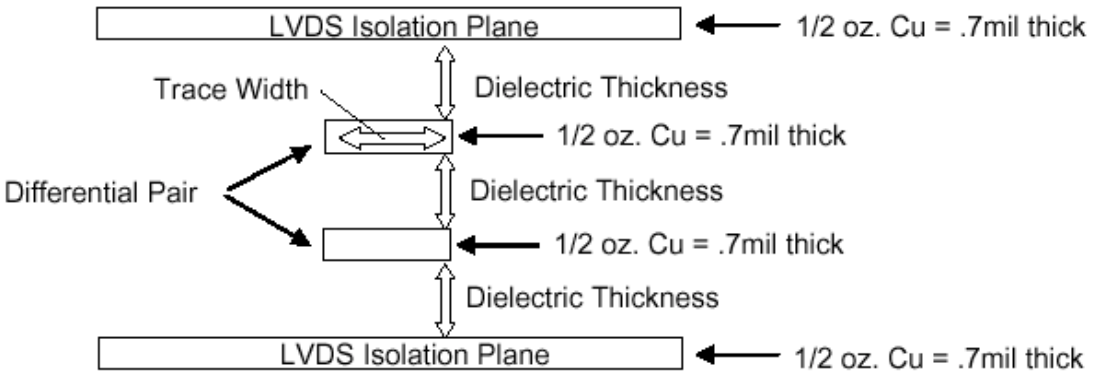
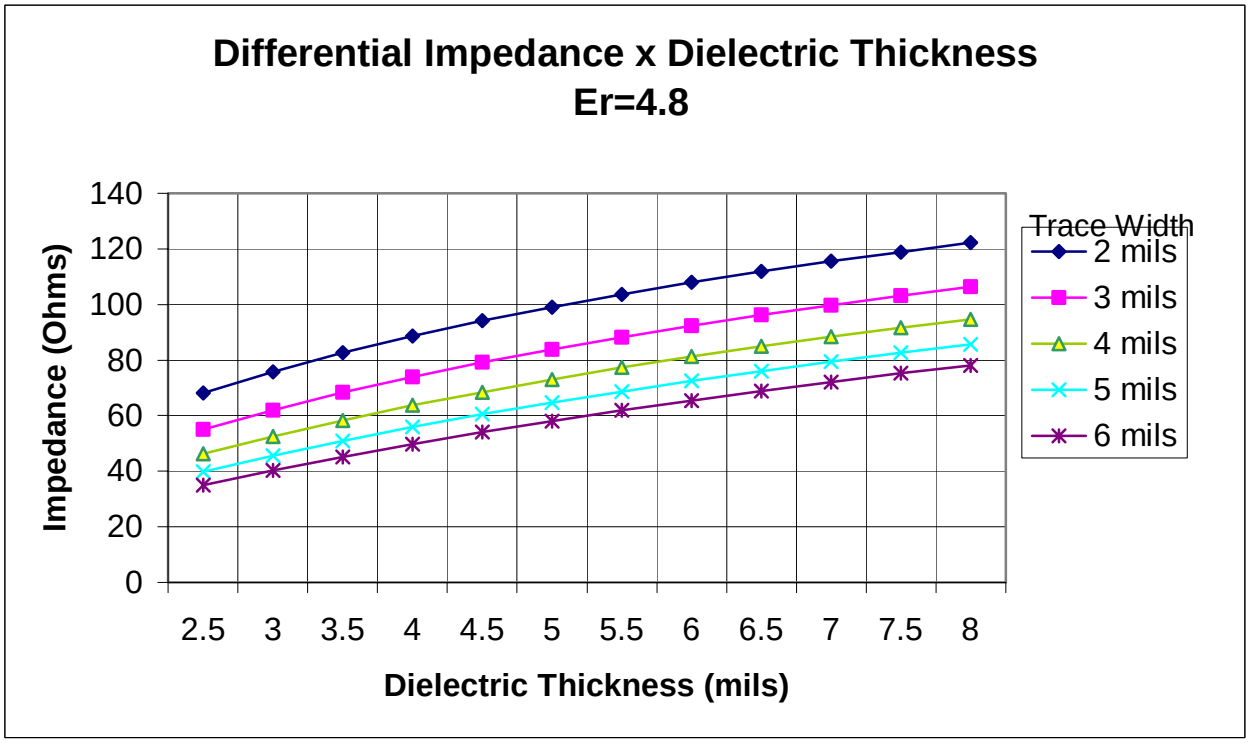
Brad Hall / Marcos Turqueti **12/22/2003**

