



Ironwood
ELECTRONICS

www.ironwoodelectronics.com

**GT – Silver Button
Technology Socket for
Semiconductor Test**



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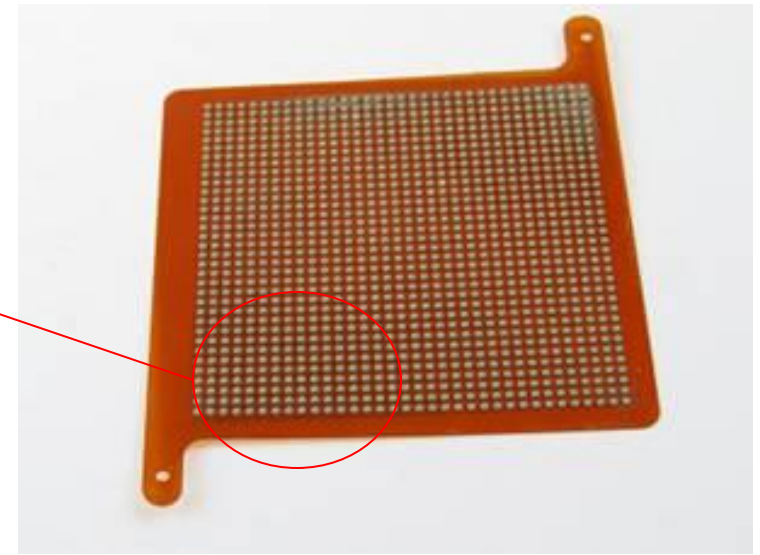
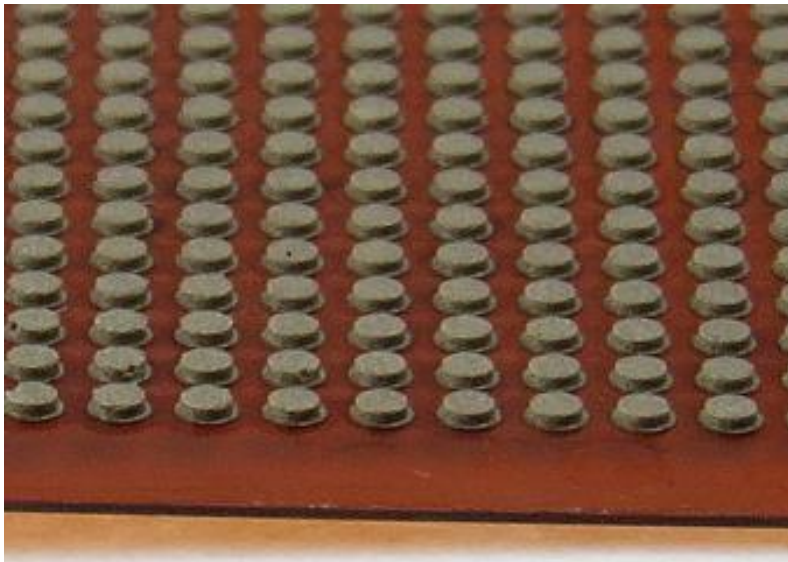
Application Need

Prototype Test Applications demand high bandwidth followed by high compliance, low resistance and high temperature.

- *Elastomers have high bandwidth*
- *Elastomers have low resistance*
- *Elastomers have low compliance*
 - *Due to small thickness and mechanical coupling*
- *Elastomers have limited temperature range*
 - *Due to the inherent process of silicone rubber*

Solution - GT Contact

GT is a new elastomer technology that has silver particles held in a conductive column like buttons which are embedded in a non-conductive polymer substrate on a proper pitch that provides high compliance and extreme temperature ranges. GT is available for BGA, LGA, QFN, PoP and other packages from 0.3mm to 1.27mm pitch.

