Signal Integrity, Inc.
Electromechanical devices and compliant coaxial assemblies

104 County Street
Suite 210, Attleboro, MA, USA
Phone: 508.226.6480
Web: www.signalin.com
Email: sales@signalin.com

A1562 Kelvin Contact Specifications

Features

0.4mm pitch

Low Contact resistance at 30 mΩ

150^{o} C operation

High Contact Pressure

2 amp continuous current

Applications

Low current/voltage measurements

ADC and mixed signal devices,

High Accuracy DC measurement

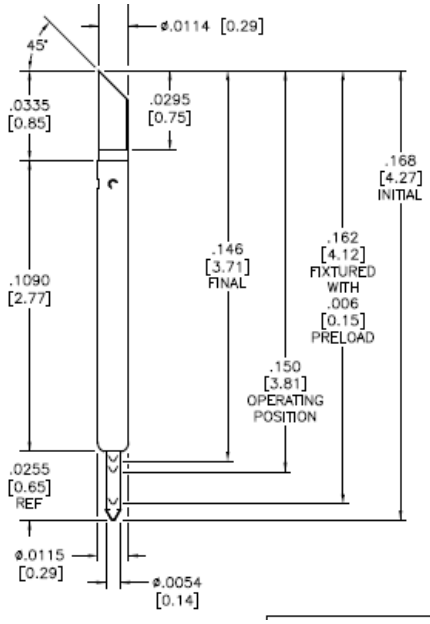
4 wire Testing

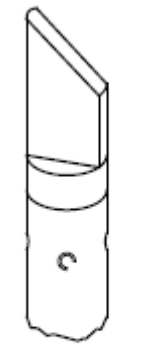
Smart Power

Parallel Pins on High Power Applications

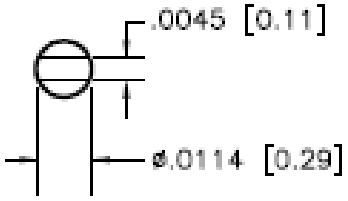
Designed for very tight contact to contact gap- Socket design for full Kelvin contact and four wire measurements.

Mechanical Specifications





ISOMETRIC VIEW OF DUT PLUNGER



Top view

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DC Operating Specification	A1562-HJ	A1562-DE
Spring Force at Operating Position (+/-10%)	29gr	19gr
Contact Resistance (+/- 5%)	29 mΩ	54 mΩ
Continuous Current at 20°C Rise in temperature above Ambient	2A	1.5A
Current Capacity at 10% duty cycle (On/Off)	4.12A	3.52A

A1562 (-HJ, -DE) Material Description

Device Plunger Material	Proprietary Solid Pd Alloy
PCB Plunger	Tool Hardened SS with Hard Au plating
Barrel	Proprietary 3-layer Clad Construction
Spring	Stainless Steel
Temperature Range	Cryogenic to 210° C Operating Range

Spring Force Table

Two spring forces available- Lower spring force is best for AuNi and AuNiPd alloy pads to minimize contact witness marks. The higher spring force is best for matte tin pads and BGA balls.

	A1562-DE	A1562-HJ
Force at Initial (Free standing 4.27mm)	9 grams	9 grams
Force at Preload (Fixtured-4.12mm)	13 grams	16 grams
Force at Operating Position (3.81mm)	19 grams	29 grams
Force at final (3.71mm)	21 grams	34 grams

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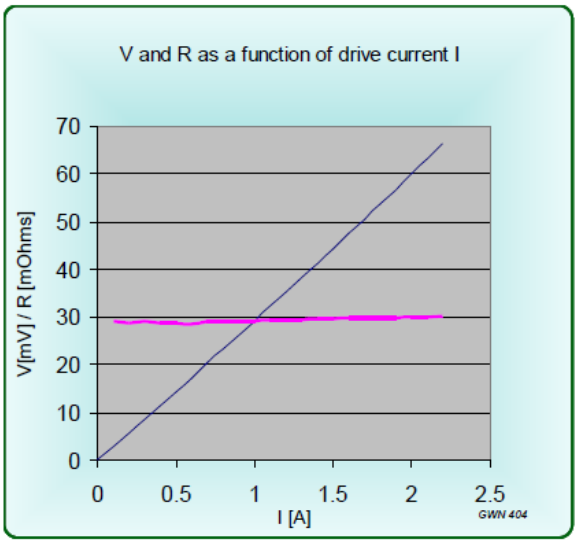
A1562 DC Operating Specifications

