

**512Kx8 MONOLITHIC SRAM, SMD 5962-95613****FEATURES**

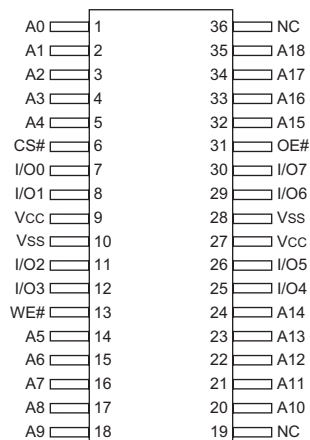
- Access Times 15, 17, 20, 25, 35, 45, 55ns
- MIL-STD-883 Compliant Devices Available
- Revolutionary, Center Power/Ground Pinout JEDEC Approved
 - 36 lead Ceramic SOJ (Package 100)
 - 36 lead Ceramic Flat Pack (Package 226)
- Evolutionary, Corner Power/Ground Pinout JEDEC Approved
 - 32 pin Ceramic DIP (Package 300)
 - 32 lead Ceramic SOJ (Package 101)
 - 32 lead Ceramic Thinpack™ Flat Pack (Package 321)

- 32 pin, Rectangular Ceramic Leadless Chip Carrier (Package 601)
- Commercial, Industrial and Military Temperature Range
- 5V Power Supply
- Low Power CMOS
- Low Power Data Retention for Battery Back-up Operation
- TTL Compatible Inputs and Outputs

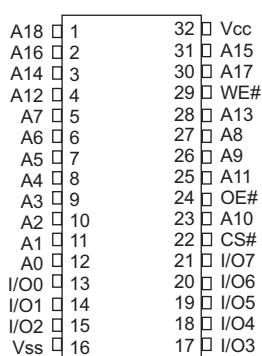
*This product is subject to change without notice.

REVOLUTIONARY PINOUT

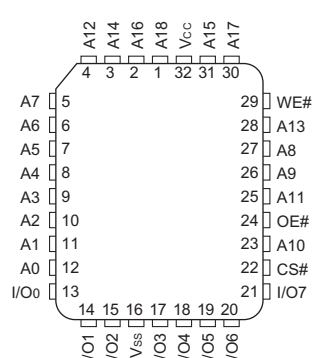
36 FLAT PACK
36 CSOJ

TOP VIEW**EVOLUTIONARY PINOUT**

32 DIP
32 CSOJ (DE)
32 FLAT PACK (FF)

TOP VIEW

32 CLCC

TOP VIEW**PIN DESCRIPTION**

A0-18	Address Inputs
I/O 0-7	Data Input/Output
CS#	Chip Select
OE#	Output Enable
WE#	Write Enable
V _{CC}	+5.0V Power
GND	Ground



Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Operating Temperature	T _A	-55	+125	°C
Storage Temperature Range	T _{STG}	-65	+150	°C
Signal Voltage Range to GND	V _G	-0.5	V _{CC} -0.5	V
Junction Temperature	T _J		150	°C
Supply Voltage Range (V _{CC})	V _{CC}	-0.5	7.0	V

Truth Table

CS#	OE#	WE#	MODE	DATA I/O	POWER
H	X	X	Standby	High Z	Standby
L	L	H	Read	Data Out	Active
L	X	L	Write	Data In	Active
L	H	H	Out Disable	High Z	Active

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V _{CC}	4.5	5.5	V
Input High Voltage	V _{IH}	2.2	V _{CC} + 0.3	V
Input Low Voltage	V _{IL}	-0.3	+0.8	V
Operating Temp. (Mil)	T _A	-55	+125	°C

Capacitance

(T_A = +25°C)

Parameter	Symbol	Conditions	Package	Speed (ns)	Max	Unit
Input capacitance	C _{IN}	V _{IN} = 0 V, f = 1.0 MHz	32 pin CSOJ, DIP, Flat Pack Evolutionary	15 to 55	20	pF
			32 pin CLCC	15 to 55	15	pF
			36 pin CSOJ & Flat Pack Revolutionary	15 to 35	12	pF
				45 to 55	20	pF
Output capacitance	C _{OUT}	V _{OUT} = 0 V, f = 1.0 MHz	32 pin CSOJ, DIP, Flat Pack Revolutionary	15 to 55	20	pF
			36 pin CSOJ & Flat Pack Revolutionary	15 to 35	12	pF
				45 to 55	20	pF

This parameter is guaranteed by design but not tested.

