

# Student Design Competition

## Designated values of mismatch lines

### (1) Mismatch line 1

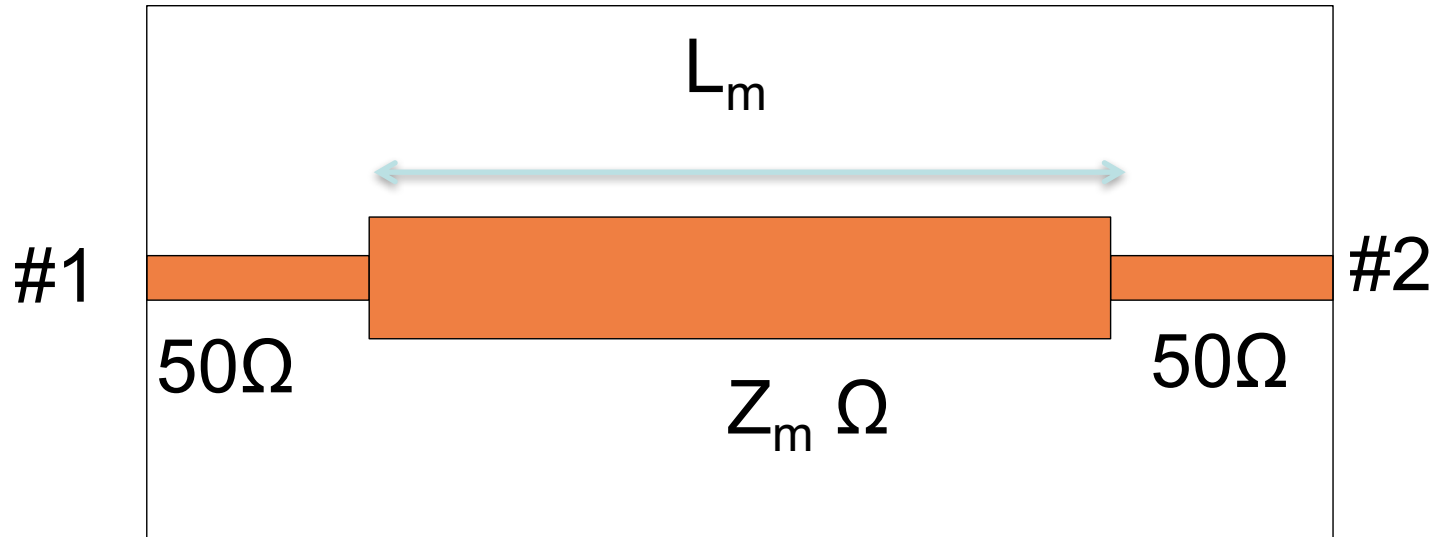
- (a)  $f_0$ : 2 GHz
- (b)  $|S_{11\_min}|$ : ideally zero
- (c)  $|S_{11\_max}|$ : decided by  $Z_m$
- (d)  $Z_m$ : 25  $\Omega$

### (2) Mismatch line 2

- (a)  $f_0$ : 3 GHz
- (b)  $|S_{11\_min}|$ : ideally zero
- (c)  $|S_{11\_max}|$ : decided by  $Z_m$
- (d)  $Z_m$ : 100  $\Omega$

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## Device descriptions



- Substrate : single layer
- Interface: Female SMA connector (metric screw thread connector)
- Transmission line type: planar type, no limitation of transmission structure
  - Microstrip, CPW, GCPW, Coplanar strip, etc
- Use of stubs and tapered transmission line structure are not permitted.

# Evaluation Criteria (TBD)

## (1) Mismatch line 1

- (a)  $f_0$ : 2 GHz
- (b)  $|S_{11\_min}|$ : ideally zero (linear)
- (c)  $|S_{11\_max}|$ : decided by  $Z_m$  (linear)
- (d)  $Z_m$ : 25  $\Omega$

## (2) Mismatch line 2

- (a)  $f_0$ : 3 GHz
- (b)  $|S_{11\_min}|$ : ideally zero (linear)
- (c)  $|S_{11\_max}|$ : decided by  $Z_m$  (linear)
- (d)  $Z_m$ : 100  $\Omega$

