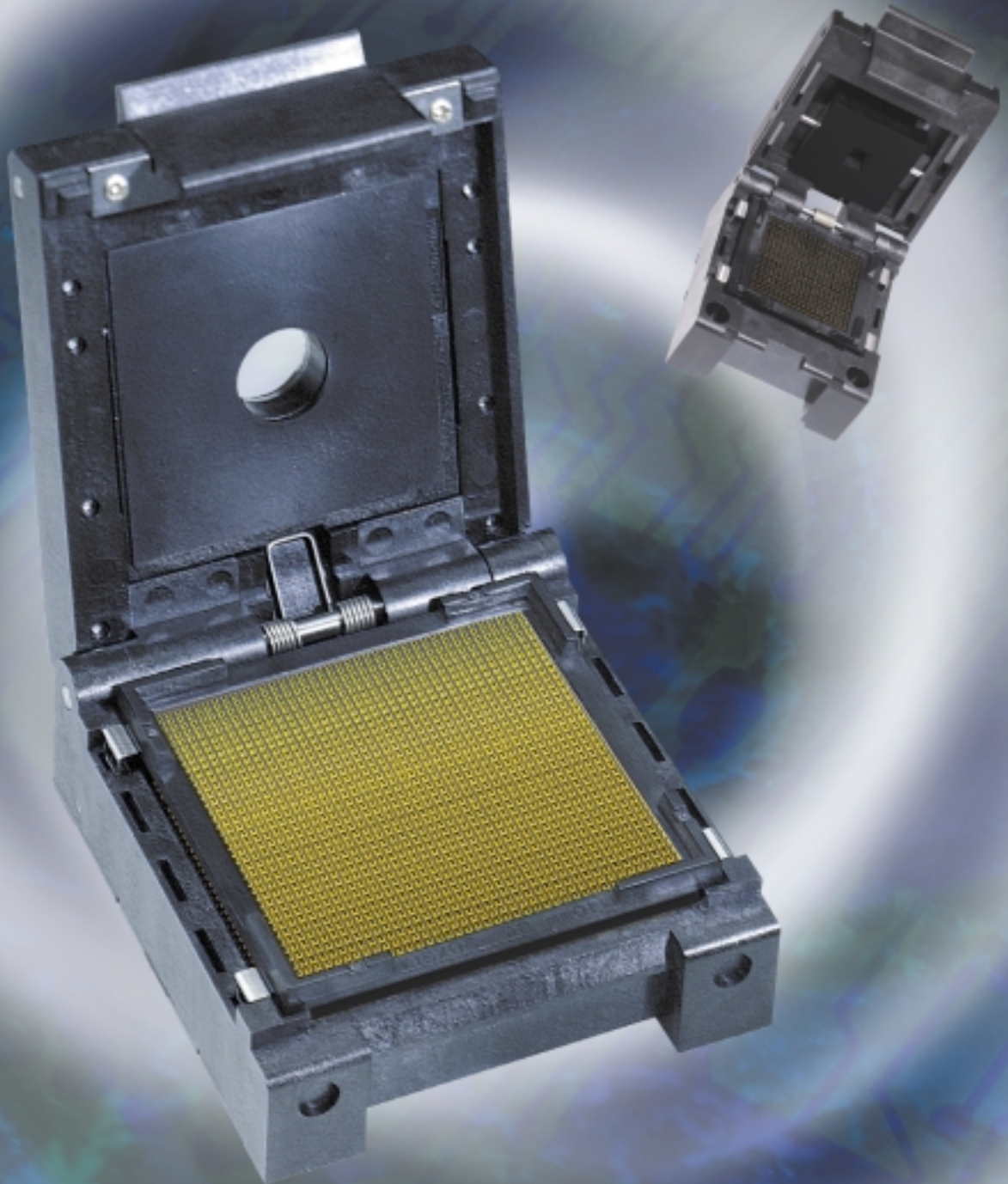


3M™ Textool™ Test and Burn-In Sockets for 1.0 mm Area Array Packages Including Ball Grid Array and Land Grid Array



3M *Innovation*

3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

1.0 mm Pitch Socket Platforms

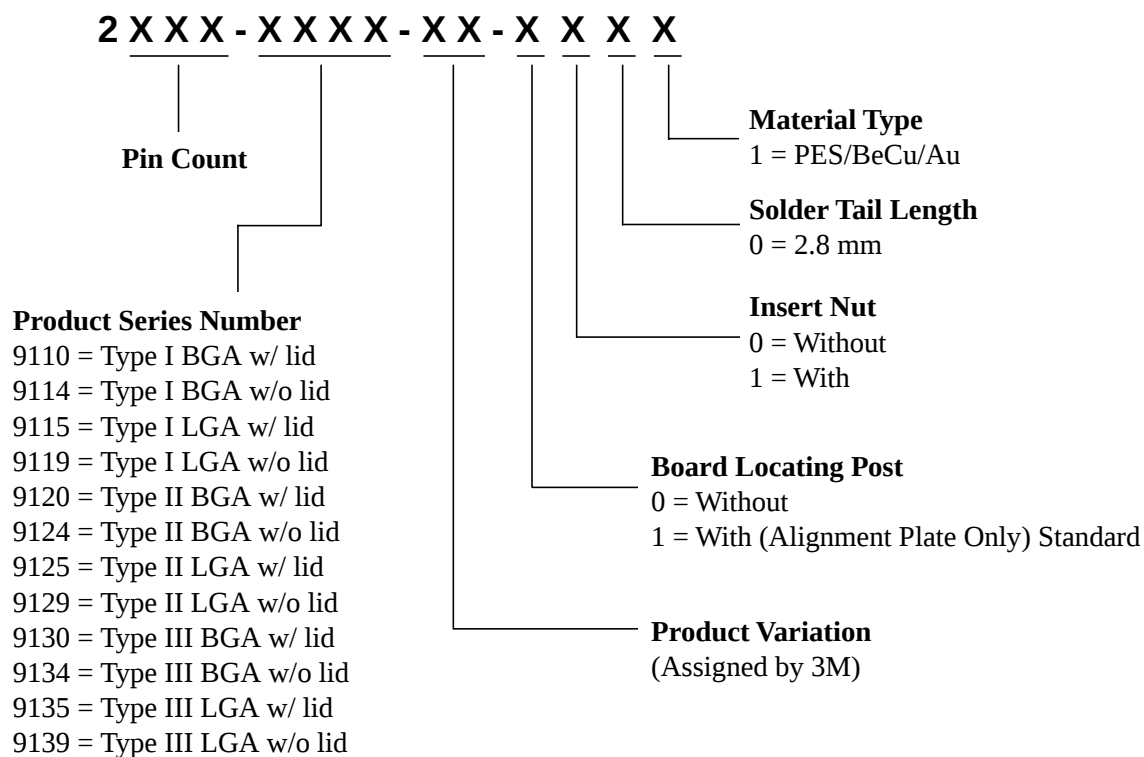
Socket Type	Max. Package Body Size	Maximum Matrix	Max. Pin Count	Lid Feature	Series Product Number		Status
					BGA	LGA	
I	23x23	21x21	441	with Lid	9110	9115	Available
	23x23	21x21	441	w/o Lid	9114	9119	Available
II	40x40	39x39	1521	with Lid	9120	9125	Available
	40x40	39x39	1521	w/o Lid	9124	9129	Available
III	47.5x47.5	45x45	2025	with Lid	9130	9135	Available
	47.5x47.5	45x45	2025	w/o Lid	9134	9139	Available

The Modular Design of the 3M Textool 1.0 mm Pitch BGA/LGA Socket enables 3M to cost effectively provide a socket that mates with almost any 1.0 mm pitch package. The nest “Package Guide” (reference illustration, p.3) can be adjusted to match the specific body size and matrix of your particular package. The socket contacts are inserted to match the ball count and pattern of your package.

Ordering Information:

- 1) Submit your detailed package drawing to 3M Customer Service.
- 2) Specify optional features desired:
 - >With or without lid assembly
 - >With or without positioning post
 - >With or without insert nuts for mounting screws
- 3) 3M Customer Service will assign complete part number.