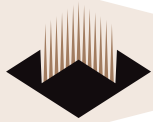
DC Characteristics - CMOS Compatible

(V_{CC} = 5.0V, GND = 0V, -55°C ≤ T_A ≤ 125°C)

Parameter	Symbol	Conditions	Min	Max	Unit
Input Leakage Current	I _{LI}	V _{CC} = 5.5, V _{IN} = GND to V _{CC}		10	A
Output Leakage Current	I _{LO}	CS# = V _{IH} , OE# = V _{IH} , V _{OUT} = GND TO V _{CC}		10	A
Operating Supply Current*	I _{CC}	CS# = V _{IH} , OE# = V _{IH} , f = 5MHz, V _{CC} = 5.5,		160	mA
Standby Current	I _{SS}	CS# = V _{IH} , OE# = V _{IH} , f = 5MHz, V _{CC} = 5.5		0.45	mA
Output Low Voltage	V _{OL}	I _{OL} = 6mA for 17 - 35ns, I _{OL} = 2.1mA for 45 - 55ns, V _{CC} = 4.5		0.4	V
Output High Voltage	V _{OH}	I _{OH} = -4.0mA for 17 - 35ns, I _{OH} = 1.0mA for 45 - 55ns, V _{CC} = 4.5	2.4		V

Data retention characteristics for low power "I" version

Parameter	Symbol	Conditions	Min	Max	Unit
Data Retention Supply Voltage	V _{DR}	CS# ³ V _{CC} -0.2V	2.0	5.5	V
Low Power Data Retention	I _{CCDR1}	V _{CC} = 3V		7	mA
Low Power Data Retention	I _{CCDR2}	V _{CC} = 2V		2	mA

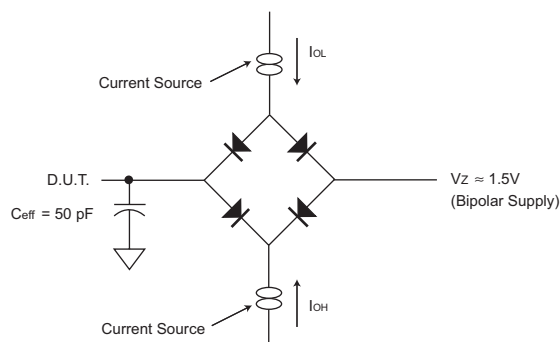
**AC Characteristics**(V_{CC} = 5.0V, GND = 0V, -55°C ≤ T_A ≤ 125°C)

Parameter	Symbol	-15		-17		-20		-25		-35		-45		-55		Unit
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Read Cycle Time	t _{RC}	15		17		20		25		35		45		55		ns
Address Access Time	t _{AA}		15		17		20		25		35		45		55	ns
Output Hold from Address Change	t _{OH}	0		0		0		0		0		0		0		ns
Chip Select Access Time	t _{ACS}		15		17		20		25		35		45		55	ns
Output Enable to Output Valid	t _{OE}		8		9		10		12		25		25		25	ns
Chip Select to Output in Low Z	t _{CLZ1}	2		2		2		2		4		4		4		ns
Output Enable to Output in Low Z	t _{OLZ1}	0		0		0		0		0		0		0		ns
Chip Disable to Output in High Z	t _{CHZ1}		8		9		10		12		15		20		20	ns
Output Disable to Output in High Z	t _{OHZ1}		8		9		10		12		15		20		20	ns

AC Characteristics(V_{CC} = 5.0V, GND = 0V, -55°C ≤ T_A ≤ 125°C)

