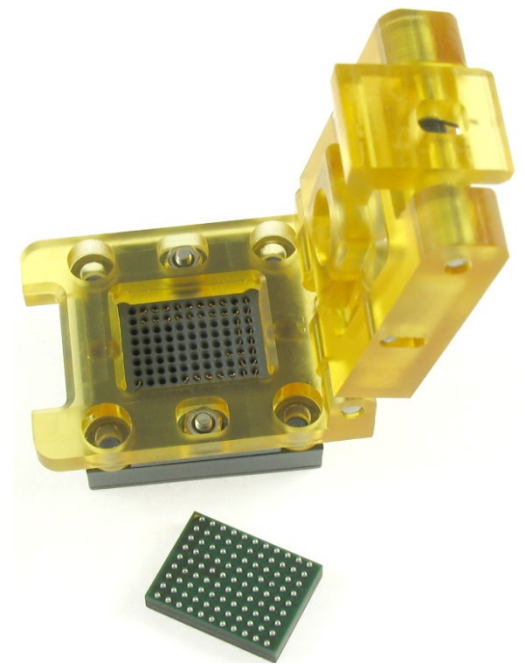




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# **SBT – Socket for Burn-in and Test Applications**

**High Performance  
IC Sockets And  
Test Adaptors**

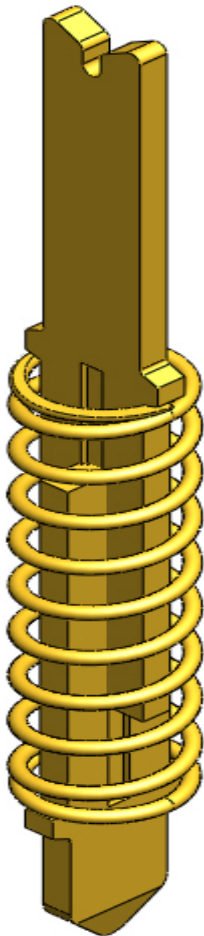
# Application Need

*Custom Burn-in and Standard Production Test Applications usually demand a spring probe solution*

- *Custom Burn-in sockets are expensive*
  - *Need high cost tooling and long development time*
- *Spring probes are expensive*
  - *Economic downturn accelerating need for cost reductions*
  - *Production factories need low cost replacement pins*
- *Spring probe delivery unpredictable*
  - *High cost means no inventory*
  - *Poor delivery lead time puts new product ramp at risk*

# Solution - SBT Contact

## BGA Contact



SBT Contact is a stamped & etched contact with outside spring as well as inside leaf spring that provides a robust solution for Burn-in & test applications.

CHARACTERIZATION  
BURN-IN  
SLT  
ATE

Solution for 1.27mm to 0.40mm (LGA, BGA, QFP packages) in Burn-in & test applications.

Contact technology has 3 part system. Top plunger, Bottom plunger and a spring. The BeCu plungers are stamped/etched and assembled to a stainless steel spring in automated system to enable reliable interconnect solution.

