

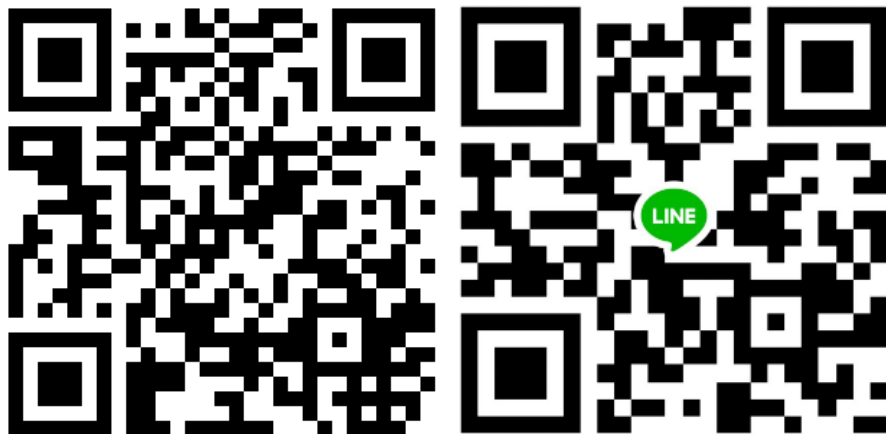
# Principles of Communications

## ECS 332

**Asst. Prof. Dr. Prapun Sukksompong**

[prapun@siit.tu.ac.th](mailto:prapun@siit.tu.ac.th)

### 4. Amplitude Modulation



**Office Hours:**

Check Google Calendar on the course website.

**Dr.Prapun's Office:**

6th floor of Sirindhralai building,  
BKD

# Principles of Communications

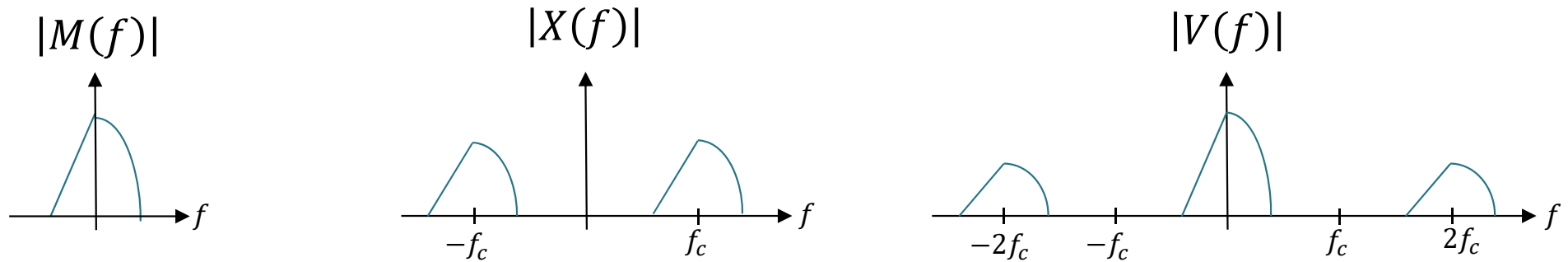
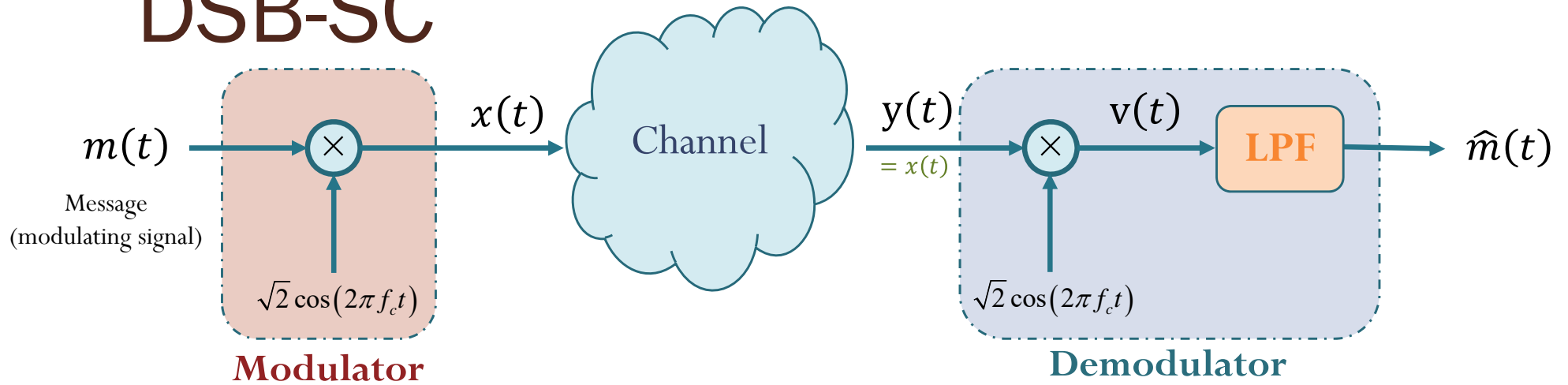
## ECS 332

