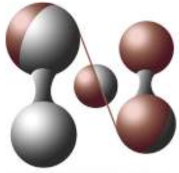


HSIO technologies

Grypper G80

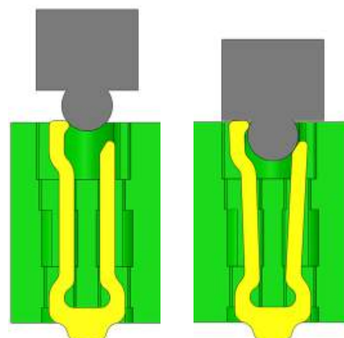
High performance, 0.8 mm+ pitch net zero package footprint engineering test sockets for BGA style packaged devices

HSIO Technologies Grypper series test socket is the next best thing to not having a socket at all. With superior electrical performance, the Grypper series test sockets allow BGA packages to fit into the exact end-use location for sample boards, failure analysis and other applications, where the space is limited only to IC package itself. The BGA IC package simply snaps into the Grypper test sockets. The Grypper G80 test sockets with reduced force required for insertions are designed for high-ball count BGA IC packages with 0.8 mm pitch and 1.0 mm pitch. The G80 is ideal for various applications, such as failure analysis, system-level test, device development and characterization.

FEATURES AND BENEFITS

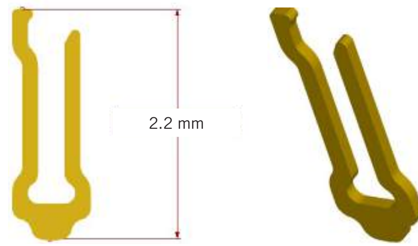
Package-size PCB footprint	Since the PCB footprint of G80 is identical to the package, only one PCB design is required, enabling a seamless transition from test and validation through production and reducing overall test costs
Low insertion force	Unique contact design reduces the insertion force required to insert and retain higher-ball-count packages safely and securely within the test socket
No lid required	The package snaps directly without a lid, enabling easy probing, scoping and troubleshooting the backside of the device
Excellent signal performance	A short signal path achieves low inductance and low insertion loss, providing a nearly invisible electrical connection

METHODOLOGY



Cross section view of test socket and package.

CONTACT



Pitch (mm)	Ball Diameter* (mm)	Ball Exposure
0.8	0.45±0.05	0.30 min
0.8	0.50±0.05	0.325 min
0.8	0.55±0.05	0.35 min
1	0.60±0.05	0.375 min
1	0.65±0.05	0.40 min

*Standard designs available. Contact HSIO Technologies for designs for other dimensions.

TEST SOCKET DESCRIPTION

The Grypper technology uses a high-frequency beam contact. The design allows the Grypper beam to snap onto the contact, while removing oxides, resulting in reliable test results. The G80, with its single beam and reduced insertion force, is ideal for high-ball count BGA IC packages.

ELECTRICAL SPECIFICATIONS

P2A** Configuration	0.8 mm Pitch, 0.5 mm Ball*	1.0 mm Pitch, 0.5 mm Ball
Loop inductance	0.90 nH	1.19 nH
Self inductance	0.61 nH	0.80 nH
Mutual inductance	0.080 nH	0.090 nH
Capacitance	0.224 pF	0.195 pF
Mutual capacitance	0.028 pF	0.023 pF
S21 Insertion loss	-1 dB @ 22 GHz	-1 dB @ 30.8 GHz
S11 Return loss	-20 dB @ 6.5 GHz	-20 dB @ 2.0 GHz
S41 Crosstalk (GSSG)	-20 dB @ 5.0 GHz	-20 dB @ 3.2 GHz
Impedance	63.4 Ω	78 Ω
Time delay	15.0 ps	16.0 ps
Current Carrying Capacity	2 A	2 A
CRES	< 50 mΩ	< 50 mΩ

* Specification based on lab measurements. Contact factory for additional electrical reports on other pitches and ball sizes.