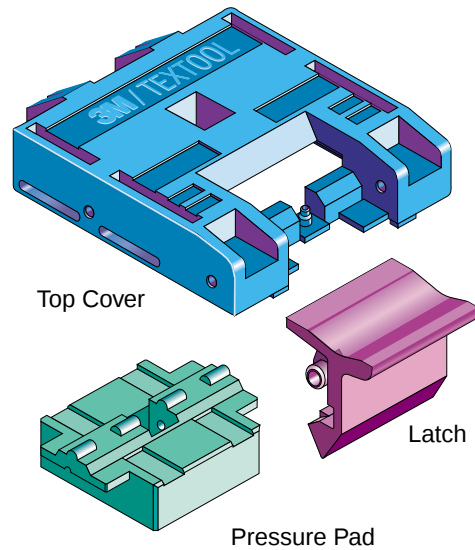
Part Number Key



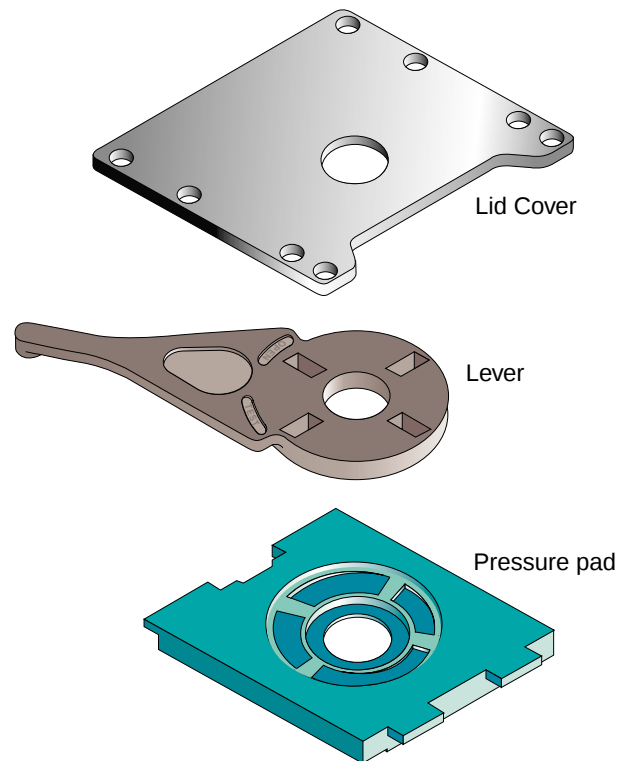
3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Socket Construction

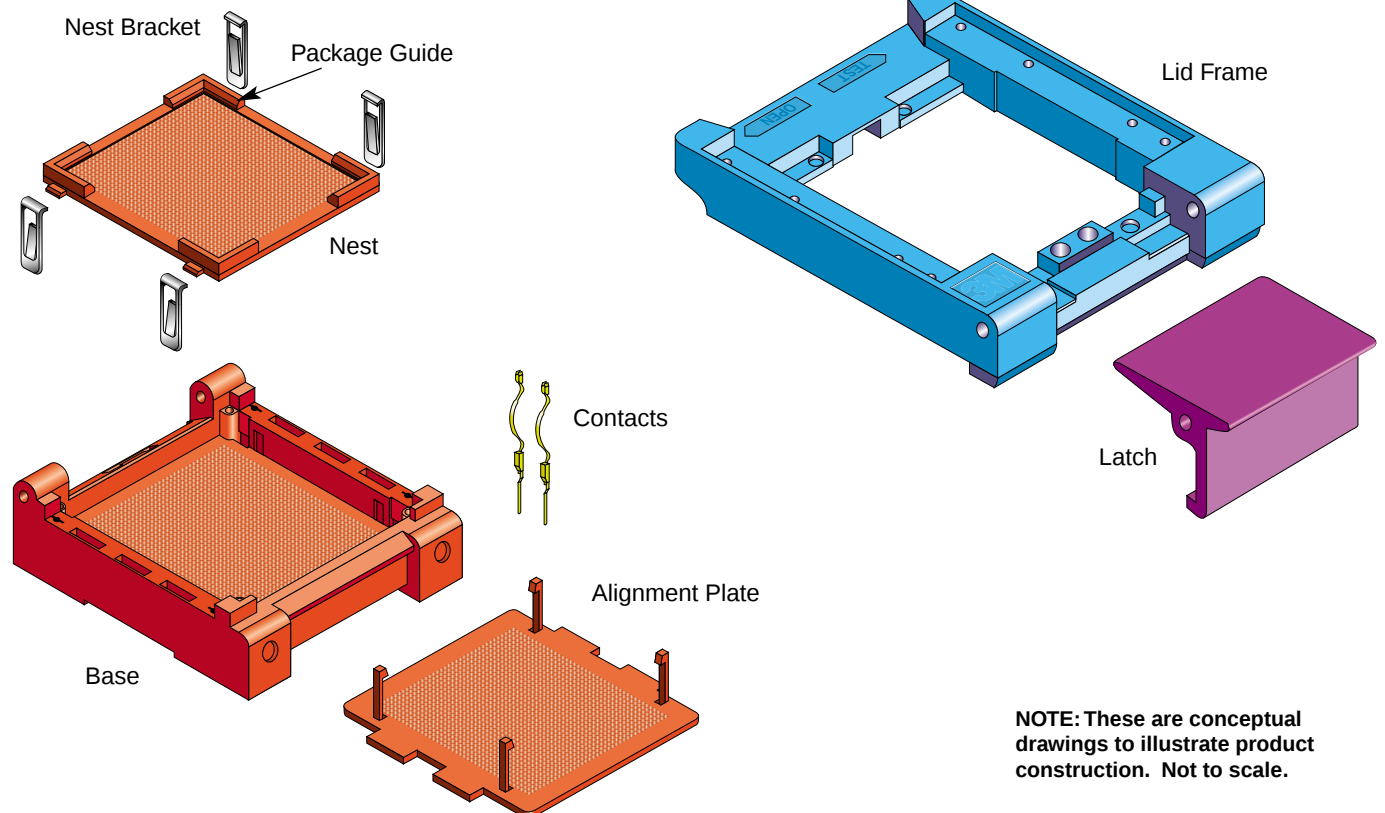
Type I Lid Assembly



Type II Lid Assembly



Base Assembly



NOTE: These are conceptual drawings to illustrate product construction. Not to scale.

3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

BGA/LGA Packages and Relation to Socket

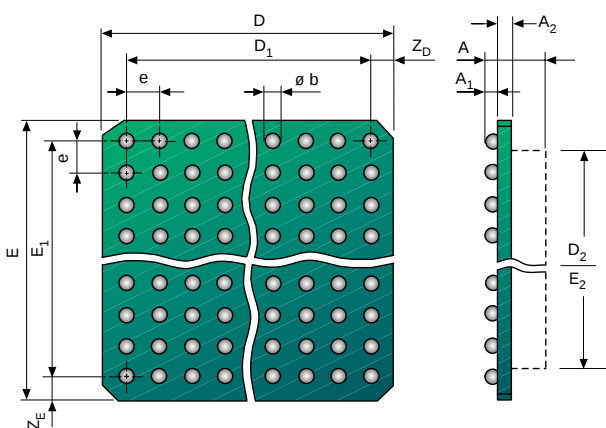
BGA packages are available from multiple sources in a wide variety of designs, materials, body sizes, matrices, pin pattern configurations, pitches and thicknesses. To assure proper mating of package to socket and reliable socket performance, all package parameters must be

precisely specified and the corresponding socket feature designed to match the package specification. **To properly select or design a socket, the following package dimensions must be specified accurately.**

Essential BGA Package Dimensions

		Dimensions
Overall Height	A	±
Ball Height	A ₁	±
Substrate Thk	A ₂	±
† Ball Diameter	ø b	±
Body Size	D	±
	E	±
Total Pitch	D ₁	±
	E ₁	±
* Pressure Free Zone If Applicable	D ₂	±
	E ₂	±
Ball Pitch	e	
Number of Rows	M _D	
	M _E	
Number of Balls	n	
Package Overhang	Z _D	±
	Z _E	±
Pattern	—	Need Pattern Drawing

† 3M socket designed for 0.6 mm ± 0.1 mm dia. ball.