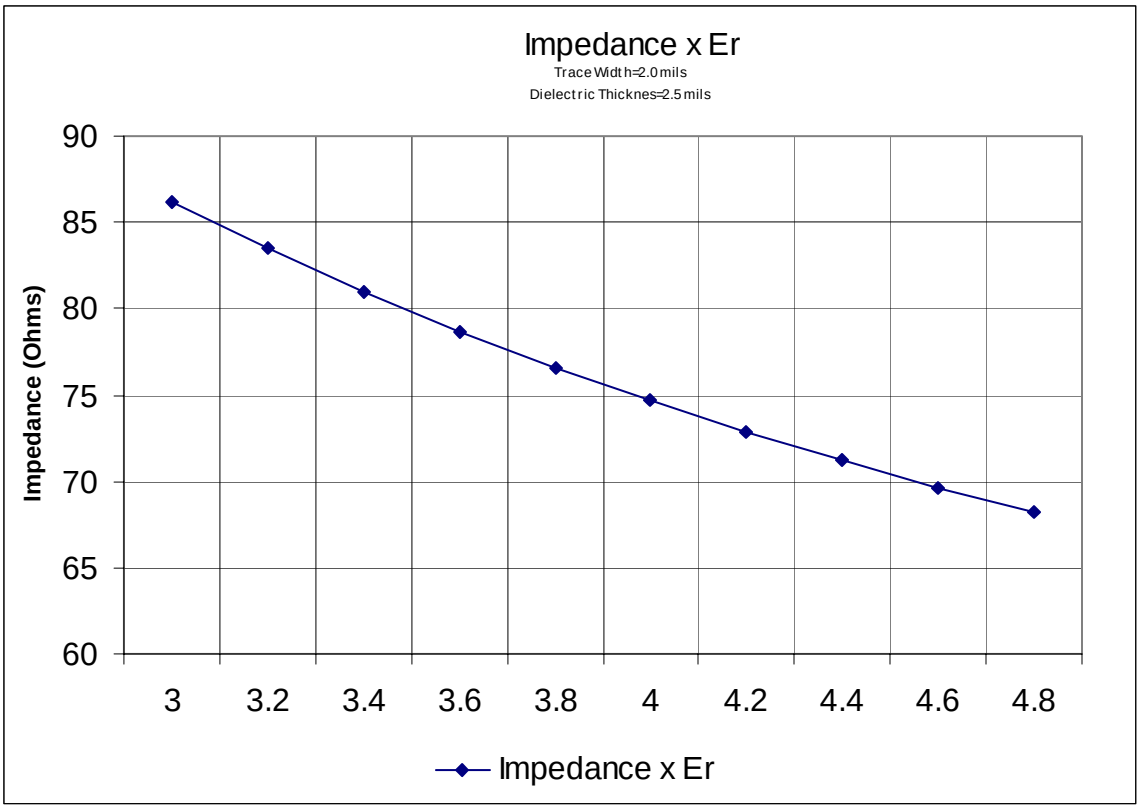
Differential Impedance vs Er, Dielectric Thickness, and Trace Width



Values in table are Zdiff (Ohms)

Values calculated using HperLynx LineSym V6.00





Trace width=2.0 mils ; Dielectric thickness=2.5 mils

Er=3.0		TRACE WIDTH (mils)				
		2	**3**	**4**	**5**	**6**
DIELECTRIC THICKNESS (mils)	**2.5**	*86.2*	*69.6*	*58.4*	*50.3*	*44.2*
	3	*95.9*	*78.4*	*66.5*	*57.7*	*50.9*
	3.5	*104.4*	*86.4*	*73.8*	*64.4*	*57.2*
	4	*112.1*	*93.5*	*80.5*	*70.7*	*63*
	4.5	*119*	*100.1*	*86.7*	*76.5*	*68.4*
	5	*125.3*	*106.1*	*92.4*	*81.9*	*73.5*
	5.5	*131.1*	*111.7*	*97.7*	*86.9*	*78.4*
	6	*136.4*	*116.9*	*102.7*	*91.7*	*82.9*
	6.5	*141.4*	*121.7*	*107.4*	*96.2*	*87.2*
	7	*146*	*126.2*	*111.8*	*100.4*	*91.3*
	7.5	*150.4*	*130.5*	*115.9*	*104.4*	*95.1*
	8	*154.5*	*134.5*	*119.8*	*108.2*	*98.8*

Er=3.2	TRACE WIDTH (mils)					
DIELECTRIC THICKNESS (mils)		**2**	**3**	**4**	**5**	**6**
	2.5	*83.5*	*67.4*	*56.6*	*48.7*	*42.8*
	3	*92.9*	*75.9*	*64.4*	*55.8*	*49.3*
	3.5	*101.1*	*83.6*	*71.5*	*62.4*	*55.4*
	4	*108.5*	*90.6*	*78*	*68.4*	*61*
	4.5	*115.2*	*96.9*	*83.9*	*74*	*66.3*
	5	*121.3*	*102.8*	*89.5*	*79.3*	*71.2*
	5.5	*126.9*	*108.1*	*94.6*	*84.2*	*75.9*
	6	*132.1*	*113.2*	*99.5*	*88.8*	*80.3*
	6.5	*136.9*	*117.8*	*104*	*93.1*	*84.4*
	7	*141.4*	*122.2*	*108.2*	*97.2*	*88.4*
	7.5	*145.6*	*126.3*	*112.2*	*101.1*	*92.1*
	8	*149.6*	*130.2*	*116*	*104.8*	*95.7*

