

# Fault Tolerance Millimeter-Wave Spatial Power Amplifiers

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Spatial power combined amplifiers have been maturing over the past few years, providing increased power output levels, power added efficiencies, and power combining efficiencies from an array printed antennas coupled closely with solid state devices. In this paper, modeling data and experimental results from a 49-elements Ka band spatial power amplifier array are presented; prospective view of this amplifier is shown in Fig. 1. In addition, system degradation versus device failure has been studied. Results for both simulated and measured cases will be discussed. As can be seen in Fig. 2 when 16% of the active devices fail across the array only 2.2 dB reduction in power was measured.

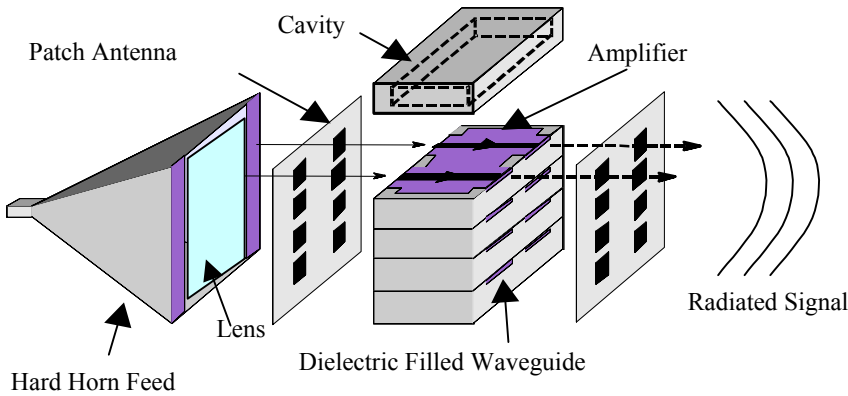


Figure 1: Prospective view of the perpendicularly-fed patch array structure.

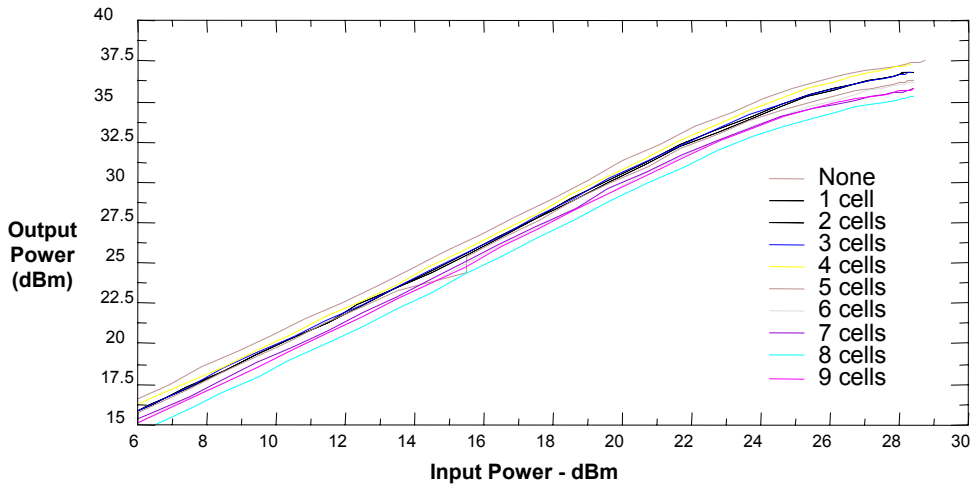


Figure 2: Measured power compression curves of the amplifier for various numbers of device failures.