576 Kilobyte Synchronous Card Edge DIMM

FEATURES

- 4x64Kx18 Synchronous
- Flow-Through Architecture
- Clock Controlled Registered Bank Enables (E1\, E2\, E3, E4\)
- Clock Controlled Registered Address
- Clock Controlled Registered Global Write (GW\)
- Aysnchronous Output Enable (G\)
- Internally self-timed Write
- Gold Lead Finish
- 3.3V+ 10%, -5% Operation
- Access Speed(s): TKHQV=9.5, 10, 11, 12, 15ns
- Common Data I/O
- High Capacitance (30pf) drive, at rated Access Speed
- Single total array Clock
- Multiple Vcc and Gnd

The EDI2KG41864VxxD2 is a Synchronous SRAM, 60 position Card Edge DIMM (120 contacts) Module, organized as 4x64Kx18. The Module contains four (4) Synchronous Burst Ram Devices, packaged in the industry standard JEDEC 14mmx20mm TQFP placed on a Multilayer FR4 Substrate. The module architecture is defined as a Synchronous Only, Flow-Through, Early Write device. This module provides high performance, ultra fast access times at a cost per bit benefit over BiCMOS Asynchronous SRAM based devices. As well as improved cost per bit, the use of Synchronous or Synchronous Burst devices or modules can ease the memory subsystem design by reducing or easing the memory controller requirement.

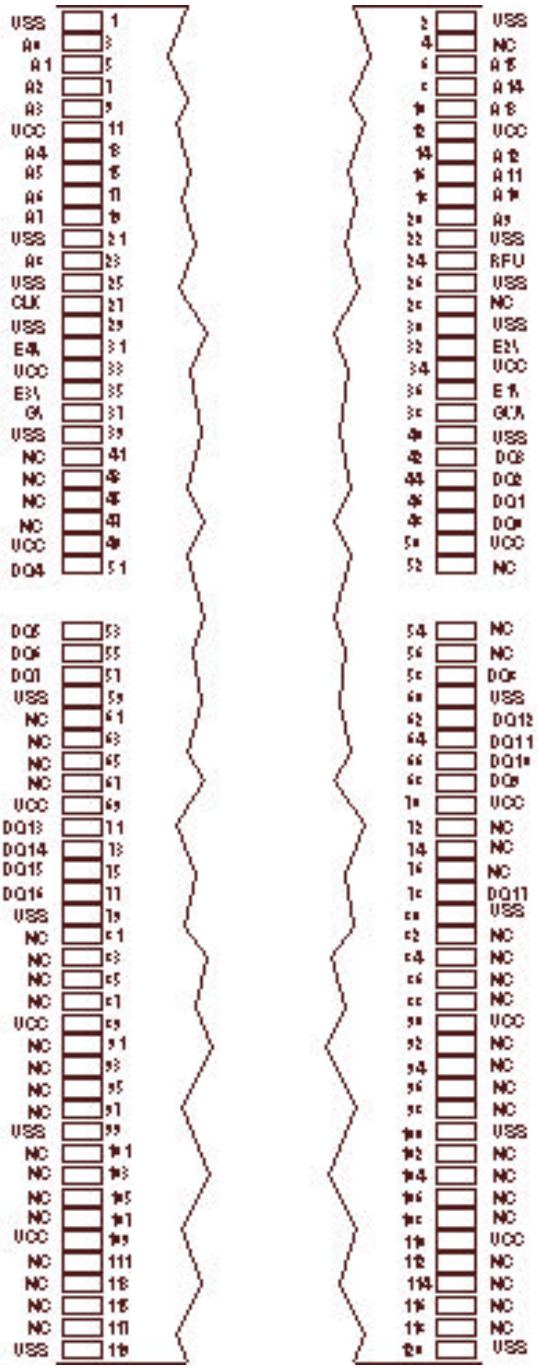
Synchronous operations are in relation to an externally supplied clock, registered address, registered global write, registered enables as well as an Asynchronous Output enable. All read and Write operations to this module are performed on Long Words (Double Words) 32 bit operation.

