

Data Sheet

**High heat resistance halogen-free
multi-layer circuit board materials**

Halogen-free

Laminate R-156AS
Prepreg R-155AS

Dec. 2025 No.250612

Specification / Laminate R-156AS

Property			Units	Test Method	Condition	Typical Value
THERMAL	Glass Transition Temp (Tg)		°C	DSC	As received	175
				TMA	As received	170
				DMA	As received	195
	Thermal Decomposition Temp (Td)		°C	TGA	As received	355
	Time to Delam (T288)	Without Cu	Min	IPC TM-650 2.4.24.1	As received	> 120
		With Cu	Min	IPC TM-650 2.4.24.1	As received	10
	CTE : α_1	X - axis	ppm / C	IPC TM-650 2.4.24	< Tg	11 – 13
		Y - axis	ppm / C	IPC TM-650 2.4.24	< Tg	13 – 15
		Z - axis	ppm / C	IPC TM-650 2.4.24	< Tg	40
	CTE : α_2	Z - axis	ppm / C	IPC TM-650 2.4.24	> Tg	180
ELECTRICAL	Volume Resistivity		M Ω - cm	IPC TM-650 2.5.17.1	C-96/35/90	1 x 10 ⁹
	Surface Resistivity		M Ω	IPC TM-650 2.5.17.1	C-96/35/90	1 x 10 ⁸
	Dielectric Constant (Dk)	@ 1MHz	-	IPC TM-650 2.5.5.9	C-24/23/50	5.0
		@ 1GHz	-	IPC TM-650 2.5.5.9	C-24/23/50	4.7
	Dissipation Factor (Df)	@ 1MHz	-	IPC TM-650 2.5.5.9	C-24/23/50	0.011
		@ 1GHz	-	IPC TM-650 2.5.5.9	C-24/23/50	0.011
PHYSICAL	Water Absorption		%	IPC TM-650 2.6.2.1	D-24/23	0.18
	Peel Strength	1oz	kN / m	IPC TM-650 2.4.8	As Received	1.6
	Flammability		-	UL 94	C-48/23/50	94V-0

Sample thickness ; 32 mil (0.8 mm)

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

* Our Halogen-free materials are based on JPCA-ES-01-2003 standard and others.
Contain; Chlorine:≤0.09wt%(900ppm), Bromine:≤0.09wt%(900ppm), Chlorine+Bromine:≤0.15wt%(1500ppm)

Specification / Laminate R-156AS

1MHz - 1GHz ; IPC TM650-2.5.5.9

Nominal Thickness		Cloth Style	Typical Resin Contet (%)	ply	Typical Dk			Typical Df		
mil	mm				1MHz	100MHz	1GHz	1MHz	100MHz	1GHz
2.5	0.06	1078	56	1	4.8	4.6	4.5	0.012	0.012	0.012
4	0.1	2116	46	1	5.0	4.8	4.7	0.011	0.011	0.011
6	0.15	1501	44	1	5.0	4.8	4.7	0.011	0.011	0.011
8	0.2	7628	46	1	5.0	4.8	4.7	0.011	0.011	0.011
12	0.3	1501	44	2	5.0	4.8	4.7	0.011	0.011	0.011
16	0.4	7628	46	2	5.0	4.8	4.7	0.011	0.011	0.011
20	0.5	7628 / 2116	46	2 / 1	5.0	4.8	4.7	0.011	0.011	0.011
24	0.6	7628	46	3	5.0	4.8	4.7	0.011	0.011	0.011

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Specification / Prepreg R-155AS

1MHz - 1GHz ; IPC TM650-2.5.5.9

Cloth Style	Resin Contents (%)	Typical Thickness (um)	Typical Dk			Typical Df		
			1MHz	100MHz	1GHz	1MHz	100MHz	1GHz
106	72	51	4.4	4.2	4.2	0.014	0.014	0.014
	74	56	4.4	4.2	4.1	0.014	0.014	0.014
1078	63	73	4.6	4.4	4.3	0.013	0.013	0.013
	66	81	4.5	4.4	4.3	0.013	0.013	0.013
	70	93	4.5	4.3	4.2	0.014	0.014	0.014
1080	63	72	4.6	4.4	4.3	0.013	0.013	0.013
	66	79	4.5	4.4	4.3	0.013	0.013	0.013
	70	91	4.5	4.3	4.2	0.014	0.014	0.014
2116	47	102	4.9	4.8	4.7	0.011	0.011	0.011
	50	110	4.9	4.7	4.6	0.012	0.012	0.012
	54	122	4.8	4.6	4.5	0.012	0.012	0.012
1501	46	159	5.0	4.8	4.7	0.011	0.011	0.011
	50	175	4.9	4.7	4.6	0.012	0.012	0.012
	54	194	4.8	4.6	4.5	0.012	0.012	0.012
7628	47	206	4.9	4.8	4.7	0.011	0.011	0.011
	50	222	4.9	4.7	4.6	0.012	0.012	0.012
	53	240	4.8	4.6	4.5	0.012	0.012	0.012

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