Socket FM2b Design Specification

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Advanced Micro Devices

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Revision History

Date	Revision	Description
April 2014	3.00	Initial Public release.

Chapter 1 Introduction

This design specification defines the requirements for a 906-position, 1.27-mm pitch, surface mount technology (SMT), zero insertion force (ZIF) socket (herein referred to as the Socket FM2b) for use with the AMD 906-pin organic, micro pin grid array (µPGA) package. The Socket FM2b, shown in Figure 1, is designed to provide a reliable electrical interconnect between the printed circuit board (PCB) and the 906 pins of the organic µPGA package throughout the life of the product.

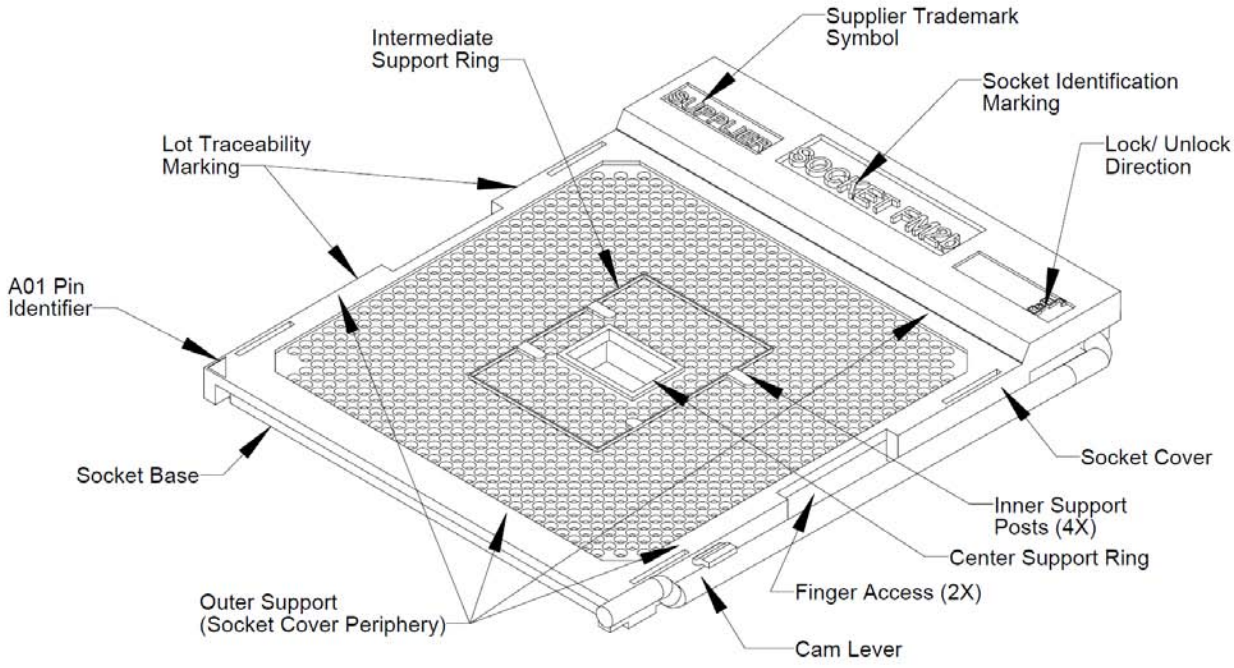


Figure 1. A 3-D View of Socket FM2b

1.1 Purpose

This design specification specifies the dimensional, mechanical, electrical, and reliability requirements for the Socket FM2b that are necessary to meet the performance requirements of AMD microprocessor products.

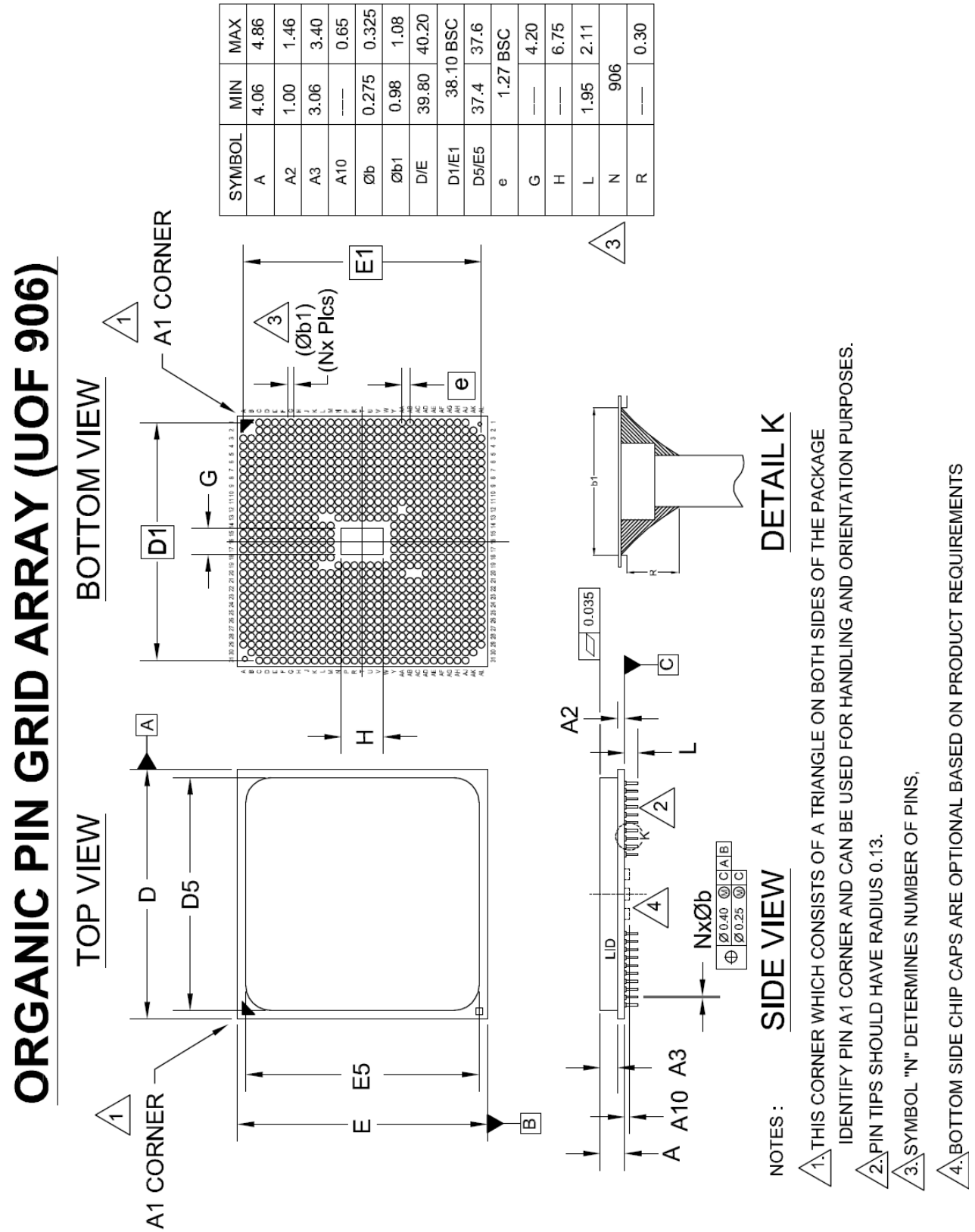
1.2 Supplier Requirements

To become a qualified supplier for the Socket FM2b, the potential socket supplier must demonstrate that their product meets the requirements listed in this document and must conduct qualification testing on their production run sockets in accordance with the *Socket FM2b Qualification Plan*, order# 52238.

