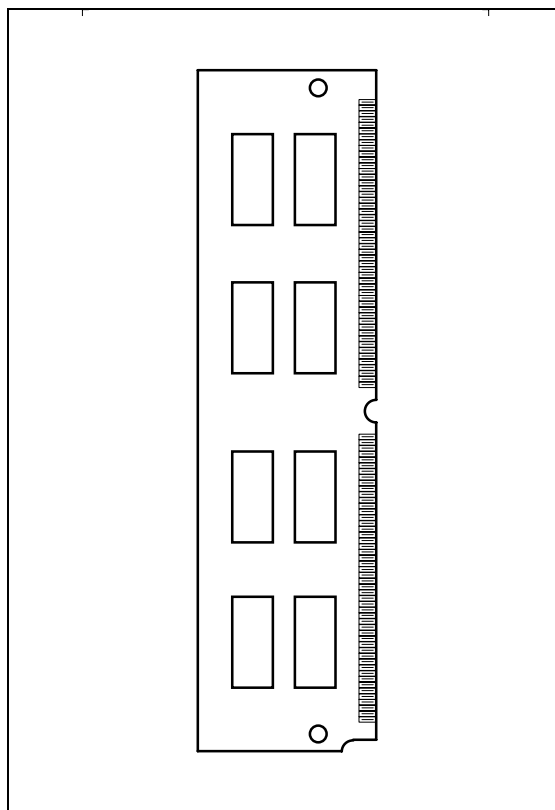


- 80 PINS JEDEC 21-C package
- FAST ACCESS TIME: 90ns
- 5V ± 10% single power supply operation
- BYTE PROGRAMMING TIME: 10µs typical
- ERASE TIME
  - Sector: 1.0 sec typical
  - Bulk: 32 sec typical
- PROGRAM/ERASE CONTROLLER (P/E.C.)
  - Program Byte-by-Byte
  - Data Polling and Toggle Protocol for P/E.C. Status
- MEMORY ERASE in SECTORS
  - 32 Sectors of 64K Bytes each
  - Sector Protection
  - Multisector Erase
- ERASE SUSPEND and RESUME MODES
- 100,000 PROGRAM/ERASE CYCLES per SECTOR
- DEPOPULATED VERSIONS AVAILABLE:
  - 16 Mbyte => **GSF16-8x16/90**
  - 8 Mbyte => **GSF8-4x16/90**



**Table 1. Signal Names**

A0-A20	Address Inputs
DQ0-DQ31	Data Input / Outputs
CE0-CE3	Chip Enable
OE	Output Enable
WE0-WE3	Write Enable
$\overline{\text{PD1-PD4}}$	Presence & Module Type Detect
$\overline{\text{PD5-PD7}}$	Module Speed Detect
VCC-VSS	Power Supply - Ground

