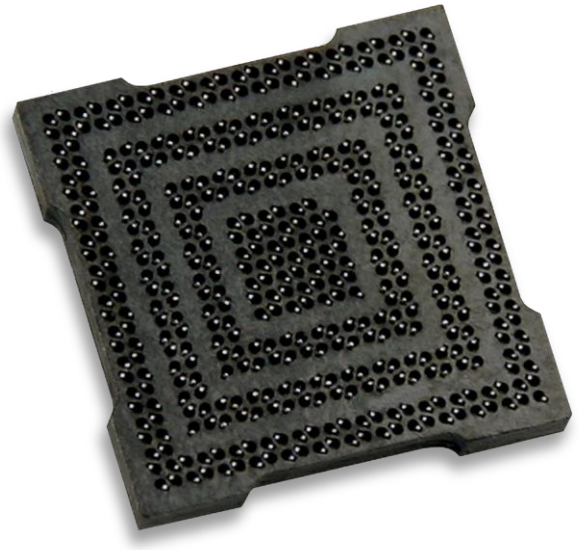
Ironwood ELECTRONICS



Grypper G35/G40

High performance, 0.35mm – 0.50mm pitch net zero package footprint engineering test sockets for BGA style packaged devices

Ironwood Electronics Grypper series test socket is the next best thing to not having a socket at all. The Grypper G35/G40 as the superior test socket solution for low-to-high-ball-count BGA packages. Sized to match the package, the G35/G40 Grypper test socket eliminates the need to make any tradeoffs in your board design to accommodate test socket-mounting holes or additional hardware. Instead, the device-footprint Grypper G35/G40 test socket is SMT soldered to the target PCB using conventional reflow methods. The test sockets come standard with lead-free solder balls attached helping to achieve seamless application process implementation between device and test socket. No test socket lid is required, allowing easy access to the backside of the device. By design, the Grypper G35/G40 is the ideal BGA test socket for engineering development and characterization.

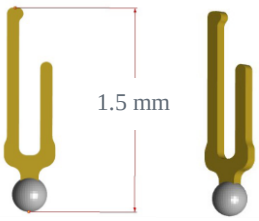
FEATURES AND BENEFITS

Device-size PCB footprint	Since the PCB footprint of Grypper is identical to the device, only one PCB design is required, enabling a seamless transition from test and validation through production and reducing overall test costs
Low insertion force	Unique contact design reduces the insertion force required to insert and retain higher-ball-count devices safely and securely within the test socket
Oxide cutting wipe action	The contact design wipes the side of the solder ball during insertion, breaking through solder oxides ensuring a good electrical connection between contact and solder ball
Signal integrity	A short signal path achieves low inductance and low insertion loss, providing a nearly invisible electrical connection

TEST SOCKET DESCRIPTION

G35/G40 Grypper test sockets are available for a wide range of BGA grid patterns, including custom designs. The unique contact design provides excellent signal fidelity for today's high-frequency applications. Each test socket is designed to match the device PCB footprint, giving designers the freedom to design PCBs without the additional time or expense of socket-mounting holes or hardware considerations. A device press is available so the insertion force can be distributed evenly across the package. Plus, an easy-to-use device extraction tool is available to enable simple removal of the device from the G35/G40 contacts.

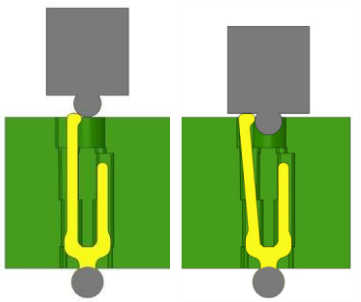
CONTACTS



Pitch (mm)	Ball Diameter* (mm)	Ball Exposure
0.35	0.20±0.05	0.130 min
0.40	0.25±0.05	0.175 min
0.50	0.30±0.05	0.200 min
0.50	0.35±0.05	0.225 min

*Standard designs available. Contact Ironwood Electronics for designs for other dimensions.

