**NXP Semiconductors**
Release Notes

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# CM RTCESL 4.3 Release Notes

## 1 Overview

These release notes are for the ARM® Cortex®-M0+, Cortex-M4(F) and Cortex-M7(F) Real Time Control Embedded Software Libraries release 4.3.

The purpose of this release are bug fixes and the addition of new functions. The GCC compiler in KDS for the CM7 core is supported by this release.

Contents

## 2 What is new

These are the new features of this release:

- KDS algorithms' support for the CM7(F) core
- New algorithms in MLIB (MnacRndSat_F16, MnacRndSat_F32, MnacRndSat_F32lls, MnacRnd_A32ass, MnacRnd_F16, MnacRnd_F32, MnacRnd_F32lls, MnacSat_F16, MnacSat_F32, MnacSat_F32lss, Mnac_A32ass, Mnac_F16, Mnac_F32, Mnac_F32lls)
- New algorithms in GFLIB (FlexSRampCalcIncr_F16, FlexSRampInit_F16, FlexSRamp_F16, FlexRamp_FLT, FlexRampCalcIncr_FLT, FlexRampInit_FLT, DFlexRamp_FLT, DFlexRampCalcIncr_FLT, DFlexRampInit_FLT, FlexSRamp_FLT, FlexSRampCalcIncr_FLT, FlexSRampInit_FLT)
- New algorithms in AMCLIB (ACIMRotFluxObsrv_FLT, ACIMRotFluxObsrvInit_FLT, ACIMSpeedMRAS_FLT, ACIMSpeedMRASInit_FLT, PMSMBemfObsrvAB_F16, PMSMBemfObsrvABInit_F16, PMSMBemfObsrvAB_FLT, PMSMBemfObsrvABInit_FLT)
- Fixed functions GFLIB_CtrlPIpAW_F16 and GFLIB_CtrlPIDpAW_F16, where the integration process did not stop when the input flag was set.
- The incorrect initialization in the GDFLIB_FilterMAInit_F16 function was fixed.

## 3 Description

This release of RTCESL supports these platforms:

- ARM Cortex M0+
- ARM Cortex M4(F)
- ARM Cortex M7(F)

It contains these libraries:

- MLIB
- GFLIB
- GDFLIB
- GMCLIB
- AMCLIB
- PCLIB

It is compiled on:

- KDS 3.2.0
- IAR 7.60.2.11350
- Keil 5.20

Optimization used:

- The accuracy is not guaranteed for some of the float functions in this version.

- Maximum speed optimization is used for all libraries on all compilers.
- GFLIB for CM0+, CM4(F), CM7(F) was compiled with Level 0 optimization using Keil; there are errors in compilation.
- For all libraries (except for GFLIB for CM4F—compiled by the GCC compiler in KDS), the Level O3 optimization (optimize most) and the optimization flag -fno-strict-overflow were used, because of errors in compilation. GFLIB for CM4F is compiled with Level O1 optimization.

This is the list of algorithms contained in the release for the CM4(F) and CM7(F) (fixed-point 16/32-bit, 32-bit single precision floating-point):