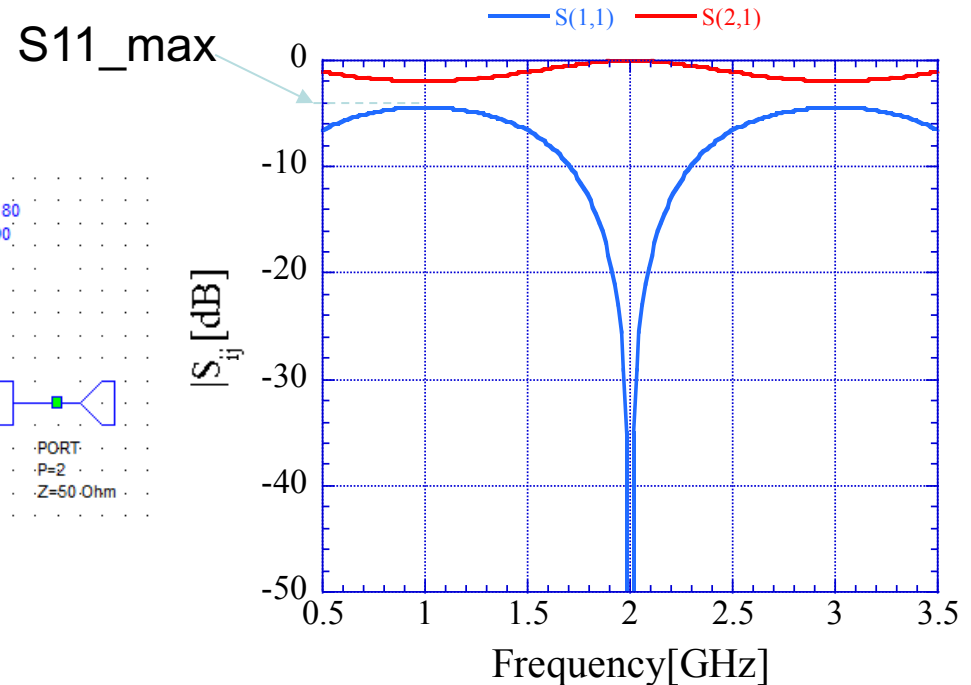
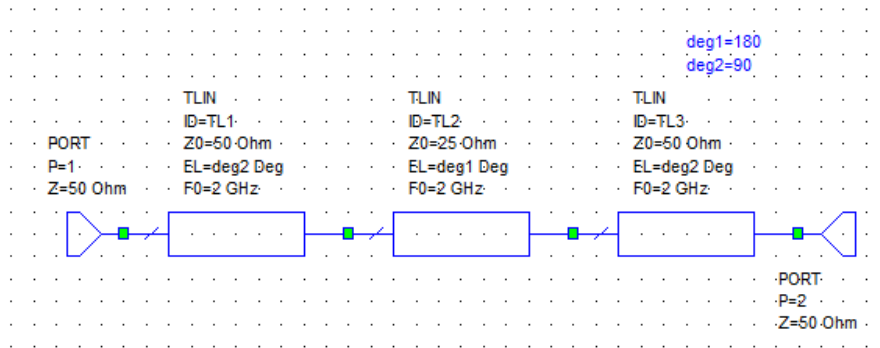
### Criteria:

1.  $\Delta f_0 = (f\_meas - f_0)$
2.  $\Delta S_{11\_min} = (S_{11\_min\_meas} - S_{11\_min})$   
 $S_{11\_min} = 0.001(\text{linear})$
3.  $\Delta S_{11\_max} = (S_{11\_max\_meas} - S_{11\_max})$  at  $f_0/2$   
 $S_{11\_max} = 2/3(\text{linear})$
4.  $\Delta Z_m = (Z_m\_meas - Z_m) / Z_m$  at  $f_0$

The winner will achieve the minimum value of the sum of the two mismatch lines measured data.

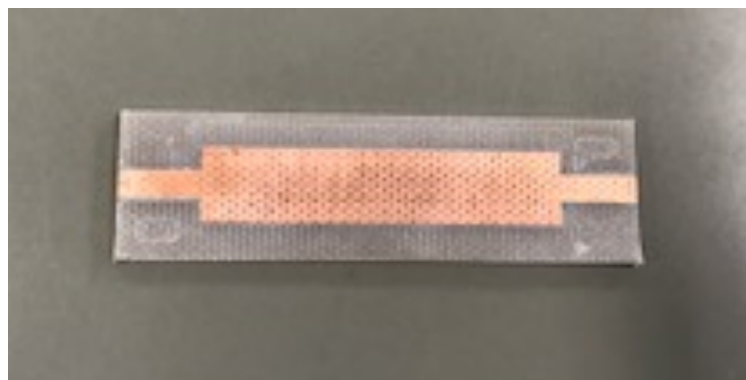
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## Example: design and simulation results

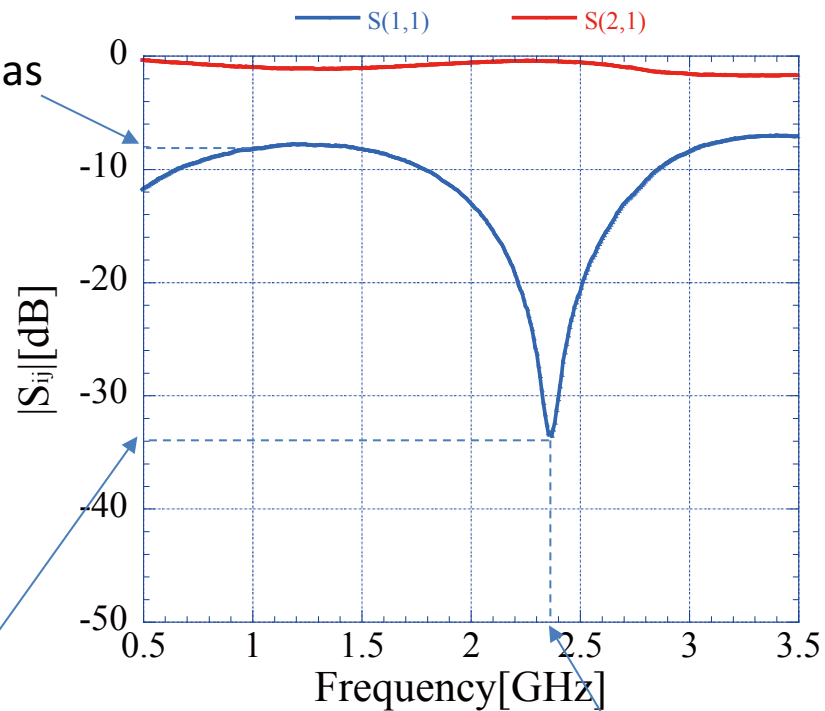


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## Example: measurement results



$S_{11\_max\_meas}$



$S_{11\_min\_meas}$

$f\_meas$