AMERICAN MICROSYSTEMS, INC.

Standard Products

BATTERY VOLTAGE

S63B1024

June 1997

1 Megabit (64K x16) CMOS Mask-Programmable ROM

Features

- Fast Read Access Time - 70ns
- Low Power CMOS Operation
  - 20µA max. Standby
  - 25mA max. Active at 5MHz
- Wide Selection of JEDEC Standard Packages
  - 40-Lead 600-mil PDIP
  - 44-Pad PLCC
  - 40-Lead TSOP
  - 48-Lead TSOP
- 2.7V–3.6V Supply
- High Reliability CMOS Technology
  - 2000V ESD Protection
  - 200mA Latchup Immunity
- Two-line Control
- CMOS and TTL Compatible Inputs and Outputs
- Full Commercial and Industrial Temperature Ranges
- Designed for Battery Supply Operation

Description

The S63B1024 is a low-power, high performance 1,048,576 bit Mask Programmable Read Only Memory (ROM) organized 64K x 16. It requires only one power supply in normal operation. Any word can be accessed in less than 70ns, eliminating the need for speed reducing WAIT states. The by-16 organization make this part ideal for high-performance 16 and 32 bit microprocessor systems.

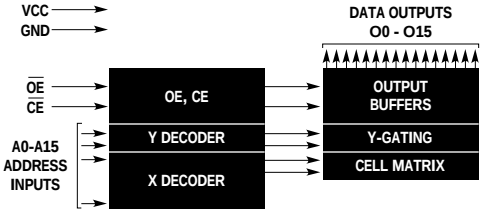
The S63B1024 typically consumes 15mA. Standby mode supply current is typically less than 10µA.

The S63B1024 is available in industry standard JEDEC-approved packages including: plastic PDIP, PLCC, and TSOP. The device features two-line control ($\overline{CE}$, $\overline{OE}$) to eliminate bus contention in high-speed systems.

With high density 64K word storage capability, the S63B1024 allows firmware to be stored reliably and to be accessed by the system without the delays of mass storage media.

AMI's S63B1024 has additional features to ensure high quality and efficient production use.

Block Diagram



Absolute Maximum Ratings[1]

Temperature Under Bias	-55°C to +125°C
Storage Temperature	-65°C to +150°C
Voltage on Any Pin with Respect to Ground	-2.0V to +6V[2]

NOTE: 1. Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent danger to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

2. Minimum voltage is -0.6V DC which may undershoot to -2.0V for pulses less than 20 ns. Maximum pin voltage is V_{CC}+0.6V DC which may overshoot to +6.0V for pulses of less than 20 ns.

Pin Configurations

PIN NAME	FUNCTION
A0-A15	Addresses
O0-O15	Outputs
$\overline{CE}$	Chip Enable
$\overline{OE}$	Output Enable
NC	No Connect

NOTE: Both GND pins must be connected.

Pin Capacitance (f = 1 MHz T = 25°C)

	TYPICAL	MAXIMUM	UNITS	CONDITIONS
C_{IN}	4	10	pF	V_{IN} = 0V
C_{OUT}	8	12	pF	V_{OUT} = 0V

NOTE: Typical values for nominal supply voltage. This parameter is only sampled and is not 100% tested.

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Operating Modes

MODE/PIN	$\overline{CE}$	$\overline{OE}$	Ai	V_{CC}	OUTPUTS
Read	V_{IL}	V_{IL}	Ai	V_{CC}	D_{OUT}
Output Disable	X	V_{IH}	X	V_{CC}	High Z
Standby	V_{IH}	X	X	V_{CC}	High Z

DC and AC Operating Conditions

S63B1024				
		-70	-90	-120
Operating Temperature	Commercial	0°C - 70°C	0°C - 70°C	0°C - 70°C
	Industrial	-40°C - 85°C	-40°C - 85°C	-40°C - 85°C
V_{dd} Power Supply		2.7V – 3.6V	2.7V – 3.6V	2.7V – 3.6V

