worst Case

Worst Case



# DB (5 GHz) Antennas Horizontal and Vertical

## Uncorrelated directional Gain



W E ' R E M A K I N G W A V E S ™

Frequency ( MHz)	Degree		Gain (dBi)		UnCorrelated Gain (dBi) - H-Pol
	Theta	Phi	DB1	DB2	
5150	118	163	0.78	-2.56	-0.58
5250	179	0	1.73	-3.40	-0.12
5350	112	155	0.90	-3.53	-0.77
5500	19	223	-0.91	-2.71	-1.72
5725	20	222	-0.54	-1.75	-1.10
5825	17	229	-0.82	-1.79	-1.28
Frequency ( MHz)	Degree		Gain (dBi)		UnCorrelated Gain (dBi)-V-Pol
	Theta	Phi	DB1	DB2	
5150	20	230	2.65	-4.06	0.48
5250	96	356	0.83	0.52	0.68
5350	93	355	1.00	0.56	0.79
5500	93	7	1.18	1.66	1.43
5725	90	8	-0.33	2.11	1.06
5825	89	353	1.13	0.92	1.03

Worst Case

# Antenna Performance Summary



W E ' R E M A K I N G W A V E S ™

Antenna	Worst Case Return Loss (dB) 2.45 GHz Band	Worst Case Return Loss (dB) 5 GHz Band	Average Efficiency 2.45 GHz Band (%)	Average Efficiency 5 GHz Band (%)	Highest Peak Gain 2.45 GHz Band (dBi)	Highest Peak Gain 5 GHz Band (dBi)	Mutual Isolation (dB) 2.45 GHz Band		Mutual Isolation (dB) 5 GHz Band	
							DB1	DB2	DB1	DB2
DB1	-13.2	-12.3	62.3%	57.9%	4.4	3.9				
DB2	-11.1	-11.1	60.5%	57.3%	2.9	4.2	-15.1		-30.6	



A photograph of two dolphins leaping from the ocean's surface. The dolphins are captured in mid-air, their bodies arched as they move from left to right. The background features a vibrant sunset with a bright sun low on the horizon, casting a golden glow across the sky and water. The sky is filled with soft, wispy clouds, and the ocean surface shows gentle ripples. The overall mood is serene and dynamic.

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