

# Fundamentals of SDR:RAHSDR480

## Module-5:SDR SELECTION CRITERIA

RAHSDR480\_L05\_P01\_R01: MOTIVATION



# MOTIVATION

- This module covers the different aspects of SDR so that we can choose our SDR based on parameters such as:
  - Bandwidth
  - Transmitter Power
  - Frequency Coverage
  - Dynamic Range
  - Cost - Efficiency Trade-off
  - RF Input to Receiver
  - Error-vector magnitude (EVM)



In this topic we have learnt about the

- ✓ **MOTIVATION for SDR selection**
- ✓ **Next we are going to learn Bandwidth & Sampling rate**



# Fundamentals of SDR:RAHSDR480

## Module-5:SDR SELECTION CRITERIA

RAHSDR480\_L05\_P02\_R01: Bandwidth & Sampling rate



# Bandwidth & Sampling rate

- Requirement of signal transmission e.g. GSM, WCDMA, LTE or LTE-CA
- Tone transmission
- FM transmission
- How much bandwidth need to be monitored if uses as a spectrum analyzer?

EX:

Nyquist Criteria:



In this topic we have learnt about the

- ✓ **Bandwidth & Sampling rate**
- ✓ **Next we are going to learn TRANSMITTER POWER**



# Fundamentals of SDR:RAHSDR480

## Module-5:SDR SELECTION CRITERIA

RAHSDR480\_L05\_P03\_R01: TRANSMITTER POWER



# TRANSMITTER POWER

- Total power required for transmission.
- Data sheet generally talk about power of transmitter for single tone.
- Channel power decreases with increase in bandwidth.



In this topic we have learnt about the

- ✓ **TRANSMITTER POWER**
- ✓ Next we are going to learn **FREQUENCY COVERAGE**



# Fundamentals of SDR:RAHSDR480

## Module-5:SDR SELECTION CRITERIA

RAHSDR480\_L05\_P04\_R01: FREQUENCY COVERAGE



# FREQUENCY COVERAGE

- Need of transmission e.g
- VHF, UHF, 5G sub 6 GHz



In this topic we have learnt about the

- ✓ **FREQUENCY COVERAGE**
- ✓ Next we are going to learn **DYNAMIC RANGE**



# Fundamentals of SDR:RAHSDR480

## Module-5:SDR SELECTION CRITERIA

RAHSDR480\_L05\_P05\_R01: DYNAMIC RANGE



# DYNAMIC RANGE

- Signal-to-noise-ratio (SNR) =  $6.02 N + 1.76$  dB
- Quality of transmission



In this topic we have learnt about the

✓ **DYNAMIC RANGE**

✓ Next we are going to learn **Cost-Efficiency Trade-off**



# Fundamentals of SDR:RAHSDR480

## Module-5:SDR SELECTION CRITERIA

RAHSDR480\_L05\_P06\_R01: Cost-Efficiency Trade-off



# Cost-Efficiency Trade-off



In this topic we have learnt about the

- ✓ **Cost-Efficiency Trade-off**
- ✓ **Next we are going to learn Error-Vector Magnitude**



# Fundamentals of SDR:RAHSDR480

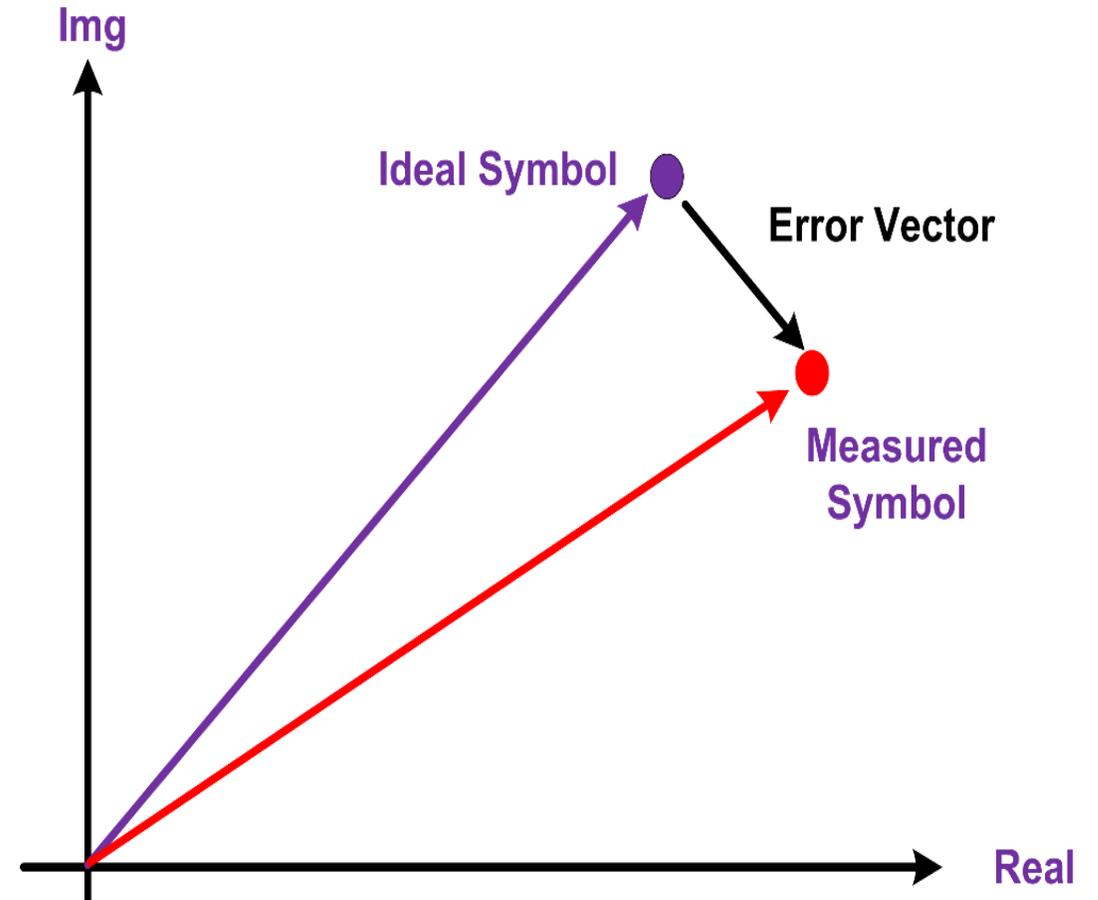
## Module-5:SDR SELECTION CRITERIA

RAHSDR480\_L05\_P07\_R01: Error-Vector Magnitude



# Error-Vector Magnitude

- The modulation quality of the transmission is determined using the EVM metric.
- To compute EVM, the received constellation is compared with the ideal constellation.
- The error vector for each point in the constellation is measured to provide accurate modulation performance.



In this topic we have learnt about the

- ✓ Error-Vector Magnitude
- ✓ Next we are going to learn **MAXIMUM RF INPUT TO RECEIVER**



# Fundamentals of SDR:RAHSDR480

## Module-5:SDR SELECTION CRITERIA

RAHSDR480\_L05\_P08\_R01: MAXIMUM RF INPUT TO RECEIVER



# MAXIMUM RF INPUT TO RECEIVER

- Maximum input power to avoid the damage to receiver



**In this topic we have learnt about the**

- ✓ **MAXIMUM RF INPUT TO RECEIVER**
- ✓ **Next we are going to learn Module-6:Application of SDRs**