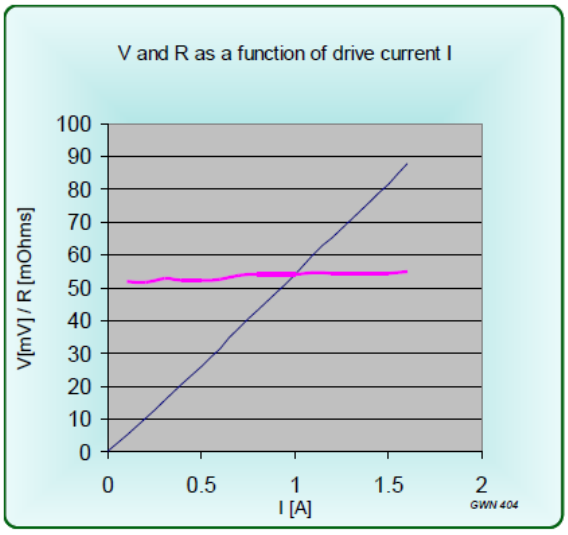
A1562 Kelvin Contact Resistance at 29gr operating force (Single pin performance)



Nominal Contact Resistance

30 mΩ at 29gr Spring Force

Contact Resistance at Lower Spring Force



Nominal Contact Resistance

54 mΩ at 19gr spring force

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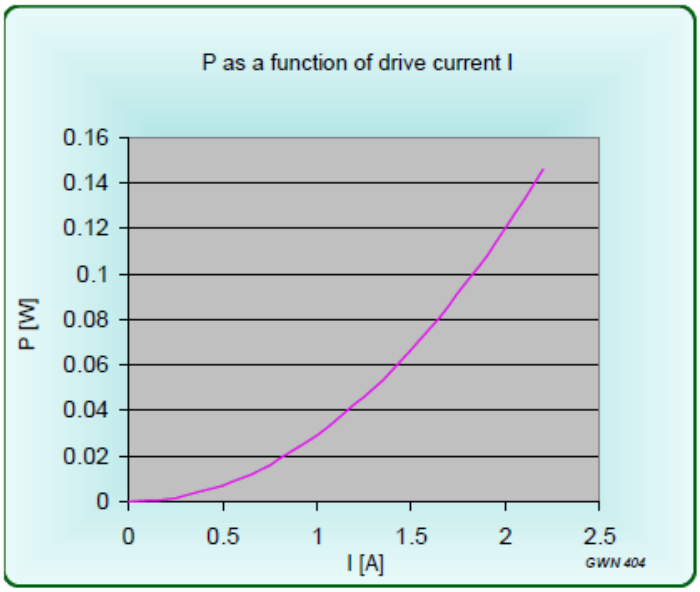
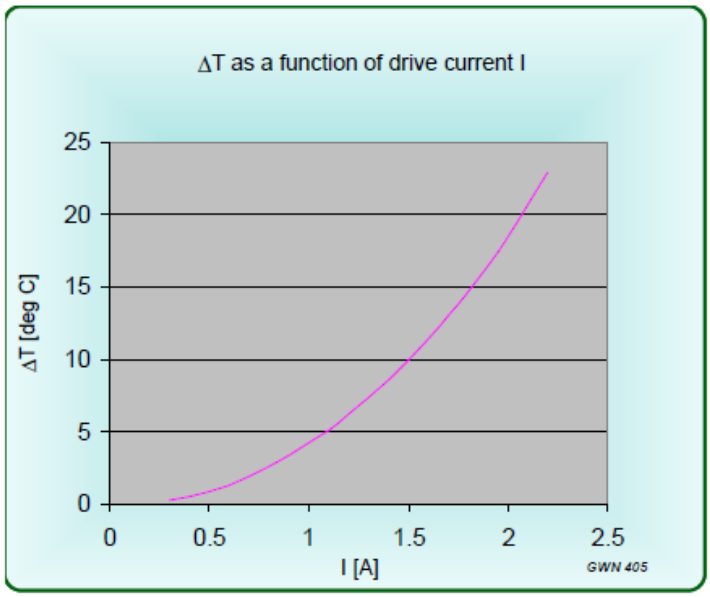
A1562 Current Capacity

