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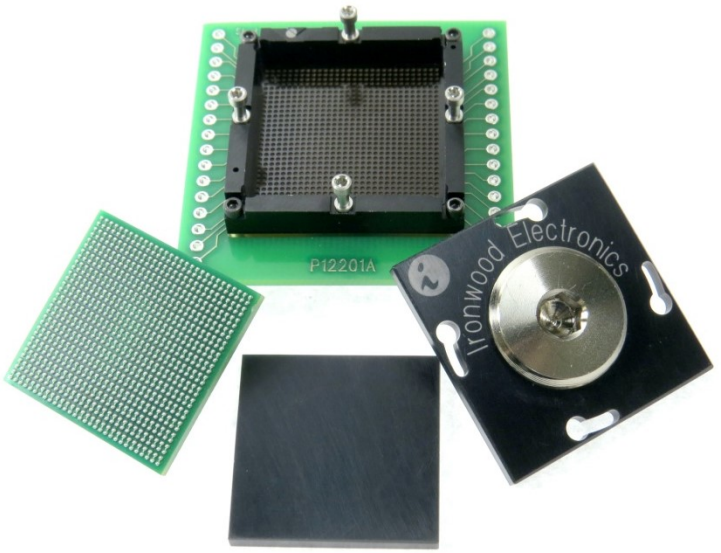

SG15 & SG25 Series

High Performance IC Sockets And Test Adaptors

IP, Aug 2016

Application Need & Solution

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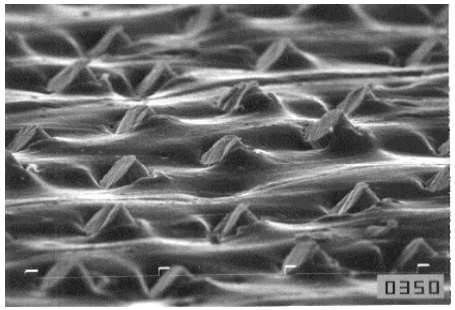
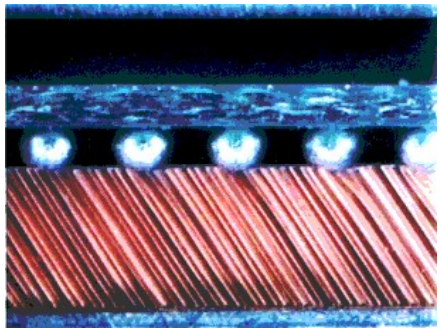
- Low cost for small quantity
- High bandwidth
- Low inductance
- Low contact resistance
- Low cycle count

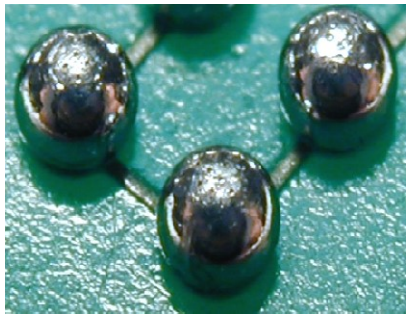
GHz BGA socket technology provide >40GHz bandwidth in a small, cost effective ZIF socket for prototype and test applications. The GHz BGA socket is a simple mechanical socket based on elastomer contact technology.



Protruded wire from elastomer



BGA compressed on Elastomer



Wire marks on BGA

The elastomer consists of a fine pitch wire matrix which are embedded at a 63-degree angle in a soft insulating sheet of silicone rubber. The insulation resistance between connections with 500V DC is 1000 MΩ. The elastomer is ideal for high-current (30mA to 50mA per filament) applications where a thin, high-density anisotropic connector is required. The gold-plated brass filaments protrude several microns from the top and bottom surfaces of the silicone sheet to penetrate heavily oxidized solder ball. The operating temperature range for the elastomer is -35° to 125° C.

