Theoretical Insertion Loss of Power Dividers

Power dividers (also known as power splitters) ideally distribute input power equally among all output ports. The theoretical insertion loss (excluding practical losses such as dielectric, conductor, or mismatch losses) is determined by the number of output ports (N). It can be calculated using the formula:

$$\text{Loss(dB)} = 10 \times \log10(N)$$

Below is the theoretical loss table for power dividers ranging from 2-way to 128-way.

Number of Ways (N)	Theoretical Loss (dB)	Number of Ways (N)	Theoretical Loss (dB)
2	3.01	26	14.15
3	4.77	28	14.47
4	6.02	30	14.77
5	6.99	32	15.05
6	7.78	34	15.31
7	8.45	36	15.56
8	9.03	38	15.80
9	9.54	40	16.02
10	10.00	42	16.23
11	10.41	46	16.63
12	10.79	48	16.81
14	11.46	50	16.99
16	12.04	52	17.16
18	12.55	54	17.32
20	13.01	56	17.48
22	13.42	64	18.06
24	13.80	128	21.07