Single Pin Power Dissipation



Operating at 2A continuous current the A1562 dissipates 0.14 wats per pin.

Thermal Characteristic of Probe under Current Load



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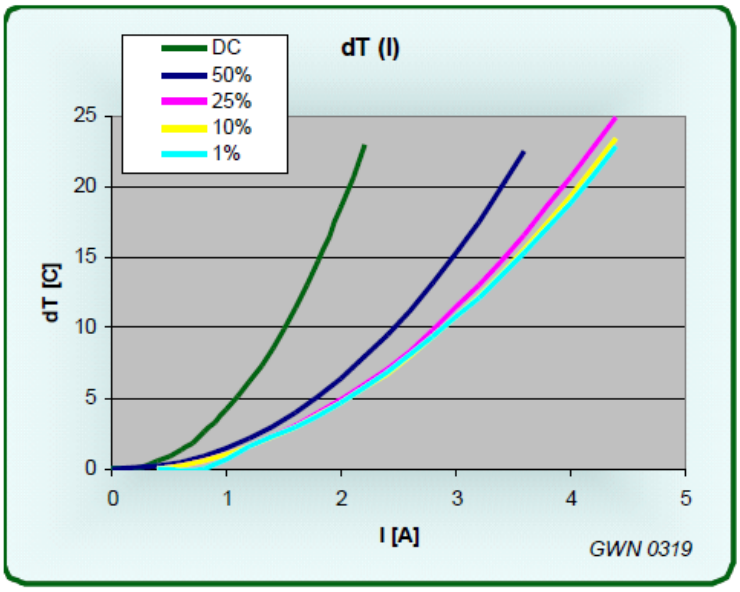
This is the temperature rise of probe above ambient. At 2A the A1652 Kelvin pin will increase 20°C.

Pulsed Current Performance



	DC	50%	25%	10%	1%	
Imax	2.00	3.40	3.94	4.07	4.12	A

The test cycle for this specification is 3 seconds. Minimum pulse duration is 300msec/ The test setup thermal constant is 280 msec so it is comparable to the duty cycle at 10%. At 1% duty cycle the test setup introduces enough thermal mass to slow the rise in temperature beyond the current pulse width.

AC Operating Parameters

	Min (100 MHz)	Nominal (1GHz)	Ma(10GHz)
Capacitance[1]	0.49 pF	0.52pF	1.1pF
Inductance[1]	0.80nH	0.82nH	1.75nH
Insertion Loss[1]	-0.1dB	-0.2dB	-0.85dB
Return Loss[1]	-35dB	-20dB	-9dB
Rise Time		28.5ps	
Impedance[2]	34 Ω		38Ω

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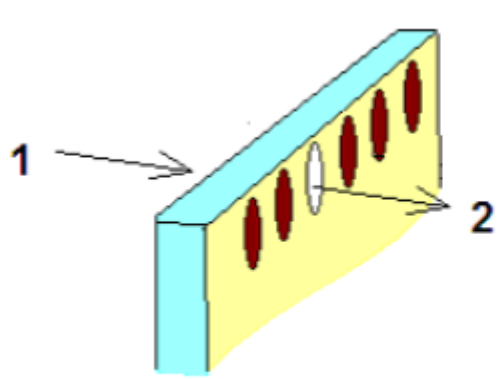
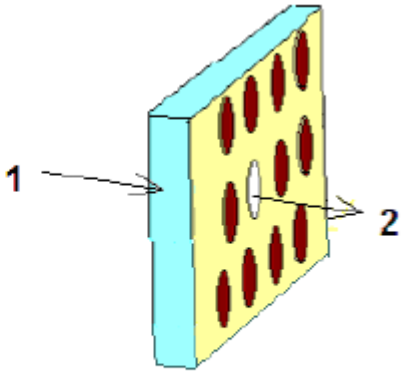
Note 1: Measured with a GSG configuration at 0.4mm pitch



