

Excellent heat resistance low Df material

(Core : R-2125、 Prepreg : R-2120)



July, 2007
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Electronic Materials Division

Features

Laminate :R 2125、Prepreg :R 2120

- 1 Low Df = 0.01 (1GHz) Realization of low transmission loss
- 2 High heat resistance Compatible with lead-free soldering
- 3 Low coefficient of thermal expansion Excellent through-hole reliability
- 4 Excellent CAF resistance

Application

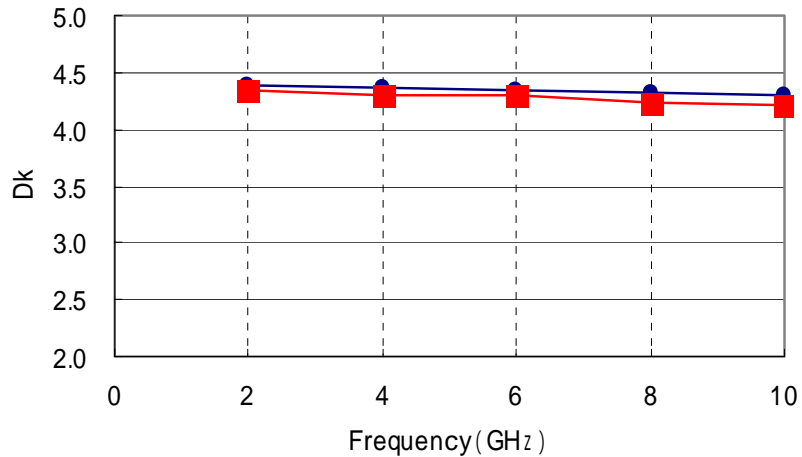
Network equipment (server, routers), measuring instruments, etc.

General Property

Test Item	Unit	R-2125	R-1755S
Dk (1GHz)	-	4.4	4.4
Df (1GHz)	-	0.010	0.015
Tg (DSC)		171	175
Thermal expansion (CTE-Z) (<Tg/ >Tg)	ppm/	33/210	50/255
Degradation Temp.		380	360
Heat Resistance		280	280
T-288	min	39	45
Moisture Absorption (121 100%)	%	0.26	0.36
Cu Peel Strength (35 μ m)	kN/m	1.4	1.4
Inflammability	UL94	Equivalent to 94V-0	94V-0

