

DSPG5000

January 1990, Rev 1.3

**A Family of Chip Sets for Cellular Phones**

FUNCTIONS PROVIDED BY THE DSPG5000 FAMILY**Baseband Audio Processing for
AMPS/TACS/NMT****Supervisory Audio Tone (SAT)
Processing****Acoustical Echo Cancellation****Voice Dialing****Noise Reduction****Digital Answering Machine****DTMF Generation****Voice Memo Pad****BENEFITS OF DSP TECHNOLOGIES FOR CELLULAR TELEPHONES****RELIABILITY**

- Higher product reliability increases user acceptance and brand recognition
- Lower incidence of repair reduces warranty costs

CLEAR RECEPTION

- Stable performance over time and a wide temperature range
- Improved noise immunity

LOWER COST

- Eliminates adjustment circuitry, reducing manufacturing costs
- Higher manufacturing yield
- Low component count

DOWNSIZING / LOW POWER

- Low component count reduces product size and power consumption.

FAST DESIGN CYCLE

- Upgrades are quickly implemented in software
- Modular design provides easy expendability

**SMOOTH MIGRATION FROM ANALOG TO
DIGITAL CELLULAR**

- Solutions for the GSM European standard and the American Digital Standard (EIA IS-54) are in development
- Same hardware implements digital and analog standard thus delivering a cost effective "Dual Mode" Cellular phone

DSPG5000 FAMILY**SPECIFICATIONS****ACOUSTICAL ECHO CANCELLATION:****Echo Residual Loss Enhancement (ERLE):**

- For White Gaussian noise: 27 dB below echo level
- For 1 KHz sine wave: 33 dB below echo level

Convergence Time:

- 1.5 sec on White Gaussian
- 0.5 sec on 1 KHz sine wave

Dynamic range

- The above specifications apply to echoes in dynamic range of 30 dB

Bandwidth

- 300 Hz — 3200 Hz

NOISE REDUCTION:

- SNR improvement >5dB @ 10dB SNR
- SNR improvement >7dB @ 5dB SNR

BASEBAND AUDIO PROCESING:**Meets AMPS/TACS/NMT specifications:**

- Bandpass filters
- Syllabic companding
- Pre-emphasis and de-emphasis
- Limiter and post limiter filter
- SAT decoding and transponding

DTMF Generation

- Generated DTMF tone conforms to EIA standard RS-470

VOICE DIALING:**Speaker Dependent Voice Recognition**

- Typical recognition rate is higher than 97% in hands free mode and higher than 99% in handset mode
- Robust to car environment noises
- Vocabulary:
 - 10 Digits
 - 10 Control Words
 - 10 User Defined Phrases

Speech Synthesis

- High quality LPC-12 synthesis
- Up to 60 words, exact vocabulary can be customized to vendor needs

MEMO PAD / DIGITAL ANSWERING MACHINE:**Incoming Message Voice Storage**

- High quality speech compression in ARAM at 11.5 Kbits/sec
- 90 seconds of voice storage per 1 MBIT ARAM
- Shared memory for incoming/outgoing messages