Single row DUTs



Multi-row DUTS

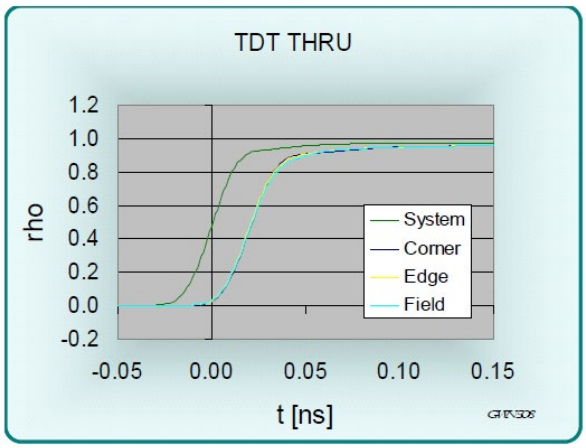
Measured with a dK of 4.0 and dF of 0.005.

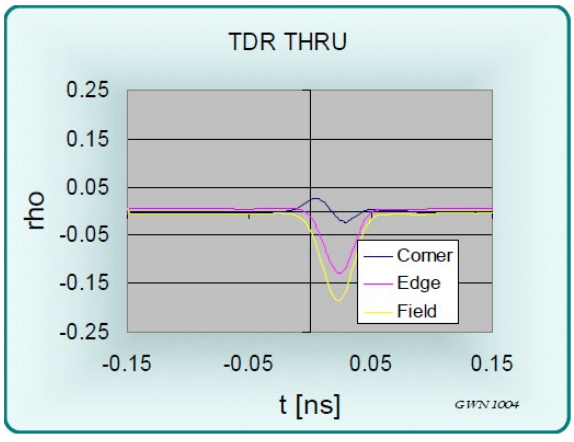
Note 2: Impedance measured as GSG at 0.4mm pitch, Impedance will vary with pitch, Impedance will improve at 0.5mm to 0.8mm pitch.

The test setup and Signal to Ground arrangement and the dielectric properties of the socket body material. The AC performance specifications of a probe or socket assembly tightly correlated with the impedance match of the probe/socket/device high speed pin configuration to the test channel impedance.

Please consult Signal Integrity applications engineering for A1562 frequency specific requirements. Signal Integrity can supply SPICE models, Transmission Line Models, PI models and ANSY HFSS models to meet your specific channel configurations.

Measured Frequency Performance of the A1562 probe





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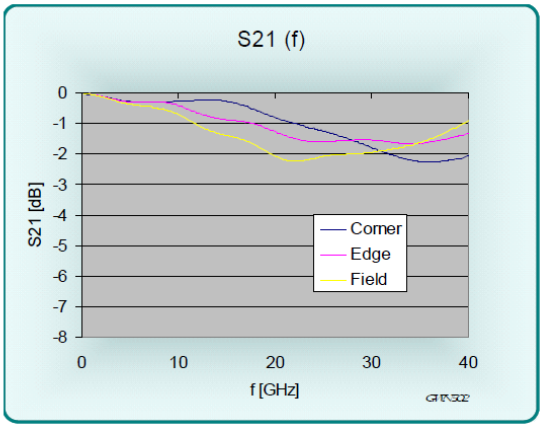

