



CAUTION:



ELECTROSTATIC DISCHARGE  
SENSITIVE

# WHM Series Package Properties

## 1. Introduction

With more and more RF and microwave applications which require high volume assembly enable components such as surface mount technology (SMT) type low noise amplifiers and power amplifiers, people have been looking for the package technologies for very low loss, least effect on the RF performance, good protection, and low cost.

After year's research and tests, WanTcom has developed WHM series amplifier products package which meet all the above mentioned merits. Besides, the process is very suitable high volume production environment and thus further lower the cost in getting the extreme high yield and easy to make.

## 2. Package Hermiticity

The package material we use for the WHM series is quite different from the traditional packaging material such as ceramic and plastic type in both high frequency electrical performance and hermiticity or the leakage rate of the package.

Comparing to the ceramic type package, the loss packaging material we use has similar low loss property than that of ceramic. However, the dielectric constant is much lower, which ultimately reduce the package effect on the electrical performance due to the high dielectric constant of the ceramic. At very low temperature, the new material appears as in liquid format which allow us to fill the package shapes as we designed to without the extreme high firing temperature for the ceramic package. The most distinguish one is that the new package is a solid filled block without any cavity internally, which allow no air or moisture inside the package.

Comparing to a plastic type package, which has very high leakage rate, the new package has much better hermiticity. It is well known that the plastic package behaves poorly in the accelerated life test and high humidity with high temperature test such as 85/85 tests. The new material package for the WHM series can pass the tough environment test such as 85/85 test. We have qualified WHM series packaged amplifier per MIL-STD-883g standard.

The new WHM series package can pass the Gross leak or equivalent hermiticity test that has the leakage

rate on the order of  $10^{-6}$  atm.cm<sup>3</sup>/S, while the traditional plastic package only has the leakage rate in the order of  $10^{-3}$  atm.cm<sup>3</sup>/S.

## 3. Package Electrical Performance

The WHM series package has been proved to work up to more than 18 GHz with very low insertion loss. Fig. 1 shows the measured insertion losses and return losses of 62 pieces of the packaged 50 Ohm lines with the WHM series packaging material and process. The package appears to be 'transparent' to the high frequency energy up to 18 GHz.

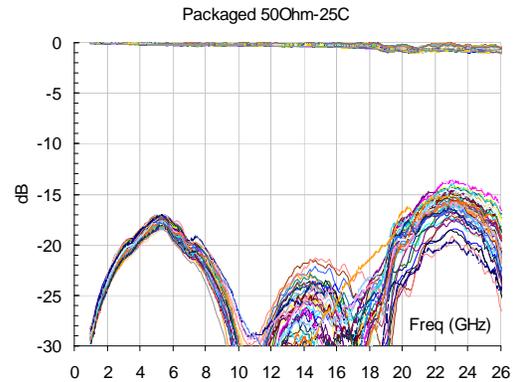


Fig. 1

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