Er=3.4	TRACE WIDTH (mils)					
DIELECTRIC THICKNESS (mils)		**2**	**3**	**4**	**5**	**6**
	2.5	*81*	*65.4*	*54.9*	*47.3*	*41.5*
	3	*90.1*	*73.7*	*62.5*	*54.2*	*47.8*
	3.5	*98.1*	*81.1*	*69.3*	*60.5*	*53.7*
	4	*105.3*	*87.9*	*75.6*	*66.4*	*59.2*
	4.5	*111.8*	*94*	*81.4*	*71.8*	*64.3*
	5	*117.7*	*99.7*	*86.8*	*76.9*	*69.1*
	5.5	*123.1*	*104.9*	*91.8*	*81.7*	*73.6*
	6	*128.2*	*109.8*	*96.5*	*86.1*	*77.9*
	6.5	*132.8*	*114.3*	*100.9*	*90.3*	*81.9*
	7	*137.2*	*118.6*	*105*	*94.3*	*85.7*
	7.5	*141.3*	*122.6*	*108.9*	*98.1*	*89.3*
	8	*145.1*	*126.4*	*112.6*	*101.7*	*92.8*

Er=3.6	TRACE WIDTH (mils)					
DIELECTRIC THICKNESS (mils)		**2**	**3**	**4**	**5**	**6**
	2.5	*78.7*	*63.5*	*53.3*	*45.9*	*40.4*
	3	*87.5*	*71.6*	*60.7*	*52.6*	*46.5*
	3.5	*95.3*	*78.8*	*67.4*	*58.8*	*52.2*
	4	*102.3*	*85.4*	*73.5*	*64.5*	*57.5*
	4.5	*108.6*	*91.4*	*79.1*	*69.8*	*62.5*
	5	*114.4*	*96.9*	*84.4*	*74.7*	*67.1*
	5.5	*119.7*	*102*	*89.2*	*79.4*	*71.5*
	6	*124.5*	*106.7*	*93.8*	*83.7*	*75.7*
	6.5	*129.1*	*111.1*	*98*	*87.8*	*79.6*
	7	*133.3*	*115.2*	*102*	*91.7*	*83.3*
	7.5	*137.3*	*119.1*	*105.8*	*95.3*	*86.8*
	8	*141*	*122.8*	*109.4*	*98.8*	*90.2*

Er=3.8	TRACE WIDTH (mils)				
DIELECTRIC THICKNESS (mils)	**2**	**3**	**4**	**5**	**6**
2.5	*76.6*	*61.8*	*51.9*	*44.7*	*39.3*
3	*85.2*	*69.7*	*59.1*	*51.2*	*45.2*
3.5	*92.8*	*76.7*	*65.6*	*57.2*	*50.8*
4	*99.6*	*83.1*	*71.5*	*62.8*	*56*
4.5	*105.7*	*88.9*	*77*	*67.9*	*60.8*
5	*111.3*	*94.3*	*82.1*	*72.8*	*65.3*
5.5	*116.5*	*99.2*	*86.8*	*77.3*	*69.6*
6	*121.2*	*103.8*	*91.3*	*81.5*	*73.6*
6.5	*125.6*	*108.1*	*95.4*	*85.5*	*77.5*
7	*129.8*	*112.2*	*99.3*	*89.2*	*81.1*
7.5	*133.6*	*115.9*	*103*	*92.8*	*84.5*
8	*137.3*	*119.5*	*106.5*	*96.2*	*87.8*

Er=4	TRACE WIDTH (mils)				
DIELECTRIC THICKNESS (mils)	**2**	**3**	**4**	**5**	**6**
2.5	*74.7*	*60.3*	*50.6*	*43.6*	*38.3*
3	*83*	*67.9*	*57.6*	*49.9*	*44.1*
3.5	*90.4*	*74.8*	*63.9*	*55.8*	*49.5*
4	*97.1*	*81*	*69.7*	*61.2*	*54.6*
4.5	*103*	*86.7*	*75.1*	*66.2*	*59.3*
5	*108.5*	*91.9*	*80*	*70.9*	*63.7*
5.5	*113.5*	*96.7*	*84.6*	*75.3*	*67.9*
6	*118.2*	*101.2*	*89*	*79.4*	*71.8*
6.5	*122.5*	*105.4*	*93*	*83.3*	*75.5*
7	*126.5*	*109.3*	*96.8*	*87*	*79*
7.5	*130.3*	*113*	*100.4*	*90.4*	*82.4*
8	*133.8*	*116.5*	*103.8*	*93.7*	*85.6*

