



# IT-180A Electrical Properties

High Tg Multifunctional Filled Epoxy Resin, Phenolic-Cured, Laminate & Prepreg

Laminate				Dk					Df				
Thickness (in)	Thickness (mm)	Constructions	Resin content (%)	1 MHz	1 GHz	2 GHz	5 GHz	10 GHz	1MHz	1 GHz	2 GHz	5 GHz	10 GHz
0.0020	0.051	106*1	72.0	3.93	3.89	3.78	3.62	3.54	0.0154	0.0156	0.0160	0.0168	0.0178
0.0020	0.051	1037*1	73.0	3.85	3.80	3.70	3.53	3.46	0.0155	0.0159	0.0164	0.0171	0.0181
0.0023	0.058	1067x1	71.0	3.96	3.92	3.83	3.64	3.54	0.0154	0.0157	0.0161	0.0168	0.0178
0.0025	0.064	1078x1	58.0	4.27	4.23	4.14	3.97	3.88	0.0147	0.0149	0.0153	0.0161	0.0170
0.0025	0.064	1067x1	75.0	3.87	3.83	3.74	3.55	3.46	0.0156	0.0159	0.0163	0.0170	0.0182
0.0030	0.076	1080x1	65.0	4.09	4.06	3.98	3.76	3.67	0.0149	0.0152	0.0156	0.0164	0.0174
0.0030	0.076	1086x1	62.0	4.17	4.13	4.04	3.85	3.78	0.0149	0.0151	0.0155	0.0163	0.0174
0.0035	0.089	3313x1	53.0	4.40	4.37	4.28	4.11	4.02	0.0144	0.0147	0.0152	0.0158	0.0168
0.0035	0.089	1037x2	70.0	3.98	3.94	3.85	3.66	3.56	0.0153	0.0155	0.0159	0.0167	0.0177
0.0040	0.102	2116x1	47.5	4.57	4.54	4.46	4.27	3.18	0.0142	0.0144	0.0149	0.0156	0.0165
0.0040	0.102	106x2	72.0	3.93	3.89	3.78	3.62	3.54	0.0154	0.0156	0.0160	0.0168	0.0178
0.0400	0.102	3313x1	57.0	4.30	4.26	4.18	3.99	3.87	0.0146	0.0149	0.0153	0.0160	0.0169
0.0045	0.114	2116x1	52.0	4.43	4.41	4.31	4.15	4.06	0.0144	0.0146	0.0151	0.0157	0.0166
0.0045	0.114	106x2	73.5	3.89	3.85	3.76	3.57	3.48	0.0155	0.0158	0.0163	0.0169	0.0178
0.0050	0.127	2116x1	56.0	4.32	4.29	4.19	4.02	3.93	0.0146	0.0148	0.0152	0.0159	0.0169
0.0050	0.127	106x2	75.0	3.87	3.83	3.75	3.54	3.45	0.0156	0.0159	0.0164	0.0169	0.0179
0.0500	0.127	1080x2	58.0	4.26	4.22	4.11	3.90	3.84	0.0146	0.0148	0.0153	0.0158	0.0168
0.0055	0.140	2116x1	59.0	4.27	4.23	4.14	3.97	3.88	0.0147	0.0149	0.0153	0.0161	0.0170
0.0055	0.140	1080x2	63.0	4.14	4.11	4.01	3.83	3.74	0.0149	0.0152	0.0156	0.0163	0.0173
0.0060	0.152	1506x1	45.5	4.65	4.60	4.47	4.34	3.25	0.0140	0.0142	0.0147	0.0154	0.0163
0.0060	0.152	1080x2	65.0	4.09	4.06	3.96	3.79	3.69	0.0150	0.0153	0.0157	0.0164	0.0174
0.0070	0.178	7627x1	44.5	4.67	4.63	4.52	4.37	4.28	0.0140	0.0142	0.0147	0.0154	0.0163
0.0070	0.178	3313x2	53.0	4.40	4.37	4.26	4.11	4.02	0.0144	0.0147	0.0151	0.0158	0.0168
0.0080	0.203	7628x1	47.0	4.58	4.55	4.43	4.28	4.19	0.0141	0.0144	0.0148	0.0155	0.0165
0.0080	0.203	2113x2	57.0	4.30	4.27	4.18	4.00	3.92	0.0147	0.0150	0.0155	0.0161	0.0170
0.0800	0.203	1080x3	63.0	4.14	4.11	4.01	3.83	3.74	0.0149	0.0152	0.0156	0.0163	0.0173
0.0090	0.229	2116x2	52.0	4.43	4.41	4.30	4.15	4.06	0.0144	0.0146	0.0151	0.0157	0.0166