DC and Operating Characteristics

2.7V to 3.6V

SYMBOL	PARAMETER	CONDITION	APP.	MIN	MAX	UNITS
I_{LI}	Input Load Current	V_{IN} = 0V to V_{CC}	Com., Ind.		±1	µA
I_{LO}	Output Leakage Current	V_{OUT} = 0V to V_{CC}	Com., Ind.		±5	µA
I_{SB}	V_{CC} Standby Current	$\overline{CE}$ = V_{CC} ± 0.3V			20	µA
I_{CC}	V_{CC} Active Current	f = 5MHz, I_{OUT} = 0mA, $\overline{CE}$ = V_{IL} ,V_{CC} = 3.6V	Com.		25	mA
			Ind.		30	mA
V_{IL}	Input Low Voltage	V_{CC} = 3.0V to 3.6V			0.8	V
		V_{CC} = 2.7V to 3.6V			0.2 x V_{CC}	V
V_{IH}	Input High Voltage	V_{CC} = 3.0V to 3.6V		2.2		V
		V_{CC} = 2.7V to 3.6V		0.7 x V_{CC}		V
V_{OL}	Output Low Voltage	2mA			0.4	V
		100µA			0.2	V
		20µA			0.1	V
V_{OH}	Output High Voltage	-1mA		2.2		V
		-100µA		V_{CC} – 0.2		V
		-20µA		V_{CC} – 0.1		V

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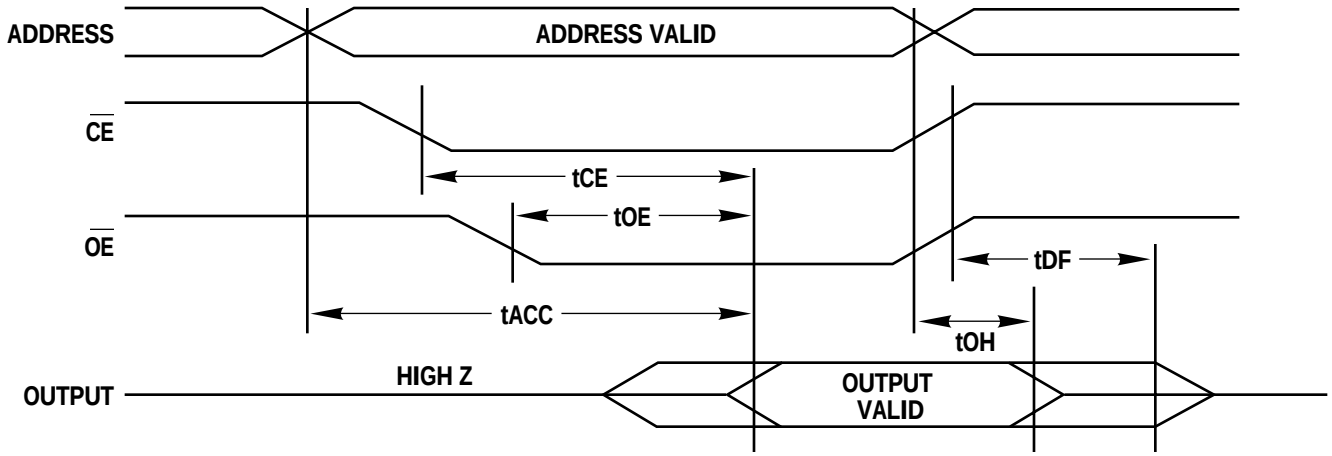
AC Characteristics for Read Operations

2.7V - 3.6V

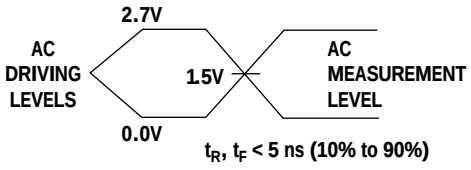
S63B1024								
SYMBOL	PARAMETER	CONDITION	-70		-90		-120	
			Min.	Max.	Min.	Max.	Min.	Max.
t_{ACC}[3]	Address to Output Delay	$\overline{CE}$=$\overline{OE}$=V_{IL}		70ns		90ns		120ns
t_{CE}[2]	$\overline{CE}$ to Output Delay	$\overline{OE}$=V_{IL}		70ns		90ns		120ns
t_{OE}[2,3]	$\overline{OE}$ to Output Delay	$\overline{CE}$=V_{IL}		30ns		35ns		35ns
t_{DF}[4,5]	$\overline{OE}$ or $\overline{CE}$ High to Output Float			25ns		25ns		30ns
t_{OH}	Output Hold from Addresses, $\overline{CE}$ or $\overline{OE}$ whichever occurred first		0ns		0ns		0ns	

