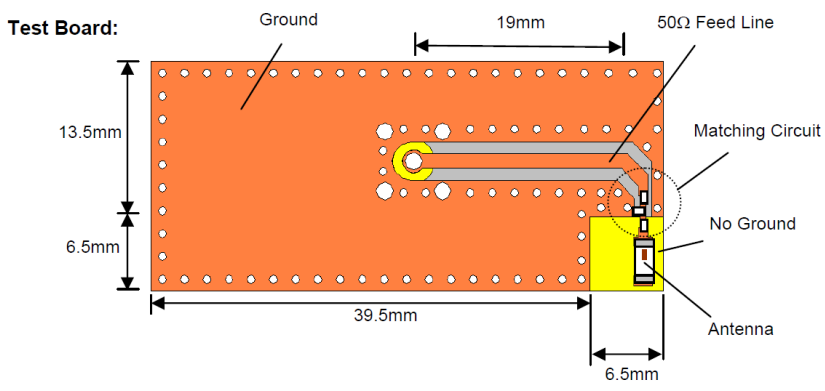


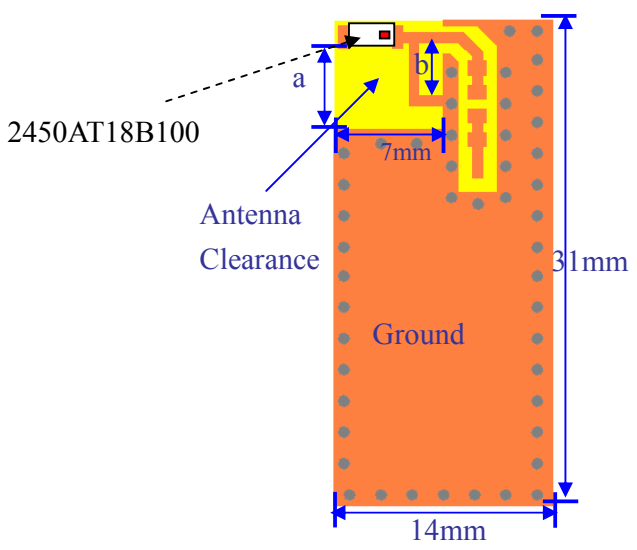
Method for bandwidth expansion for chip antennas:

2450AT18B100 Bandwidth with original Eval board: 100MHz

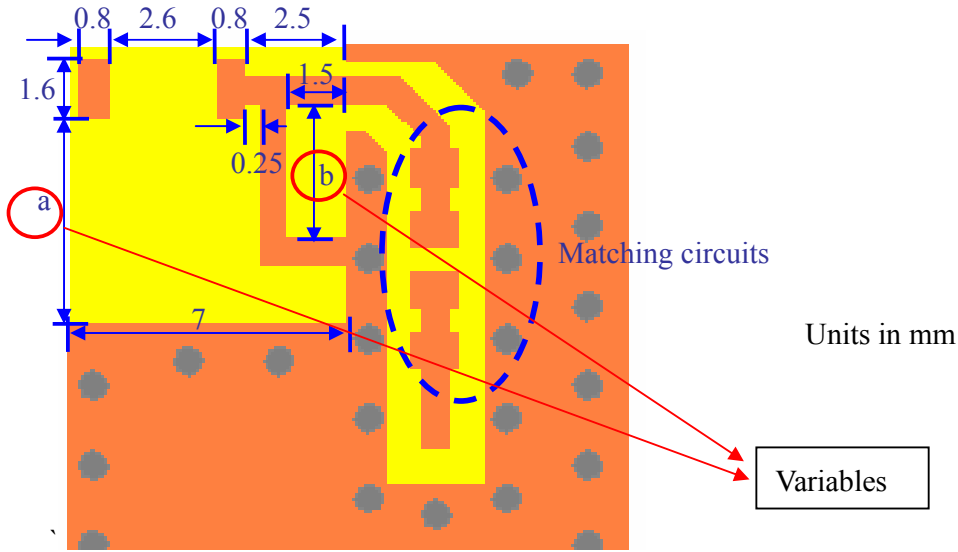


Layout with additional “elbow” to GND:

(A) Evaluation board

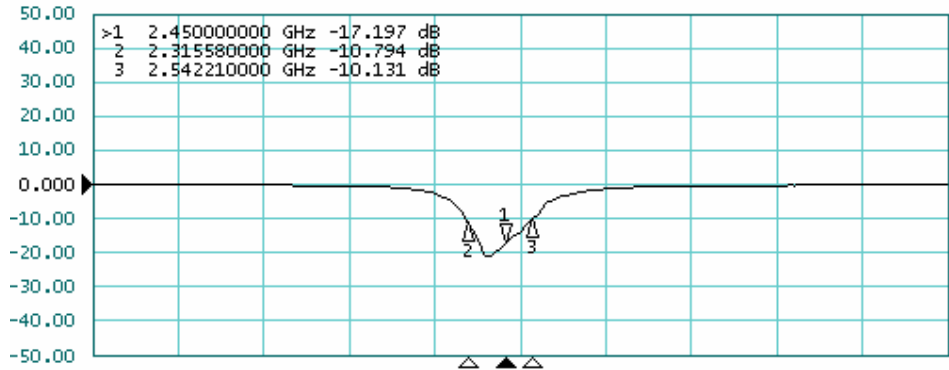


(B) Detailed land pattern with dimensions (+ 2 variables)

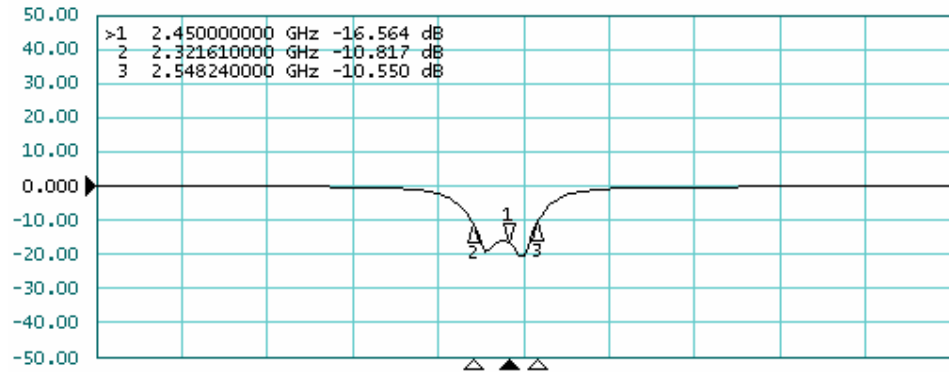


Return loss measurement (variables a and b dependent)

(A) a=5mm, b=3.25mm



(B) a=3mm, b=2.25mm



**Bandwidth Summary with PIFA type. Table-1**

Case	New Bandwidth ( $S_{11} < -10\text{dB}$ )	Frequency Range
a=5mm, b=3.25mm H-direction_1 PIFA	220 MHz	2.32 ~ 2.54GHz
a=3mm, b=2.25mm H-direction_3 PIFA	230 MHz	2.32 ~ 2.55GHz