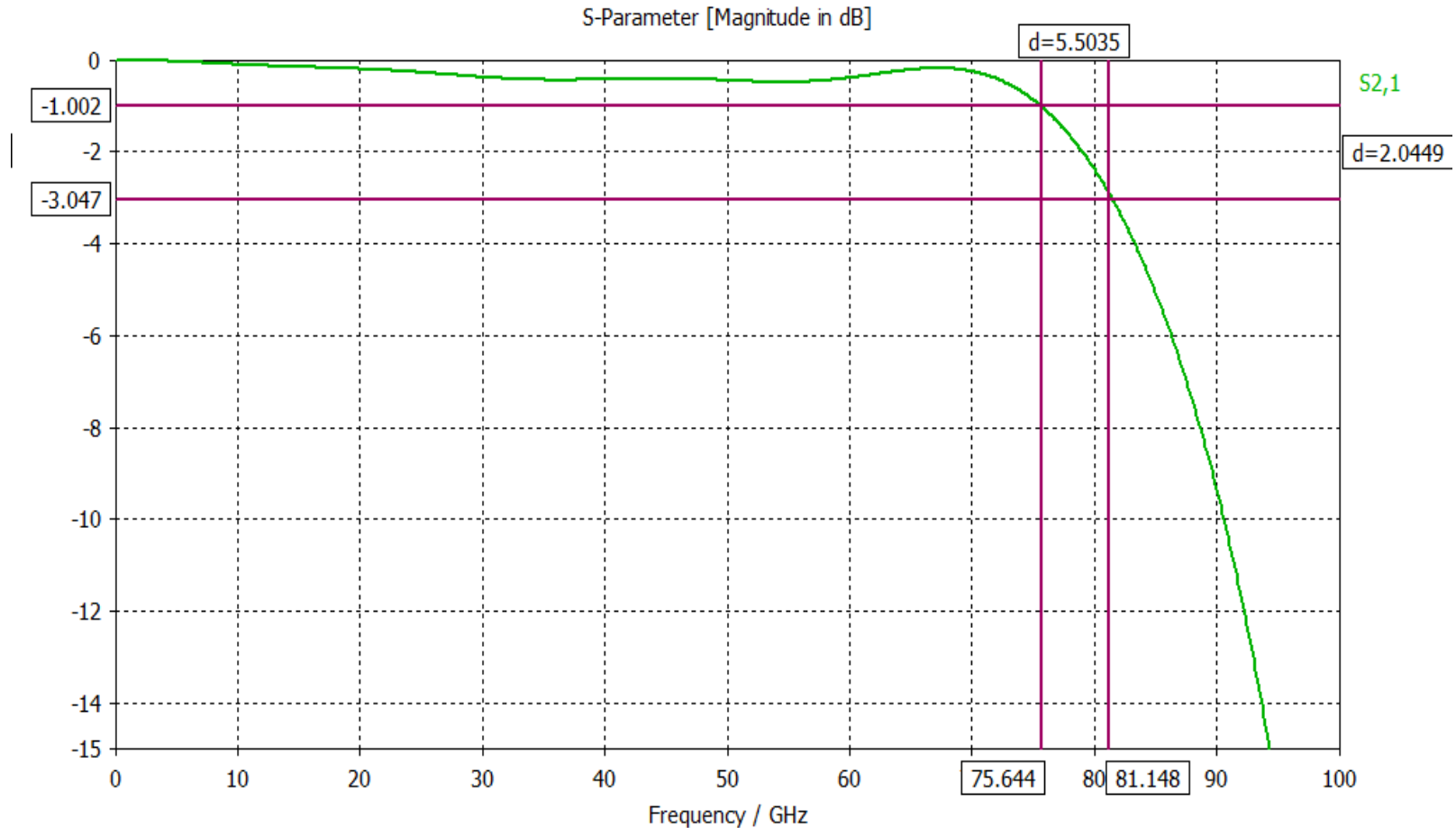


GT Contact - Typical Characteristics

- Contact resistance <30 mOhms
- Bandwidth >94GHz @-1dB
- Current 5.4A @ 20C rise
- Force 20-70grams per contact
- Operating temperature -55 to +160° C
- Insertion/Extraction cycles >1000*
- Contact length (compressed): 0.08mm
- Compliance: 0.15mm

