

GOFAST[®] for NEC V83x

Features

- ◆ Fast
- ◆ Reentrant
- ◆ ROMable
- ◆ Conforms to IEEE 754
- ◆ Includes single and double precision
- ◆ “Link and Go” compiler support
- ◆ Complete source code provided
- ◆ Includes test programs and makefiles

Compiler Support

GOFAST[®] libraries are designed for “link and go” operation with each compiler. These libraries provide the user with a significant speed advantage when no floating point coprocessor hardware is available. This is of particular significance in real-time embedded systems.

GOFAST for NEC V83x includes drop-in libraries for “link and go” seamless operation with Green Hills C compiler. The GOFAST routines directly replace the compiler’s floating point runtime library routines.

Capabilities and Accuracy

GOFAST is reentrant. There is no need to perform any special state save/restore. GOFAST is ROMable. GOFAST is IEEE 754 and ANSI C compatible.

The basic functions + - * / and the conversions perform the IEEE 754 “nearest or even” rounding exactly. The other functions are accurate within one mantissa unit.

GOFAST routines make no distinction between quiet and signaling Not-a-Numbers (NaNs). In the case of an invalid operation, the answer is always a standard quiet NaN.

GOFAST routines support IEEE 754 masked exception handling for overflows and invalid operations. No unmasked exceptions are supported. Underflow and loss of precision are not reported. Division by zero is treated as an invalid operation.

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GOFAST Support

U S Software maintains a test lab where comprehensive confidence tests are performed on GOFAST in each target environment. A demonstration test program is included with your product delivery, and you are encouraged to run it on your own target hardware to verify system operation. Phone and fax support can be provided with the product. Extended support is also available.

Functionality

GOFAST contains the following floating point routines in both single and double precision:

add, subtract, multiply, divide	conversion operations
compare operations	sin, cos, tan
asin, acos, atan, atan2	sinh, cosh, tanh
log, log10	exp, pow
fabs, ceil, floor	modf, fmod, frexp, ldexp

Performance

GOFAST delivers the optimized performance you can expect with the NEC V83x processor. The following timings were measured using GOFAST library calls with an NEC V830 processor at 33 MHz on an RTE-V830-PC board. The test used the Green Hills v1.8.8 compiler.

Microsecond Timings

function	double	single
add	8.3	5.0
subtract	10.5	6.1
multiply	7.6	13.2
divide	14.4	6.3
sqrt	24.7	13.7
exp	34.4	13.3
log	52.7	16.6
log10	56.1	18.6
sin	32.3	14.5
cos	31.4	13.9
tan	46.9	16.7
asin	68.5	33.6
acos	74.2	37.3
atan	46.9	18.2
atan2	55.0	26.2
pow	78.3	36.2

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U S Software

7175 NW Evergreen Parkway, Suite 100, Hillsboro, Oregon 97124 USA
In USA: 800-356-7097 Phone: 503-844-6614 Fax: 503-844-6480
Email: info@ussw.com Web: <http://www.ussw.com>

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