MOTOROLA

DSP56800SDKPB/D
Rev 7.0, 5/2003

56800SDK

Product Brief

Smart Development Tools

Embedded SDK for 56800, Rev 3.0

Motorola's Embedded SDK offers reusable software components designed to expedite time to market and reduce development costs. The latest version, Embedded SDK Rev 3.0, makes it easy to develop the most demanding real-time embedded applications, ranging from MCU control functions to DSP signal processing algorithms, for the entire Family of 56800 Processors.

Now that's Smart!

Embedded SDK Overview

Motorola's Embedded SDK (Software Development Kit) provides a rapidly expanding set of reusable software components. The Embedded SDK reduces your development costs and expedites your time to market. Production quality drivers, algorithms implemented for optimal efficiency, and sample applications are provided for the entire 56800 Family of processors.

Comprehensive documentation demonstrates how to combine Embedded SDK capabilities to quickly create a wide variety of embedded applications ranging from mission-critical MCU control functions to the most demanding digital signal processing algorithms. Because full source code is included for all Embedded SDK components, developers have complete flexibility to achieve their goals.

All Embedded SDK components are callable from both C and Assembly. Combining C, to dramatically speed application development, with Assembly, to optimize time critical sections, the SDK offers a smart engineering approach. APIs (Application Program- ming Interfaces) standardize SDK operation for all 56800 processors. This standardization provides application portability across the 56800 processor family. Developers can rapidly prototype their application with Motorola's Evaluation Modules (EVMs) using flexible external RAM, migrate to self-contained Flash operation during development, and finally select the lowest cost 56800 processor best suited for the production hardware.

The Embedded SDK includes standard libraries for:

- Fractional math
- Digital signal processing
- Data structure manipulation
- Interrupt handling
- Memory management
- Drivers for all peripherals
- Motor Control
- Vocoders
- Modems
- Telephony
- Security
- RTOS Support

Test cases are provided for all libraries. Applications demonstrate proper operation of library components for telephony, vocoders, modems, and motor control. SDK documentation publishes performance statistics for library components. The Embedded SDK provides minimal interrupt latencies while using all SDK drivers.

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CodeWarrior by Metrowerks

Motorola's Embedded SDK builds upon the Metrowerks' CodeWarrior IDE (Integrated Development Environment) for the 56800 Family. CodeWarrior provides the user with a complete software development environment for Motorola's embedded processor solutions. CodeWarrior's comprehensive and highly visual development environment lets designers build and deploy even the most sophisticated control systems quickly and easily.

CodeWarrior is a Windows-based Integrated Development Environment (IDE) with an efficient C compiler. The IDE is a sophisticated tool for navigation, editing, compiling, and debugging. It includes an intuitive graphical project management and build system; a highly-optimized C compiler; an assembler and linker; a graphical source level debugger; an instruction set simulator and much more.

CodeWarrior streamlines system design, helping designers solve complex problems quickly and efficiently. Combining this highly sophisticated IDE environment with the SDK's capabilities, Motorola provides MCU and DSP customers with an efficient and highly capable development environment.

For information on Metrowerks' CodeWarrior, access the web:
http://www.metrowerks.com/embedded/

Embedded SDK Rev 3.0

The Embedded SDK Version Rev 3.0 utilizes Metrowerks' CodeWarrior for Motorola DSP56800 Embedded Systems Version 5.1 hosted on Windows 98/2000/NT/ME/XP platforms. Embedded SDK Version Rev 3.0 now supports all of the members of the 56800 Family.

New algorithms and sample applications for security, vocoder, modem, telephony, speech recognition and motor control libraries are offered in SDK Rev 3.0. The following chart gives an overview of the SDK contents. Components included from the previous SDK releases are denoted by a ●. Components new to SDK Rev 3.0 are denoted by a ✓. SDK components which are either not applicable to the hardware platform, or scheduled for a future release, are left blank.

The Embedded SDK Rev 3.0 is available from Motorola immediately. For a limited time, Motorola is offering the Embedded SDK Rev 3.0 at no charge. To download your free copy go to: **http://www.motorola.com/semiconductors** (do a search for SDK and select MSW3SDK000AA Product Summary Page from the search results.)

Driver/Library	Doc	F801[2]	F802[2]	F803	F805	F807	824	F826	F827
Vocoders									
G.711 (1)	●	●	●	●	●	●	●	●	●
G.726 (1)	●	●	●	●	●	●	●	●	●
Modem Algorithms*									
V.8bis	●			●	●	●	●	●	●
V.21	●			✓	✓	✓	✓	✓	✓
V.22bis	●			●	●	●	●	●	●
V.42bis (1)	●			●	●	●	●	●	●
Telephony									
G.165 (1)	●	●	●	●	●	●	●	●	●
G.168 (1)	●	✓	✓	✓	✓	✓	✓	✓	✓
DTMF Generate (1)	●	●	●	●	●	●	●	●	●
DTMF Detect (1)	●	●	●	●	●	●	●	●	●
Caller ID	●	●	●	●	●	●	●	●	●
Call Progress Tones (CPT)	●	●	●	●	●	●	●	●	●
Voice Activity Detect (VAD) (1)	●	●	●	●	●	●	●	●	●
CAS Detection	●	●	●	●	●	●	●	●	●
Acoustic Echo Canceller (1)	●			●	●	●	●	●	●
Common Tone Generation (1)	●	✓	✓	✓	✓	✓	✓	✓	✓
MFC - R2 (1)	●	✓	✓	✓	✓	✓	✓	✓	✓
DSP Functions									
Fractional Math	●	●	●	●	●	●	●	●	●
FFT	●	●	●	●	●	●	●	●	●
FIR	●	●	●	●	●	●	●	●	●
IIR	●	●	●	●	●	●	●	●	●
Trigonometric	●	●	●	●	●	●	●	●	●
Matrix	●	●	●	●	●	●	●	●	●
Vector	●	●	●	●	●	●	●	●	●
Correlation	●	●	●	●	●	●	●	●	●