AMCLIB_ACIMRotFluxObsrvInit_FLT

AMCLIB_ACIMRotFluxObsrv_FLT

AMCLIB_ACIMSpeedMRASInit_FLT

AMCLIB_ACIMSpeedMRAS_FLT

AMCLIB_AngleTrackObsrvInit_A32

AMCLIB_AngleTrackObsrvInit_F16

AMCLIB_AngleTrackObsrv_A32ff

AMCLIB_AngleTrackObsrv_F16

AMCLIB_PMSMBemfObsrvABInit_F16

AMCLIB_PMSMBemfObsrvABInit_FLT

AMCLIB_PMSMBemfObsrvAB_F16

AMCLIB_PMSMBemfObsrvAB_FLT

AMCLIB_PMSMBemfObsrvDQInit_A32fff

AMCLIB_PMSMBemfObsrvDQInit_F16

AMCLIB_PMSMBemfObsrvDQ_A32fff

AMCLIB_PMSMBemfObsrvDQ_F16

AMCLIB_TrackObsrvInit_A32af

AMCLIB_TrackObsrvInit_F16

AMCLIB_TrackObsrv_A32af

AMCLIB_TrackObsrv_F16

GDFLIB_FilterIIR1Init_F16

GDFLIB_FilterIIR1Init_FLT

GDFLIB_FilterIIR1_F16

GDFLIB_FilterIIR1_FLT

GDFLIB_FilterIIR2Init_F16

GDFLIB_FilterIIR2Init_FLT

GDFLIB_FilterIIR2_F16

GDFLIB_FilterIIR2_FLT

GDFLIB_FilterIIR3Init_F16

GDFLIB_FilterIIR3Init_FLT
GDFLIB_FilterIIR3_F16
GDFLIB_FilterIIR3_FLT
GDFLIB_FilterIIR4Init_F16
GDFLIB_FilterIIR4Init_FLT
GDFLIB_FilterIIR4_F16
GDFLIB_FilterIIR4_FLT
GDFLIB_FilterMAInit_F16
GDFLIB_FilterMAInit_FLT
GDFLIB_FilterMA_F16
GDFLIB_FilterMA_FLT

GFLIB_Acos_F16
GFLIB_Acos_FLT
GFLIB_Asin_F16
GFLIB_Asin_FLT
GFLIB_AtanYX_A32f
GFLIB_AtanYX_F16
GFLIB_AtanYX_FLT
GFLIB_Atan_A32f
GFLIB_Atan_F16
GFLIB_Atan_FLT
GFLIB_Cos_F16
GFLIB_Cos_FLT
GFLIB_Cos_FLTa
GFLIB_CtrlPIDpAWInit_F16
GFLIB_CtrlPIDpAWInit_FLT
GFLIB_CtrlPIDpAW_F16
GFLIB_CtrlPIDpAW_FLT
GFLIB_CtrlPIpAWInit_F16
GFLIB_CtrlPIpAWInit_FLT
GFLIB_CtrlPIpAW_F16

GFLIB_CtrlPIpAW_FLT
GFLIB_DFlexRampCalcIncr_F16
GFLIB_DFlexRampCalcIncr_FLT
GFLIB_DFlexRampInit_F16
GFLIB_DFlexRampInit_FLT
GFLIB_DFlexRamp_F16
GFLIB_DFlexRamp_FLT
GFLIB_DRampInit_F16
GFLIB_DRampInit_F32
GFLIB_DRampInit_FLT
GFLIB_DRamp_F16
GFLIB_DRamp_F32
GFLIB_DRamp_FLT
GFLIB_FlexRampCalcIncr_F16
GFLIB_FlexRampCalcIncr_FLT
GFLIB_FlexRampInit_F16
GFLIB_FlexRampInit_FLT
GFLIB_FlexRamp_F16
GFLIB_FlexRamp_FLT
GFLIB_FlexSRampCalcIncr_F16
GFLIB_FlexSRampCalcIncr_FLT
GFLIB_FlexSRampInit_F16
GFLIB_FlexSRampInit_FLT
GFLIB_FlexSRamp_F16
GFLIB_FlexSRamp_FLT
GFLIB_Hyst_F16
GFLIB_Hyst_FLT
GFLIB_IntegratorInit_F16
GFLIB_IntegratorInit_FLT
GFLIB_Integrator_F16
GFLIB_Integrator_FLT
GFLIB_Limit_F16

GFLIB_Limit_F32
GFLIB_Limit_FLT
GFLIB_LowerLimit_F16
GFLIB_LowerLimit_F32
GFLIB_LowerLimit_FLT
GFLIB_Lut1D_F16
GFLIB_Lut1D_FLT
GFLIB_LutPer1D_F16
GFLIB_LutPer1D_FLT
GFLIB_RampInit_F16
GFLIB_RampInit_F32
GFLIB_RampInit_FLT
GFLIB_Ramp_F16
GFLIB_Ramp_F32
GFLIB_Ramp_FLT
GFLIB_Sin_F16
GFLIB_Sin_FLT
GFLIB_Sin_FLTa
GFLIB_Sqrt_F16
GFLIB_Sqrt_F16l
GFLIB_Sqrt_FLT
GFLIB_Tan_F16
GFLIB_Tan_FLT
GFLIB_Tan_FLTa
GFLIB_UpperLimit_F16
GFLIB_UpperLimit_F32
GFLIB_UpperLimit_FLT
GFLIB_VectorLimit1_F16
GFLIB_VectorLimit1_FLT
GFLIB_VectorLimit_F16
GFLIB_VectorLimit_FLT

