



## D16000 System-On-Chip Family

### Product Description

#### Primary Applications

- Feature Phones
- Digital Answering Functions for Corded or Cordless Phones
- Stand-Alone Digital Answering Devices
- Portable Digital Voice Recorders
- Automotive Applications

#### "System-On-Chip" Solution For Fully Integrated Digital Telephones

The D16000 Family of products features a state-of-the-art, fully integrated DSP System-On-Chip specially designed to provide custom solutions for Integrated Digital Telephones (IDT) which among other functions offer advanced digital answering applications.

DSP Group's advanced proprietary technology ensures unparalleled performance and cost-effectiveness, as well as critical time-to-market capabilities in this new generation of chip technology.

# D16000 System-On-Chip Family

## Real Single System Chip Solutions

### D16000 – The Leading Family of DSP “System-On-Chip” Products

The D16000 Family of products provides real, single system chip solutions for Integrated Digital Telephones including advanced Digital Answering and Feature Phone applications. The Family’s open architecture allows for standard product configuration with internal or external Host Controller with fixed functionality - or custom solution with internal programmable Host Controller.

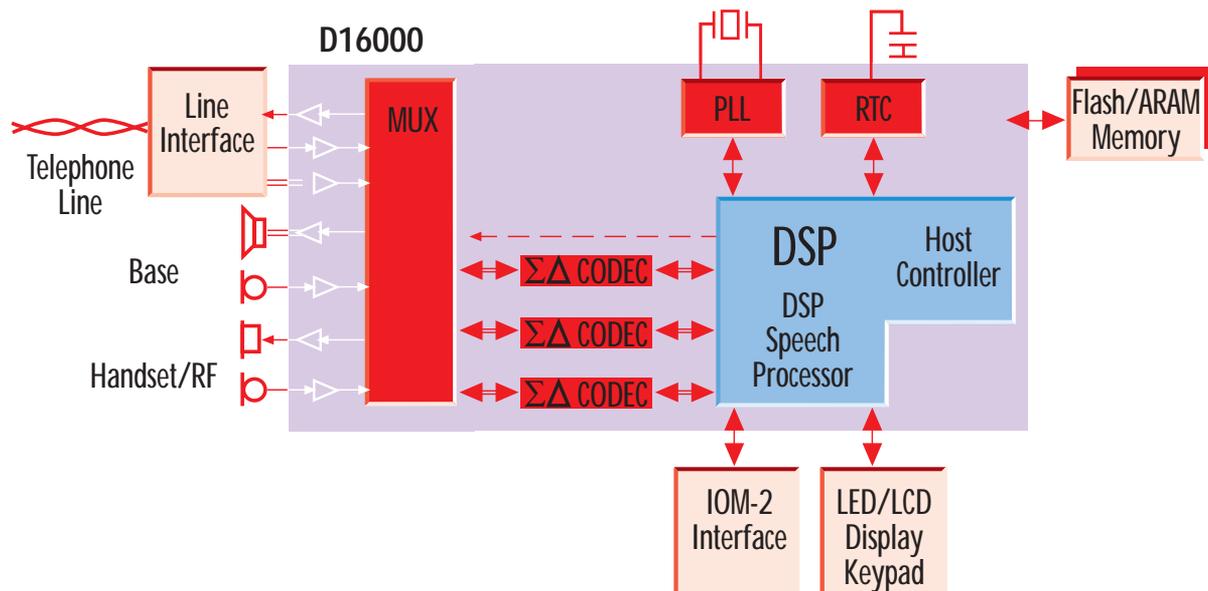
#### TrueSpeech® Voice Compression

- Superior Quality TrueSpeech® Triple Rate Coder™ for optimization of voice quality and recording time. Enables selectable recording times: 11, 15, 25 minutes per 4Mb of memory.
- High-Quality TrueSpeech® Low-Rate Coder enables 15 minutes of recording time per 4Mb of memory.

#### ► Highlights

- Embedded Sigma Delta CODECS
- Analog Front End and Host Controller
- True Full Duplex SpeakerPhone® with both acoustical and near-end echo cancellation
- Caller ID (CID), CID on Call Waiting (CWCID) (Bell 202 & V.23)
- Supports External Flash & ARAM Message Memory
- IOM-2 Interface for Direct Connection to ISDN and DECT
- Language Independent Voice Recognition
- Optional Internal or External Host Controller Configuration
- TrueSpeech® Natural Voice Prompting (Optional)
- Flexispeech™ Playback at variable speed (50%-200%)
- Multiple OGM and Mailbox Playback and Recording
- Call Progress, Tone Detection
- Automatic Gain Control (AGC) specifically for Speech in Telephony environments

Integrated Digital Telephone System-On-Chip  
DSP with Embedded  $\mu$ C Function, AFE, 1-3  $\Sigma\Delta$  CODECS, PLL & RTC



# Versatile Range of Integrated Solutions

## An Open Architecture Family of Advanced System-On-Chip Solutions

The open architecture of the D16000 Family allows customers to mix and match features available from DSP Group's proprietary algorithms to suit their real product market requirements. This unique capability to customize DSP functionalities results in cost-effective creation of highly differentiated end-user products.