Dielectric Property

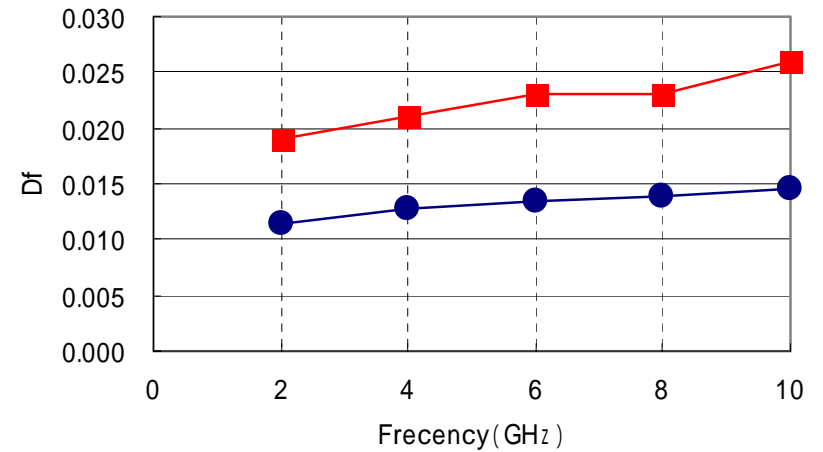
Dielectric Constant D_k



:R-2125

:R-1755S

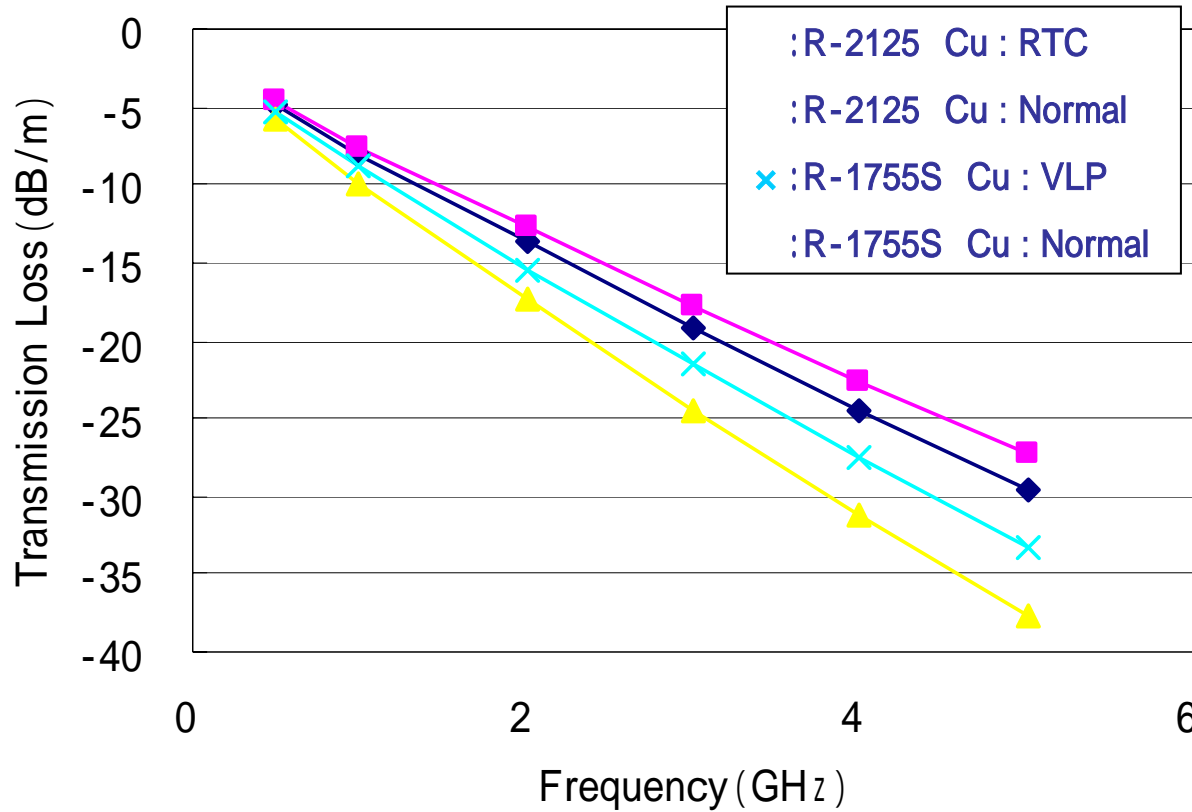
Dielectric Factor D_f



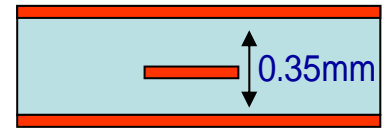
[Test Method]

IPC TM650-2.5.5.5

Transmission Loss Date



Test Sample

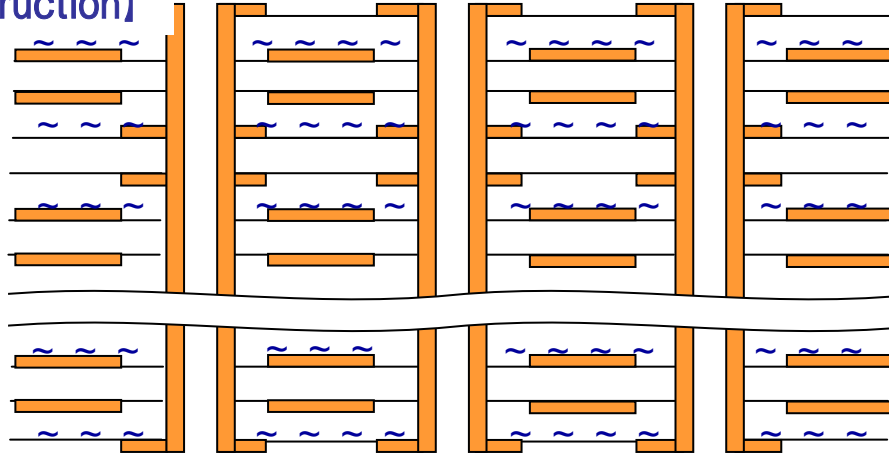


Circuit Length : 1m
 Circuit Width : 80 ~ 100 μ m
 Cu Thickness : 35 μ m
 Impedance : 50

