

Fig. 8. (a) Characteristic impedance of microstrip for $T/W = 0$. (b) Velocity of propagation on microstrip for $T/W = 0$.

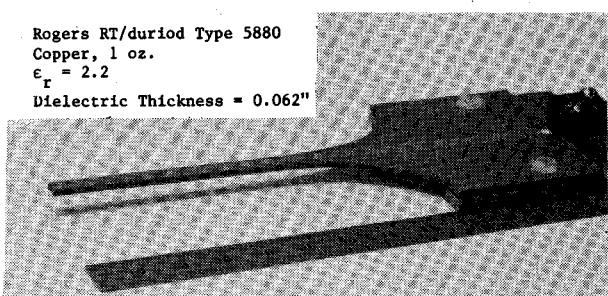


Fig. 9. Physical layout of 50-73- Ω balun with laminate characteristics.

supports the use of this data for design where the physical environment demands that such a modified microstrip geometry be employed.

REFERENCES

- [1] C. E. Smith and R. S. Chang, "Microstrip transmission line with finite-width dielectric," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-28, pp. 90-94, Feb. 1980.
- [2] J. W. Duncan and V. P. Minerva, "100:0 bandwidth balun transformer," *Proc. IRE*, vol. 48, pp. 156-164, Feb. 1960.
- [3] M. Gans, D. Kajfez, and V. H. Rumsey, "Frequency independent baluns," *Proc. IEEE*, vol. 53, pp. 647-648, June 1965.

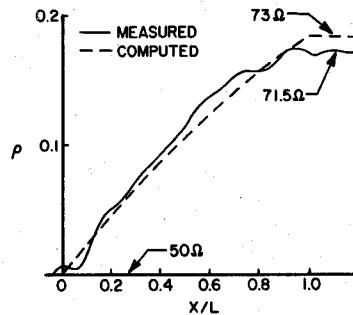


Fig. 10. Measured and computed reflection coefficients for linear impedance taper balun (50-73 Ω). Measurements made using time-domain reflectometer (TDR) with 28-ps risetime and 3-percent magnitude accuracy.

TABLE I
LINE PARAMETERS FOR 50-73- Ω MICROSTRIP BALUN

Normalized Position X/L	Z_0 , Ω	T/W	W/H^*
<0.0	50.	>5.	3.12
0.0	50.	3.	3.31
0.2	54.6	2.	2.91
0.4	59.2	1.	2.68
0.6	63.8	0.5	2.33
0.8	68.4	0.25	2.27
1.0	73.	0.0	2.53
>1.0	73.	0.0	2.53

*Graphical design data used to determine basic design. Final W/H checked with computer results which are presented in table.

- [4] R. E. Collin, *Foundations for Microwave Engineering*. New York: McGraw-Hill, 1966, ch. 5.
- [5] R. K. L. Poon, "Capacitance of a microstrip of unequal widths in a homogeneous medium," *Electron. Lett.*, vol. 15, no. 2, pp. 44-45, Jan. 1979.
- [6] C. E. Smith, "On the accuracy of design data for microstrip of unequal widths in an inhomogeneous media," *Electron. Lett.*, vol. 19, no. 15, pp. 575-576, July 21, 1983.
- [7] R. F. Harrington and K. Pontoppidan, "Computation of Laplacian potentials by an equivalent source method," *Proc. Inst. Elec. Eng.*, vol. 116, no. 10, pp. 1715-1720, Oct. 1969.
- [8] A. T. Adams and J. R. Mautz, "Computer solution of electrostatic problems by matrix inversion," in *Proc. Nat. Electronic Conf.*, vol. 25, Dec. 1969, pp. 198-201.
- [9] C. E. Smith, "A coupled integral equation solution for microstrip transmission lines," *IEEE G-MTT Microwave Symp. Dig.*, June 1973, pp. 284-286.
- [10] S. M. Rao, T. K. Sarkar, and R. F. Harrington, "The electrostatic field of conducting bodies in multiple dielectric media," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-32, pp. 1441-1448, Nov. 1984.
- [11] T. G. Bryant and J. A. Weiss, "Parameters of microstrip transmission lines and of coupled pairs of microstrip lines," *IEEE Trans. Microwave Theory Tech.*, vol. MTT-16, pp. 1021-1027, Dec. 1968.

Correction to "Waveguide Modes Via an Integral Equation Leading to a Linear Matrix Eigenvalue Problem"

G. CONCIAURO, M. BRESSAN, AND C. ZUFFADA

After having examined the above paper,¹ we noticed that the symbol of principal value in integral (1) is inappropriate. In fact, integral (1) can represent the field on σ only in the limit as the observation point approaches σ . This oversight, however, does not affect the theory at all.

Furthermore, in (5), the symbol δ' should be read as ∇' .

Manuscript received May 6, 1985.

The authors are with the Dipartimento di Elettronica dell'Università di Pavia, 27100 Pavia, Italy.

¹G. Conciauro *et al.*, *IEEE Trans. Microwave Theory Tech.*, vol. MTT-32, pp. 1495-1504, Nov. 1984.