

GOFAST[®] for ColdFire and Diab Data C/C++ Compiler

Features

- ◆ Fast
- ◆ Reentrant
- ◆ ROMable
- ◆ Conforms to IEEE 754
- ◆ "Link and Go" compiler support for Diab Data C/C++
- ◆ Includes startup code
- ◆ Includes complete source, test programs, and make file

Description

GOFAST[®] for ColdFire was carefully designed for high performance operation and ease of use including "link and go" compatibility with the Diab Data C/C++ compiler. GOFAST provides ROMable, reentrant IEEE and ANSI compatible ColdFire floating point support.

Functionality

GOFAST supports reentrant floating point calculations for the Diab Data C/C++ compiler. GOFAST includes the following routines for both single and double precision in library format:

- ◆ **intrinsic basic operations + - * /**
- ◆ **intrinsic conversions**
- ◆ **sqrt**
- ◆ **sin, cos, tan**
- ◆ **asin, acos, atan, atan2**
- ◆ **sinh, cosh, atanh**
- ◆ **log, log10, exp, pow**
- ◆ **floor, ceil, fabs**
- ◆ **modf, fmod, frexp, ldexp**

The following files are included in source format to support GOFAST testing:

- ◆ **makefile** Sample makefile
- ◆ **putchr.c** To read and display characters
- ◆ **start.s** Skeleton startup
- ◆ **suppa.s** Assembly support for putchr.c
- ◆ **test1.c** Simple test program

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Considerations

GOFAST is primarily designed to facilitate embedded operation. However, it is also tuned for performance. The following table gives the timing of some floating point operations, both with the Diab Data floating point library and the GOFAST floating point library. The times, given in microseconds, were measured using a 25 MHz 5204 ColdFire processor with three wait states. The version of Diab Data C/C++ compiler used was 4.1a.

Microsecond Timings

Library Function	Single Precision		Double Precision	
	Diab Data	GOFAST	Diab Data	GOFAST
add	36.1	21.7	45.1	34.7
subtract	38.8	24.9	47.6	36.4
multiply	55.0	26.2	70.8	50.9
divide	92.2	86.5	188.4	172.8
sqrt	159.0	172.6	809.4	329.3
exp	665.5	61.9	1239.0	275.7
log	683.3	122.2	1341.9	380.7
log10	740.0	127.1	1412.7	401.9
sin	607.5	60.3	1097.3	213.8
cos	639.3	56.8	1137.3	208.9
tan	585.5	131.7	1246.6	455.8
asin	676.4	352.1	1585.2	818.8
acos	714.4	420.1	1632.2	982.3
atan	730.8	124.7	1647.8	346.5
atan2	904.8	198.6	1944.0	509.0
pow	4241.8	197.1	5528.7	665.5