Write cycles are internally self timed and are initiated by a rising clock edge. This feature relieves the designer the task of developing external write pulse width circuitry.

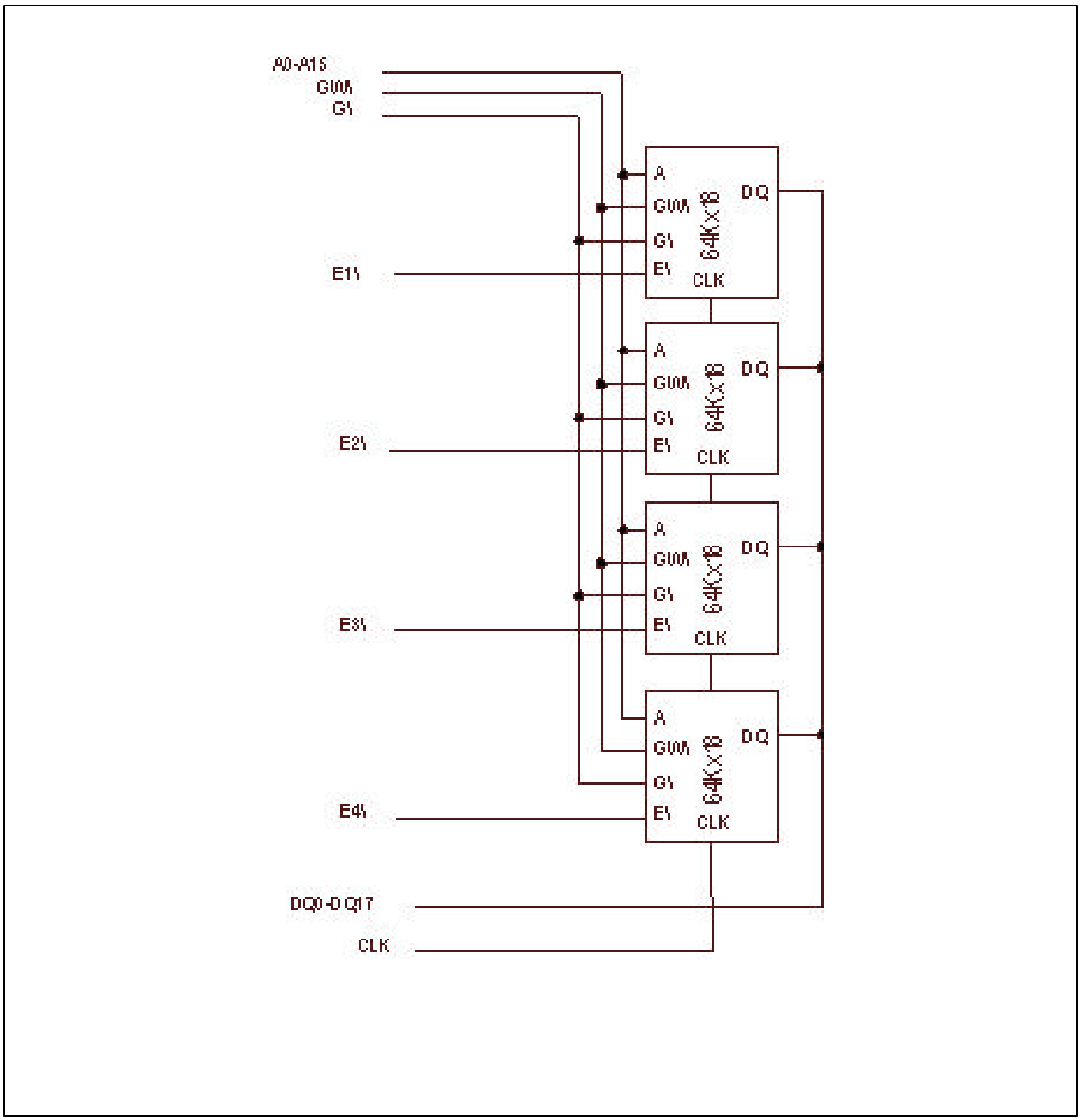
PIN NAMES

DQ0-DQ17	Input/Output Bus
A0-A15	Address Bus
E1\, E2\, E3\, E4\	Synchronous Bank Enables
Clk	Array Clock
GW\	Synchronous Global write Enable
G\	Asynchronous Output Enable
Vcc	3.3V Power Supply
Vss	Gnd

