

(19) (KR)  
(12) (A)

(51) 。 Int. Cl. <sup>7</sup> (11) 2002 - 0043987  
G11C 5/02 (43) 2002 06 12

(21) 10 - 2002 - 7005087  
(22) 2002 04 19  
2002 04 19  
(86) PCT/US2001/25396 (87) WO 2002/17692  
(86) 2001 08 14 (87) 2002 02 28

(81) : , , ,  
(30) 09/645,858 2000 08 24 (US)  
(71) 94089 , 가 1267  
(72) .  
13039 8829  
. 13208 148

(74)  
:

(54)

, 가 , , (66)  
(62) (68) (62) , ,  
2 I/O (46, 54 62) ,  
(46, 54 62) (62) , (62)  
(packed) (unpacked) (28) . (68)  
(46, 54 62)

3

, , , , , I/O

" Li" 5,928,005 (self - assembled low insertion force connector assembly) , 09/461,069(1999 12 14 ); 09/461,065 (1999 12 14 ); 09/461,064 (1999 12 14 ) 09/645,859 (2000 8 24 ) ,

,  
,

가 , RAM  
가

가 ,  
가

) 가 , 가 (

, (RAM) , PC 가  
가 266Mbits , (termination)  
가

, RAMBUS , RIMM  
(RAMBUS Inline Memory Module) 3

/ , / 1RIMM  
/ 2 3RIMM 2 RIMM /

, 800Mbit 가 .

가 가 .

(dv/dt)

가 , 가 ,

( ; data - to - clock skew)

256MB 288MB RAMBUS 가 ( , ) (RIMM  
RIMM , )

, 256MB 288MB 가 RIMM  
RIMM ,

I/O

3

6

가 가 가 ), 가

( , 64 )

가 가 가 가 가 가

가,

, 2 가

가 , ,

2 I/O

(packed)

(unpacked)

가

1

2a 1

2b 2a

2c 2a

3

4a 3

4b 4a

4c 4a

5 RIMM

6

7a 3

7b 7a ,

7c 7a .

, , (bare)

1 , (3 ) (10)  
 . 2 3 , (12)

(12) RAMBUS 가 . DRCG(direct R  
 AMBUS clock generator) (14) DRAC(18; direct RAMBUS ASIC cell) (16)  
 (12) . RAMBUS (20) DRAC(18) (22) . (22)  
 (12) . RAMBUS (20) ( )  
 (12) , ( )가  
 . (22) RIMM (24)

RAMBUS (20) (26) RIMM (24) , (23) RIMM  
 (24) (28a 28b; ) . RAMBUS RAMBUS  
 (30) RIMM (24) 1RIMM (24) (12) . 가  
 RAMBUS (25) (12) 2 (31) . 2 (31) 2RIMM  
 M (35)

2RIMM (35) RAMBUS (32), (28a 28b( )), ( )  
 33) RAMBUS (34) , RAMBUS (37)  
 (34) 3 (36) , 3RAMBUS 3 (38), 3 (39), RAMB  
 US (40) RAMBUS (42) . RAMBUS (41)  
 (44) , /  
 (44) (12)

RAMBUS (44) , (22, 31, 36)  
 RIMM (24, 35 38) 가 . RIMM (24, 35, 38) (28a 28  
 b) RAMBUS , (22, 31 36)  
 . 가, " " (12)

2a, 2b 2c , 1 1RIMM (24) , . RIMM

(35 38, 1) RIMM (24) , 2a, 2b 2c  
 . (28a 28b) (24) . RAMBUS ( (23)  
 20, 1) (26) (24) (28a 28b)  
 . RAMBUS 1RIMM (24) , RAMBUS (30) 1RIMM  
 (24) (12) ( 1).

2b , RIMM (24) (28a) RIMM (24) ( (28b)  
 28b) , 2a RIMM (24) . (28a) (28b)  
 , (28b) / (I/O) (28a) / (I/O) (mirrors)

(24) 1 (24a) (28a) (d) (28a) 가, 2 (24b) (28b)  
 (24) 1 (24a) (28a) ( ) (offset)  
 , (28a 28b) RAMBUS (vias)  
 , (vias)

2c 1 (24a) (28a) 2 (24b) (28b) 2a RIMM (2  
 4)

3 , (3 ) (10)  
 . (12) RAMBUS 가 . DRCG(di  
 rect RAMBUS clock generator) (14) DRAC(18; direct RAMBUS ASIC cell) (16)  
 (12)