* RTC : reverse side treatment copper

Heat Resistance (High layer-count board)

【Sample Construction】



Prepreg 2116 53% 1ply
Core 0.1mm 18/18

Layer Count : 40 layers
Thickness : 5.0mm

THthrough-hole
Wall to wall : 0.5mm
Diameter : 0.25, 0.45, 0.65, 0.80mm

【 Test result of Solder Heat Resistance (Delamination) 】

Solder Condition 288 10sec. Float 6cycle

Observation result of delamination (Delamination number/Observation number)

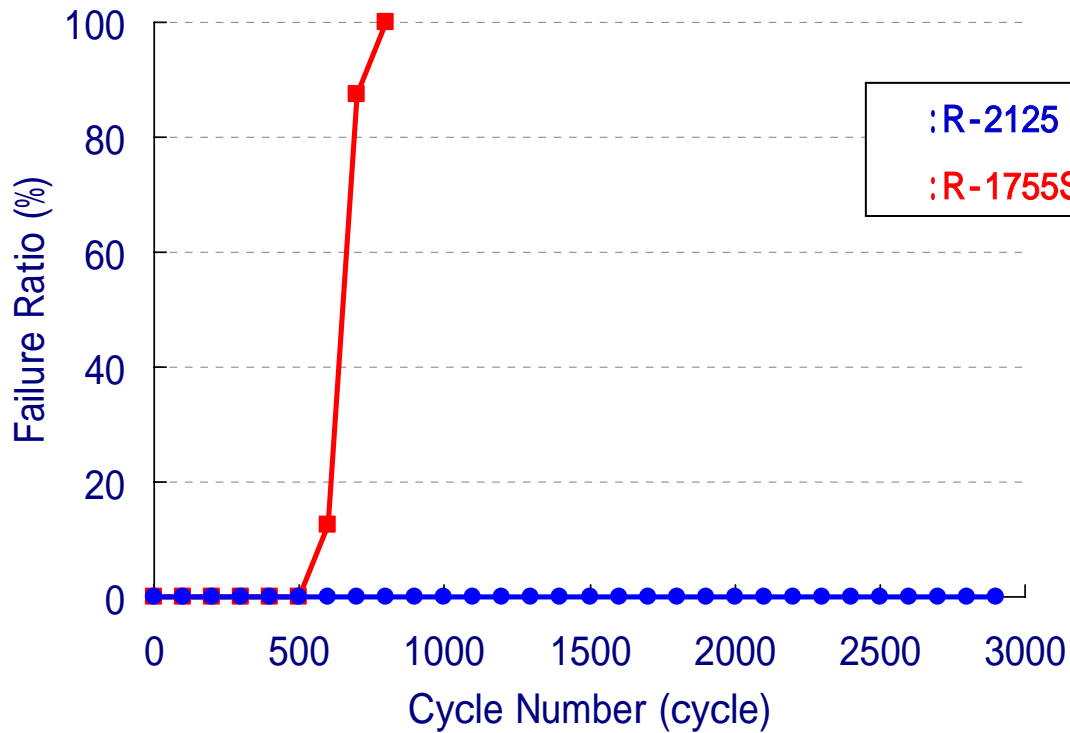
Copper	TH Diameter (mm)			
	0.25	0.45	0.65	0.8
RTC	0/28	0/22	0/18	0/15
Normal	0/28	0/22	0/18	0/15

