can vary several ohms at 9 kMc (Fig. 12), the error in f_c for these high capacitance units can easily be understood.

Of the first two approaches which have given consistent results, the cavity-resonance method is by far the simplest and most adapted for very high Q diodes. The method is easy to calibrate and the measurement is not affected by variations in the diode packages, since the measurement frequency is chosen as low as 1 kMc. In Approach 3, if the diode Q is higher than 5 at 9 kMc, then a higher frequency of measurement is recommended in order to be able to neglect R_p in our equivalent circuit. A higher measurement frequency, however, requires extreme precision in package, in diode holder and in all respects of the measurements.

V. Conclusions

A general representation has been given of the importance and requirements of the fundamental electrical parameters of microwave variable capacitance diodes. It is suggested that the following parameters be specified:

1) the breakdown voltage,
2) the capacitance at zero-volt bias,
3) the exact variation of the capacitance with bias voltage (from which the nonlinearity coefficient can be calculated),
4) the cutoff frequency or the Q at a particular frequency,
5) the dynamic back-biased resistance (because the diodes also have applications at the lower frequencies).

The Q of the diode is not an easy parameter to measure; therefore, three different approaches were considered in order to gain comparison. In the first method, a general four-terminal transformation is used from the active region of the device to the transmission line in which the measurements are made. Special terminations such as open circuit, a short circuit, and a standard impedance were used instead of the active diode region when determining the general four-terminal coupling network. It was shown that a simple L network was a good approximation up to 2 kMc, and it led to a fairly accurate and easy method for measuring the diode junction impedance. In the second approach, the diode Q was deduced by placing the diode in a cavity resonator which is considered as a transmission device. From the measured bandwidth and the resonant frequency of the cavity with the diode inserted, the diode Q could be computed after the cavity, without the diode, was first calibrated by using a known capacitance change. Finally, a simplified form of a general Weissfloch canonical network was presented, which led to another Q-evaluation method.

The results obtained from all these methods compare fairly well. However, from measurement on several diodes, it can be concluded that the cavity resonance method (at around 2 kMc) may be the best for a specification test because of the ease with which these measurements can be accomplished, and the accuracy and the reproducibility of the results. In order to standardize this method, the cavity dimensions have to be specified for such a test.

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Correction

W. H. Eggiman, author of "Scattering of a Plane Wave on a Ferrite Cylinder and Normal Incidence," which appeared on pp. 441–445 of the July, 1960, issue of these Transactions, has brought the following to the attention of the *Editor*. By an oversight, the sponsoring agency of the work described in the paper was not mentioned. The author regrets the omission very much and wishes to express his sincere appreciation to the Electronics Research Directorate of the Air Force Cambridge Research Center, Air Research and Development Command, which supported the work under contract No. AF 19 (604)-3887.