

# MN195001

## Single-Chip Fax Engine LSI

### ■ Overview

The MN195001 reduces to a single chip CPU functions related to facsimile control, peripheral device control functions, and modem functions. The last include complete fax/modem support for the ITU-T G3 recommendations V.29, V.27ter, and V.21 Channels 1 and 2.

The MN195001 consists of the following blocks: digital signal processor (DSP), facsimile peripheral circuits, analog circuits, DTE interface, clock generator, and dual-port RAM. Changing the contents of an external ROM tailors the chip for a wide variety of facsimile applications.

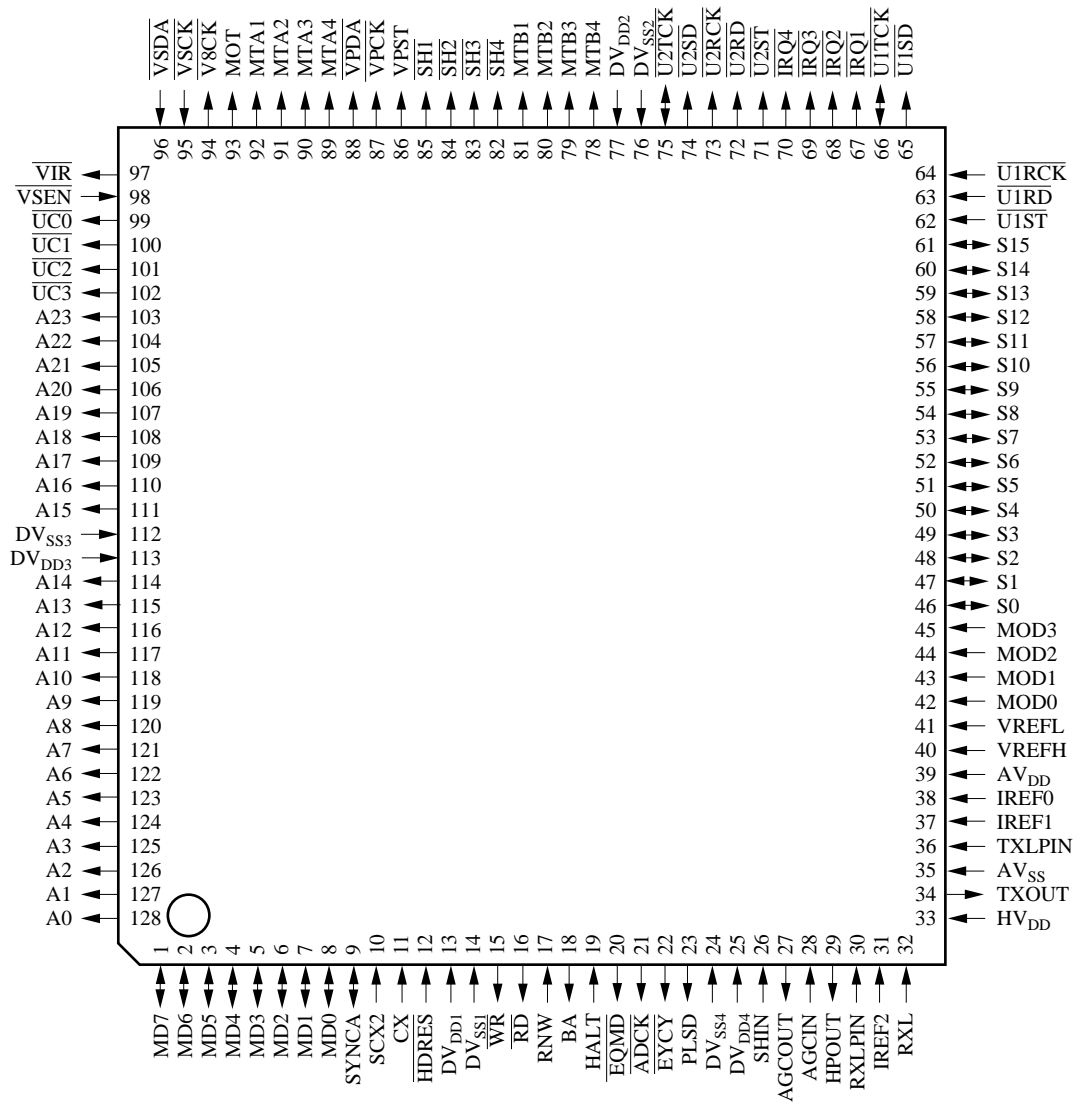
### ■ Features

- Digital signal processor (DSP) block
  - Micro ROM:  $4096 \times 32$  bits
  - Data RAM:  $512 \times 16$  bits  $\times 2$  sets
  - Machine cycle: 90 ns
  - Parallel multiplier:
    - $16 \text{ bits} \times 16 \text{ bits} \times \rightarrow 32 \text{ bits}$
  - Arithmetic and logic unit (ALU): 32-bit
- Facsimile peripheral circuit block
  - Scanner/plotter interface
  - Two USART channels
  - Two motor control channels
  - One thermal head control channel
  - Programmable chip select
- Analog circuit block
  - Built-in 8-bit D/A converter, A/D converter, and filters
- DTE interface block
  - Built-in 8-bit I/O interface and serial interface
- Clock generator block
  - Sampling clock and baud rate clock generators
- Dual-port RAM block
  - $1024 \times 8$  bits
- Single 5 volt power supply

