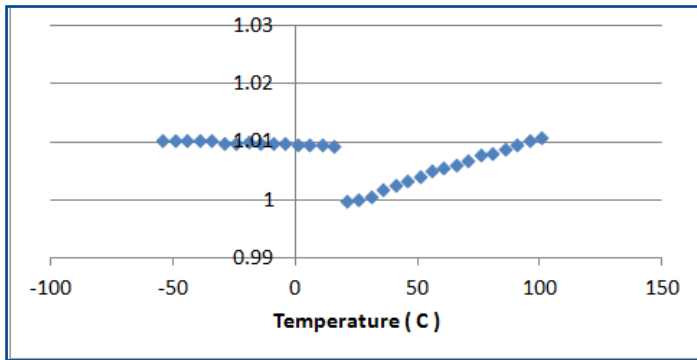
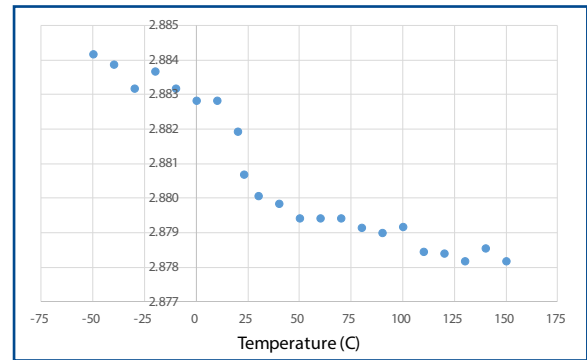


EZ-IO Next Generation PTFE Laminate

Dependence of Dielectric Properties on Temperature:

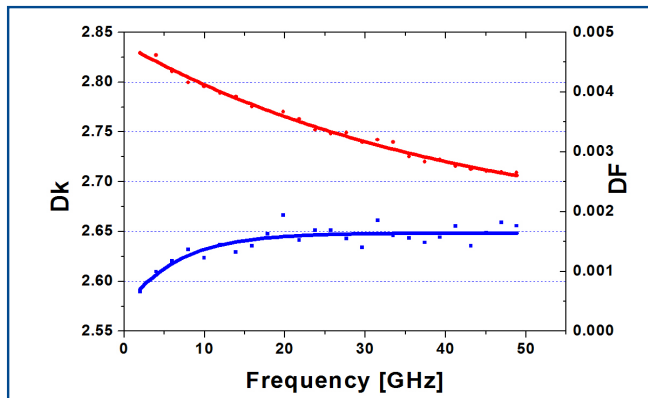


Normalized DK by using a Stripline Cavity Resonator

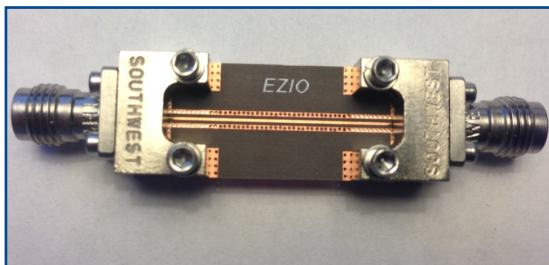
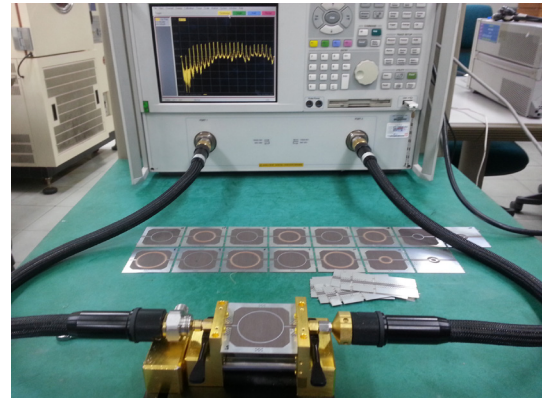


