

512Kx36 & 1Mx18-Bit Flow Through NtRAM™

FEATURES

- 3.3V+0.165V/-0.165V Power Supply.
- I/O Supply Voltage 3.3V+0.165V/-0.165V for 3.3V I/O or 2.5V+0.4V/-0.125V for 2.5V I/O
- Byte Writable Function.
- Enable clock and suspend operation.
- Single READ/WRITE control pin.
- Self-Timed Write Cycle.
- Three Chip Enable for simple depth expansion with no data contention .
- A interleaved burst or a linear burst mode.
- Asynchronous output enable control.
- Power Down mode.
- TTL-Level Three-State Outputs.
- 100-TQFP-1420A /119BGA(7x17 Ball Grid Array Package).

FAST ACCESS TIMES

Parameter	Symbol	-65	-75	-85	-90	Unit
Cycle Time	t _{CYC}	7.5	8.5	10	10	ns
Clock Access Time	t _{CD}	6.5	7.5	8.5	9.0	ns
Output Enable Access Time	t _{OE}	3.5	3.5	4.0	4.0	ns

GENERAL DESCRIPTION

The K7M163625A and K7M161825A are 18,874,368-bits Synchronous Static SRAMs.

The NtRAM™, or No Turnaround Random Access Memory utilizes all bandwidth in any combination of operating cycles.

Address, data inputs, and all control signals except output enable and linear burst order are synchronized to input clock. Burst order control must be tied "High or Low".

Asynchronous inputs include the sleep mode enable(ZZ).

Output Enable controls the outputs at any given time.

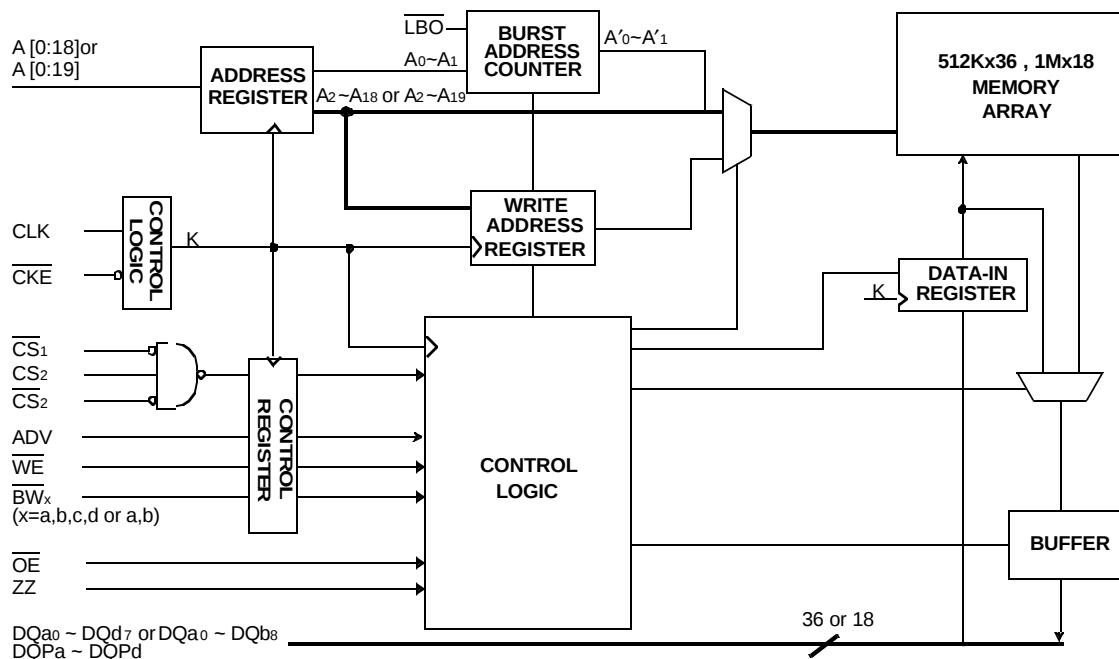
Write cycles are internally self-timed and initiated by the rising edge of the clock input. This feature eliminates complex off-chip write pulse generation

and provides increased timing flexibility for incoming signals.

For read cycles, Flow-Through SRAM allows output data to simply flow freely from the memory array.

The K7M163625A and K7M161825A are implemented with SAMSUNG's high performance CMOS technology and is available in 100pin TQFP and 119BGA packages. Multiple power and ground pins minimize ground bounce.