Chapter 2 Microprocessor Package Description

Figure 2, on page 11, provides dimensional information for the 906-pin organic µPGA package that mates with the Socket FM2b.

Socket FM2b is designed to be functional with only the lidded package configuration.



SYMBOL	MIN	MAX
A	4.06	4.86
A2	1.00	1.46
A3	3.06	3.40
A10	—	0.65
Øb	0.275	0.325
Øb1	0.98	1.08
D/E	39.80	40.20
D1/E1	38.10 BSC	
D5/E5	37.4	37.6
e	1.27 BSC	
G	—	4.20
H	—	6.75
L	1.95	2.11
N	906	
R	—	0.30

Figure 2. AMD 906-Pin Organic µPGA Package Drawing

Chapter 3 Socket Mechanical Requirements

This chapter describes the socket outline and mechanical requirements for the Socket FM2b.

3.1 Socket Outline

Figure 3 shows the maximum allowable outline for the Socket FM2b.

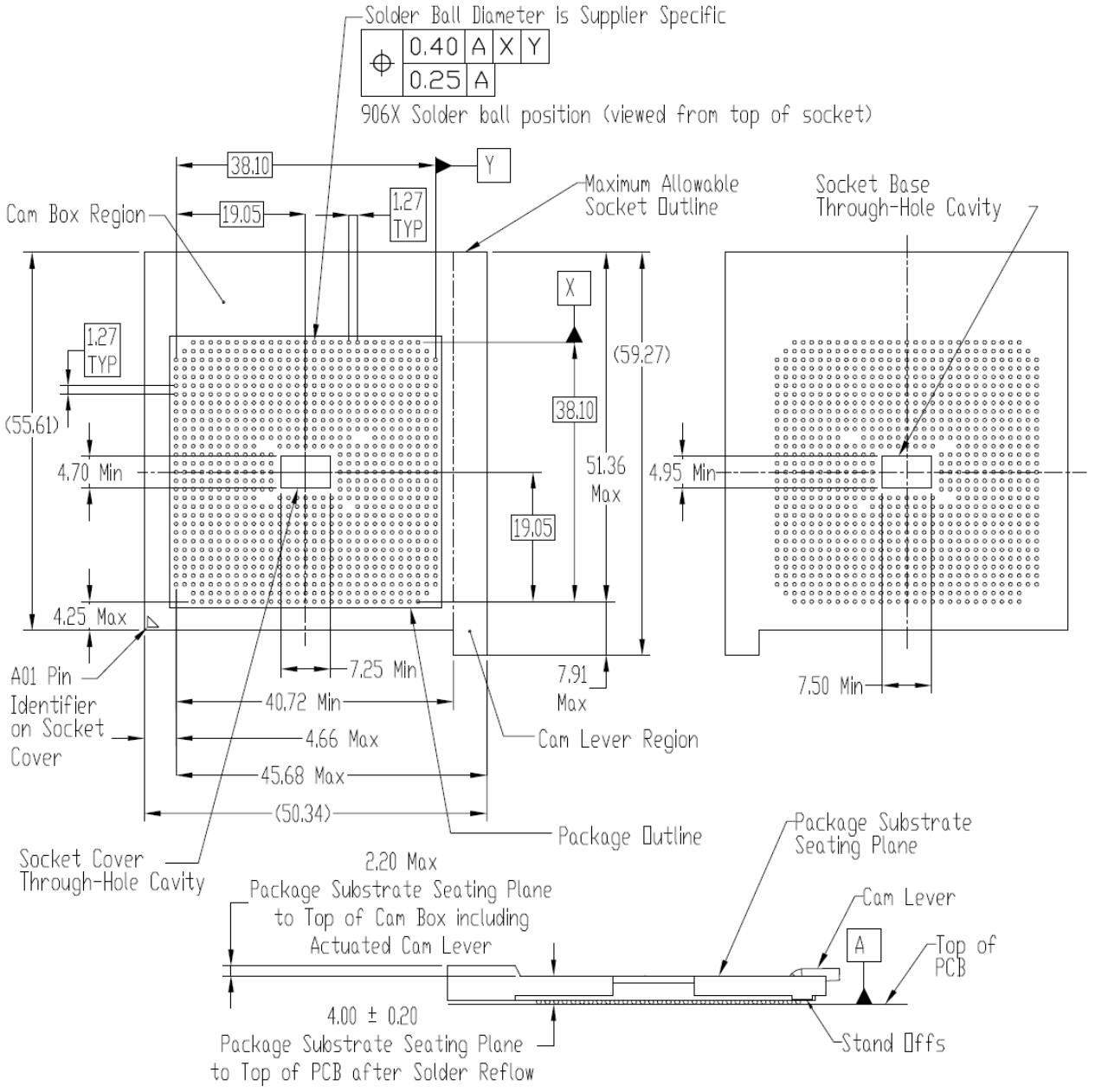


Figure 3. Socket FM2b Outline

The minimum size of the through-hole cavity in the socket cover and the socket base is shown in Figure 3, on page 12. The socket base through-hole cavity is located in the center of the solder ball array on the socket base. The socket cover through-hole cavity is located in the center of the pin-hole array in the socket cover.

The allowable component keep-in area within the socket housing cavity on the PCB is shown in Figure 4. The height of the devices mounted on the PCB within the keep-in area of the socket housing must be less than 2.00 mm.

