

## S7IPL-J Based MCPs

**Stacked Multi-Chip Product (MCP) Flash Memory and  
RAM 256M/128/64/32 Megabit (16/8/4/2M x 16-bit) CMOS 3.0  
Volt-only Simultaneous Operation Page Mode Flash  
Memory and 64/32/16/8/4 Megabit (4M/2M/1M/512K/256K x  
16-bit) Static RAM/Pseudo Static RAM**



*Data Sheet*

**ADVANCE  
INFORMATION**

**Notice to Readers:** The Advance Information status indicates that this document contains information on one or more products under development at Spansion LLC. The information is intended to help you evaluate this product. Do not design in this product without contacting the factory. Spansion LLC reserves the right to change or discontinue work on this proposed product without notice.

## Notice On Data Sheet Designations

SpanSion LLC issues data sheets with Advance Information or Preliminary designations to advise readers of product information or intended specifications throughout the product life cycle, including development, qualification, initial production, and full production. In all cases, however, readers are encouraged to verify that they have the latest information before finalizing their design. The following descriptions of SpanSion data sheet designations are presented here to highlight their presence and definitions.

### Advance Information

The Advance Information designation indicates that SpanSion LLC is developing one or more specific products, but has not committed any design to production. Information presented in a document with this designation is likely to change, and in some cases, development on the product may discontinue. SpanSion LLC therefore places the following conditions upon Advance Information content:

"This document contains information on one or more products under development at SpanSion LLC. The information is intended to help you evaluate this product. Do not design in this product without contacting the factory. SpanSion LLC reserves the right to change or discontinue work on this proposed product without notice."

### Preliminary

The Preliminary designation indicates that the product development has progressed such that a commitment to production has taken place. This designation covers several aspects of the product life cycle, including product qualification, initial production, and the subsequent phases in the manufacturing process that occur before full production is achieved. Changes to the technical specifications presented in a Preliminary document should be expected while keeping these aspects of production under consideration. SpanSion places the following conditions upon Preliminary content:

"This document states the current technical specifications regarding the SpanSion product(s) described herein. The Preliminary status of this document indicates that product qualification has been completed, and that initial production has begun. Due to the phases of the manufacturing process that require maintaining efficiency and quality, this document may be revised by subsequent versions or modifications due to changes in technical specifications."

### Combination

Some data sheets will contain a combination of products with different designations (Advance Information, Preliminary, or Full Production). This type of document will distinguish these products and their designations wherever necessary, typically on the first page, the ordering information page, and pages with DC Characteristics table and AC Erase and Program table (in the table notes). The disclaimer on the first page refers the reader to the notice on this page.

### Full Production (No Designation on Document)

When a product has been in production for a period of time such that no changes or only nominal changes are expected, the Preliminary designation is removed from the data sheet. Nominal changes may include those affecting the number of ordering part numbers available, such as the addition or deletion of a speed option, temperature range, package type, or  $V_{IO}$  range. Changes may also include those needed to clarify a description or to correct a typographical error or incorrect specification. SpanSion LLC applies the following conditions to documents in this category:

"This document states the current technical specifications regarding the SpanSion product(s) described herein. SpanSion LLC deems the products to have been in sufficient production volume such that subsequent versions of this document are not expected to change. However, typographical or specification corrections, or modifications to the valid combinations offered may occur."

Questions regarding these document designations may be directed to your local AMD or Fujitsu sales office.

# S71PL-J Based MCPs

Stacked Multi-Chip Product (MCP) Flash Memory and RAM 256M/I28/64/32 Megabit (I6/8/4/2M x I6-bit) CMOS 3.0 Volt-only Simultaneous Operation Page Mode Flash Memory and 64/32/I6/8/4 Megabit (4M/2M/IM/512K/256K x I6-bit) Static RAM/Pseudo Static RAM



Data Sheet

ADVANCE  
INFORMATION

## Distinctive Characteristics

### MCP Features

- Power supply voltage of 2.7 V to 3.1 V
- High performance
  - 65 ns (65 ns Flash, 70 ns pSRAM)
- Packages
  - 7 x 9 x 1.2mm 56 ball FBGA
  - 8 x 11.6 x 1.2mm 64 ball FBGA
  - 8 x 11.6 x 1.4mm 84 ball FBGA
- Operating Temperature
  - -25°C to +85°C
  - -40°C to +85°C

## General Description

The S71PL series is a product line of stacked Multi-Chip Product (MCP) packages and consists of:

- One or more S29PL (Simultaneous Read/Write) Flash memory die
- pSRAM or SRAM (See "Referenced Data Sheets" on page 2)

The 256Mb Flash memory consists of two S29PL127J devices. In this case, CE#f2 is used to access the second Flash and no extra address lines are required.

The products covered by this document are listed in the table below:

		Flash Memory Density			
		32Mb	64Mb	I28Mb (Note 2)	256Mb (Note 2)
pSRAM Density	4 Mb	S71PL032J40			
	8 Mb	S71PL032J80	S71PL064J80		
	16 Mb	S71PL032JA0	S71PL064JA0		
	32 Mb		S71PL064JB0	S71PL127JB0	
	64 Mb			S71PL127JC0	S71PL254JC0

		Flash Memory Density	
		32Mb	64Mb
SRAM Density (Note 1)	4 Mb	S71PL032J04	
	8 Mb	S71PL032J08	S71PL064J08
	16 Mb		S71PL064J0A

#### Notes:

1. Not recommended for new designs; use pSRAM based MCPs instead.
2. Not recommended for new designs; use S71PL127N and S71PL256N instead.

Publication Number S71PL-J\_00 Revision B Amendment 3 Issue Date March 17, 2006

This document contains information on one or more products under development at Spansion LLC. The information is intended to help you evaluate this product. Do not design in this product without contacting the factory. Spansion LLC reserves the right to change or discontinue work on this proposed product without notice.

For detailed specifications, please refer to the individual data sheets listed in the following table.

**Referenced Data Sheets**

Document	Publication Identification Number (PID)
S29PL-J	S29PL-J_M0
pSRAM Type 1	psram_12
pSRAM Type 2	psram_15
8 Mb pSRAM Type 3	psram_25
16 Mb pSRAM Type 3	psram_06
pSRAM Type 4	psram_18
pSRAM Type 5	psram_21
pSRAM Type 6	psram_14
pSRAM Type 7	psram_13
4 Mb/8 Mb SRAM Type 1	sram_02
16 Mb SRAM Type 1	sram_06
SRAM Type 4	sram_07

## Product Selector Guide

### 32Mb Flash Memory

Device-Model#	Flash Access time (ns)	(p)SRAM density	(p)SRAM Access time (ns)	pSRAM type	Package
S71PL032J04-0B	65	4M SRAM	70	SRAM1	TSC056
S71PL032J04-0K	65	4M SRAM	70	SRAM4	TSC056
S71PL032J40-0K	65	4M pSRAM	70	pSRAM4	TLC056
S71PL032J08-0B	65	8M SRAM	70	SRAM1	TSC056
S71PL032J80-0F	65	8M pSRAM	70	pSRAM5	TSC056
S71PL032J80-Q7	65	8M pSRAM	70	pSRAM1	TSC056
S71PL032J80-QF	65	8M pSRAM	70	pSRAM3	TSC056
S71PL032JA0-0K	65	16Mb pSRAM	70	pSRAM1	TSC056
S71PL032JA0-QF	65	16Mb pSRAM	70	pSRAM3	TSC056
S71PL032JA0-0Z	65	16M pSRAM	70	pSRAM7	TLC056

### 64Mb Flash Memory

Device-Model#	Flash Access time (ns)	(p)SRAM density	(p)SRAM Access time (ns)	(p)SRAM type	Package
S71PL064J08-0B	65	8M SRAM	70	SRAM1	TLC056
S71PL064J80-0K	65	8M pSRAM	70	pSRAM1	TSC056
S71PL064J0A-0S	65	16M SRAM	70	SRAM1	TLC056
S71PL064JA0-0Z	65	16M pSRAM	70	pSRAM7	TLC056
S71PL064JA0-0B	65	16M pSRAM	70	pSRAM3	TLC056
S71PL064JA0-07	65	16M pSRAM	70	pSRAM1	TLC056
S71PL064JA0-0P	65	16M pSRAM	70	pSRAM7	TLC056
S71PL064JB0-0B	65	32M pSRAM	70	pSRAM2	TLC056
S71PL064JB0-0U	65	32M pSRAM	70	pSRAM6	TLC056

