

Numerics

16-Point Complex Fast Fourier Transform (Inline) 95
16-Point Real Fast Fourier Transform (Inline) 324
2-Dimensional Convolution of a Matrix and a 3 x 3 Kernel 129
2-Dimensional Convolution of a Matrix and a 3 x 3 Program Memory Kernel 130
2-Dimensional Convolution of a Matrix and a 5 x 5 Kernel 131
2-Dimensional Convolution of a Matrix and a 5 x 5 Program Memory Kernel 132
2-Dimensional Convolution of a Matrix and a 7 x 7 Kernel 133
2-Dimensional Convolution, K x K Kernel 128
2-Dimensional Coordinate Transformation 134
2-Dimensional Correlation, K x K Kernel 137
32-Point Real Fast Fourier Transform (Inline) 326
3-Dimensional Coordinate Transformation 135
5-Tap Finite Impulse Response (FIR) Filter 201
8 x 8 Two-Dimensional Discrete Cosine Transform 181
8-Point Complex Fast Fourier Transform (Inline) 93
8-Point Real Fast Fourier Transform (Inline) 322

A

Absolute Value of Floating Point Number 192
Accumulating Auto-Spectrum 63
Accumulating Cross-Spectrum 139
Adaptive Finite Impulse Response (FIR) Filter 203
a-Law Compression 58
a-Law Expansion 59
AND Matrix 224
Arc Cosine 57
Arc Sine 61
Arc Tangent 64
Arc Tangent of 2 Arguments (a Ratio) 65
Auto-Correlation (Time Domain) 56

B

Bartlett Window 67
Base 10 Logarithm 219
Bi-Quad IIR Filter 68
Blackman Window Multiply 70
Blackman-Harris Window Multiply 72

C

Choleski Decomposition 233
Coherence Function 125
Combination 126
Complement Matrix 280
Complete Pivoting For a Matrix 236
Complex 2-Dimensional Fast Fourier Transform 90
Complex Auto-Correlation (Time Domain) 74
Complex Cross-Correlation (Time Domain) 80
Complex Dot Product 84

Complex Dot Product By Conjugate 75
Complex Finite Impulse Response (FIR) Filter 82
Complex Finite Impulse Response Filter 101
Complex Matrix Addition 104
Complex Matrix Move 106
Complex Matrix Multiplication 107
Complex Matrix Multiplication (Data w/ Program Mem to Program Memory) 111
Complex Matrix Multiplication (Data w/Program Mem to Data Memory) 109
Complex Matrix Multiplication (Program w/ Data Mem to Data Memory) 113
Complex Matrix Multiplication (Program w/ Data Mem to Program Memory) 115
Complex Matrix Multiply By Conjugate of Complex Matrix 76
Complex Matrix Subtraction 119
Complex Matrix Transpose 121
Complex Matrix-Vector Multiply 123
Complex Scalar-Complex Conjugate Matrix Multiplication 78
Complex Scalar-Matrix Multiplication 117
Complex Vector Absolute Value 140
Complex Vector Add 141
Complex Vector Add (Data Memory + Program Memory to Data Memory) 142
Complex Vector Add (Data Memory + Program Memory to Program Memory) 143
Complex Vector Add Complex Scalar 174
Complex Vector And Real Vector Add 165
Complex Vector And Real Vector Divide 166
Complex Vector Conjugate 149
Complex Vector Conjugate and Multiply 148
Complex Vector Conjugate, Multiply and Add 144
Complex Vector Create From Integers 147
Complex Vector Create From Reals 145
Complex Vector Create From Reals, dm and pm to dm 146
Complex Vector Divide By Complex Scalar 175
Complex Vector Division 150
Complex Vector Exponential 151
Complex Vector Exponential and Multiply 152
Complex Vector Fill 153
Complex Vector Magnitude Squared 155
Complex Vector Magnitude Squared and Add 156
Complex Vector Move 159
Complex Vector Move (From Data Memory to Program Memory) 160
Complex Vector Move (From Program Memory to Data Memory) 161
Complex Vector Move From Data Memory to Program Memory 160
Complex Vector Move From Program Memory to Data Memory 161
Complex Vector Multiply 162
Complex Vector Multiply and Add 154
Complex Vector Multiply By Complex Scalar 177
Complex Vector Multiply By Complex Scalar & Add Complex Vector 176
Complex Vector Multiply By Real Vector 168