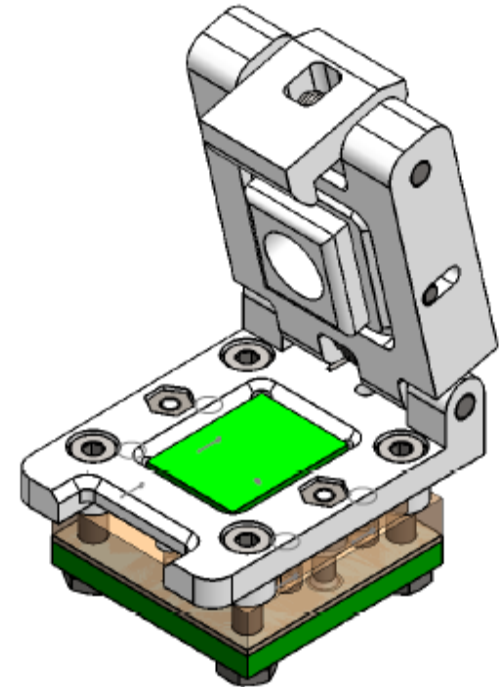
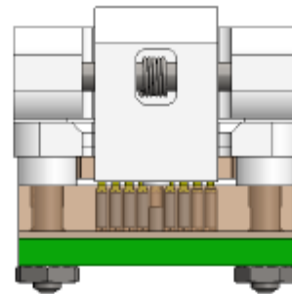
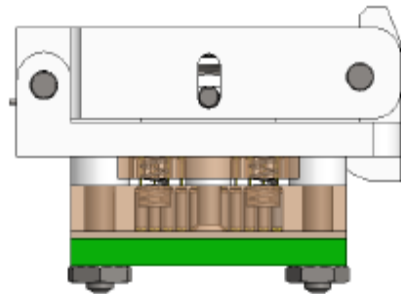
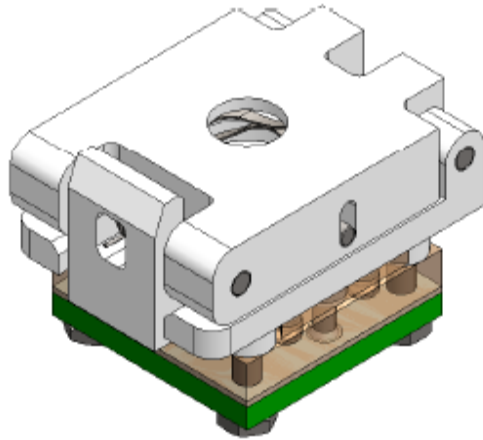
## LGA Contact



# SBT Socket

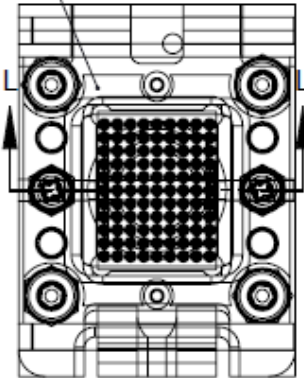
## FEATURES:

- Wide temperature range (-55C to +180C)
- High current capability (up to 8A)
- Excellent signal integrity at high frequencies
- Low and stable contact resistance for reliable production yield
- Highly compliant to accommodate wide co-planarity variations
- Automated probe manufacturing enables low cost and short lead time



# SBT Socket Details

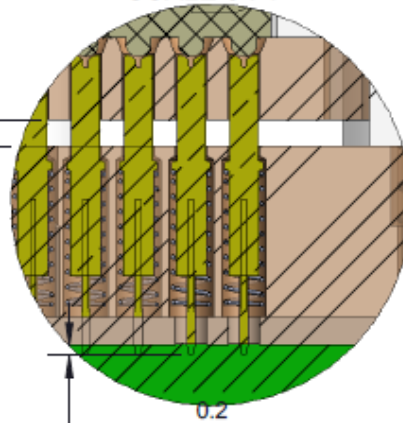
A1 Corner



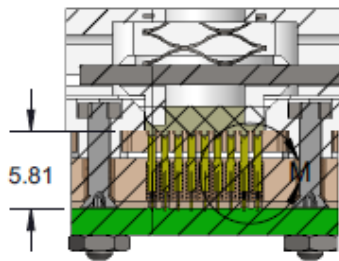
ITEM NO.	Description	Material
1	Bottom Pogo Guide	Ultem
2	Socket Base 12mm snap lid	PPS
3	12mm Plastic Snap Clamshell Socket Lid	PPS/Ultem
4	Clamshell Latch Snap Lid Socket	PPS/Ultem
5	Compression Plate Plastic Snap lid 10mm	PPS/Ultem
6	Target PCB	Material <not specified>
7	Middle guide	Ultem 1000
8	BGA	FR4
9	Top Floating Guide	Ultem 1000
10	Pogo Pin, 1mm Pitch SBT BGA pin	
11	Floating Guide Spring	Alloy Steel (SS)
12	Dowel Pin, M1.5 X 20mm LG, 18-8 SS	AISI 317 Annealed Stainless Steel (SS)
13	Dowel Pin, M2 X 20mm LG, 18-8 SS	AISI 317 Annealed Stainless Steel (SS)
14	Torsion Spring, 180 0.109" OD, Ccw/Rh	Steel Music Wire
15	Wave Spring 0.375"OD 0.15" In 100lbs/in	Steel Music Wire
16	#0-80 X .313" LG FL HD, Phillips, SS	Material <not specified>
17	Dowel Pin, M1 x 4mm long	Alloy Steel
18	Hex nut, M2 thread size, 4mm width, 0.4mm pitch, 18-8 stainless steel	
19	socket cap screws, M2 10mm lng 1.5mm hex size 12.9 alloy steel	
20	#0-80 Nut	1023 Carbon Steel Sheet (SS)