**P2A refers to the standard GSG, one signal contact with two ground contacts, one on either side of the signal.

P8A* configuration	0.8 mm Pitch, 0.5 mm Ball	1.0 mm Pitch, 0.5 mm Ball
Loop inductance	0.75 nH	0.88 nH
Self inductance	0.61 nH	0.80 nH
Capacitance	0.300 pF	0.263 pF
S21 Insertion loss	-1 dB > 40 GHz	-1 dB > 40 GHz
S11 Return loss	-20 dB @ 18 GHz	-20 dB @ 6.0 GHz
Impedance	50 Ω	58 Ω
Time delay	13.9 ps	14.3 ps
Current Carrying Capacity	2 A	2 A
CRES	< 50 mΩ	< 50 mΩ

*P8A refers to one signal contact surrounded by eight ground contacts.

MECHANICAL SPECIFICATIONS

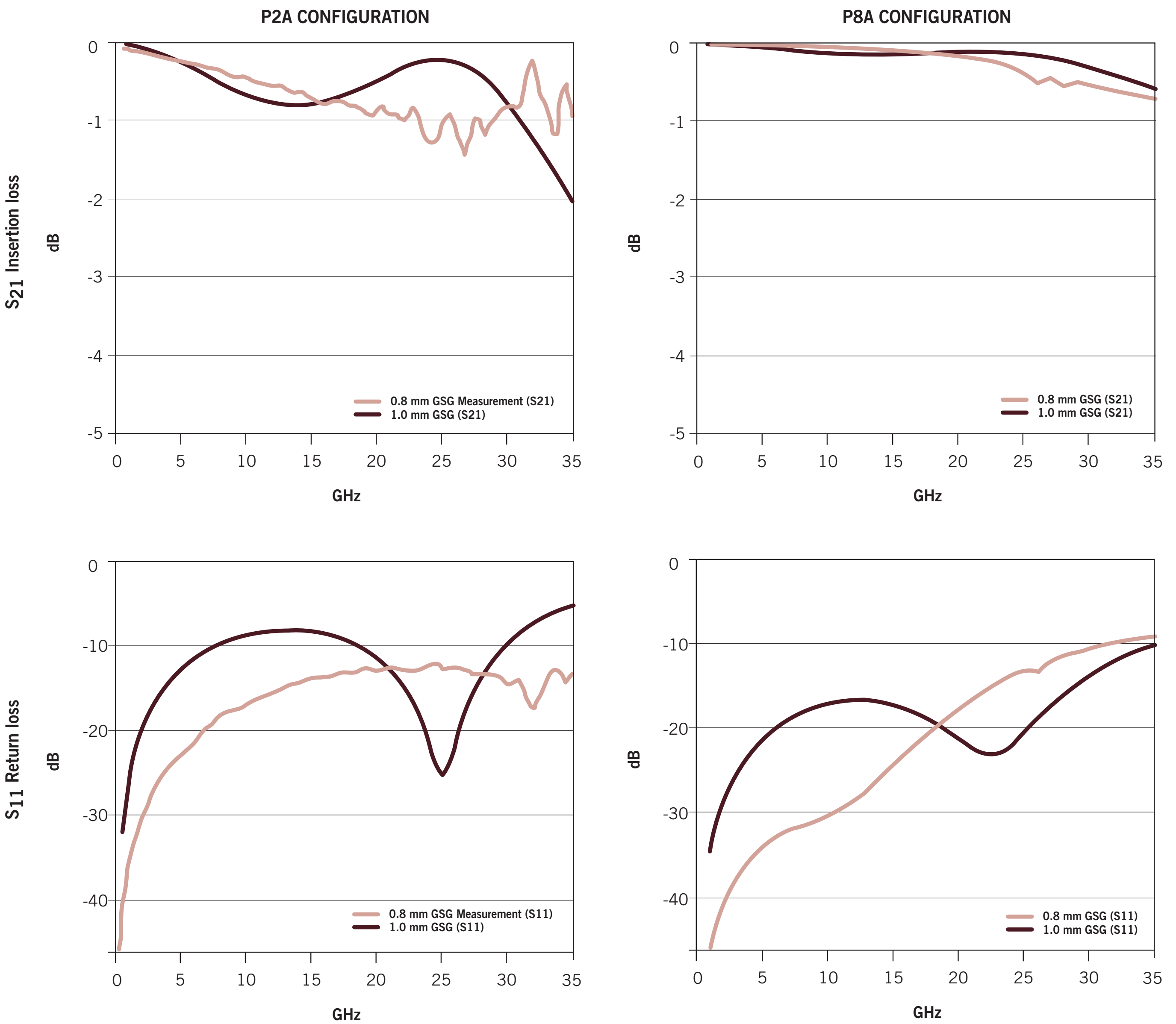
Contactor life	50 insertions
Insertion Force*	40 grams / contact
Contact Length	2.2 mm