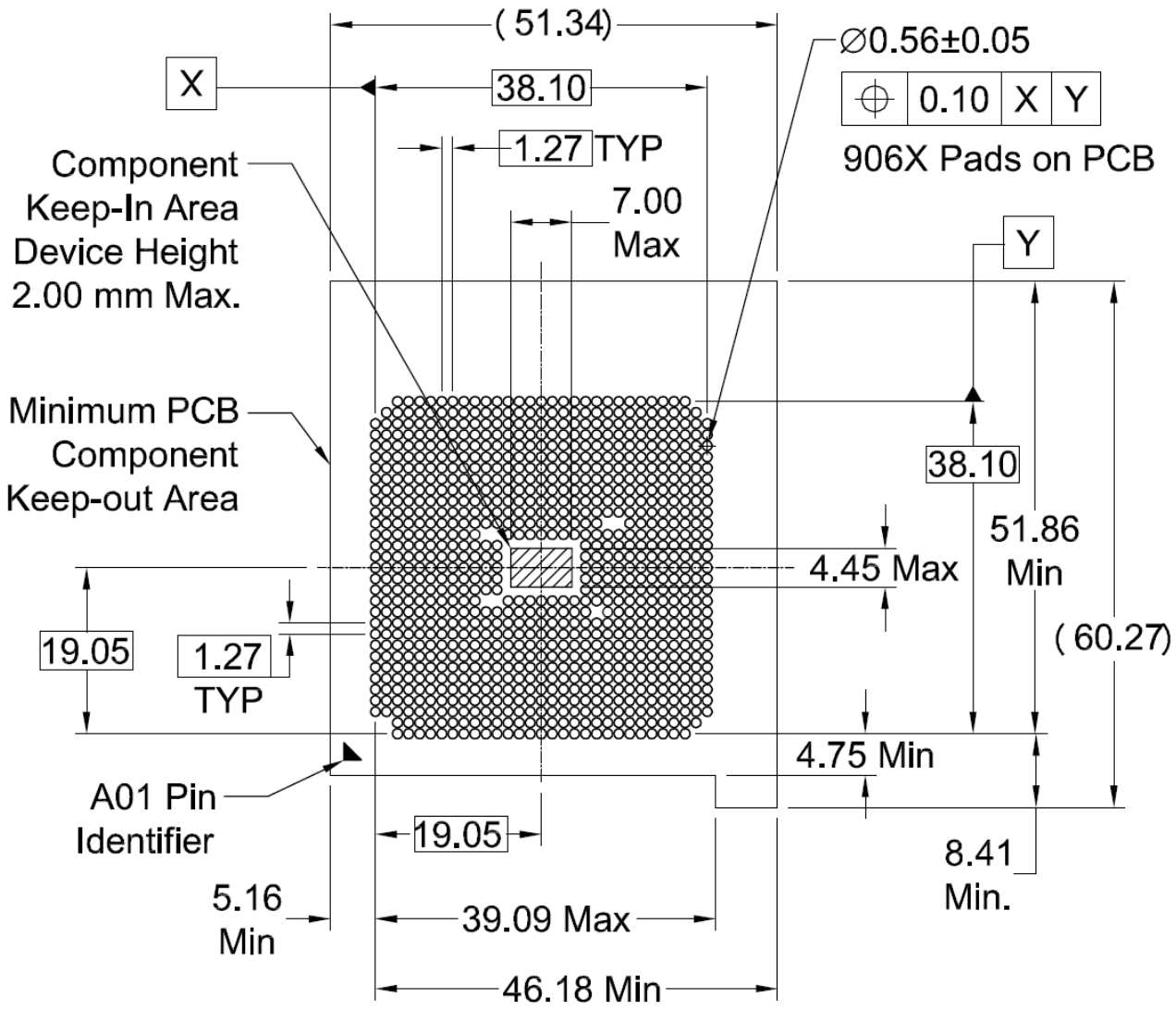


Figure 4. Allowable PCB Component Keep-In, Keep-Out Area

3.2 Socket Base and Socket Cover

The socket base and socket cover are made from liquid crystal polymer (LCP) with a UL flammability rating of 94 V-0. The colors for the socket base and cover are as follows:

- Socket base color — black
- Socket cover color — black

The thickness of the socket cover (including the 0.30-mm pocket recess) must not exceed 1.17 mm. The socket cover flatness must be less than 0.25 mm before and after the SMT reflow to the PCB. The socket cover flatness must remain less than 0.25 mm after environmental and mechanical testing.

A plastic cover cap acts as an overlay on the top of the socket cover. The overlay facilitates socket pick-and-place operation with a vacuum nozzle during board assembly. The overlay must not outgas during the solder reflow processes or leave any residue upon removal prior to package pins insertion.

Before socket reflow to the PCB, the latches on the cover cap must provide a minimum retention force of 0.5 kgf, when measured at the center of the cover cap. After socket reflow to the PCB, the latches on the cover cap must provide a minimum retention force of 0.3 kgf, again measured at the center of the cover cap. The force required at the removal tabs to remove the cover cap must be less than 1.0 kgf, after socket reflow to the PCB.

The height of the cam box must be less than 2.20 mm above the package seating plane, as shown in Figure 3, on page 12.

3.2.1 Socket Cover Hole

The socket cover pin holes must have a diameter greater than 0.485 mm. The socket cover pin holes must have a pattern relating true position of less than 0.25 mm, and a feature relating true position of less than 0.13mm.

3.2.2 Socket Cover Finger Access

The socket cover must incorporate finger access cut-outs as shown in Figure 1, on page 9. The cut-outs must be at least 8.8 mm long. The center-line of the cut-outs must not be off-set from the center line of the socket cover pin-hole array by more than 2.5 mm.

3.3 Package Seating Plane

The cover for the Socket FM2b is designed to accommodate the package pin shoulder and braze/solder fillet as shown by the 906-pin organic µPGA package drawings in Figure 2, on page 11. Package support structures are incorporated into the socket cover to provide sufficient mechanical support (seating plane) for the package substrate without causing damage to the package pins at any time.

Before and after SMT, the package-seating plane on the socket cover has a surface flatness of less than 0.25 mm when unmated, as well as when mated, with a package. After the socket is mounted to the PCB, the package-seating plane on the socket cover is 4.00 mm ± 0.20 mm from the mounting surface of the PCB.

3.3.1 Package Supports and Seating Plane Dimensional Requirements

To ensure proper support of the processor package while it is situated in the socket, the outer support region of the package seating plane, the intermediate support ring, the inner support posts, and the center support ring on the socket cover (indicated in Figure 1, on page 9) must meet the following dimensional requirements:

Table 1. Package Supports and Seating Plane Dimensional Requirements

Item No.	Requirements
1	Before and after the socket is reflowed to the PCB, the outer support region step height on the socket cover is 0.30 mm ± 0.05 mm.
2	Before and after the socket is reflowed to the PCB, the flatness of the outer support region on the socket cover must not exceed 0.25 mm.
3	After the socket is reflowed to the PCB, the height of the intermediate support ring on the socket cover is +0.06 mm± 0.05 mm above the least mean squares defined plane (LMS1) of the outer support region on the socket cover.
4	After the socket is reflowed to the PCB, the height of the four inner support posts are +0.06 mm± 0.05 mm above the least mean squares defined plane (LMS1) of the outer support region on the socket cover.
5	After the socket is reflowed to the PCB, the height of the center support ring is – 0.03 mm ± 0.05 mm from the least mean squares defined plane (LMS2) of the intermediate support ring.

Refer to measurement requirements in Section 3.3.2.

3.3.2 Measurement Method for Package Supports and Seating Plane

The features in Section 3.3.1 must be measured using the methodologies shown in Sections 3.3.2.1 through 3.3.2.6, on pages 15 through 19, respectively.

3.3.2.1 Measurement Conditions

The socket to be measured must be reflowed to a PCB using the recommended reflow process for the socket with the particular solder ball composition.