No Delamination

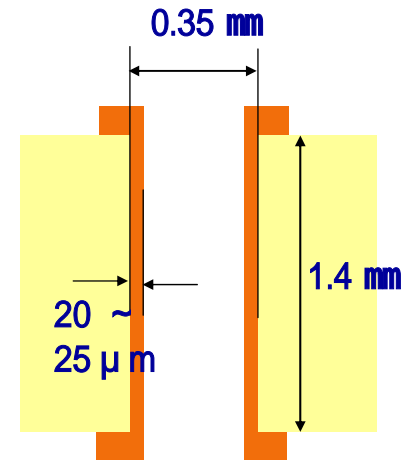
Through-hole Reliability

Cycle Condition

-45 (15min) 150 (15min)



Test Sample



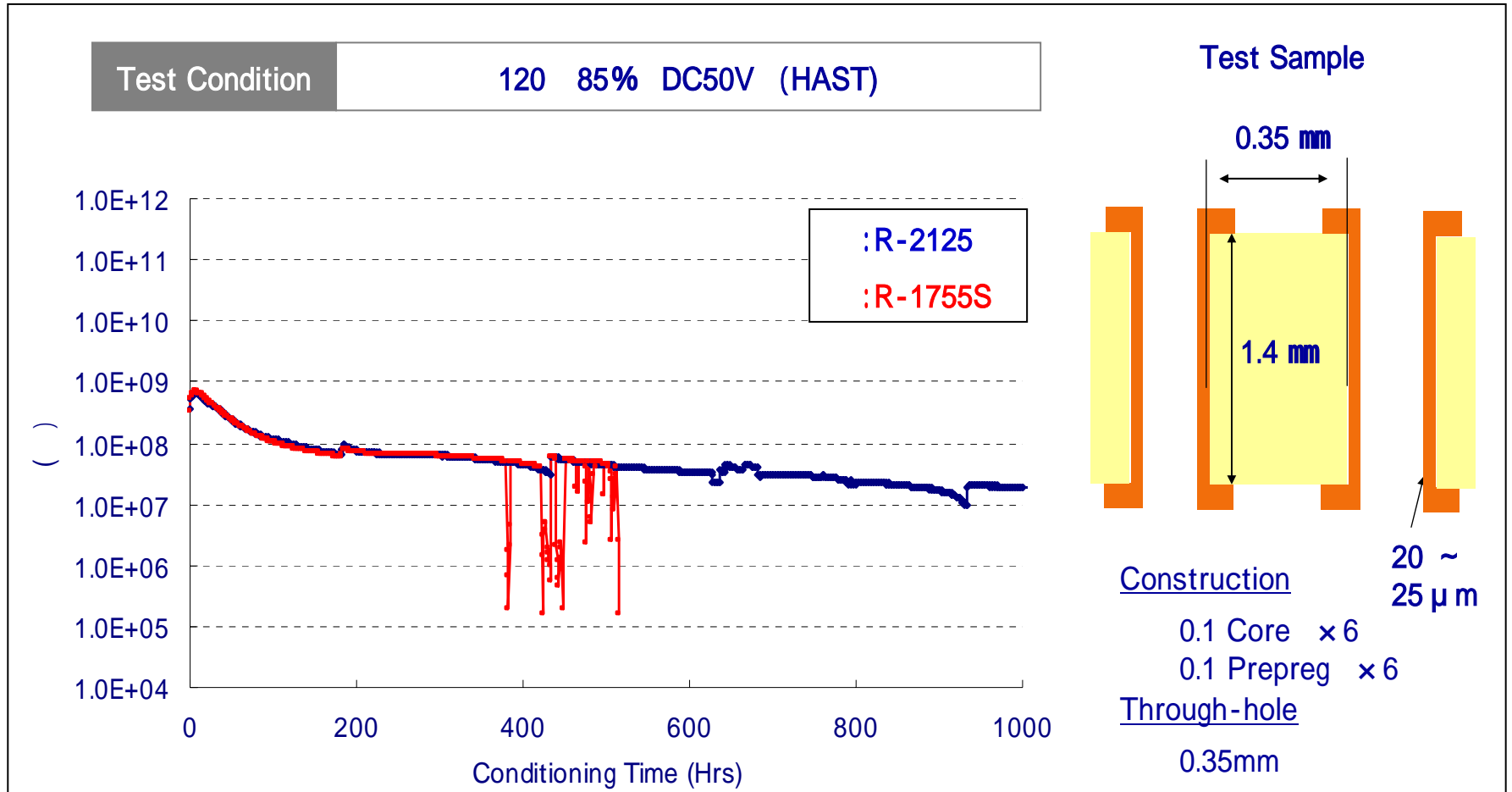
Construction

0.1 Core × 6
0.1 Prepreg × 6