### ■ Applications

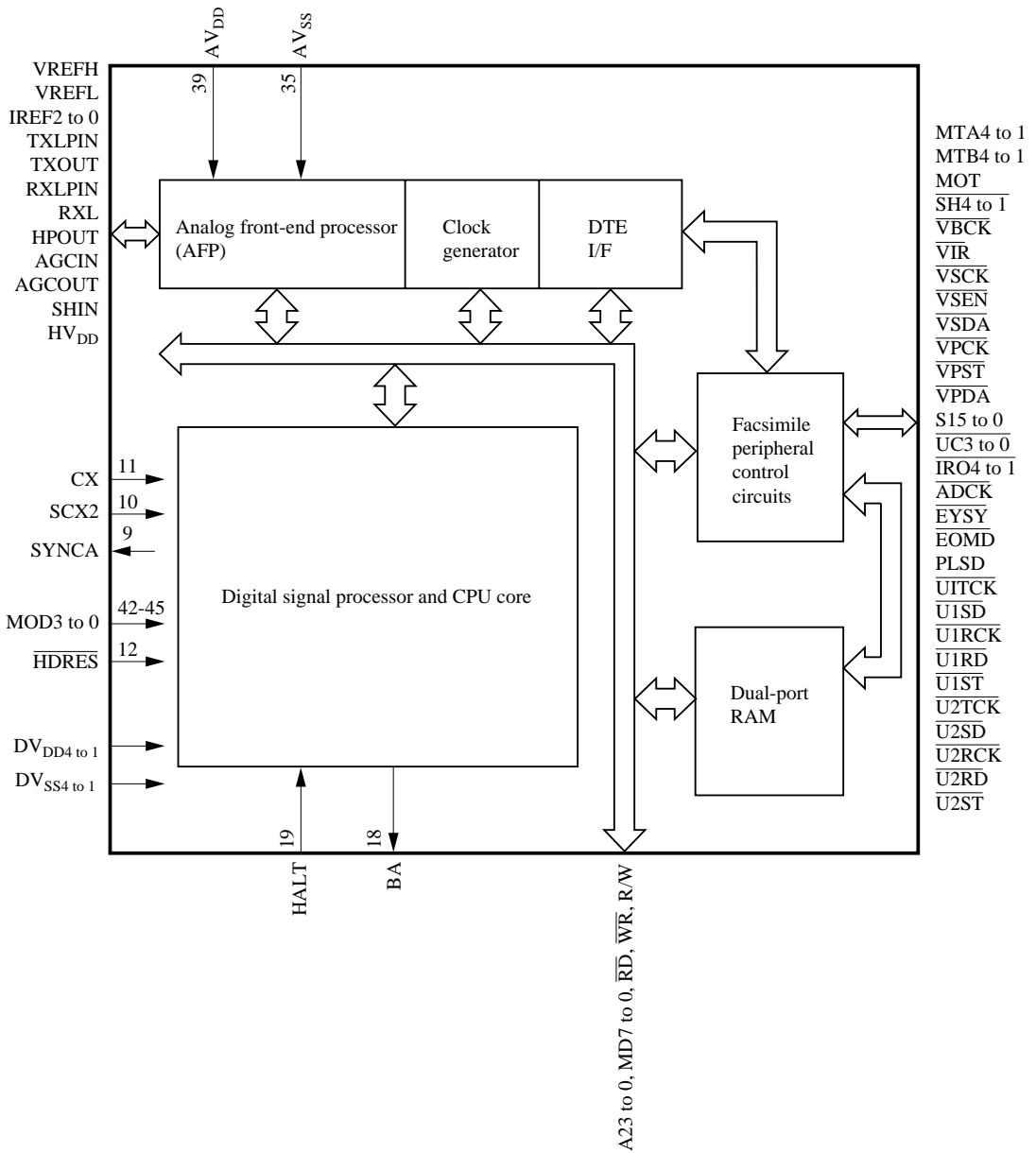
- Facsimile equipment

■ Pin Assignment



QFH128-P-1818

■ Block Diagram



### ■ Pin Descriptions

Functional Group	Symbol	Pin No.	I/O	Function Description
Memory Interface	A0 to 23	128 to 114, 111 to 103	O	External memory address bus
	MD0 to 7	8 to 1	I/O	External memory data bus
	$\overline{\text{RD}}$	16	O	External memory read signal
	$\overline{\text{WR}}$	15	O	External memory write signal
	R/W	17	I	External memory read/write control
Control Interface	CX	11	I	Basic clock input
	SCX2	10	I	Basic clock frequency selection
	SYNCA	9	O	System clock output
	$\overline{\text{HDRES}}$	12	I	Reset signal
	MOD0 to 3	42 to 45	I	Mode setting inputs
	HALT	19	I	HALT signal for internal digital signal processor
Analog Interface	BA	18	O	External memory bus available signal
	IREF0	38	AI	D/A converter input
	IREF1	37	AI	Reference voltage for transmit circuits
	TXLPIN	36	AI	Transmit low-pass filter input
	TXOUT	34	AO	Analog transmit signal output
	RXL	32	AI	Analog receive signal input
	IREF2	31	AI	Reference voltage for receive circuit
	RXLPIN	30	AI	Receive low-pass filter input
	HPOUT	29	AO	Receive high-pass filter output
	AGCIN	28	AI	Receive automatic gain control input
	AGCOUT	27	AO	Receive automatic gain control output
	SHIN	26	AI	A/D converter sample-and-hold circuit input
	VREFH	40	AI	A/D converter reference "H" level
	VREFL	41	AI	A/D converter reference "L" level
	PLSD	23	O	External amplifier gain control signal
Fax control Signals	SO to 15	46 to 61	I/O	General-purpose I/O port
	$\overline{\text{UC0 to 3}}$	99 to 102	O	Programmable chip select
	$\overline{\text{IRO1 to 4}}$	67 to 70	I	External interrupts
	$\overline{\text{U1ST}}$	62	I	USART (CH1) external synchronization clock
	$\overline{\text{U1RD}}$	63	I	USART (CH1) receive data
