Corrections to "A New Approach to Design Triple-Band Filtering Power Dividers Based on Coupled Lines"

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THE authors of [1], regret that due to typing and mathematical errors in the proof, a few corrections need to be made to the letter. Despite these errors, the main contributions as well as the conclusions are correct.

The authors apologize for any inconvenience caused.

The corrections are the following:

1) The title of [1] should be "A New Approach to Designing Triple-Band Filtering Power Dividers Based on Coupled Lines."
2) In [1], Fig. 1 (a) should be updated as following Fig. 1.

Under the even-mode analysis, the input reflection of port 1 is derived as (1), and the input reflection of port 2 is derived as (2). Under the odd-mode analysis, the input reflection of port 2 is derived as (3).

$$\Gamma_e^{in} = (Z_{A6} - 2Z_0)/(Z_{A6} + 2Z_0) \tag{1}$$

$$\Gamma_e = (Z_{ine} - Z_0)/(Z_{ine} + Z_0) \tag{2}$$

$$\Gamma_o = (Z_{ino} - Z_0)/(Z_{ino} + Z_0). \tag{3}$$

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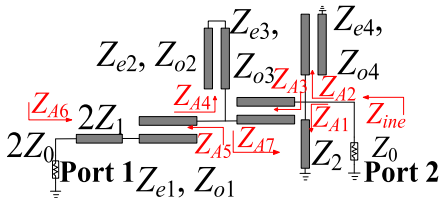

Fig. 1. Even-mode equivalent bisection circuit of the proposed design.

Ultimately, the theoretical S-parameter of the proposed design can be derived as follows

$$|S_{11}| = \left|S_{11}^e\right| = \left|\Gamma_e^{in}\right|, |S_{21}| = \sqrt{\left(1 - |S_{11}|^2\right)/2} \tag{4a}$$

$$S_{23} = (\Gamma_e - \Gamma_o)/2. \tag{4b}$$

Then, the locations of six TZs could be derived as (5), and the positions of six TPs could also be found at the top of the next page.

$$\begin{aligned} &f_{tz1} = 0,\ f_{tz4} = 2f_0 - f_{tz3},\ f_{tz5} = 2f_0 - f_{tz2},\ f_{tz6} = 2f_0 \\ &f_{tz2} = \frac{2f_0}{\pi} \arcsin\sqrt{Z_{e2}/(Z_{e2} + Z_{o2})} \\ &f_{tz3} = \frac{2f_0}{\pi} \arcsin\left(2\sqrt{Z_{e4}Z_{o4}}/(Z_{e4} + Z_{o4})\right). \end{aligned} \tag{5}$$

3) In Section II, the phrase "and therefore Z_{e2} and Z_{o2} are selected as 56.4 Ω and 27.0 Ω, Z_{e4} and Z_{o4} are selected as 176.0 Ω and 126.0 Ω according to the above analysis" should be modified as "and therefore Z_{e2} and Z_{o2} are selected as 66.3 Ω and 30.1 Ω, Z_{e4} and Z_{o4} are selected as 171.3 Ω and 124.2 Ω according to the above analysis," and the impedance Z_{B5} should be modified as follows:

$$Z_{B5} = -\frac{2Z_{e1}Z_{o1}\left(jR_1(Z_{e1} + Z_{o1})\cot\theta + 4Z_{e1}Z_{o1}\left(\cot\theta^2 - \csc\theta^2\right)\right)}{(Z_{e1} + Z_{o1})(R_1(Z_{e1} + Z_{o1}) - 4jZ_{e1}Z_{o1}\cot\theta)}.$$

It is note that in addition to the above corrections, the other related formulas can be found in the original version.

$$f_{tp1} \approx \frac{2f_0}{\pi} \arcsin \sqrt{\frac{Z_{e3}^2 Z_{o1}^2 Z_{o2}^2}{2\left(4Z_0^2 Z_{o1}^2 Z_{o2}^2 - Z_{e3}^2 Z_{o1}^2 Z_{o2}^2 + 8Z_0^2 Z_{e1} Z_{o1} Z_{o2} Z_{o3} + 4Z_0^2 Z_{e1}^2 Z_{o3}^2\right)}},$$

$$f_{tp2} \approx \frac{2f_0}{\pi} \arcsin \sqrt{\frac{3Z_0^2 Z_{o1}^2 Z_{o2}^2}{4Z_0^2 Z_{o1}^2 Z_{o2}^2 - Z_{e3}^2 Z_{o1}^2 Z_{o2}^2 + 8Z_0^2 Z_{e1} Z_{o1} Z_{o2} Z_{o3} + 4Z_0^2 Z_{e1}^2 Z_{o3}^2}}$$

$$f_{tp3} \approx \frac{2f_0}{\pi} \arcsin \sqrt{\frac{-2\left(2Z_{e3}^2 Z_{o1} Z_{o2}^2 - 12Z_0^2 Z_{o1}^2 Z_{o2}^2 + Z_{e3}^2 Z_{o1}^2 Z_{o2}^2 - 8Z_0^2 Z_{e1} Z_{o1} Z_{o2} Z_{o3}\right)}{3\left(-4Z_0^2 Z_{o1}^2 Z_{o2}^2 + Z_{e3}^2 Z_{o1}^2 Z_{o2}^2 - 8Z_0^2 Z_{e1} Z_{o1} Z_{o2} Z_{o3} - 4Z_0^2 Z_{e1}^2 Z_{o3}^2\right)}},$$

$$f_{tp4} \approx 2f_0 - f_{tp3},\ f_{tp5} \approx 2f_0 - f_{tp2},\ f_{tp6} \approx 2f_0 - f_{tp1}$$

$$Z_{A6} = \frac{2\cot\theta Z_1((-2j\cot\theta Z_{A4} Z_{A7}(Z_{e1} - Z_{o1}) + (Z_{A4} + Z_{A7})(Z_{e1} - Z_{o1}))(4Z_1 + Z_{e1} - Z_{o1}) + 8jZ_1 Z_{A4} Z_{A7}\tan\theta)}{-4j\csc^2\theta Z_1(Z_{A4} + Z_{A7})(Z_{e1} - Z_{o1}) + 2\cot\theta Z_{A4} Z_{A7}(4Z_1 + Z_{e1} - Z_{o1}) + j(Z_{A4} + Z_{A7})(Z_{e1} - Z_{o1})(4Z_1 + Z_{e1} - Z_{o1})}$$

$$Z_{A7} = \frac{-0.5j\cot\theta(Z_{e3} + Z_{o3}) + \left(\csc^2\theta(Z_0 Z_{A1} + Z_0 Z_{A2})(Z_{e3} + Z_{o3})^2\right)}{2(2Z_0 Z_{A1} Z_{A2} - j\cot\theta Z_0 Z_{A1} Z_{e3} - j\cot\theta Z_0 Z_{A2} Z_{e3} - j\cot\theta Z_{A1} Z_{A2} Z_{e3} + j\cot\theta_0 Z_{A1} Z_{o3} + j\cot\theta Z_0 Z_{A2} Z_{o3} + j\cot\theta Z_{A1} Z_{A2} Z_{A3})}$$

REFERENCES

[1] Z. Luo et al., "A new approach to design triple-band filtering power dividers based on coupled lines," *IEEE Microw. Wireless Technol. Lett.*, vol. 33, no. 8, pp. 1123–1126, Aug. 2023, doi: 10.1109/LMWT.2023.3266009.