Parameter	Symbol	-15		-17		-20		-25		-35		-45		-55		Unit
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Write Cycle Time	t _{WC}	15		17		20		25		35		45		55		ns
Chip Select to End of Write	t _{CW}	13		14		14		15		25		35		50		ns
Address Valid to End of Write	t _{AW}	13		14		14		15		25		35		50		ns
Data Valid to End of Write	t _{DW}	8		9		10		10		20		25		25		ns
Write Pulse Width	t _{WP}	13		14		14		15		25		35		40		ns
Address Setup Time	t _{AS}	2		2		2		2		2		2		2		ns
Address Hold Time	t _{AH}	0		0		0		0		0		5		5		ns
Output Active from End of Write	t _{OW1}	2		2		3		4		4		5		5		ns
Write Enable to Output in High Z	t _{WHZ1}		8		9		9		10		15		20		25	ns
Data Hold Time	t _{DH}	0		0		0		0		0		0		0		ns

1. This parameter is guaranteed by design but not tested.

AC TEST CIRCUIT**AC TEST CONDITIONS**

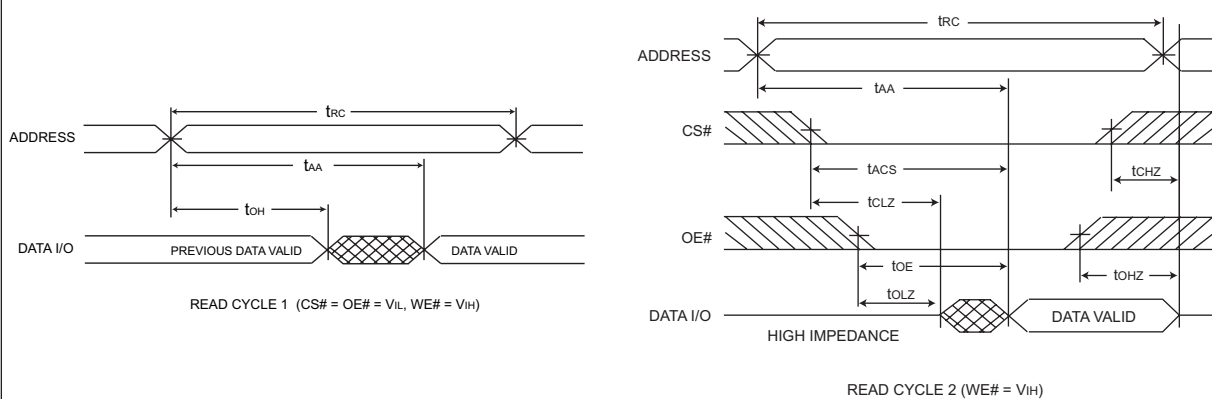
Parameter	Typ	Unit
Input Pulse Levels	V _{IL} = 0, V _{IH} = 3.0	V
Input Rise and Fall	5	ns
Input and Output Reference Level	1.5	V
Output Timing Reference Level	1.5	V

Notes:V_Z is programmable from -2V to +7V.I_{OL} & I_{OH} programmable from 0 to 16mA.Tester Impedance Z₀ = 75 Ω.V_Z is typically the midpoint of V_{OH} and V_{OL}.I_{OL} & I_{OH} are adjusted to simulate a typical resistive load circuit.

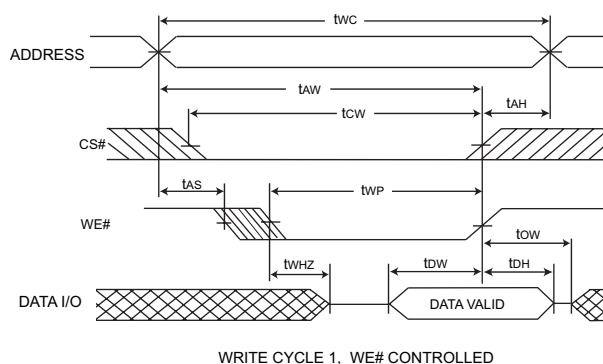
ATE tester includes jig capacitance.



