

## □ Documentation

[Accelerate](#) / [Fast Fourier transforms](#) / Out-of-Place Functions for 1D Multiple-Signal Complex FFT

API Collection

# Out-of-Place Functions for 1D Multiple-Signal Complex FFT

Perform fast Fourier transforms out of place on multiple-signal 1D complex data.

## Overview

The functions in this group use the following operation for a complex-to-complex transform:

```
N = 1 << Log2N;

scale = 0 < Direction ? 1 : 1./N;

// Repeat M times:
for (m = 0; m < M; ++m)
{

    // Define a complex vector, h:
    for (j = 0; j < N; ++j)
        h[j] = A->realp[m*IMA + j*IA] + i * A->imagp[m*IMA + j*IA];

    // Perform Discrete Fourier Transform.
    for (k = 0; k < N; ++k)
        H[k] = scale * sum(h[j]
            * e**(-Direction*2*pi*i*j*k/N)), 0 <= j < N);

    // Store result.
    for (k = 0; k < N; ++k)
    {
        C->realp[m*IM + k*IC] = Re(H[k]);
    }
}
```

```
C->magp[m*IM + k*IC] = Im(H[k]);  
}  
}
```

The temporary buffer versions perform the same operation but use a temporary buffer for improved performance.

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## Topics

### Out-of-Place FFT Functions

`vDSP_fftM_zop`

Computes a forward or inverse out-of-place, single-precision complex FFT on multiple signals.

`vDSP_fftM_zopD`

Computes a forward or inverse out-of-place, double-precision complex FFT on multiple signals.

### Out-of-Place FFT Functions with Temporary Buffer

`vDSP_fftM_zopt`

Computes a forward or inverse out-of-place, single-precision complex FFT on multiple signals using a temporary buffer.

`vDSP_fftM_zoptD`

Computes a forward or inverse out-of-place, double-precision complex FFT on multiple signals using a temporary buffer.

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## See Also

### Functions for 1D Multiple-Signal Complex FFT

≡ In-Place Functions for 1D Multiple-Signal Complex FFT

Perform fast Fourier transforms in place on multiple-signal 1D complex data.