GMCLIB_ClarkInv_F16
GMCLIB_ClarkInv_FLT
GMCLIB_Clark_F16
GMCLIB_Clark_FLT
GMCLIB_DecouplingPMSM_F16
GMCLIB_DecouplingPMSM_FLT
GMCLIB_ElimDcBusRipFOC_F16
GMCLIB_ElimDcBusRipFOC_F16ff
GMCLIB_ElimDcBusRip_F16fff
GMCLIB_ElimDcBusRip_F16sas
GMCLIB_ParkInv_F16
GMCLIB_ParkInv_FLT
GMCLIB_Park_F16
GMCLIB_Park_FLT
GMCLIB_SvmIct_F16
GMCLIB_SvmStd_F16
GMCLIB_SvmU0n_F16
GMCLIB_SvmU7n_F16

MLIB_AbsSat_F16
MLIB_AbsSat_F32
MLIB_Abs_F16
MLIB_Abs_F32
MLIB_Abs_FLT
MLIB_Add4Sat_F16
MLIB_Add4Sat_F32
MLIB_Add4_F16
MLIB_Add4_F32
MLIB_Add4_FLT
MLIB_AddSat_F16
MLIB_AddSat_F32
MLIB_Add_A32as

MLIB_Add_A32ss
MLIB_Add_F16
MLIB_Add_F32
MLIB_Add_FLT
MLIB_Clb_U16l
MLIB_Clb_U16s
MLIB_ConvSc_A32ff
MLIB_ConvSc_F16ff
MLIB_ConvSc_F32ff
MLIB_ConvSc_FLTaf
MLIB_ConvSc_FLTlf
MLIB_ConvSc_FLTsf
MLIB_Conv_A32f
MLIB_Conv_F16f
MLIB_Conv_F16l
MLIB_Conv_F32f
MLIB_Conv_F32s
MLIB_Conv_FLTa
MLIB_Conv_FLTl
MLIB_Conv_FLTs
MLIB_Div1QSat_A32as
MLIB_Div1QSat_F16
MLIB_Div1QSat_F16ll
MLIB_Div1QSat_F16ls
MLIB_Div1QSat_F32
MLIB_Div1QSat_F32ls
MLIB_Div1Q_A32as
MLIB_Div1Q_A32ll
MLIB_Div1Q_A32ls
MLIB_Div1Q_A32ss
MLIB_Div1Q_F16
MLIB_Div1Q_F16ll

MLIB_Div1Q_F16ls
MLIB_Div1Q_F32
MLIB_Div1Q_F32ls
MLIB_DivSat_A32as
MLIB_DivSat_F16
MLIB_DivSat_F16ll
MLIB_DivSat_F16ls
MLIB_DivSat_F32
MLIB_DivSat_F32ls
MLIB_Div_A32as
MLIB_Div_A32ll
MLIB_Div_A32ls
MLIB_Div_A32ss
MLIB_Div_F16
MLIB_Div_F16ll
MLIB_Div_F16ls
MLIB_Div_F32
MLIB_Div_F32ls
MLIB_Div_FLT
MLIB_Log2_U16
MLIB_Mac4RndSat_F16
MLIB_Mac4RndSat_F32
MLIB_Mac4Rnd_F16
MLIB_Mac4Rnd_F32
MLIB_Mac4Sat_F32ssss
MLIB_Mac4_F32ssss
MLIB_Mac4_FLT
MLIB_MacRndSat_F16
MLIB_MacRndSat_F32
MLIB_MacRndSat_F32lls
MLIB_MacRnd_A32ass
MLIB_MacRnd_F16

