Abstracts

A family of Q, V and W-band monolithic resistive mixers

M. Kimishima, T. Ataka and H. Okabe. "A family of Q, V and W-band monolithic resistive mixers." 2001 MTT-S International Microwave Symposium Digest 01.1 (2001 Vol. I [MWSYM]): 115-118 vol.1.

This paper presents the design, fabrication, and testing results of Q, V, and W-band monolithic broadband resistive mixers for measurement instruments. Low conversion loss and good flatness of the frequency response across a wide frequency range were achieved using an InGaP-InGaAs HEMT biased in the resistive mode. Three mixers in Q, V, and W-band show similar excellent measured performance. Q and V-band mixers were designed using two Lange couplers. The Q-band mixer exhibits a conversion loss of 11.7 dB and a loss flatness of 1.2 dB for 11 GHz IF frequency over 42-56 GHz RF frequency band. The V-band mixer exhibits a conversion loss of 12.8 dB and a loss flatness of 1.0 dB for 18 GHz IF frequency over 56-72 GHz RF frequency band. On the other hand, the W-band mixer using a 180-degree balun, shows a conversion loss of 10.6 dB and a loss flatness of 1.2 dB for 30 GHz IF frequency over a 72-84 GHz RF frequency band.

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