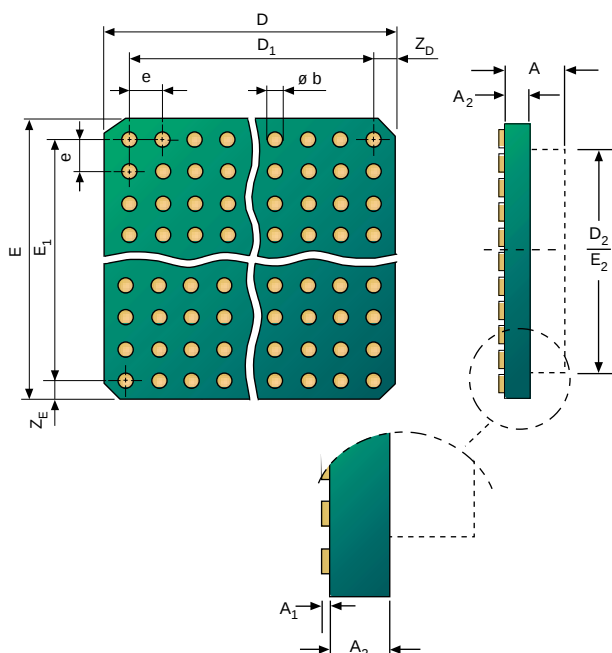
Note: Please fill in dimensions above or send detailed package drawing to 3M Customer Service.

*See illustration on page 12.

Essential LGA Package Dimensions

		Dimensions
Overall Height	A	
Raised Pad Height or Recessed Pad Depth	A ₁	±
Substrate Thk	A ₂	±
†† Pad Diameter	øb	±
Body Size	D	±
	E	±
Total Pitch	D ₁	±
	E ₁	±
* Pressure Free Zone If Applicable	D ₂	±
	E ₂	±
Pad Pitch	e	
Number of Rows	M _D	
	M _E	
Number of Pads	n	
Package Overhang	Z _D	±
	Z _E	±
Pattern	—	Need Pattern Drawing

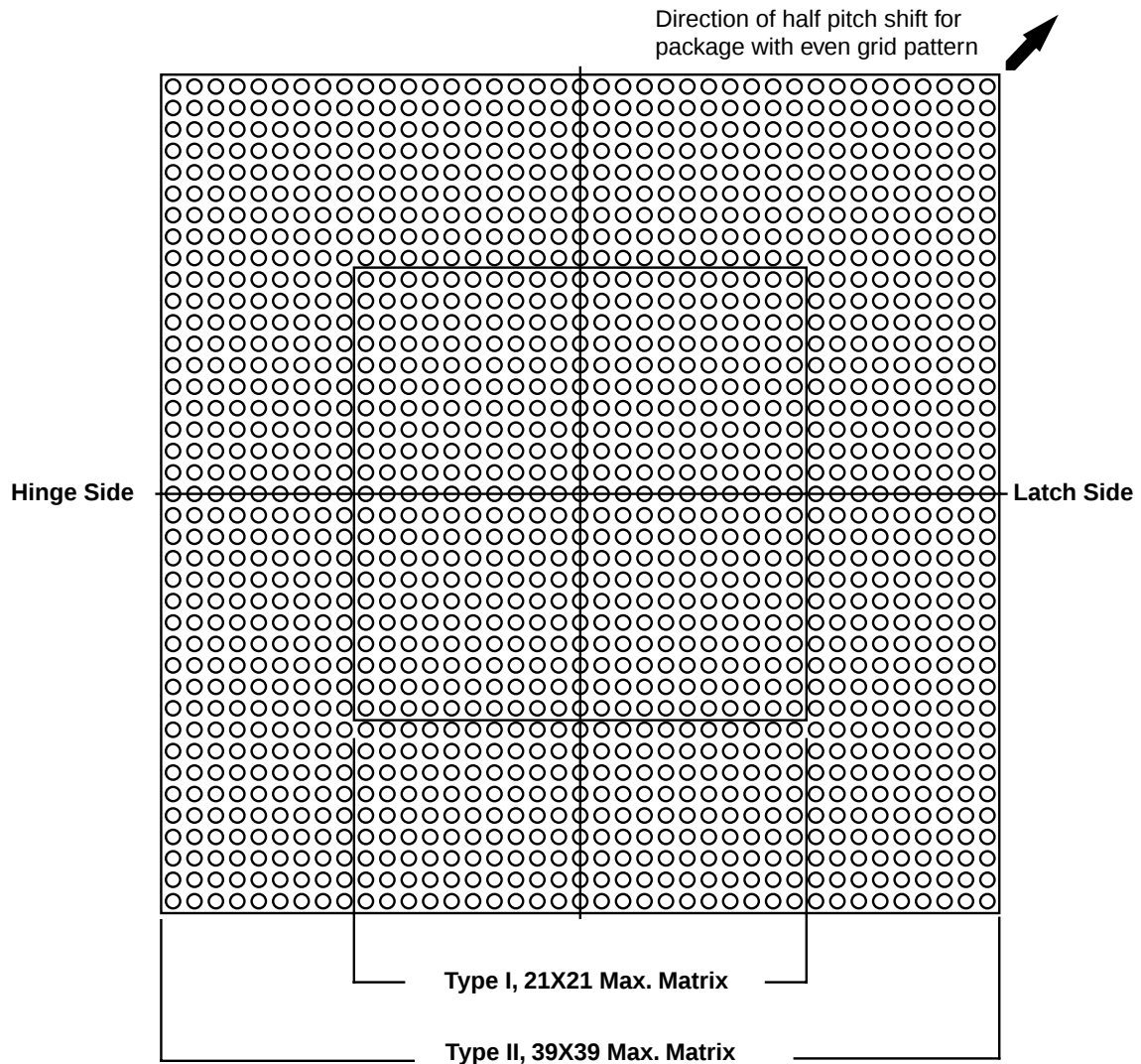
†† 3M socket designed for 0.6 mm ± 0.1 mm dia. pad.



3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Pin Pattern of 1.0 mm Pitch BGA/LGA T/B Socket

Note: Socket pin pattern will be mirror image of package bottom side view.



Specify options required by checking appropriate box

- | | | | |
|--|---------------------------------|--|---|
| ☐ Type I Socket | Package Type | ☐ BGA | ☐ LGA |
| | (4) Threaded insert (JIS M2.6) | ☐ With | ☐ Without (Standard) |
| | Board Locating Posts: | | |
| | -Alignment Plate (2 Posts) | ☐ With (Standard) | ☐ Without |
| | -Length of Contact Tail | ☐ 2.8 mm (Standard) | ☐ Other |
|
 | | | |
| ☐ Type II Socket | Package Type | ☐ BGA | ☐ LGA |
| | (4) Threaded insert (UNC# 2-56) | ☐ With | ☐ Without (Standard) |
| | Board Locating Posts: | | |
| | -Alignment Plate (2 Posts) | ☐ With (Standard) | ☐ Without |
| | -Length of Contact Tail | ☐ 2.8 mm (Standard) | ☐ Other* |

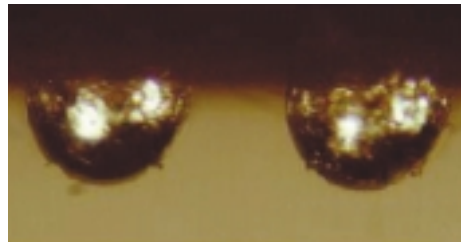
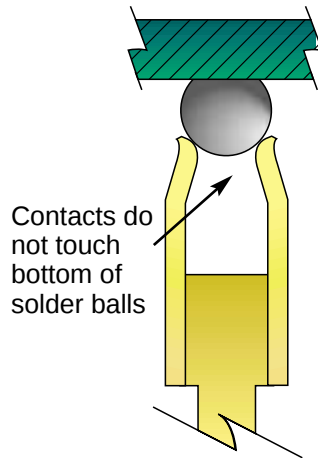
*Note: Contact 3M Customer Service