MLIB_MacRnd_F32
MLIB_MacRnd_F32lls
MLIB_MacSat_F16
MLIB_MacSat_F32
MLIB_MacSat_F32lss
MLIB_Mac_A32ass
MLIB_Mac_F16
MLIB_Mac_F32
MLIB_Mac_F32lss
MLIB_Mac_FLT
MLIB_MnacRndSat_F16
MLIB_MnacRndSat_F32
MLIB_MnacRndSat_F32lls
MLIB_MnacRnd_A32ass
MLIB_MnacRnd_F16
MLIB_MnacRnd_F32
MLIB_MnacRnd_F32lls
MLIB_MnacSat_F16
MLIB_MnacSat_F32
MLIB_MnacSat_F32lss
MLIB_Mnac_A32ass
MLIB_Mnac_F16
MLIB_Mnac_F32
MLIB_Mnac_F32lls
MLIB_Mnac_FLT
MLIB_Msu4RndSat_F16
MLIB_Msu4RndSat_F32
MLIB_Msu4Rnd_F16
MLIB_Msu4Rnd_F32
MLIB_Msu4Sat_F32ssss
MLIB_Msu4_F32ssss
MLIB_Msu4_FLT

MLIB_MsuRndSat_F16
MLIB_MsuRndSat_F32
MLIB_MsuRndSat_F32lls
MLIB_MsuRnd_A32ass
MLIB_MsuRnd_F16
MLIB_MsuRnd_F32
MLIB_MsuRnd_F32lls
MLIB_MsuSat_F16
MLIB_MsuSat_F32
MLIB_MsuSat_F32lss
MLIB_Msu_A32ass
MLIB_Msu_F16
MLIB_Msu_F32
MLIB_Msu_F32lss
MLIB_Msu_FLT
MLIB_MulNegRndSat_A32
MLIB_MulNegRndSat_F16as
MLIB_MulNegRnd_A32
MLIB_MulNegRnd_F16
MLIB_MulNegRnd_F16as
MLIB_MulNegRnd_F32
MLIB_MulNegRnd_F32ls
MLIB_MulNegSat_A32
MLIB_MulNegSat_F16as
MLIB_MulNeg_A32
MLIB_MulNeg_F16
MLIB_MulNeg_F16as
MLIB_MulNeg_F32
MLIB_MulNeg_F32ss
MLIB_MulNeg_FLT
MLIB_MulRndSat_A32
MLIB_MulRndSat_F16

MLIB_MulRndSat_F16as
MLIB_MulRndSat_F32
MLIB_MulRndSat_F32ls
MLIB_MulRnd_A32
MLIB_MulRnd_F16
MLIB_MulRnd_F16as
MLIB_MulRnd_F32
MLIB_MulRnd_F32ls
MLIB_MulSat_A32
MLIB_MulSat_F16
MLIB_MulSat_F16as
MLIB_MulSat_F32
MLIB_MulSat_F32ss
MLIB_Mul_A32
MLIB_Mul_F16
MLIB_Mul_F16as
MLIB_Mul_F32
MLIB_Mul_F32ss
MLIB_Mul_FLT
MLIB_NegSat_F16
MLIB_NegSat_F32
MLIB_Neg_F16
MLIB_Neg_F32
MLIB_Neg_FLT
MLIB_Rcp1Q1_A32s
MLIB_Rcp1Q_A32s
MLIB_Rcp1_A32s
MLIB_Rcp_A32s
MLIB_RndSat_F16l
MLIB_Rnd_F16l
MLIB_Sat_F16a
MLIB_Sh1LSat_F16

MLIB_Sh1LSat_F32
MLIB_Sh1L_F16
MLIB_Sh1L_F32
MLIB_Sh1R_F16
MLIB_Sh1R_F32
MLIB_ShLBiSat_F16
MLIB_ShLBiSat_F32
MLIB_ShLBi_F16
MLIB_ShLBi_F32
MLIB_ShLSat_F16
MLIB_ShLSat_F32
MLIB_ShL_F16
MLIB_ShL_F32
MLIB_ShRBiSat_F16
MLIB_ShRBiSat_F32
MLIB_ShRBi_F16
MLIB_ShRBi_F32
MLIB_ShR_F16
MLIB_ShR_F32
MLIB_Sign_F16
MLIB_Sign_F32
MLIB_Sign_FLT
MLIB_Sub4Sat_F16
MLIB_Sub4Sat_F32
MLIB_Sub4_F16
MLIB_Sub4_F32
MLIB_Sub4_FLT
MLIB_SubSat_F16
MLIB_SubSat_F32
MLIB_Sub_A32as
MLIB_Sub_A32ss
MLIB_Sub_F16

