ABSTRACT

Y Circulator and isolator based micro strip and ferrite 2,0 GHz – 3,0 GHz is designed by some purposes, like:

1. To provide Y circulator prototype and wideband isolator, so can be used by some applications. It can reduce quantity of using antennas.
2. To make circulator which has high quality in low price and contains local materials

Y circulator's Specifications are working frequency between 2, 0 GHz – 3, 0 GHz in VSWR $\leq$ 1,5 : 1 on 3 terminals 50 Ω, Insertion loss max 0, 2 dB and have isolation min 30 dB. Y circulator and isolator is had to designed by micro strip so wideband, and ferrite rubber with condition: $\varepsilon_r \geq 10$; $\mu_r \geq n.10^3$; $\beta = 10^4$ f common metals.

From formula of micro strip, can be had the construction (size and type of materials which is used) with details: length ($l \leq 5$ cm) so TEM w_1 = 4, 37 mm (width strip on ferrite); $\varepsilon_{r\ eff}$ ferrite = 10,218; w_2 = 14,044 mm (width of strip on cork medium). $\varepsilon_{r\ eff}$ cork = 4,0288. $h \leq 5$ cm, then chosen h = 0,9 cm (height of space between plate of copper with ground plane), $s \geq 6$ cm and then chosen s = 6 cm (length of strip which fill TEM). Afterwards ferrite is designed from silicon glue and ferromagnetic sand by ratio 1:3, so founded ε_r = 13, 3. Dielectric's materials are consists of ferrite and cork with ε_r = 4, 6.

Pass through the testing specifications in Microwave Laboratory, can be had the following result: in range frequency 2,0 GHz – 3,0 GHz, can be had VSWR $\leq$ 1,5 on A terminal with Z_T = 48,10 + j1,854 Ω; insertion loss = 0,6 dB; isolation = 29,768 dB. In range frequency 2510,66 – 2966,66 MHz, can be had VSWR $\leq$ 1,5 on B terminal with Z_T = 48,44 + j0,564 Ω; insertion loss = 1,2 dB; isolation = 30,318 dB. In range frequency 2175,66 – 2755,66 MHz, can be had VSWR $\leq$ 1,5 on C terminal with Z_T = 45,41 + j1,942 Ω; insertion loss = 0,16 dB; isolation = 25,759 dB.