***** Modem algorithms are fully tested data pumps that the customer can incorporate in a full modem solution.

Driver/Library	Doc	F801[2]	F802[2]	F803	F805	F807	824	F826	F827
Voice Recognition									
VRLite-1 (1)	●			●	●	●	●	●	●
Security									
DES (1)	●	●	●	●	●	●	●	●	●
3DES (1)	●	●	●	●	●	●	●	●	●
RSA (1)	●	●	●	●	●	●	●	●	●
Drivers for On-Chip Peripherals									
ADC	●	●	●	●	●	●			●
Quadrature Decoder	●			●	●	●			
Flash	●	●	●	●	●	●		●	●
GPIO	●	●	●	●	●	●	●	●	●
Interrupt Controller	●	●	●	●	●	●	●	●	●
MSCAN (1)	●			●	●	●			
PLL	●	●	●	●	●	●	●	●	●
Posix Timer	●	●	●	●	●	●	●	●	●
PWM	●	●	●	●	●	●			
Quad Timer	●	●	●	●	●	●		●	●
Serial/SCI	●	●	●	●	●	●	●	●	●
SIM	●	●	●	●	●	●		●	●
SPI	●	●		●	●	●	●	●	●
SSI	●						●	●	●
TOD (Time OF Day)	●							●	●
Drivers for Off-Chip Peripherals on EVMs									
BLDC	●	●	●	●	●	●			
Brake	●	●	●	●	●	●			
Button	●	●	●	●	●	●	●	●	●
Codec	●						●	●	●
DAC	●				●	●			
EEPROM / Flash (SPI Bus Serial)	●						●	●	●
PC Master	●	●	●	●	●	●		●	●
File I/O	●	●	●	●	●	●	●	●	●
LED	●	●	●	●	●	●	●	●	●
Switch	●	●	●	●	●	●			
TDC1 DAA/Codec	●								✓
Tools									
PC Master	●	●	●	●	●	●		●	●
File I/O	●	●	●	●	●	●	●	●	●
JTAG Flash Loader	●	●	●	●	●	●	●	●	●
RTOS Support									
MicroC/OS-II	●			●	●	●		●	●
Miscellaneous									
Serial Bootloader	●	●	●	●	●	●		●	●
Narrowband Filter Demo	●						●	●	●
Data structures (FIFO)	●	●	●	●	●	●	●	●	●
Motor Control Applications									
AC Induction Motors (ACIM) V/Hz Open Loop	●	●		●	●	●			
AC Induction Motors (ACIM) V/Hz Open Loop, PFC	●			●	●	●			
AC Induction Motors (ACIM) V/Hz Closed Loop	●			●	●	●			
Brushless DC Motors w/ HALL Sensors Closed Loop	●			●	●	●			
Brushless DC Motors w/Encoder	●			●	●	●			
Sensorless Brushless DC Motors w/Back-EMF ADC	●	●		●	●	●			
Sensorless Brushless DC Motors w/ Back-EMF ZC	●			●	●	●			
Synchronous Perm Mag Closed Loop w/Encoder	●			●	●	●			
Low-End SR w/ Position Sensor - Hall Sensors	●			●	●	●			
Digital Power Factor Correction	●			●	●	●			
AC Induction Motor Vector Control	●			●	●	●			
PM Synchronous Motor Vector Controls	●			●	●	●			
SR Sensorless	●			●	●	●			
SR with Encoder	●			●	●	●			

Driver/Library	Doc	F801[2]	F802[2]	F803	F805	F807	824	F826	F827
MOTOR CONTROL ALGORITHMS									
3-phase Sine Waveform Generation	●	●	●	●	●	●			
Clarke/Park Transformation	●	●	●	●	●	●			
Space Vector Modulation	●	●	●	●	●	●			
Ramp	●	●	●	●	●	●			
D-Q System (2 phase)	●	●	●	●	●	●			
FOC decoupling	●	●	●	●	●	●			
BLDC Commutation Handler w/ Sensors	●	●	●	●	●	●			
BLDC Commutation Sensorless - Back-EMF Measurement	●	●	●	●	●	●			
BLDC commutation Handler sensorless - Zero Cross	●	●	●	●	●	●			
SR Commutation Handler	●	●	●	●	●	●			
Speed push button	●	●	●	●	●	●			
PI/PID Controllers	●	●	●	●	●	●			
Velocity Calculation and Estimation	●	●	●	●	●	●			
Look-up Table	●	●	●	●	●	●			
Brake Control	●	●	●	●	●	●			
Switch Control	●	●	●	●	●	●			
Example Applications									
CODEC	●						●	●	●
Quad Timer	●	●	●	●	●	●		●	●
POSIX Timer	●	●	●	●	●	●	●	●	●
Serial/SCI	●	●	●	●	●	●	●	●	●
DTMF Generation (1)	●			●	●	●	●	●	●
DTMF Detection (1)	●						●	●	●
G.165 (1)	●						●	●	●
G.711 (1)	●						●	●	●
G.726 (1)	●						●	●	●
VRLite-1 (1)	●						●	●	●
DES (1)	●						●	●	●
3DES (1)	●						●	●	●
RSA (1)	●						●	●	●

(1) Note 1 - SDK component is priced separately
(2) Note 2- 60MHz 56F801 and 56F802 parts are also supported by SDK 3.0. Please contact factory for list of SDK applications that support these two new devices.

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