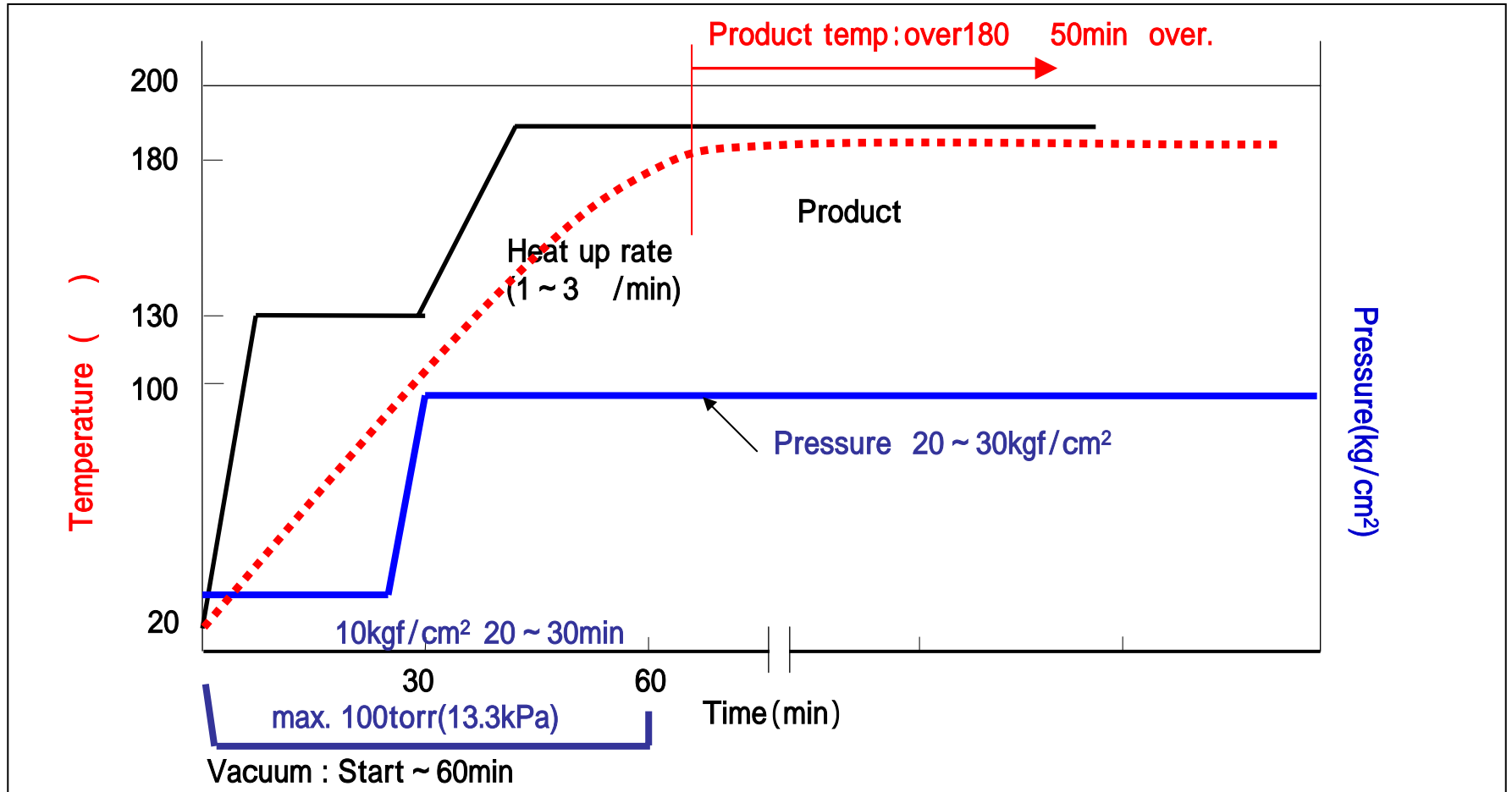
Through-hole

0.35mm
306 holes/1 piece

CAF Resistance



Press Condition



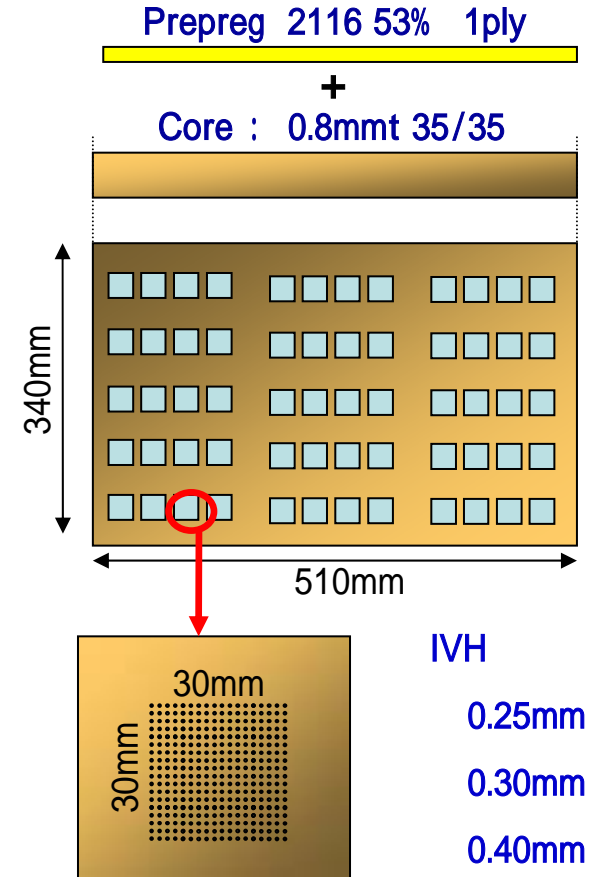
Via Filling Ability

R-2120

IVH (mm)	Hole number (30 × 30mm)		
	11 × 11 = 121	16 × 16 = 256	31 × 31 = 961