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**4.1 DSB-SC**

# DSB-SC



Key equation:

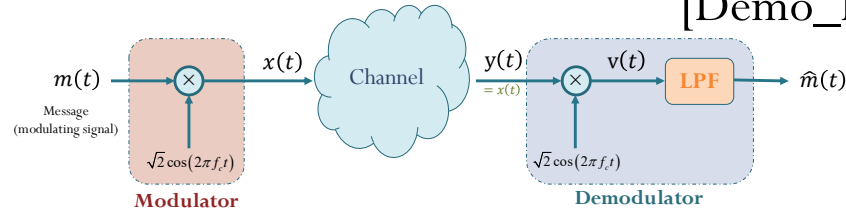
$$\text{LPF} \left\{ \underbrace{\left( m(t) \times \sqrt{2} \cos(2\pi f_c t) \right)}_{x(t)} \times \left( \sqrt{2} \cos(2\pi f_c t) \right) \right\} = m(t)$$

$v(t)$

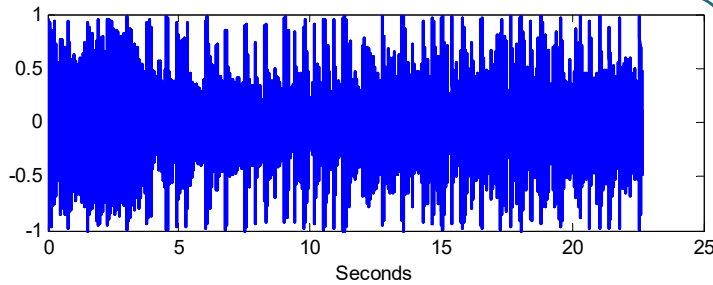


# DSB-SC

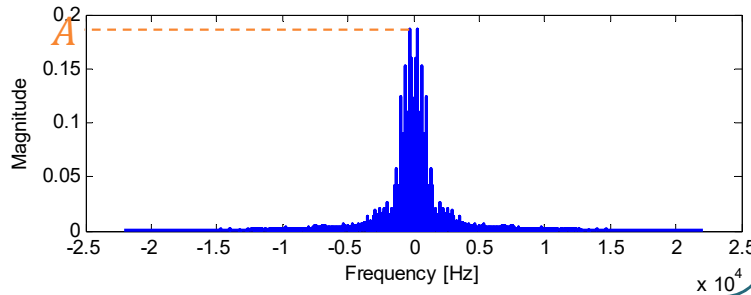
[Demo\_DSBSC\_Sound\_ReadWAV.m]



