



# DSP56800ESDK

## *Preliminary Product Brief*

# Smart Development Tools Embedded SDK for DSP56800E, Rev 2.0E

Motorola's Embedded SDK offers reusable software components designed to expedite time to market and reduce development costs. The Embedded SDK for DSP56800E v2.0E makes it easy to develop the most demanding real-time embedded applications, ranging from MCU protocol stacks to DSP signal processing algorithms, for the entire Family of 56800E 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, example applications, and reference applications are provided for the entire 56800E 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 source code is included for many 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 Programming Interfaces) standardize SDK operation for all 56800E processors. This standardization provides application portability across all of the 56800E processor families. Developers can rapidly prototype their application with Motorola's Evaluation Modules (EVMs) using flexible external RAM, migrate to self-contained RAM operation during development, and finally select the lowest cost 56800E 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
- Vocoders
- Modems
- Telephony
- Security
- RTOS Support
- Feature Phone
- Voice Processing

Test cases are provided for all libraries. Example applications demonstrate proper operation of library components included in the SDK. SDK documentation publishes performance statistics for library components. The Embedded SDK provides minimal interrupt latencies while using all SDK drivers.

## CodeWarrior 2.0 for Motorola DSP56800E by Metrowerks

Motorola's Embedded SDK builds upon the Metrowerks' CodeWarrior IDE (Integrated Development Environment) for the 56800E Family. CodeWarrior provides the user with a complete software development environment for Motorola's embedded processor solutions.

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. Combining this 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/DSP56800E/>

## Embedded SDK for DSP56800E

The Embedded SDK utilizes Metrowerks' CodeWarrior for Motorola DSP56800E Embedded Systems hosted on Windows 98/2000/NT/ME/XP platforms.

The following chart gives an overview of the SDK contents. Components included in the 2.0E release are denoted by a ✓. Those drivers/libraries that have Large Memory Model (LMM) support are denoted by a ●. SDK components which are either not applicable to the hardware platform, or scheduled for a future release, are left blank.

You can download your free copy of the 2.0E SDK from: <http://www.motorola.com/semiconductors> (do a search for SDK and select MSW3SDK000AA Product Summary Page from the search results.)

## Comprehensive SDK Training

Motorola offers a comprehensive set of DSP56800E training literature and exercises. Order your free copy of this easy-to-use training CD through the Motorola web site: <http://www.motorola.com/semiconductors> under Training/Tutorials (order number CD342/D).

Driver/Library	Doc	852	853	854	855	857	858
<b>Vocoders</b>							
G.711 (1)	✓	●	●	●	●	✓	●
G.723.1a (1)	✓			✓	✓	✓	✓
G.726 (1)	✓	✓	✓	✓	✓	✓	✓
G.729A/B (1)	✓			✓	✓	✓	✓
<b>Modem Algorithms*</b>							
V.8bis	✓		✓	✓	✓	✓	✓
V.21	✓	✓	✓	✓	✓	✓	✓
V.22bis	✓	✓	✓	✓	✓	✓	✓
V.42bis (1)	✓	✓	✓	✓	✓	✓	✓
<b>Telephony</b>							
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)	✓	●	●	●	●	✓	●
Noise Suppression Library (1)	✓	✓	✓	✓	✓	✓	✓
Automatic Gain Control (1)	✓	●	●	●	●	✓	●
MFC - R2 (1)	✓	✓	✓	✓	✓	✓	✓
VAD/CNG/DTX (1)	✓	✓	✓	✓	✓	✓	✓
<b>Voice Recognition</b>							
VR Lite (1)	✓			✓	✓	✓	✓