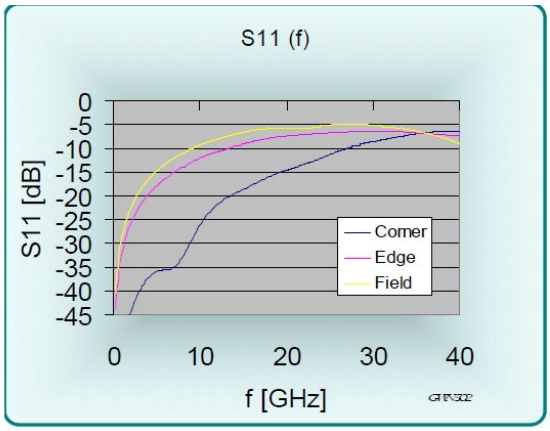

Differential Configuration (GSSG at 0.4mm pitch)		
Insertion Loss	-1dB	10.8 GHz
Return Loss[1]	-20dB	3.4 GHz
	-10dB	13.6 GHz
Impedance (into 100Ω)	Minimum: 76Ω	Maximum: 102

Example Socket Applications

In a Kelvin contact, the limiting design specification is the available contact surface area on the test pad of the device under test. The tip-to-tip distance is dependent on the socket insulating material and the ability to consistently drill a thin wall.

The A1562 Shark fin (Chisel) probe tip provides the lowest surface area profile and an optimized tip to tip contact distance for the limits of the socket drill accuracy and the minimum wall thickness the socket housing material can bear.

Kelvin Socket Contact Specifications

Minimum Target Contact Surface Area

2 adjacent Pins – 0.07mm^2

Target contact radius 0.05mm

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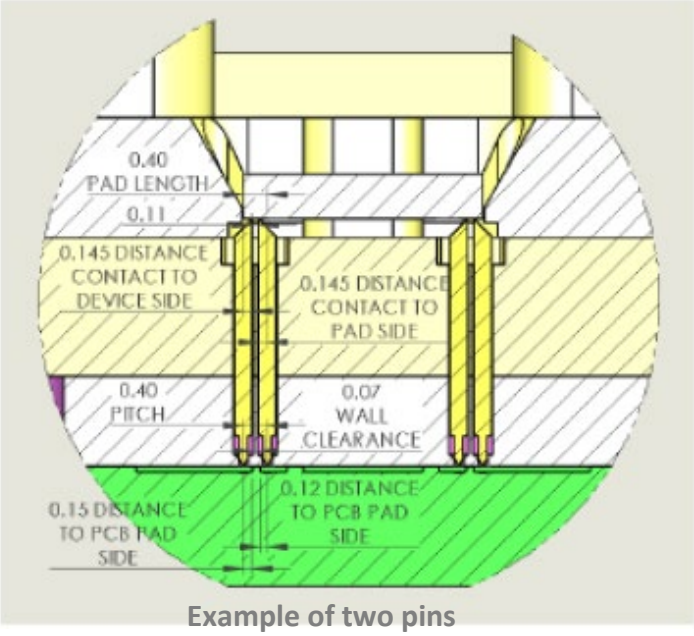
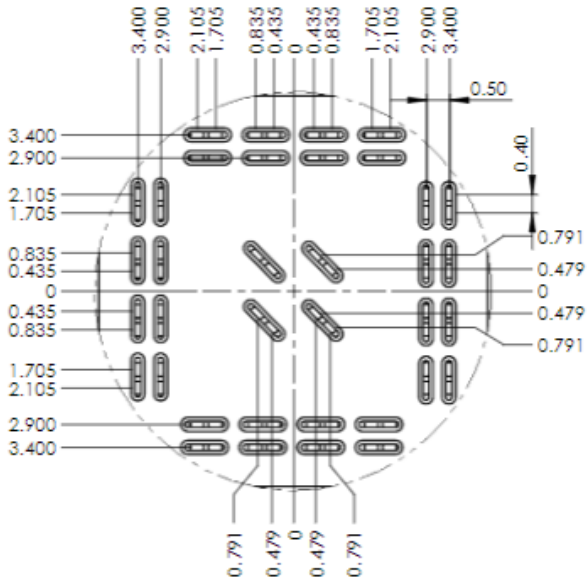


Example of two pins per pad on 0.5mm pitch

4 wire Application

Pin Contact Map



Note: Socket Design pin slot fixes probe tip orientation and will not allow probe to rotate.