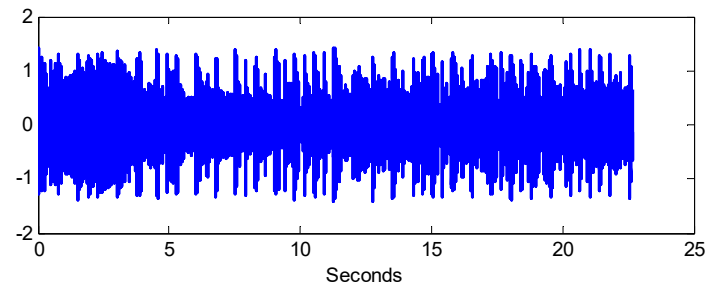
$m(t)$



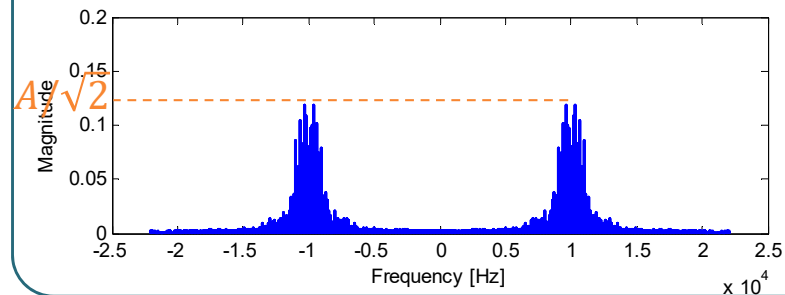
$|M(f)|$



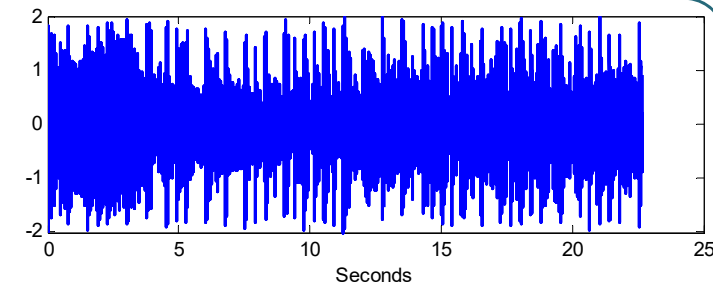
$x(t)$



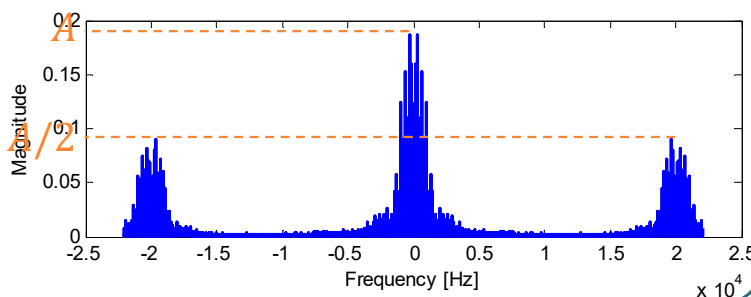
$|X(f)|$