DK by Full Sheet Resonance Testing

EZ-IO Temperature Dependence of DK by IPC 2.5.5.5.1 (left) and 2.5.5.6 (right)

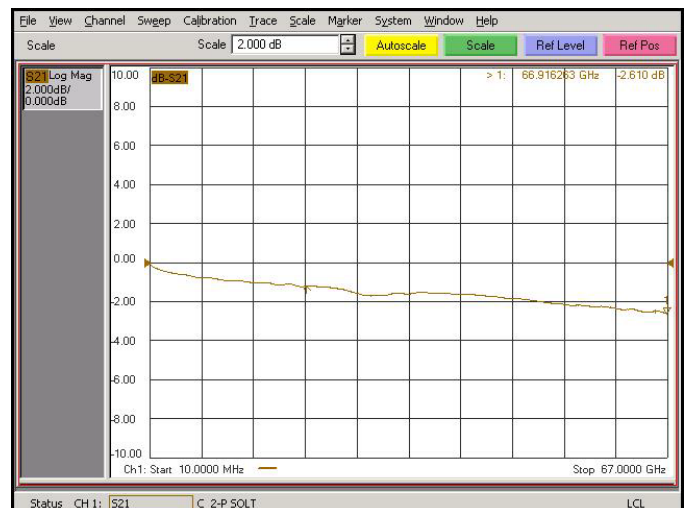


EZ-IO DK and DF vs. Frequency Measured by a Ring Resonator



Microstrip insertion loss of EZ-IO-0050 (2.61 dB/in at 67 GHz) using Southwest Connectors (12.45 mil trace width, 0.5 oz HVLP)

Southwest: 1892-04A-5
(1.85 mm female end launch, pin .005D, diel. .0290D)