PIN CONFIGURATION



FUNCTIONAL BLOCK DIAGRAM



PIN DESCRIPTIONS

DIMM Pins	Symbol	Type	Description
3, 5, 7, 9, 13, 15, 17, 19, 23, 20, 18, 16, 14, 10, 8, 6	A0-A17	Input Synchronous	Addresses: These inputs are registered and must meet the setup and hold times around the rising edge of CLK. The burst counter generates internal addresses associated with A0 and A1, during burst and wait cycle.
38	GW\	Input Synchronous	Global Write: This active LOW input allows a full 72-bit WRITE to occur independent of the BWE\ and BWx\ lines and must meet the setup and hold times around the rising edge of CLK.
27	CLK	Input Synchronous	Clock: This signal registers the addresses, data, chip enables, write control and burst control inputs on its rising edge. All synchronous inputs must meet setup and hold times around the clock's rising edge.
36, 32, 35, 31	E1\, E2\ E3\, E4\	Input Synchronous	Bank Enables: These active LOW inputs are used to enable each individual bank and to gate ADSP\.
37	G\	Input	Output Enable: This active LOW asynchronous input enables the data output drivers.
Various	DQ0-63	Input/Output	Data Inputs/Outputs: First byte is DQ0-7, second byte is DQ8-15, third byte is DQ16-23, fourth byte is DQ24-31, fifth byte is DQ32-39, sixth byte is DQ40-47, seventh byte is DQ48-55 and the eight byte is DQ56-64.
Various	Vcc	Supply	Core power supply: +3.3V -5%/+10%
Various	Vss	Ground	Ground

SYNCHRONOUS ONLY - TRUTH TABLE

Operation	E1\	E2\	E3\	E4\	GW\	G\	CLK	DQ
Synchronous Write-Bank 1	L	H	H	H	L	H	↑	High-Z
Synchronous Read-Bank 1	L	H	H	H	H	L	↑	
Synchronous Write-Bank 2	H	L	H	H	L	H	↑	High-Z
Synchronous Read-Bank 2	H	L	H	H	H	L	↑	
Synchronous Write-Bank 3	H	H	L	H	L	H	↑	High-Z
Synchronous Read-Bank 3	H	H	L	H	H	L	↑	
Synchronous Write-Bank 4	H	H	H	L	L	H	↑	High-Z
Synchronous Read-Bank 4	H	H	H	L	H	L	↑	

ABSOLUTE MAXIMUM RATINGS*

Voltage on Vcc Relative to Vss	-0.5V to +4.6V
Vin	-0.5V to Vcc +0.5V
Storage Temperature	-55°C to +125°C
Operating Temperature (Commercial)	0°C to +70°C
Operating Temperature (Industrial)	-40°C to +85°C
Short Circuit Output Current	20 mA

**Stress greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions greater than those indicated in operational sections of this specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.*

RECOMMENDED DC OPERATING CONDITIONS

Parameter	Sym	Min	Typ	Max	Units
Supply Voltage	VCC	3.14	3.3	3.6	V
Supply Voltage	VSS	0.0	0.0	0.0	V
Input High	VIH	2.2	3.0	VCC+0.3	V
Input Low	VIL	-0.3	0.0	0.8	V
Input Leakage	ILi	-2	1	2	µA
Output Leakage	ILo	-2	1	2	µA
Output High IOH=-4mA	VOH	2.4	-	-	V
Output Low IOL =+8mA	VOL	-	-	0.4	V