DETAIL M  
SCALE 8 : 1

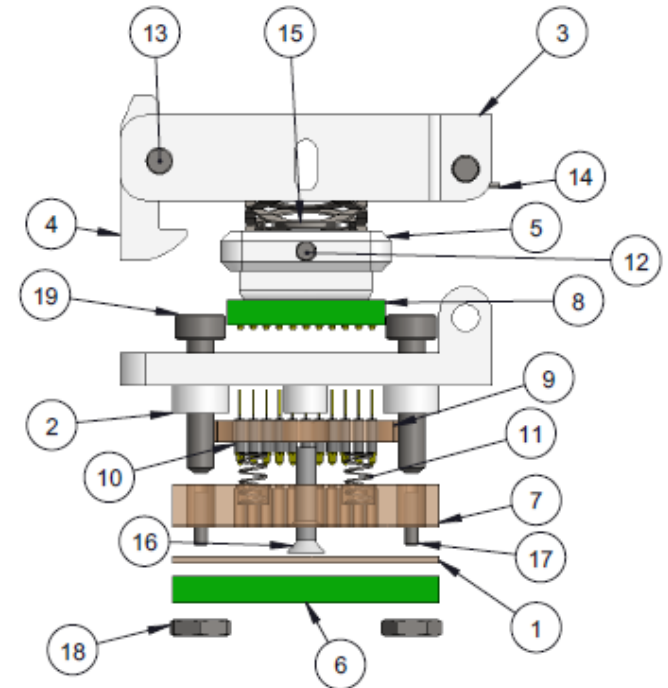
0.5  
Stroke length



0.2  
Target PCB  
Pre-Compression



SECTION L-L



**DESCRIPTION: Socket Assy, Insulation Plate**

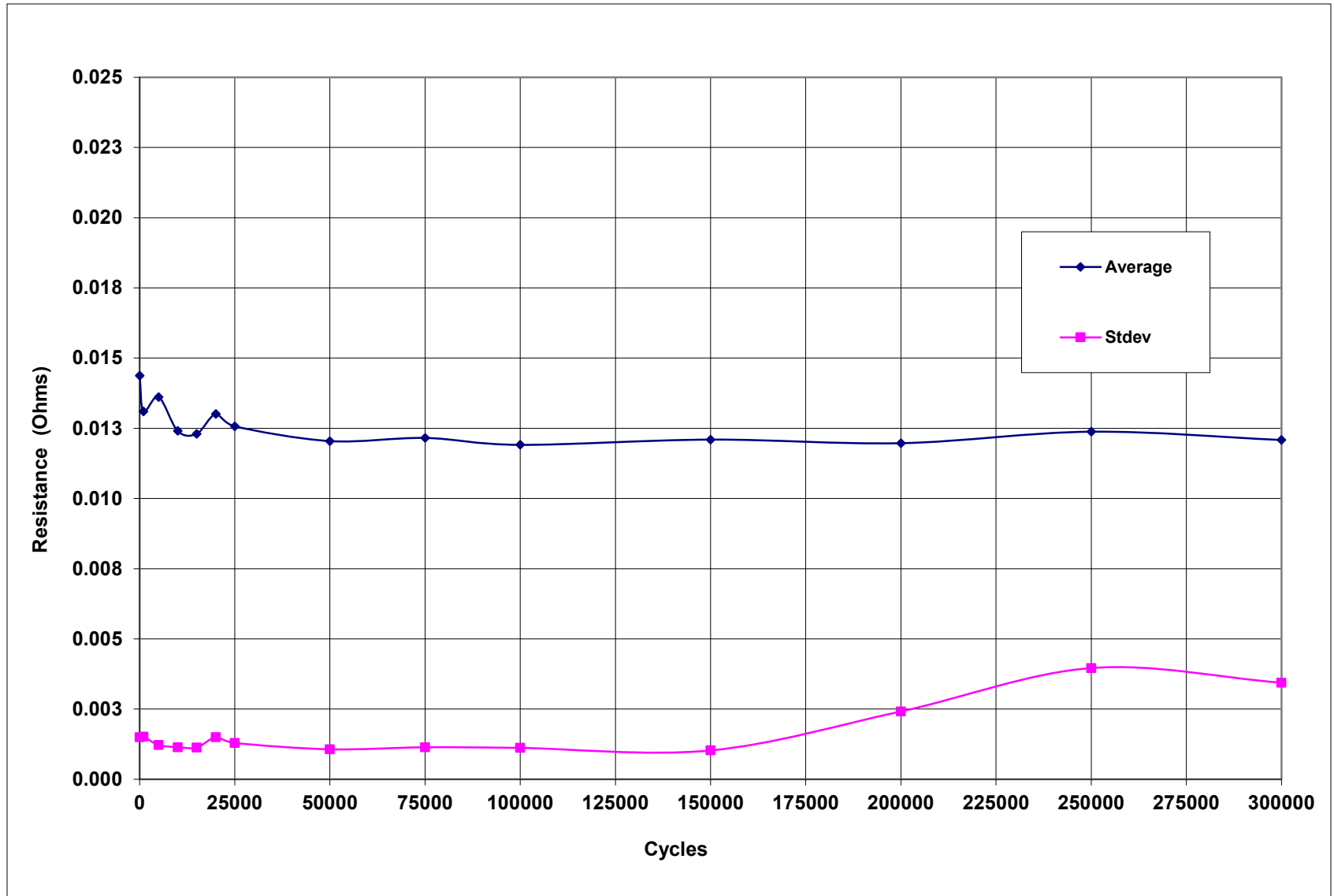
Primary dimension units are millimeters, Secondary dimension units are [inches].  
Tolerances: diameters  $\pm 0.03\text{mm}$  [ $\pm 0.001"$ ], all other tolerances  $\pm 0.13\text{mm}$  [ $\pm 0.005"$ ] unless stated otherwise.  
Materials and specifications are subject to change without notice.