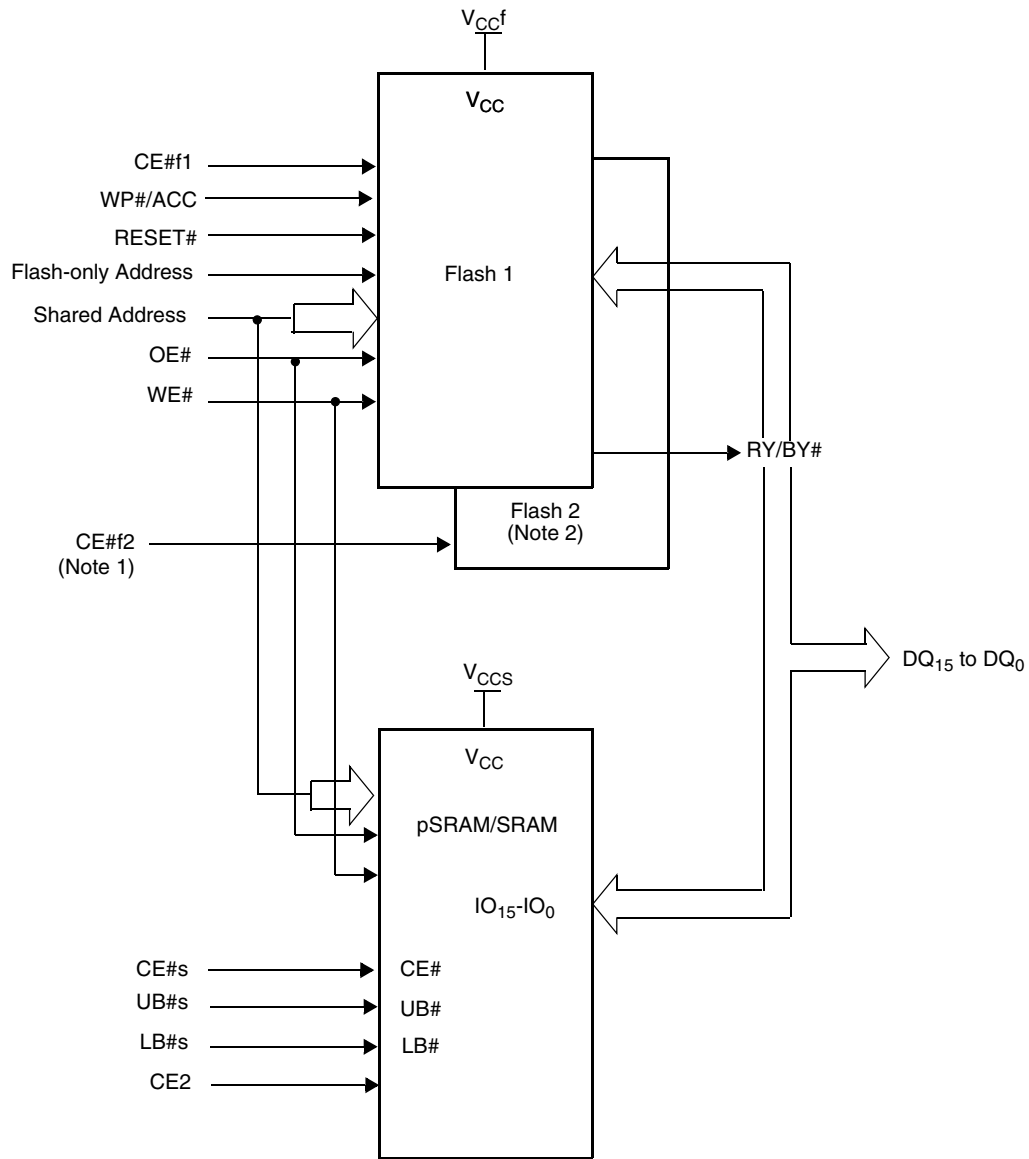
**128Mb Flash Memory** (Not recommended for new designs; use S7IPL127N instead)

Device-Model#	Flash Access time (ns)	pSRAM density	pSRAM Access time (ns)	pSRAM type	Package
S71PL127JB0-9Z	65	32M pSRAM	70	pSRAM7	TLA064
S71PL127JB0-9U	65	32M pSRAM	70	pSRAM6	TLA064
S71PL127JB0-9B	65	32M pSRAM	70	pSRAM2	TLA064
S71PL127JC0-9B	65	64M pSRAM	70	pSRAM2	TLA064
S71PL127JC0-9Z	65	64M pSRAM	70	pSRAM7	TLA064
S71PL127JC0-9U	65	64M pSRAM	70	pSRAM6	TLA064

**256Mb Flash Memory (2xS29PL127J)** (Not recommended for new designs: use S7IPL256N instead)

Device-Model#	Flash Access time (ns)	pSRAM density	pSRAM Access time (ns)	pSRAM type	Package
S71PL254JC0-TB	65	64M pSRAM	70	pSRAM2	FTA084
S71PL254JC0-TZ	65	64M pSRAM	70	pSRAM7	FTA084

## MCP Block Diagram

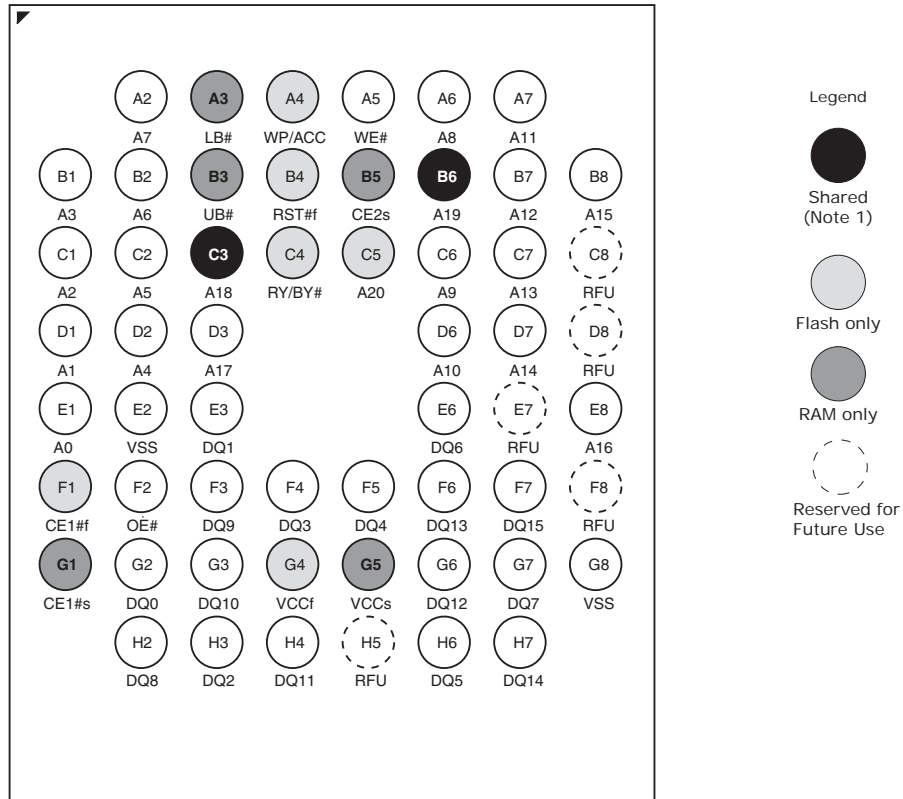


**Notes:**

1. For 1 Flash + pSRAM,  $CE\#f1 = CE\#$ . For 2 Flash + pSRAM,  $CE\# = CE\#f1$  and  $CE\#f2$  is the chip-enable for the second Flash.
2. For 256Mb only, Flash 1 = Flash 2 = S29PL127J.

# Connection Diagram (S7IPL032J)

56-ball Fine-Pitch Ball Grid Array  
(Top View, Balls Facing Down)



**Notes:**

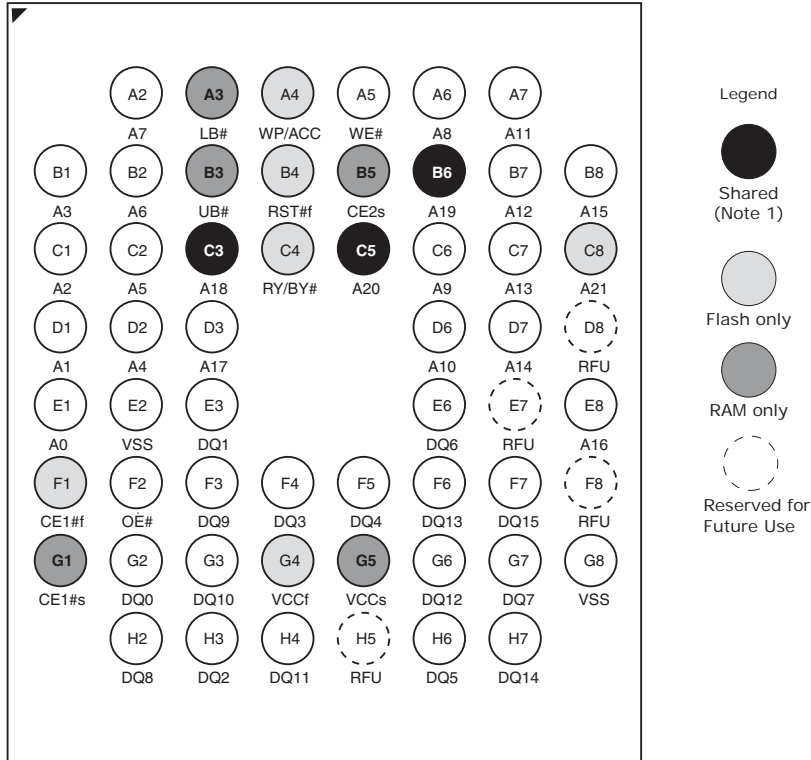
1. May be shared depending on density.
  - A19 is shared for the 16M pSRAM configuration.
  - A18 is shared for the 8M pSRAM and above configurations.
2. Connecting all  $V_{CC}$  and  $V_{SS}$  balls to  $V_{CC}$  and  $V_{SS}$  is recommended.

