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1P81 - E-band Power Combining Experiment for High Power Millimeter Waves*

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Millimeter wave summation is the only way to achieve high power generation due to the limited power handling capability of a single high power microwave source. In this work, a 12-way power combiner was experimentally studied. The amplitude and phase of each input are adjustable using 12 attenuators and 12 phase shifters. The output of the power combiner was received by an open-ended waveguide probe. The experiment was performed in E-band where the designed frequency was at 78 GHz.

The power combiner converts the fundamental mode of the rectangular waveguide to the TE01 mode in over-moded circular waveguide. The TE01 output mode is a reasonable option due to the fact that conductive losses decreases for this mode as frequency increases.

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