## Typical Characteristics

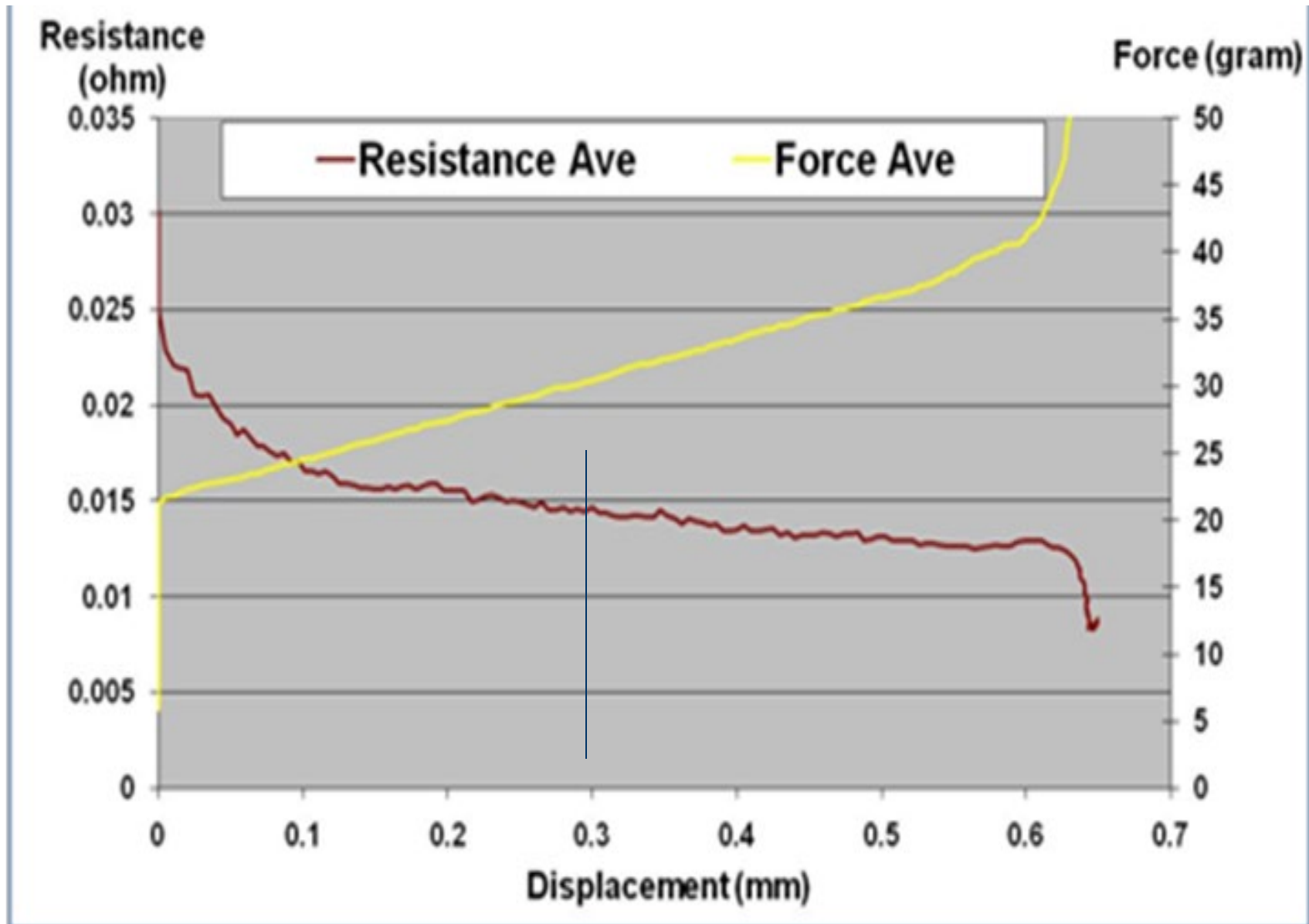
- Contact resistance < 15 mOhms
- Self Inductance 0.88nH to 0.95nH
- Bandwidth 4.15GHz to 31.7GHz @-1dB
- Capacitance <0.3pF
- Force 18gm - 34gm per contact
- Operating temperature -55 to +180° C
- Insertion/Extraction cycles >500,000\*
- Current rating 4A per contact

\*Cycle life shown at room temperature. Reduced cycle life is expected when used at extreme temperatures, thermal cycling, improper force, cleaning and handling.

