



PRODUCT BULLETIN

Novaflex[®] VHD Very High Density Flexible Circuit Interconnect

Novaflex VHD uses a unique material construction of *Novaclad*[®] adhesiveless material, laser generated micro-vias, and ultra fine-line photoimaging to provide the highest density 1 or 2 layer flexible printed circuits in high-volume production today. *Novaflex* VHD is processed in a state of the art roll-to-roll processing system with 305mm wide webs in our Longmont, Colorado and Northfield, Minnesota facilities.

This unique material construction also makes *Novaflex* VHD extraordinarily reliable because the micro-vias have an equal, continuous plating thickness; the same as the surface copper.

The design features of *Novaflex* VHD are:

- **Layers** – 1 or 2
- **Base Material** – 50 μm *Novaclad* adhesiveless material
- **Line Width/Space** – 50 $\mu\text{m}/50 \mu\text{m}$
- **Via Exit/Entry Diameter** – 25 $\mu\text{m}/60 \mu\text{m}$
- **Via Pad Diameter** – 140 μm
- **Soldermask/Dielectric** – photoimageable or laminated film
- **Operating Temperature** – $-65^{\circ}\text{C} - 150^{\circ}\text{C}$

Novaflex VHD is available with a variety of photoimaged soldermasks and laminated films. Surface finishes include electroplated hard or soft wire-bondable gold, electroplated solder, and *Shelcoat*[™] OSP.

Applications for *Novaflex* VHD include disk drives, cellular phones, medical imaging, hearing aids, displays, printers, pagers.

Novaflex VHD is manufactured under a QS-9000 and ISO 9001 certified quality system.



Novaflex® VHD Reliability Data

Test Environment	Duration	Failures	Comments
129°C Operating Life Test	1,000 Hours	0	
Biased 85°C/85% RH	1,000 Hours	0	
Thermal Cycle (-40°C-125°C)	1,000 Cycles	0	
Thermal Cycle (-55°C-125°C)	1,000 Cycles	0	Tested to with
Thermal Shock (-65°C-150°C)	1,000 Cycles	0	
Storage Life (150°C)	1,000 Hours	0	

Novaclad® Properties

Property	Test Method	Units	Typical Value
Peel Strength, as received	IPC-TM-650, 2.4.9A	lbs/in	7
Peel Strength, after solder float	IPC-TM-650, 2.4.9C	lbs/in	6
Peel Strength, after 72 hours @ 210°C	Sheldahl TM-6594G	lbs/in	4
Initiation Tear Strength	IPC-TM-650, 2.4.16	lbs/in	4.6 (MD)
Propagation Tear Strength (50µm film)	IPC-TM-650, 2.4.17	grams	1
Low Temperature Flexibility	IPC-TM-650, 2.4.18		P
Dimensional Stability (after etch)	IPC-TM-650, 2.2.4B	%	0
Dimensional Stability (after thermal)	IPC-TM-650, 2.2.4C	%	0
Solder Float	IPC-TM-650, 2.4.13A		P
Solderability	IPC-S-804, Method 1		P
Dielectric Constant @ 1Mhz	IPC-TM-650, 2.5.5.3		3
Dielectric Strength	ASTM-D-149	Volts/mil	5,
Moisture and Insulation Resistance	IPC-TM-650, 2.6.3.2	Megaohms	1
Flammability	UL94		V

For more information visit Sheldahl's web page at www.sheldahl.com, e-mail us at novaflexvhd@sheldahl.com or contact Sheldahl at one of the phone numbers below.

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