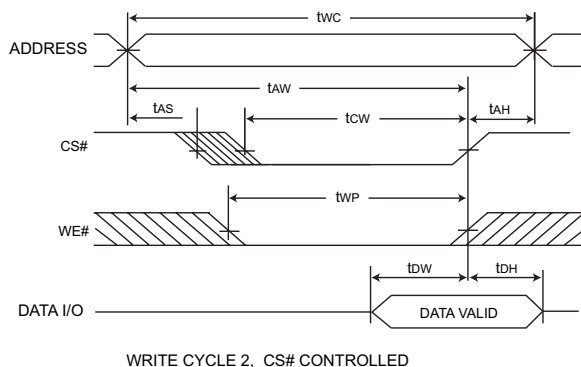
TIMING WAVEFORM - READ CYCLE



WRITE CYCLE - WE# CONTROLLED

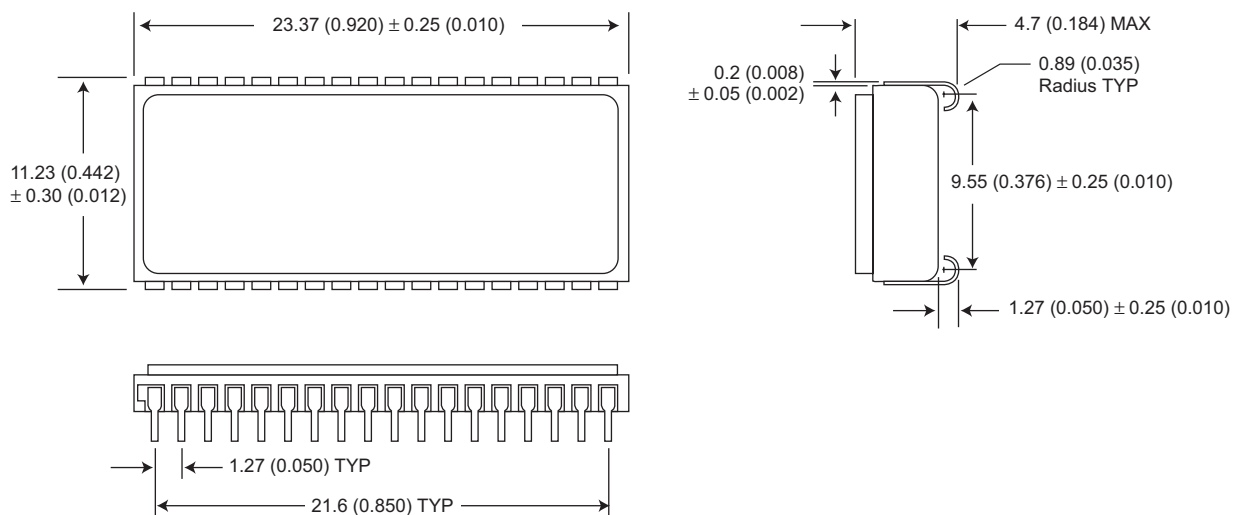


WRITE CYCLE - CS# CONTROLLED



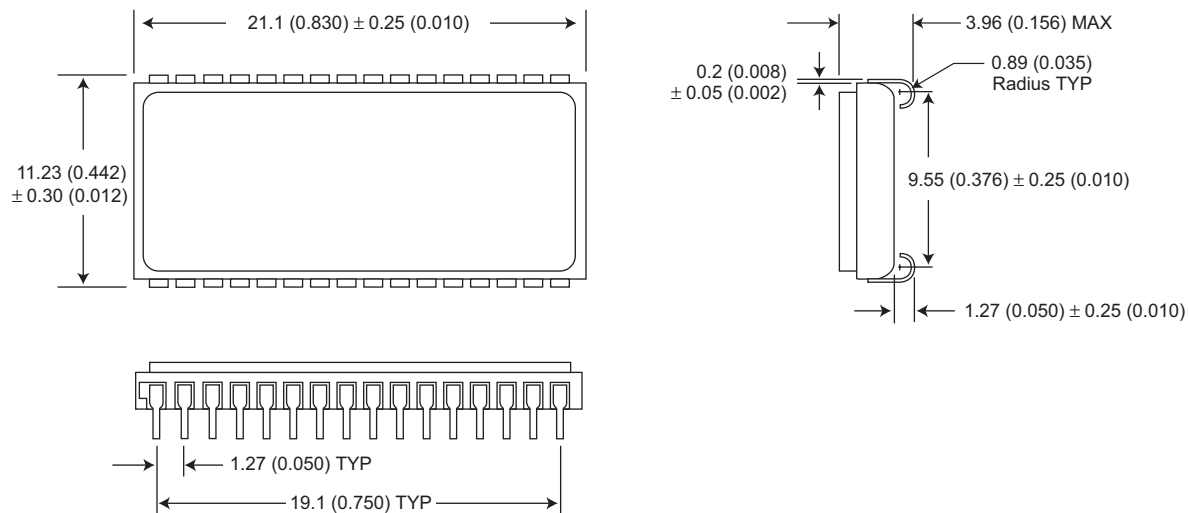