Note: *An AMD approved fixture that pushes the socket cover downward to make contact with the socket base at the inner seating plane supports (intermediate support ring, inner support posts, center support ring) must be used for the socket measurement.*

3.3.2.2 Outer Support Region Step Height Measurement

Measure the outer step height at 24 evenly-spaced points (6 per side) around the outer support on the socket cover, using a local point-to-point method as shown in Figure 5, on page 16.

The step height is the difference in height between a point on the outer support region and an adjacent point on the recessed plane of the socket cover. See Figure 6, on page 16, for the definition of step height.

Note: *The outer support step height must conform to the dimensional requirements of item 1, in Table 1, on page* 15.

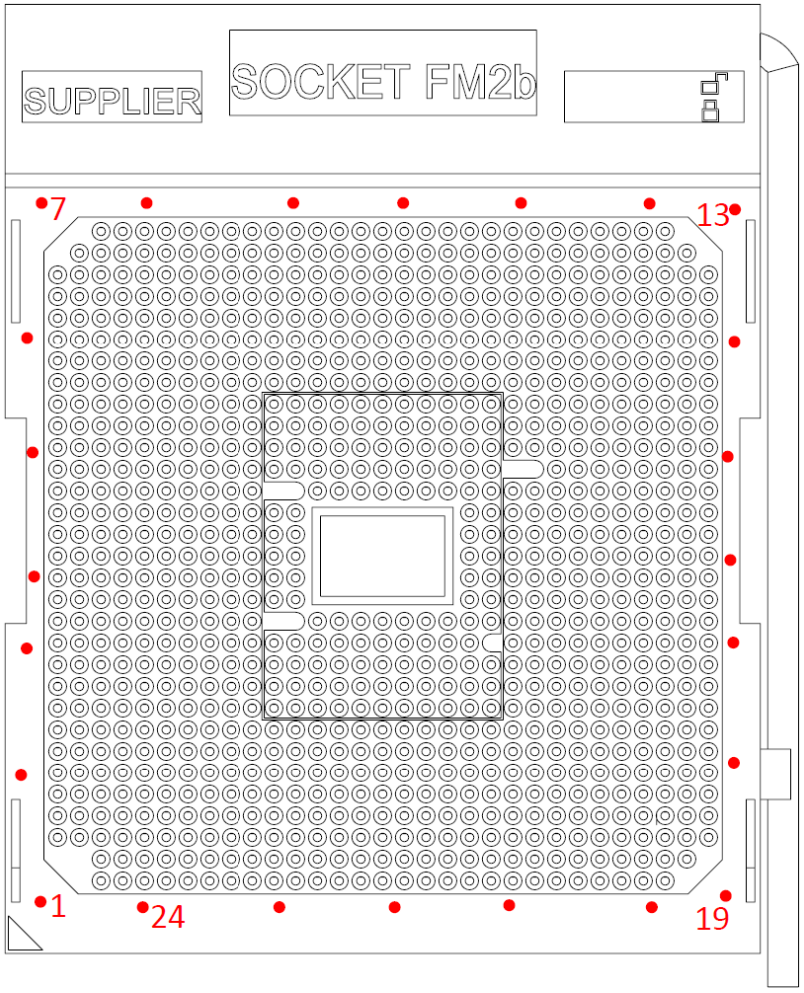


Figure 5. Illustration of Outer Region Measurement Points

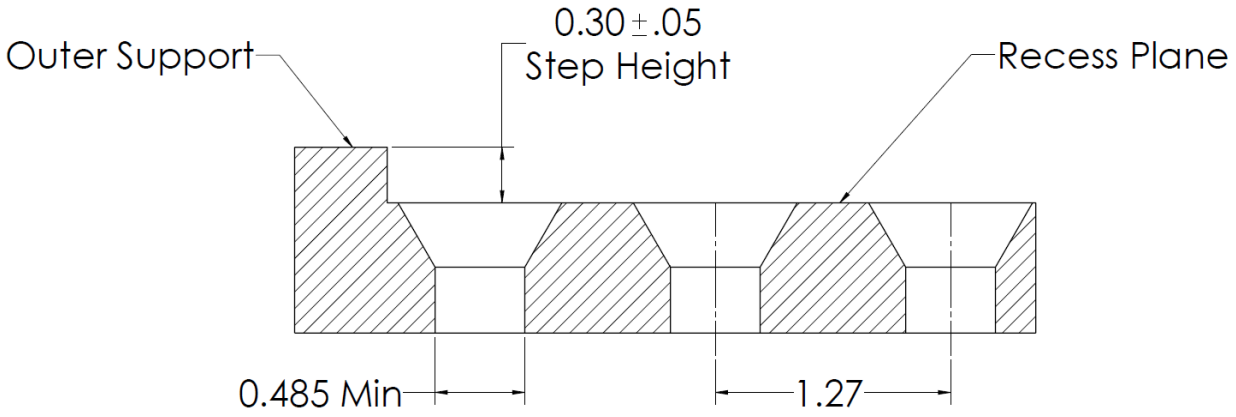


Figure 6. Definition of Step Height

3.3.2.3 Outer Support Region Flatness Measurement

Determine the best fit plane (LMS1) using the least mean squares method, for the 24 points measured on outer support region used in the step height measurement in section 3.3.2.2, on page 16.

Calculate the normal distance from each point to the LMS1 plane. Outer support region flatness equals the maximum normal distance of all points above the LMS1 plane minus the maximum normal distance of all points beneath the LMS1 plane (the distance of all points beneath the LMS1 plane is a negative number). Refer to Figure 7 for more detail.

Note: *The flatness of the outer support region on the socket cover must meet the criteria in item 2, of Table 1, on page 15.*

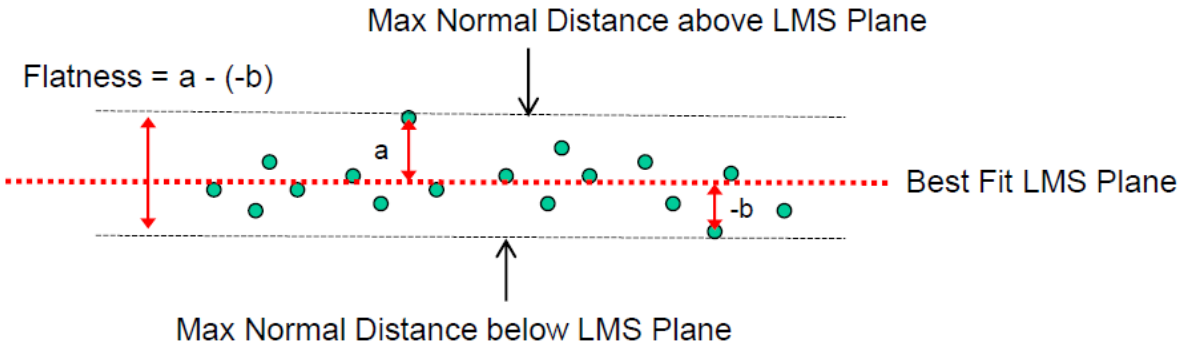


Figure 7. Illustration of Best Fit Plane

3.3.2.4 Intermediate Support Ring Height Measurement

Measure the height of the Intermediate Support Ring on the socket cover, at 4 points (points 25 to 28 as shown in Figure 8) around the intermediate support ring using a local plane-to-point method.