EZ-IO-0050 Typical Values

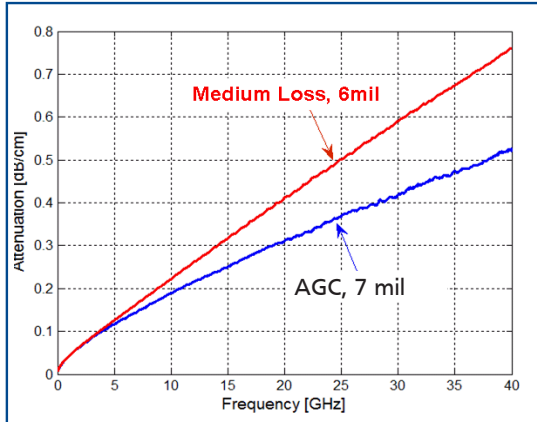
Property	Test Method	Unit	Value	Unit	Value
Dielectric Thickness*		mil	5	mm	.13
Dk @ 10 GHz	IPC-650 2.5.5.5.1 (Modified)		2.80		2.80
Df @ 10 GHz	IPC-650 2.5.5.5.1 (Modified)		0.0012		0.0012
T _c K		ppm/ °C	2.24	ppm/ °C	2.24
Resin Content		%	93	%	93
Dielectric Breakdown	IPC-650 2.5.6/ASTM D149	kV	46.4	kV	46.4
Dielectric Strength	IPC-650 2.5.6/ASTM D149	V/mil	743	V/mm	29,252
Arc Resistance	IPC-650 2.5.1	Seconds	420	Seconds	420
Moisture Absorption	IPC-650 2.6.2.1	%	0.12	%	0.12
Tensile Strength (MD)	IPC-650 2.4.19/ASTM D3039	psi	12,200	N/mm ²	52,800
Tensile Strength (CD)	IPC-650 2.4.19/ASTM D3039	psi	5,680	N/mm ²	39.16
Tensile Modulus (MD)	IPC-650 2.4.19/ASTM D3039	kpsi	766	N/mm ²	5,281
Tensile Modulus (CD)	IPC-650 2.4.19/ASTM D3039	kpsi	576	N/mm ²	3,971
Elongation at Break (MD)	IPC-650 2.4.19/ASTM D3039	%	2.47	%	2.47
Elongation at Break (CD)	IPC-650 2.4.19/ASTM D3039	%	2.25	%	2.25
Poisson's Ratio (MD)	IPC-650 2.4.19/ASTM D3039		0.251		0.251
Poisson's Ratio (CD)	IPC-650 2.4.19/ASTM D3039		0.195		0.195
Compressive Modulus	ASTM D695 (23 °C)	psi	289,000	N/mm ²	1,993
Flexural Strength (MD)	IPC-650 2.4.4/ASTM D790	psi	16,200	N/mm ²	111.70
Flexural Strength (CD)	IPC-650 2.4.4/ASTM D790	psi	7,850	N/mm ²	54.12
Flexural Modulus (MD)	IPC-650 2.4.4/ASTM D790	kpsi	710	N/mm ²	4,895
Flexural Modulus (CD)	IPC-650 2.4.4/ASTM D790	kpsi	478	N/mm ²	3,296
Peel Strength (0.5 oz. HVLP)	IPC-650 2.4.8, sec. 5.2.2	lbs/in	5 - 7	N/mm	0.9 - 1.2
Peel Strength (1 oz. HVLP)	IPC-650 2.4.8, sec. 5.2.2	lbs/in	5 - 7	N/mm	0.9 - 1.2
Thermal Conductivity	ASTM E1530 / ASTM E1461	W/M*K	0.42/0.61	W/M*K	0.42/0.61
Dimensional Stability (MD)	IPC-650 2.4.39, sec. 5.4 (After Bake)	mils/inch	0.38	mm/M	0.38
Dimensional Stability (CD)	IPC-650 2.4.39, sec. 5.4 (After Bake)	mils/inch	0.46	mm/M	0.46
Dimensional Stability (MD)	IPC-650 2.4.39, sec. 5.5 (TS)	mils/inch	0.30	mm/M	0.30
Dimensional Stability (CD)	IPC-650 2.4.39, sec. 5.5 (TS)	mils/inch	0.40	mm/M	0.40
Surface Resistivity (ET)	IPC-TM-650	Mohms	1.04 x 10 ⁷	Mohms	1.04 x 10 ⁷
Surface Resistivity (HC)	IPC-TM-650	Mohms	4.33 x 10 ⁷	Mohms	4.33 x 10 ⁷
Volume Resistivity (ET)	IPC-TM-650	Mohms/cm	5.49 x 10 ⁷	Mohms/cm	5.49 x 10 ⁷
Volume Resistivity (HC)	IPC-TM-650	Mohms/cm	1.43 x 10 ⁷	Mohms/cm	1.43 x 10 ⁷
CTE (X axis) (RT- 125 °C)	IPC-650 2.4.41/TMA	ppm/°C	13	ppm/°C	13
CTE (Y axis) (RT- 125 °C)	IPC-650 2.4.41/TMA	ppm/°C	24	ppm/°C	24
CTE (Z axis) (RT- 125 °C)	IPC-650 2.4.41/TMA	ppm/°C	63	ppm/°C	63
Density (Specific Gravity)	ASTM D792	g/cm ³	2.15	g/cm ³	2.15
Hardness	ASTM D2240 (Shore D)	J/gK	75.1	J/gK	75.1

* Available in 5 mil increments

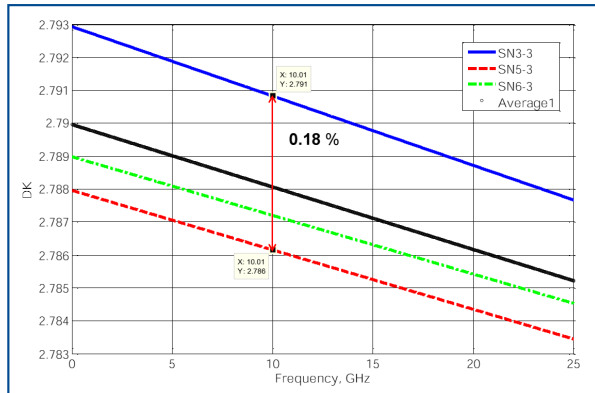
All values are for single ply construction.