# Endurance Data – 1mm pin



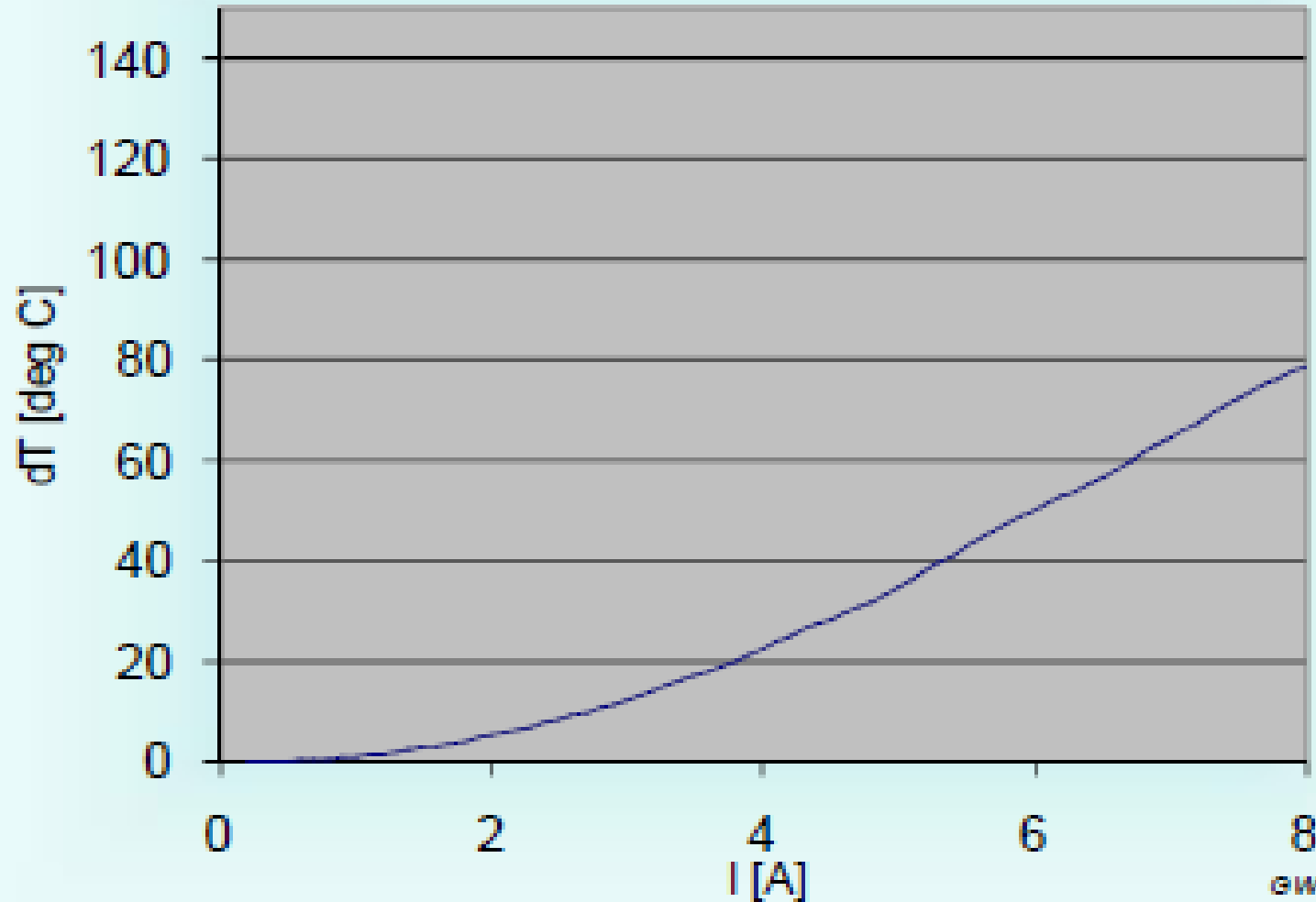
# Force Deflection Resistance Data – 1mm pin





# Current Data – 1mm pin

Temperature