

Unit 8 - Week 6

Course outline

How does an NPTEL online course work?

Practice Assignment

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Week 3

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Week 6

Lecture 24 : Broadband MSA-I

Lecture 25 : Broadband MSA-II

Lecture 26 : Broadband MSA-III

Lecture 27 : Broadband MSA-IV

Lecture 28 : Broadband MSA-V

Week-6 Study Material

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Assignment-6

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2020-03-11, 23:59 IST.

1) For a given substrate height h , which one of the following substrate dielectric constants will give higher VSWR bandwidth for an RMSA? **2 points**

- $\epsilon_r = 1$
- $\epsilon_r = 2.2$
- $\epsilon_r = 6$
- $\epsilon_r = 10.2$

No, the answer is incorrect. Score: 0

Accepted Answers: $\epsilon_r = 1$

2) Which of the following techniques cannot be used to improve bandwidth of a microstrip antenna? **2 points**

- Gap coupling multiple RMSAs
- Cutting a U-slot at the center of an RMSA
- Cutting the corners of an RMSA
- Stacking of multiple MSAs

No, the answer is incorrect. Score: 0

Accepted Answers: Cutting the corners of an RMSA

Common data for Questions 3-5: A radiating-edges gap-coupled broadband RMSA using three patches, as shown in Fig. 1, is to be designed to operate in the frequency range of 880 to 970 MHz. The substrate parameters are: $\epsilon_r = 2.55$, $h = 0.32$ cm.

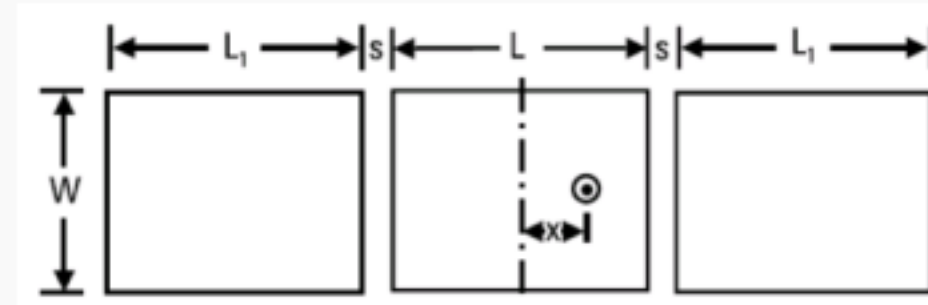


Fig. 1

3) The length L of the central patch should be, approximately: **2 points**

- 8.5 cm
- 9.4 cm
- 10.1 cm
- 11.2 cm

No, the answer is incorrect. Score: 0

Accepted Answers: 10.1 cm

4) The length L_1 of the coupled patches should be, approximately: **2 points**

- 8.5 cm
- 9.8 cm
- 10.5 cm
- 12.2 cm

No, the answer is incorrect. Score: 0

Accepted Answers: 9.8 cm

5) For a certain value of the feed location x , the observed impedance plot is shown in Fig. 2. To improve impedance matching, the feed location should be shifted: **2 points**

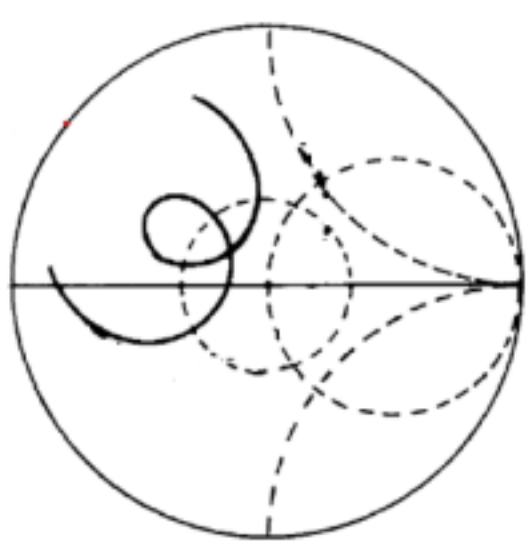


Fig. 2

- Up
- Down
- Left
- Right

No, the answer is incorrect. Score: 0

Accepted Answers: Right

6) Which of the following configurations can increase the VSWR bandwidth without increasing the volume of an antenna? **2 points**

- Non-radiating edge gap-coupled RMSA
- Gap-coupled semi-circular CMSA
- RMSA with a U-slot
- Both gap-coupled semi-circular CMSA and RMSA with U-slot

No, the answer is incorrect. Score: 0

Accepted Answers: Both gap-coupled semi-circular CMSA and RMSA with U-slot

Common Data for Questions 7-9: An electromagnetically coupled RMSA configuration, as shown in Fig. 3 (side view), is to be designed to cover frequency band of 1.7 GHz to 2 GHz. The two metallic patches are stacked above each other in air with $\Delta_1 = 1$ cm and $\Delta_2 = 1.2$ cm.

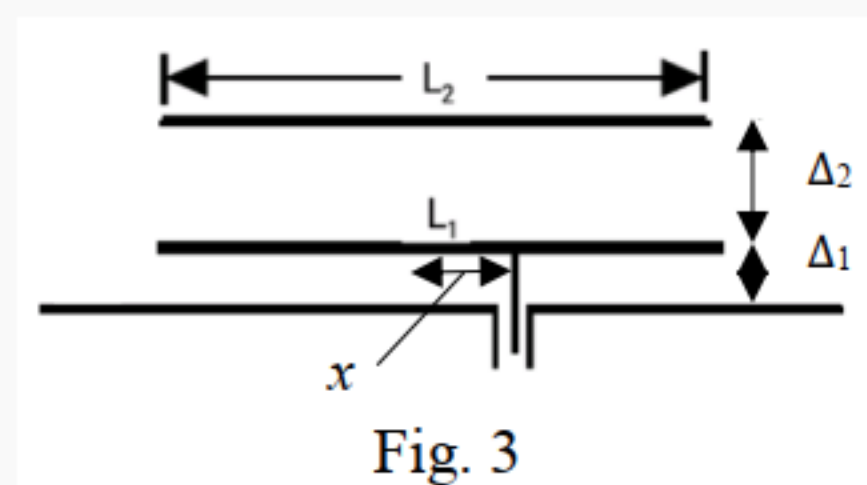


Fig. 3

7) The length of the lower patch (L_1) should be, approximately: **2 points**

- 7 cm
- 6.5 cm
- 5.4 cm
- 3 cm

No, the answer is incorrect. Score: 0

Accepted Answers: 6.5 cm

8) The length of the upper patch (L_2) should be, approximately: **2 points**

- 7 cm
- 6.5 cm
- 5.5 cm
- 2 cm

No, the answer is incorrect. Score: 0

Accepted Answers: 5.5 cm

9) Which one of the following values of the feed location x can be chosen? **2 points**

- 0.2 cm
- 0.8 cm
- 1.5 cm
- 2.5 cm

No, the answer is incorrect. Score: 0

Accepted Answers: 2.5 cm

10) An application requires a high gain broadband antenna. The antenna is to be mounted on a surface of a large object with maximum height limitation of $1/10$ of the wavelength. Which of the following configurations can be suggested to meet the requirements? **2 points**

- Stacked Electromagnetically Coupled MSA in Air
- RMSA with a U-slot
- Gap-coupled semi-circular CMSA
- Four-edges gap-coupled RMSA

No, the answer is incorrect. Score: 0

Accepted Answers: Four-edges gap-coupled RMSA