3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Contact Design - BGA

Contact Features

- Low normal force
- Controlled ball deformation away from seating plane
- Double contact points

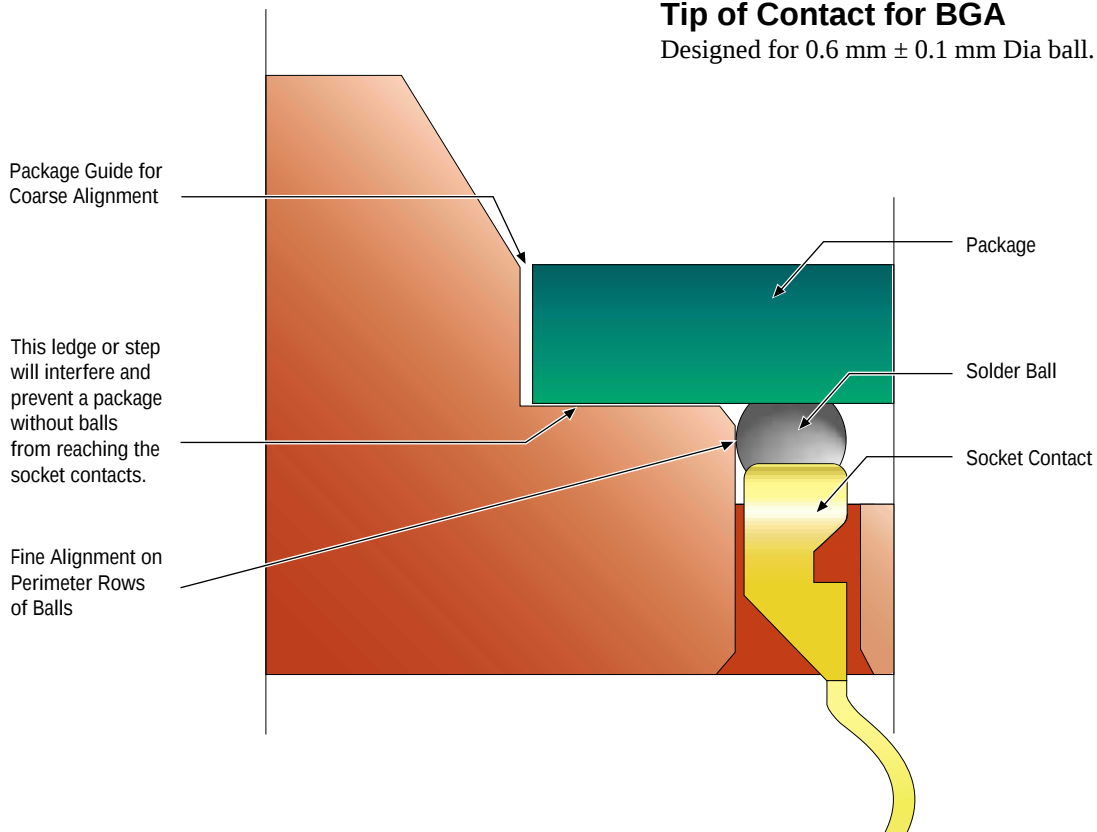


Ball Deformation after 8 hrs. at 125°C



Tip of Contact for BGA

Designed for 0.6 mm $\pm$ 0.1 mm Dia ball.



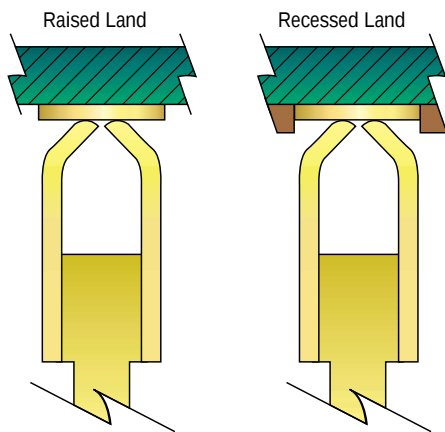
3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Contact Design - LGA

Contact Features

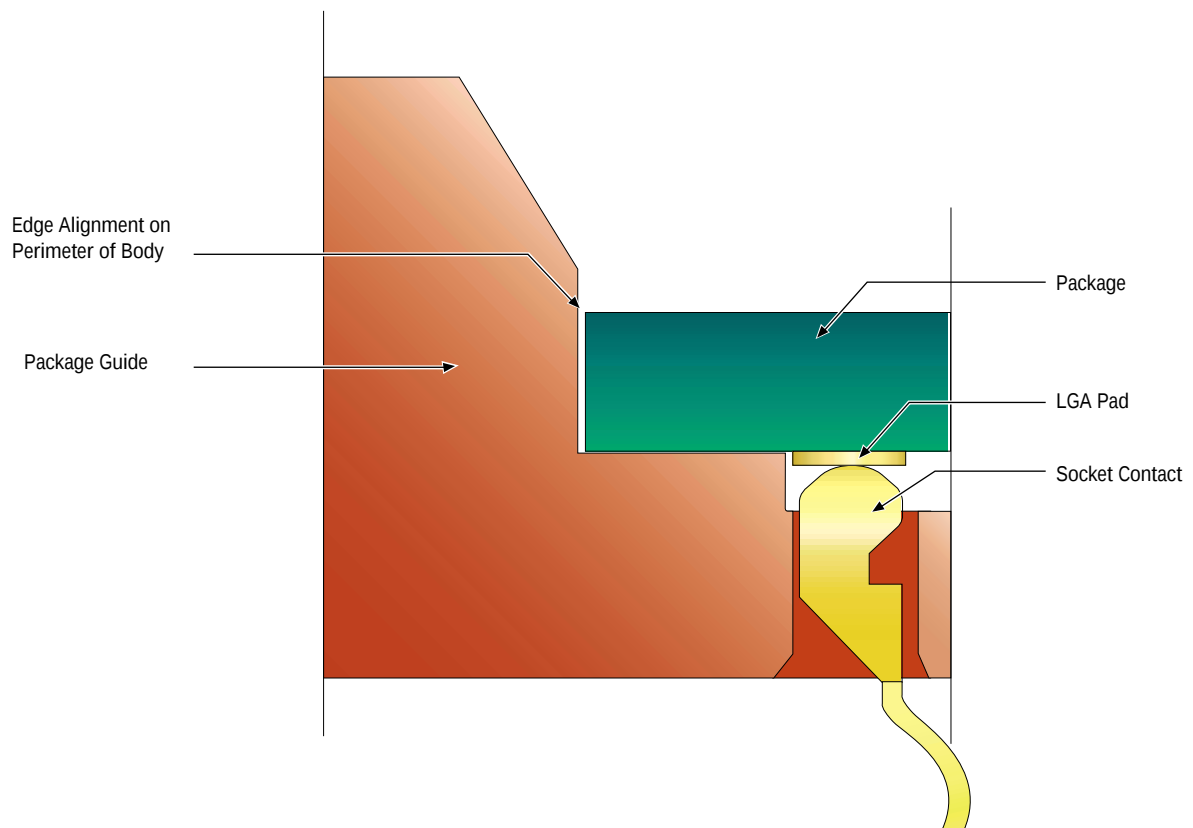
- Low normal force
- Works with LGAs having raised or recessed pads
- Double contact points

Double Point Design



Tip of Contact for LGA

Designed for either recessed or raised pads.
Designed for 0.6 mm $\pm$ 0.1 mm Dia land.



3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Instruction for Use

Package Thickness Tolerance

The 3M BGA socket is designed to accept a package thickness of ± 0.1 mm of specified nominal. *The proper normal force will not be applied if the thickness is outside this range.*

Contact Probing

Top side probing can be accomplished by using a probe head that matches the device pattern. Individual contact probing should only be on the contact tails. *Top side probing of individual contacts could cause damage.*

Receptacle Use

Care should be taken when using 3M BGA sockets with receptacles. A ZIF receptacle is highly recommended.

