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DOUBLE SIDE BAND-SUPPRESSED CARRIER

(DSB-SC)

(*a*) Block diagram of product modulator. (*b*) Baseband signal. (*c*) DSB-SC modulated wave.

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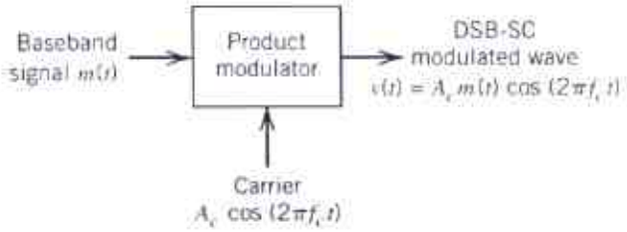
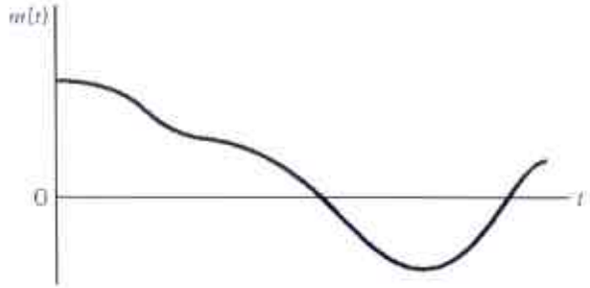
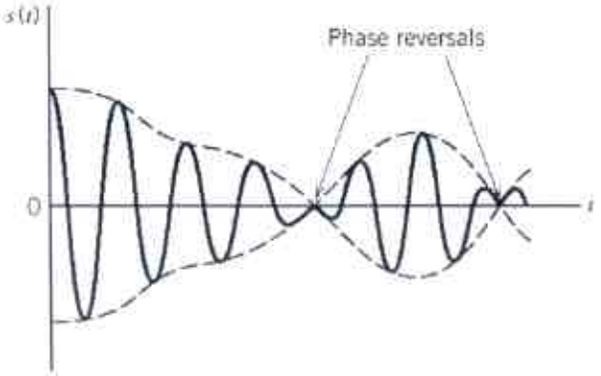


(*a*)



(*b*)



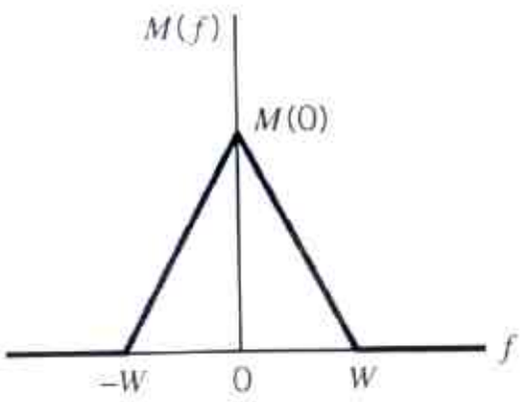
(*c*)

$$S(t) = m(t) \cdot A_c \cos 2\pi f_c t$$

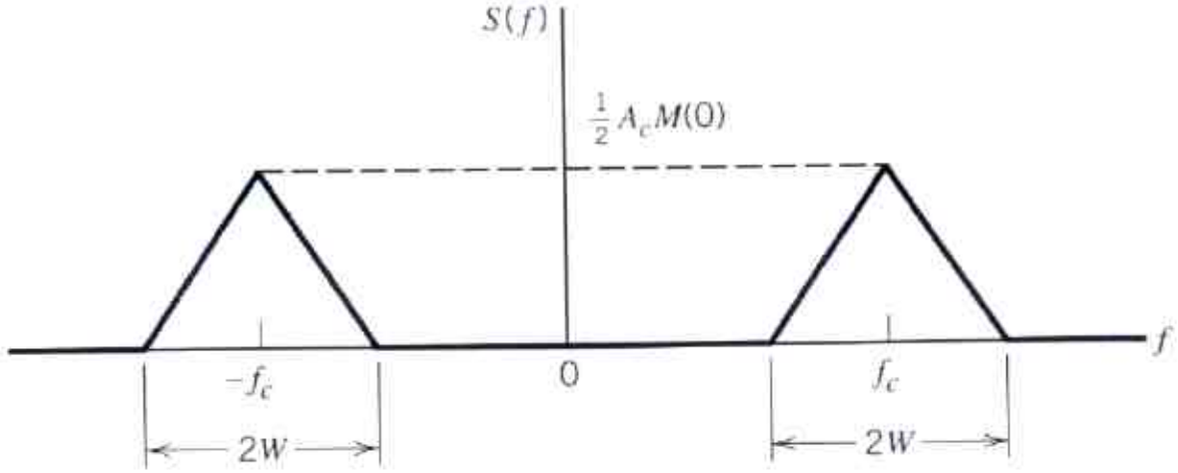
$$m(t) \longleftrightarrow M(f)$$

$$S(f) \longleftrightarrow \frac{1}{2} A_c \left[M(f - f_c) + M(f + f_c) \right]$$

(*a*) Spectrum of baseband signal
(*b*) Spectrum of DSB-SC modulated wave



(*a*)



(*b*)

Power in DSB-SC signal is : $\langle s^2(t) \rangle$

$$= \frac{1}{2} A_c^2 \langle m^2(t) \rangle$$

$$= \frac{1}{2} A_c^2 S_m$$

Modulation efficiency : 100%

Disadvantage:

→ Less information about the carrier at the receiver

→ Needs a coherent detection at receiver