MCP	Flash-only Addresses	Shared Addresses
S71PL032JA0	A20	A19-A0
S71PL032J80	A20-A19	A18-A0
S71PL032J08	A20-A19	A18-A0
S71PL032J40	A20-A18	A17-A0
S71PL032J04	A20-A18	A17-A0



# Connection Diagram (S7IPL064J)

56-ball Fine-Pitch Ball Grid Array  
(Top View, Balls Facing Down)



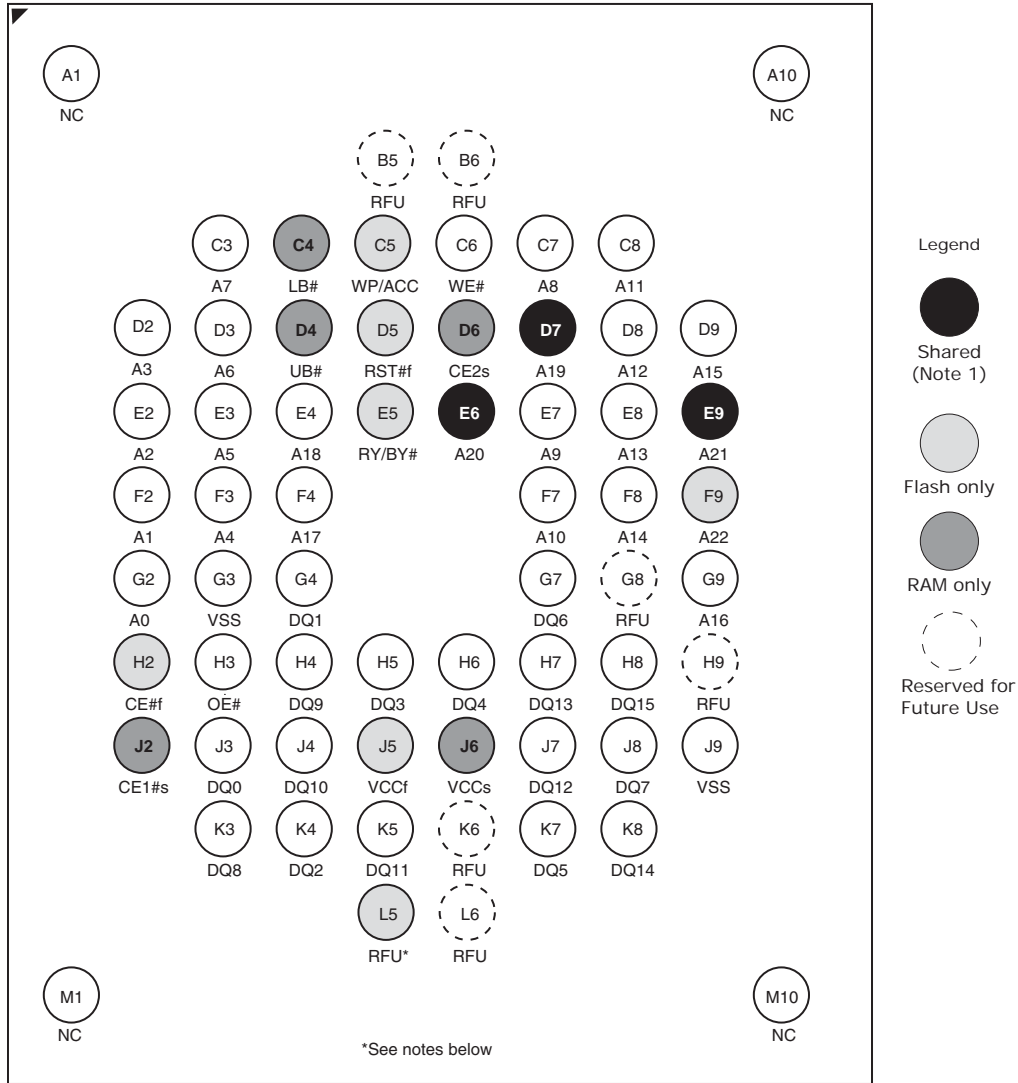
**Notes:**

1. May be shared depending on density.
  - A20 is shared for the 32M pSRAM configuration.
  - A19 is shared for the 16M pSRAM and above configurations.
  - A18 is shared for the 8M pSRAM and above configurations.
2. Connecting all V<sub>CC</sub> and V<sub>SS</sub> balls to V<sub>CC</sub> and V<sub>SS</sub> is recommended.

MCP	Flash-only Addresses	Shared Addresses
S71PL064JB0	A21	A20-A0
S71PL064JA0	A21-A20	A19-A0
S71PL064JOA	A21-A20	A19-A0
S71PL064J80	A21-A19	A18-A0
S71PL064J08	A21-A19	A18-A0

# Connection Diagram (S7IPL127J)

64-ball Fine-Pitch Ball Grid Array  
(Top View, Balls Facing Down)



**Notes:**

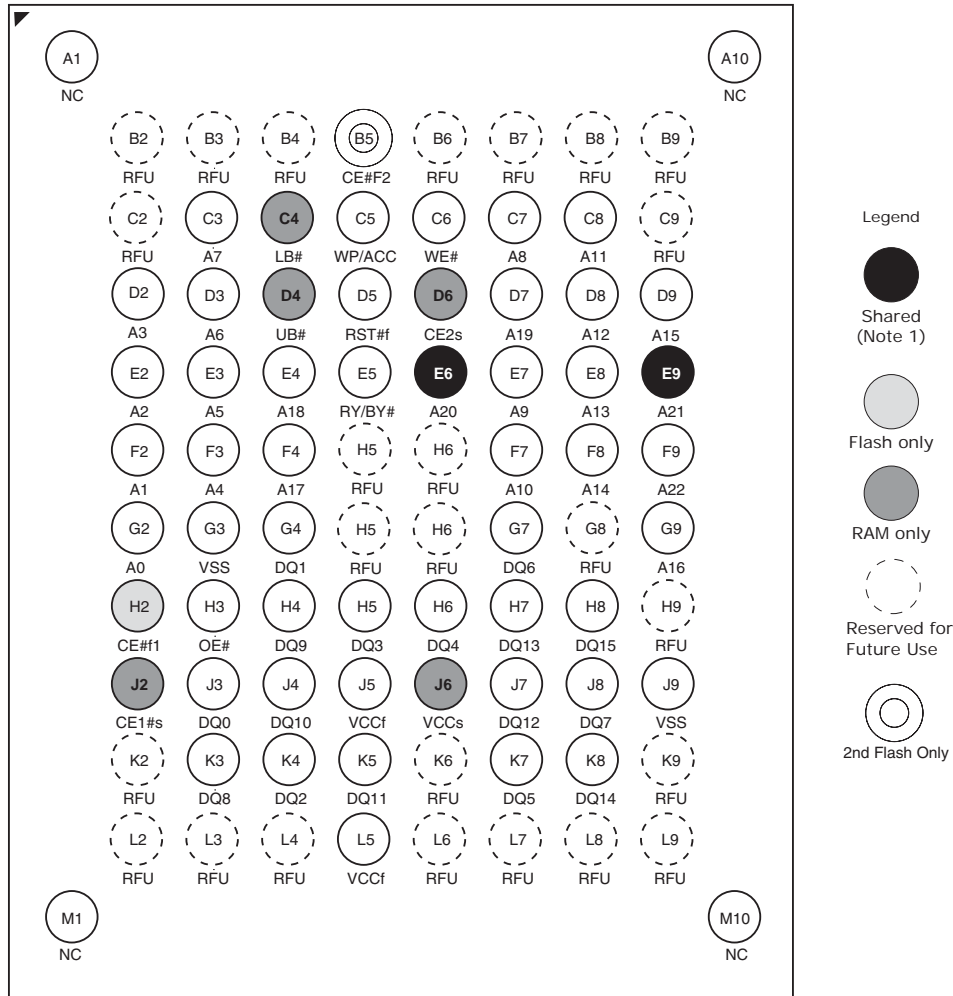
1. May be shared depending on density.
  - A21 is shared for the 64M pSRAM configuration.
  - A20 is shared for the 32M pSRAM and above configurations.
2. A19 is shared for the 16M pSRAM and above configurations.

MCP	Flash-only Addresses	Shared Addresses
S71PL127JC0	A22	A21-A0
S71PL127JB0	A22-A21	A20-A0

3. Connecting all  $V_{CC}$  and  $V_{SS}$  balls to  $V_{CC}$  &  $V_{SS}$  is recommended.
4. Ball L5 will be  $V_{CCF}$  in the 84-ball density upgrades. Do not connect to  $V_{SS}$  or any other signal.

# Connection Diagram (S7IPL254J)

84-ball Fine-Pitch Ball Grid Array  
(Top View, Balls Facing Down)



**Notes:**

1. May be shared depending on density.
  - A21 is shared for the 64M pSRAM configuration.
  - A20 is shared for the 32M pSRAM configuration.

