

1,048,576 WORD X 32 BIT (EDO) DYNAMIC RAM MODULE

Description

The THM3210B5BS/BSG is a 1,048,576 words by 32 bits dynamic RAM module which assembled 2 pcs of TC5118165BJ on the printed circuit board. This module is optimized for application to the systems which are required high density and large capacity such as main memory of the computers and as image memory systems, and to the others which are requested compact size.

Features

- 1,048,576 word by 32 bit organization
- Fast access time and cycle time
- Single power supply of 5V±5%
- Low Power
 - 1,890mW MAX. Operating (THMxxxxxx-60)
 - 1,575mW MAX. Operating (THMxxxxxx-70)
 - 10.5mW MAX. Standby
- CAS before RAS refresh, RAS-only refresh, Hidden refresh and Hyper Page Mode (EDO) capability
- All inputs and outputs TTL compatible
- 1024 refresh cycles/16ms
- Package
 - THM3210B5BS - xx: 2nd Gen. 72pin SIMM (Tin-Lead Contact)
 - THM3210B5BSG - xx: 2nd Gen. 72pin SIMM (Gold Contact)

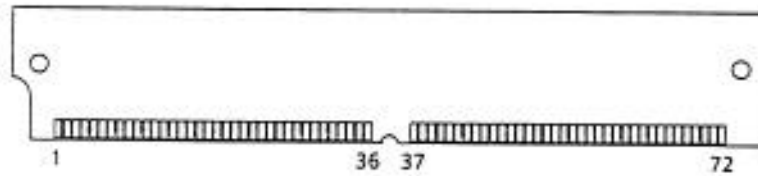
Key Parameters

Item	THM3210B5BS/BSG	
	-60	-70
t _{RAC} $\overline{\text{RAS}}$ Access Time	60ns	70ns
t _{AA} Column Address Access Time	30ns	35ns
t _{CAC} $\overline{\text{CAS}}$ Access Time	15ns	20ns
t _{RC} Cycle Time	104ns	124ns
t _{HPC} Hyper Page Mode Cycle Time	25ns	30ns

Pin Name

A0-A9	Address
DQ0-DQ31	Data Input/Output
$\overline{\text{CAS0}}-\overline{\text{CAS3}}$	Column Address Strobe
$\overline{\text{RAS0}}, \overline{\text{RAS2}}$	Row Address Strobe
$\overline{\text{W}}$	Read/Write Input
V _{CC}	Power (+5V)
V _{SS}	Ground
PD	Presence Detect Pin
NC	No Connection

Pin Connection



1	V _{SS}	10	V _{CC}	19	NC	28	A7	37	NC	46	NC	55	DQ11	64	DQ31			
2	DQ0	11	NC	20	DQ4	29	NC	38	NC	47	$\overline{\text{W}}$	56	DQ27	65	DQ15			
3	DQ16	12	A0	21	DQ20	30	V _{CC}	39	V _{SS}	48	NC	57	DQ12	66	NC			
4	DQ1	13	A1	22	DQ5	31	A8	40	$\overline{\text{CAS0}}$	49	DQ8	58	DQ28	67	PD0			
5	DQ17	14	A2	23	DQ21	32	A9	41	$\overline{\text{CAS2}}$	50	DQ24	59	V _{CC}	68	PD1			
6	DQ2	15	A3	24	DQ6	33	NC	42	$\overline{\text{CAS3}}$	51	DQ9	60	DQ29	69	PD2	PD0	-60	-70
7	DQ18	16	A4	25	DQ22	34	$\overline{\text{RAS2}}$	43	$\overline{\text{CAS1}}$	52	DQ25	61	DQ13	70	PD3	PD1	V _{SS}	V _{SS}
8	DQ3	17	A5	26	DQ7	35	NC	44	$\overline{\text{RAS0}}$	53	DQ10	62	DQ30	71	NC	PD2	NC	V _{SS}
9	DQ19	18	A6	27	DQ23	36	NC	45	NC	54	DQ26	63	DQ14	72	V _{SS}	PD3	NC	NC

2,097,152 WORD X 32 BIT (EDO) DYNAMIC RAM MODULE

Description

The THM3220B5BS/BSG is a 2,097,152 words by 32 bits dynamic RAM module which assembled 4 pcs of TC5118165BJ on the printed circuit board. This module is optimized for application to the systems which are required high density and large capacity such as main memory of the computers and as image memory systems, and to the others which are requested compact size.