AC Waveforms[1]

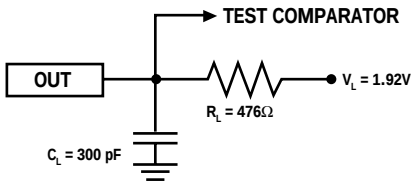


Notes:1. Timing measurement references are 1.5V. Input AC driving levels are 0V and 2.7V.
2. $\overline{OE}$ may be delayed up to t_{CE}-t_{OE} after the falling edge of $\overline{CE}$ without impact on t_{CE}.
3. $\overline{OE}$ may be delayed up to t_{ACC}-t_{OE} after the address is valid without impact on t_{ACC}.
4. This parameter is only sampled and is not 100% tested.
5. Output float is defined as the point when data is no longer driven.

Input Test Waveforms and Measurement Levels



Output Test Load



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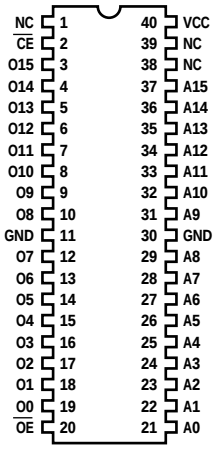
40-Pin PDIP Specifications

Description

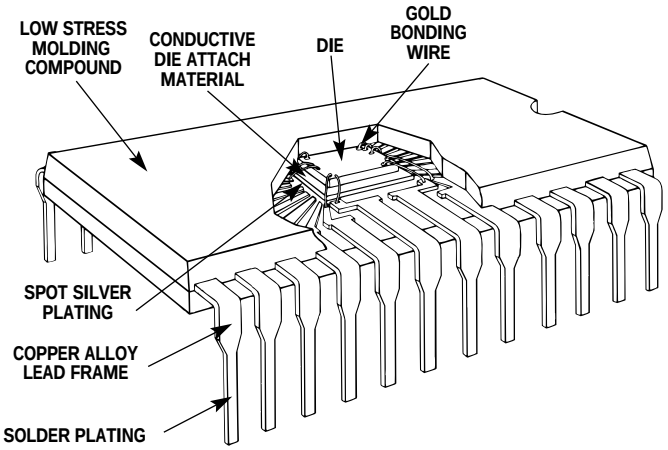
The Plastic Dual-In-Line Package (PDIP) meets widely accepted industry standard for MOS/VLSI applications. The package consists of a plastic body, transfer-molded around the leadframe and die. The leadframe is copper alloy, with external pins solder plated.

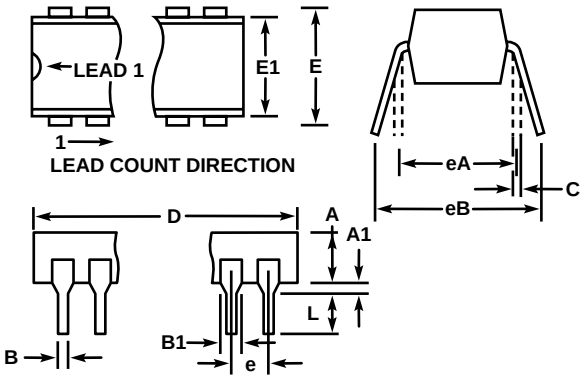
Internally, there is 125µ inch silver spot plating on the die attach pad and on each bonding fingertip. These fingers are electrically connected to the die by thermosonic gold ball bonding techniques.