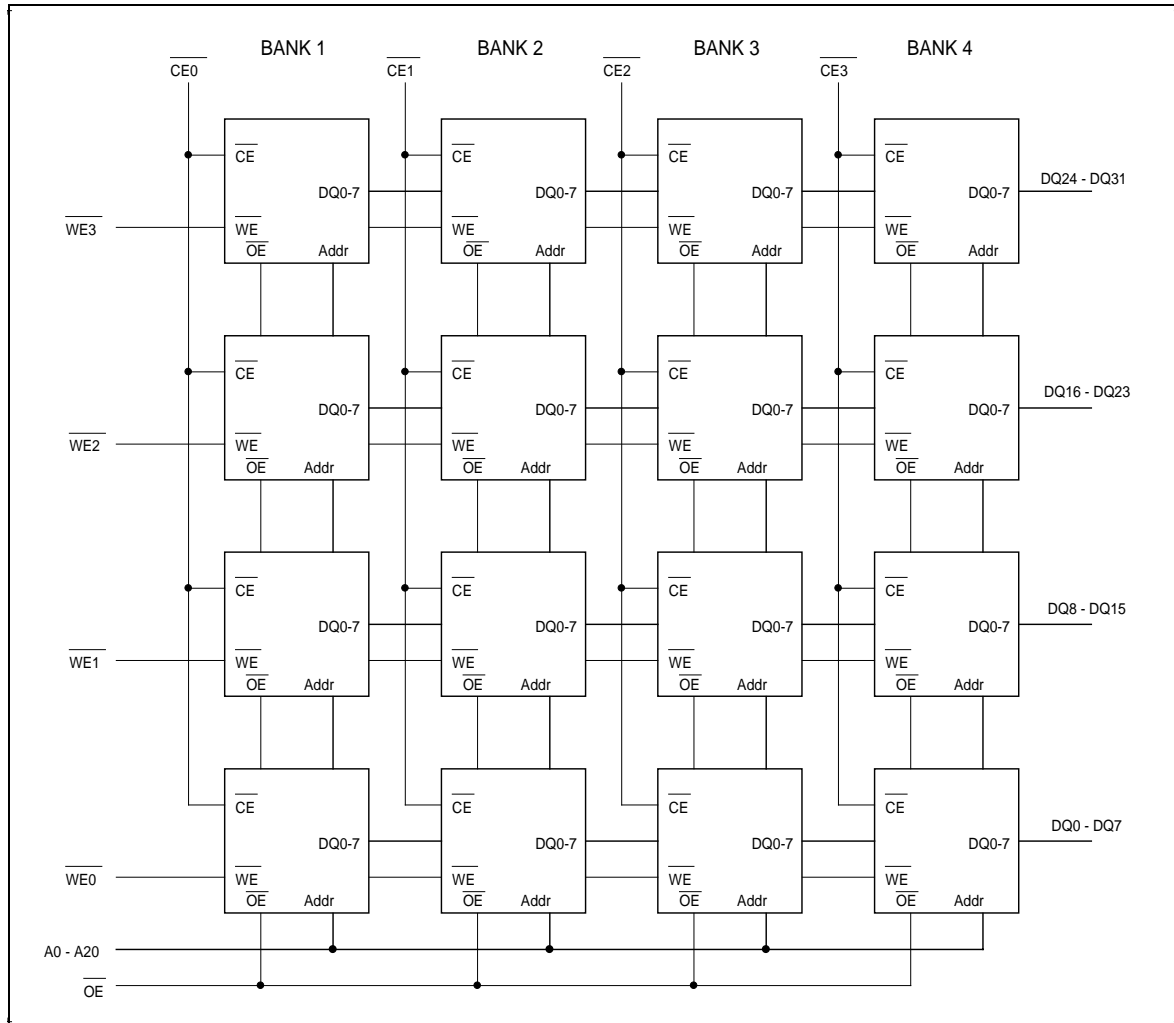
### DESCRIPTION

The GSF32-16x16/90 is a 32 Mbyte SIMM memory module built around 16 x 29F016 FLASH memory chips (please see relevant data sheet for all detailed informations about the chip performances). The devices are mounted on a Jedec 21-C standardized SIMM printed circuit.

### Organisation

Figure 1 shows the block diagram. The FLASH module is organized as 16 x 2M x 8 bits with address lines A0-A20 and Data Inputs/Outputs DQ0 to 7, DQ8 to 15, DQ16 to 23 and DQ24 to 31. Memory control is provided by 4 Chip Enable (CE0,

Fig. 1. Block diagram



1,2,3) inputs used to address the 4 memory banks and by 4 Write Enable inputs used to select through the four DQ0-7, DQ8-15, DQ16-23, DQ24-31 groups. An Output Enable input is used to read the stored data.

Erase and Program Functions are performed through the internal Program/Erase Controller (P/E.C.).

**Configuration & speed pins**

PD1-PD4 pins are used by the SIMM module to inform the motherboard about its relevant configuration while PD5 to PD7 are used to inform about the speed of the chips used.

As the module allocates 32Mbyte memory, using 90 ns chips, configuration is the following:

PD1 : Vss PD2 : Vss PD3 : Vss PD4 : Vss  
 PD5 : Vss PD6 : Vss PD7 : Vss

**OTHER CONFIGURATIONS**

The 32 Mbyte module can be also depopulated in order to achieve 16 M and 8 Mbyte configurations. Part numbers are as follows:

16MByte : **GSF16-8x16/70**

8 Mbyte : **GSF8-4x16/90**

Depopulation consists in removing banks 3 and 4 to achieve the 16 M and also bank 2 to achieve the 8 Mbyte configuration. Configuration pins PD1 to PD4 becomes as follows:

**16 MByte:**

PD1 : Open PD2 : Vss PD3 : Vss PD4 : Vss

**8 Mbyte:**

PD1 : Vss PD2 : Open PD3 : Vss PD4 : Vss

Figure 2. Mechanical dimensions

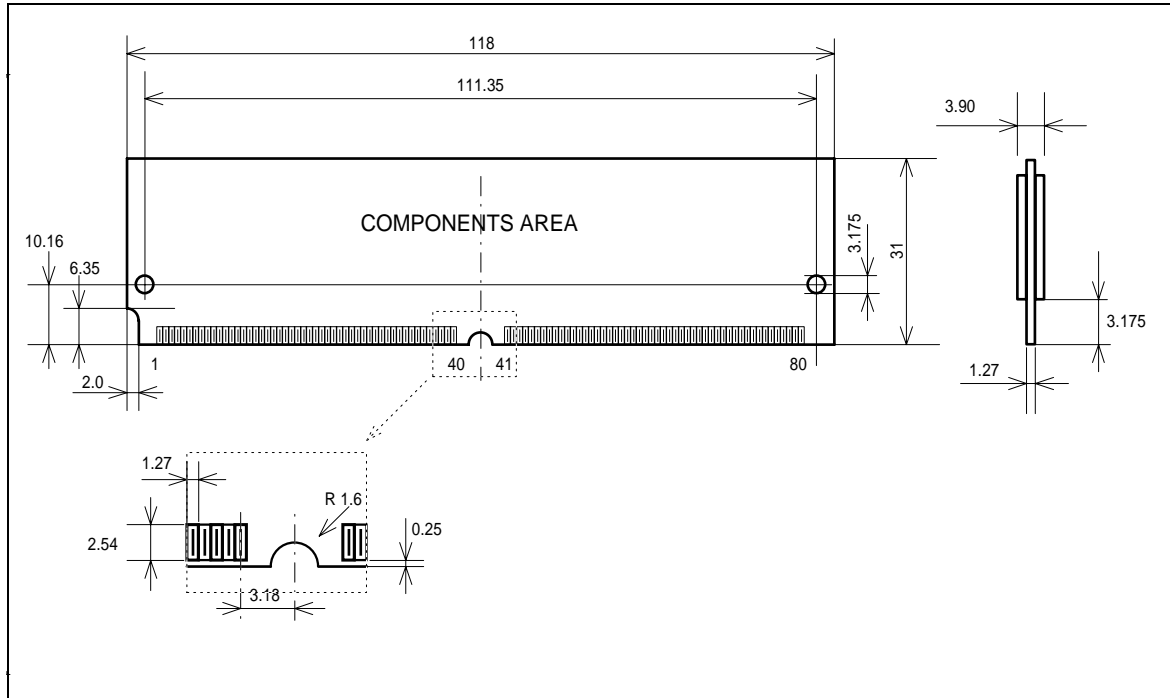


Table 1. Pin configuration

Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	VSS	21	CE3	41	A11	61	DQ9
2	VCC	22	CE2	42	A10	62	DQ8
3	Pin 71	23	CE1	43	A9	63	DQ7
4	OE	24	CE0	44	A8	64	DQ6
5	WE0	25	VSS	45	A7	65	DQ5
6	WE1	26	DQ29	46	A6	66	DQ4
7	NC	27	DQ30	47	A5	67	DQ3
8	DQ16	28	DQ31	48	A4	68	DQ2
9	DQ17	29	WE2	49	A3	69	DQ1
10	DQ18	30	NC	50	A2	70	DQ0
11	DQ19	31	NC	51	A1	71	Pin 3
12	DQ20	32	A20	52	A0	72	VCC
13	DQ21	33	A19	53	WE3	73	PD1
14	DQ22	34	A18	54	VSS	74	PD2
15	DQ23	35	A17	55	DQ15	75	PD3
16	DQ24	36	A16	56	DQ14	76	PD4
17	DQ25	37	A15	57	DQ13	77	PD5
18	DQ26	38	A14	58	DQ12	78	PD6
19	DQ27	39	A13	59	DQ11	79	PD7
20	DQ28	40	A12	60	DQ10	80	VSS

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