

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's surface shows gentle ripples.

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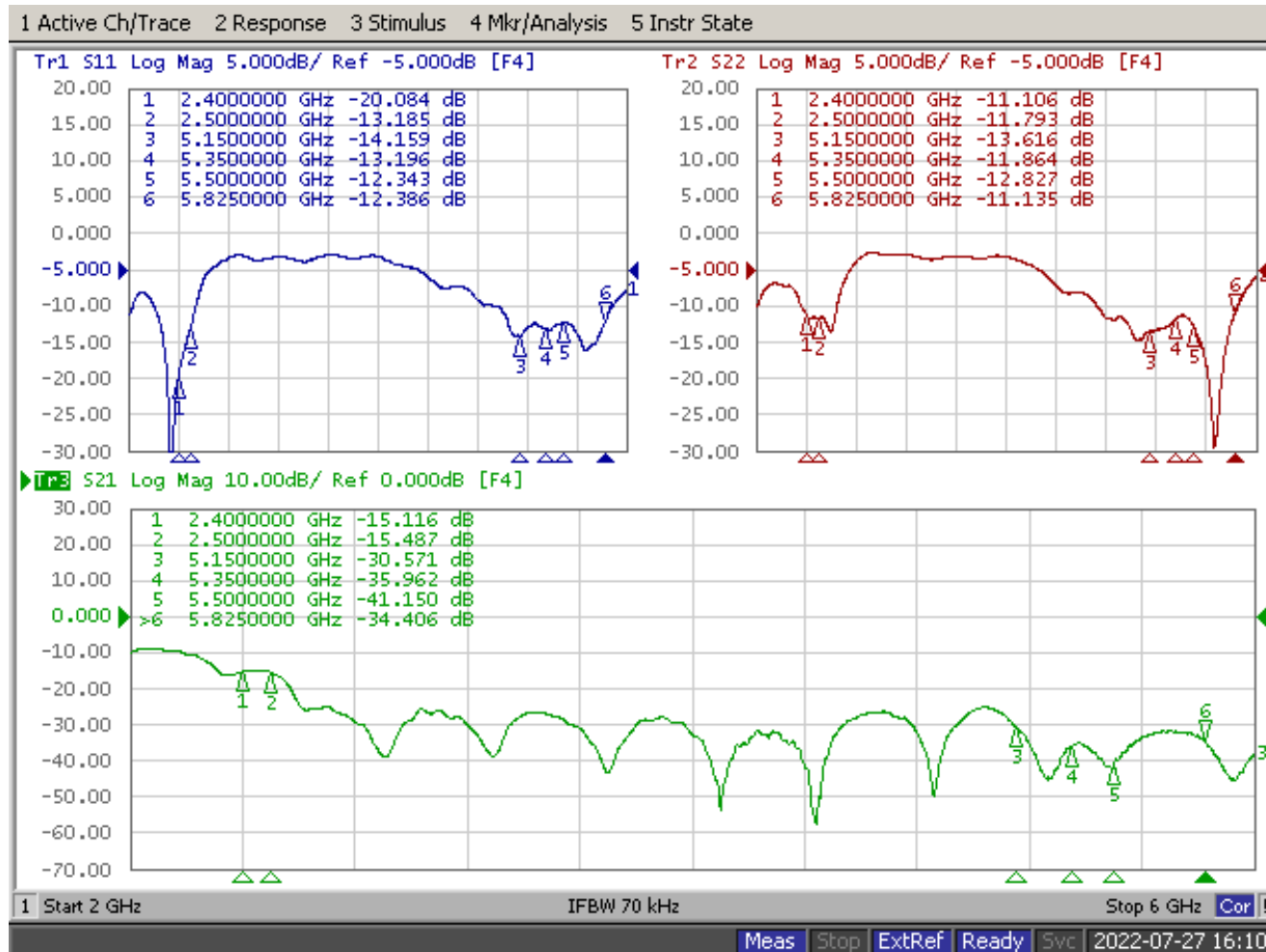
Innovative Antenna Solutions

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 TM



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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Frequency (MHz)	Degree		Gain (dBi)		Correlated Gain (dBi) - H-Pol
	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
Frequency (MHz)	Degree		Gain (dBi)		Correlated Gain (dBi)-V-Pol
	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	

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