Pin Configuration



Package Description and Outline Dimensions





PDIP Specifications

	SYMBOL													
	A	A1	B	B1	C	D	E	E1	e	eA	eB	L	B2	S
MAX	0.200	-	0.020	0.060	0.012	2.455	0.610	0.560	0.100 TYP	-	0.686	0.100 MIN	-	-
MIN	-	0.015	0.015	0.040	0.008	1.980	0.580	0.520		0.580	-		-	-

NOTE: 1. All measurements in inches.
2. Data is subject to change. Contact the factory for most current specifications.

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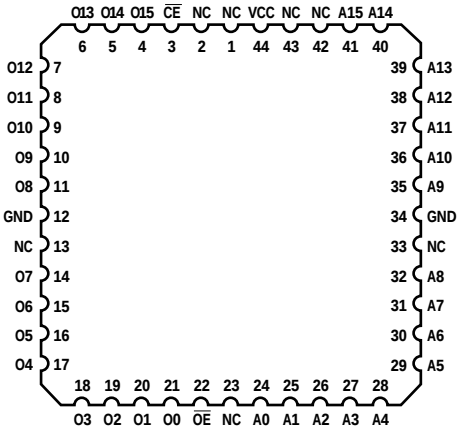
44-Pin PLCC Specifications

Description

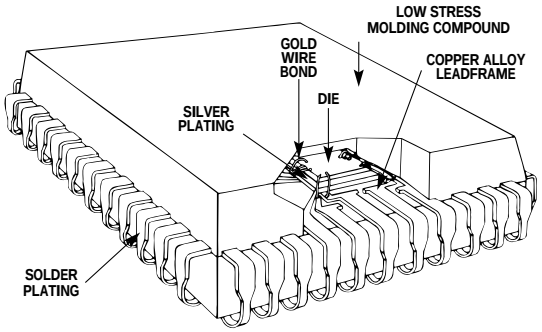
The PLCC is transfer molded and thermosonic wire bonded. Die is mounted on a copper alloy leadframe and external leads are solder plated to provide improved solderability.

Pin Configuration

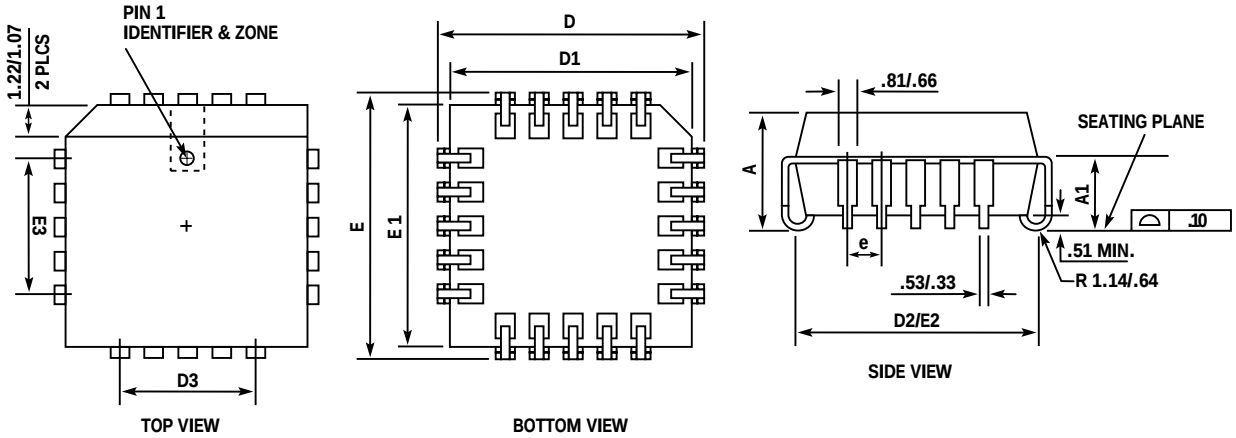


NOTE: PLCC package pins 1 and 23 are DON'T CONNECT

Package Description



Package Outline Dimensions



PLCC Specifications

	SYMBOL										
	A	A1	D1	D2	D3	E1	E2	E3	e	D	E
MAX	4.57	3.04	16.66	16.00	12.70 BSC	16.66	16.00	12.70 BSC	1.27 BSC	17.65	17.65
MIN	4.20	2.29	16.51	14.99		16.51	14.99			17.40	17.40

NOTE: 1. All measurements in millimeters.
2. Data is subject to change. Contact the factory for most current specifications.