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

Driver/Library	Doc	852	853	854	855	857	858
<b>Feature Phone Application</b>							
Type 1 and 2 Telephony Features (1)	✓	✓					✓
Generic Echo Canceller (1)	✓	✓					✓
Full Duplex Speakerphone (1)	✓	✓					✓
Type 1 and 2 Telephony Parser (1)	✓	✓					✓
<b>Security</b>							
DES (1)	✓	✓	✓	✓	✓	✓	✓
3DES (1)	✓	✓	✓	✓	✓	✓	✓
RSA (1)	✓	✓	✓	✓	✓	✓	✓
<b>DSP Functions</b>							
Fractional Math	✓	•	•	•	•	✓	•
FFT	✓	•	•	•	•	✓	•
FIR	✓	•	•	•	•	✓	•
IIR	✓	•	•	•	•	✓	•
Trigonometric	✓	•	•	•	•	✓	•
Matrix	✓	•	•	•	•	✓	•
Vector	✓	•	•	•	•	✓	•
Correlation	✓	•	•	•	•	✓	•
<b>Drivers for On-Chip Peripherals</b>							
GPIO	✓	•	•	•	•	✓	•
Interrupt Controller	✓	•	•	•	•	✓	•
PLL	✓	•	•	•	•	✓	•
POSIX Timer	✓	•	•	•	•	✓	•
Quad Timer	✓	•	•	•	•	✓	•
SCI	✓	•	•	•	•	✓	•
SPI	✓	•	•	•	•	✓	•
ESSI/SSI	✓	•	•	•	•	✓	•
ESSI DMA	✓	•	•	•	•	✓	•
EMI (PCS)	✓	•	•	•	•		•
Host Port Interface	✓		•	•		✓	•
TOD	✓		•	•	•	✓	•
DMA	✓		•	•	•	✓	•
COP	✓	•	•	•	•	✓	•
<b>Drivers for Off-Chip Peripherals</b>							
CODEC	✓	•	•	•	•	✓	•
Internet Daughter Card	✓		•	•	•	✓	•
File I/O	✓	•	•	•	•	✓	•
FLASH (SPI Bus Serial)	✓	•	•	•	•	✓	•
LED	✓	•	•	•	•	✓	•
Button	✓	•	•	•	•	✓	•
PC Master Software	✓	•	•	•	•	✓	•
TDC1 DAA/Codec	✓	•	•	•	•	✓	•
TDC1 Keypad	✓	•	•	•	•	✓	•
TDC1 LCD Display	✓	•	•	•	•	✓	•
<b>RTOS Support</b>							
MicroC/OS-II (Port files only)	✓	•	•	•	•	✓	•
<b>Miscellaneous</b>							
Testing & Stack Services	✓	•	•	•	•	✓	•
Data structures (FIFO)	✓	•	•	•	•	✓	•
Second Stage SPI Boot loader	✓	•	•	•	•	✓	•
Cycle Count Tool	✓	•	•	•	•	✓	•
<b>Example Applications (2)</b>							
CODEC	✓	✓	✓	✓	✓	✓	✓
Quad Timer	✓	✓	✓	✓	✓	✓	✓
POSIX Timer	✓	✓	✓	✓	✓	✓	✓
SCI	✓	✓	✓	✓	✓	✓	✓

Driver/Library	Doc	852	853	854	855	857	858
<b>Example Applications (Continued)</b>							
DTMF Generation (1)	✓	✓	✓	✓	✓	✓	✓
DTMF Detection (1)	✓	✓	✓	✓	✓	✓	✓
G.165 (1)	✓	✓	✓	✓	✓	✓	✓
G.168 (1)	✓	✓	✓	✓	✓	✓	✓
G.711 (1)	✓	✓	✓	✓	✓	✓	✓
G.723.1a (1)	✓			✓	✓	✓	✓
G.726 (1)	✓	✓	✓	✓	✓	✓	✓
G.729A/B (1)	✓			✓	✓	✓	✓
VR Lite-1 (1)	✓			✓	✓	✓	✓
DES (1)	✓	✓	✓	✓	✓	✓	✓
3DES (1)	✓	✓	✓	✓	✓	✓	✓
RSA (1)	✓	✓	✓	✓	✓	✓	✓
Second Stage SPI Boot loader	✓	✓	✓	✓	✓	✓	✓
Host Interface Demo	✓	✓	✓	✓	✓	✓	✓
V.22bis	✓	✓	✓	✓	✓	✓	✓
V.42bis (1)	✓	✓	✓	✓	✓	✓	✓
VAD (1)	✓	✓	✓	✓	✓	✓	✓
CPT	✓	✓	✓	✓	✓	✓	✓
AGC (1)	✓	✓	✓	✓	✓	✓	✓
TDC1 DAA/Codec	✓	✓	✓	✓	✓	✓	✓
Noise Suppression (1)	✓	✓	✓	✓	✓	✓	✓
CTG (1)	✓	✓	✓	✓	✓	✓	✓
COP	✓	✓	✓	✓	✓	✓	✓
<b>Tools</b>							
Serial Data Flash Programmer	✓	✓	✓	✓	✓	✓	✓
PC Master Software	✓	✓	✓	✓	✓	✓	✓
File I/O	✓	✓	✓	✓	✓	✓	✓
<b>Reference Applications</b>							
Feature Phone Application (1)	✓	✓					✓

(1) Note 1 - SDK component is priced separately, contact your local Motorola Sales Office or authorized Motorola distributor for more information.

(2) Note 2 - Example applications for DSP56853/54/55/57/58 supported using DSP56858 EVM

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