
Closed path in a high-frequency electromagnetic field. A high-frequency time-harmonic electromagnetic field exist in a lossy medium. The current density vector in the medium is \mathbf{J} , the electric flux density vector is \mathbf{D} , and the magnetic flux density vector is \mathbf{B} . The line integral of the magnetic field intensity vector \mathbf{H} , along an arbitrary planar contour (closed path) in the medium equals to the flux of the following vector through a flat surface spanned over the contour:

- (A) \mathbf{J} ,
- (B) \mathbf{B} ,
- (C) $\frac{\partial \mathbf{D}}{\partial t}$,
- (D) $\mathbf{J} + \frac{\partial \mathbf{D}}{\partial t}$,
- (E) $-\frac{\partial \mathbf{B}}{\partial t}$,

where the orientation of the contour and the orientation of the surface are adopted in accordance to the right-hand rule.

Solution: (D)

Answer: (D)