Complex Vector Multiply By Real Vector (Data to Program to Data Memory) 169
Complex Vector Multiply By Real Vector (Data to Program to Program Memory) 170
Complex Vector Multiply By Real Vector (Program Mem x Data Mem to Data Mem) 171
Complex Vector Multiply By Real Vector (Program Mem x Data Mem to Program Mem) 172
Complex Vector Negate 163
Complex Vector Phase 164
Complex Vector Reciprocal 167
Complex Vector Square Root 178
Complex Vector Subtract 180
Complex Vector Subtract Complex Scalar 179
Complex Vector Subtract Real Vector 173
Complex Vector-Matrix Multiply 157
Compute the Powers of a Scalar 343
Computes Kronecker Product of Two Matrices 266
Constant Matrix 235
Convolution Function 127
Correlation Function 136
Cosine 138
Create a Null Matrix 282
Cross-Correlation (Time Domain) 81
D
Determinant of 3 x 3 Matrix 241
Determinant of a 2 x 2 Matrix 240
Determinant of a Matrix 238
Direct Form Decimating Finite Impulse Response (FIR) Filter 183
Direct Form Finite Impulse Response (FIR) Filter 199
Doppler Signal Generation 187
Dot Product 188
Dot Product (Data Memory x Program Memory to Data Memory) 189
E
Endian Order 190
Exponential Base 10 191
Exponential Base e 191
Extract Sub Matrix From A Source Matrix 244
F
Factorial 193
Fast Cosine Transform 194
Fast Fourier Transform of Complex Input Data 86
Fast Fourier Transform of Real Input/Output Data 318
Fast Fourier Transform of Real Input/Output Data - In Place 332
Fast Fourier Transform of Real Input/Output Data Using Sorenson Method 336
Fast Hartley Transform 197
FFT Weights Array 196
Finite Impulse Response (FIR) Filter of Two Vectors with Decimation and Delay Memory 185
Floating Point Remainder 204