MLIB_Sub_F32
MLIB_Sub_FLT

PCLIB_Ctrl2P2ZInit_F16
PCLIB_Ctrl2P2Z_F16
PCLIB_Ctrl3P3ZInit_F16
PCLIB_Ctrl3P3Z_F16
PCLIB_CtrlPIDInit_F16
PCLIB_CtrlPID_F16
PCLIB_CtrlPIInit_F16
PCLIB_CtrlPI_F16
PCLIB_CtrlPIandLPInit_F16
PCLIB_CtrlPIandLP_F16

This is the list of algorithms contained in the release for CM0+ (fixed-point 16- and 32-bit):
AMCLIB_AngleTrackObsrvInit_F16
AMCLIB_AngleTrackObsrv_F16
AMCLIB_PMSMBemfObsrvDQHw_F16
AMCLIB_PMSMBemfObsrvDQInit_F16
AMCLIB_PMSMBemfObsrvDQ_F16
AMCLIB_TrackObsrvInit_F16
AMCLIB_TrackObsrv_F16

GDFLIB_FilterIIR1Init_F16
GDFLIB_FilterIIR1_F16
GDFLIB_FilterIIR2Init_F16
GDFLIB_FilterIIR2_F16
GDFLIB_FilterMAInit_F16
GDFLIB_FilterMA_F16

