

## Determination of Multipactor Breakdown Test Criteria using Sample DUTs for S-band Space RF Hardware

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This work is to make a decision of the test methodology and the determination of test criteria by reviewing the measured results for MP(Multipactor) breakdown phenomena in order to verify and qualify the components as a space level. The 3-D electric field analysis was adapted to calculate the expected MP breakdown threshold RF input power for several sample DUTs and the KARI's MP test facility was also employed with various MP test methods such as forward/reverse power measurement, electron current detection, mixed signal DC voltage detection, phase nulling spectrum monitoring and so on. The two MP test modes as CW mode, pulsed mode are tested and the measured results are analyzed for all sample DUTs. The detected MP breakdown powers for both CW and pulsed mode to be compared with those of calculated show maximum 2.86 and 3.23 dB differences respectively. The maximum deviation of test results between CW and pulse mode is also ranked as about 2 dB and this effect was estimated as a differences of thermal dissipation and testing dwell time for each test mode. As above tests and calculated results, the final MP test facility is fixed and the MP test criteria in terms of test conditions and detection methods are determined in order to test the MP breakdown sensitivity for s-band space RF hardware.