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

Bandwidth Data – 0.8mm Pitch

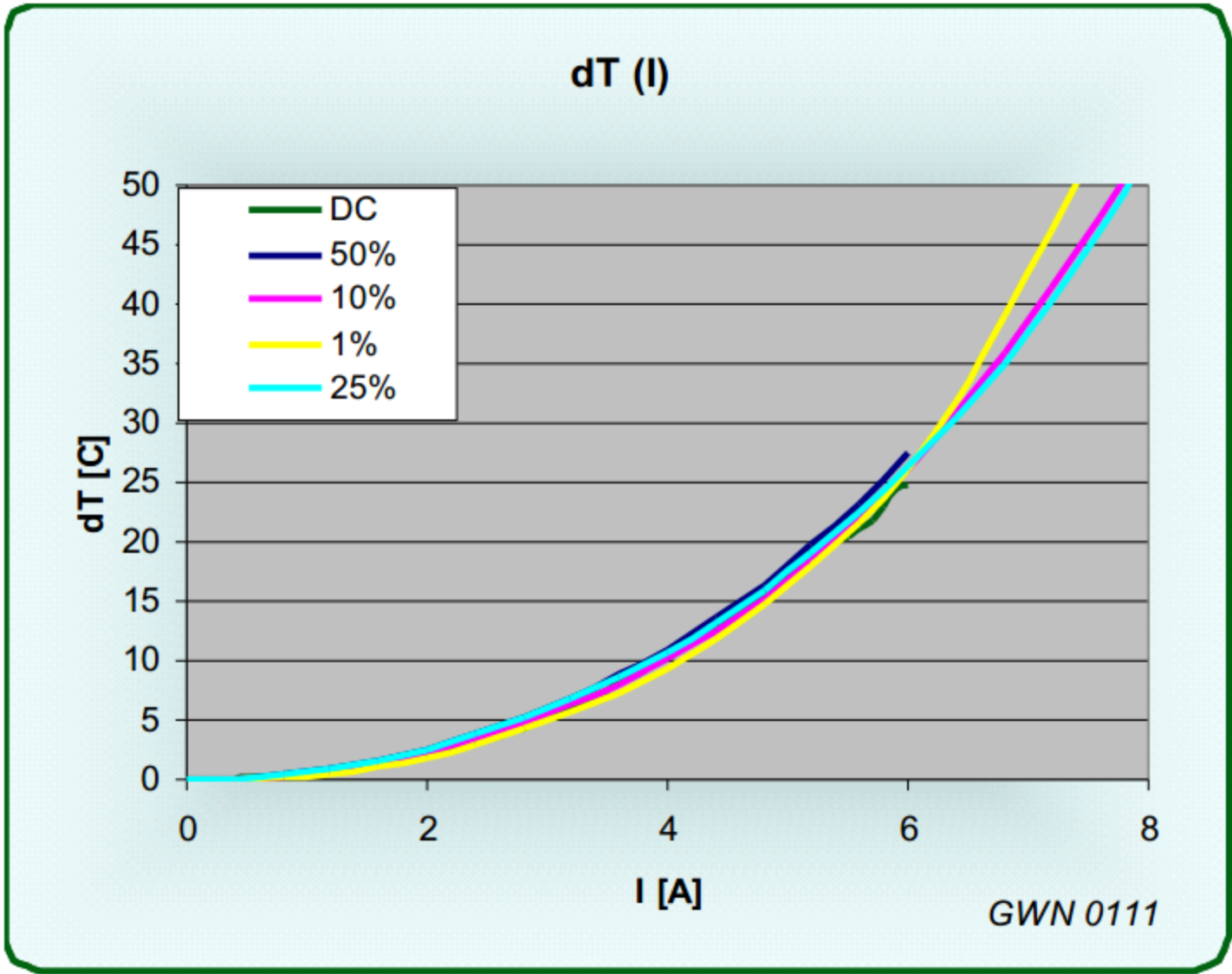


Insertion Loss -1dB @ 75.6GHz

Bandwidth Data – 0.5mm Pitch

	Corner	Edge	Field	
Delay	2.4	2.4	2.4	ps
Risetime open	27	27	28.5	ps
Risetime short	28.5	28.5	28.5	ps
Risetime thru, 50 Ω	30	30	30	ps
Insertion loss (1dB)	>40	>40	>40	GHz
Insertion loss (3dB)	>40	>40	>40	GHz
VSWR (2:1)	>40	>40	>40	GHz