Er=4.2	TRACE WIDTH (mils)				
DIELECTRIC THICKNESS (mils)	**2**	**3**	**4**	**5**	**6**
2.5	*72.9*	*58.8*	*49.4*	*42.5*	*37.4*
3	*81*	*66.3*	*56.2*	*48.7*	*43*
3.5	*88.3*	*73*	*62.4*	*54.4*	*48.3*
4	*94.7*	*79.1*	*68*	*59.7*	*53.2*
4.5	*100.6*	*84.6*	*73.3*	*64.6*	*57.8*
5	*105.9*	*89.7*	*78.1*	*69.2*	*62.2*
5.5	*110.8*	*94.4*	*82.6*	*73.5*	*66.2*
6	*115.3*	*98.8*	*86.8*	*77.5*	*70.1*
6.5	*119.5*	*102.9*	*90.7*	*81.3*	*73.7*
7	*123.4*	*106.7*	*94.5*	*84.9*	*77.1*
7.5	*127.1*	*110.3*	*98*	*88.3*	*80.4*
8	*130.6*	*113.7*	*101.3*	*91.5*	*83.5*

Er=4.4	TRACE WIDTH (mils)					
DIELECTRIC THICKNESS (mils)		**2**	**3**	**4**	**5**	**6**
	2.5	*71.2*	*57.5*	*48.3*	*41.6*	*36.5*
	3	*79.2*	*64.8*	*54.9*	*47.6*	*42*
	3.5	*86.2*	*71.3*	*60.9*	*53.2*	*47.2*
	4	*92.5*	*77.2*	*66.5*	*58.4*	*52*
	4.5	*98.3*	*82.7*	*71.6*	*63.1*	*56.5*
	5	*103.5*	*87.6*	*76.3*	*67.6*	*60.7*
	5.5	*108.2*	*92.2*	*80.7*	*71.8*	*64.7*
	6	*112.7*	*96.5*	*84.8*	*75.7*	*68.4*
	6.5	*116.8*	*100.5*	*88.7*	*79.4*	*72*
	7	*120.6*	*104.2*	*92.3*	*82.9*	*75.3*
	7.5	*124.2*	*107.8*	*95.7*	*86.2*	*78.5*
	8	*127.6*	*111.1*	*98.9*	*89.4*	*81.6*

Er=4.6	TRACE WIDTH (mils)					
DIELECTRIC THICKNESS (mils)		**2**	**3**	**4**	**5**	**6**
	2.5	*69.6*	*56.2*	*47.2*	*40.6*	*35.7*
	3	*77.4*	*63.3*	*53.7*	*46.6*	*41.1*
	3.5	*84.3*	*69.7*	*59.6*	*52*	*46.2*
	4	*90.5*	*75.5*	*65*	*57.1*	*50.9*
	4.5	*96.1*	*80.8*	*70*	*61.8*	*55.3*
	5	*101.2*	*85.7*	*74.6*	*66.1*	*59.4*
	5.5	*105.9*	*90.2*	*78.9*	*70.2*	*63.3*
	6	*110.2*	*94.4*	*82.9*	*74.1*	*66.9*
	6.5	*114.2*	*98.3*	*86.7*	*77.7*	*70.4*
	7	*117.9*	*101.9*	*90.3*	*81.1*	*73.7*
	7.5	*121.5*	*105.4*	*93.6*	*84.3*	*76.8*
	8	*124.8*	*108.6*	*96.8*	*87.4*	*79.8*

Er=4.8	TRACE WIDTH (mils)					
DIELECTRIC THICKNESS (mils)		**2**	**3**	**4**	**5**	**6**
	2.5	*68.2*	*55*	*46.2*	*39.8*	*34.9*
	3	*75.8*	*62*	*52.6*	*45.6*	*40.3*
	3.5	*82.6*	*68.3*	*58.3*	*50.9*	*45.2*
	4	*88.6*	*74*	*63.7*	*55.9*	*49.8*
	4.5	*94.1*	*79.1*	*68.5*	*60.5*	*54.1*
	5	*99*	*83.9*	*73.1*	*64.7*	*58.1*
	5.5	*103.6*	*88.3*	*77.3*	*68.7*	*61.9*
	6	*107.9*	*92.4*	*81.2*	*72.5*	*65.5*
	6.5	*111.8*	*96.2*	*84.9*	*76*	*68.9*
	7	*115.5*	*99.8*	*88.4*	*79.4*	*72.1*
	7.5	*118.9*	*103.2*	*91.6*	*82.6*	*75.2*
	8	*122.2*	*106.3*	*94.7*	*85.6*	*78.1*