G

Get Fraction and Integer 283

Get Mantissa and Exponent 205

H

Hamming Window Multiply 206

Hanning Window Multiply 208

Hyperbolic Cosine 138

Hyperbolic Sine 349

Hyperbolic Tangent 359

I

in Data Memory 499

Insert Sub-Matrix Into Source Matrix 254

Integral Non-Linearity 210

Inverse Complex FFT 97

Inverse Fast Fourier Transform of Real Input/Output Data 328

Inverse Hyperbolic Cosine 57

Inverse Hyperbolic Sine 62

Inverse Hyperbolic Tangent 66

K

Kaiser-Bessel Window Multiply 213

Kaiser-Bessel Window Shape Parameter 60

L

Least-Squares Regression Fit 221

Linear Interpolation 216

M

Matrix Add 223

Matrix Forward-Back Substitution 246

Matrix Identity 248

Matrix Invert 258

Matrix Multiply (Data Memory x Data Memory to Data Memory) 275

Matrix Multiply (Data Memory x Program Memory to Data Memory) 276

Matrix Multiply (Data Memory x Program Memory to Program Memory) 277

Matrix Multiply (Program Memory x Data Memory to Data Memory) 278

Matrix Multiply (Program Memory x Data Memory to Program Memory) 279

Matrix Scalar Multiply 296

Matrix Skew-Symmetric Check 294

Matrix Subtract 298

Matrix Symmetric Check 299

Matrix Trace 301

Matrix Transpose 302

Matrix-Vector Multiply 310

Maximum Element of Matrix with Coordinates 227

Maximum Magnitude of Vector 228

Maximum Value of a Matrix 226

Maximum Value of a Pair of Matrices 270

Mean Deviation 242

Mean Squared Error 297
Memory Test 243
Minimum Element of a Matrix with Coordinates 250
Minimum Magnitude of Vector 251
Minimum Value of A Matrix 249
Minimum Value of Pair of Matrices 271
Monopulse Function 292
Monopulse Function (Program Memory) 293
Move a Source DM Matrix to a Destination PM Matrix 273
Move a Source Matrix to a Destination Matrix 272
Move a Source PM Matrix to a Destination DM Matrix 274
Moving Average 288
Multiply by Power of 2 215
N
Natural Logarithm 219
O
OR Matrix 284
Orthogonal Matrix Check 286
P
Pack a Floating-Point Vector of Ones and Zeros Into 32-Bit Words 475
Pack an Integer of Ones and Zeros Into 32-Bit Word Arguments 476
Partial Pivoting for a Matrix 290
Perform Checksum 103
Permutation 311
Power 314
R
Range of Vectors 315
Reciprocal Square Root 341
Round Down to Nearest Integer 204
Round Up to Nearest Integer 85
S
Scalar Divide By Vector 342
Selection 538
Signal Noise Distortion 352
Sinc Function 348
Sine Function 347
Sliding Window 350
Sort Ouput Data from rfftip() function for rffti() function 500
Sort Ouput Data from rffts() function for rffti() function 501
Square Root 353
Standard Deviation 354
Standard Error of Estimate 345
Subtract Vector from Scalar 344
T
Tangent 359
Transfer Function 549

U

u-Law Compression 303

u-Law Expansion 304

Unity Matrix 305

Unpack an Input Vector of 32-Bit Words Into a Floating-Point Vector or Ones and Zeros 551

Unpack an Input Vector of Ones and Zeros Into Integer 32-Bit Word Arguments 552

Unpack an IQ Integer Packed Matrix 211

V

Variance 371

Vector Absolute Value 361

Vector Accumulating Auto-Spectrum 380

Vector Add 368

Vector Add and Multiply 369

Vector Add and Scalar Multiply 372

Vector Add and Scalar Subtract 373

Vector Add, Add, and Multiply 360

Vector Add, Subtract and Multiply 379

Vector AND 370

Vector Arc Cosecant 366

Vector Arc Cotangent 364

Vector Arc Hyperbolic Cosecant 367

Vector Arc Hyperbolic Cotangent 365

Vector Arc Hyperbolic Secant 375

Vector Arccosine 362

Vector Arcsecant 374

Vector Arcsine 377

Vector Arctangent 381

Vector Arctangent, 2 Arguments 382

Vector Arithmetic Shift 376

Vector Base 10 Exponential 410

Vector Base 10 Logarithm 438

Vector Base 2 Exponential 411

Vector Base 2 Logarithm 439

Vector Build Normal Distribution 492

Vector Build Ramp 491

Vector Build Uniform Distribution 494

Vector Cartesian To Polar Coordinates Conversion 312

Vector Ceiling (Round Up To Nearest Integral Value) 388

Vector Clear 390

Vector Clip 389

Vector Compress 392

Vector Compressed Merge 391

Vector Compute NCO Values 465

Vector Compute NCO Values Using Bin & Amplitude 464

Vector Convert Decibels To Linear Power Units 402

Vector Convert Decibels To Linear Volt Units 401

Vector Convert Linear Power Units To Decibels 435
Vector Convert Linear Volt Units To Decibels 434
Vector Convert Radians to Degrees 490
Vector Copy Imaginary Parts 427
Vector Copy Real and Imaginary Parts 498
Vector Copy Real Parts 495
Vector Cosecant 398
Vector Cosine 393
Vector Cosine (Input Program Memory, Output Data Memory) 394
Vector Cotangent 396
Vector Cube 400
Vector Cube Root 387
Vector Degrees to Radians 403
Vector Distance 404
Vector Divide 405
Vector Divide with Zero Check 406
Vector Envelope 407
Vector Equal 408
Vector Exclusive OR 556
Vector Exponential Average 384
Vector Fill 412
Vector Floating-Point To Integer Conversion 413
Vector Floating-Point To Integer Conversion for Negative Arguments 469
Vector Floating-Point To Integer Conversion for Positive Arguments 477
Vector Floor (Round Down To Nearest Integral Value) 415
Vector Gather 417
Vector Generation by Linear Interpolation and Extrapolation 419
Vector Greater Than 421
Vector Greater Than Or Equal 418
Vector Histogram 422
Vector Hyperbolic Cosecant 399
Vector Hyperbolic Cosine 395
Vector Hyperbolic Cotangent 397
Vector Hyperbolic Secant 521
Vector Hyperbolic Sine 525
Vector Hyperbolic Tangent 544
Vector Index 428
Vector Integer Histogram 424
Vector Integer To Floating-Point Conversion 414
Vector Integer To Floating-Point Conversion of Short Word 522
Vector Inverse Hyperbolic Cosine 363
Vector Inverse Hyperbolic Sine 378
Vector Inverse Hyperbolic Tangent 383
Vector Inverted Clip 426
Vector Less Than 441
Vector Less Than Or Equal 432