If a LIF receptacle is used it must have < 140 gm per pin insertion force and all contact pins should be carefully aligned before inserting socket into receptacle. *Improper insertion may dislodge or break the BGA contact pins.*

Field Repairability

BGA socket contacts are generally not repairable or replaceable. BGA socket lids are field repairable.

Avoid Internal Shorting

Package solder ball pattern must exactly match socket pattern and all positions must be uniformly depressed.

Physical

Body:	
Material:	Polyethersulfone (PES)
Flammability:	UL 94V-0
Color:	Black
Alignment Plate:	
Material:	Liquid Crystal Polymer (LCP)
Flammability:	UL 94V-0
Color:	Black
Contact:	
Material:	Beryllium Copper
Plating:	0.76 μ m Gold over Nickel
Threaded inset (Optional):	
Material:	Brass
Other Metal Parts:	
Stainless Steel	
Marking:	
3M Logo/Textool Logo	

Electrical

Insulation Resistance:	> 1000 M Ω at 500 Vdc
Dielectric Withstanding Voltage:	500 Vrms at Sea Level
Initial Contact Resistance:	< 100 m Ω measured at 1.0 mA applied current
Current Rating:	1.0 A max @ 25°C

Environmental

Operating Temperature Rating:	-55°C to +150°C
--------------------------------------	-----------------

Mechanical

Durability:	10,000 actuations at room temperature
Contact Force:	36gf (0.35N) Nominal

Safety

Precautions

Provide appropriate local exhaust ventilation when product is heated. Avoid skin contact with hot material. Wear appropriate gloves to prevent thermal burns.

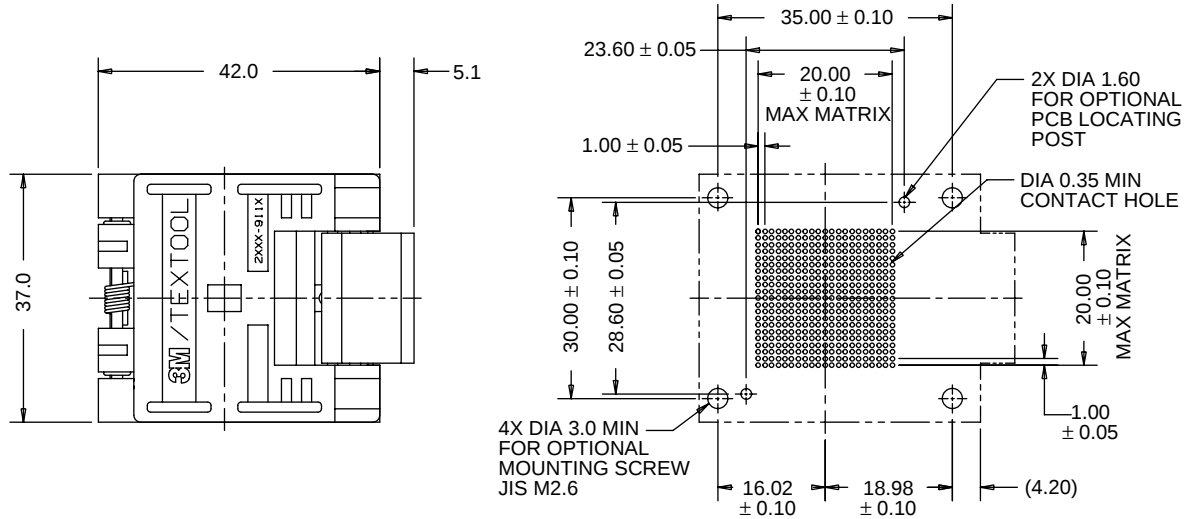
Caution!

Overheating of product may release vapors which may cause eye and respiratory irritation. Skin contact with heated product may cause burns.

Consult Material Safety Data Sheet for further information on health hazards, precautions, and suggested first aid.

3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Type I



PCB BOARD PATTERN

DIMENSIONS IN MILLIMETERS		
DIM	.0	.00
TOL	±0.25	±0.13

PACKAGE SPECIFICATIONS

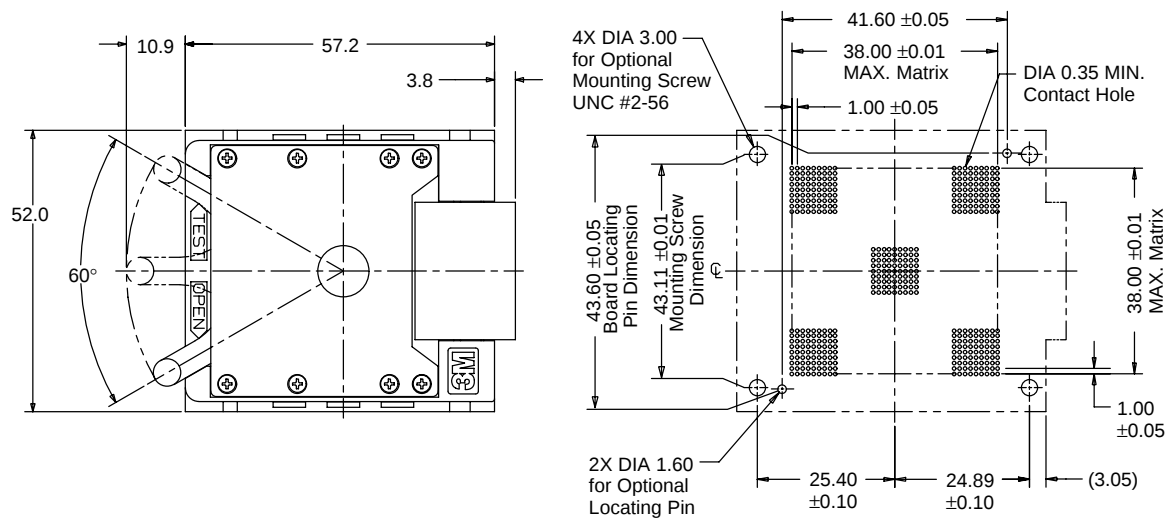
Max Package Size	23 mm Max ± 0.20 mm SQ
Max Package Thickness	3.50 ± 0.10 mm Max
Max Matrix	21 x 21
Ball or Land Dia	0.50 to 0.70 mm
Ball Height	0.40 to 0.60 mm

PCB RECOMMENDATIONS

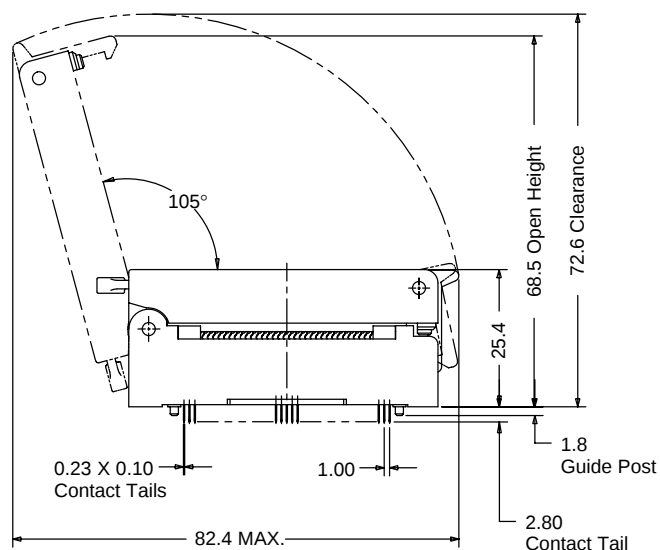
Board Thickness	1.60 mm
Through Hole Diameter	0.35 mm Min

