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## MICROWAVE MODULE FOR A 50-58GHZ BROADBAND MILLIMETER WAVE RADIOMETER

## Abstract

This paper describes the contributions from the microwave module to the 50-58GHz radiometer, which is a part of the FY-3 satellite launched in 2017. The radiometer is composed of 13 microwave channels(50-58GHz).the microwave module is interconnected with antenna by a rectangular waveguide.the noise signal came into an amplified and band pass filtered heterodyne receiver with two down converter chain in redundancy, drived by a LO operating at 57.290344GHz, then the noise signal is fed into a power splitter. the first path provides a broad band pass filter for a single sideband intermediate frequency(IF) band, which is located at 1.5-7.1GHz, this band pass through a set of common amplifier signal splitters and 7 different broadband channels are selected the other path is lowpass filtered fistly, and then a double sideband IF band located at 10-400 MHz away from the LO frequency is amplified in comman and then conventional bandpass filtered (SAW) into 6 narrowband channels.both the broad band channels and narrow band channels are detected by square law detector the total gain for the RF stages of each channel is about 60-75dB and 20dB for the post detection stage the NF for the whole microwave part is about 4dB. The fundmental of the design are described, and all of the components have been tested individually before integration.using single tone and wide band noise stimuli, the overall output voltage has been measured with hot and cold load, the testing data shows that the radiometer could realize a high sensitivity and linerity performance , which is also verified by the in orbit tests.