**Description**

\( \text{epsilon}(x) \) returns the unit roundoff error in quantities of size \( \text{abs}(x) \).

**Syntax**

\[
\text{real scalar} \quad \text{epsilon}(\text{real scalar } x)
\]

**Remarks and examples**

On all computers on which Stata and Mata are currently implemented—which are computers following IEEE standards—\( \text{epsilon}(1) \) is \( 1.0\times 10^{-34} \), or about \( 2.22045\times 10^{-16} \). This is the smallest amount by which a real number can differ from 1.

\( \text{epsilon}(x) \) is \( \text{abs}(x) \times \text{epsilon}(1) \). This is an approximation of the smallest amount by which a real number can differ from \( x \). The approximation is exact at integer powers of 2.

**Conformability**

\( \text{epsilon}(x) \):

\[
\begin{align*}
\text{x:} & \quad 1 \times 1 \\
\text{result:} & \quad 1 \times 1
\end{align*}
\]

**Diagnostics**

\( \text{epsilon}(x) \) returns . if \( x \) is missing.

**Also see**

[M-5] \texttt{mindouble()} — Minimum and maximum nonmissing value

[M-5] \texttt{editzero()} — Edit matrix for roundoff error (zeros)

[M-4] \texttt{utility} — Matrix utility functions