3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Type II



PCB HOLE PATTERN



DIMENSIONS IN MILLIMETERS		
DIM	.0	.00
TOL	±0.25	±0.13

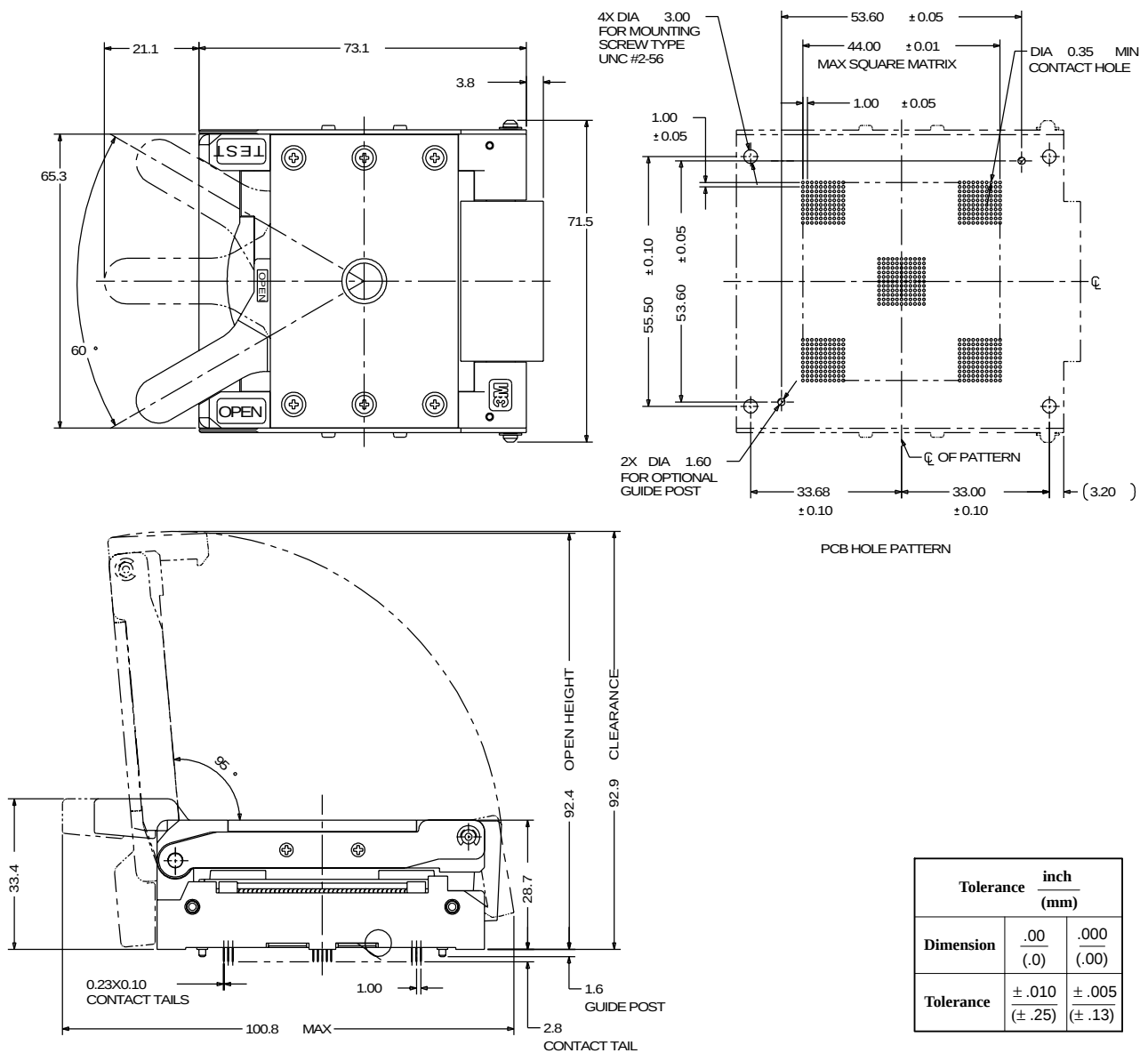
Ordering Information

PACKAGE SPECIFICATIONS	
Max Package Size	40 mm Max ± 0.20 mm SQ
Max Package Thickness	3.50 ±0.10 mm Max
Max Matrix	39 x 39
Ball or Land Dia	0.50 to 0.70 mm
Ball Height	0.40 to 0.60 mm

PCB RECOMMENDATIONS	
Board Thickness	1.60 mm
Through Hole Diameter	0.35 mm Min

3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Type III



Ordering Information

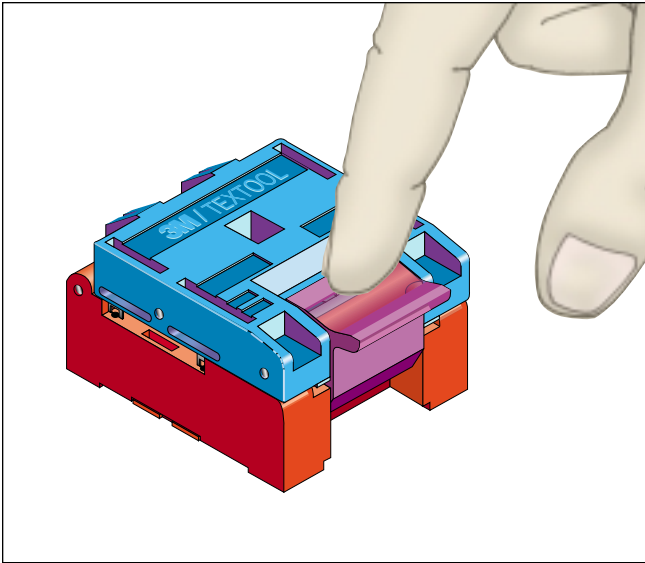
PACKAGE SPECIFICATIONS	
Max Package Size	47.5 mm Max $\pm$ 0.20 mm SQ
Max Package Thickness	4.0 Max $\pm$ 0.10 mm
Max Matrix	45 x 45 Max
Ball or Land Dia	0.50 to 0.70 mm
Ball Height	0.40 to 0.60 mm

PCB RECOMMENDATIONS	
Board Thickness	1.60 mm
Through Hole Diameter	0.35 mm Min

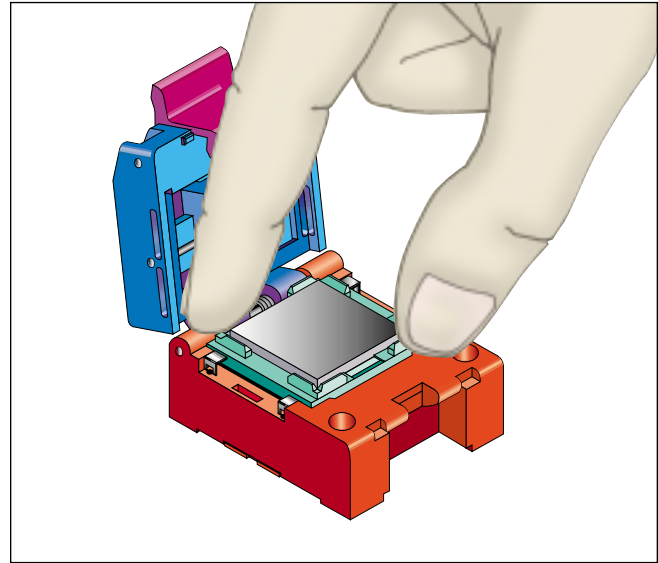
3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Type I Lid Instructions

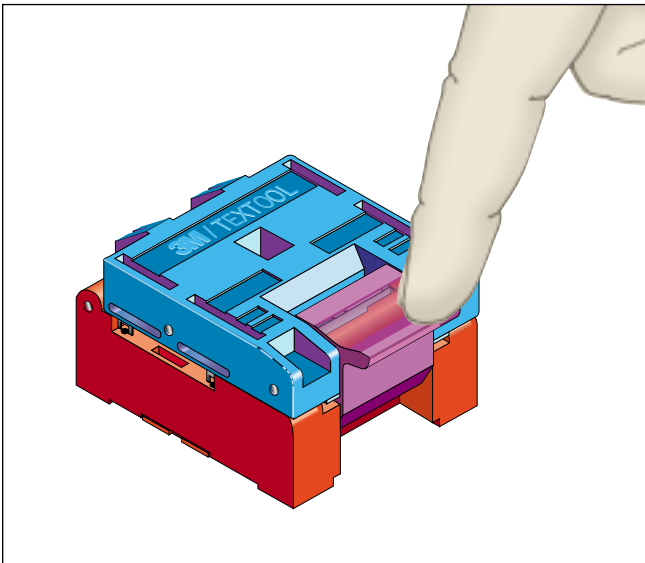
The lid for Type I is a simple 1-step actuation mechanism. The pressure pad is customized to match to the package thickness.