DC ELECTRICAL CHARACTERISTICS - READ CYCLE

				Max				
Description	SYM	Typ	9.5	10	11	12	15	Units
Power Supply Current	Icc1	380	*	450	400	375	350	mA
Power Supply Current Device Selected,No Operation	Icc	100	*	200	200	225	225	mA
Snooze Mode	IccZZ	10	*	15	15	15	15	mA
CMOS Standby	Icc3	20	*	35	35	35	35	mA
Clock Running-Deselect	IccK	300	*	400	400	300	300	mA

**TBD*

AC TEST CONDITIONS

Input Pulse Levels	Vss to 3.0V
Input and Output Timing Ref.	1.25V
Output Test equivalencies	

AC TEST LOAD

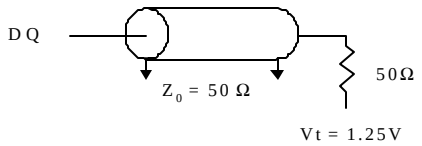


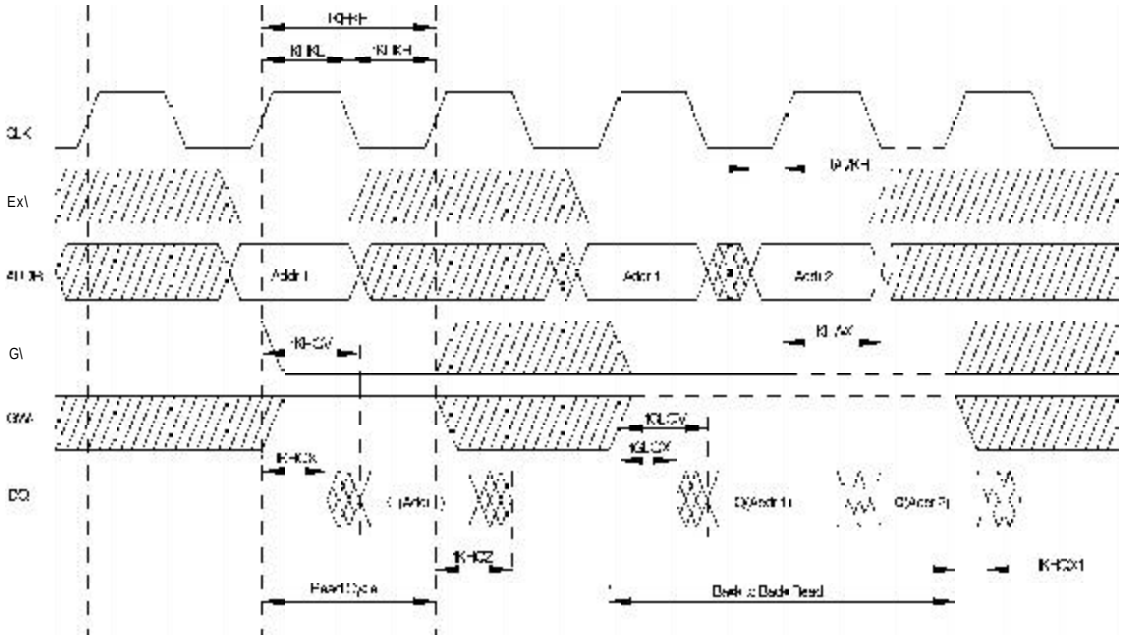
Fig. 1 Output Load Equivalent

READ CYCLE TIMING PARAMETERS

		9.5ns		10ns		11ns		12ns		15ns		
Description	**Sym**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Units**
Clock Cycle Time	tKhKh	*	*	12		12		15		20		ns
Clock High Time	tKHKL	*	*	5		5		5		6		ns
Clock Low Time	tKLKH	*	*	5		5		5		6		ns
Clock to Output Valid	tKHQV	*	*		10		11		12		15	ns
Clock to Output Invalid	tKHQX1	*	*	3		3		3		3		ns
Clock to Output Low-Z	tKHQX	*	*	2		2		2		2		ns
Output Enable to Output Valid	tGLQV	*	*		4		5		5		6	ns
Output Enable to Output Low-Z	tGLQX	*	*	0		0		0		0		ns
Output Enable to Output High-Z	tGHQZ	*	*		4		5		5		6	ns
Address Setup	tAVKH	*	*	2.5		2.5		2.5		2.5		ns
Bank Enable Setup	tEVKH	*	*	2.5		2.5		2.5		2.5		ns
Address Hold	tKHAX	*	*	1.0		1.0		1.0		1.0		ns
Bank Enable Hold	tKHEX	*	*	1.0		1.0		1.0		1.0		ns

