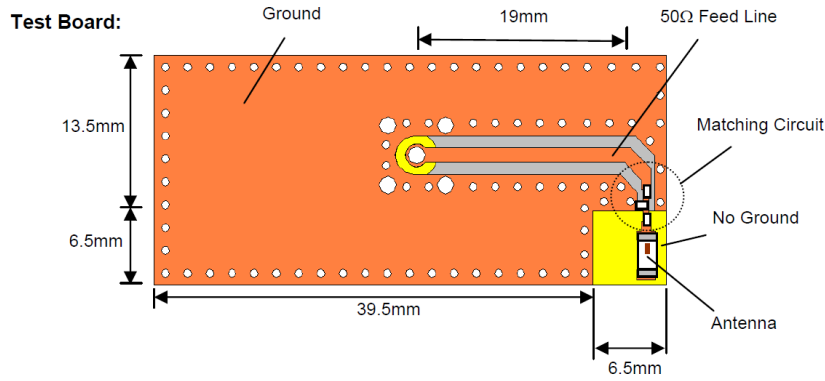


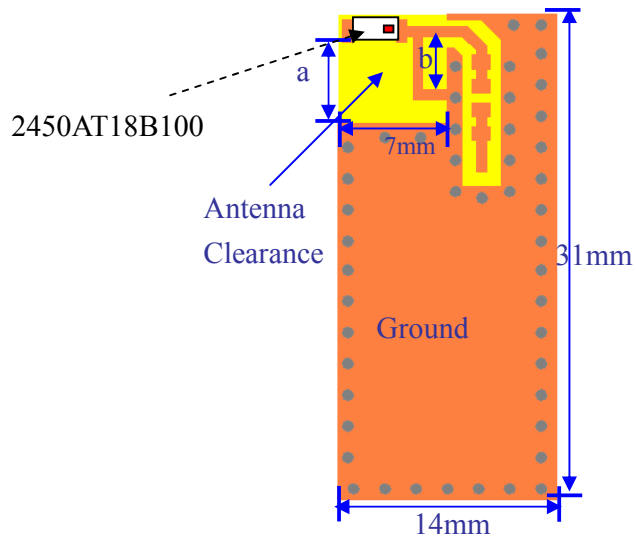
Method for bandwidth expansion for chip antennas:

2450AT18B100 Bandwidth with original Eval board: 100MHz

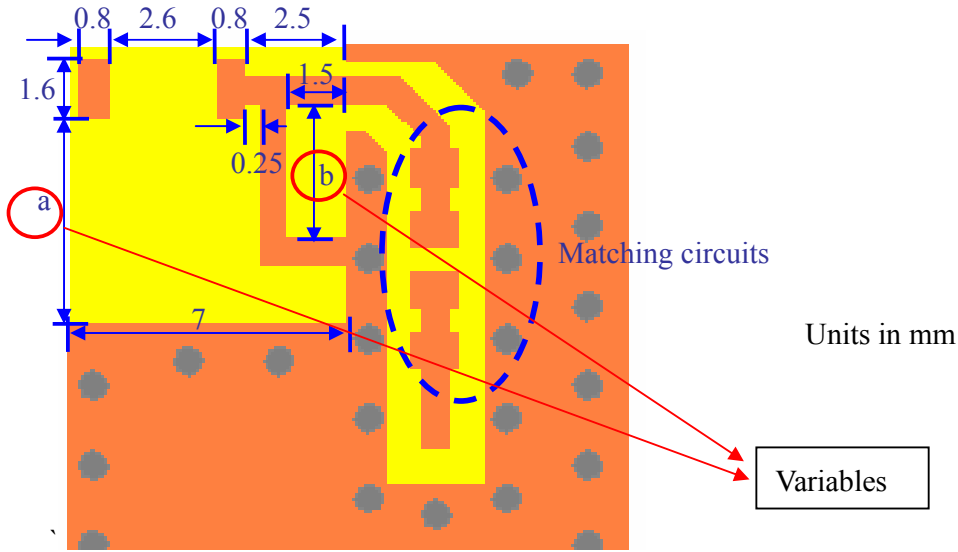


Layout with additional “elbow” to GND:

(A) Evaluation board

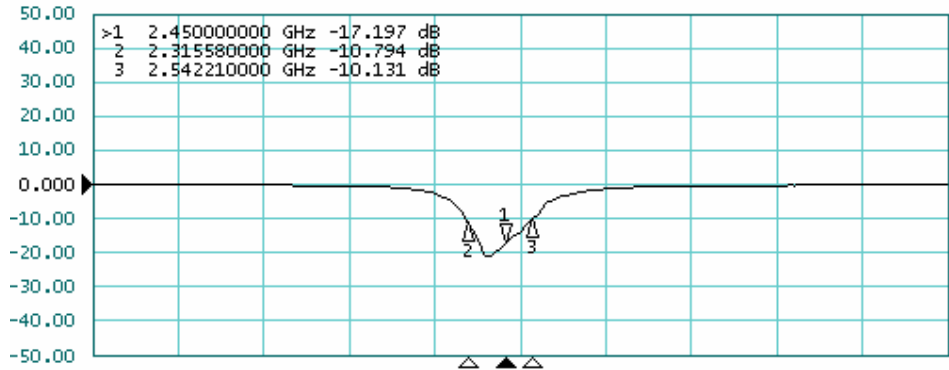


(B) Detailed land pattern with dimensions (+ 2 variables)

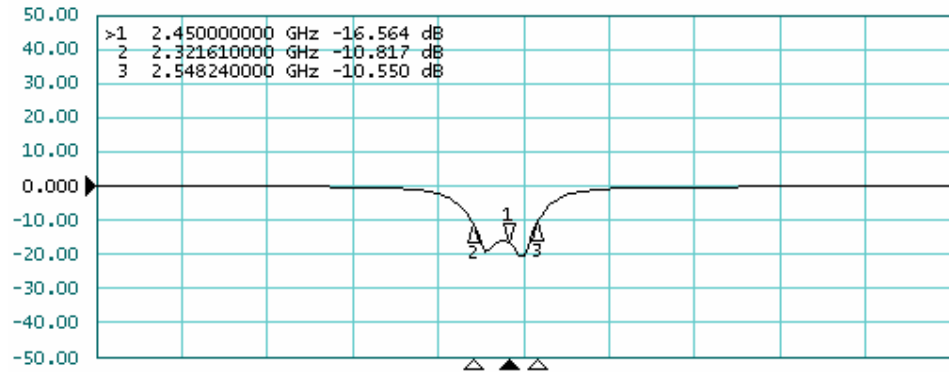


Return loss measurement (variables a and b dependent)

(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<br>H-direction_1 PIFA | 220 MHz                                   | 2.32 ~ 2.54GHz  |
| a=3mm, b=2.25mm<br>H-direction_3 PIFA | 230 MHz                                   | 2.32 ~ 2.55GHz  |