The height is the difference between a point on the intermediate support ring relative to the outer support least mean square plane (LMS1). Refer to Figure 11, on page 21, for an illustration of the measurement method.

Note: *The intermediate support ring height must conform to the dimensional requirements of item 3, in* Table 1*, on page 15.*

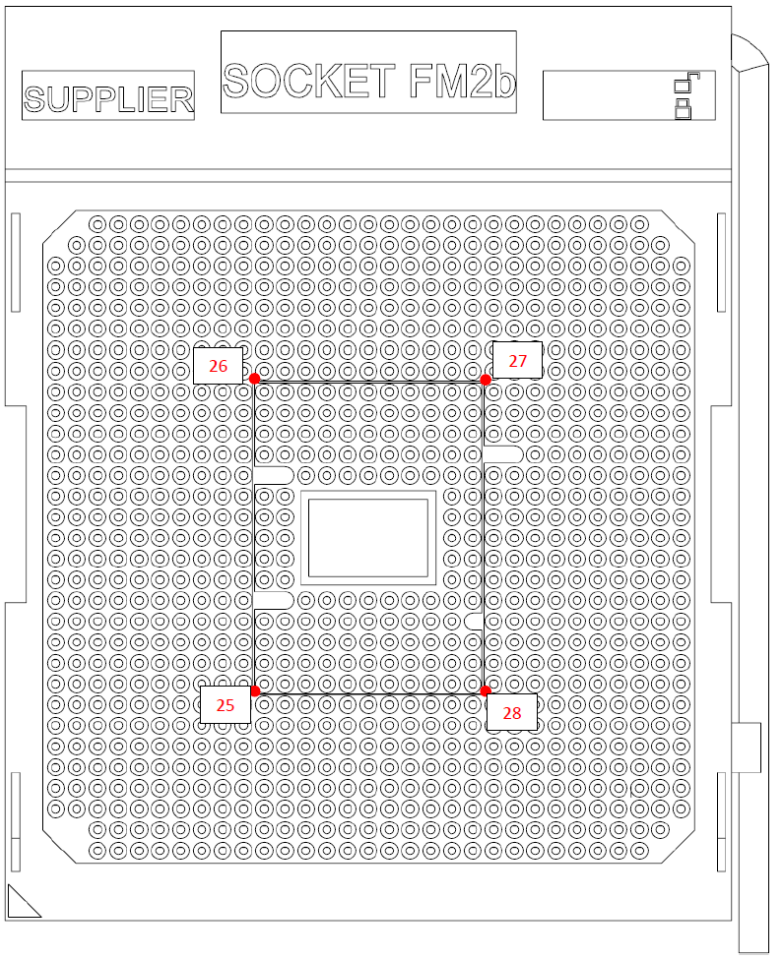


Figure 8. Illustration of the Intermediate Support Ring Measurement Locations

3.3.2.5 Inner Support Post Height Measurement

Measure the height of the four inner support posts on the socket cover (points 29 to 32 as shown in Figure 9, on page 19) using a local plane-to-point method.

The height is the difference between a point on the inner support post relative to the outer support least mean square plane (LMS1). Refer to Figure 11, on page 21, for an illustration of the measurement method.

Note: *The height of the four inner support posts must conform to the dimensional requirements of item 4 in Table 1, on page 15.*

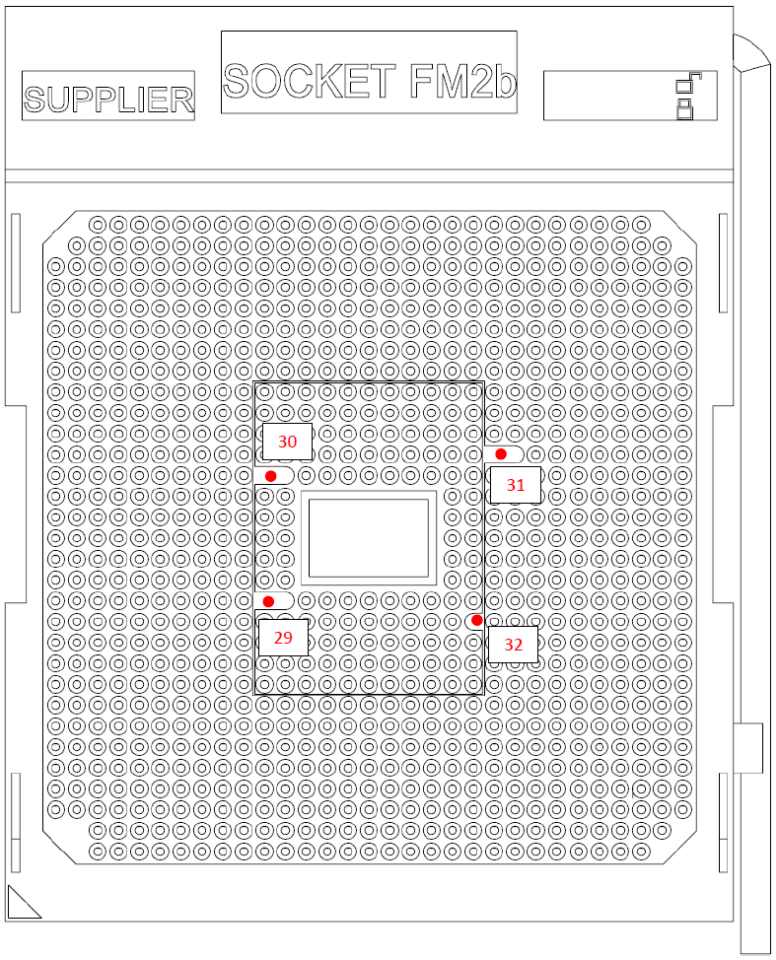


Figure 9. Illustration of the Inner Support Posts Measurement Locations

3.3.2.6 Center Support Ring Height Measurement

Determine the best fit plane (LMS2), using the least mean squares method, for the four points measured on the intermediate support ring used in the height measurement in Section 3.3.2.4, on page 18.

Measure the height of the center support ring at 8 points (points 33 to 40 as shown in Figure 10, on page 20) around the center support ring using a local plane-to-point method.

The height is the difference between a point on the center support ring relative to the intermediate support ring least mean square plane (LMS2). Refer to Figure 11, on page 21, for an illustration of the measurement method.