Features

- 2,097,152 word by 32 bit organization
- Fast access time and cycle time
- Single power supply of 5V±5%
- Low Power
 - 1,911mW MAX. Operating (THMxxxxxx-60)
 - 1,596mW MAX. Operating (THMxxxxxx-70)
 - 21mW MAX. Standby
- CAS before RAS refresh, $\overline{\text{RAS}}$ -only refresh, Hidden refresh and Hyper Page Mode (EDO) capability
- All inputs and outputs TTL compatible
- 1024 refresh cycles/16ms
- Package
 - THM3220B5BS - xx: 2nd Gen. 72pin SIMM (Tin-Lead Contact)
 - THM3220B5BSG - xx: 2nd Gen. 72pin SIMM (Gold Contact)

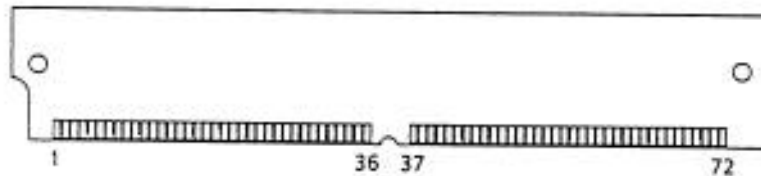
Key Parameters

Item	THM3220B5BS/BSG	
	-60	-70
t_{RAC} $\overline{\text{RAS}}$ Access Time	60ns	70ns
t_{AA} Column Address Access Time	30ns	35ns
t_{CAC} $\overline{\text{CAS}}$ Access Time	15ns	20ns
t_{RC} Cycle Time	104ns	124ns
t_{HPC} Hyper Page Mode Cycle Time	25ns	30ns

Pin Name

A0-A9	Address
DQ0-DQ31	Data Input/Output
$\overline{\text{CAS0}}-\overline{\text{CAS3}}$	Column Address Strobe
$\overline{\text{RAS0}}-\overline{\text{RAS3}}$	Row Address Strobe
$\overline{\text{W}}$	Read/Write Input
V_{CC}	Power (+5V)
V_{SS}	Ground
PD	Presence Detect Pin
NC	No Connection

Pin Connection



1	V_{SS}	10	V_{CC}	19	NC	28	A7	37	NC	46	NC	55	DQ11	64	DQ31			
2	DQ0	11	NC	20	DQ4	29	NC	38	NC	47	$\overline{\text{W}}$	56	DQ27	65	DQ15			
3	DQ16	12	A0	21	DQ20	30	V_{CC}	39	V_{SS}	48	NC	57	DQ12	66	NC			
4	DQ1	13	A1	22	DQ5	31	A8	40	$\overline{\text{CAS0}}$	49	DQ8	58	DQ28	67	PD0			
5	DQ17	14	A2	23	DQ21	32	A9	41	$\overline{\text{CAS2}}$	50	DQ24	59	V_{CC}	68	PD1			
6	DQ2	15	A3	24	DQ6	33	$\overline{\text{RAS3}}$	42	$\overline{\text{CAS3}}$	51	DQ9	60	DQ29	69	PD2		-60	-70
7	DQ18	16	A4	25	DQ22	34	$\overline{\text{RAS2}}$	43	$\overline{\text{CAS1}}$	52	DQ25	61	DQ13	70	PD3	PD0	NC	NC
8	DQ3	17	A5	26	DQ7	35	NC	44	$\overline{\text{RAS0}}$	53	DQ10	62	DQ30	71	NC	PD1	NC	NC
9	DQ19	18	A6	27	DQ23	36	NC	45	$\overline{\text{RAS1}}$	54	DQ26	63	DQ14	72	V_{SS}	PD2	NC	V_{SS}
																PD3	NC	NC

4,194,304 WORD X 32 BIT (EDO) DYNAMIC RAM MODULE

Description

The THM324005BS/BSG is a 4,194,304 words by 32 bits dynamic RAM module which assembled 8 pcs of TC5117405BSJ on the printed circuit board. This module is optimized for application to the systems which are required high density and large capacity such as main memory of the computers and as image memory systems, and to the others which are requested compact size.