**TBD*

SYNCHRONOUS READ CYCLE

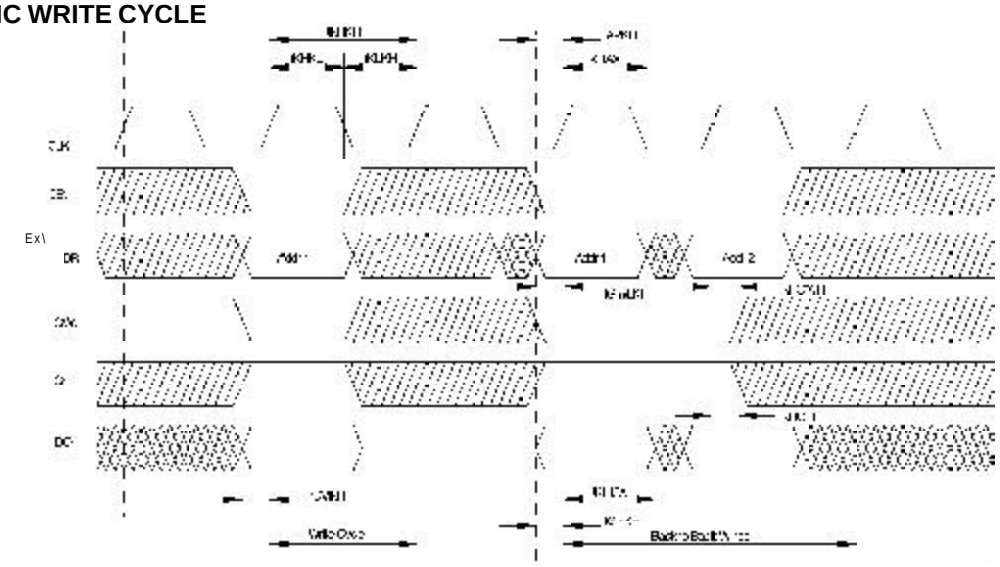


WRITE CYCLE TIMING PARAMETERS

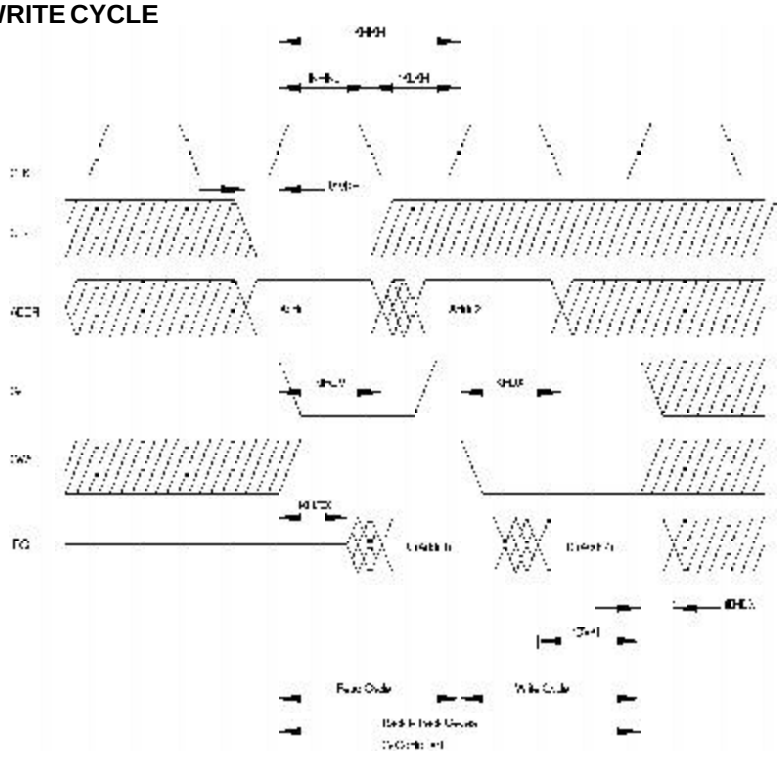
Description	Sym	9.5ns Min	9.5ns Max	10ns Min	10ns Max	11ns Min	11ns Max	12ns Min	12ns Max	15ns Min	15ns Max	Units
Clock Cycle Time	tKHKH	*	*	12		12		15		20		ns
Clock High Time	tKHKL	*	*	5		5		5		6		ns
Clock Low Time	tKLKH	*	*	5		5		5		6		ns
Address Setup	tAVKH	*	*	2.5		2.5		2.5		2.5		ns
Address Hold	tKHAX	*	*	1.0		1.0		1.0		1.0		ns
Bank Enable Setup	tEVKH	*	*	2.5		2.5		2.5		2.5		ns
Bank Enable Hold	tKHEX	*	*	1.0		1.0		1.0		1.0		ns
Global Write Enable Setup	tWVKH	*	*	2.5		2.5		2.5		2.5		ns
Global Write Enable Hold	tKHWX	*	*	1.0		1.0		1.0		1.0		ns
Data Setup	tDVKH	*	*	2.5		2.5		2.5		2.5		ns
Data Hold	tKHDX	*	*	1.0		1.0		1.0		1.0		ns

