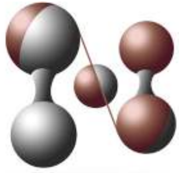
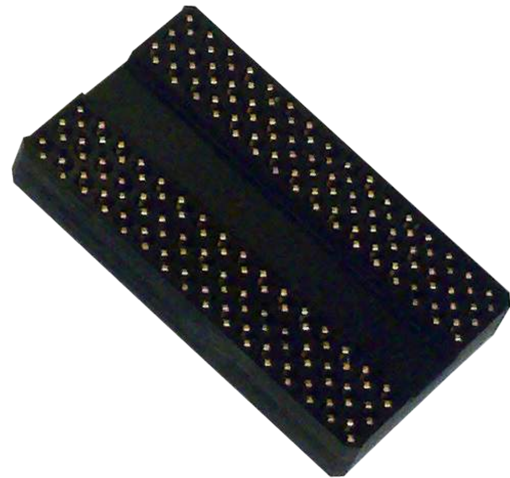


HSIO technologies



Grypper

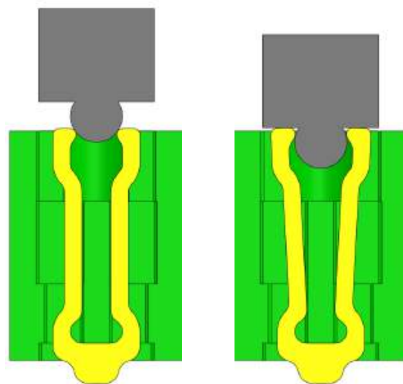
High performance, 0.65 mm pitch net zero package footprint engineering test sockets for BGA style packaged devices

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 devices to fit into the exact end-use location for sample boards, failure analysis and other applications, where the space is limited only to IC packages itself. The BGA IC package simply snaps into the Grypper sockets. The Grypper sockets with their dual beam contact are designed for BGA IC packages with 0.65 mm pitch to 1.0 mm pitch. The Grypper is ideal for various applications, such as failure analysis, system-level test, device development and characterization. The Grypper is widely used in the characterization of DDR2, 3, and 4 type memory devices and other memories.

FEATURES AND BENEFITS

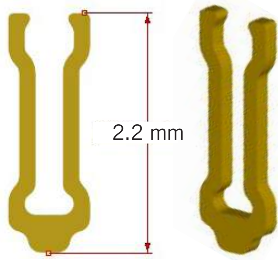
Package-size PCB footprint	Since the PCB footprint of Grypper is identical to the package, only one PCB design is required, enabling a seamless transition from test and validation through production and reducing overall test costs
No lid required	The package snaps directly without a lid, enabling easy 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.

CONTACTS



Pitch (mm)	Ball Diameter* (mm)	Ball Exposure
0.65	0.35±0.05	0.250 min
0.65	0.40±0.05	0.250 min
0.8	0.45±0.05	0.275 min
0.8	0.50±0.05	0.30 min
1	0.60±0.05	0.35 min
1	0.65±0.05	0.375 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 Grypper, with its dual beam is designed for BGA IC packages or 200 balls or less.

ELECTRICAL SPECIFICATIONS

P2A Configuration	0.8 mm Pitch, 0.45 mm Ball*	1.0 mm Pitch, 0.6 mm Ball
GSG Loop inductance	0.655 nH	1.07 nH
Self inductance	0.51 nH	0.69 nH
Mutual inductance**	0.046 nH	0.075 nH
Capacitance (GSG - Signal pin to Return)	0.250 pF	0.231 pF
Mutual capacitance**	0.030 pF	0.027 pF
S21 Insertion loss / GSG	-1 dB @ 23 GHz	-1 dB @ 31.0 GHz
S11 Return Loss / GSG	-10 dB @ 36 GHz -20 dB @ 8.5 GHz	-10 dB @ 29.5 GHz -20 dB @ 2.6 GHz
S41 Crosstalk (Open Circuit Adjacent GSG)	-20 dB @ 6.5 GHz	-20 dB @ 6.7 GHz
S41 Crosstalk GSSG Thru***	-20 dB @ 5.8 GHz -30 dB @ 21.7 GHz	-20 dB @ 3.8 GHz -30 dB @ 21.5 GHz
Impedance	51.2 Ω	68.1 Ω
Time delay	13.1 ps	16.0 ps
Current Carrying Capacity	4 A	4 A
CRES	< 25 mΩ	< 25 mΩ

