Numeric Expression Conventions

Numeric values can also be indirectly represented by parameters; see the **.PARAM (Parameter)** command. Numeric values and parameters can be used together to form arithmetic expressions. PSpice expressions can incorporate the intrinsic functions shown in the following table.

The Function column lists expressions that PSpice and PSpice A/D recognize. The Meaning column lists the mathematical definition of the function. There are some differences between these functions available in PSpice and those available in Probe. Refer to Probe Help for more information.

Function*	Meaning	Comments
ABS(x)	|x|	
ACOS(x)	arccosine of x	-1.0 <= x <= +1.0
ARCTAN(x)	$\tan^{-1}(x)$	result in radians
ASIN(x)	arcsine of x	-1.0 <= x <= +1.0
ATAN(x)	$\tan^{-1}(x)$	result in radians
ATAN2(y,x)	arctan of (y/x)	result in radians
COS(x)	cos(x)	x in radians
COSH(x)	hyperbolic cosine of x	x in radians
DDT(x)	time derivative of x	transient analysis only
EXP(x)	e^x	
IF(t, x, y)	x if t=TRUE y if t=FALSE	t is a Boolean expression that evaluates to TRUE or FALSE and can include logical and relational operators (see **Command Line Options for MicroSim Applications**). X and Y are either numeric values or expressions. For example, {IF (v(1)<THL, v(1), v(1)*v(1)/THL)} Care should be taken in modeling the discontinuity between the IF and ELSE parts, or convergence problems can result.
IMG(x)	imaginary part of x	returns 0.0 for real numbers
LIMIT(x,min,max)		result is min if x < min, max if x > max, and x otherwise
LOG(x)	ln(x)	log base e
LOG10(x)	log(x)	log base 10
M(x)	magnitude of x	this produces the same result as ABS(x)
MAX(x,y)	maximum of x and y	
MIN(x,y)	minimum of x and y	
P(x)	phase of x	returns 0.0 for real numbers

Function*	Meaning	Comments
PWR(x,y)	$\|x\|^y$ or, {x**y}	the binary operator ** is interchangeable with PWR(x,y)
PWRS(x,y)	$+\|x\|^y$ (if x>0), $-\|x\|^y$ (if x<0)	
R(x)	real part of x	
SDT(x)	time integral of x	transient analysis only
SGN(x)	signum function	
SIN(x)	sin(x)	x in radians
SINH(x)	hyperbolic sine of x	x in radians
STP(x)	1 if x>0.0 0 if x<0.0	The unit step function can be used to suppress a value until a given amount of time has passed. For instance, {v(1)*STP(TIME-10ns)} gives a value of 0.0 until 10ns has elapsed, then gives v(1).
SQRT(x)	$x^{1/2}$	
TAN(x)	tan(x)	x in radians
TANH(x)	hyperbolic tangent of x	x in radians
TABLE ($x,x_1,y_1,x_2,y_{2,...}x_n,y_n$)		Result is the y value corresponding to x, when all of the x_n,y_n points are plotted and connected by straight lines. If x is greater than the max x_n, then the value is the y_n associated with the largest x_n. If x is less than the smallest x_n, then the value is the y_n associated with the smallest x_n.

* Most numeric specifications in PSpice allow for arithmetic expressions. Some exceptions do exist and are summarized in your PSpice user's guide. There are also some differences between the intrinsic functions available in PSpice and those available in Probe. Refer to your user's guide for more information on Probe.