PACKAGE 100: 36 LEAD, CERAMIC SOJ



ALL LINEAR DIMENSIONS ARE MILLIMETERS AND PARENTHETICALLY IN INCHES

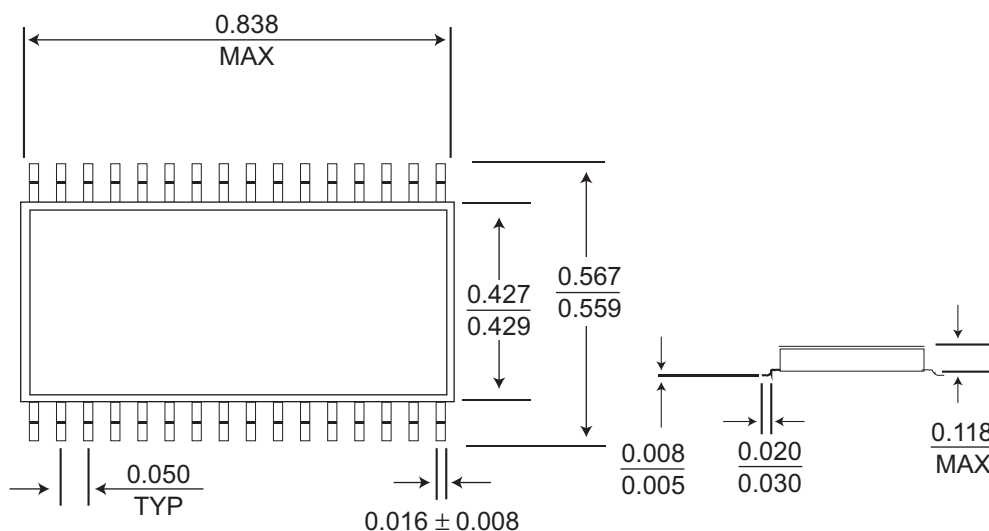
PACKAGE 101: 32 LEAD, CERAMIC SOJ



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