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

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

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

P8A Configuration	0.8 mm Pitch, 0.45 mm Ball	1.0 mm Pitch, 0.6 mm Ball
GSG Loop inductance	0.664 nH	0.761 nH
Self inductance	0.51 nH	0.69 nH
Capacitance (GSG - Signal pin to Return)	0.307 pF	0.294 pF
S21 Insertion loss / GSG	-1 dB > 40 GHz	-1 dB > 40 GHz
S11 Return Loss / GSG	-10 dB > 40 GHz -20 dB @ 14 GHz	-10 dB > 40 GHz -20 dB @ 19.5 GHz
Impedance	46.6 Ω	50.9 Ω
Time delay	12.8 ps	13.7 ps
Current Carrying Capacity	4 A	4 A
CRES	< 25 mΩ	< 25 mΩ

MECHANICAL SPECIFICATIONS

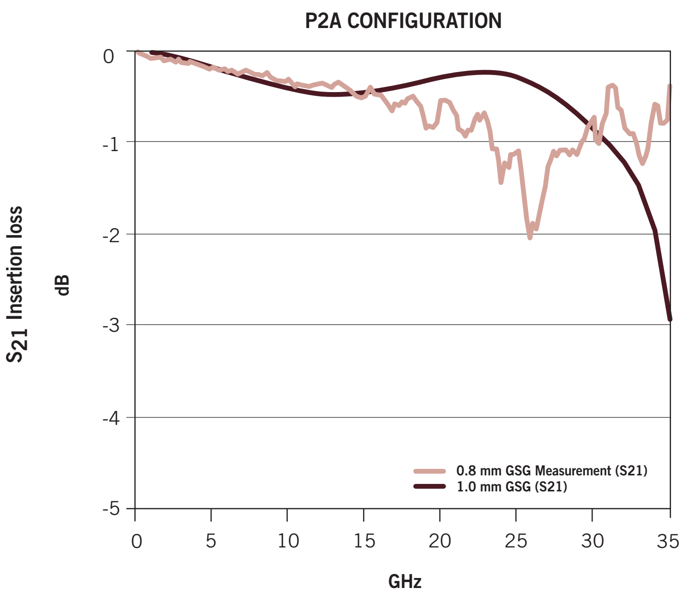
Contactor life	100 Insertions
Insertion Force*	95 grams / contact
Contact Length	2.2 mm

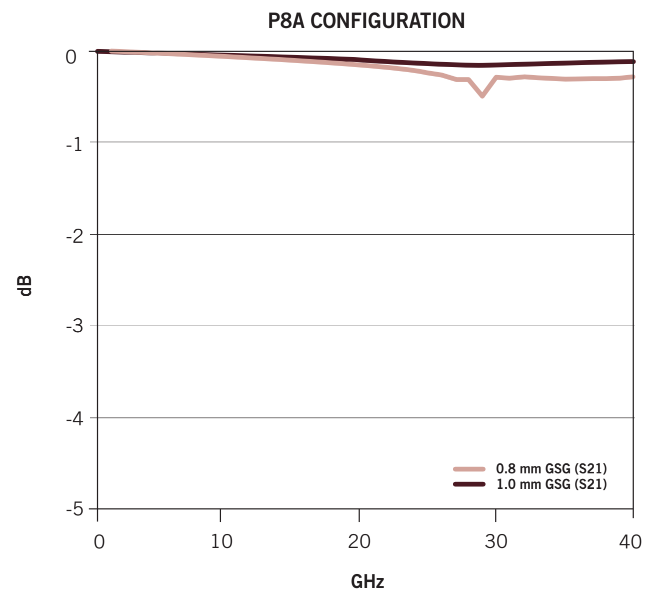
*Insertion force based on 0.8 mm pitch, 0.45 mm diameter SAC 305 solder balls.