MCP	Flash-only Addresses	Shared Addresses
S71PL254JCO	A22	A21-A0

2. Connecting all Vcc & Vss balls to Vcc & Vss is recommended.

### Special Handling Instructions For FBGA Package

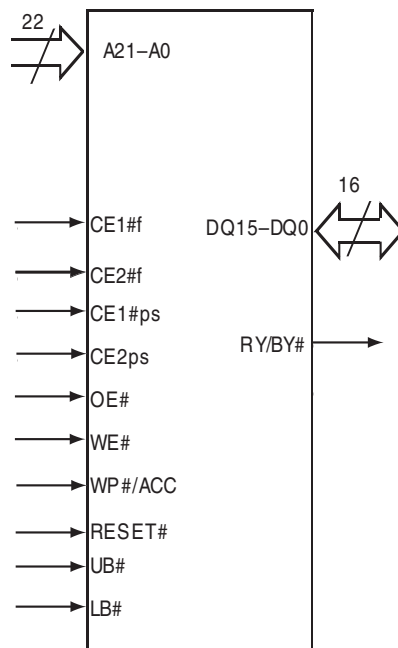
Special handling is required for Flash Memory products in FBGA packages.

Flash memory devices in FBGA packages may be damaged if exposed to ultrasonic cleaning methods. The package and/or data integrity may be compromised if the package body is exposed to temperatures above 150°C for prolonged periods of time.

## Pin Description

A21-A0	=	22 Address Inputs (Common)
DQ15-DQ0	=	16 Data Inputs/Outputs (Common)
CE1#f	=	Chip Enable 1 (Flash)
CE#f2	=	Chip Enable 2 (Flash)
CE1#ps	=	Chip Enable 1 (pSRAM)
CE2ps	=	Chip Enable 2 (pSRAM)
OE#	=	Output Enable (Common)
WE#	=	Write Enable (Common)
RY/BY#	=	Ready/Busy Output (Flash 1)
UB#	=	Upper Byte Control (pSRAM)
LB#	=	Lower Byte Control (pSRAM)
RESET#	=	Hardware Reset Pin, Active Low (Flash 1)
WP#/ACC	=	Hardware Write Protect/Acceleration Pin (Flash)
V <sub>CCf</sub>	=	Flash 3.0 volt-only single power supply (see Product Selector Guide for speed options and voltage supply tolerances)
V <sub>CCPS</sub>	=	pSRAM Power Supply
V <sub>SS</sub>	=	Device Ground (Common)
NC	=	Pin Not Connected Internally

## Logic Symbol



## Ordering Information

The order number is formed by a valid combinations of the following:

S7IPL	I27	J	B0	BA	W	9	Z	0
								<p><b>PACKING TYPE</b></p> <p>0 = Tray 2 = 7" Tape and Reel 3 = 13" Tape and Reel</p> <p><b>MODEL NUMBER</b></p> <p>See the Valid Combinations table.</p> <p><b>PACKAGE MODIFIER</b></p> <p>0 = 7 x 9mm, 1.2mm height, 56 balls (TLC056 or TSC065) 9 = 8 x 11.6mm, 1.2mm height, 64 balls (TLA064 or TSB064) T = 8 x 11.6mm, 1.4mm height, 84 balls (FTA084)</p> <p><b>TEMPERATURE RANGE</b></p> <p>W = Wireless (-25°C to +85°C)</p> <p><b>PACKAGE TYPE</b></p> <p>BA = Fine-pitch BGA Lead (Pb)-free compliant package BF = Fine-pitch BGA Lead (Pb)-free package</p> <p><b>pSRAM DENSITY</b></p> <p>C0 = 64Mb pSRAM B0 = 32Mb pSRAM A0 = 16Mb pSRAM 80 = 8Mb pSRAM 40 = 4Mb pSRAM 0A = 16Mb SRAM 08 = 8Mb SRAM 04 = 4Mb SRAM</p> <p><b>PROCESS TECHNOLOGY</b></p> <p>J = 110 nm, Floating Gate Technology</p> <p><b>FLASH DENSITY</b></p> <p>254 = 256Mb 127 = 128Mb 064 = 64Mb 032 = 32Mb</p> <p><b>PRODUCT FAMILY</b></p> <p>S71PL Multi-chip Product (MCP) 3.0-volt Simultaneous Read/Write, Page Mode Flash Memory and RAM</p>

S71PL032J Valid Combinations				Speed Options (ns)	(p)SRAM Type/Access Time (ns)	Package Marking
Base Ordering Part Number	Package & Temperature	Package Modifier/ Model Number	Packing Type			
S71PL032J04	BAW	OB	0, 2, 3 (Note 1)	65	SRAM2 / 70	(Note 2)
S71PL032J04		OK			SRAM4 / 70	
S71PL032J40		OK			pSRAM4 / 70	
S71PL032J80		OF			pSRAM5 / 70	
S71PL032J08		OB			SRAM2 / 70	
S71PL032J80		Q7			pSRAM1 / 70	
S71PL032J80		QF			pSRAM3 / 70	
S71PL032JA0		07			pSRAM1 / 70	
S71PL032JA0		QF			pSRAM3 / 70	
S71PL032JA0		OZ			pSRAM2 / 70	
S71PL032J04	BFW	OB	0, 2, 3 (Note 1)	65	SRAM2 / 70	(Note 2)
S71PL032J04		OK			SRAM4 / 70	
S71PL032J40		OK			pSRAM4 / 70	
S71PL032J80		OF			pSRAM5 / 70	
S71PL032J08		OB			SRAM2 / 70	
S71PL032J80		Q7			pSRAM1 / 70	
S71PL032J80		QF			pSRAM3 / 70	
S71PL032JA0		07			pSRAM1 / 70	
S71PL032JA0		QF			pSRAM3 / 70	
S71PL032JA0		OZ			pSRAM2 / 70	

S71PL064J Valid Combinations				Speed Options (ns)	(p)SRAM Type/ Access Time (ns)	Package Marking
Base Ordering Part Number	Package & Temperature	Package Modifier/ Model Number	Packing Type			
S71PL064J08	BAW	OB	0, 2, 3 (Note 1)	65	SRAM1 / 70	(Note 2)
S71PL064J80		OK			pSRAM1 / 70	
S71PL064J0A		OS			SRAM1 / 70	
S71PL064JA0		OB			pSRAM3 / 70	
S71PL064JA0		07			pSRAM1 / 70	
S71PL064JA0		OP			pSRAM7 / 70	
S71PL064JB0		QB			pSRAM2 / 70	
S71PL064JB0		OU			pSRAM6 / 70	
S71PL064J08	BFW	OB	0, 2, 3 (Note 1)	65	SRAM1 / 70	(Note 2)
S71PL064J80		OK			pSRAM1 / 70	
S71PI064J0A		OS			SRAM1 / 70	
S71PL064JA0		OB			pSRAM3 / 70	
S71PL064JA0		07			pSRAM1 / 70	
S71PL064JA0		OP			pSRAM7 / 70	
S71PL064JB0		QB			pSRAM2 / 70	
S71PL064JB0		OU			pSRAM6 / 70	

**Notes:**

1. Type 0 is standard. Specify other options as required.
2. BGA package marking omits leading "S" and packing type designator from ordering part number.

**Valid Combinations**

Valid Combinations list configurations planned to be supported in volume for this device. Consult your local sales office to confirm availability of specific valid combinations and to check on newly released combinations.

S71PL127J Valid Combinations				Speed Options (ns)	(p)SRAM Type/ Access Time (ns)	Package Marking
Base Ordering Part Number	Package & Temperature	Package Modifier/Model Number	Packing Type			
S71PL127JB0	BAW	9Z	0, 2, 3 (Note 1)	65	pSRAM7 / 70	(Note 2)
S71PL127JB0		9U			pSRAM6 / 70	
S71PL127JCO		9B			pSRAM2 / 70	
S71PL127JCO		9Z			pSRAM7 / 70	
S71PL127JCO		9U			pSRAM6 / 70	
S71PL127JB0		9B			pSRAM2 / 70	
S71PL127JB0	BFW	9Z	0, 2, 3 (Note 1)	65	pSRAM7 / 70	(Note 2)
S71PL127JB0		9U			pSRAM6 / 70	
S71PL127JCO		9B			pSRAM2 / 70	
S71PL127JCO		9Z			pSRAM7 / 70	
S71PL127JCO		9U			pSRAM6 / 70	
S71PL127JB0		9B			pSRAM2 / 70	

**Notes:**

1. Type 0 is standard. Specify other options as required.
2. BGA package marking omits leading "S" and packing type designator from ordering part number.

**Valid Combinations**

Valid Combinations list configurations planned to be supported in volume for this device. Consult your local sales office to confirm availability of specific valid combinations and to check on newly released combinations.