All reported values are typical and should not be used for specification purposes. In all instances, the user shall determine suitability in any given application.

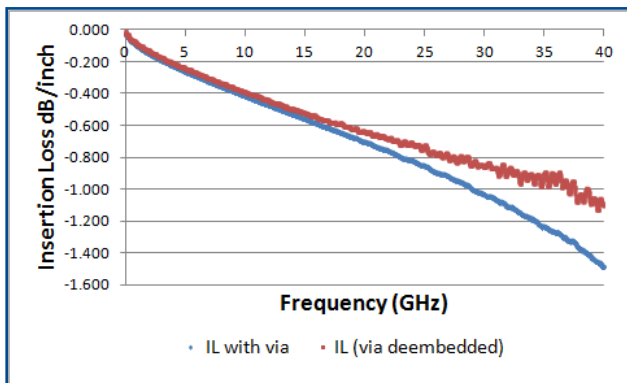
EZ-IO Next Generation PTFE Laminate



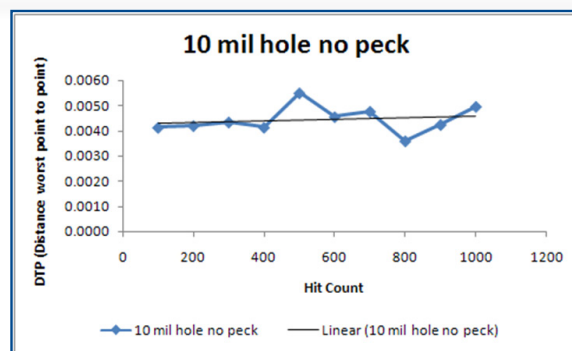
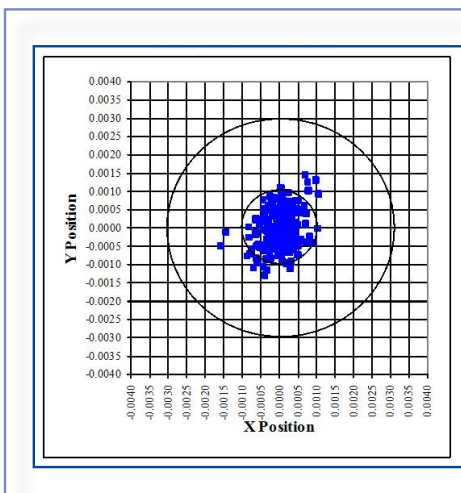
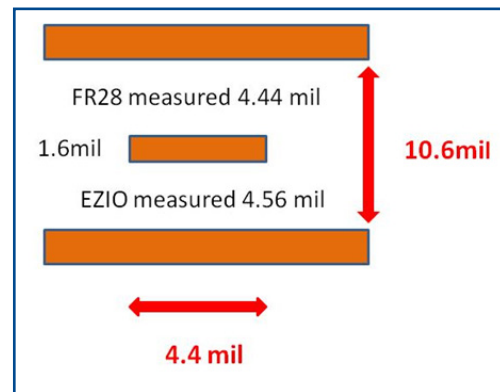
Insertion loss comparison of a benchmark Japanese high speed digital material vs. an AGC comparable matching stripline structure on the same test vehicle, trace widths indicated above (*fastRise™* prepreg).



Dielectric Constant variation from three separate PWBs from the same manufacturing lot testing the same signal channel.



Stripline insertion loss of EZ-IO/FR-28-0040-50 (HVL P Cu) with and without via and connectors de-embedded.



Positional accuracy of EZ-IO mechanical drilling showing no increase in drill wander with 1000 hits/bit.

An example of our part number is:

EZ-IO-0050-CF1/CF1 - 18" x 24" (457 mm x 610 mm)

Please see our Product Selector Guide for information on available copper cladding.