Elastomer Classification

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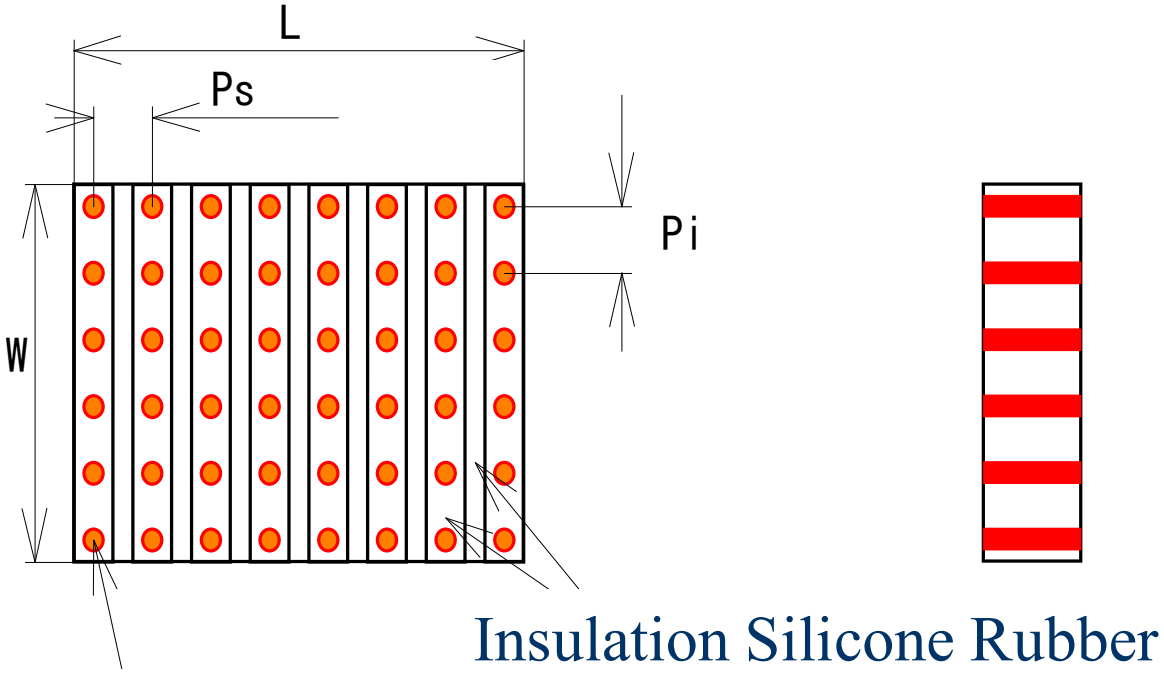