rise as a function of drive current I

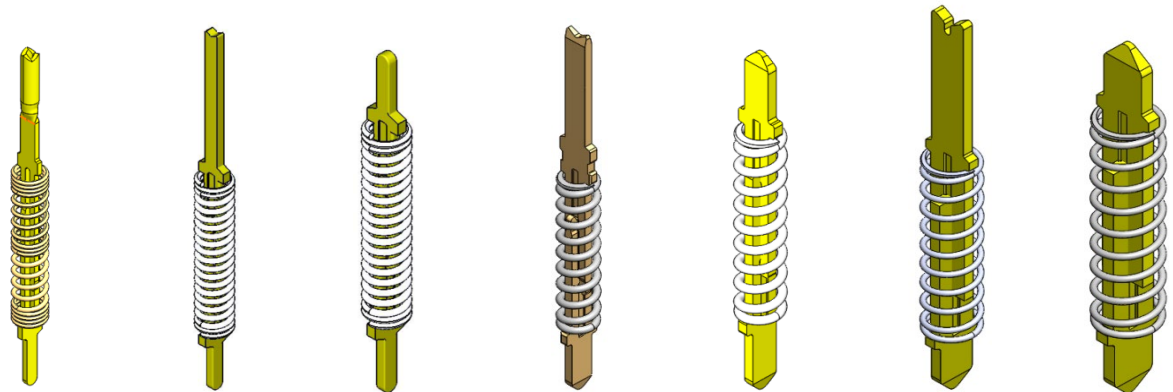
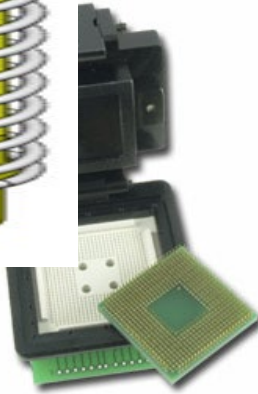
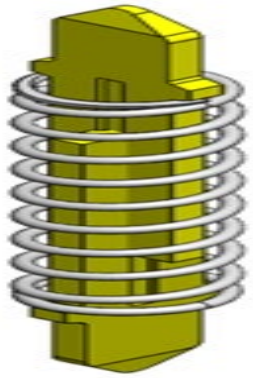