Vector Limit 433
Vector Linear Average 385
Vector Linear Interpolate 429
Vector Linear Magnitude 218
Vector Log Based Magnitude 220
Vector Logical Merge 436
Vector Logical Shift 440
Vector Lower Threshold 442
Vector LU Decomposition 268
Vector Magnitude Squared 444
Vector Matrix Multiply 453
Vector Maximum 445
Vector Maximum Magnitude 447
Vector Maximum Magnitude with Index 229
Vector Maximum of 3 Vectors 446
Vector Maximum Value 231
Vector Maximum Value With Index 232
Vector Mean 306
Vector Mean of Magnitudes 307
Vector Mean of Signed Squares 309
Vector Mean of Squares 308
Vector Minimum 448
Vector Minimum Magnitude 450
Vector Minimum Magnitude with Index 252
Vector Minimum of 3 Vectors 449
Vector Minimum Value 256
Vector Minimum Value With Index 257
Vector Move 454
Vector Move Data Memory to Program Memory 455
Vector Move Program Memory to Data Memory 456
Vector Move Program Memory to Program Memory 457
Vector Multiply 461
Vector Multiply and Add 443
Vector Multiply and Scalar Add 459
Vector Multiply and Scalar Subtract 460
Vector Multiply and Subtract 458
Vector Multiply by 1 over Pi 430
Vector Multiply by Pi 479
Vector Multiply By Scalar, Add to Vector Multiplied By Scalar 529
Vector Multiply By Sine and Cosine 554
Vector Multiply, Multiply, and Add 451
Vector Multiply, Multiply, and Subtract 452
Vector Natural Exponential 409
Vector Natural Logarithm 437
Vector Negate 468
Vector Negative Absolute Value 462

Vector Negative Merge 470
Vector NOT (Complement) 472
Vector NOT AND 463
Vector Not Equal 467
Vector NOT Exclusive Bitwise OR 473
Vector NOT OR 471
Vector OR 474
Vector Perform Bubble Sort 386
Vector Phase 478
Vector Polar To Cartesian Coordinates Conversion 316
Vector Polynomial Evaluation 481
Vector Positive Merge 480
Vector Power 482
Vector Power Spectra 484
Vector PRN Generator 483
Vector Pythagoras 486
Vector Quadratic Interpolation 487
Vector Quick Sort 488
Vector Reciprocal 496
Vector Reciprocal Square Root 507
Vector Reciprocal Square Root with Domain Check 508
Vector Reciprocal with Zero Domain Check 497
Vector Reverse Order 510
Vector Root Mean Square 340
Vector Rotate Left 503
Vector Rotate N Bits 505
Vector Rotate Right 504
Vector Round 506
Vector Round Floating Point to Integer 431
Vector Running Sum 509
Vector Scalar Add 513
Vector Scalar Add and Scalar Multiply 511
Vector Scalar Add and Scalar Subtract 512
Vector Scalar Divide 515
Vector Scalar Multiply 518
Vector Scalar Multiply and Scalar Add 527
Vector Scalar Multiply and Scalar Subtract 528
Vector Scalar Multiply and Vector Add 516
Vector Scalar Multiply and Vector Subtract 517
Vector Scalar Subtract 519
Vector Scalar Subtract and Scalar Add 533
Vector Scalar Subtract and Scalar Multiply 534
Vector Scatter 514
Vector Secant 520
Vector Selection Sort 538
Vector Signed Square 540

Vector Simpson's Integration 523
Vector Sine 524
Vector Square 530
Vector Square Root 531
Vector Square Root With Zero Domain Check 532
Vector Subtract 541
Vector Subtract and Multiply 526
Vector Subtract and Scalar Add 535
Vector Subtract and Scalar Multiply 536
Vector Subtract, Subtract and Scalar Multiply 537
Vector Sum 355
Vector Sum Magnitudes 356
Vector Sum of the Signed Squares 358
Vector Sum of the Squares 357
Vector Swap 542
Vector Tangent 543
Vector Tapered Merge 548
Vector Threshold 545
Vector Threshold With Signed Constant 547
Vector Threshold With Zero Fill 546
Vector Trapezoidal Integration 550
Vector Truncate To Fraction 416
Vector Upper Threshold 553
W
Weighted Mean 559
Welch Window Multiply 557
Window Cosine/Sine Weights Array 558
Z
Zero Crossing Detector 560