METHODOLOGY



Cross section view of test socket and device.

ELECTRICAL SPECIFICATIONS

P2A Configuration	0.4 mm Pitch, 0.25 mm Ball *	0.5 mm Pitch, 0.3 mm Ball
GSG Loop inductance	0.770 nH	0.918 nH
Self-inductance	0.43 nH	0.56 nH
Mutual inductance**	0.054 nH	0.056 nH
Capacitance (GSG - Signal pin to Return)	0.183 pF	0.170 pF
Mutual capacitance**	0.022 pF	0.019 pF
S21 Insertion loss / GSG	-1 dB @ 24.5 GHz	-1 dB @ 20.7 GHz
S11 Return Loss / GSG	-20 dB @ 4.5 GHz	-20 dB @ 2.8 GHz
S41 Crosstalk GSSG Thru***	-20 dB @ 5.0 GHz	-20 dB @ 14.5 GHz
Impedance	64.9 Ω	73.5 Ω
Time delay	11.1 ps	12.4 ps
Current Carrying Capacity	1 A	1 A
CRES	< 50 mΩ	< 50 mΩ

* Specification based on lab measurements. Contact factory for additional electrical reports and S-Parameters and HFSS data.

**These values are determined through curve-fit approximation, as they cannot be measured directly.

***All GSSG and GSGSG Crosstalk values are based on simulation.

P8A Configuration	0.4 mm Pitch, 0.25 mm Ball	0.5 mm Pitch, 0.3 mm Ball
GSG Loop inductance	0.54 nH	0.56 nH
Self-inductance	0.43 nH	0.56 nH
Capacitance (GSG - Signal pin to Return)	0.239 pF	0.291 pF
S21 Insertion loss / GSG	-1 dB @ 27 GHz	-1 dB @ 25.8 GHz
S11 Return Loss / GSG	-10 dB @ 24 GHz -20 dB @ 13.8 GHz	-10 dB @ 25.6 GHz -20 dB @ 12 GHz
Impedance	47.5 Ω	51.4 Ω
Time delay	10.0 ps	9.4 ps
Current Carrying Capacity	1 A	1 A
CRES	< 50 mΩ	< 50 mΩ

MECHANICAL SPECIFICATIONS

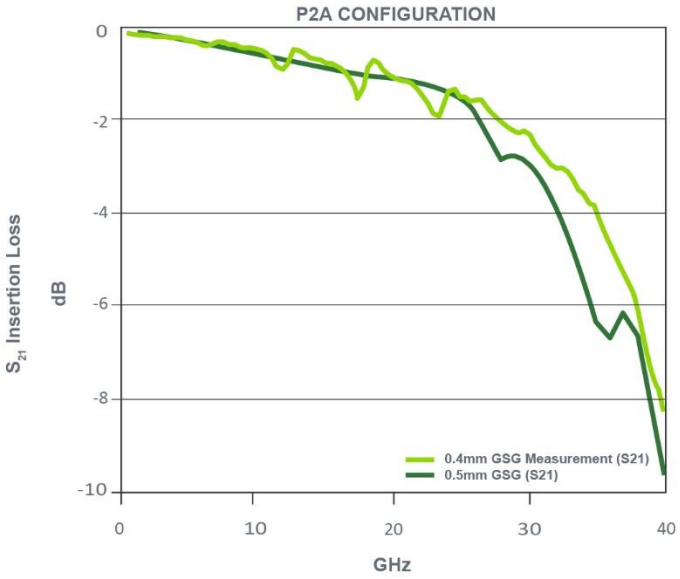
Contactor life	50 insertions
Insertion Force	20 grams / contact
Contact Length	1.5 mm