GFLIB_AtanYXHw_F16

GFLIB_AtanYX_F16

GFLIB_Atan_F16

GFLIB_Cos_F16

GFLIB_CtrlPIpAWInit_F16

GFLIB_CtrlPIpAW_F16

GFLIB_DFlexRampCalcIncrHw_F16

GFLIB_DFlexRampCalcIncr_F16

GFLIB_DFlexRampInit_F16

GFLIB_DFlexRamp_F16

GFLIB_DRampInit_F16

GFLIB_DRampInit_F32

GFLIB_DRamp_F16

GFLIB_DRamp_F32

GFLIB_FlexRampCalcIncrHw_F16

GFLIB_FlexRampCalcIncr_F16

GFLIB_FlexRampInit_F16

GFLIB_FlexRamp_F16

GFLIB_Hyst_F16

GFLIB_IntegratorInit_F16

GFLIB_Integrator_F16

GFLIB_Limit_F16

GFLIB_Limit_F32

GFLIB_LowerLimit_F16

GFLIB_LowerLimit_F32

GFLIB_Lut1D_F16

GFLIB_LutPer1D_F16

GFLIB_RampInit_F16

GFLIB_RampInit_F32

GFLIB_Ramp_F16

GFLIB_Ramp_F32

GFLIB_Sin_F16

GFLIB_SqrtHw_F16

GFLIB_SqrtHw_F16l

GFLIB_Sqrt_F16

GFLIB_Sqrt_F16l

GFLIB_UpperLimit_F16

GFLIB_UpperLimit_F32

GFLIB_VectorLimit1Hw_F16

GFLIB_VectorLimit1_F16

GMCLIB_ClarkInv_F16

GMCLIB_Clark_F16

GMCLIB_DecouplingPMSM_F16

GMCLIB_ElimDcBusRipFOCHw_F16

GMCLIB_ElimDcBusRipFOC_F16

GMCLIB_ElimDcBusRipHw_F16sas

GMCLIB_ElimDcBusRip_F16sas

GMCLIB_ParkInv_F16

GMCLIB_Park_F16

GMCLIB_SvmIct_F16

GMCLIB_SvmStd_F16

GMCLIB_SvmU0n_F16

GMCLIB_SvmU7n_F16

MLIB_AbsSat_F16

MLIB_AbsSat_F32

MLIB_Abs_F16

MLIB_Abs_F32

MLIB_Add4Sat_F16

MLIB_Add4Sat_F32

MLIB_Add4_F16

MLIB_Add4_F32

MLIB_AddSat_F16

MLIB_AddSat_F32

MLIB_Add_A32as

MLIB_Add_A32ss

MLIB_Add_F16

MLIB_Add_F32

MLIB_Clb_U16l

MLIB_Clb_U16s

MLIB_Conv_F16l

MLIB_Conv_F32s

MLIB_Div1QHw_A32as

MLIB_Div1QSatHw_A32as

MLIB_Div1QSat_A32as

MLIB_Div1QSat_F16

MLIB_Div1QSat_F16ll

MLIB_Div1QSat_F16ls

MLIB_Div1QSat_F32

MLIB_Div1QSat_F32ls

MLIB_Div1Q_A32as

MLIB_Div1Q_A32ll

MLIB_Div1Q_A32ls

MLIB_Div1Q_A32ss

MLIB_Div1Q_F16

MLIB_Div1Q_F16ll

MLIB_Div1Q_F16ls

MLIB_Div1Q_F32

MLIB_Div1Q_F32ls

MLIB_DivHw1QSat_F16

MLIB_DivHw1QSat_F16ll

MLIB_DivHw1QSat_F16ls

MLIB_DivHw1QSat_F32

MLIB_DivHw1QSat_F32ls

MLIB_DivHw1Q_A32as

MLIB_DivHw1Q_A32ll

MLIB_DivHw1Q_A32ls

MLIB_DivHw1Q_A32ss

MLIB_DivHw1Q_F16

MLIB_DivHw1Q_F16ll

MLIB_DivHw1Q_F16ls

MLIB_DivHw1Q_F32

MLIB_DivHw1Q_F32ls

MLIB_DivHwSat_A32as

MLIB_DivHwSat_F16

MLIB_DivHwSat_F16ll

MLIB_DivHwSat_F16ls

MLIB_DivHwSat_F32

MLIB_DivHwSat_F32ls

MLIB_DivHw_A32as

MLIB_DivHw_A32ll

MLIB_DivHw_A32ls

MLIB_DivHw_A32ss

MLIB_DivHw_F16

MLIB_DivHw_F16ll

MLIB_DivHw_F16ls

MLIB_DivHw_F32

MLIB_DivHw_F32ls

MLIB_DivHw_F32ls

MLIB_DivSatHw_A32as

MLIB_DivSat_A32as

MLIB_DivSat_F16

MLIB_DivSat_F16ll

MLIB_DivSat_F16ls

MLIB_DivSat_F32

MLIB_DivSat_F32ls

MLIB_Div_A32as

MLIB_Div_A32ll

MLIB_Div_A32ls

MLIB_Div_A32ss

MLIB_Div_F16

MLIB_Div_F16ll

MLIB_Div_F16ls

MLIB_Div_F32

MLIB_Div_F32ls

MLIB_Log2_U16

MLIB_Mac4RndSat_F16

MLIB_Mac4RndSat_F32

