FAX Solution Card

National Semiconductor
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SYSTEM DESCRIPTION

A facsimile (FAX) machine enables a reliable and easy to use medium of transferring images through a telephone line. Transmission and reception standards are defined by the CCITT. Most of today's FAX machines are implemented in accordance with group 3 definition. Group 4 defines FAX machines that work with the ISDN protocol.

A traditional approach towards the implementation of the electronics of a FAX machine requires a microcontroller to control the different activities, a dedicated modem chip, memory chips, and other glue-logic and analog devices.

Today an innovative approach towards FAX machine implementation, the NSFAX is available. Utilizing advanced embedded processors that can perform the computation, control, and modem tasks, these advanced processors have the Digital Signal Processing (DSP) capabilities to perform the complex task of a software modem. A highly-integrated Analog Front-End (AFE), provides the analog/digital interface. By going a step further and providing all of the modem software, this is virtually supplying a turn-key solution for FAX machines.

The advantage of using software to implement a FAX allows the manufacturer to easily differentiate his product from others in the market place. In-fact, the same system architecture may be employed to add to the system data modem and voice mail capabilities. The power, flexibility, and the large linear addressing space of the 32-bit processor allow implementation of the FAX application code to be written in High Level Language (HLL). Even time-critical portions of the DSP code are written in C. This boosts immensely programmers' productivity and cuts time-to-market of new products.

DESIGN CHALLENGES

- Component Count

  Reduce component count
- High Silicon Utilization

  Same hardware platform can perform several tasks: Group 3 FAX, data modem, voice mail, Postscript™ interpreter, non-impact printer controller, and more.
- Modular Software Approach

  Allows use of proven building blocks from software libraries. Reusable modules. Easy adaptation to evolving standards. Allows for future product upgrades. Easy integration of proprietary features.
- Time-to-Market

  Shorten time-to-market of new products.

KEY COMPONENTS

NS32FX16 or NS32GX320	CPU Function with DSP
NS32FX210	AFE Function
EEPROM	Store Speed Dialing and Reports
EPROM	Program Storage
SRAM/DRAM	Working Space and Data Buffers
DAA	Telephone Line Interface
Printer	Thermal, Inkjet, or Laser
Scanner	Contact/CCD Image Sensor

Bill of Material of Major Components for Group 3 FAX Machine

Function	Description	NSC Part	Other Mfg	Qty
CPU	Embedded Processor	NS32FX16		1
AFE	Analog Front-End	NS32FX210		1
RTC	Real Time Clock	NS32FX211		1
Memory				
EPROM	256K Bytes	NMC27C010		2
EEPROM	4096 Bytes	NMC93C66		1
SRAM	16K Byte		6264-15	2
Logic				
System ASIC	Interface	(Note 1)		1

Note 1: The system ASIC design is available from National, or may be designed using National's ASIC capabilities.

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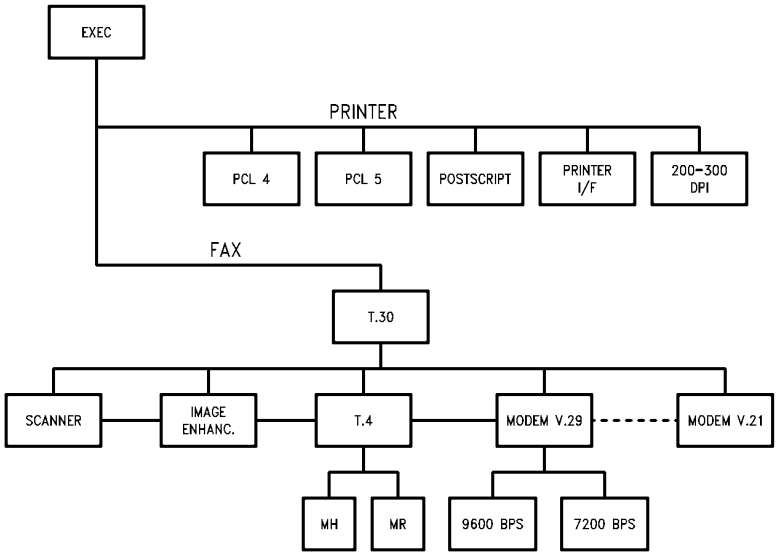
FAX and Printer Software



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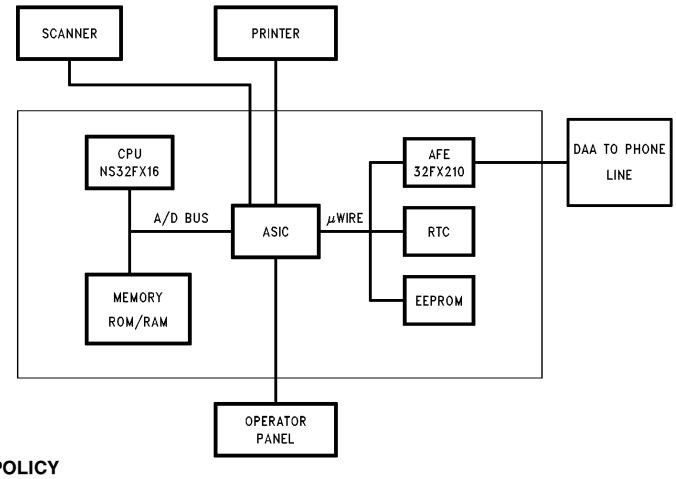

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