GT Contact 1mm Pitch - Current Capability

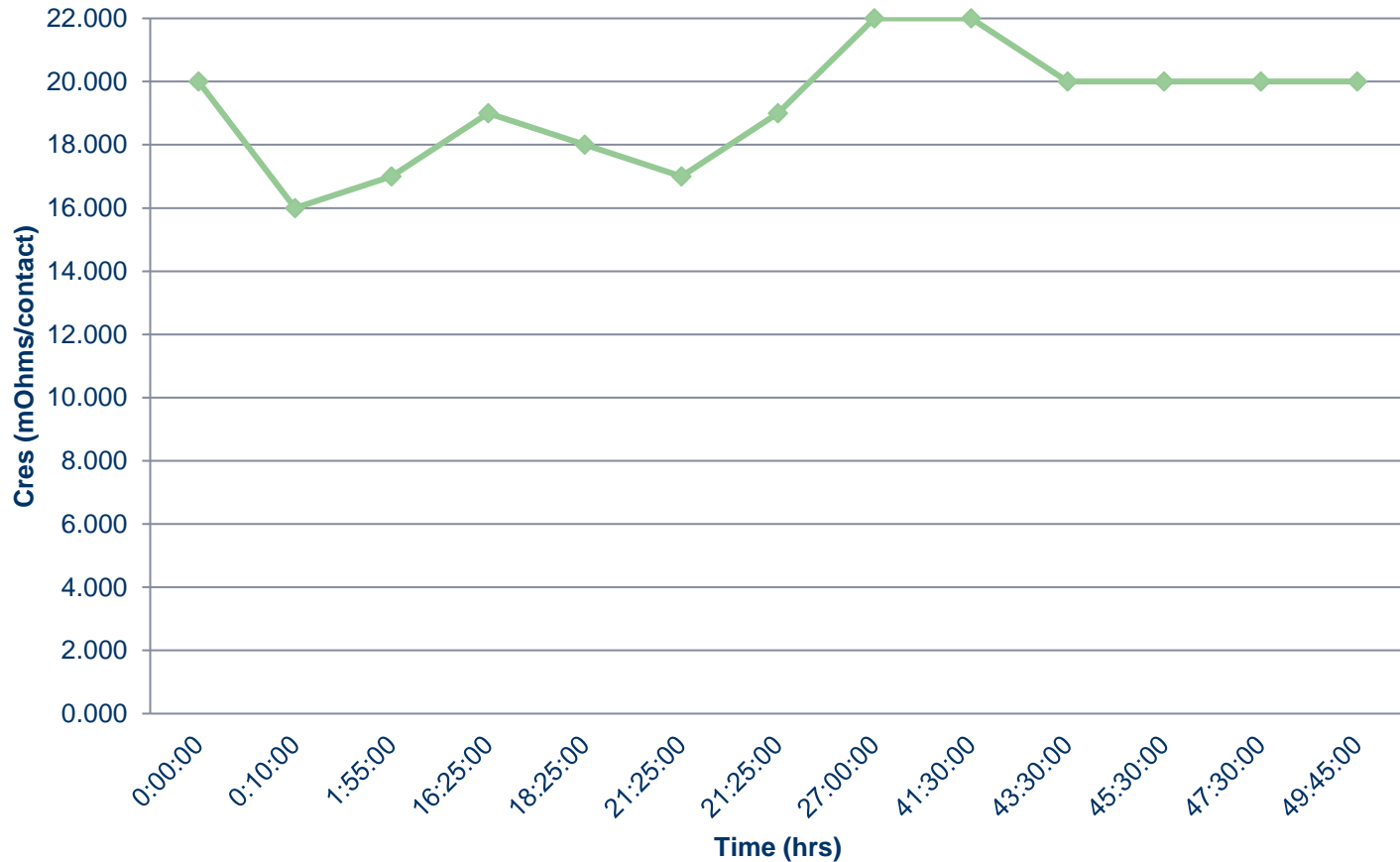


20C rise at 5.4A