0.25	OK	OK	OK
0.30	OK	OK	NG
0.40	OK	OK	NG

R-1650S

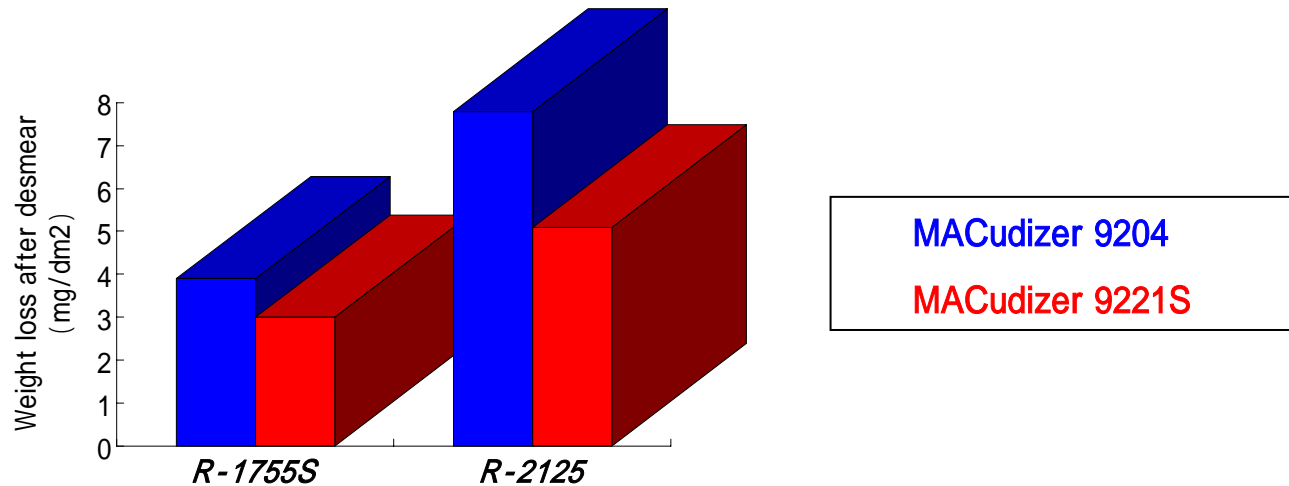
IVH (mm)	Hole number (30 × 30mm)		
	11 × 11 = 121	16 × 16 = 256	31 × 31 = 961
0.25	OK	OK	OK
0.30	OK	OK	NG
0.40	OK	OK	NG