S71PL254J Valid Combinations				Speed Options (ns)	(p)SRAM Type/Access Time (ns)	Package Marking
Base Ordering Part Number	Package & Temperature	Model Number	Packing Type			
S71PL254JCO	BAW	TB	0, 2, 3 (Note1)	65	pSRAM2 / 70	(Note 2)
S71PL254JCO		TZ			pSRAM7 / 70	
S71PL254JCO	BFW	TB	0, 2, 3 (Note1)	65	pSRAM2 / 70	(Note 2)
S71PL254JCO		TZ			pSRAM7 / 70	

**Notes:**

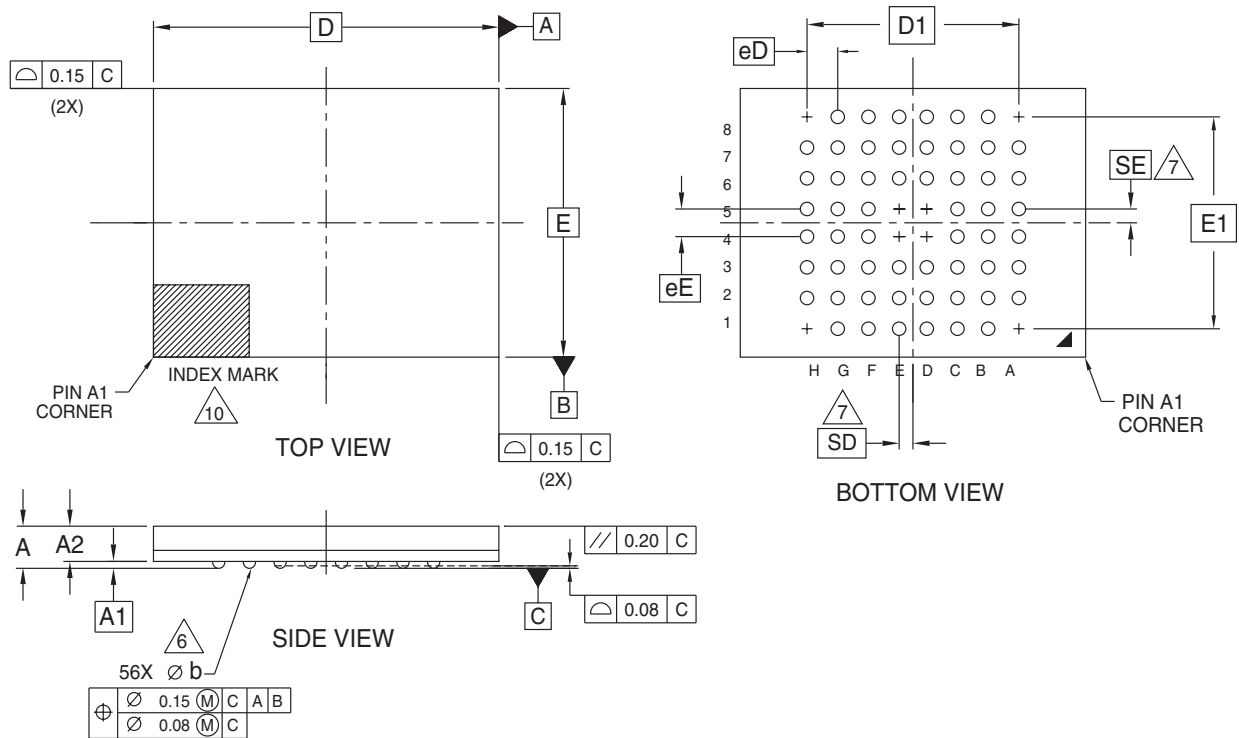
1. Type 0 is standard. Specify other options as required.
2. BGA package marking omits leading "S" and packing type designator from ordering part number.

**Valid Combinations**

Valid Combinations list configurations planned to be supported in volume for this device. Consult your local sales office to confirm availability of specific valid combinations and to check on newly released combinations.

# Physical Dimensions

## TLC056—56-ball Fine-Pitch Ball Grid Array (FBGA) 9 x 7mm Package



PACKAGE	TLC 056			
JEDEC	N/A			
D x E	9.00 mm x 7.00 mm PACKAGE			
SYMBOL	MIN	NOM	MAX	NOTE
A	---	---	1.20	PROFILE
A1	0.20	---	---	BALL HEIGHT
A2	0.81	---	0.97	BODY THICKNESS
D	9.00 BSC.			BODY SIZE
E	7.00 BSC.			BODY SIZE
D1	5.60 BSC.			MATRIX FOOTPRINT
E1	5.60 BSC.			MATRIX FOOTPRINT
MD	8			MATRIX SIZE D DIRECTION
ME	8			MATRIX SIZE E DIRECTION
n	56			BALL COUNT
φb	0.35	0.40	0.45	BALL DIAMETER
eE	0.80 BSC.			BALL PITCH
eD	0.80 BSC			BALL PITCH
SD / SE	0.40 BSC.			SOLDER BALL PLACEMENT
	A1,A8,D4,D5,E4,E5,H1,H8			DEPOPULATED SOLDER BALLS

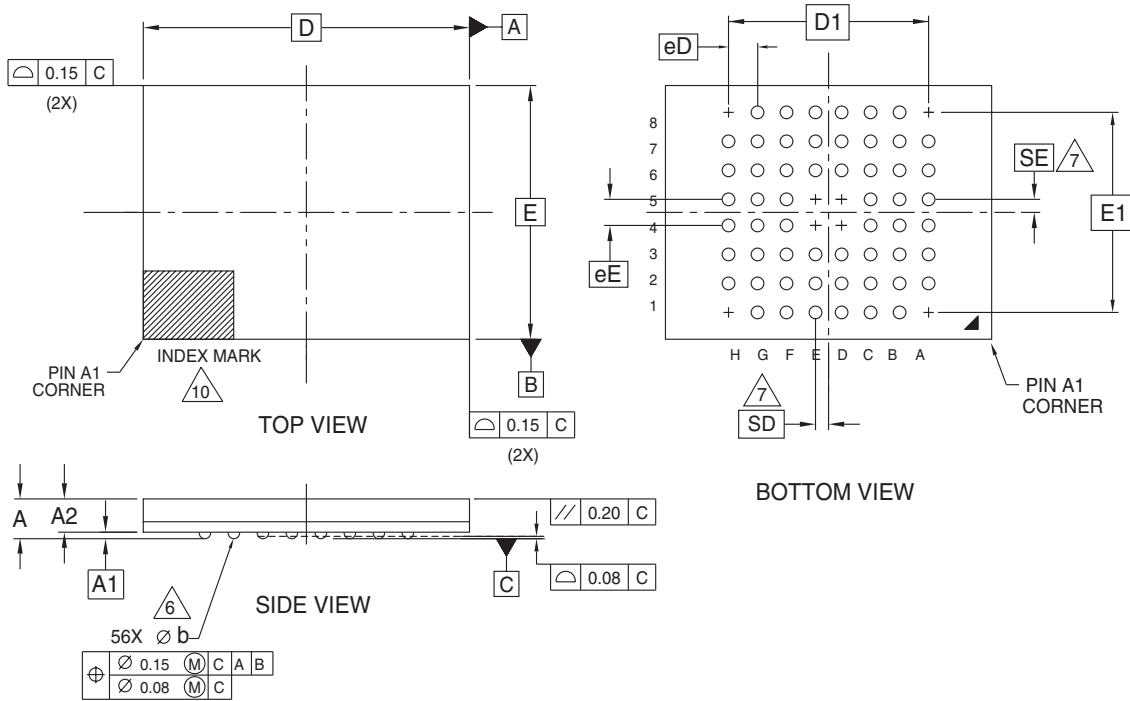
NOTES:

- DIMENSIONING AND TOLERANCING METHODS PER ASME Y14.5M-1994.
- ALL DIMENSIONS ARE IN MILLIMETERS.
- BALL POSITION DESIGNATION PER JESD 95-1, SPP-010.
- [e] REPRESENTS THE SOLDER BALL GRID PITCH.
- SYMBOL "MD" IS THE BALL MATRIX SIZE IN THE "D" DIRECTION.  
SYMBOL "ME" IS THE BALL MATRIX SIZE IN THE "E" DIRECTION.  
n IS THE NUMBER OF POPULATED SOLDER BALL POSITIONS FOR MATRIX SIZE MD X ME.
- DIMENSION "b" IS MEASURED AT THE MAXIMUM BALL DIAMETER IN A PLANE PARALLEL TO DATUM C.
- SD AND SE ARE MEASURED WITH RESPECT TO DATUMS A AND B AND DEFINE THE POSITION OF THE CENTER SOLDER BALL IN THE OUTER ROW.  
WHEN THERE IS AN ODD NUMBER OF SOLDER BALLS IN THE OUTER ROW SD OR SE = 0.000.  
WHEN THERE IS AN EVEN NUMBER OF SOLDER BALLS IN THE OUTER ROW, SD OR SE = [e/2]
- "+" INDICATES THE THEORETICAL CENTER OF DEPOPULATED BALLS.
- N/A
- A1 CORNER TO BE IDENTIFIED BY CHAMFER, LASER OR INK MARK, METALLIZED MARK INDENTATION OR OTHER MEANS.