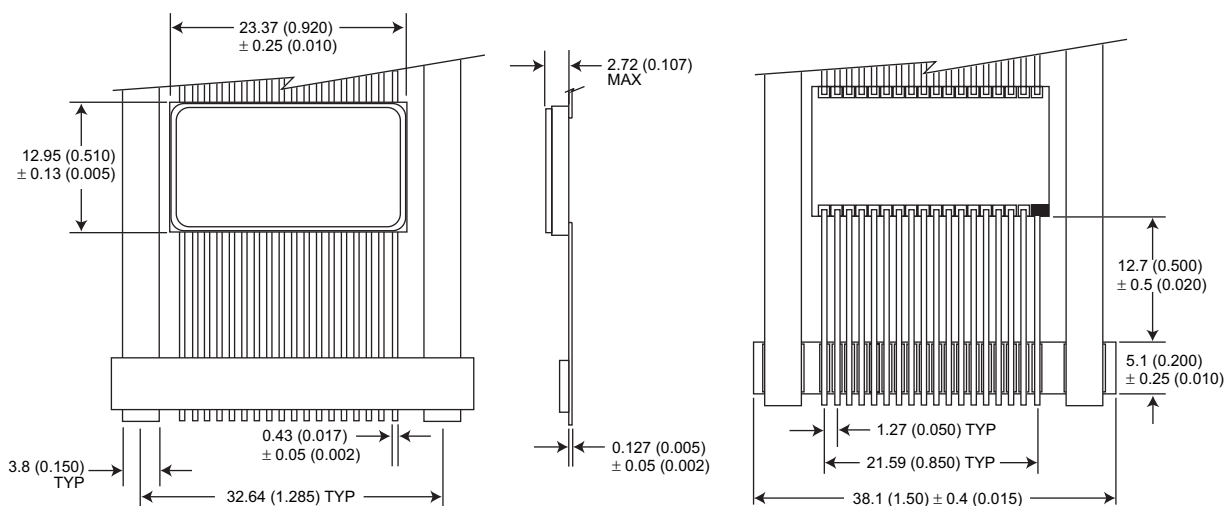


PACKAGE 321: 32 PIN CERAMIC THINPACK™ FLATPACK



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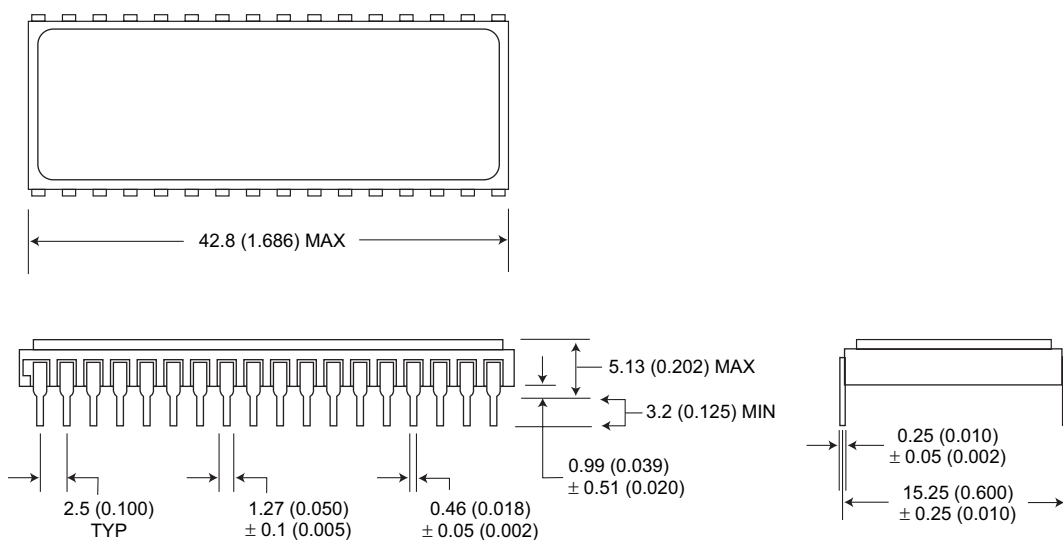
PACKAGE 226: 36 LEAD, CERAMIC FLAT PACK