GWN 404

# Bandwidth Data – 0.4mm pin

	Corner	Edge	Field	
Delay	15.4	14.4	14.6	ps
Risetime open	34.5	31.5	46.5	ps
Risetime short	96	30	120	ps
Risetime thru, 50Ω	33	30	33	ps
Insertion loss (1dB)	20.5	26.7	31.7	GHz
Insertion loss (3dB)	27.1	35.5	35.5	GHz
VSWR (2:1)	25.3	31.5	31.5	GHz

# Pin Datasheet



Pin Family	SBT	SBT	SBT	SBT	SBT	SBT	SBT
Part Number	P-P204A	P-P185A	P-P184A	P-P196A	P-P150A	P-P151A	P-P152A
Minimum Pitch (mm)	0.35	0.4	0.4	0.5	0.5	1.0	1.0
Pin Type	BGA	BGA	LGA	BGA	LGA	BGA	LGA
Length (mm)	3.46	3.81	2.9	3.86	2.95	5.69	4.45
DUT Side Tip Shape	Crown	V Shape	Radius Cone	V Shape	Radius Cone	Notched V	Radius Cone
DUT Side Tip Dimension (mm)	0.17	0.14	0.12	0.2	0.06	0.54	0.1
PCB Side Tip Shape	Radius Cone	Radius Cone	Radius Cone	Radius Cone	Radius Cone	Radius Cone	Radius Cone
PCB Side Tip Dimension (mm)	0.12	0.12	0.12	0.04	0.06	0.1	0.1
DUT Side Travel (mm)	0.3	0.5	0.3	0.33	0.33	0.6	0.6
PCB Side Travel (mm)	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Force (g)	8.7	17	14.5	30	30	19	19
Cres (mOhms)	< 70	< 50	< 50	< 30	< 30	< 15	< 15
CCC @ ambient (Amps)	0.5	1.8	1.8	2.9	2.9	4.0	4.0
Bandwidth (GHz @ -1dB)**	23.5 - 26.1	20.5 - 31.7	20.5 - 31.7	5.2 - 15.7	5.2 - 15.7	14.1 - 21.9	14.1 - 21.9
Self inductance (nH)	0.92	0.98	0.98	0.88	0.88	0.93	0.93
Temperature (deg C)	-55 to +180C	-55 to +180C	-55 to +180C	-55 to +180C	-55 to +180C	-55 to +180C	-55 to +180C
Insertion Cycles	50K	50K	50K	500K	500K	500K	500K

\* 0.4mm/0.5mm pitch SBT pins are used in 0.65mm and 0.8mm pitch applications

\*\* Bandwidth range is based on pin location (corner, edge, field). See report for test conditions and setup.

- Low cost pin solution – 1/3<sup>rd</sup> of conventional spring probe cost
- Extreme temperature solutions (-55 to +180C)
- High power applications (excellent current rating of 4A)
- High speed digital and RF applications (excellent bandwidth 4.15GHz – 31.7GHz)
- Less maintenance and handler downtime (longer cycle life 500K+)
- Reliable yield data due to stable contact resistance throughout life cycle
- High compliancy for large package warpage
- Stocked inventory due to high volume automated assembly

# SBT Value Proposition

- SBT contact replaces spring pin in all lab and evaluation applications due to low cost and better electrical/mechanical performance than conventional pogo pin.
- Custom burn-in socket can be produced using SBT contact in 3 weeks when standard socket is not available.
- SBT sockets with wide temperature range are available in same footprint as elastomer GHz sockets.
- SBT sockets are robust and can be used in demonstration products for multiple handling process without contact degradation.