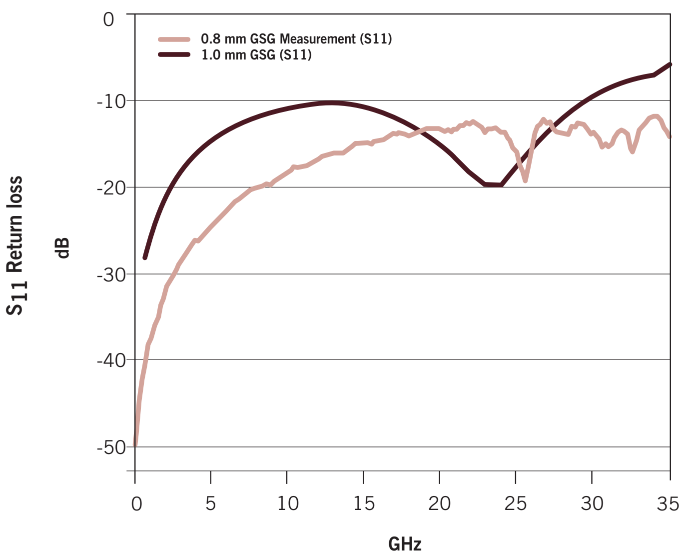
MATERIAL SPECIFICATIONS

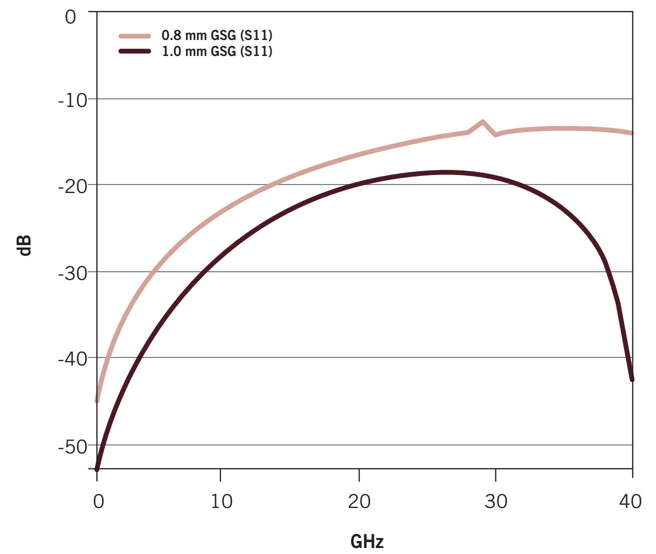
Contact base material	Copper (Cu) alloy
Contact plating	Gold (Au) over Nickel (Ni)
Housing	Polyimide (Cirlex ®)
Environmental	-55° C to +155° C

PERFORMANCE

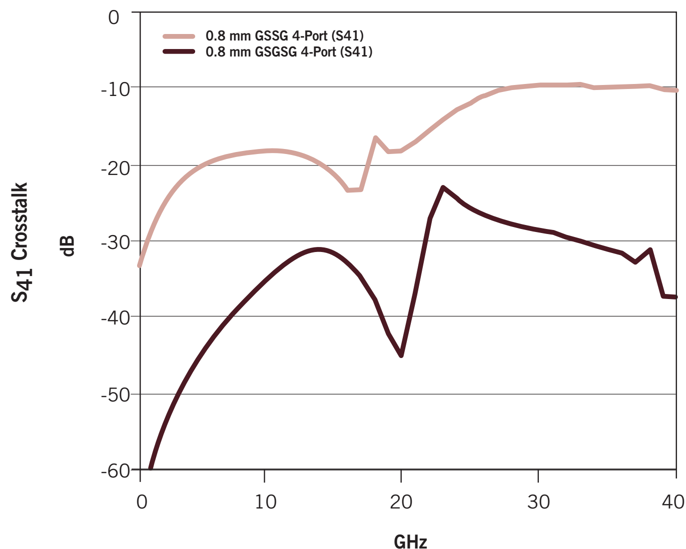


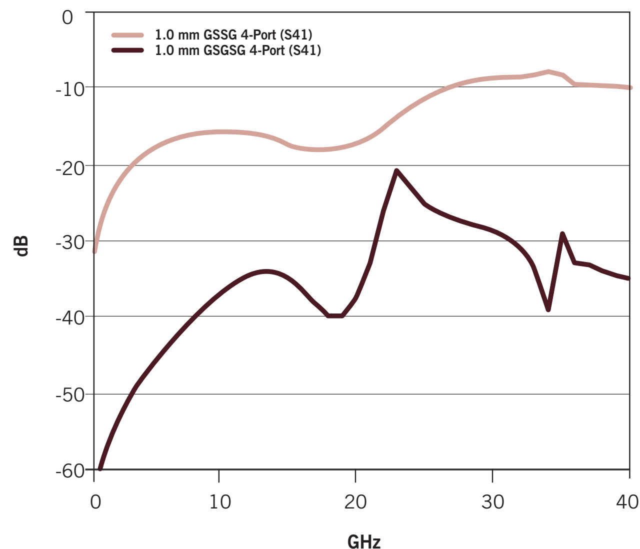






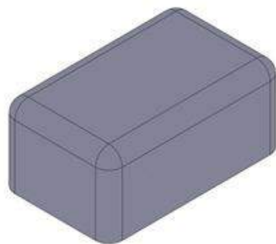
PERFORMANCE





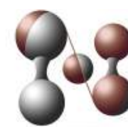
OPTIONS/SPARES

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



Device Press

Extraction tool



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