Note: *The center support ring height must conform to the dimensional requirements of item 5 in Table 1, on page 15.*

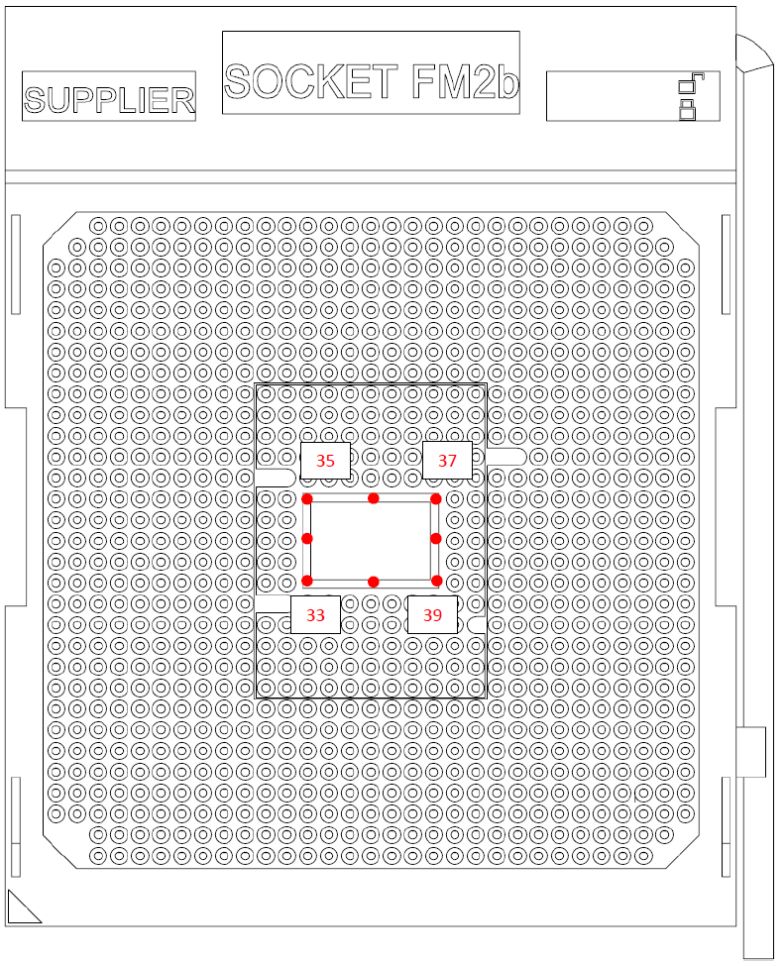


Figure 10. Illustration of the Center Support Ring Measurement Locations

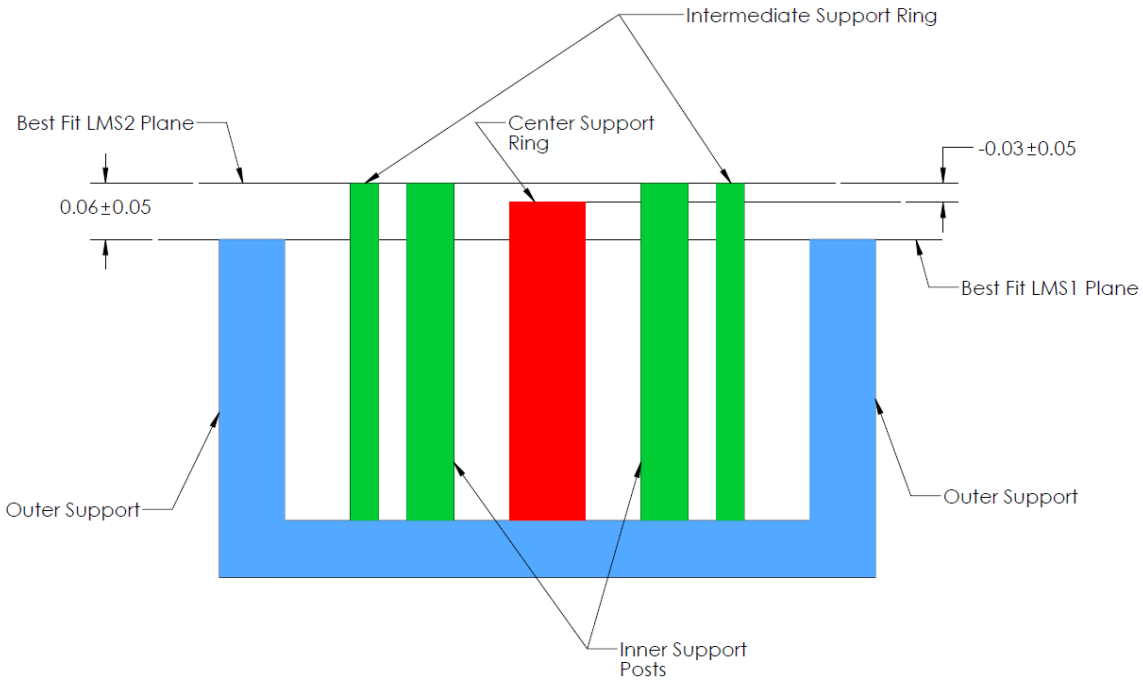


Figure 11. Illustration of Intermediate Support Ring, Inner Support Posts and Center Support Ring Measurement Method

3.4 Socket Contact

This section describes the contact material and solder balls for socket attachment to the PCB.

Note: *No lubricants can be present on the contact mating areas of fully assembled sockets that are shipped to customers by the supplier.*

3.4.1 Contact Base Metal

The contact base metal is made of high-strength copper alloy.

3.4.2 Contact Plating

The specifications for the contact plating are as follows:

- The entire contact is plated with 1.27-µm minimum thickness of nickel.
- The contact mating area is plated with 0.25-µm minimum thickness of gold over the 1.27 µm minimum thickness of nickel underplating. Gold porosity in the contact mating areas must be monitored, with no more than two pores with a diameter greater than 0.05 mm allowed per set of 25 contacts examined. This pore count should be maintained as a production quality control indicator.

3.4.3 Surface Mount Technology (SMT) Solder Balls

The specifications for the surface mount technology (SMT) solder balls are as follows:

- The socket is mounted to the PCB by SMT. The PCB solder pad diameter is 0.56 mm.
- The solder balls on the socket have a diameter of 0.76 ± 0.15 mm (or AMD approved solder ball diameter) and are of a lead-free composition.
- Lead-free solder ball composition can be Sn4.0Ag0.5Cu (SAC405), Sn3.0Ag0.5Cu (SAC305), or Sn3.5Ag.
- The contact must include a solder barrier feature to prevent solder from wicking up into the contact mating area during solder reflow.
- The Socket FM2b solder ball field must meet the co-planarity requirement of 0.20 mm.
- Before SMT reflow to PCB, the force required to extract the solder ball from the contact must be a minimum of:
  - 0.75 kgf shear force for the reflow attached type contact to solder ball interface,
    or
  - 0.010 kgf retention force for mechanical attached type contact to solder ball interface.

3.5 Socket Actuation Lever

The socket incorporates a lever to the right side of the cam box for actuating and de-actuating the socket contacts with the package pins. This actuation lever provides the mechanical advantage to easily actuate the socket in an OEM high-volume manufacturing environment and also facilitates tool-less socket actuation and de-actuation operations by the end-user.

