

# Technology Roadmap

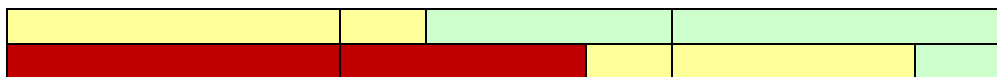
2009

2010

2011

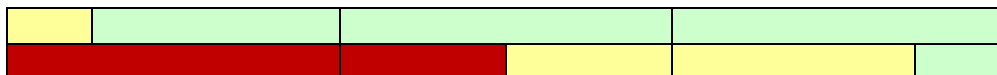
## Line/Spacing, External

4.0 mils / 4.0 mils  
 3.0 mils / 3.5 mils



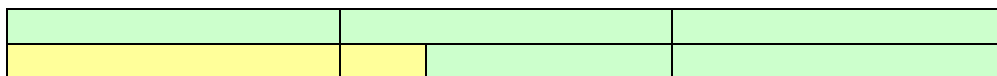
## Line/Spacing, Internal

3.0 mils / 3.0 mils  
 2.5 mils / 2.5 mils



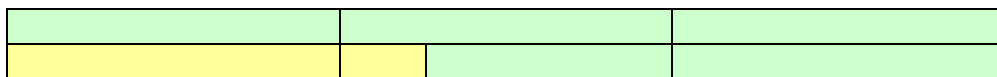
## Pad Diameter, Internal (D=Drill Dia.)

$(0.0055" + \text{Min A/R}) * 2 + D$   
 $(0.0050" + \text{Min A/R}) * 2 + D$



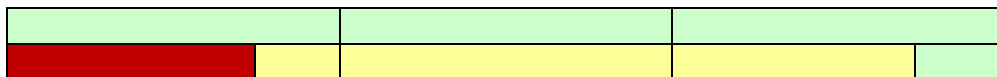
## Pad Diameter, External (D=Drill Dia.)

$(0.0035" + \text{Min A/R}) * 2 + D$   
 $(0.0030" + \text{Min A/R}) * 2 + D$



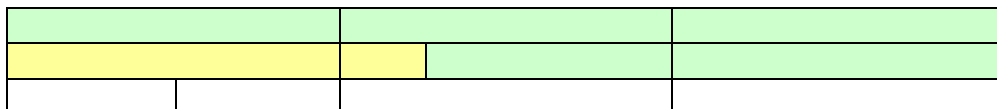
## Plane Clearance (D=Drill Dia.)

$(0.007" + \text{Min Space}) * 2 + D$   
 $(0.0065" + \text{Min Space}) * 2 + D$



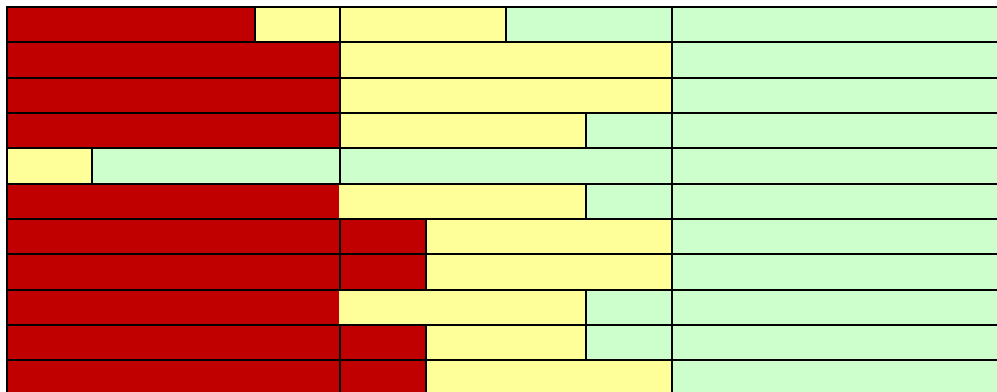
## Plating Aspect Ratio

10:1  
 12:1  
 15:1



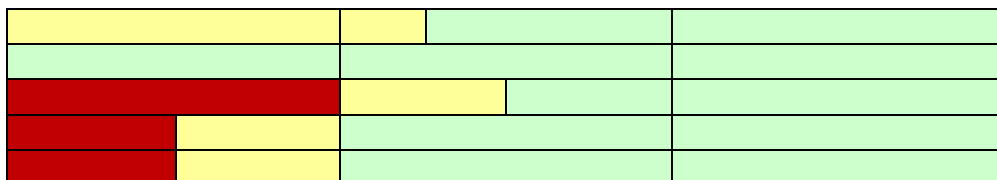
## Materials being developed

Embedded Capacitance  
 Arlon 91ML  
 Arlon 99ML  
 DuPont Interra  
 Gore SPEEDBOARD C  
 Isola FR408  
 Isola IS620  
 Isola IS680  
 Isola P96 & P26  
 Nelco N4000-12  
 Ohmega Ohmega-Ply



## Laser uVias

.9:1 aspect ratio  
 .004 Dia  
 .003 Dia  
 .007" Capture Pad Dia (Outer)  
 .007" Target Pad Dia (Inner)





11126 Bren Road West  
 Minnetonka, Minnesota U.S.A 55343  
 www.HOLADAY.com

Tel 952.933.3303  
 Sales Fx 952.933.2383  
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Staggered			
Stacked			
Cu uVia Fill			
260C Tg Non-conductive uVia Fill			
Non-conductive uVia Fill			

**Surface Finish**

Hot Air Solder Level (HASL)			
Electroless Ni Imm. Gold (ENIG)			
Hot Oil Reflow			
IR Fused			
Selective Solder Strip			
Electrolytic Ni/Gold			
Electrolytic Hard Ni			
Carbon Ink			
Selective Finishes			
Electroless Bondable Soft Au			
Electrolytic Gold (Soft)			
OSP			
Immersion Silver			
Lead Free HASL			

**Solder Masks**

LPI			
Dry Film			
Screened			
LDI			

**Certifications**

ISO 9000:200			
AS9100:2001			
NADCAP			
MIL-PRF-31032			
MIL-PRF-55110G (GF, GI, BI)			
NHB 5300.4(3I)			

**Testing**

Raw Materials			
IST			
Lamination Tg			
Solder Purity			
Copper Purity			
Elongation / Tensile Strength			
Monthly Group B Testing			
Thermal Stress Testing			
Ionic Cleanliness			
SIR (Surface Insulation Resistance)			



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-  Standard Volume Technology
-  Limited Volume Technology
-  Developmental Technology

This is a list of technology changes.