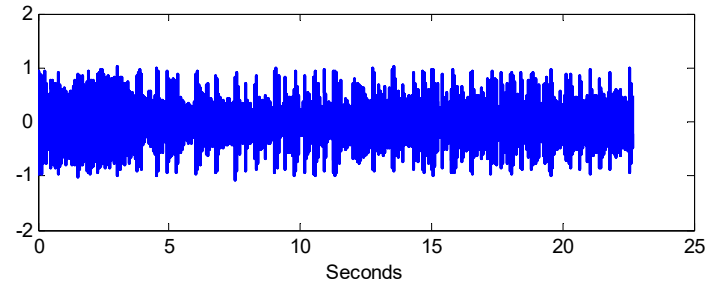
$v(t)$



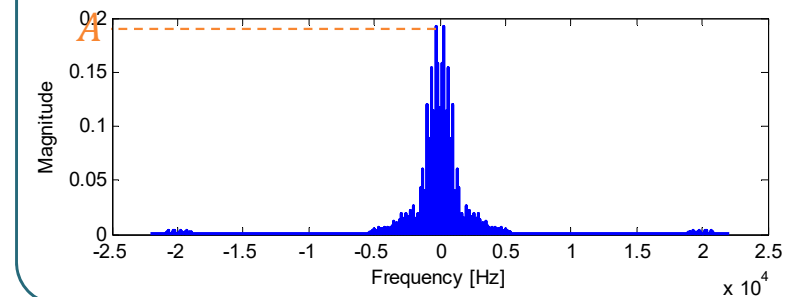
$|V(f)|$



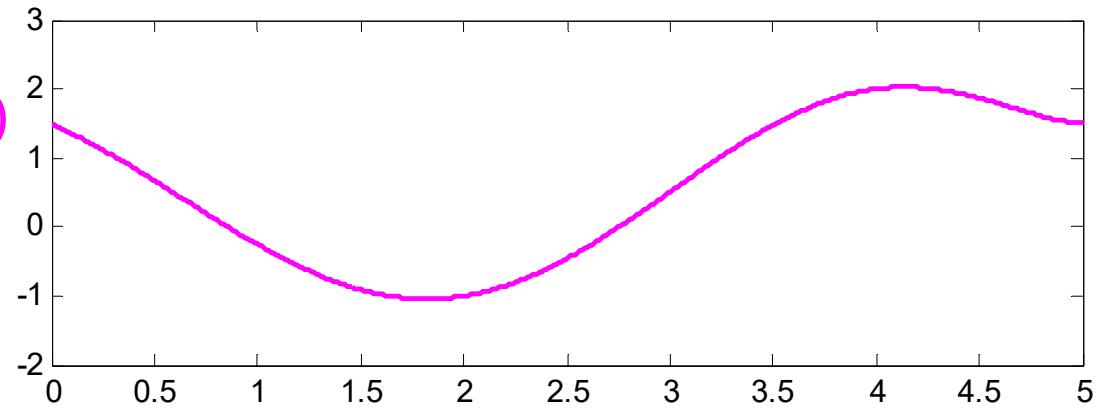
$\hat{m}(t)$



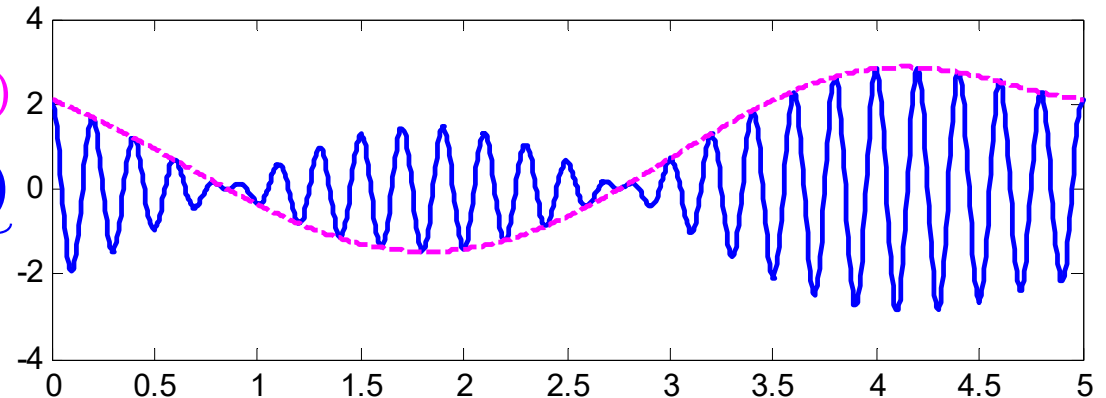