3348 \ 16-038.22a



# TSC056—56-ball Fine-Pitch Ball Grid Array (FBGA) 9 x 7mm Package



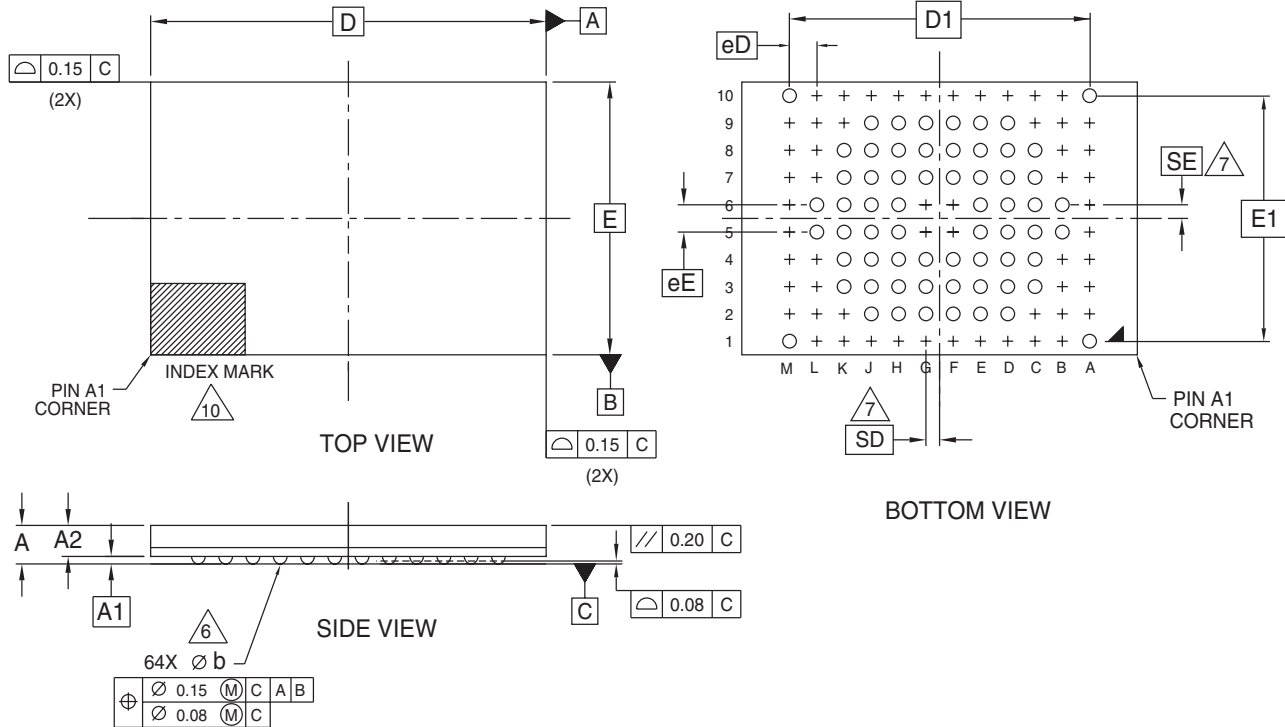
PACKAGE	TSC 056			
JEDEC	N/A			
D x E	9.00 mm x 7.00 mm PACKAGE			
SYMBOL	MIN	NOM	MAX	NOTE
A	---	---	1.20	PROFILE
A1	0.17	---	---	BALL HEIGHT
A2	0.81	---	0.97	BODY THICKNESS
D	9.00 BSC.			BODY SIZE
E	7.00 BSC.			BODY SIZE
D1	5.60 BSC.			MATRIX FOOTPRINT
E1	5.60 BSC.			MATRIX FOOTPRINT
MD	8			MATRIX SIZE D DIRECTION
ME	8			MATRIX SIZE E DIRECTION
n	56			BALL COUNT
φb	0.35	0.40	0.45	BALL DIAMETER
eE	0.80 BSC.			BALL PITCH
eD	0.80 BSC.			BALL PITCH
SD / SE	0.40 BSC.			SOLDER BALL PLACEMENT
	A1,A8,D4,D5,E4,E5,H1,H8			DEPOPULATED SOLDER BALLS

NOTES:

- DIMENSIONING AND TOLERANCING METHODS PER ASME Y14.5M-1994.
- ALL DIMENSIONS ARE IN MILLIMETERS.
- BALL POSITION DESIGNATION PER JESD 95-1, SPP-010.
- $\boxed{e}$  REPRESENTS THE SOLDER BALL GRID PITCH.
- SYMBOL "MD" IS THE BALL MATRIX SIZE IN THE "D" DIRECTION.  
SYMBOL "ME" IS THE BALL MATRIX SIZE IN THE "E" DIRECTION.  
n IS THE NUMBER OF POPULATED SOLDER BALL POSITIONS FOR MATRIX SIZE MD X ME.
- $\triangle 6$  DIMENSION "b" IS MEASURED AT THE MAXIMUM BALL DIAMETER IN A PLANE PARALLEL TO DATUM C.
- $\triangle 7$  SD AND SE ARE MEASURED WITH RESPECT TO DATUMS A AND B AND DEFINE THE POSITION OF THE CENTER SOLDER BALL IN THE OUTER ROW.  
WHEN THERE IS AN ODD NUMBER OF SOLDER BALLS IN THE OUTER ROW SD OR SE = 0.000.  
WHEN THERE IS AN EVEN NUMBER OF SOLDER BALLS IN THE OUTER ROW, SD OR SE =  $\boxed{e/2}$
- "+" INDICATES THE THEORETICAL CENTER OF DEPOPULATED BALLS.
- N/A
- $\triangle 10$  A1 CORNER TO BE IDENTIFIED BY CHAMFER, LASER OR INK MARK, METALLIZED MARK INDENTATION OR OTHER MEANS.

3427 \ 16-038.22

### TLA064—64-ball Fine-Pitch Ball Grid Array (FBGA) 8 x 11.6mm Package



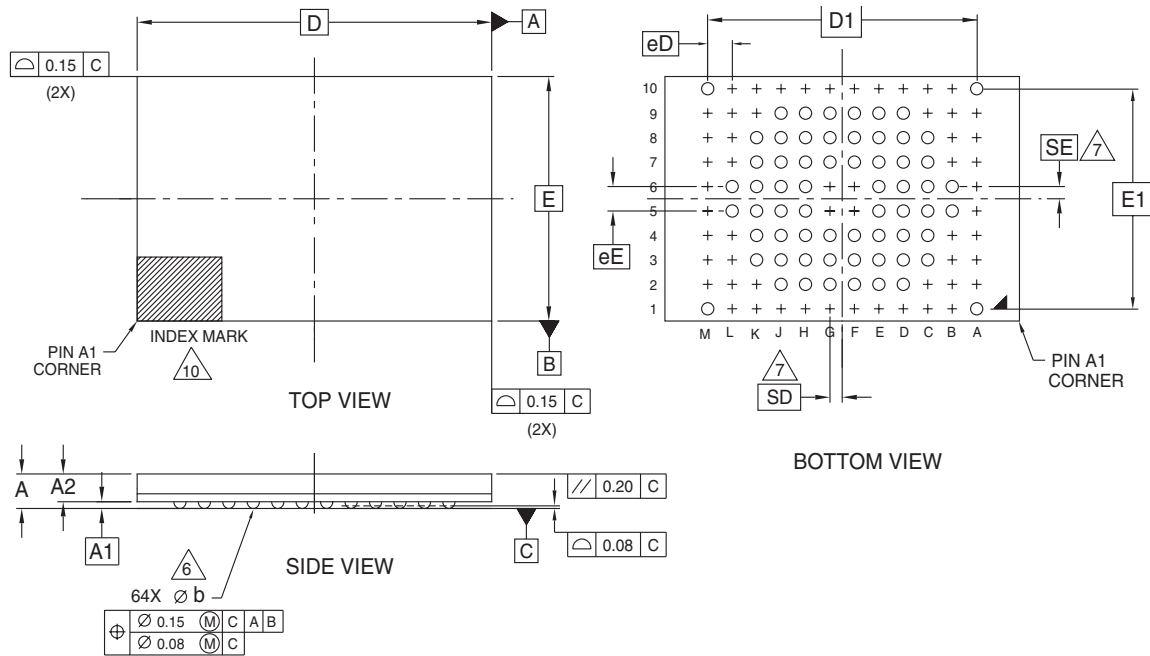
PACKAGE	TLA 064			
JEDEC	N/A			
D x E	11.60 mm x 8.00 mm PACKAGE			
SYMBOL	MIN	NOM	MAX	NOTE
A	---	---	1.20	PROFILE
A1	0.17	---	---	BALL HEIGHT
A2	0.81	---	0.97	BODY THICKNESS
D	11.60 BSC.			BODY SIZE
E	8.00 BSC.			BODY SIZE
D1	8.80 BSC.			MATRIX FOOTPRINT
E1	7.20 BSC.			MATRIX FOOTPRINT
MD	12			MATRIX SIZE D DIRECTION
ME	10			MATRIX SIZE E DIRECTION
n	64			BALL COUNT
φb	0.35	0.40	0.45	BALL DIAMETER
eE	0.80 BSC.			BALL PITCH
eD	0.80 BSC.			BALL PITCH
SD / SE	0.40 BSC.			SOLDER BALL PLACEMENT
	A2,A3,A4,A5,A6,A7,A8,A9 B1,B2,B3,B4,B7,B8,B9,B10 C1,C2,C9,C10,D1,D10,E1,E10, F1,F5,F6,F10,G1,G5,G6,G10 H1,H10,J1,J10,K1,K2,K9,K10 L1,L2,L3,L4,L7,L8,L9,L10 M2,M3,M4,M5,M6,M7,M8,M9			DEPOPULATED SOLDER BALLS

NOTES:

- DIMENSIONING AND TOLERANCING METHODS PER ASME Y14.5M-1994.
- ALL DIMENSIONS ARE IN MILLIMETERS.
- BALL POSITION DESIGNATION PER JESD 95-1, SPP-010.
- [e] REPRESENTS THE SOLDER BALL GRID PITCH.
- SYMBOL "MD" IS THE BALL MATRIX SIZE IN THE "D" DIRECTION.  
SYMBOL "ME" IS THE BALL MATRIX SIZE IN THE "E" DIRECTION.  
n IS THE NUMBER OF POPULATED SOLDER BALL POSITIONS FOR MATRIX SIZE MD X ME.
- DIMENSION "b" IS MEASURED AT THE MAXIMUM BALL DIAMETER IN A PLANE PARALLEL TO DATUM C.
- SD AND SE ARE MEASURED WITH RESPECT TO DATUMS A AND B AND DEFINE THE POSITION OF THE CENTER SOLDER BALL IN THE OUTER ROW.
- WHEN THERE IS AN ODD NUMBER OF SOLDER BALLS IN THE OUTER ROW SD OR SE = 0.000.  
WHEN THERE IS AN EVEN NUMBER OF SOLDER BALLS IN THE OUTER ROW, SD OR SE = [e/2]
- "+" INDICATES THE THEORETICAL CENTER OF DEPOPULATED BALLS.
- N/A
- A1 CORNER TO BE IDENTIFIED BY CHAMFER, LASER OR INK MARK, METALLIZED MARK INDENTATION OR OTHER MEANS.

3352 \ 16-038.22a

# TSB064—64-ball Fine-Pitch Ball Grid Array (FBGA) 8 x 11.6 mm Package



PACKAGE	TSB 064			
JEDEC	N/A			
D x E	11.60 mm x 8.00 mm PACKAGE			
SYMBOL	MIN	NOM	MAX	NOTE
A	---	---	1.20	PROFILE
A1	0.17	---	---	BALL HEIGHT
A2	0.81	---	0.97	BODY THICKNESS
D	11.60 BSC.			BODY SIZE
E	8.00 BSC.			BODY SIZE
D1	8.80 BSC.			MATRIX FOOTPRINT
E1	7.20 BSC.			MATRIX FOOTPRINT
MD	12			MATRIX SIZE D DIRECTION
ME	10			MATRIX SIZE E DIRECTION
n	64			BALL COUNT
$\phi b$	0.35	0.40	0.45	BALL DIAMETER
eE	0.80 BSC.			BALL PITCH
eD	0.80 BSC			BALL PITCH
SD / SE	0.40 BSC.			SOLDER BALL PLACEMENT
	A2, A3, A4, A5, A6, A7, A8, A9 B1, B2, B3, B4, B7, B8, B9, B10 C1, C2, C9, C10, D1, D10, E1, E10 F1, F5, F6, F10, G1, G5, G6, G10 H1, H10, J1, J10, K1, K2, K9, K10 L1, L2, L3, L4, L7, L8, L9, L10 M2, M3, M4, M5, M6, M7, M8, M9			DEPOPULATED SOLDER BALLS

NOTES:

1. DIMENSIONING AND TOLERANCING METHODS PER ASME Y14.5M-1994.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. BALL POSITION DESIGNATION PER JESD 95-1, SPP-010.
4. [e] REPRESENTS THE SOLDER BALL GRID PITCH.
5. SYMBOL "MD" IS THE BALL MATRIX SIZE IN THE "D" DIRECTION.  
SYMBOL "ME" IS THE BALL MATRIX SIZE IN THE "E" DIRECTION.

n IS THE NUMBER OF POPULATED SOLDER BALL POSITIONS FOR MATRIX SIZE MD X ME.

$\Delta 6$  DIMENSION "b" IS MEASURED AT THE MAXIMUM BALL DIAMETER IN A PLANE PARALLEL TO DATUM C.

$\Delta 7$  SD AND SE ARE MEASURED WITH RESPECT TO DATUMS A AND B AND DEFINE THE POSITION OF THE CENTER SOLDER BALL IN THE OUTER ROW.

WHEN THERE IS AN ODD NUMBER OF SOLDER BALLS IN THE OUTER ROW SD OR SE = 0.000.

WHEN THERE IS AN EVEN NUMBER OF SOLDER BALLS IN THE OUTER ROW, SD OR SE = [e/2]

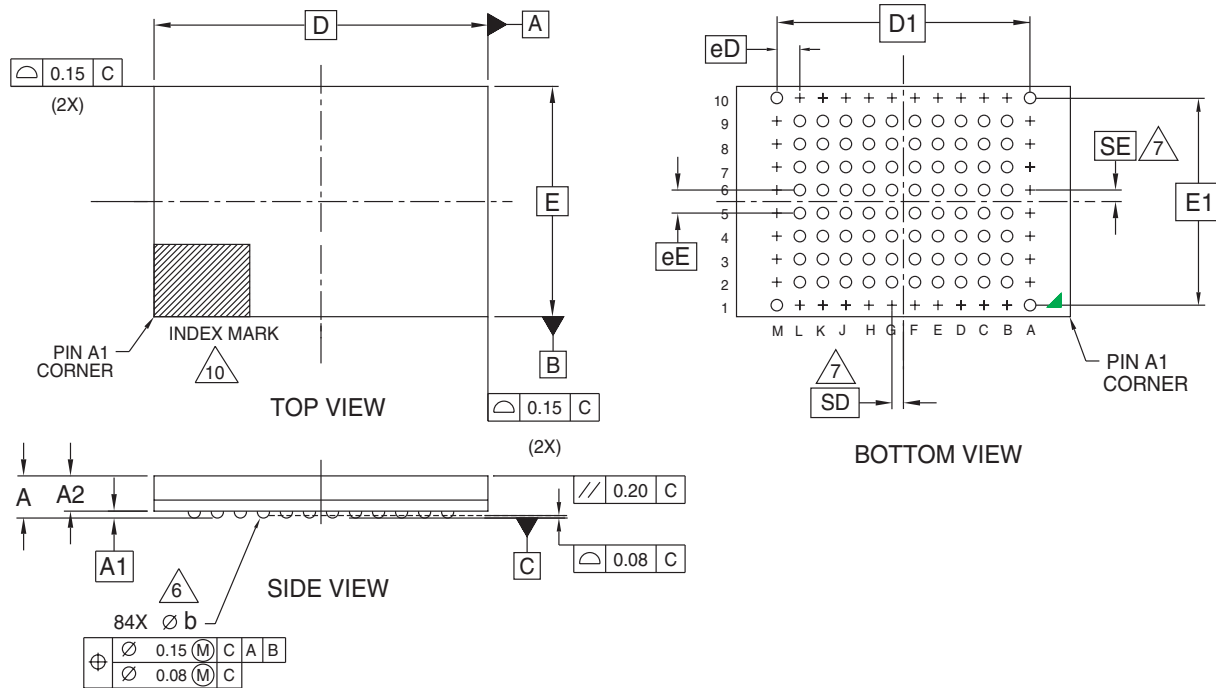
8. "+" INDICATES THE THEORETICAL CENTER OF DEPOPULATED BALLS.

9. N/A

$\Delta 10$  A1 CORNER TO BE IDENTIFIED BY CHAMFER, LASER OR INK MARK, METALLIZED MARK INDENTATION OR OTHER MEANS.

3351 \ 16-038.22a

### FTA084—84-ball Fine-Pitch Ball Grid Array (FBGA) 8 x 11.6mm Package



PACKAGE	FTA 084			NOTE
JEDEC	N/A			
D x E	11.60 mm x 8.00 mm PACKAGE			
SYMBOL	MIN	NOM	MAX	
A	---	---	1.40	PROFILE
A1	0.17	---	---	BALL HEIGHT
A2	1.02	---	1.17	BODY THICKNESS
D	11.60 BSC.			BODY SIZE
E	8.00 BSC.			BODY SIZE
D1	8.80 BSC.			MATRIX FOOTPRINT
E1	7.20 BSC.			MATRIX FOOTPRINT
MD	12			MATRIX SIZE D DIRECTION
ME	10			MATRIX SIZE E DIRECTION
n	84			BALL COUNT
φb	0.35	0.40	0.45	BALL DIAMETER
eE	0.80 BSC.			BALL PITCH
eD	0.80 BSC.			BALL PITCH
SD / SE	0.40 BSC.			SOLDER BALL PLACEMENT
	A2,A3,A4,A5,A6,A7,A8,A9 B1,B10,C1,C10,D1,D10,E1,E10 F1,F10,G1,G10,H1,H10 J1,J10,K1,K10,L1,L10 M2,M3,M4,M5,M6,M7,M8,M9			DEPOPULATED SOLDER BALLS

NOTES:

- DIMENSIONING AND TOLERANCING METHODS PER ASME Y14.5M-1994.
- ALL DIMENSIONS ARE IN MILLIMETERS.
- BALL POSITION DESIGNATION PER JESD 95-1, SPP-010.
- e REPRESENTS THE SOLDER BALL GRID PITCH.
- SYMBOL "MD" IS THE BALL MATRIX SIZE IN THE "D" DIRECTION.  
SYMBOL "ME" IS THE BALL MATRIX SIZE IN THE "E" DIRECTION.  
n IS THE NUMBER OF POPULATED SOLDER BALL POSITIONS FOR MATRIX SIZE MD X ME.
- DIMENSION "b" IS MEASURED AT THE MAXIMUM BALL DIAMETER IN A PLANE PARALLEL TO DATUM C.
- SD AND SE ARE MEASURED WITH RESPECT TO DATUMS A AND B AND DEFINE THE POSITION OF THE CENTER SOLDER BALL IN THE OUTER ROW.  
WHEN THERE IS AN ODD NUMBER OF SOLDER BALLS IN THE OUTER ROW SD OR SE = 0.000.  
WHEN THERE IS AN EVEN NUMBER OF SOLDER BALLS IN THE OUTER ROW, SD OR SE =  $\frac{e}{2}$
- "+" INDICATES THE THEORETICAL CENTER OF DEPOPULATED BALLS.
- N/A
- A1 CORNER TO BE IDENTIFIED BY CHAMFER, LASER OR INK MARK, METALLIZED MARK INDENTATION OR OTHER MEANS.