3.5.1 Lever Material

The recommended material for the actuation lever is stainless steel.

3.5.2 Package Insertion and Extraction Force

With the actuation lever in the open position, the package insertion and extraction forces, conceptually, are zero. These insertion and extraction forces must not exceed 0.075 kgf in actual applications.

3.5.3 Socket Retention Force

With the actuation lever in the closed position, the force required to extract the package pins out of the socket contacts must be a minimum of 0.013 kgf per pin.

3.5.4 Locking Latch

The socket cover incorporates a latch mechanism to lock the lever in the closed position after the socket contacts are mated with the package pins. Support tab(s) are added to the socket cover to

cradle the actuation lever in the closed position. The tab(s) prevent the actuation lever from contacting the PCB.

3.5.5 Lever Actuation and Deactuation Force

The force required to actuate or deactuate the lever must be less than 3.6 kgf.

3.5.6 Pin Field Actuation Displacement

The package pins must be displaced less than 1.0 mm during socket actuation or deactuation.

3.6 Socket Durability

The socket must maintain electrical and mechanical integrity after 50 actuation and deactuation cycles with each mating package used for no more than 5 mating cycles.

3.7 Socket Weight

The Socket FM2b with the pick-and-place cover cap attached must weigh 13±2g.

3.8 Socket Markings

The requirements for socket markings are as follows:

- The socket identifier marking “SOCKET FM2b” must be molded into the top surface of the socket cover cam box region. See Figure 1, on page 9.
- A locked and unlocked directional designator is molded into the top surface of the cam box in close proximity to the actuation lever. See Figure 1, on page 9.
- A triangular shape symbol must be molded into the top of the socket cover for proper package pin A01 orientation. This orientation symbol is located to remain visible after the package is mated to the socket as shown in Figure 1, on page 9, and Figure 3, on page 12.
- The supplier’s trademark symbol must be molded on the socket cover. Locate this marking to allow visibility and readability after the socket is solder mounted onto the PCB.
- The lot traceability number can be ink, laser, or impact marked on the socket cover. Locate the marking to be visible and readable after the socket is solder mounted onto the PCB.

3.9 Visual Inspection

All visual inspections must be at 1X magnification, except for solder balls that must be inspected at 5X magnification.

3.9.1 Solder Balls

No missing, malformed, damaged, or misaligned solder balls attached to the contacts are allowed.

3.9.2 Contacts

No missing or damaged contacts that prevent the socket from functioning properly are allowed. Contact mating surface must not be missing gold plating.

After the socket is reflowed on to the PCB, both arms of the socket contact must be visible through the cover pin hole when the actuation lever is at approximately 45 degrees.

3.9.3 Socket Cover and Socket Base

No cracks or flashing visible on the socket cover and socket base are allowed. All tabs that secure the socket cover to the base must not be damaged or missing. The socket cover must fit properly on the socket base with no visible gap between them. The lever latch cannot be damaged or malformed.

3.9.4 Actuation Lever

The actuation lever cannot be damaged, malformed, or missing.

3.10 Critical-to-Function Parameter List

All critical-to-function parameters are identified in Table 2. These parameters must be verified on 100% of the socket during production or on per lot sampling basis as a part of quality control process.

Table 2. Socket FM2b Critical-to-Function Parameters

Critical-to-Function Parameter List					
List	**Parameters**	**Nominal**	**Tolerance**	**Unit**	**Monitoring**
1	Socket Length	59.27	Max	mm	Sampling
2	Socket Width	50.34	Max	mm	Sampling
3	Socket Seating Plane Height From Top of PCB after SMT	4.00	± 0.20	mm	Sampling
4	Solder Ball Size	Supplier Specific	Supplier Specific	mm	100%
5	Solder Ball Pitch	1.27	Basic	mm	100%
6	Solder Ball Pattern TP	0.4	Max	mm	Sampling
7	Solder Ball Feature TP	0.25	Max	mm	100%
8	Solder Ball Co-Planarity	0.20	Max	mm	100%
9	Cover Pin Hole Diameter before SMT	Supplier Specific	± 0.03	mm	Sampling

Table 2. Socket FM2b Critical-to-Function Parameters (Continued)

Critical-to-Function Parameter List					
List	**Parameters**	**Nominal**	**Tolerance**	**Unit**	**Monitoring**
10	Cover Pin Hole Diameter after SMT	Supplier Specific	± 0.03	mm	Sampling
11	Cover Flatness before SMT	0.25	Max	mm	Sampling
12	Cover Flatness after SMT	0.25	Max	mm	Sampling
13	Cover Pin Hole Pitch before SMT	1.27	Basic	mm	Sampling
14	Cover Pin Hole Pitch after SMT	1.27	Basic	mm	Sampling
15	Cover Pin Hole Pattern TP before SMT	0.25	Max	mm	Sampling
16	Cover Pin Hole Pattern TP after SMT	0.25	Max	mm	Sampling
17	Cover Pin Hole Feature TP before SMT	0.13	Max	mm	Sampling
18	Cover Pin Hole Feature TP after SMT	0.13	Max	mm	Sampling
19	Contact Pattern TP before SMT	Supplier Specific		mm	Sampling
20	Contact Pattern TP after SMT	0.25	Max	mm	Sampling
21	Contact Feature TP before SMT	Supplier Specific		mm	Sampling
22	Contact Feature TP after SMT	0.13	Max	mm	Sampling
23	Cam Box Height from Top of package Seating Plane	2.2	Max	mm	Sampling
24	Cover Center Support Ring Height below Intermediate Support Ring (LMS2) plane (Compressed after SMT)	–0.03	± 0.05	mm	Sampling
25	Cover Inner support Post Height above Outer Support Region (LMS1) plane (Compressed after SMT)	0.06	± 0.05	mm	Sampling
26	Cover Intermediate Support Ring Height above Outer Support Region (LMS1) plane (Compressed after SMT)	0.06	± 0.05	mm	Sampling
27	Outer Support Region Step Height (recessed for the Package pin fillet clearance) after SMT	0.30	± 0.05	mm	Sampling
28	Cover Cavity Length	7.25	Min	mm	Sampling
29	Cover Cavity Width	4.70	Min	mm	Sampling

Table 2. Socket FM2b Critical-to-Function Parameters (Continued)

Critical-to-Function Parameter List					
List	**Parameters**	**Nominal**	**Tolerance**	**Unit**	**Monitoring**
30	Base Cavity Length	7.50	Min	mm	Sampling
31	Base Cavity Width	4.95	Min	mm	Sampling
32	Contact Gold Plating Thickness	0.25	Min	µm	Sampling
33	Contact Ni Plating Thickness	1.27	Min	µm	Sampling
34	Contact Gap	Supplier Specific		mm	100%
35	Contact Normal Force (RSS)	15 to 30		gram	Sampling
36	Lever Actuation Force	3.60	Max	kgf	Sampling
37	Socket Weight	13	± 2	g	Sampling

Chapter 4 Socket Electrical Requirements

This chapter describes the contact current rating, inductance, capacitance, differential impedance, propagation delay, cross talk, dielectric withstanding voltage, and insulation resistance of the Socket FM2b.

