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| **Microchip PIC32 DSP Library**The PIC32 DSP library consists of a set of functions applicable to many multimedia application areas. Most of the functions, like vector operations, filters, and transforms, are commonly used in many DSP and multimedia applications. Complete documentation for the PIC32 DSP Libraries can be found in the [MPLAB C32 C Libraries Manual](http://www.microchip.com/Microchip.WWW.SecureSoftwareList/secsoftwaredownload.aspx?device=en532454&lang=en&ReturnURL=http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=2615&dDocName=en532454). The library works with all PIC32 devices! |
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| **PIC32 DSP Library Functions**

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| **Function** | **Description** |
| mips\_vec\_abs16/32 | Compute the absolute value of each Q15/Q31vector element. |
| mips\_vec\_add16/32 | Add the corresponding elements of twoQ15/Q31 vectors. |
| mips\_vec\_addc16/32 | Add a constant to all elements of a vector. |
| mips\_vec\_dotp16/32 | Compute dot product of two Q15/Q31 vectors. |
| mips\_vec\_mul16/32 | Multiply the corresponding elements of twoQ15/Q31 vectors. Can be used for applying windows. |
| mips\_vec\_mulc16/32 | Multiply all elements of a vector by a constant. |
| mips\_vec\_sub16/32 | Subtract the corresponding elements of twoQ15/Q31 vectors. |
| mips\_vec\_sum\_squares16/32 | Calculate the sum of squares of elements of avector in Q15/Q31 format. |
| mips\_fir16 | Applies a block FIR filter to a Q15 vector. |
| mips\_fir16\_setup | Prepare the filter coefficients for the mips\_fir16 function. |
| mips\_iir16 | Single-sample IIR filter. |
| mips\_iir16\_setup | Prepare the filter coefficients for the mips\_iir16 function. |
| mips\_lms16 | Single-sample LMS filter |
| mips\_fft16 | Compute the complex FFT of a vector containing Q15 complex samples, i.e., 16-bit fractional real and imaginary parts. |
| mips\_fft16\_setup | Create a vector of twiddle factors used by the mips\_fft16 function. |
| mips\_fft32 | Compute the complex FFT of a vector containing Q31 complex samples, i.e., 32-bit fractional real and imaginary parts. |
| mips\_fft32\_setup | Create a vector of twiddle factors used by the mips\_fft32 function. |
| mips\_h264\_iqt | Inverse quantization and transform for H.264 decoding. |
| mips\_h264\_iqt\_setup | Create inverse quantization matrix used by the mips\_h264\_iqt function. |
| mips\_h264\_mc\_luma | 1/4-pixel motion compensation for luma pixels in H.264 video decoding. |

 | **Features**• [**Free library included with MPLAB compiler**](http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=2615&dDocName=en532454)• Compatible with all devices in the Microchip PIC32 family• Fully optimized DSP functions supporting both 16 and 32 bit data.• Applicable to audio, video and other multimedia applications• Includes general math functions, filters, transforms, and video operations.**Devices Supported**All processors in the PIC32 family**Getting Started**• Download and install MPLAB and the free trial version of the C32 C compiler• See Chapter 3 of the [MPLAB C32 C Libraries Manual](http://www.microchip.com/Microchip.WWW.SecureSoftwareList/secsoftwaredownload.aspx?device=en532454&lang=en&ReturnURL=http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=2615&dDocName=en532454)• Start using the PIC32 DSP libraries! |
| **A complete list of DSP functions is available in the** [**MPLAB C32 C Libraries Manual**](http://www.microchip.com/Microchip.WWW.SecureSoftwareList/secsoftwaredownload.aspx?device=en532454&lang=en&ReturnURL=http://www.microchip.com/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=2615&dDocName=en532454) |