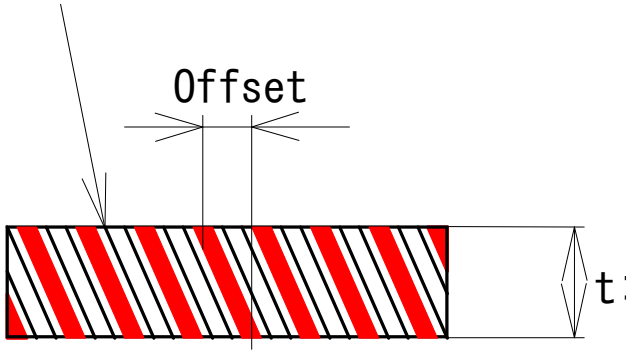

SG-6000 series

Ps, Pi = 0.1mm
L, W = 1mm to 50mm
t = 0.75mm
BGA, QFN, etc, >=0.75mm pitch

SG-7000 series

Ps, Pi = 0.05mm
L, W = 1mm to 50mm
t = 0.5mm
BGA, QFN, etc, >=0.5mm pitch

SG-8000 series

Ps, Pi = 0.1mm
L, W = 1mm to 50mm
t = 0.5mm
BGA, QFN, etc, >=0.75mm pitch

SG-9000 series

Ps, Pi = 0.075mm
L, W = 1mm to 50mm
t = 0.5mm
BGA, QFN, etc, >=0.4mm pitch

Elastomer Classification

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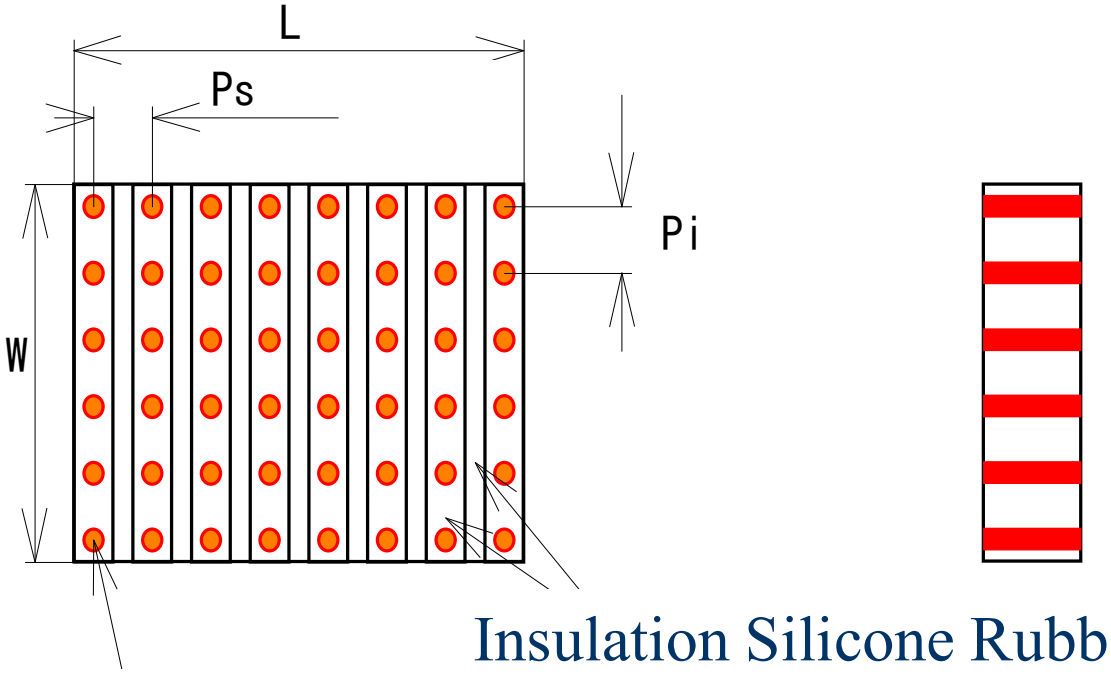
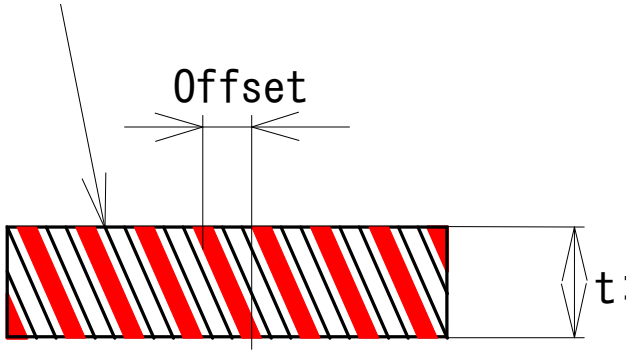


Insulation Silicone Rubber

Inclined Gold plated brass wire



SG25 - series

Ps, Pi = 0.05mm
L, W = 1mm to 25mm
t = 0.25mm
BGA, QFN, etc, >=0.3mm pitch

SG15 - series

Ps, Pi = 0.05mm
L, W = 1mm to 25mm
t = 0.15mm
BGA, QFN, etc, >=0.3mm pitch

Socket Lid Options

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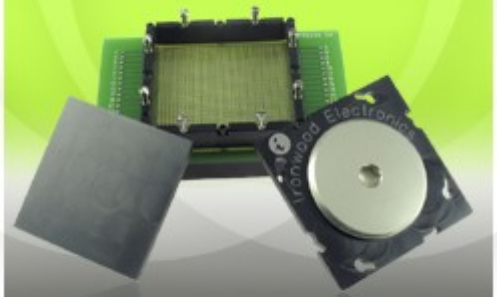
IMPROVED SWIVEL LID