0.0090	0.229	7628x1	52.0	4.40	4.36	4.26	4.13	4.04	0.0145	0.0147	0.0151	0.0156	0.0166
0.0100	0.254	2116x2	57.0	4.28	4.25	4.16	3.99	3.90	0.0147	0.0149	0.0154	0.0159	0.0169
0.0110	0.279	2116x2	60.0	4.21	4.18	4.09	3.91	3.83	0.0148	0.0150	0.0154	0.0162	0.0172
0.0120	0.305	1506x2	45.0	4.66	4.61	4.50	4.36	4.27	0.0140	0.0142	0.0147	0.0154	0.0163
0.0130	0.330	1506x2	49.0	4.52	4.49	4.39	4.23	4.24	0.0142	0.0145	0.0149	0.0156	0.1660
0.0130	0.330	2116x2+1080x1	57.9	4.25	4.22	4.13	3.96	3.87	0.0148	0.0151	0.0156	0.0162	0.0172
0.0140	0.356	7628x2	43.5	4.73	4.68	4.56	4.42	4.33	0.0139	0.0141	0.0146	0.0153	0.0162
0.0150	0.381	7628x2	44.5	4.67	4.63	4.52	4.37	4.28	0.0140	0.0142	0.0147	0.0154	0.0164
0.0150	0.381	2116x3	57.0	4.28	4.25	4.16	3.99	3.90	0.0147	0.0149	0.0154	0.0159	0.0169
0.0160	0.406	7628x2	47.5	4.57	4.54	4.43	4.27	4.18	0.0142	0.0144	0.0149	0.0156	0.0165
0.0160	0.406	2116x2+106x3	58.5	4.23	4.20	4.10	3.93	3.84	0.0150	0.0154	0.0159	0.0165	0.0175
0.0170	0.432	7627 43.5x2+1080x1	46.0	4.63	4.59	4.50	4.33	4.26	0.0141	0.0142	0.0146	0.0155	0.0165
0.0170	0.432	7630x2	46.5	4.63	4.58	4.45	4.32	4.23	0.0142	0.0146	0.0150	0.0156	0.0164
0.0180	0.457	7628x2	52.0	4.40	4.36	4.26	4.13	4.04	0.0145	0.0147	0.0151	0.0156	0.0166
0.0180	0.457	7628x2+1080x1	47.6	4.57	4.54	4.42	4.27	4.18	0.0142	0.0144	0.0149	0.0156	0.0166
0.0190	0.483	7628x2+2116	45.0	4.66	4.61	4.51	4.36	4.26	0.0140	0.0142	0.0147	0.0154	0.0164
0.0190	0.483	2116x4	57.0	4.28	4.25	4.16	3.99	3.90	0.0147	0.0149	0.0154	0.0159	0.0169
0.0200	0.508	628x1+2116x1+7628x	47.3	4.58	4.55	4.45	4.28	4.18	0.0141	0.0144	0.0149	0.0155	0.0164
0.0210	0.533	7628x3	43.0	4.71	4.67	4.56	4.41	4.31	0.0139	0.0141	0.0146	0.0153	0.0162
0.0220	0.559	7628x3	44.5	4.67	4.63	4.52	4.37	4.28	0.0140	0.0142	0.0147	0.0154	0.0164
0.0230	0.584	7628x3	46.5	4.62	4.58	4.49	4.32	4.25	0.0141	0.0142	0.0146	0.0155	0.0165
0.0240	0.610	7628x3	47.5	4.57	4.54	4.43	4.27	4.18	0.0142	0.0144	0.0149	0.0156	0.0166
0.0240	0.610	1506x4	45.0	4.64	4.61	4.53	4.37	4.31	0.0139	0.0142	0.0146	0.0154	0.0164
0.0250	0.635	7628x2+2116x2	48.9	4.52	4.49	4.39	4.23	4.14	0.0142	0.0145	0.0149	0.0156	0.0164
0.0260	0.660	1080x2+7628x3	45.5	4.65	4.60	4.49	4.35	4.26	0.0140	0.0142	0.0147	0.0154	0.0163
0.0260	0.660	7628x2+1506x2	42.5	4.73	4.68	4.56	4.42	4.31	0.0139	0.0141	0.0146	0.0153	0.0162
0.0270	0.686	7627x4	41.0	4.78	4.73	4.63	4.47	4.38	0.0137	0.0140	0.0145	0.0153	0.0162
0.0280	0.711	7627x4	43.0	4.71	4.67	4.56	4.41	4.32	0.0139	0.0141	0.0146	0.0154	0.0163
