Summary
The Digital Filter Design tool for the dsPIC® 16-bit Digital Signal Controllers makes designing, analyzing and implementing Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) digital filters easy through a menu-driven and intuitive user interface. The filter design tool performs complex mathematical computations for filter design, provides superior graphical displays and generates comprehensive design reports. Desired filter frequency specifications are entered and the tool automatically generates the filter code and coefficient files ready to use in the MPLAB® Integrated Development Environment (IDE). System analysis of the filter transfer function is supported with multiple generated graphs such as: magnitude, phase, group delay, log magnitude, impulse response and pole/zero locations.

Finite Impulse Response Filter Design
- Design Method Selection
  - FIR Windows Design
  - FIR Equiripple Design (Parks-McClellan)
- Lowpass, Highpass, Bandpass and Bandstop filters
- FIR filters can have up to 513 taps
- Following window functions are supported:
  - Rectangular
  - Hanning (Hann)
  - Hamming
  - Triangular
  - Blackman
  - Exact Blackman
  - 3 Term Cosine
  - 3 Term Cosine with continuous 3rd Derivative
  - Minimum 3 Term Cosine
- Reports show design details such as window coefficients and Impulse Response prior to multiplying by the window function
- Filters are designed for a maximum gain of 1

Infinite Impulse Response Filter Design
- Lowpass, Highpass, Bandpass and Bandstop Filters
- Filter orders up to 10 for Lowpass and Highpass Filters
- Filter orders up to 20 for Bandpass and Bandstop Filters
- Five Analog Prototype Filters are available:
  - Butterworth
  - Tschebyscheff
  - Inverse Tschebyscheff
  - Elliptic
  - Bessel
- Digital Transformations are performed by Bilinear Transformation Method
- Reports show design details such as all transformations from normalized lowpass filter to desired filter

Code Generation Features
- Generated files are compliant with the Microchip dsPIC30F C30 Compiler, Assembler and Linker
- Choice of placement of coefficients in Program Space or Data Space
- C wrapper/header code generation

Graphs
- Magnitude Response vs. Frequency
- Log Magnitude vs. Frequency
- Phase Response vs. Frequency
- Group Delay vs. Frequency
- Impulse Response vs. Time (per sample)
- Step Response vs. Time (per sample)
- Pole and Zero Locations (IIR only)
Host System Requirements

- PC-compatible system with an Intel Pentium® class or higher processor, or equivalent
- A minimum of 16 MB RAM
- A minimum of 40 MB available hard drive space
- CD ROM drive
- Microsoft Windows® 98, Windows 2000, Windows XP or Windows NT®

Part Numbers and Ordering Information:

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Development Tools from Microchip

- MPLAB® IDE
  Integrated Development Environment (IDE)
- MPASM™ Assembler
  Universal PICmicro® Macro-Assembler
- MPLINK™ Linker/MPLIB™ Librarian
  Linker/Librarian
- MPLAB SIM Simulator
  Software Simulator
- MPLAB C18
  C Compiler for PIC18CXXX MCUs
- MPLAB C30
  C Compiler for dsPIC30F MCUs
- PICKit™ 1
  Flash Starter Kit
- MPLAB ICD 2
  In-Circuit Debugger
- MPLAB ICE 2000
  Full-featured Modular In-Circuit Emulator for PIC12, PIC16 and PIC18 MCUs
- MPLAB ICE 4000
  Full-featured Modular In-Circuit Emulator for PIC18 and dsPIC MCUs
- PICSTART® Plus Programmer
  Entry-level Development Kit with Programmer
- MPLAB PM3 Device Programmer
  Full-featured, Modular Device Programmer
- KeloLog® Evaluation Kit
  Encoder/Decoder Evaluator
- microID® Developer’s Kit
  125 kHz and 13.56 MHz RFID Development Tools

Americas

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As of 7/14/04

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