LOGIC BLOCK DIAGRAM

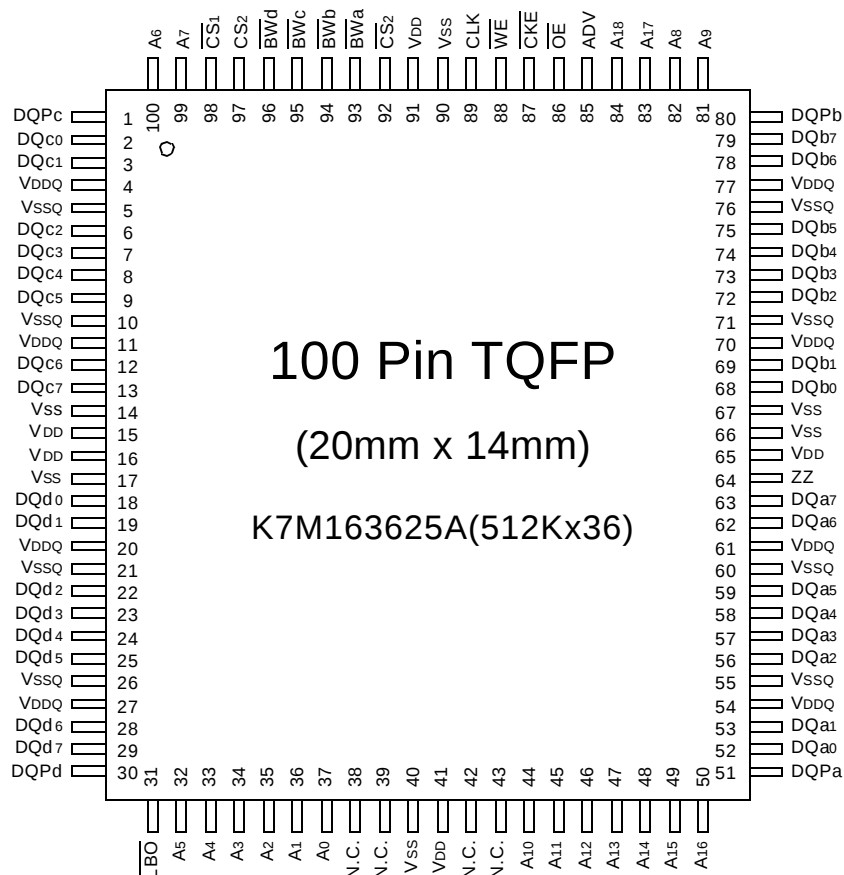


K7M163625A
K7M161825A

512Kx36 & 1Mx18 Flow-Through NtRAM™

Preliminary

PIN CONFIGURATION(TOP VIEW)



PIN NAME

SYMBOL	PIN NAME	TQFP PIN NO.	SYMBOL	PIN NAME	TQFP PIN NO.
A0 - A18	Address Inputs	32,33,34,35,36,37,44 45,46,47,48,49,50,81 82,83,84,99,100	VDD	Power Supply(+3.3V)	15,16,41,65,91
			VSS	Ground	14,17,40,66,67,90
ADV	Address Advance/Load	85	N.C.	No Connect	38,39,42,43
WE	Read/Write Control Input	88			
CLK	Clock	89	DQa0~a7	Data Inputs/Outputs	52,53,56,57,58,59,62,63
CKE	Clock Enable	87	DQb0~b7	Data Inputs/Outputs	68,69,72,73,74,75,78,79
CS1	Chip Select	98	DQc0~c7	Data Inputs/Outputs	2,3,6,7,8,9,12,13
CS2	Chip Select	97	DQd0~d7	Data Inputs/Outputs	18,19,22,23,24,25,28,29
CS2	Chip Select	92	DQPa~Pd	Data Inputs/Outputs	51,80,1,30
BWx(x=a,b,c,d)	Byte Write Inputs	93,94,95,96			
OE	Output Enable	86	VDDQ	Output Power Supply (2.5V or 3.3V)	4,11,20,27,54,61,70,77
ZZ	Power Sleep Mode	64			
LBO	Burst Mode Control	31	VSSQ	Output Ground	5,10,21,26,55,60,71,76