*Insertion force based on 0.8 mm pitch, 0.45 mm diameter SAC 305 solder balls.

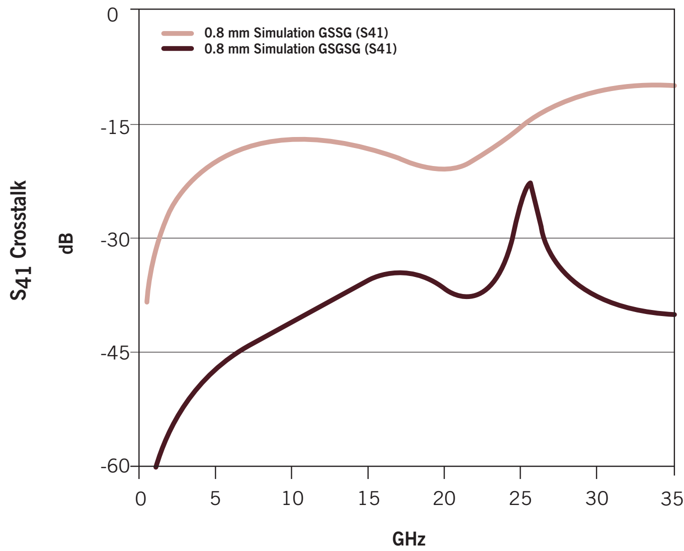
MATERIAL SPECIFICATIONS

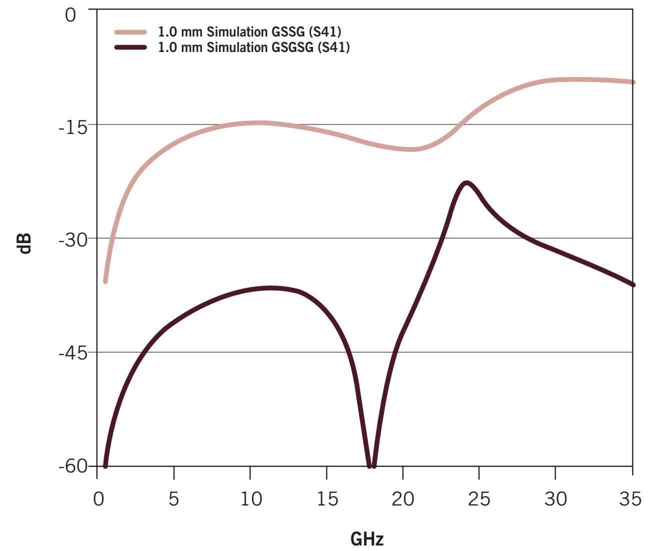
Contact base material	Copper (Cu) alloy
Contact plating	Gold (Au) over Nickel (Ni)
Housing	Polyimide (Cirlex®)
Environmental	-55° C to +155° C

PERFORMANCE



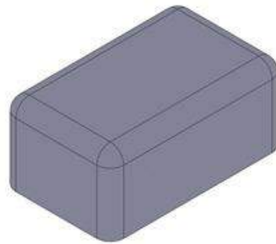
PERFORMANCE





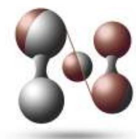
OPTIONS/SPARES

Package press	The package press provides uniform surface to press the package into the socket
Extraction tool	This tool assists removing the device from the contactor



Device Press

Extraction tool



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