GT Contact 0.8mm Pitch

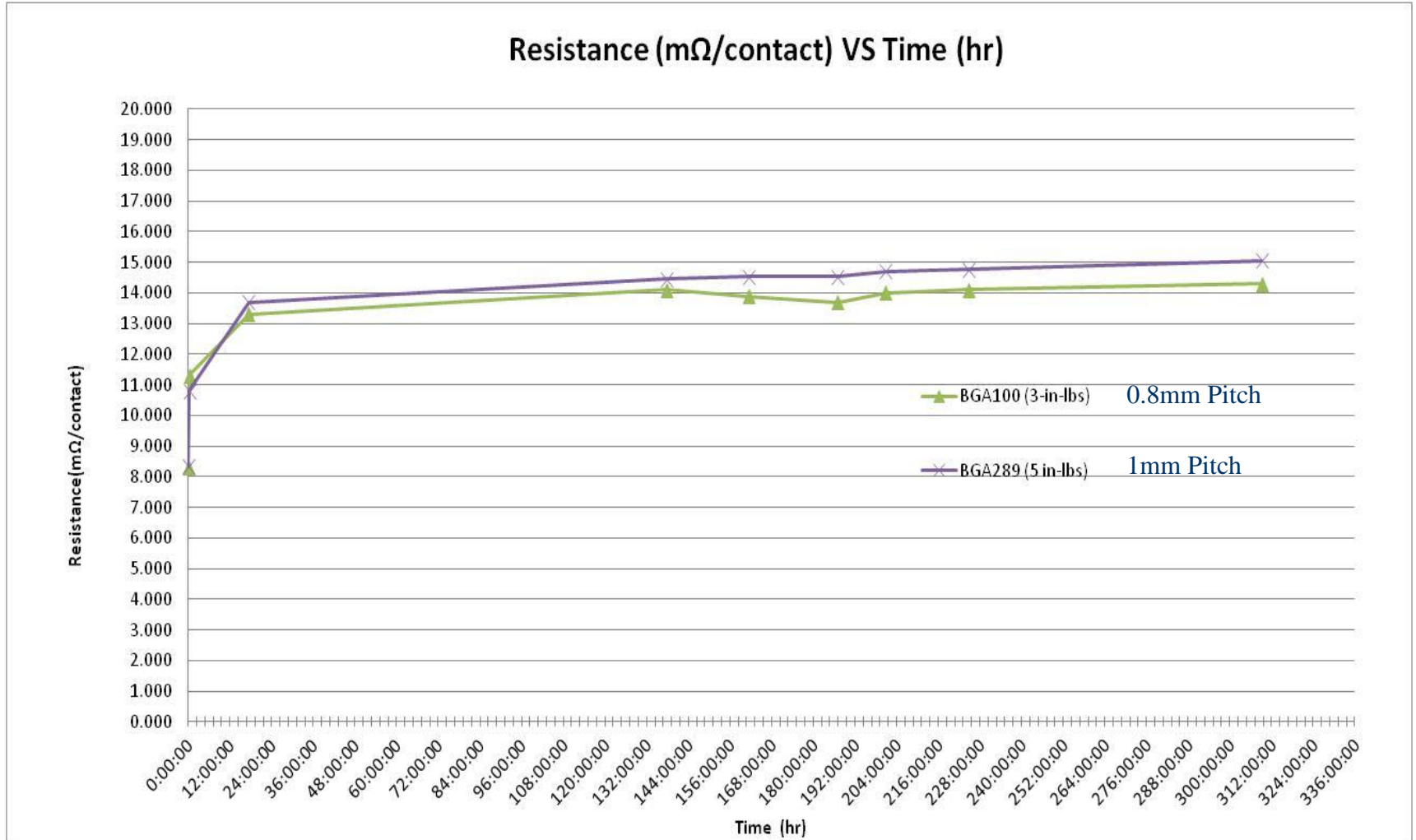
-55C Temperature Data

Cres(mohm/contact) Vs Time(hrs)