0.0280	0.711	2116x2+1506x3	48.8	4.52	4.49	4.39	4.23	4.14	0.0142	0.0145	0.0149	0.0156	0.0164
0.0280	0.711	7628x2+1506x2	46.4	4.62	4.58	4.49	4.32	4.25	0.0141	0.0142	0.0146	0.0155	0.0165
0.0290	0.737	7628x4	42.5	4.73	4.68	4.56	4.42	4.34	0.0139	0.0141	0.0146	0.0153	0.0162
0.0300	0.762	7628x4	44.5	4.67	4.63	4.53	4.37	4.28	0.0140	0.0142	0.0147	0.0154	0.0163
0.0310	0.787	7628x4	47.5	4.57	4.54	4.44	4.27	4.18	0.0142	0.0144	0.0149	0.0156	0.0165
0.0320	0.813	7628x4	47.5	4.57	4.54	4.44	4.27	4.18	0.0142	0.0144	0.0149	0.0156	0.0165
0.0330	0.838	7628x4+1080x1	47.6	4.57	4.54	4.44	4.27	4.18	0.0142	0.0144	0.0149	0.0156	0.0165
0.0340	0.864	628x2+2116x1+7628x	45.0	4.66	4.61	4.50	4.36	4.26	0.0140	0.0142	0.0148	0.0154	0.0164
0.0350	0.889	7628x5	40.5	4.80	4.76	4.63	4.49	4.39	0.0137	0.0139	0.0144	0.0153	0.0162

0.0360	0.914	7628*5	43.5	4.70	4.66	4.54	4.40	4.31	0.0139	0.0141	0.0146	0.0155	0.0164
0.0370	0.940	7628x5	44.50	4.67	4.63	4.53	4.37	4.28	0.0140	0.0142	0.0147	0.0154	0.0163
0.0380	0.965	7628*5	45.5	4.65	4.60	4.49	4.34	4.25	0.0140	0.0142	0.0146	0.0154	0.0163
0.0390	0.991	7628x5	47.5	4.57	4.54	4.44	4.27	4.18	0.0142	0.0144	0.0149	0.0156	0.0165

Laminated Prepreg				Dk					Df				
Glass Type	Thickness (mil)	Thickness (mm)	Resin Content (%)	1 MHz	1 GHz	2 GHz	5 GHz	10 GHz	1MHz	1 GHz	2 GHz	5 GHz	10 GHz
7628	6.75	0.171	40.0	4.80	4.76	4.67	4.49	4.42	0.0137	0.0139	0.0143	0.0153	0.0162
	6.95	0.177	43.0	4.71	4.67	4.57	4.41	4.34	0.0139	0.0141	0.0145	0.0153	0.0163
	7.40	0.188	46.0	4.63	4.59	4.50	4.33	4.26	0.0141	0.0142	0.0146	0.0155	0.0165
	7.75	0.197	48.0	4.55	4.52	4.43	4.26	4.19	0.0142	0.0145	0.0149	0.0156	0.0166
	8.10	0.206	50.0	4.48	4.46	4.38	4.20	4.10	0.0143	0.0145	0.0150	0.0156	0.0167
1506	8.50	0.216	52.0	4.40	4.36	4.26	4.13	4.04	0.0145	0.0147	0.0151	0.0156	0.0166
	6.26	0.159	49.0	4.52	4.49	4.39	4.23	4.24	0.0142	0.0145	0.0149	0.0156	0.1660
	6.59	0.167	51.0	4.46	4.44	4.35	4.18	4.09	0.0143	0.0146	0.0150	0.0156	0.0165
2116	6.92	0.176	53.0	4.40	4.37	4.27	4.11	4.04	0.0144	0.0147	0.0151	0.0158	0.0167
	4.15	0.105	49.0	4.53	4.49	4.38	4.26	4.15	0.01420	0.0145	0.0149	0.0154	0.0164
	4.36	0.111	51.0	4.46	4.44	4.35	4.18	4.11	0.0143	0.0146	0.0150	0.0156	0.0166
	4.67	0.119	54.0	4.38	4.35	4.27	4.08	3.98	0.0145	0.0147	0.0151	0.0158	0.0157
	4.77	0.121	55.0	4.35	4.32	4.23	4.04	3.95	0.0145	0.0147	0.0151	0.0158	0.0159
	4.88	0.124	56.0	4.32	4.29	4.19	4.02	3.93	0.0146	0.0148	0.0152	0.0159	0.0169
3313/2313	5.09	0.129	58.0	4.27	4.23	4.24	3.97	3.88	0.0147	0.0149	0.0153	0.0161	0.0171
	5.30	0.135	60.0	4.21	4.18	4.09	3.91	3.83	0.0148	0.0150	0.0154	0.0162	0.0172