Outgoing greeting Voice Storage

- Compressed voice in ARAM
- Flexible length of messages

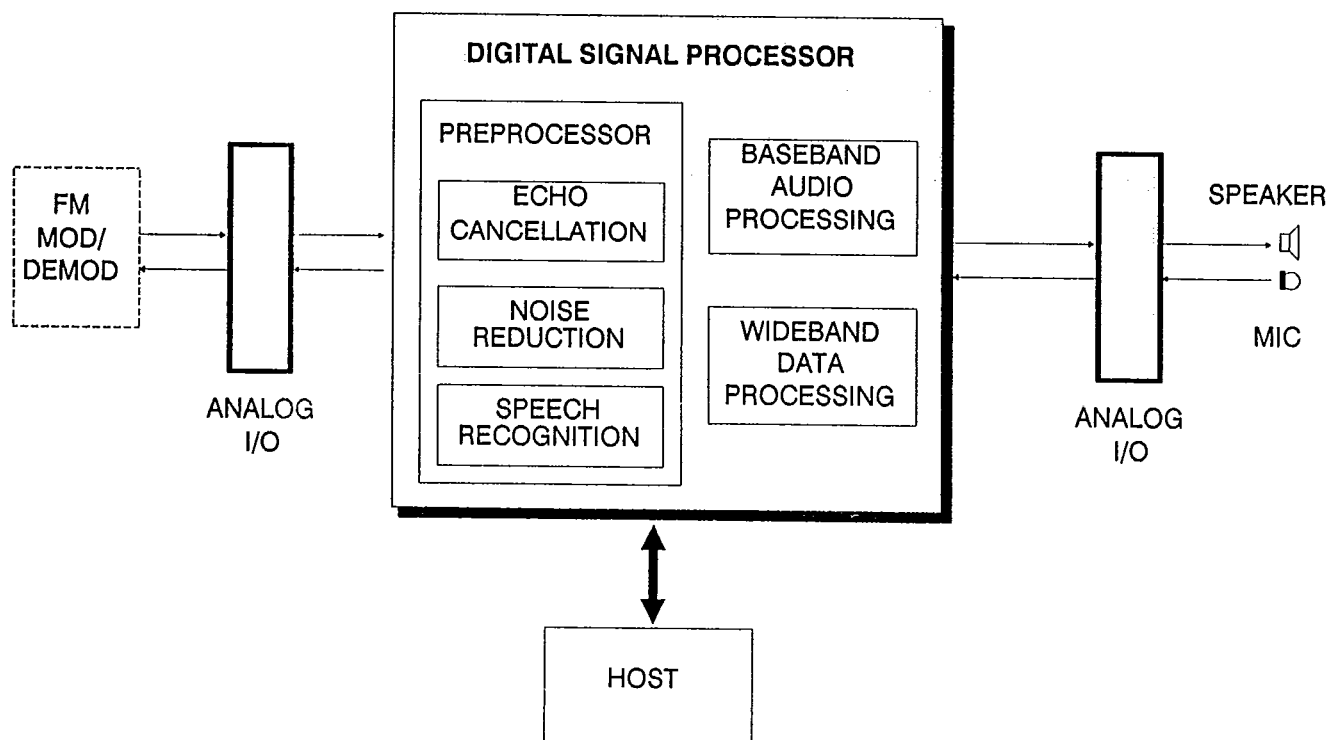
Note: Specifications are subject to change without prior notice.



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DSPG5000 FAMILY OVERVIEW

PART	FUNCTION	HARDWARE	NOTES
5001	Baseband Audio Processing SAT Processing Echo Suppression DTMF Generation	DSP IC Analog I/O x2	
5001/D	Same as 5001 with wideband data processing		
5002	Acoustical Echo Cancellation Noise Reduction Baseband Audio Processing DTMF Generation	DSP IC x2 ASIC Analog I/O x2	Two 8Kx8 120nS SRAMS to be supplied by the customer
5003	Acoustical Echo Cancellation Noise Reduction	DSP IC ASIC Analog I/O x2	Two 8Kx8 120nS SRAMS to be supplied by the customer
5004	Acoustical Echo Cancellation	DSP IC ASIC Analog I/O x2	One 8Kx8 120nS SRAM to be supplied by the customer
5004L	Acoustical Echo Cancellation Low Cost	DSP IC Analog I/O x2	
5005	Acoustical Echo Cancellation Baseband Audio Processing SAT Processing DTMF Generation	DSP IC ASIC Analog I/O x2	Two 8Kx8 120nS SRAMS to be supplied by the customer
5005/D	Same as 5005 with wideband data processing		
5006	Voice Recognition/Response	DSP IC ASIC Analog I/O	32Kx8 , 8Kx8 SRAM to be supplied by the customer
5007	Digital Memo Pad/ Answering Machine	DSP IC ASIC Analog I/O ARAM (1-Mbit)	8Kx8 SRAM, 1-16 ARAMs to be supplied by the customer

DSPG5000 FAMILY**DSPG5000 Family Typical Application**