- Easier-to-use swivel lid
- Maintains low-profile design
- Quick IC installation

SNAP LID WITH ADJUSTABLE PRESSURE SCREW SOCKET

- No tools required
- Reliable installation
- Available for all IC's

LEVER LID SOCKET

- Fully removable lid
- Optional heat sink
- Easy access to IC

HEAT SINK LID SOCKET

- Easy 2-in-1 installation
- Up to 100 watts
- Optional fan available

CLAM-SHELL ADJUSTABLE HARD STOP SOCKET

- Easy to use snap lid
- Quick IC installation
- Low profile designs available

OPEN TOP LID SOCKET

- Optical applications
- Easy access to chip
- Thermal applications

SG25 Test Data

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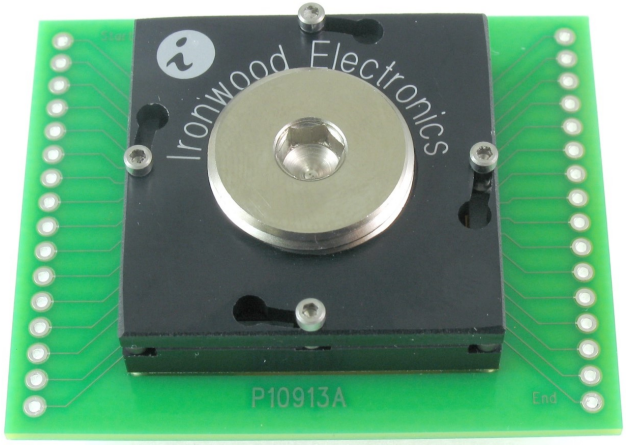
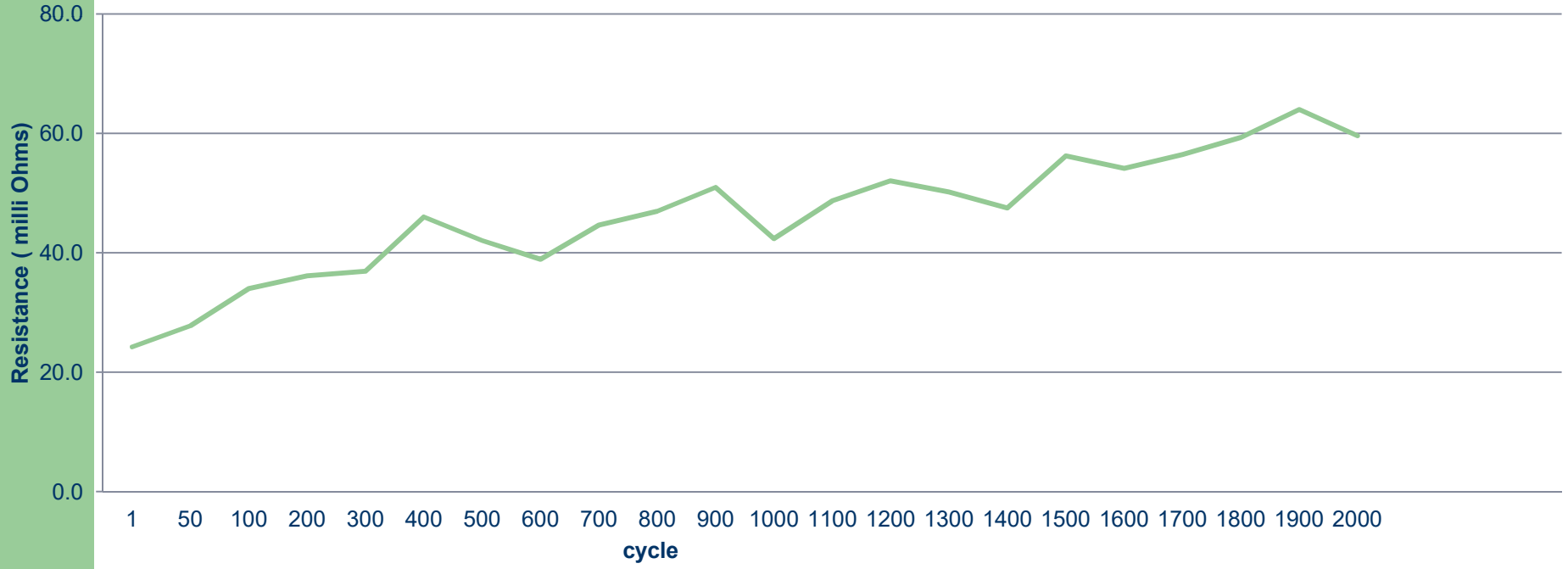