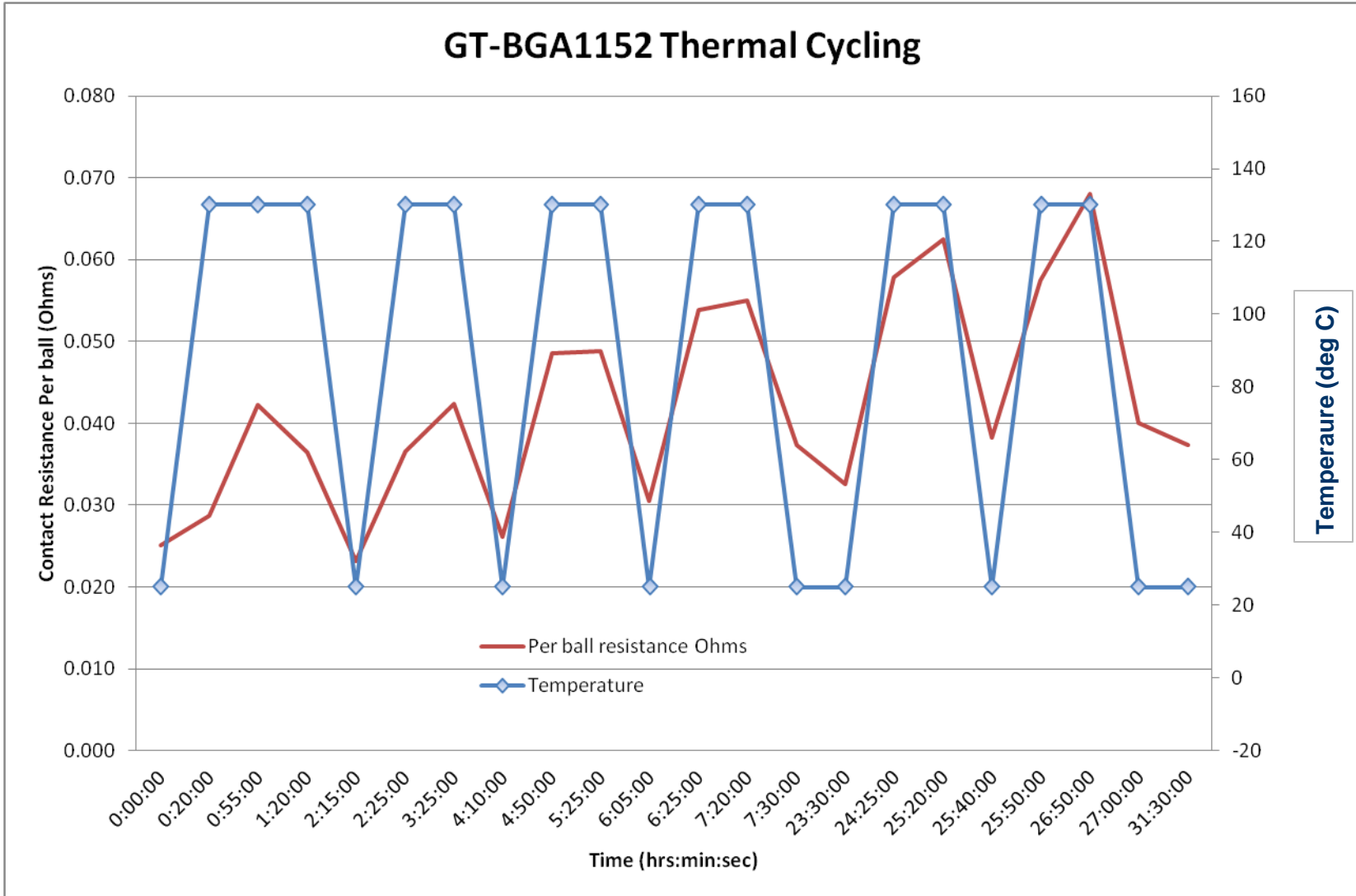
GT Contact

+160C Temperature Data



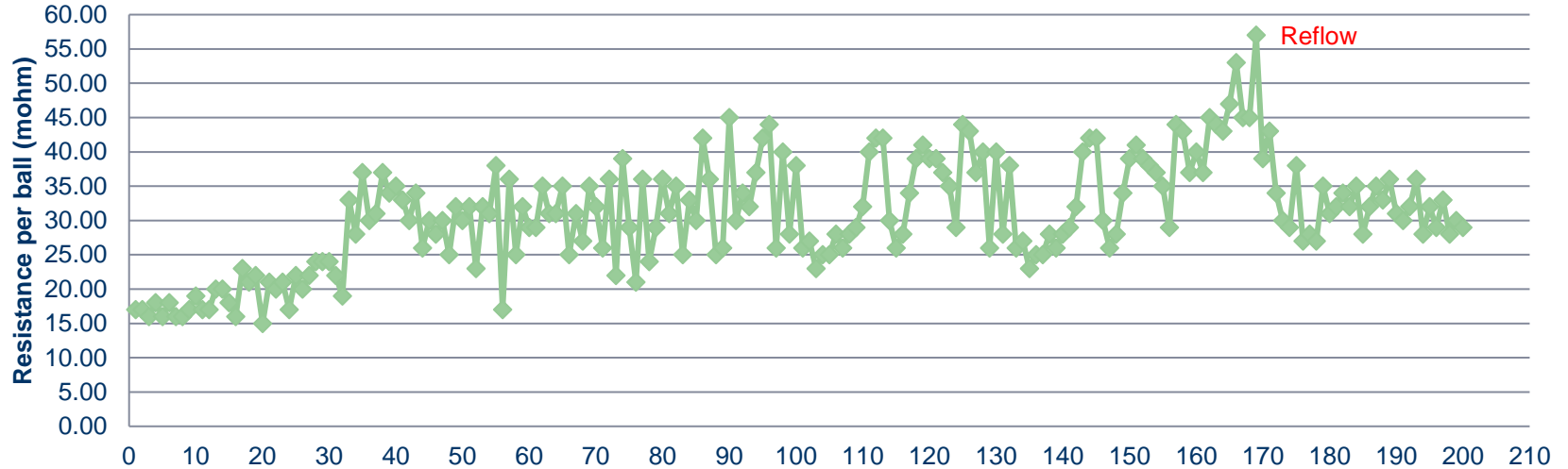
GT Contact

Thermal Cycling Data