Features	D16500	D16300
Superset of all D16000 family components	X	X
Superior Quality TrueSpeech® Triple Rate Coder™	X	
Dynamic recompression of higher bit rate messages for additional memory space	X	
High-Quality TrueSpeech® Low-Bit Rate Coder		X
Memory management to external message memory	Flash	Flash/ ARAM
Voice Prompt storage in embedded ROM		X
Flexible architecture and choice of internal or external Host Controller implementation	X	X
Memory size and CODEC tailoring	X	X
Flash-based version with Multiple Time Programming (MTP) for debugging, testing and qualifying customer applications	X	X

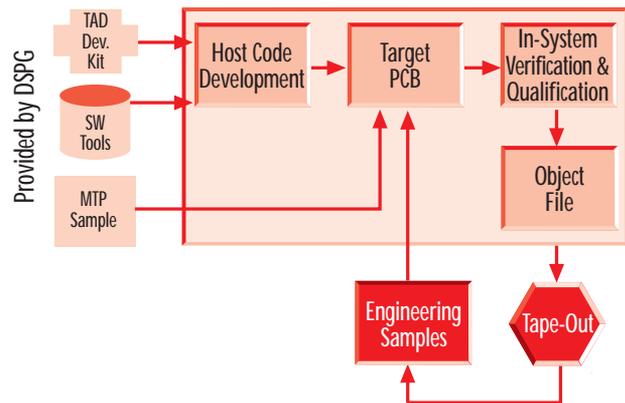
## Feature Phone Applications

The D16000 Family is a cost-effective platform for Feature Phones with single ICs offering Full Duplex SpeakerPhone, Natural Voice Prompt, Caller ID (CID) and Voice Recognition options.

## Programming The Internal Host Controller

The D16000 Family provides a user-friendly and effective development environment enabling the programming of the internal Host Controller to ensure a product's critical fast time to market. DSP Group also offers reference design programs which can be used as main kernels for users' applications.

## D16000 Host Software Development Flow



DSP Group offers a unified line of development tools which provides for the flawless development and debugging of users' defined applications. Running under Windows with a friendly GUI, the Software Development Tools (SDT) include:

- Assembler
- Linker
- Debugger
- C Compiler

# D16000 System-On-Chip Family

## Product Range

### THE D16000 FAMILY RANGE OF PRODUCTS

#### SUPERIOR QUALITY TRUESPEECH® TRIPLE RATE CODER™

P/N	Host	Message Memory	CODEC	Internal RAM/ROM For User [Word]	VP (Typ/Max) [Sec]	Features
D16529	Internal	Flash	1 <sup>(1)</sup>	480/24K	Ext. Flash	CID option
D16559	Internal	Flash	2 <sup>(1)</sup>	480/32K	Ext. Flash	CID option FDSP
D16521	External	Flash	1	N/A	Ext. Flash	CID option
D16551	External	Flash	2	N/A	Ext. Flash	CID option FDSP
D16571	External	Flash	1	N/A	Ext. Flash	FDSP IOM-2
D16587	External	Flash	1	N/A	Ext. Flash	VR

#### HIGH QUALITY TRUESPEECH® LOW-BIT RATE CODER

P/N	Host	Message Memory	CODEC	Internal RAM/ROM For User [Word]	Internal VP (Typ/Max [Sec])	Features
D16328	Internal	ARAM	1 <sup>(1)</sup>	176/38K <sup>(2)</sup>	34/56 <sup>(3)</sup>	CID option
D16358	Internal	ARAM	2 <sup>(1)</sup>	176/38K <sup>(2)</sup>	34/56 <sup>(3)</sup>	CID option FDSP
D16329	Internal	Flash	1 <sup>(1)</sup>	500/12K	Ext. Flash	CID option
D16359	Internal	Flash	2 <sup>(1)</sup>	500/12K	Ext. Flash	CID option FDSP
D16321	External	Flash	1	N/A	Ext. Flash	CID
D16351	External	Flash	2	N/A	Ext. Flash	CID FDSP
D16325	External	ARAM	1	for VP only	80	CID
D16355	External	ARAM	2	for VP only	80	CID FDSP
D16308	Internal	ARAM	1	N/A	Fixed	Fixed Functions

<sup>(1)</sup> optional additional 1/2 CODEC

<sup>(2)</sup> including internal Voice Prompt

<sup>(3)</sup> standard Voice Prompt is 34 sec. – option up to 56 sec.



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