BGA1156, 14x14mm, 0.4mm pitch
34x34 ball array

1. Socket assembled to daisy chain test PCB.
2. Daisy chain device simulator placed inside the socket.
3. Recommended torque applied.
4. Contact resistance measured using multi-meter.
5. Un-tighten the compression screw.
6. Step 3-5 repeated.

SG25 Cycle life @ 40 gms/ per ball



IP, May 2017

SG25 Test Data

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0.4mm pitch

Parameter	Value
Inductance	0.060 nH
Mutual Inductance	0.019 nH
Capacitance to Ground*	0.129 pF
Mutual Capacitance	0.017 pF
S21 (insertion loss) @ -1dB, GSG	25.1 GHz
S21 (insertion loss) @ -1dB, GSSG	40.0 GHz
S11 (return loss) @ -20 dB, GSG	6.0 GHz
S11 (return loss) @-20 dB, GSSG	27.5 GHz
Crosstalk at -20dB	24.5 GHz
Impedance, GSG	40.6 Ω
Impedance, GSSG	48.5 Ω

SG15 Test Data

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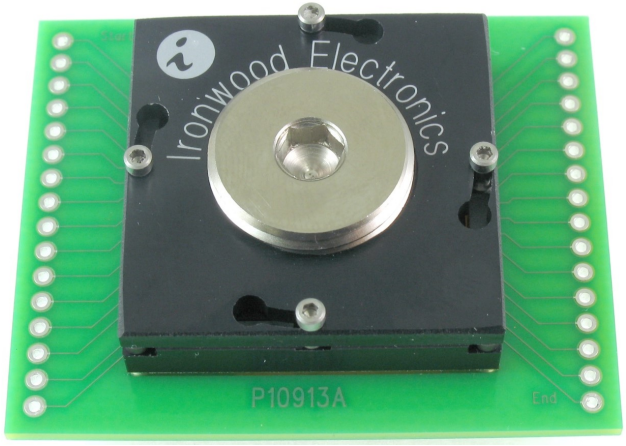
