

Frequency Domain View of Electronic Signals: Practical Application of the Fourier Theory

Objectives: The Frequency Domain

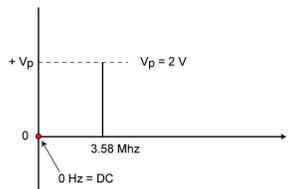
1. Define frequency domain.
2. Explain the relationship between the time and frequency domains.
3. Explain the trigonometric expression that represents a sine wave in the frequency domain.

1. What piece of equipment is used to view a frequency domain signal?
 - a. Oscilloscope
 - b. Phase meter
 - c. Pulse generator
 - d. Spectrum analyzer

2. When a sine wave is represented in the frequency domain, the horizontal axis is the
 - a. Frequency from 0 Hz (DC) to some upper frequency
 - b. Peak value
 - c. Power of the sine wave in a load
 - d. Time

3. What is the range of frequencies shown called?
 - a. Bandwidth
 - b. Frequency continuum
 - c. Frequency range
 - d. Frequency spectrum

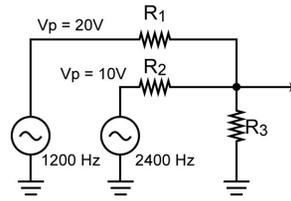
4. In the figure shown, what does the vertical line at 3.58 MHz represent?



- a. Average frequency
- b. Frequency range
- c. Peak frequency
- d. Sine wave voltage



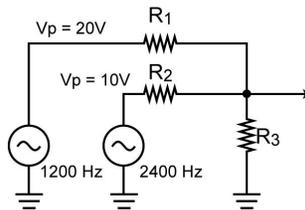
5. In the linear mixer shown, what does the time domain waveform across the load R3 represent?



Linear mixer

- a. The sum of the individual waveforms
- b. The difference between the individual waveforms
- c. 1200 Hz sine wave
- d. 2400 Hz sine wave

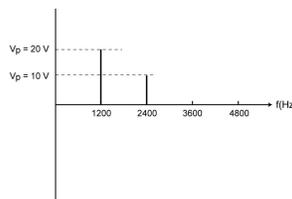
6. Which of the following is the mathematical expression for the signal shown in the linear mixer?



Linear mixer

- a. $v = 10 \sin [2\pi(1200)t] + 20 \sin [2\pi(2400)t]$
- b. $v = 10 \sin [2\pi(2400)t] - 20 \sin [2\pi(1200)t]$
- c. $v = 20 \sin [2\pi(1200)t] - 10 \sin [2\pi(2400)t]$
- d. $v = 20 \sin [2\pi(1200)t] + 10 \sin [2\pi(2400)t]$

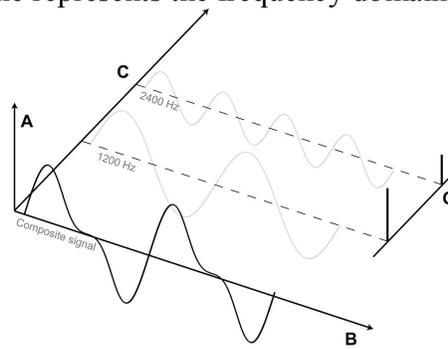
7. What does this figure represent?



- a. It represents a frequency domain view of a composite signal made up of a 1200 Hz wave at 20 volts and a 2400 Hz wave at 10 volts.
- b. It represents a time domain view of a composite signal made up of a 1200 Hz wave at 20 volts and a 2400 Hz wave at 10 volts.
- c. It represents a frequency domain view of a composite signal made up of a 1200 Hz wave at 10 volts and a 2400 Hz wave at 20 volts.
- d. It represents a time domain view of a composite signal made up of a 1200 Hz wave at 0 volts and a 2400 Hz wave at 20 volts.



8. In the figure shown here, which line represents the frequency domain?



- a. A
- b. B
- c. C