3388 \ 16-038.21a

# MCP Revision Summary

## Revision A (May 3, 2004)

Initial release.

## Revision AI (May 6, 2004)

### MCP Features

Corrected the high performance access times.

### Connection Diagrams

Added reference points on all diagrams.

### Ordering Information

Corrected package types.

Corrected the description of product family to Page Mode Flash memory.

### pSRAM Type 1

Corrected the description of the 8Mb device to 512Kb Word x 16-bit.

### pSRAM Type 6

Corrected the description of the 2Mb device to 128Kb Word x 16-bit.

Corrected the description of the 4Mb device to 256Kb Word x 16-bit.

## Revision A2 (May 11, 2004)

### General Description

Corrected the tables to reflect accurate device configurations.

## Revision A3 (June 16, 2004)

### Ordering Information

Corrected the Valid Combinations tables to reflect accurate device configurations.

### SRAM

New section added.

## Revision A4 (July 16, 2004)

### Global Changes

Global Change of FASL to Spansion.

Global change to remove space between M and Mb callouts.

### “32Mb Flash Memory” on page 3

Replaced “S71PL032J08-07” with “S71PL032J08-0B”.

Replaced “S71PL032JA0” with “S71PL032JA0-07”.

Added row with the following content: S71PL032JA0-08; 65; 16Mb pSRAM; 70; pSRAM3; TLC056.

### “64Mb Flash Memory” on page 3

Replaced “S71PL064J08-0K” with “S71PL064J08-0B”.

Replaced “S71PL064J08-0P” with “S71PL064J08-0U”.

Deleted “S71PL064J80-05” row.

Replaced “S71PL064JA0-07” with “S71PL064JA0-0K”.

Replaced "S71PL064JA0-0Z" with

Added row with the following content: S71PL064JB0-07; 65; 32M pSRAM; 70; Pstram 1; TLC056.

**"32Mb Flash Memory" on page 3**

Replaced "S71PL032JA0-08" with "S71PL032JA0-0F".

**"64Mb Flash Memory" on page 3**

Replaced "S71PL032JA0-07" with "S71PL032JA0-0K".

**"128Mb Flash Memory" on page 4**

Added row with the following content: S71PL127JB0-9; 65; 32M pSRAM; 70; pSRAM; TLA064.

Replaced "S71PL127JB0-97" with "S71PL127JB0-9Z".

Added row with the following content: S71PL127JC0-97; 65; 64M pSRAM; 70; pSRAM1; TLA064.

Replaced "S71PL127JC0-9P" with "S71PL127JC0-9Z".

In the S71PL254JB0-TB row changed pSRAM type from "pSRAM3" to "pSRAM2".

**"256Mb Flash Memory (2xS29PLI27J)" on page 4**

Added row with the following content: S71PL254JB0-TB; 65; 32M pSRAM; 70; pSRAM3; FTA084.

Added row with the following content: S71PL254JC0-TB; 65; 64M pSRAM; 70; pSRAM2; FTA084.

**"Connection Diagram (S7IPLI27J)" on page I2**

Updated pins D8, D9, and L5.

Added notes 2 and 3 to drawing.

**"Connection Diagram (S7IPL254J)" on page I3**

Updated pins D8 and D9.

Added Note 2 to drawing.

**"S7IPL032J Valid Combinations" on page I6**

Changed S71PL032J08 (p)SRAM Type Access Time (ns) from "SRAM1" to "SRAM2" (4 changes made in table).

Changed S71PL032JA0 (p)SRAM Type Access Time (ns) from "SRAM3 / 70" to pSRAM3 /70".

Deleted all cells with the following collaborated text: "BAW,BFW, BAI. BFI". Merged previous place holder with cell above.

**"S7IPL064J Valid Combinations" on page I7**

In (p)SRAM Type/Access Time (ns) changed all instances of "stet" to "pSRAM1/70".

In Package Modifier/Model Number changed all instances of "stet" to "07".

Added row to BAW Package and Temperature sections with the following content: S71PL064JB0; 07; 65 (previously inclusive); pSRAM1/70.

**"S7IPLI27J Valid Combinations" on page I8**

Changed the S71PL127JA0 Package Modifier/Model Number from "9Z" to "9P" (4 instances).

Added 4 rows with the following content: S71PL127JCO; 97; pSRAM1/70.

**“S7IPL254J Valid Combinations” on page 20**

Added 4 rows with the following content: S71PL254JCO; TB; pSRAM2/70.

Added 4 rows with the following content: S71PL254JB0; TB; pSRAM2/70.

**“S7IPL-J based MCPs” on page I**

Added 254M to Megabit indicator.

Added 16 to CMOS indicator.

**Revision A5 (September 14, 2004)**

**Product Selector Guide**

Updated the 128Mb Flash Memory table.

**Valid Combinations Table**

Updated the S71PL127J Valid Combinations table.

**Revision A6 (November 22, 2004)**

**Product Selector Guide**

Updated the 32Mb and 64Mb tables.

**Valid Combinations Tables**

Updated the 32Mb and 64Mb combinations.

**Physical Dimensions**

Added the TSB064 package.

**Revision A7 (February 8, 2005)**

**pSRAM Type 7**

Updated all information in this section.

**Revision A8 (April 6, 2005)**

**S29PL-J Flash**

Updated all information in this section.

**Revision A9 (May 12, 2005)**

**S71PL-J MCP**

Added the S71PL064JOA option to cover the inclusion of the 16M SRAM

**pSRAM Type 2**

Added the latest revision for the pSRAM Type 2

**SRAM Type 2**

Added this module to the S71PL-J MCP

**Revision A10 (June 22, 2005)**

**S71PL-J MCP**

Removed 127/16 and 254/32 pSRAM and updated OPN for 64/16SRAM

**Revision A11 (July 29, 2005)**

**pSRAM Type 7**

Updated module

**Revision B0 (September 29, 2005)**

S29PL-J

Updated module

**SRAM Type 1**

Updated module

**Revision B1 (October 25, 2005)****pSRAM Module Type 5**

Added module

**Revision B2 (January 25, 2006)**

Added notices for devices not recommended for new designs

Modified the *Product Selection Guide*Modified the *S71PL032J*, *S71PL064J*, *S71PL127J* Valid Combinations tables**Revision B3 (March 17, 2006)**

Modified the structure of the document. Related data sheets are referenced rather than be embedded. Added data sheet reference table to that effect.

Added the SRAM Type 4 option

Added the 8Mb pSRAM Type 3 option

**Colophon**

The products described in this document are designed, developed and manufactured as contemplated for general use, including without limitation, ordinary industrial use, general office use, personal use, and household use, but are not designed, developed and manufactured as contemplated (1) for any use that includes fatal risks or dangers that, unless extremely high safety is secured, could have a serious effect to the public, and could lead directly to death, personal injury, severe physical damage or other loss (i.e., nuclear reaction control in nuclear facility, aircraft flight control, air traffic control, mass transport control, medical life support system, missile launch control in weapon system), or (2) for any use where chance of failure is intolerable (i.e., submersible repeater and artificial satellite). Please note that Spansion will not be liable to you and/or any third party for any claims or damages arising in connection with above-mentioned uses of the products. Any semiconductor devices have an inherent chance of failure. You must protect against injury, damage or loss from such failures by incorporating safety design measures into your facility and equipment such as redundancy, fire protection, and prevention of over-current levels and other abnormal operating conditions. If any products described in this document represent goods or technologies subject to certain restrictions on export under the Foreign Exchange and Foreign Trade Law of Japan, the US Export Administration Regulations or the applicable laws of any other country, the prior authorization by the respective government entity will be required for export of those products.

**Trademarks and Notice**

The contents of this document are subject to change without notice. This document may contain information on a Spansion LLC product under development by Spansion LLC. Spansion LLC reserves the right to change or discontinue work on any product without notice. The information in this document is provided as is without warranty or guarantee of any kind as to its accuracy, completeness, operability, fitness for particular purpose, merchantability, non-infringement of third-party rights, or any other warranty, express, implied, or statutory. Spansion LLC assumes no liability for any damages of any kind arising out of the use of the information in this document.

Copyright ©2004 – 2006 Spansion LLC. All Rights Reserved. Spansion, the Spansion logo, MirrorBit, ORNAND, and combinations thereof are trademarks of Spansion LLC. Other names are for informational purposes only and may be trademarks of their respective owners.