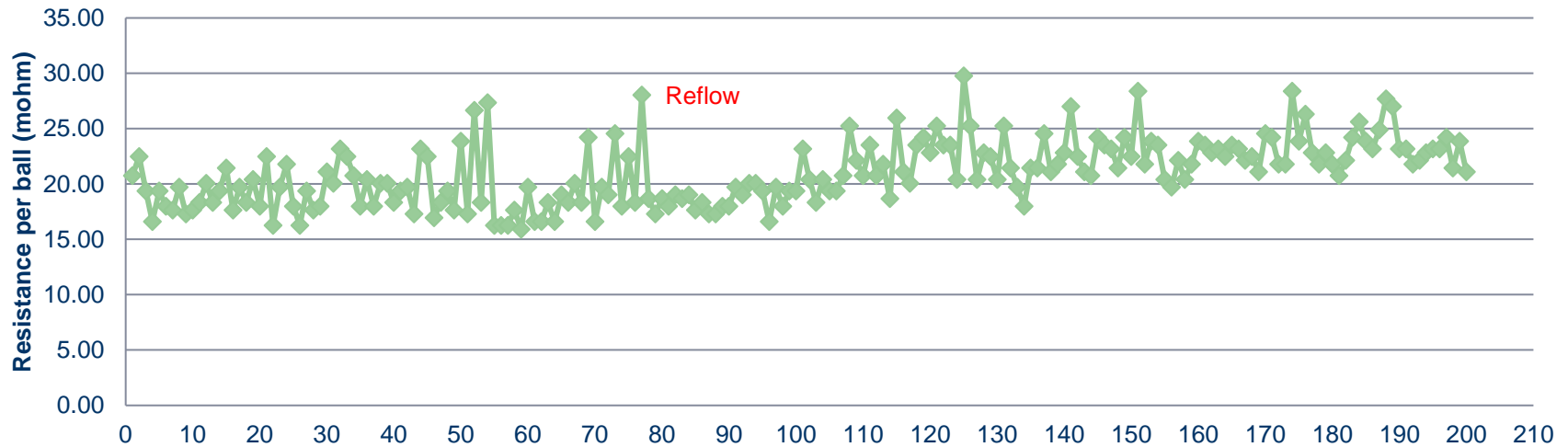


GT Contact - Endurance Data

BGA100 (0.8mm Pitch)

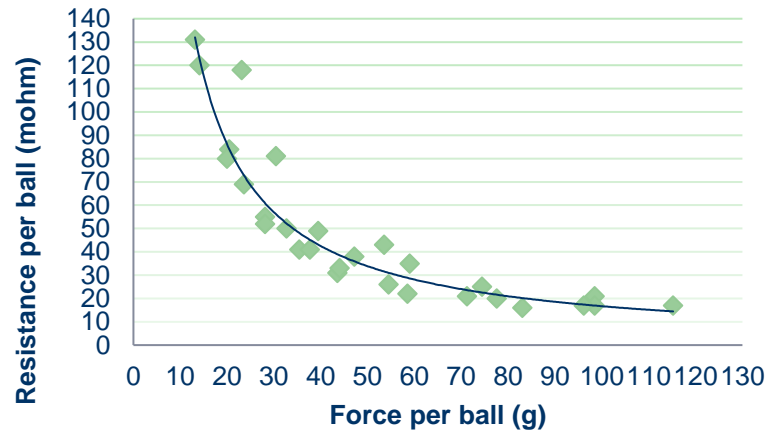


BGA289 (1mm Pitch)