$|\hat{M}(f)|$



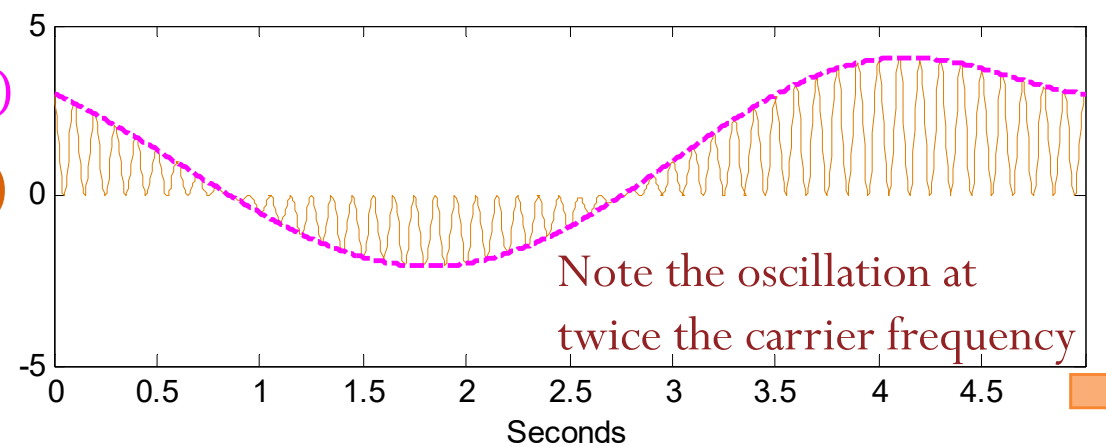
# In the time domain...



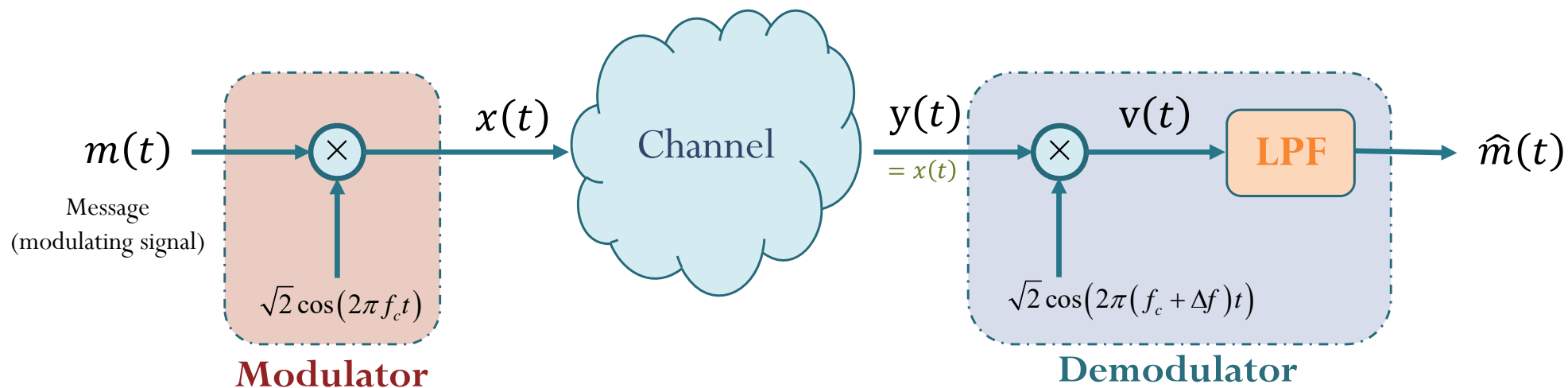
$$\underbrace{m(t)} \times \sqrt{2} \cos(2\pi f_c t) = \underbrace{x(t)}$$