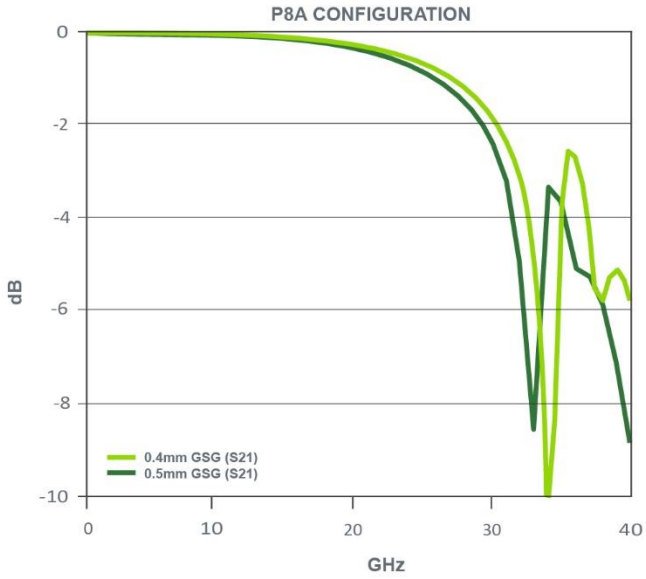
MATERIAL SPECIFICATIONS

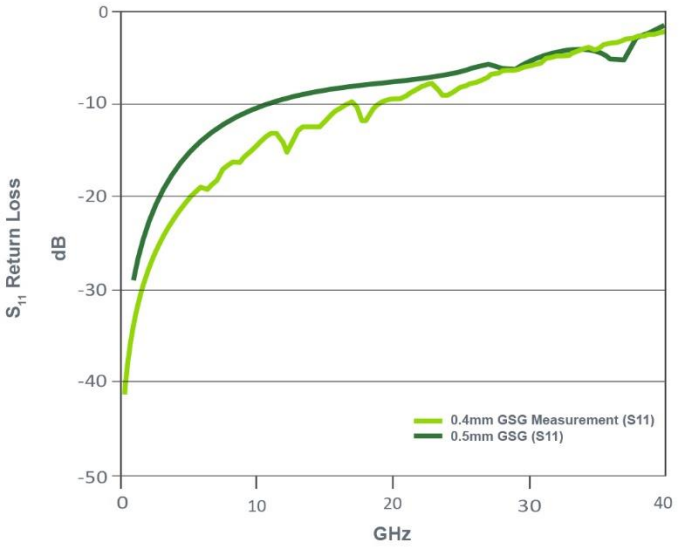
Contact base material	Copper (Cu) alloy
Contact plating	Gold (Au) over Nickel (Ni)
Housing	Polyimide (Cirlex®)
Environmental	-55C to 155C

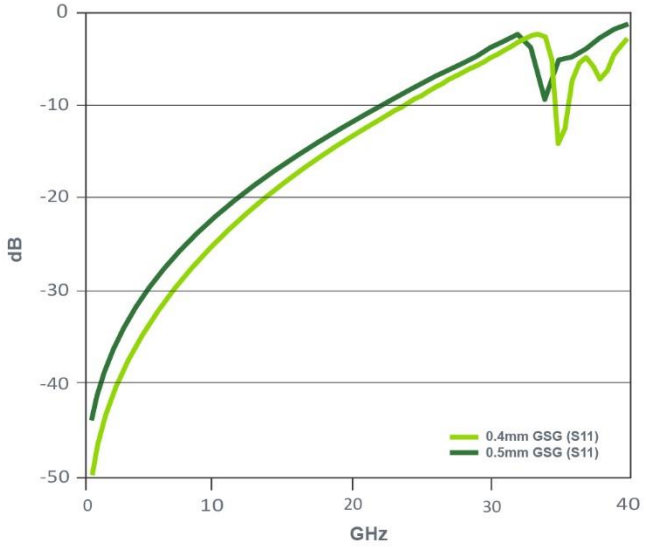
Performance may vary based on application and compliance requirements. Additional performance data may be available on request.