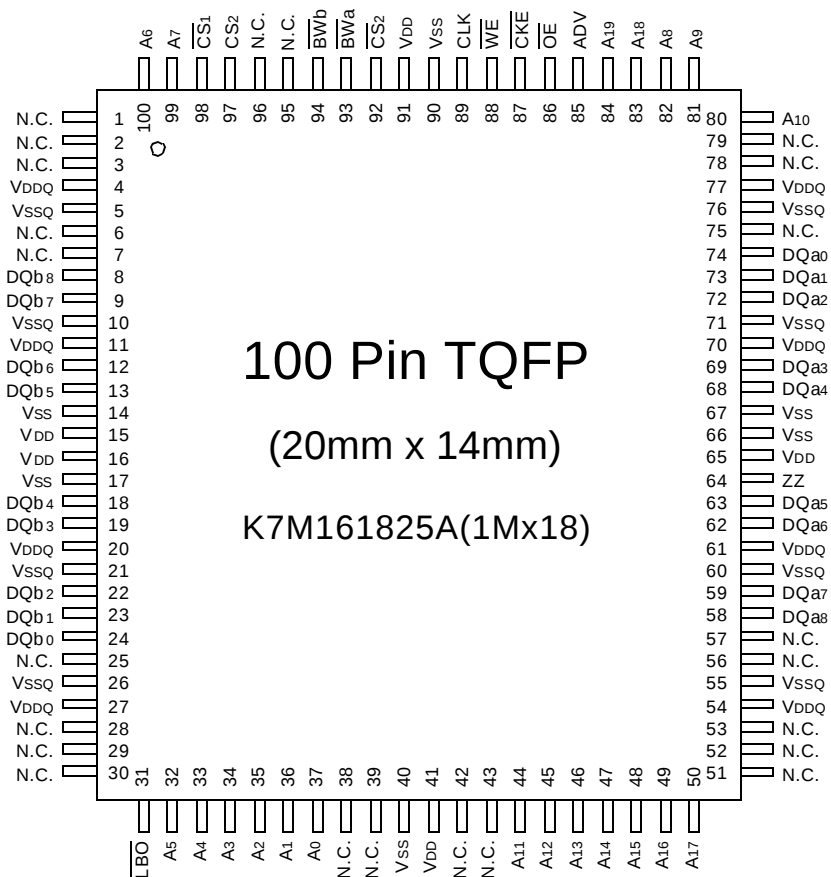
Notes : 1. A₀ and A₂ are the two least significant bits(LSB) of the address field and set the internal burst counter if burst is desired.

K7M163625A
K7M161825A

512Kx36 & 1Mx18 Flow-Through NtRAM™

Preliminary

PIN CONFIGURATION(TOP VIEW)



PIN NAME

SYMBOL	PIN NAME	TQFP PIN NO.	SYMBOL	PIN NAME	TQFP PIN NO.
A0 - A19	Address Inputs	32,33,34,35,36,37,44 45,46,47,48,49,50,80 81,82,83,84,99,100	VDD	Power Supply(+3.3V)	15,16,41,65,91
			Vss	Ground	14,17,40,66,67,90
ADV	Address Advance/Load	85	N.C.	No Connect	1,2,3,6,7,25,28,29,30, 38,39,42,43,51,52,53, 56,57,75,78,79,95,96
WE	Read/Write Control Input	88			
CLK	Clock	89			
CKE	Clock Enable	87			
CS1	Chip Select	98	DQa0~a8	Data Inputs/Outputs	58,59,62,63,68,69,72,73,74
CS2	Chip Select	97	DQb0~b8	Data Inputs/Outputs	8,9,12,13,18,19,22,23,24
CS2	Chip Select	92			
BWx(x=a,b)	Byte Write Inputs	93,94			
OE	Output Enable	86	VDDQ	Output Power Supply (2.5V or 3.3V)	4,11,20,27,54,61,70,77
ZZ	Power Sleep Mode	64			
LBO	Burst Mode Control	31	VSSQ	Output Ground	5,10,21,26,55,60,71,76

Notes : 1. A0 and A1 are the two least significant bits(LSB) of the address field and set the internal burst counter if burst is desired.



ELECTRONICS

119BGA PACKAGE PIN CONFIGURATIONS(TOP VIEW)

K7M163625A(512Kx36)

	1	2	3	4	5	6	7
A	VDDQ	A	A	A	A	A	VDDQ
B	NC	CS2	A	ADV	A	$\overline{CS2}$	NC
C	NC	A	A	VDD	A	A	NC
D	DQc	DQPc	VSS	NC	VSS	DQPb	DQb
E	DQc	DQc	VSS	$\overline{CS1}$	VSS	DQb	DQb
F	VDDQ	DQc	VSS	$\overline{OE}$	VSS	DQb	VDDQ
G	DQc	DQc	$\overline{BWc}$	A	$\overline{BWb}$	DQb	DQb
H	DQc	DQc	VSS	$\overline{WE}$	VSS	DQb	DQb
J	VDDQ	VDD	NC	VDD	NC	VDD	VDDQ
K	DQd	DQd	VSS	CLK	VSS	DQa	DQa
L	DQd	DQd	$\overline{BWd}$	NC	$\overline{BWa}$	DQa	DQa
M	VDDQ	DQd	VSS	$\overline{CKE}$	VSS	DQa	VDDQ
N	DQd	DQd	VSS	A1*	VSS	DQa	DQa
P	DQd	DQPd	VSS	A0*	VSS	DQPa	DQa
R	NC	A	$\overline{LBO}$	VDD	NC	A	NC
T	NC	NC	A	A	A	NC	ZZ
U	VDDQ	TMS	TDI	TCK	TDO	NC	VDDQ