RAMBUS (20) DRAC(18) (22) . (22) (12)  
 RAMBUS (20) ( ) (12)  
 , ( )가 . (22) 1R  
 IMM (46)

RAMBUS (20) (48) RIMM (46) , (50) RIMM  
 (46) (28) . RAMBUS RAMBUS (52)  
 RIMM (46) 1RIMM (46) (12) 가  
 RAMBUS (25) (12) 2 (31) . 2 (31) 2RIMM (54)

, RAMBUS 2RIMM (54) RAMBUS (37) (6  
 8) RIMM (62) . (68)  
 / (44) , (68) RIMM (62)  
 , RAMBUS (12) ( )가 가 .

, 가 가 , 가  
(12)

4a, 4b 4c , 3 1RIMM (46)  
2RIMM (54, 3) 1RIMM (46) , 4a, 4b 4c  
(20; 3) (28) (46) . RAMBUS  
(48) (46) (50) (28)  
. RAMBUS 2RIMM (46) , RAMBUS (52) RIMM (46)  
(12) ( 3).

4b 4a RIMM (46) . RIMM (24, 2b) ,  
RIMM (46) , 가  
, 2 1 . 가 ,  
RIMM (46) , 가 . RIMM (46) ,  
(28) , RIMM  
(62, 3) RIMM 3 , RIMM

4c , RIMM (46) (28) , 2a RIMM .  
가 2 , 가

5 , (70) ,  
5 ,

I/O ,  
1 - , (72) , (76) (74) (72) .

(76) 3 : 2 (78 80) (82).  
, (76) , (88) (84)가 . 가  
(86)  
28 .

(76) (76) ( 5),  
(76) (82) , 28 ,  
(78 80)

가 가 , 가 .

1 , (design rules)

0.1mm 0.004

53

( )

RAMBUS 256MB 288MB RDRAM  
(simple meander)

. RDRAM

, 256MB 288MB

가

6

6  
(50, 58 66)

(50, 58 66, 3)  
(94)

(90) (92)

(foldback)

(94) (蛇行狀; serpentine)  
0.004 0.004 0.005

(96)

(98)

rowave Theory and Techniques(1958 4 )" , B.M. Schiffman  
rowave 90 - Degree Phase Shifters"

" The IRE Transactions on Mic  
" A New Class of Broad - Band Mic

가

I/O

7a, 7b 7c

(28) RIMM (62)

RIMM (62)

. RAMBU

S (37, 3)

(64) RIMM

(66)

(28) . RAMBUS (68) RIMM(62)

RIMM (

24, 35 38, 1) RAMBUS (30, 34 42)

, RIMM (46 54, 3)

RAMBUS (52 60)

가

7b 7a RIMM (46 54, 3)  
 (28) RIMM (62)  
 가 RIMM (62) (68) 가  
 가 가 /  
 45,859 09/461,069 09/6  
 , 3 3 , ,  
 09/645,859 09/461,069

7c RIMM (62)

(28)

7a RIMM

RAMBUS 가  
 (Micron Technology) DDR SDRAM(double data rate synchronous dynamic random access memory)

가  
가 가

(57)

1.

가 ;

가 ;

가

2.

1 ,

3.

1 ,

4.

3 ,

5.

1 ,  
(meander)

6.

5 , , (serpentine),

7.

1 , ,

8.

2 ,

9.

8 ,

10.

8 , ,

11.

10 ,

12.

10 , .

13.

10 , .

14.

, 가 ;

가 ;

;

, , 가 ,

15.

14 , .

16.

14 , .

17.

16 , , .

18.

14 , .

19.

18 , , , .

20.

14 , , .

21.

15 ,

22.

21 ,

23.

21 , ,

24.