Features

- 4,194,304 word by 32 bit organization
- Fast access time and cycle time
- Single power supply of 5V±5%
- Low Power
 - 4,620mW MAX. Operating (THMxxxxxx-60)
 - 3,990mW MAX. Operating (THMxxxxxx-70)
 - 42mW MAX. Standby
- CAS before RAS refresh, $\overline{\text{RAS}}$ -only refresh, Hidden refresh and Hyper Page Mode (EDO) and Test Mode capability
- All inputs and outputs TTL compatible
- 2,048 refresh cycles/32ms
- Package
 - THM324005BS - xx: 2nd Gen. 72pin SIMM (Tin-Lead Contact)
 - THM324005BSG - xx: 2nd Gen. 72pin SIMM (Gold Contact)

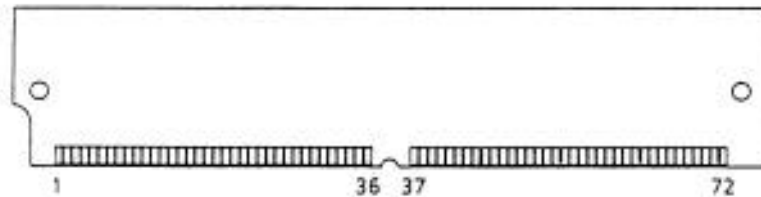
Key Parameters

Item	THM324005BS/BSG	
	-60	-70
t_{RAC} $\overline{\text{RAS}}$ Access Time	60ns	70ns
t_{AA} Column Address Access Time	30ns	35ns
t_{CAC} $\overline{\text{CAS}}$ Access Time	15ns	20ns
t_{RC} Cycle Time	104ns	124ns
t_{HPC} Hyper Page Mode Cycle Time	25ns	30ns

Pin Name

A0-A9	Address
DQ0-DQ31	Data Input/Output
$\overline{\text{CAS0}}-\overline{\text{CAS3}}$	Column Address Strobe
$\overline{\text{RAS0}}, \overline{\text{RAS2}}$	Row Address Strobe
$\overline{\text{W}}$	Read/Write Input
V_{CC}	Power (+5V)
V_{SS}	Ground
PD	Presence Detect Pin
NC	No Connection

Pin Connection



1	V_{SS}	10	V_{CC}	19	A10	28	A7	37	NC	46	NC	55	DQ11	64	DQ31
2	DQ0	11	NC	20	DQ4	29	NC	38	NC	47	$\overline{\text{W}}$	56	DQ27	65	DQ15
3	DQ16	12	A0	21	DQ20	30	V_{CC}	39	V_{SS}	48	NC	57	DQ12	66	NC
4	DQ1	13	A1	22	DQ5	31	A8	40	$\overline{\text{CAS0}}$	49	DQ8	58	DQ28	67	PD0
5	DQ17	14	A2	23	DQ21	32	A9	41	$\overline{\text{CAS2}}$	50	DQ24	59	V_{CC}	68	PD1
6	DQ2	15	A3	24	DQ6	33	NC	42	$\overline{\text{CAS3}}$	51	DQ9	60	DQ29	69	PD2
7	DQ18	16	A4	25	DQ22	34	$\overline{\text{RAS2}}$	43	$\overline{\text{CAS1}}$	52	DQ25	61	DQ13	70	PD3
8	DQ3	17	A5	26	DQ7	35	NC	44	$\overline{\text{RAS0}}$	53	DQ10	62	DQ30	71	NC
9	DQ19	18	A6	27	DQ23	36	NC	45	NC	54	DQ26	63	DQ14	72	V_{SS}

	-60	-70
PD0	NC	NC
PD1	NC	NC
PD2	NC	V_{SS}
PD3	NC	NC