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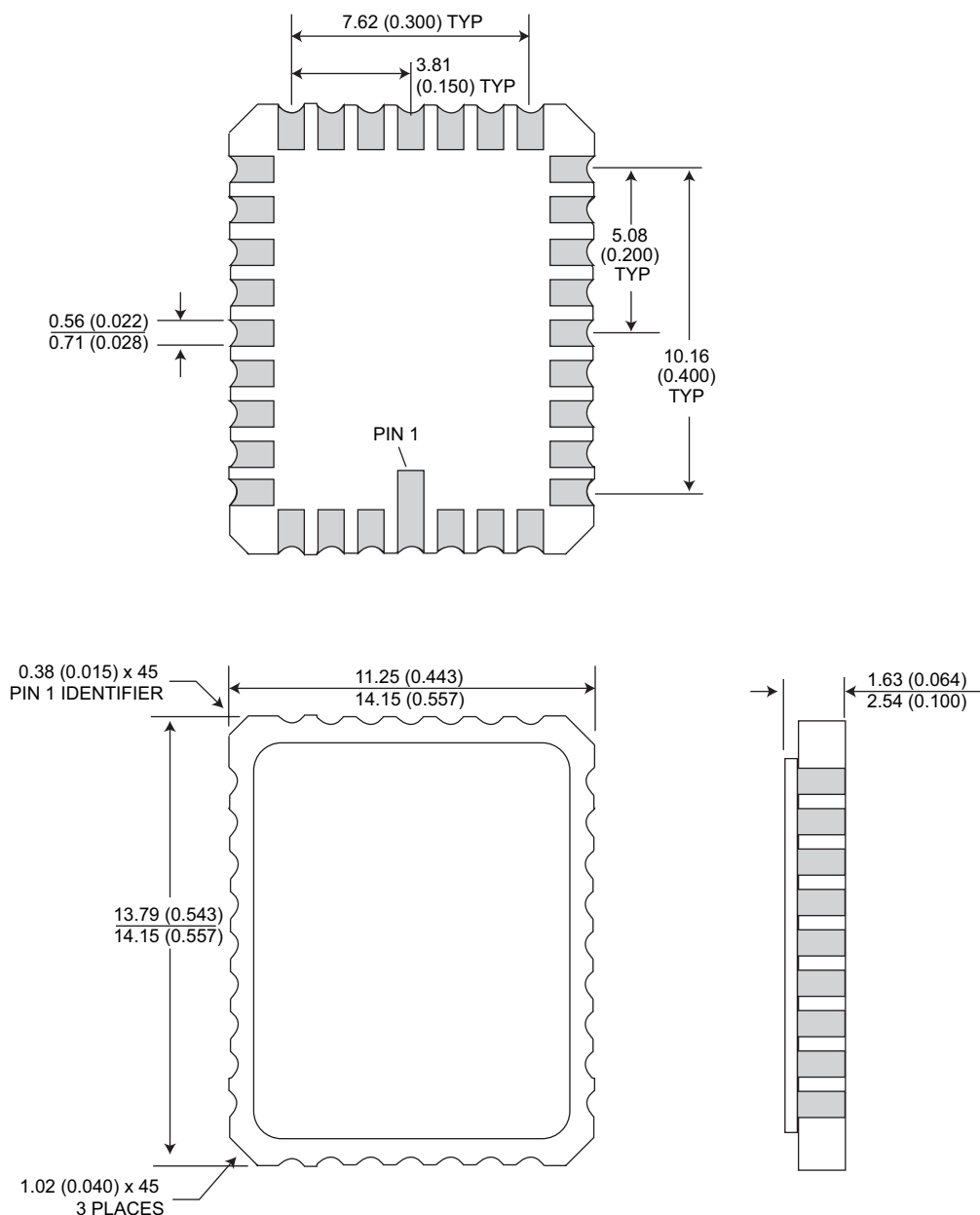
PACKAGE 300: 32 PIN, CERAMIC DIP, SINGLE CAVITY SIDE BRAZED



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PACKAGE 300: 32 PIN, CERAMIC DIP, SINGLE CAVITY SIDE BRAZED



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**ORDERING INFORMATION**

WHITE ELECTRONIC DESIGNS CORP. _____ **W M S 512K 8 X - XXX X X X**

MONOLITHIC _____

SRAM _____

ORGANIZATION, 512K X 8 _____

IMPROVEMENT MARK: _____
BLANK = STANDARD
L = LOW POWER DATA RETENTION

ACCESS TIME (NS) _____

PACKAGE: _____
C = 32 PIN CERAMIC 0.600" DIP (PACKAGE 300)
CL = 32 PIN RECTANGULAR CERAMIC LEADLESS CHIP CARRIER (PACKAGE 601)
DE = 32 LEAD CERAMIC SOJ (PACKAGE 101) EVOLUTIONARY
DJ = 36 LEAD CERAMIC SOJ (PACKAGE 100)
F = 36 LEAD CERAMIC FLAT PACK (PACKAGE 226)
FF = 32 LEAD CERAMIC THINPACK™ FLAT PACK (PACKAGE 321)