PERFORMANCE

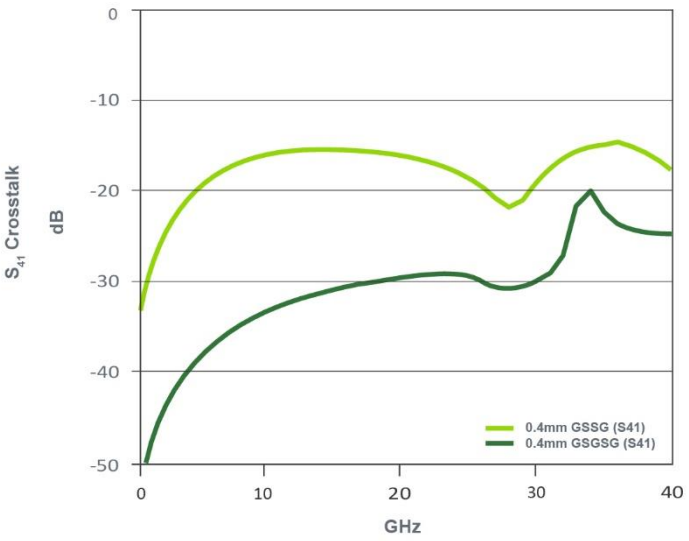


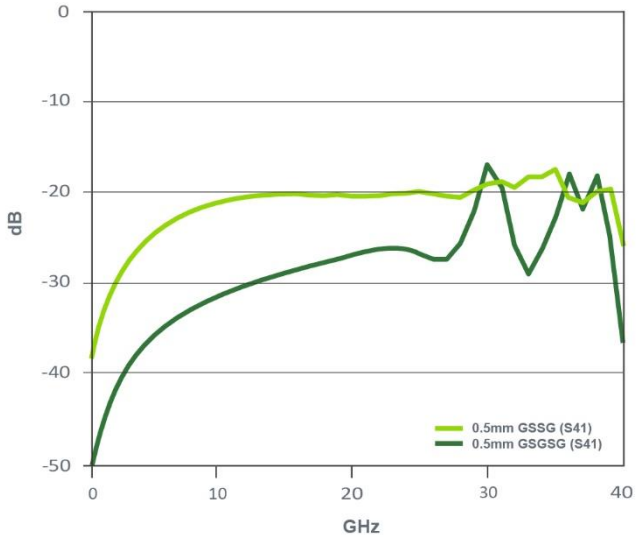






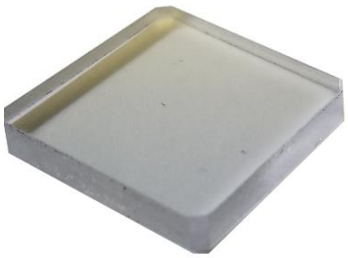
PERFORMANCE





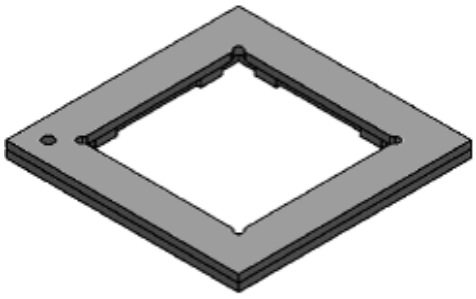
OPTIONS

Solder Ball Options	Sockets are available with no solder balls using a Stencil to apply solder paste for reflow/attachment, or with a pre-attached solder ball; either SAC-305 or Eutectic (SnPb)
Device Press	The device press provides uniform surface to press the device into the socket
Extraction Tool	This tool assists removing the device from the contactor
Alignment Frame	Used to Ensure proper device alignment to the socket



Device Press

Extraction tool



Alignment frame

Ironwood Electronics / 1335 Eagandale Ct., Eagan, MN 55121 USA
+1.952.229.8200 / info@ironwoodelectronics.com / **www.ironwoodelectronics.com**