1. With locking mechanism in open position, press on rear of latch to open.



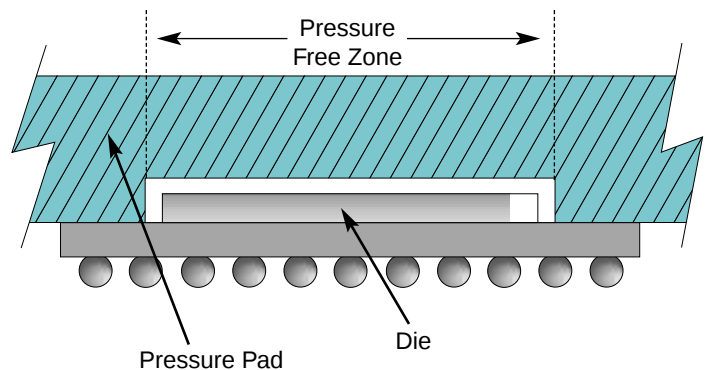
2. Place package into alignment guides in nest.
Caution: Do not depress nest without package in place.



3. To close the lid, press on leading edge of latch.

Type I & II Recessed Lid for Pressure Free Zone

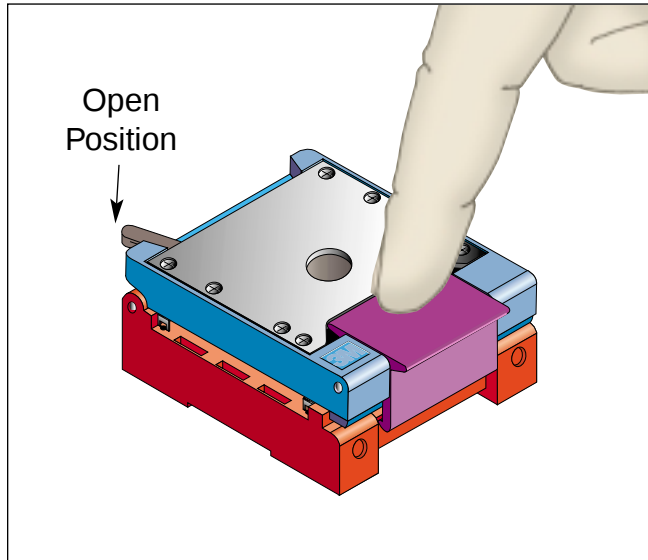
The pressure pad can also be recessed to provide no clamp zones for bare die or other raised package features.



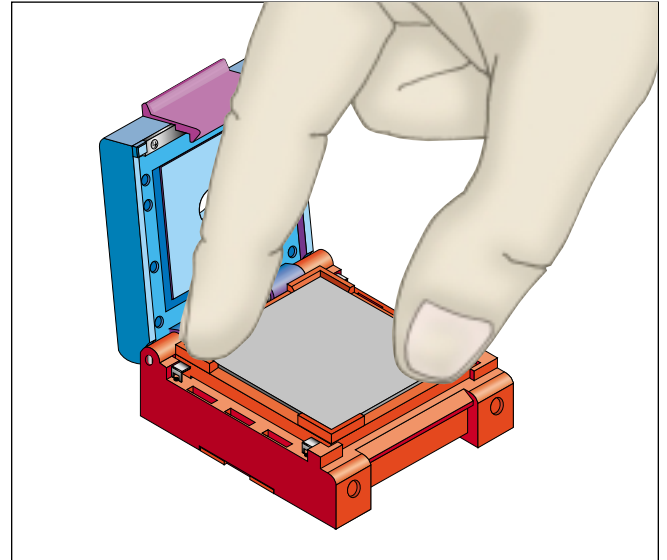
3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Type II & III Lid Instructions

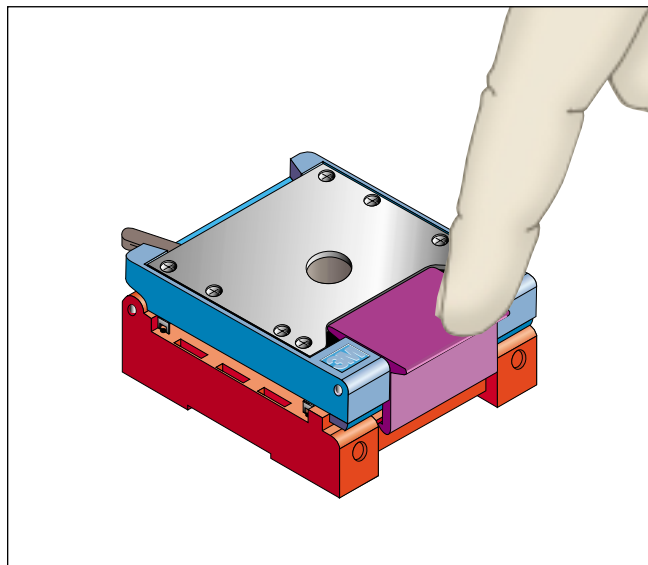
The lids for Type II and Type III are a 2-step actuation, providing a mechanical advantage of approximately 10:1. This reduction in lid closure force is particularly helpful for high lead count packages. In addition, the actuation force is applied vertically, eliminating hinging effects during lid closure. The pressure pad is customized to match to the package thickness.



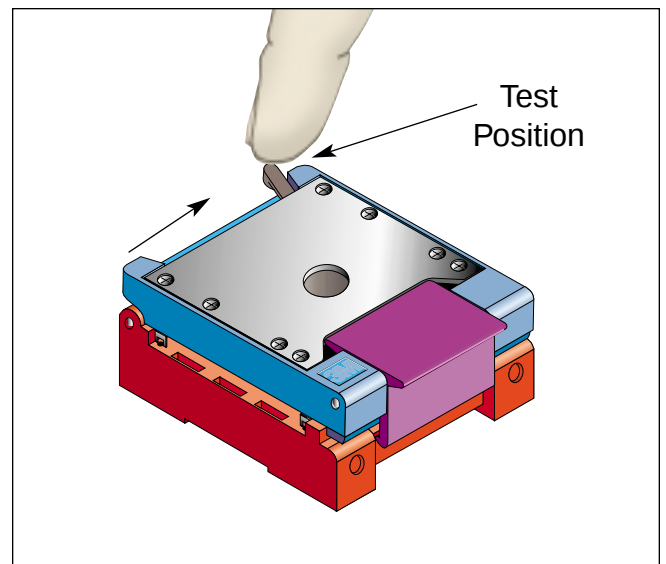
1. With locking mechanism in open position, press on rear of latch to open.