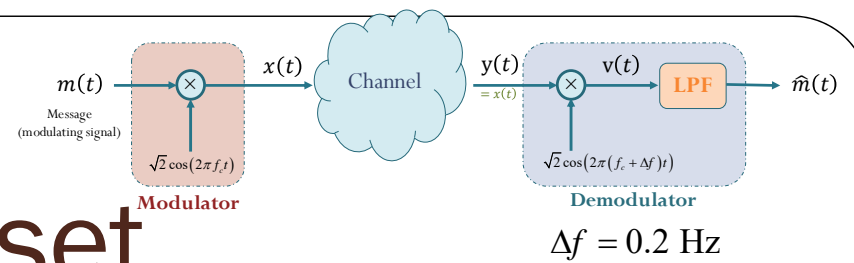


$$\underbrace{x(t)} \times \sqrt{2} \cos(2\pi f_c t) = \underbrace{v(t)}$$

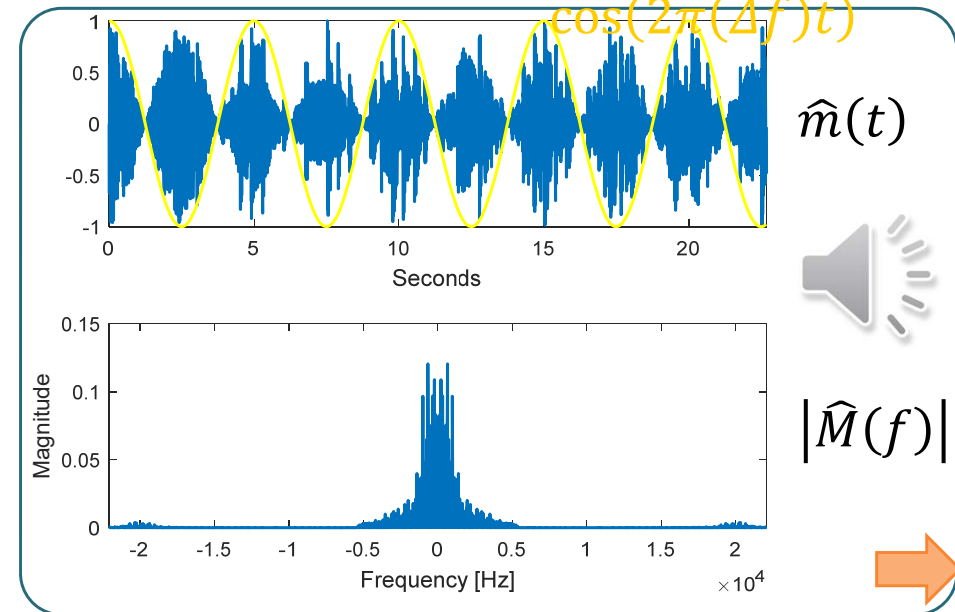
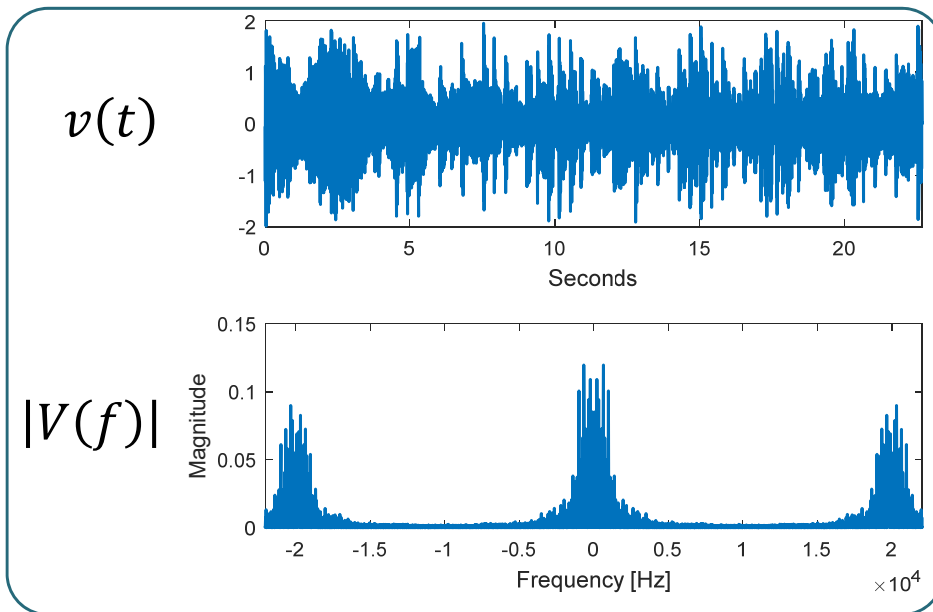