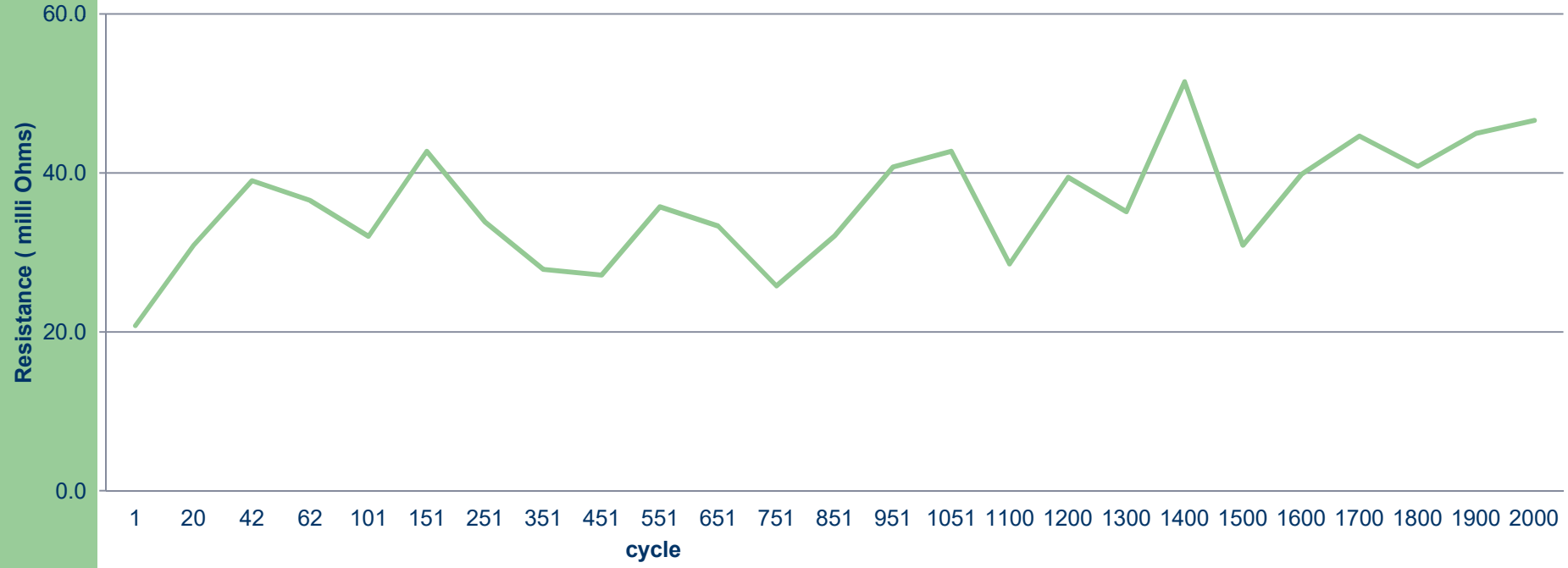


BGA1156, 14x14mm, 0.4mm pitch
34x34 ball array

1. Socket assembled to daisy chain test PCB.
2. Daisy chain device simulator placed inside the socket.
3. Recommended torque applied.
4. Contact resistance measured using multi-meter.
5. Un-tighten the compression screw.
6. Step 3-5 repeated.

SG15 Cycle life @ 40 gms/ per ball



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SG15 Test Data

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0.4mm pitch

Parameter	Value
Inductance	0.060 nH
Mutual Inductance	0.023 nH
Capacitance to Ground*	0.089 pF
Mutual Capacitance	0.012 pF
S21 (insertion loss) @ -1dB, GSG	40.0 GHz
S21 (insertion loss) @ -1dB, GSSG	40.0 GHz
S11 (return loss) @ -20 dB, GSG	9.8 GHz
S11 (return loss) @-20 dB, GSSG	32.9 GHz
Crosstalk at -20dB	24.1 GHz
Impedance, GSG	43.6 Ω
Impedance, GSSG	51.3 Ω

