

電工實驗 5

第一次實驗

預報

Date: 2024/09/24

Class: 電機四全英班

Group: Group 9

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I. TXLINE 參數設定

The screenshot shows the TXLINE 2003 - Microstrip software interface. The top menu bar includes options: Microstrip, Stripline, CPW, CPW Ground, Round Coaxial, Slotline, Coupled MSLine, and Coupled Stripline. The main window is divided into several sections:

- Material Parameters:**
 - Dielectric: GaAs (dropdown)
 - Conductor: Copper (dropdown)
 - Dielectric Constant: 4.7
 - Conductivity: 5.88E+07 S/m
 - Loss Tangent: 0.02
- Electrical Characteristics:**
 - Impedance: 40 Ohms
 - Frequency: 1.5 GHz
 - Electrical Length: 239.642 deg
 - Phase Constant: 3423.46 deg/m
 - Effective Diel. Const: 3.6123
 - Loss: 5.40605 dB/m
- Physical Characteristic:**
 - Physical Length (L): 70 mm
 - Width (W): 2.04411 mm
 - Height (H): 0.8 mm
 - Thickness (T): 0.035 mm

On the right side, there is a diagram of a microstrip line on a dielectric substrate, with labels for width (W), height (H), thickness (T), and dielectric constant (ϵ_r). The AWR logo is also visible.

結論: $W = 2.04411\text{mm}$

II. Libra 的 code

A. 開路

```

DIM
FREQ    GHZ
RES      OH
LNG      MM
ANG      DEG
IND      NH
CAP      PF

CKT
MSUB    ER=4.7  H=0.8  T=0.035  RHO=0  RGH=0
TAND    TAND=0.02
MLIN    1      2      W=2.04411  L=70

DEF1P   1      EXP1

FREQ
SWEEP   0      4      0.01

OUT
EXP1    DB[S11]  GR1
EXP1    MAG[z1]  GR2

GRID
RANGE   0      4      0.01
GR1     -2     0.5    0.01
GR2     -100   1500   100
  
```

B. 短路

```
DIM
FREQ      GHZ
RES       OH
LNG       MM
ANG       DEG
IND       NH
CAP       PF

CKT
MSUB      ER=4.7  H=0.8  T=0.035  RHO=0  RGH=0
TAND      TAND=0.02
MLIN      1      2      W=2.04411  L=70
RES       2      0      R=0
DEF1P     1      EXP1

FREQ
SWEEP     0      4      0.01

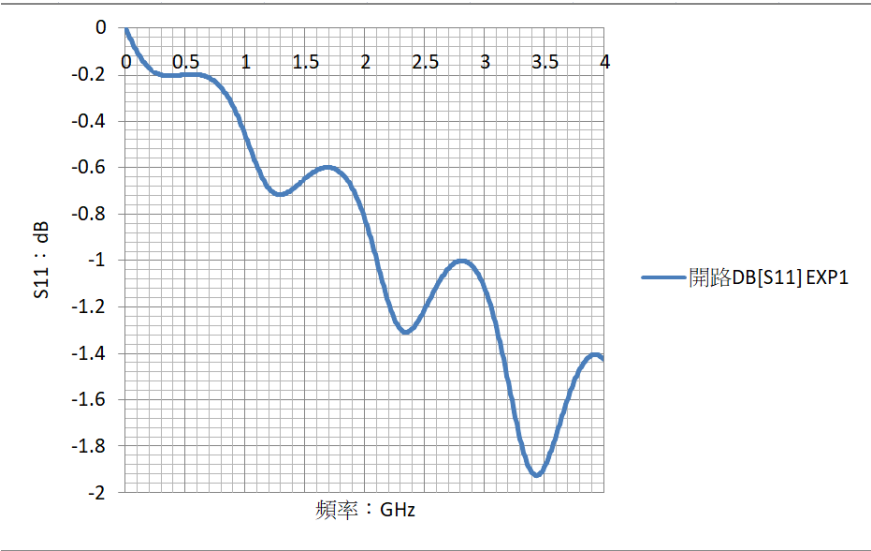
OUT
EXP1      DB[S11]  GR1
EXP1      MAG[z1]  GR2

GRID
RANGE     0      4      0.01
GR1       -2     0.5    0.01
GR2       -100   1500   100
```

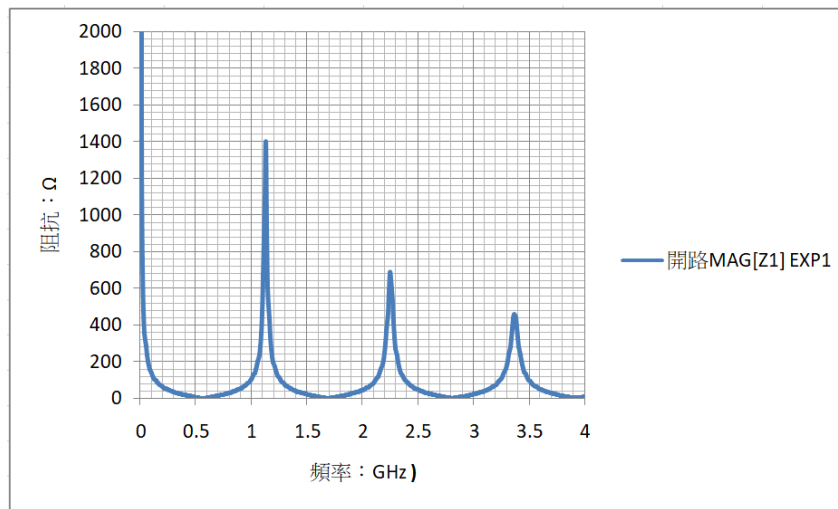
III. 模擬結果

A. 開路

1. S11

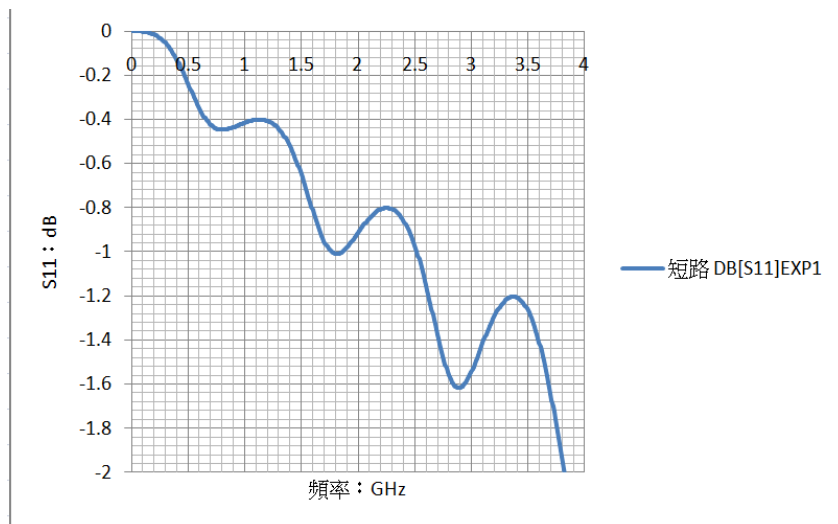


2. Z1



B. 短路

1. S11



2. Z1

