M451 DSP FFT Function

Directory Introduction for 32-bit NuMicro® Family

Directory Information

Library	Driver header and source files.
Sample	M451 DSP FFT Function Sample Code.

For additional information or questions, please contact: Nuvoton Technology Corporation.

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Support Series

M451 series, NUC400 series, NUC505

Function Description

以下为程序各调用函数意义解释。

```
/* 初始化设定FFT/IFFT */
arm_cfft_radix4_init_f32(&S, fftSize, ifftFlag, doBitReverse);
/* 执行FFT运算，将结果回传到原输入数组中 */
arm_cfft_radix4_f32(&S, testInput_f32_10khz);
/* 取各计算结果数值的绝对值来得其各个频率强度 */
arm_cmplx_mag_f32(testInput_f32_10khz, testOutput, fftSize);
/* 取最大值为主频位置及数值 */
arm_max_f32(testOutput, fftSize, &maxValue, &testIndex);
/* 频率 = 排序第几个频率位置×取样频率/fft计算个数 */
Mainfreq=testIndex*5000/fftSize;
```

范例程序中，有一讯号如图1，经过快速傅立叶传换后，取得各频率的复数值，再对复数值取绝对值，即可得到各频率强度分布如图2。因此杂乱讯号经过傅立叶变换后即可看出其频率强度分布，并找出此输入讯号为10k赫兹带有噪声的讯号。

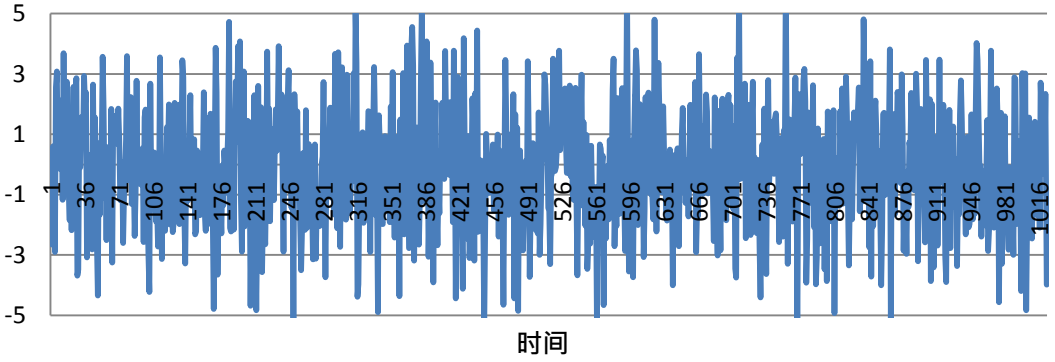

图 1 范例程序输入讯号时域图

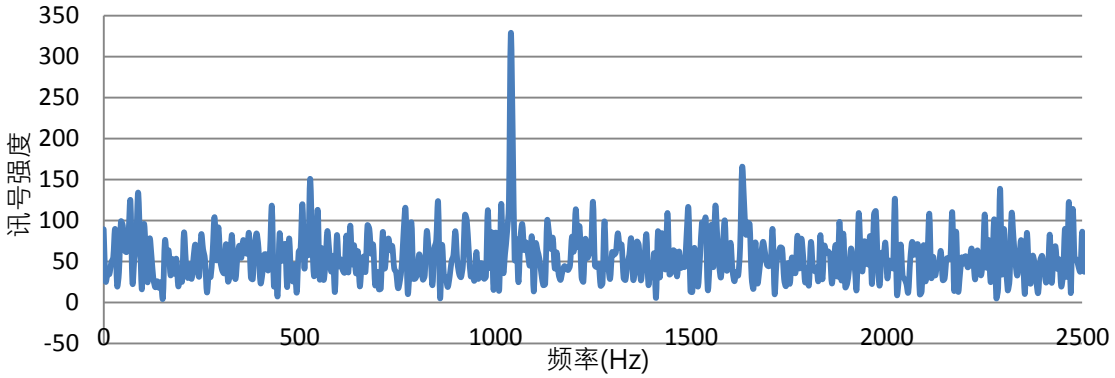

图 2 讯号经 FFT 转换后的频域图

BSP Version

M451 Series BSP CMSIS v3.01.001

Development Resources

NuEdu-SDK-M451

Revision History

Date	Revision	Description
Sep 22, 2016	1.00	1. Initially issued.

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