**TBD*

SYNC WRITE CYCLE

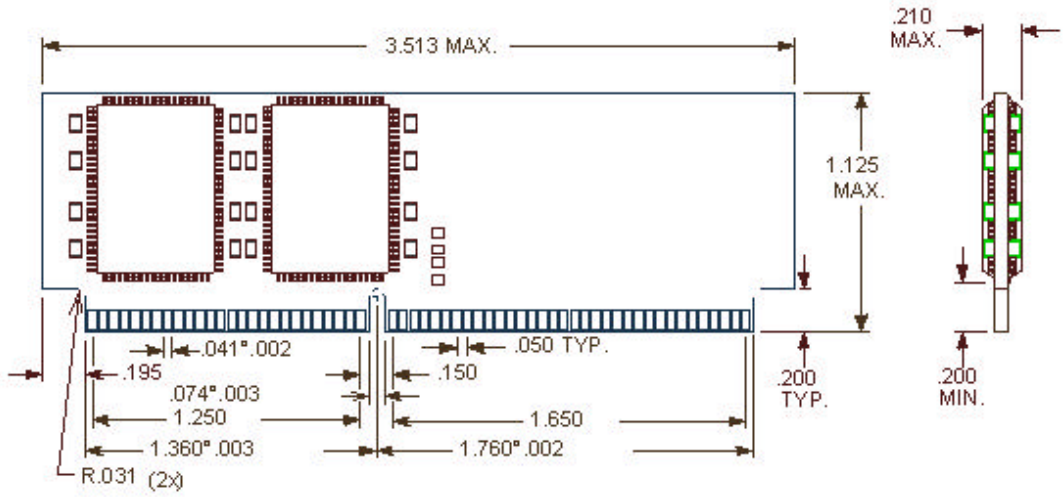


SYNC READ/WRITE CYCLE



PACKAGE DESCRIPTION

Package No. 436
120 Lead
Card Edge DIMM



Ordering Information

Part Number	Organization	Voltage	Speed (ns)	Package
EDI2GG41864V95D*	4x64Kx18	3.3	9.5	120 Card Edge DIMM
EDI2GG41864V10D*	4x64Kx18	3.3	10	120 Card Edge DIMM
EDI2GG41864V11D	4x64Kx18	3.3	11	120 Card Edge DIMM
EDI2GG41864V12D	4x64Kx18	3.3	12	120 Card Edge DIMM
EDI2GG41864V15D	4x64Kx18	3.3	15	120 Card Edge DIMM

**Consult Factory for Availability*