Introduction to Hilbert Transform

Definition: H(f)=-jsgn(f) *(defined in frequency domain)*

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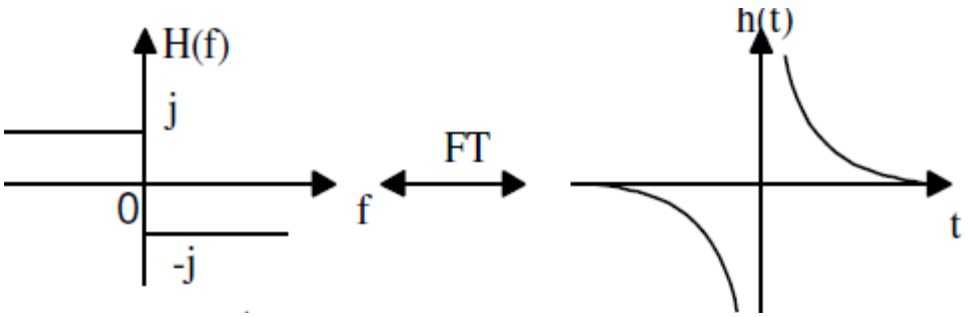

Figure 3.16

h(t)=1/(t)

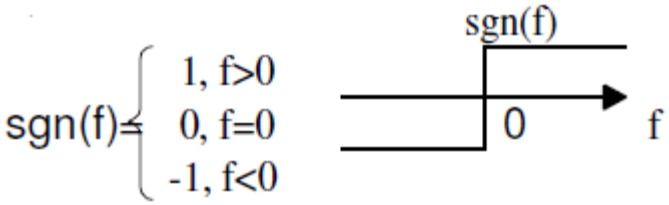

Figure 3.17

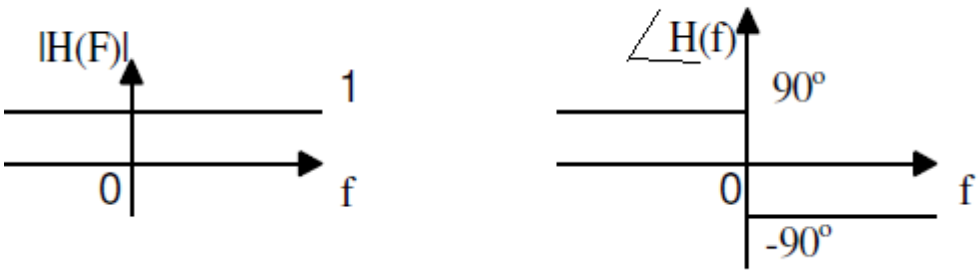

Figure 3.18

Time domain system function:

$$\frac{j}{\pi t} \overset{FT}{\leftrightarrow} \operatorname{sgn}(f)$$

Hilbert transform $\hat{x}(t)$ = Inverse.F.T (H(f) X(f))

Proprerties of Hilbert Transform:

1. The energy in a signal x(t and its Hilbert Transform $\hat{x}(t)$ are equal.
2. The signal x(t and its Hilbert Transform $\hat{x}(t)$ are orthogonal to each other.
3. It can be used in band pass signal applications.
4. It can be used in SSB applications.
5. The Hilbert Transform of Hilbert Transformed signal is equal to the original signal but amplitude changes.