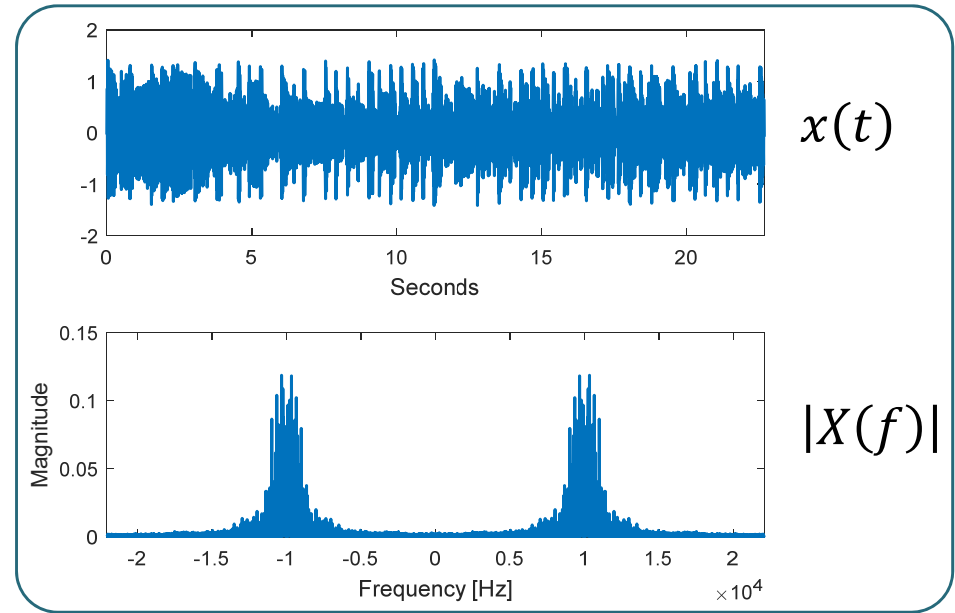
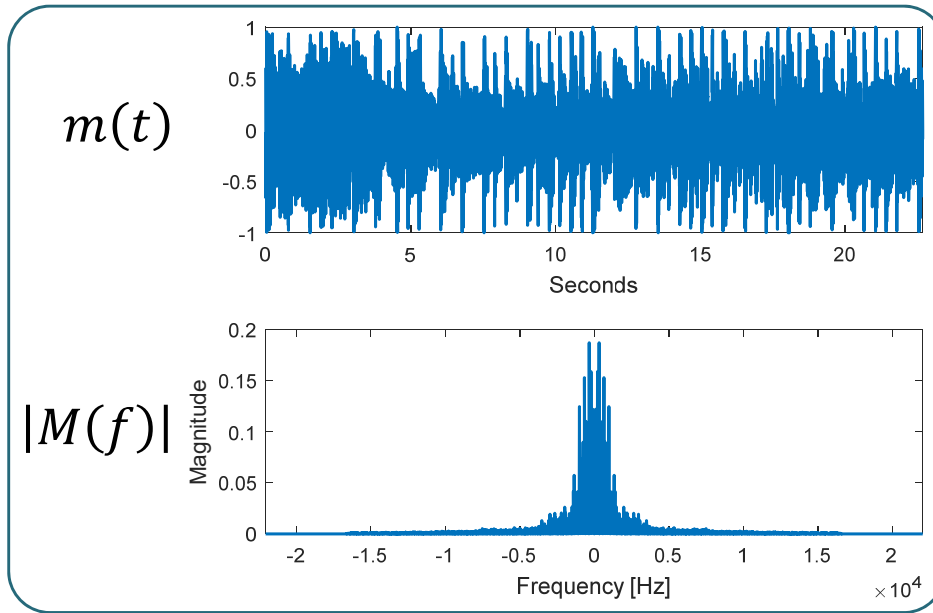


# DSB-SC w/ Freq. Offset





# DSB-SC w/ Freq. Offset



# DSB-SC w/ Freq. Offset

