

Data Sheet

**Halogen-free Ultra-low transmission loss
Multi-layer Circuit board materials**

XPEDION¹

Laminate R-5515
Prepreg R-5410

July 2022 No.22072951

Specification / Laminate R-5515

Property			Units	Test Method	Condition	R-5515 (5mil #1078x1)	
						Typical Value	
THERMAL	Glass Transition Temperature (Tg)		C	TMA	As received	170	
			C	DMA (Tensile)	As received	200	
	Thermal Decomposition Temperature (Td)		C	TGA	As received	410	
	Time to Delamination (T288)	Without Cu	Min	IPC TM-650 2.4.24.1	As received	> 120	*1
		With Cu	Min	IPC TM-650 2.4.24.1	As received	> 120	*1
	Thermal Stress (288C)	With Cu	Sec	IPC TM-650 2.4.13.1	As received	-	
	CTE : $\alpha 1$	X - axis	ppm / C	IPC TM-650 2.4.24	< Tg	19 - 21	
		Y - axis	ppm / C	IPC TM-650 2.4.24	< Tg	19 - 21	
		Z - axis	ppm / C	IPC TM-650 2.4.24	< Tg	50	*1
CTE : $\alpha 2$	Z - axis	ppm / C	IPC TM-650 2.4.24	> Tg	300	*1	
ELECTRICAL	Dielectric Constant (Dk)	@ 14GHz	-	IEC 63185 (2020) *2	C-24/23/50	3.06	
	Dissipation Factor (Df)	@ 14GHz	-	IEC 63185 (2020) *2	C-24/23/50	0.002	
	Volume Resistivity		M Ω m	IPC TM-650 2.5.17.1	C-96/35/90	1 x 10 ⁷	
	Surface Resistivity		M Ω	IPC TM-650 2.5.17.1	C-96/35/90	1 x 10 ⁸	
PHYSICAL Flammability	Water Absorption		%	IPC TM-650 2.6.2.1	D-24/23	0.19	
	Peel Strength	H oz (H-VLP2)	kN / m	IPC TM-650 2.4.8	As Received	0.6	
	Flammability		-	UL-94	A&E-168/70	94V-0	
	Young's Modulus (X,Y direction)		GPa	ASTM D3039	As received	9.7	
	Poisson's Ratio (X,Y direction)		-	JIS K7161-1	As received	0.2	

*1 : Sample Thickness ; 20mil = 0.5 mm

*2 : Balanced-type Circular Disk Resonance Method [IEC 63185 (2020)]

* The data in the above table are not guaranteed values.

Specification / Laminate R-5515 : Low-Dk glass

Test Method ; Balanced-type Circular Disk Resonance Method [IEC 63185 (2020)]

Core Type (mil)	Actual Thickness		Cloth Style	Ply	Typical Resin Content (%)	Typical Dk				
	mil	mm				14GHz	26GHz	37GHz	48GHz	60GHz
4	4.1	0.105	1067	1	82	3.01	3.00	3.00	3.00	3.00
5	5	0.127	1078	1	78	3.06	3.05	3.05	3.05	3.05
10	10	0.254	1078	2	78	3.06	3.05	3.05	3.05	3.05

Core Type (mil)	Actual Thickness		Cloth Style	Ply	Typical Resin Content (%)	Typical Df				
	mil	mm				14GHz	26GHz	37GHz	48GHz	60GHz
4	4.1	0.105	1067	1	82	0.0023	0.0025	0.0027	0.0029	0.0030
5	5	0.127	1078	1	78	0.0021	0.0024	0.0026	0.0029	0.0031
10	10	0.254	1078	2	78	0.0021	0.0024	0.0026	0.0029	0.0031

* The data in the above table are not guaranteed values.

Specification / Laminate R-5410 : Low-Dk glass

Test Method ; Balanced-type Circular Disk Resonance Method [IEC 63185 (2020)]

Cloth Style	Resin Content (%)	Typical Thickness (um)	Typical Dk				
			14GHz	26GHz	37GHz	48GHz	60GHz
1067	82	105	3.01	3.00	3.00	3.00	3.00
1078	78	127	3.06	3.05	3.05	3.05	3.05

Cloth Style	Resin Content (%)	Typical Thickness (um)	Typical Df				
			14GHz	26GHz	37GHz	48GHz	60GHz
1067	82	105	0.0023	0.0025	0.0027	0.0029	0.0030
1078	78	127	0.0021	0.0024	0.0026	0.0029	0.0031

* The data in the above table are not guaranteed values.

++ Before purchase ++

【Notes before you use】

- Please verify the suitability and fitness for intended application by quality testing, evaluation or other means at your own option before any adoption, use or change of use conditions of a product listed in the datasheet.
- We would like to have a delivery specifications mutually agreed for the product that you have decided to use. The agreements defined in the delivery specifications are assigned higher priority.
- Please note that images shown may somewhat differ from the actual product in color.
- Please note that specifications and external design are subject to change for product improvement without notice.
- For details on products in the datasheet, please contact your distributor or our sales department.

【Safety Information】

- Before using the product, please read the delivery specifications carefully or contact the distributor from which you purchased the product or our sales department in order to use the product correctly.
- The products in the datasheet are Electronic circuit board materials for electronic and electrical devices. Please do not use them for other than specified use.

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