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the Linear least squares estimator and the Bayesian least squares estimator are special cases. *See also* [minimum variance unbiased estimator](#), [linear least squares estimator](#), Bayesian least squares estimator, [maximum a posteriori estimator](#), [maximum likelihood estimation](#).

minimum noise factor for an active circuit or device, occurs when the input terminal is terminated with an impedance which produces the minimum noise factor.

minimum phase system a system that has all poles and zeroes inside the unit circle. It is called minimum phase because the poles and zeroes inside the unit circle cause the group delay, which is the derivative of the phase of the signal to be minimized.

minimum polynomial for a given element α of a field, and for a subfield F , the polynomial of smallest degree, with coefficients in F having α as a root. The set of roots of a minimum polynomial form a conjugacy class that is defined by the polynomial.

minimum time-to-clear *See* [clearing time](#).

minimum time-to-melt *See* [melting time](#).

minimum variance unbiased estimator an estimator $\hat{\theta}$ of a parameter θ is said to have minimum variance and to be unbiased if

$$E\hat{\theta} = \theta$$

and

$$E(\hat{\theta} - \theta)^2 \leq E(\tilde{\theta} - \theta)^2,$$

where $\tilde{\theta}$ is any other estimator of θ .

minimum-shift keying (MSK) a variant of FSK in which the separation between transmitted frequencies is $1/(2T)$, where T is the symbol duration. In addition, the initial phase associated with each bit is adjusted so that phase transitions between successive bits are continuous.

minimum-shift keying Gaussian (GMSK)

a variant of MSK in which the transmitted frequency makes smooth transitions between the frequencies associated with the input bits. A GMSK signal can be generated when the input to the voltage-controlled oscillator (VCO) is a PAM signal with a Gaussian baseband pulse shape.

minisub in European usage, a miniature substation.

Minkowski distance between two real valued vectors $(x_1, x_2, \dots, x_n)$ and $(y_1, y_2, \dots, y_n)$ a difference measure given by

$$D_{\text{Minkowski}} = \left(\sum_{i=1}^n |x_i - y_i|^\lambda \right)^{\frac{1}{\lambda}}$$

minor hysteresis loop a hysteresis loop generated within the major hysteresis loop when a magnetic material is not driven to full positive or negative saturation.

minority carrier a hole in an n-type or an electron in a p-type semiconductor.

minterm a Boolean product term in which each variable is represented in either true or complement form. For example, $u \cdot v' \cdot w \cdot z'$ is a minterm for a four-variable function.

MIPS millions of instructions per second, a measure of the speed of a computer.

mirror optical element that reflects and may also transmit incident light rays and beams; used to provide feedback in laser oscillators.

mirroring fault tolerance architecture for managing two or more hard disks as a unique disk by replicating the same data on all the disks in the mirroring system. The system also includes mechanism for verifying that all disks contain the same information.

MISD *See* [multiple instruction single data architecture](#).