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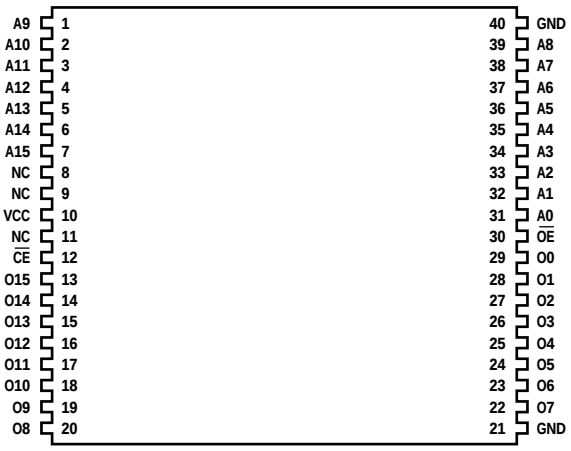
40-Pin TSOP Specifications

Description

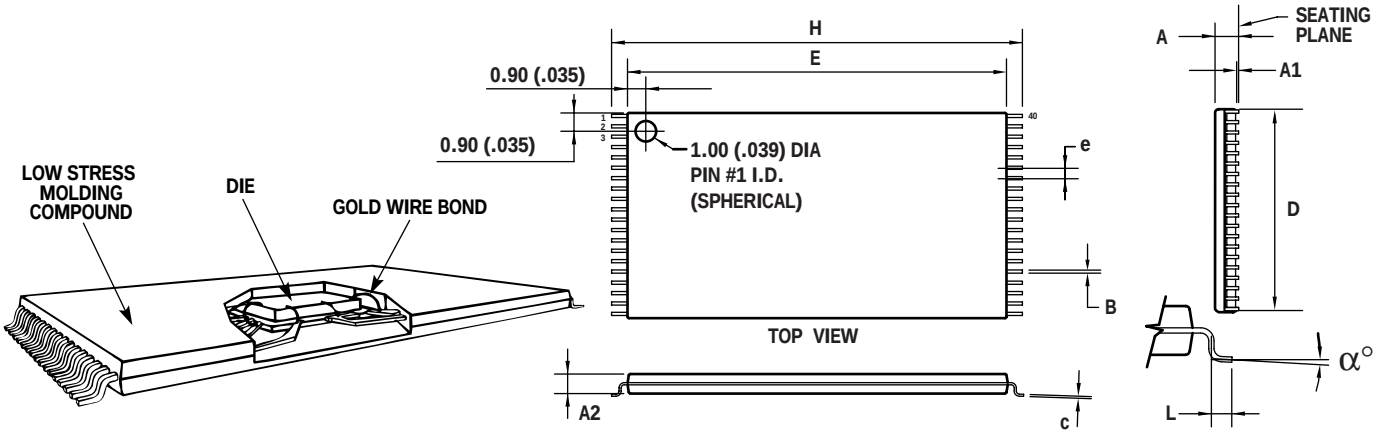
The Type I Thin Small Outline Package (TSOP) is a thin ends only package. This package is constructed using the latest low stress molding compounds and bonding technology to provide a package with total body thickness of less than 1.90mm.

This package is popular for ROM applications in memory cards and other thin card applications.

Pin Configuration



Package Description and Outline Dimensions



TSOP Specifications

SYMBOL											
	A	A1	A2	B	D	E	H	e	c	L	α°
MAX	1.20	0.15	1.10	0.30	10.10	18.50	20.20	0.50 BSC	0.16	0.70	5
MIN	-	0	0.95	0.15	9.90	18.30	19.80		0.10	0.50	0

NOTE: 1. All measurements in millimeters.
2. Data is subject to change. Contact the factory for most current specifications.