SG15 Data – 0.6mm Pitch

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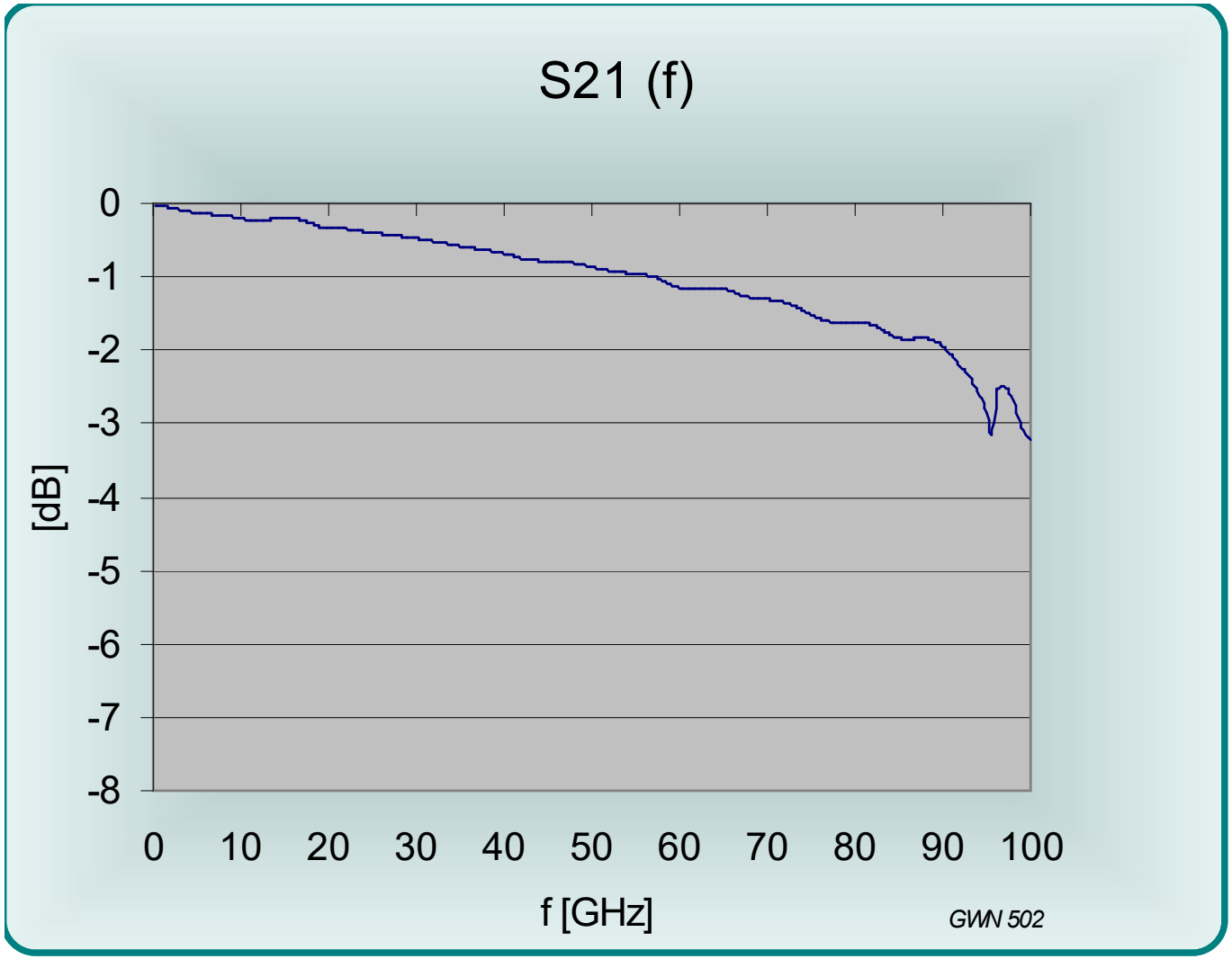

Insertion loss S2,1

Elastomer Current Data

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- 40 Micron Diameter Cu wire fusing limit is 750mA/wire. Recommended safe amount = 50mA/wire
- 23 Micron Diameter BeCu wire fusing limit is 350mA/wire. Recommended safe amount = 30mA/wire
- Maximum amount should not be reached, but higher limits can be achieved as long as the test can handle higher temperature ranges.
- For example: a couple of hundred mA per wire would be fine for a short term test (< 5 sec), but if the test is being held for hours, a heat sink may be necessary to pull off excess heat that may be produced from pushing large amounts of current through each wire.