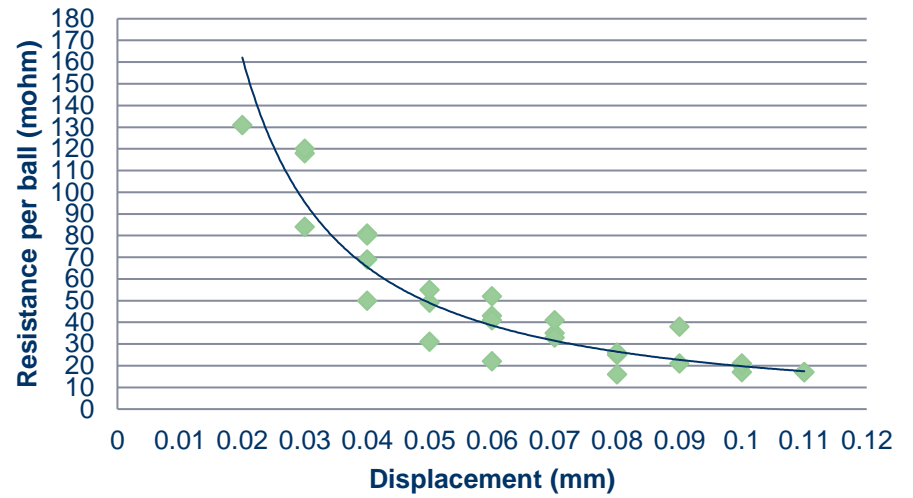


GT Contact – FDR (BGA100, 0.8mm Pitch)

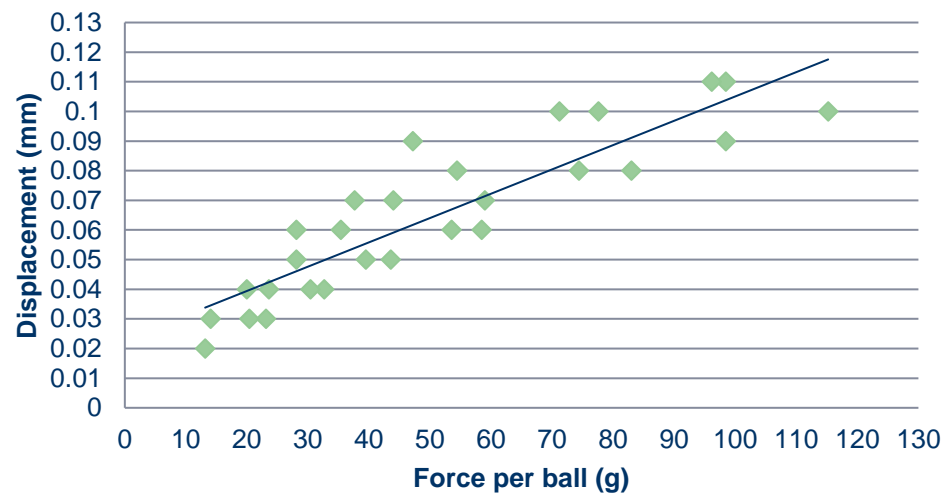
Resistance per ball VS force per ball



Resistance per ball VS displacement



Force VS Displacement



BGA100
0.8mm pitch
10x10 array

GT Value Proposition

- Low cost elastomer solution for 0.3mm to 1.27mm pitch devices
- Extreme temperature solutions (-55 to +160C)
- High speed digital and RF applications (excellent bandwidth >75GHz)
- Reliable testing due to stable contact resistance throughout life cycle
- Accommodates large packages with warpages
- Mixed pitch and non-conventional array solutions for densely populated devices at low cost
- GT contact provides superior solution in all lab and evaluation applications due to individual button technology at affordable cost
- GT sockets with wide temperature range are available in same footprint as other Ironwood sockets
- Custom test socket can be produced using GT contact in less than 3 weeks when standard socket is not available
- GT sockets are robust and can be used in demonstration products for multiple handling process without contact degradation