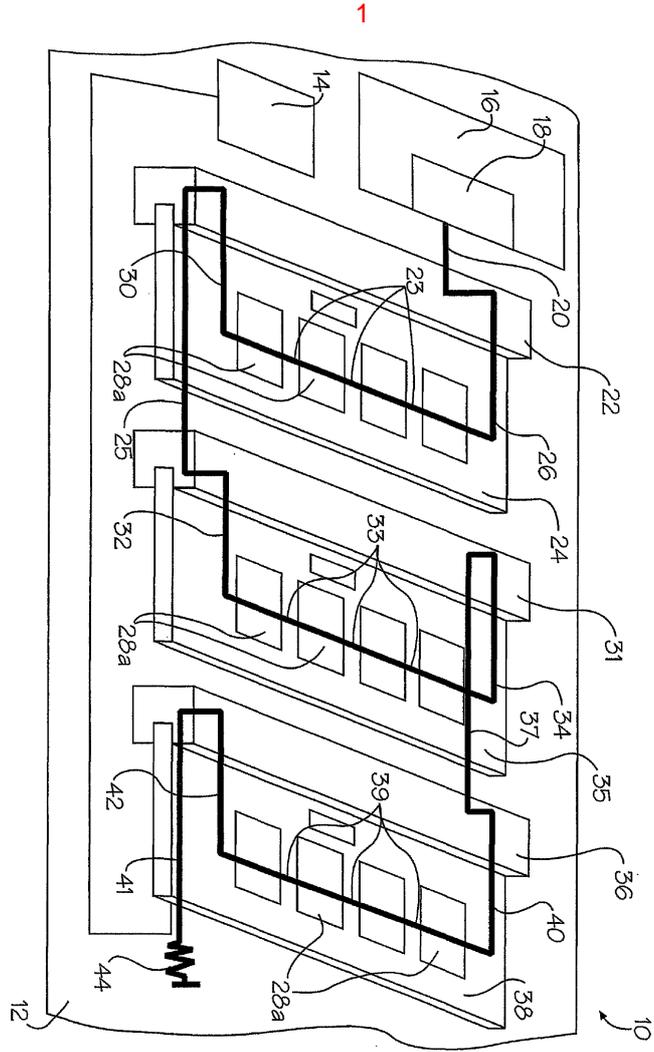
23 ,

25.

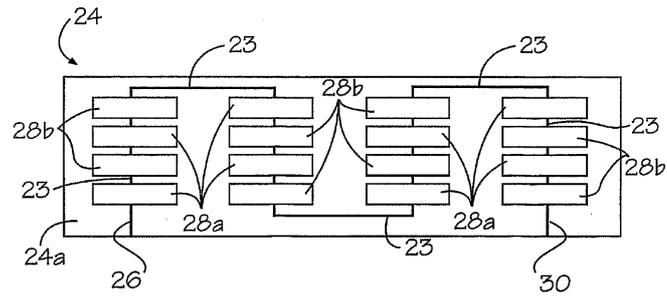
23 ,

26.