MLIB_Mac4Rnd_F16

MLIB_Mac4Rnd_F32

MLIB_Mac4Sat_F32ssss

MLIB_Mac4_F32ssss

MLIB_MacRndSat_F16

MLIB_MacRndSat_F32

MLIB_MacRndSat_F32lls

MLIB_MacRnd_A32ass

MLIB_MacRnd_F16

MLIB_MacRnd_F32

MLIB_MacRnd_F32lls

MLIB_MacSat_F16

MLIB_MacSat_F32

MLIB_MacSat_F32lss

MLIB_Mac_A32ass

MLIB_Mac_F16

MLIB_Mac_F32

MLIB_Mac_F32lss

MLIB_MnacRndSat_F16

MLIB_MnacRndSat_F32

MLIB_MnacRndSat_F32lls

MLIB_MnacRnd_A32ass

MLIB_MnacRnd_F16

MLIB_MnacRnd_F32

MLIB_MnacRnd_F32lls

MLIB_MnacSat_F16

MLIB_MnacSat_F32

MLIB_MnacSat_F32lss

MLIB_Mnac_A32ass

MLIB_Mnac_F16

MLIB_Mnac_F32

MLIB_Mnac_F32lls

MLIB_Msu4RndSat_F16

MLIB_Msu4RndSat_F32

MLIB_Msu4Rnd_F16

MLIB_Msu4Rnd_F32

MLIB_Msu4Sat_F32ssss

MLIB_Msu4_F32ssss

MLIB_MsuRndSat_F16

MLIB_MsuRndSat_F32

MLIB_MsuRndSat_F32lls

MLIB_MsuRnd_A32ass

MLIB_MsuRnd_F16

MLIB_MsuRnd_F32

MLIB_MsuRnd_F32lls

MLIB_MsuSat_F16

MLIB_MsuSat_F32

MLIB_MsuSat_F32lss

MLIB_Msu_A32ass

MLIB_Msu_F16

MLIB_Msu_F32

MLIB_Msu_F32lss

MLIB_MulNegRndSat_A32

MLIB_MulNegRndSat_F16as

MLIB_MulNegRnd_A32

MLIB_MulNegRnd_F16

MLIB_MulNegRnd_F16as

MLIB_MulNegRnd_F32

MLIB_MulNegRnd_F32ls

MLIB_MulNegSat_A32

MLIB_MulNegSat_F16as

MLIB_MulNeg_A32

MLIB_MulNeg_F16

MLIB_MulNeg_F16as

MLIB_MulNeg_F32

MLIB_MulNeg_F32ss

MLIB_MulRndSat_A32

MLIB_MulRndSat_F16

MLIB_MulRndSat_F16as

MLIB_MulRndSat_F32

MLIB_MulRndSat_F32ls

MLIB_MulRnd_A32

MLIB_MulRnd_F16

MLIB_MulRnd_F16as

MLIB_MulRnd_F32

MLIB_MulRnd_F32ls

MLIB_MulSat_A32

MLIB_MulSat_F16

MLIB_MulSat_F16as

MLIB_MulSat_F32

MLIB_MulSat_F32ss

MLIB_Mul_A32

MLIB_Mul_F16

MLIB_Mul_F16as

MLIB_Mul_F32

MLIB_Mul_F32ss

MLIB_NegSat_F16

MLIB_NegSat_F32

MLIB_Neg_F16

MLIB_Neg_F32

MLIB_Rcp1Q1_A32s

MLIB_Rcp1Q_A32s

MLIB_Rcp1_A32s

MLIB_RcpHw1Q1_A32s

MLIB_RcpHw1Q_A32s

MLIB_RcpHw1_A32s

MLIB_RcpHw_A32s

MLIB_Rcp_A32s

MLIB_RndSat_F16l

MLIB_Rnd_F16l

MLIB_Sat_F16a

MLIB_Sh1LSat_F16

MLIB_Sh1LSat_F32

MLIB_Sh1L_F16

MLIB_Sh1L_F32

MLIB_Sh1R_F16

MLIB_Sh1R_F32

MLIB_ShLBiSat_F16

MLIB_ShLBiSat_F32

MLIB_ShLBi_F16

MLIB_ShLBi_F32

MLIB_ShLSat_F16

MLIB_ShLSat_F32

MLIB_ShL_F16

MLIB_ShL_F32

MLIB_ShRBiSat_F16

MLIB_ShRBiSat_F32

MLIB_ShRBi_F16

MLIB_ShRBi_F32

MLIB_ShR_F16

MLIB_ShR_F32

MLIB_Sign_F16

MLIB_Sign_F32

MLIB_Sub4Sat_F16

MLIB_Sub4Sat_F32

MLIB_Sub4_F16

MLIB_Sub4_F32

MLIB_SubSat_F16

MLIB_SubSat_F32

MLIB_Sub_A32as

MLIB_Sub_A32ss

MLIB_Sub_F16

MLIB_Sub_F32

PCLIB_Ctrl2P2ZInit_F16

PCLIB_Ctrl2P2Z_F16

PCLIB_Ctrl3P3ZInit_F16

PCLIB_Ctrl3P3Z_F16

PCLIB_CtrlPIDInit_F16

PCLIB_CtrlPID_F16

PCLIB_CtrlPIInit_F16

PCLIB_CtrlPI_F16

PCLIB_CtrlPIandLPInit_F16

PCLIB_CtrlPIandLP_F16

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