2. Place package into alignment guides in nest.
Caution: Do not depress nest without package in place.



3. To close the lid, press on leading edge of latch.

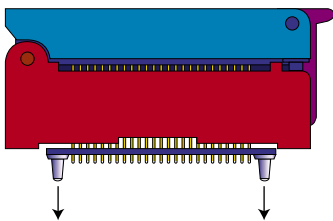
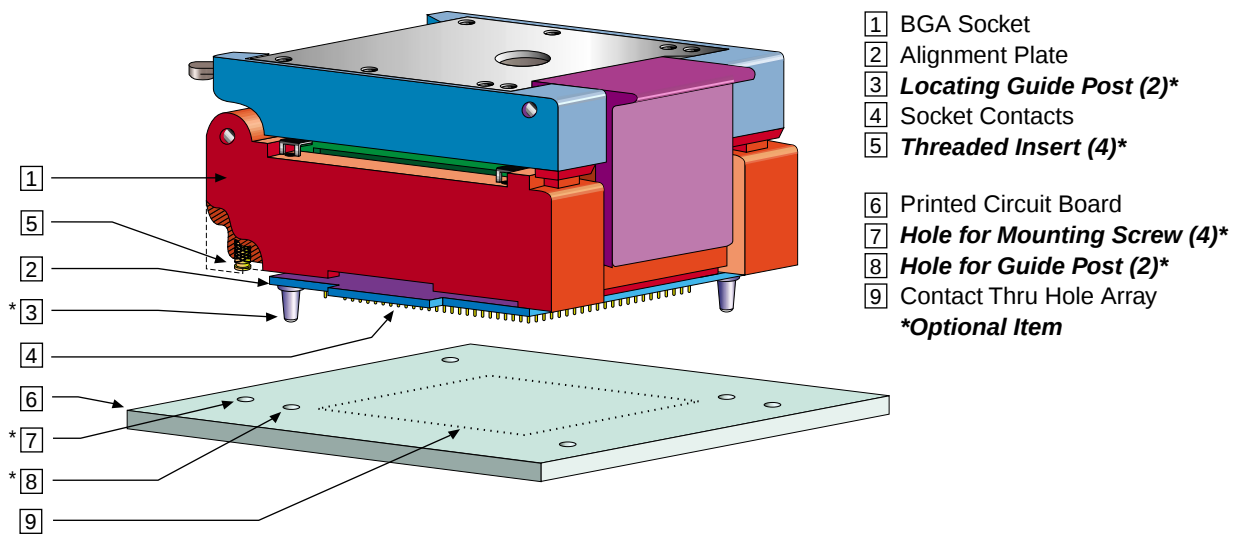


4. Move lever to test position to apply force. Reverse procedure to remove package.

NOTE: Do not open socket with lever in test position.

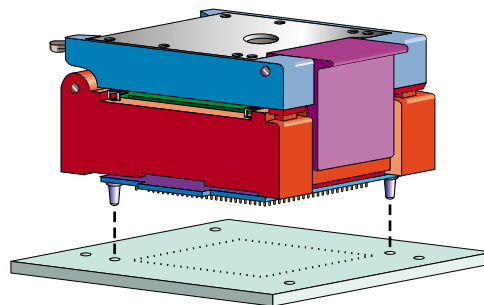
3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Board Mounting Instructions



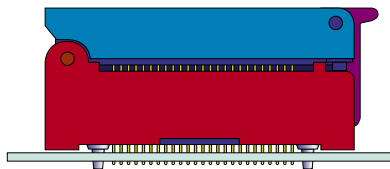
Step 1

Pull guide plate carefully away from bottom of socket towards contact tips. Caution: use of force will damage guide plate.



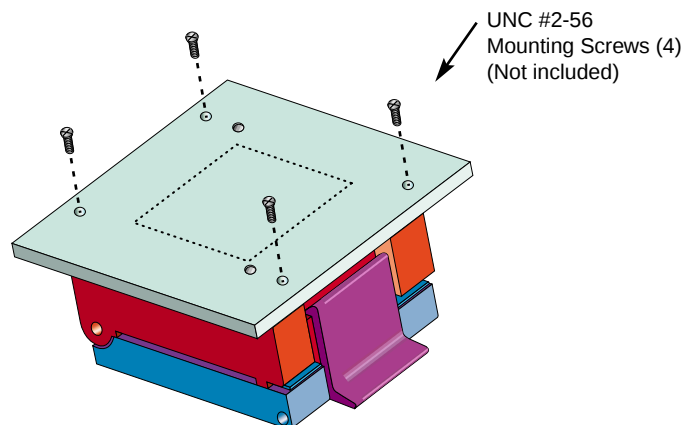
Step 2

Align guide post into holes on printed circuit board. (When post is not in use, align socket contacts into holes.)



Step 3

Carefully press socket contacts through board. (Resistance indicates contacts are not aligned.)



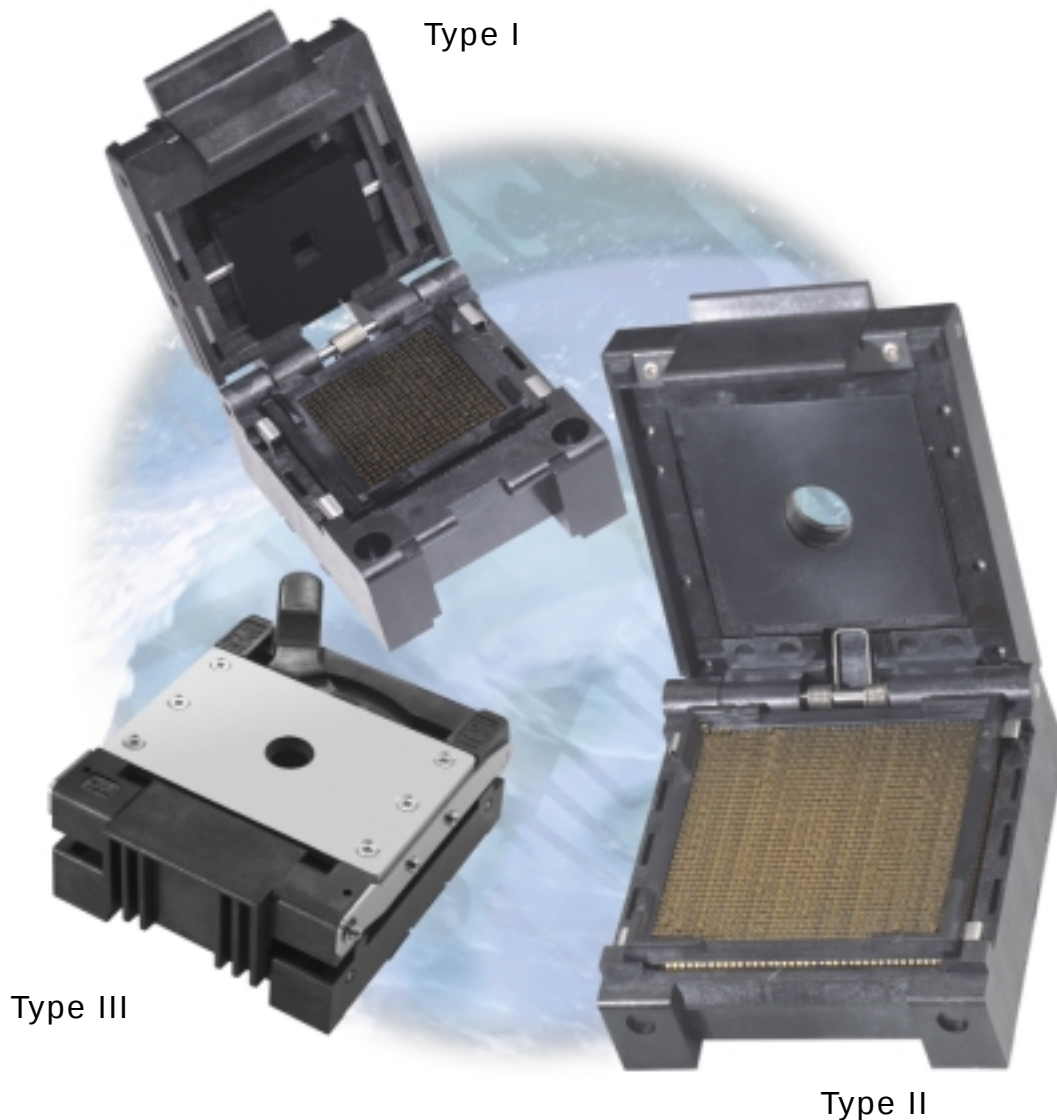
Step 4

Holding socket in place, turn board over and install screws into threaded inserts (if used).

NOTE: These are conceptual drawings to illustrate product construction. Not to scale.

3M™ Textool™ 1.0 mm BGA/LGA Lidded Sockets

Notes



Type I

Type III

Type II

Textool is a trademark of 3M.

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