	$\overline{\text{U1RCK}}$	64	I	USART (CH1) receive clock
	$\overline{\text{U1SD}}$	65	O	USART (CH1) transmit data
	$\overline{\text{U1TCK}}$	66	I/O	USART (CH1) transmit clock
	$\overline{\text{U2ST}}$	71	I	USART (CH2) external synchronization clock
	$\overline{\text{U2RD}}$	72	I	USART (CH2) receive data
	$\overline{\text{U2RCK}}$	73	I	USART (CH2) receive clock
	$\overline{\text{U2SD}}$	74	O	USART (CH2) transmit data
	$\overline{\text{U2TCK}}$	75	I/O	USART (CH2) transmit clock
	$\overline{\text{SH1 to 4}}$	85 to 82	O	Thermal head control signals
	MTA1 to 4	92 to 89	O	Motor A control signals

■ Pin Descriptions (continued)

Functional Group	Symbol	Pin No.	I/O	Function Description
Fax Control Signals	MTB1 to 4	81 to 78	O	Motor B control signals
	MOT	93	O	Motor synchronization signal
	$\overline{\text{VPST}}$	86	O	Plotter data clock
	$\overline{\text{VPCK}}$	87	O	Plotter synchronization burst clock
	$\overline{\text{VPDA}}$	88	O	Plotter data
	$\overline{\text{V8CK}}$	94	O	Scanner clock
	$\overline{\text{VSCK}}$	95	I	Scanner data input clock
	VSDA	96	I	Scanner data
	$\overline{\text{VIR}}$	97	O	Scanner input ready
	$\overline{\text{VSEN}}$	98	I	Scanner data input enable
EYE I/F	$\overline{\text{ADCK}}$	21	O	Eye pattern data clock
	$\overline{\text{EYSY}}$	22	O	Eye pattern data synchronization signal
	$\overline{\text{EQMD}}$	20	O	Eye pattern data
Power Supply Interface	DV <sub>DD1 to 4</sub>	13, 77, 114, 25	DP	Power supply for digital circuits +5 V
	DV <sub>SS1 to 4</sub>	14, 76, 112, 24	DP	Power supply for digital circuits GND
	AV <sub>DD</sub>	39	AP	Power supply for analog circuits +5 V
	AV <sub>SS</sub>	35	AP	Power supply for analog circuits GND
	HV <sub>DD</sub>	33	AO	HVDD output

■ Package Dimensions (Unit: mm)

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