4.1 Contact Current Rating

The contact must be rated at a current rating of 1.5 A per contact with less than 30°C temperature rise and with a minimum of ten rows of mated contacts and pins energized.

4.2 Low Level Circuit Resistance (LLCR)

Contact resistance applies to the mounted socket with actuated package pin and includes the bulk resistance of the contact, solder ball, package pin, and the interface resistance between the contact and the package pin, but does not include the package internal trace resistance.

4.2.1 Initial Resistance

Initial contact resistance must be measured immediately after the first mating of the package pins to the socket contacts. The 453 daisy-chained pairs (904 contact locations) must be measured per socket sample. Initial LLCR must not exceed 20 mΩ per contact when mated with Cu Alloy-194 pins, based on measurements made on a daisy-chained pair of contacts.

4.2.2 Final Resistance

Final contact resistance must be measured after the mechanical and environmental testing of the mated package and socket is complete. The same 453 daisy-chained pairs (904 contact locations) must be measured per socket sample. Final LLCR must not exceed 20 mΩ per contact when mated with Cu Alloy-194 pins, based on measurements made on a daisy-chained pair of contacts.

4.3 Inductance

The inductance specifications for the Socket FM2b are as follows:

- The mated, partial self-inductance of a single pin must be less than 4 nH.
- The mated-loop inductance of two nearest pins must be less than 3.3 nH.
- The mated partial-loop inductance matrix of three neighboring pins must be less than 3.3 nH for the diagonal entries, and must be less than 2.2 nH for the off-diagonal entries.

Note: *Measurements are made at frequencies of 500 MHz and 2 GHz.*

4.4 Capacitance

The capacitance specifications for the Socket FM2b are as follows:

- The mated capacitance between two nearest pins must be less than 1 pF.
- The mated capacitance matrix of three neighboring pins must be less than 1 pF.

Note: *Measurements are made at frequencies of 500 MHz and 2 GHz.*

4.5 Differential Impedance

The differential (or odd mode) impedance for three, mated-pins configuration (one pin as the voltage/current reference—S1, S2, and G) must be 100 Ω ± 10% between the two nearest pins (with an additional ± 2-Ω measurement error). If the Time Domain Method is used, the signal must have a rise time of 150 ps for the signal amplitude to go from 10% to 90%.

4.6 Propagation Delay

The propagation delay specifications for the Socket FM2b are as follows:

- The propagation delay skew among single-ended signals must be less than 10 ps, plus a maximum measurement error of 3 ps.
- The propagation delay skew among differential signal pairs must be less than 10 ps, plus a maximum measurement error of 3 ps.

4.7 Cross Talk

Cross talk between the nearest single-ended and differential signals must be measured and compared to results from the measured partial-loop inductance and the Maxwell capacitance matrices.

4.8 Dielectric Withstanding Voltage (DWV)

The contact-to-contact dielectric withstanding voltage between randomly selected adjacent lateral, diagonal, and vertical contacts must be a minimum of 650 VAC.

4.9 Insulation Resistance (IR)

The contact-to-contact insulation resistance between randomly selected adjacent lateral, diagonal, and vertical contacts must be a minimum of 1000 MΩ.

Chapter 5 Socket Environmental Requirements

This section describes the socket design required to meet reliability requirements for the end-user field-use environment, OEM high volume manufacturing environment, and shipping and handling conditions of desktop computers.

5.1 Thermal Shock

Sockets must meet low-level circuit resistance (LLCR) and visual inspection requirements after being subjected to 10 thermal shock cycles with the cold temperature extreme at –55°C and the hot temperature extreme at +110°C. The dwell at each temperature extreme is 30 minutes with less than 15 seconds transition time. The test should be conducted with the associated heatsink assembly (AMD part number 7120038000G) attached to the processor package.

5.2 Cyclic Humidity

Sockets must meet LLCR, dielectric withstanding voltage (DWV), insulation resistance (IR), and visual inspection requirements after being subjected to 1000 hours of cyclic humidity tests with a cycle time of eight hours. Temperature range is 25°C to 85°C with relative humidity maintained between 90% to 95%. This test should be conducted with the associated heatsink assembly (AMD part number 7120038000G) attached to the processor package.

5.3 Thermal Cycling

Sockets must meet LLCR and visual inspection requirements after being subjected to a minimum of 1000 cycles of thermal cycles with testing continued until 60% of the sockets fail or 3000 cycles are completed. Cold temperature extreme is –55°C with a dwell time of 20 minutes, and hot temperature extreme is +110°C with a dwell time of 15 minutes. The average rate of temperature change between the hot and cold temperature extremes must not exceed 10°C per minute. This test should be conducted with the associated heatsink assembly (AMD part number 7120038000G) attached to the processor package.

5.4 Temperature Life

Sockets must meet LLCR and visual inspection requirements after being subjected to 500 hours of temperature life testing at 115°C. This test should be conducted with the associated heatsink assembly (AMD part number 7120038000G) attached to the processor package.

5.5 Industrial Mixed Flowing Gas

Sockets must meet LLCR and visual inspection requirements after being subjected to mixed flowing gas testing with half the samples mated and the other half samples unmated for the first

five days, and then all samples mated for the final five days. The test temperature is 30°C with a relative humidity of 70%. Mixed flowing gas constituents are 10-ppb chlorine, 10-ppb hydrogen sulfide, 200-ppb nitrogen dioxide, and 100-ppb sulfur dioxide.

5.6 Mechanical Shock

Sockets must meet LLCR, continuity intermittency of less than 1-µs duration, and visual inspection requirements after being subjected to mechanical shock testing at 50 g, 11-ms duration, half-sine waveform with three shocks per positive and negative directions on all three axes — totaling 18 shocks. This test should be conducted with the associated heatsink assembly (AMD part number 7120038000G) attached to the processor package.

5.7 Random Vibration

Sockets must meet LLCR, continuity intermittency of less than 1-µs duration, and visual inspection requirements after being subjected to random vibration testing at 3.1 g rms between 20 Hz to 500 Hz for duration of 45 minutes per axis for each of the three axes. This test should be conducted with the associated heatsink assembly (AMD part number 7120038000G) attached to the processor package.

5.8 Resistance to Solder Heat

Sockets must meet LLCR, cover flatness, and visual inspection requirements after being subjected to four convection-solder-reflow processes for mounting the socket to the PCB. No deterioration of the markings on the socket is allowed.

5.9 Resistance to Solvents

Sockets must meet visual inspection requirements after being subjected to the Four Solutions test. No deterioration of the markings on the socket is allowed.

5.10 Heatsink Assembly

The associated heatsink assembly (AMD part number 7120038000G) attached to the processor package in the environmental testing can weigh up to 450 grams.