DEVICE GRADE: _____
Q = MIL-STD-883 COMPLIANT
M = MILITARY SCREENED -55°C ≤ TA ≤ 125°C
I = INDUSTRIAL -40°C ≤ TA ≤ 85°C
C = COMMERCIAL 0°C ≤ TA ≤ 70°C

LEAD FINISH: _____
BLANK = GOLD PLATED LEADS
A = SOLDER DIP LEADS



DEVICE TYPE	SPEED	PACKAGE	SMD NO.
512K x 8 SRAM Monolithic	55ns	32 pin DIP (C)	5962-95613 05HYX
512K x 8 SRAM Monolithic	45ns	32 pin DIP (C)	5962-95613 06HYX
512K x 8 SRAM Monolithic	35ns	32 pin DIP (C)	5962-95613 07HYX
512K x 8 SRAM Monolithic	25ns	32 pin DIP (C)	5962-95613 08HYX
512K x 8 SRAM Monolithic	20ns	32 pin DIP (C)	5962-95613 09HYX
512K x 8 SRAM Monolithic	17ns	32 pin DIP (C)	5962-95613 10HYX
512K x 8 SRAM Monolithic	15ns	32 pin DIP (C)	5962-95613 14HYX
512K x 8 SRAM Monolithic	55ns	32 lead SOJ Evol (DE)	5962-95613 05HTX
512K x 8 SRAM Monolithic	45ns	32 lead SOJ Evol (DE)	5962-95613 06HTX
512K x 8 SRAM Monolithic	35ns	32 lead SOJ Evol (DE)	5962-95613 07HTX
512K x 8 SRAM Monolithic	25ns	32 lead SOJ Evol (DE)	5962-95613 08HTX
512K x 8 SRAM Monolithic	20ns	32 lead SOJ Evol (DE)	5962-95613 09HTX
512K x 8 SRAM Monolithic	17ns	32 lead SOJ Evol (DE)	5962-95613 10HTX
512K x 8 SRAM Monolithic	15ns	32 lead SOJ Evol (DE)	5962-95613 14HTX
512K x 8 SRAM Monolithic	55ns	36 lead SOJ (DJ)	5962-95613 05HZX
512K x 8 SRAM Monolithic	45ns	36 lead SOJ (DJ)	5962-95613 06HZX
512K x 8 SRAM Monolithic	35ns	36 lead SOJ (DJ)	5962-95613 07HZX
512K x 8 SRAM Monolithic	25ns	36 lead SOJ (DJ)	5962-95613 08HZX
512K x 8 SRAM Monolithic	20ns	36 lead SOJ (DJ)	5962-95613 09HZX
512K x 8 SRAM Monolithic	17ns	36 lead SOJ (DJ)	5962-95613 10HZX
512K x 8 SRAM Monolithic	15ns	36 lead SOJ (DJ)	5962-95613 14HZX
512K x 8 SRAM Monolithic	55ns	36 lead Flatpack (F)	5962-95613 05HXX
512K x 8 SRAM Monolithic	45ns	36 lead Flatpack (F)	5962-95613 06HXX
512K x 8 SRAM Monolithic	35ns	36 lead Flatpack (F)	5962-95613 07HXX
512K x 8 SRAM Monolithic	25ns	36 lead Flatpack (F)	5962-95613 08HXX
512K x 8 SRAM Monolithic	20ns	36 lead Flatpack (F)	5962-95613 09HXX
512K x 8 SRAM Monolithic	17ns	36 lead Flatpack (F)	5962-95613 10HXX
512K x 8 SRAM Monolithic	15ns	36 lead Flatpack (F)	5962-95613 14HXX