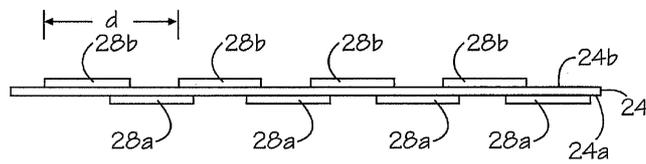
23 ,



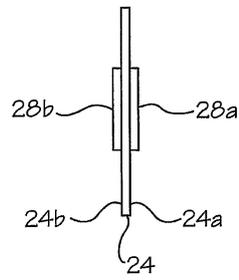
2a



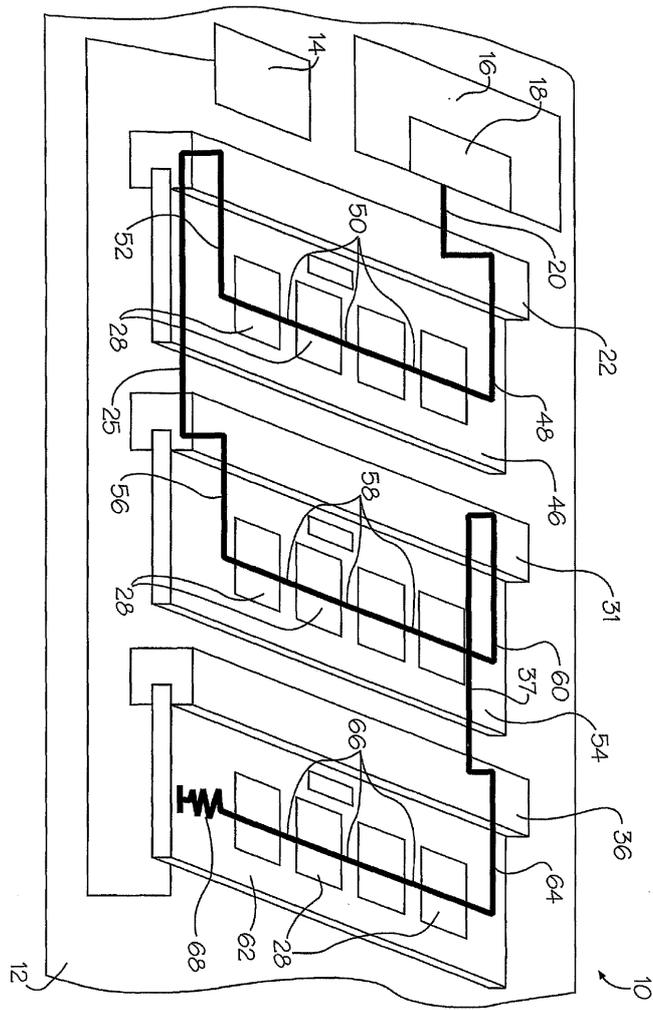
2b



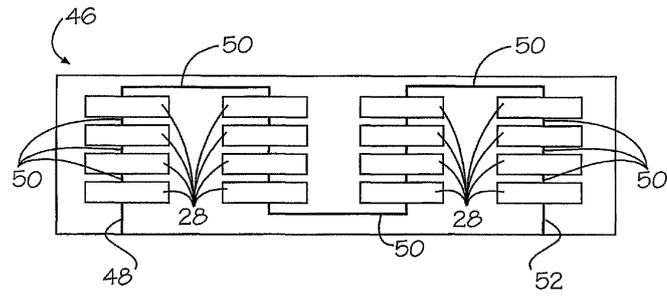
2c



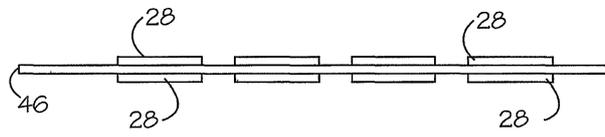
3



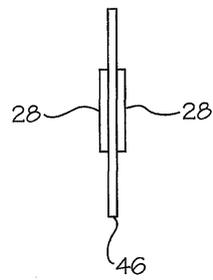
4a



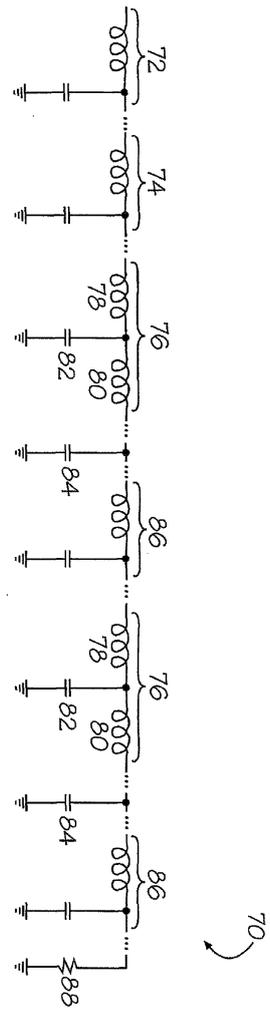
4b



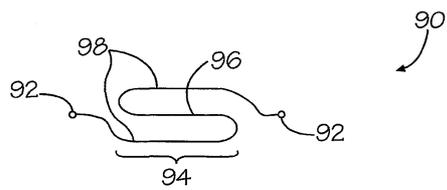
4c



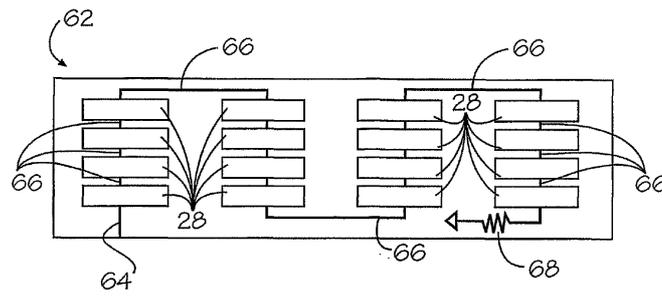
5



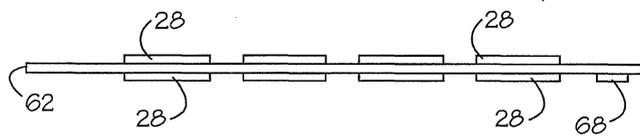
6



7a



7b



7c