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1 Megabit (64K x16) CMOS Mask-Programmable ROM

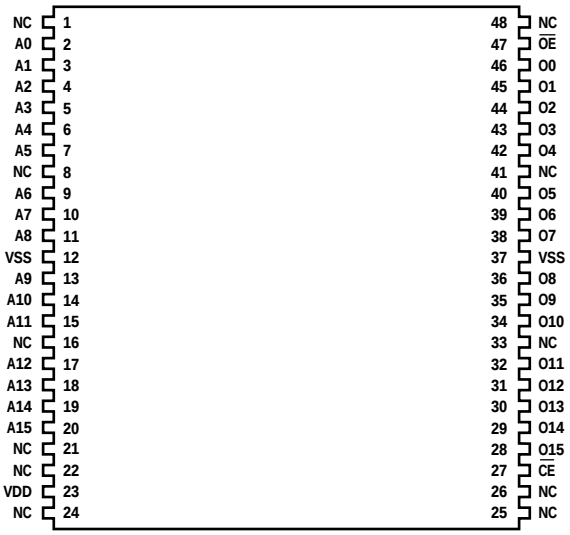
48-Pin TSOP Specifications

Description

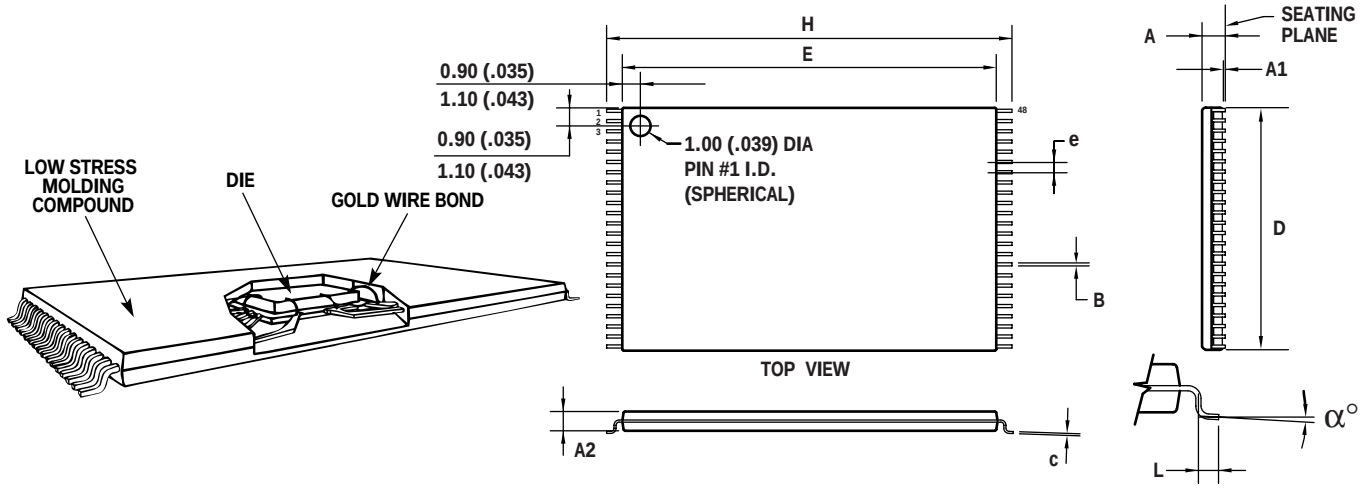
The Type I Thin Small Outline Package (TSOP) is a thin ends only package. This package is constructed using the latest low stress molding compounds and bonding technology to provide a package with total body thickness of less than 1.90mm.

This package is popular for ROM applications in memory cards and other thin card applications.

Pin Configuration



Package Description and Outline Dimensions



TSOP Specifications

	SYMBOL										
	A	A1	A2	B	D	E	H	e	c	L	α°
MAX	1.20	0.15	1.05	0.25	12.20	18.50	20.20	0.50 BSC	0.20	0.60	5
MIN	-	0.00	0.95	0.15	11.80	18.30	19.80		0.10	0.40	0

NOTE: 1. All measurements in millimeters.

2. Data is subject to change. Contact the factory for most current specifications.

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