	3.62	0.092	55.0	4.35	4.32	4.21	4.05	3.94	0.0145	0.0148	0.0152	0.0159	0.0168
	3.83	0.097	57.0	4.30	4.26	4.18	3.99	3.87	0.0146	0.0149	0.0153	0.0160	0.0169
	4.04	0.103	59.0	4.24	4.21	4.13	3.94	3.85	0.0147	0.0150	0.0154	0.0161	0.0170
2113	4.25	0.108	61.0	4.19	4.16	4.08	3.88	3.79	0.0148	0.0151	0.0155	0.0162	0.0172
	3.62	0.092	56.0	4.32	4.29	4.19	4.02	3.91	0.0146	0.0148	0.0152	0.0159	0.0169
	3.88	0.099	58.0	4.27	4.23	4.15	3.97	3.88	0.0147	0.0149	0.0153	0.0161	0.0170
1086	4.14	0.105	60.0	4.21	4.18	4.07	3.91	3.82	0.0148	0.0150	0.0154	0.0162	0.0172
	2.80	0.071	60.0	4.21	4.18	4.09	3.91	3.82	0.0148	0.0150	0.0154	0.0162	0.0173
	2.96	0.075	62.0	4.17	4.13	4.04	3.85	3.78	0.0149	0.0151	0.0155	0.0163	0.0174
	3.36	0.085	66.0	4.09	4.04	3.95	3.74	3.67	0.0150	0.0153	0.0157	0.0165	0.0176
1080	3.52	0.089	68.0	4.02	3.98	3.88	3.70	3.60	0.0152	0.0154	0.0158	0.0166	0.0178
	2.24	0.057	58.0	4.26	4.22	4.11	3.90	3.84	0.0146	0.0148	0.0153	0.0158	0.0168
	2.42	0.061	60.0	4.21	4.18	4.07	3.91	3.82	0.0148	0.0150	0.0155	0.0162	0.0172
	2.69	0.068	63.0	4.14	4.11	4.01	3.83	3.74	0.0149	0.0152	0.0156	0.0163	0.0173
	2.96	0.075	66.0	4.07	4.04	3.96	3.74	3.65	0.0150	0.0153	0.0157	0.0165	0.0175
	3.14	0.080	68.0	4.02	3.98	3.89	3.70	3.61	0.0152	0.0154	0.0158	0.0166	0.0177
1078	3.41	0.087	71.0	3.96	3.92	3.81	3.64	3.52	0.0154	0.0156	0.0160	0.0167	0.0179
	2.62	0.067	63.0	4.14	4.11	4.03	3.83	3.75	0.0149	0.0152	0.0156	0.0163	0.0173
	2.85	0.072	65.0	4.09	4.06	3.95	3.77	3.67	0.0150	0.0153	0.0157	0.0164	0.0174
1067	3.07	0.078	68.0	4.02	3.98	3.90	3.70	3.61	0.0152	0.0154	0.0158	0.0166	0.0176
	2.12	0.054	70.0	3.98	3.94	3.85	3.66	3.58	0.0153	0.0156	0.0160	0.0167	0.0178
	2.34	0.059	72.0	3.93	3.89	3.79	3.62	3.51	0.0154	0.0156	0.0161	0.0168	0.0180
106	2.52	0.064	74.0	3.89	3.85	3.76	3.57	3.48	0.0155	0.0158	0.0162	0.0169	0.0181
	1.90	0.048	72.0	3.93	3.89	3.78	3.62	3.54	0.0154	0.0156	0.0160	0.0168	0.0178
	2.10	0.053	74.0	3.89	3.85	3.75	3.57	3.50	0.0155	0.0158	0.0162	0.0169	0.0179
	2.29	0.058	76.0	3.84	3.81	3.72	3.51	3.42	0.0156	0.0159	0.0163	0.0170	0.0180
	2.48	0.063	78.0	3.80	3.77	3.68	3.45	3.38	0.0158	0.0161	0.0165	0.0172	0.0182

Test meth 1MHz~1GHz by RF impedance/material analyzer HP4291B (IPC 2.5.5.9); 2GHz, 5GHz, 10GHz by Resonator Cavity (IPC 2.5.5.13)  
The above data is provided to designers and PCB shops for their reference. We truly believe the information is accurate, however, internal testing is recommended.  
The effective sale is in accordance with the specification and ITEQ maintains the authority of revision to keep the best suitability for users.