Note : * A₀ and A₁ are the two least significant bits(LSB) of the address field and set the internal burst counter if burst is desired.

PIN NAME

SYMBOL	PIN NAME	SYMBOL	PIN NAME
A	Address Inputs	VDD	Power Supply
A ₀ ,A ₁	Burst Address Inputs	VSS	Ground
ADV	Address Advance/Load	N.C.	No Connect
$\overline{WE}$	Read/Write Control Input		
CLK	Clock	DQa	Data Inputs/Outputs
$\overline{CKE}$	Clock Enable	DQb	Data Inputs/Outputs
CS ₁	Chip Select	DQc	Data Inputs/Outputs
CS ₂	Chip Select	DQd	Data Inputs/Outputs
$\overline{CS2}$	Chip Select	DQPa~Pd	Data Inputs/Outputs
$\overline{BWx}$	Byte Write Inputs		
(x=a,b,c,d)		VDDQ	Output Power Supply
$\overline{OE}$	Output Enable		
ZZ	Power Sleep Mode		
$\overline{LBO}$	Burst Mode Control		
TCK	JTAG Test Clock		
TMS	JTAG Test Mode Select		
TDI	JTAG Test Data Input		
TDO	JTAG Test Data Output		

119BGA PACKAGE PIN CONFIGURATIONS(TOP VIEW)

K7M161825A(1Mx18)

	1	2	3	4	5	6	7
A	VDDQ	A	A	A	A	A	VDDQ
B	NC	CS2	A	ADV	A	$\overline{CS2}$	NC
C	NC	A	A	VDD	A	A	NC
D	DQb	NC	VSS	NC	VSS	DQPa	NC
E	NC	DQb	VSS	$\overline{CS1}$	VSS	NC	DQa
F	VDDQ	NC	VSS	$\overline{OE}$	VSS	DQa	VDDQ
G	NC	DQb	$\overline{BWb}$	A	VSS	NC	DQa
H	DQb	NC	VSS	$\overline{WE}$	VSS	DQa	NC
J	VDDQ	VDD	NC	VDD	NC	VDD	VDDQ
K	NC	DQb	VSS	CLK	VSS	NC	DQa
L	DQb	NC	VSS	NC	$\overline{BWa}$	DQa	NC
M	VDDQ	DQb	VSS	$\overline{CKE}$	VSS	NC	VDDQ
N	DQb	NC	VSS	A1*	VSS	DQa	NC
P	NC	DQPb	VSS	A0*	VSS	NC	DQa
R	NC	A	$\overline{LBO}$	VDD	NC	A	NC
T	NC	A	A	NC	A	A	ZZ
U	VDDQ	TMS	TDI	TCK	TDO	NC	VDDQ

Note : * A₀ and A₁ are the two least significant bits(LSB) of the address field and set the internal burst counter if burst is desired.

PIN NAME

SYMBOL	PIN NAME	SYMBOL	PIN NAME
A	Address Inputs	VDD	Power Supply
A ₀ ,A ₁	Burst Address Inputs	VSS	Ground
ADV	Address Advance/Load	N.C.	No Connect
$\overline{WE}$	Read/Write Control Input		
CLK	Clock		
$\overline{CKE}$	Clock Enable	DQa	Data Inputs/Outputs
$\overline{CS1}$	Chip Select	DQb	Data Inputs/Outputs
CS2	Chip Select	DQPa, Pb	Data Inputs/Outputs
$\overline{CS2}$	Chip Select		
$\overline{BWx}$	Byte Write Inputs	VDDQ	Output Power Supply
(x=a,b)			
$\overline{OE}$	Output Enable		
ZZ	Power Sleep Mode		
LBO	Burst Mode Control		
TCK	JTAG Test Clock		
TMS	JTAG Test Mode Select		
TDI	JTAG Test Data Input		
TDO	JTAG Test Data Output		