Desmear Data

Operation	Chemicals	Temperature ()	Process Time (min)
Sweller (Hole Conditioning)	MACudizer 9204	35	7
	MACudizer 9221S	55	7
Permanganic acid etching	MACudizer 9275	75	15
Reduction	MACudizer 9279	43	5

Sample Size: 100 × 100 × 1.0mmt



Line-up (Core)

1. 1MHz-1GHz : IPC TM650-2.5.5.9

Nominal Thickness		Cloth Style	Typical Resin Content	ply	Typical Dk			Typical Df		
(mil)	(mm)				1MHz	100MHz	1GHz	1MHz	100MHz	1GHz
2.4	0.06	1080	59%	1	4.4	4.2	4.1	0.006	0.009	0.011
3.1	0.08	3313	48%	1	4.6	4.5	4.4	0.006	0.009	0.010
3.9	0.10	2116	46%	1	4.7	4.5	4.4	0.005	0.009	0.010
3.9	0.10	1067	66%	2	4.2	4.1	4.0	0.006	0.010	0.011
5.9	0.15	1501	46%	1	4.7	4.5	4.4	0.005	0.009	0.010
7.9	0.20	2116	46%	2	4.7	4.5	4.4	0.005	0.009	0.010
15.7	0.40	7628	49%	2	4.6	4.5	4.4	0.006	0.009	0.010

2. 2GHz-10GHz : IPC TM650-2.5.5.5

Nominal Thickness		Cloth Style	Typical Resin Content	ply	Typical Dk					Typical Df				
(mil)	(mm)				2GHz	4GHz	6GHz	8GHz	10GHz	2GHz	4GHz	6GHz	8GHz	10GHz
2.4	0.06	1080	59%	1	4.1	4.1	4.1	4.0	4.0	0.013	0.014	0.015	0.015	0.016
3.1	0.08	3313	48%	1	4.3	4.3	4.3	4.3	4.3	0.012	0.013	0.014	0.014	0.015
3.9	0.10	2116	46%	1	4.4	4.4	4.4	4.3	4.3	0.011	0.013	0.013	0.014	0.015
3.9	0.10	1067	66%	2	4.0	3.9	3.9	3.9	3.9	0.013	0.015	0.015	0.016	0.016
5.9	0.15	1501	46%	1	4.4	4.4	4.4	4.3	4.3	0.011	0.013	0.013	0.014	0.015
7.9	0.20	2116	46%	2	4.4	4.4	4.4	4.3	4.3	0.011	0.013	0.013	0.014	0.015
15.7	0.40	7628	49%	2	4.3	4.3	4.3	4.3	4.2	0.012	0.013	0.014	0.014	0.015

Line-up (PP)

1. 1MHz-1GHz : IPC TM650-2.5.5.9

Cloth Style	Resin Content (%)	Typical Dk			Typical Df		
		1MHz	100MHz	1GHz	1MHz	100MHz	1GHz
1067	66	4.2	4.1	4.0	0.006	0.010	0.011
1080	65	4.2	4.1	4.0	0.006	0.010	0.011
3313	57	4.4	4.3	4.2	0.006	0.009	0.011
2116	56	4.4	4.3	4.2	0.006	0.009	0.011
1501	51	4.6	4.4	4.3	0.006	0.009	0.011

2. 2GHz-10GHz : IPC TM650-2.5.5.5

Cloth Style	Resin Content (%)	Typical Dk					Typical Df				
		2GHz	4GHz	6GHz	8GHz	10GHz	2GHz	4GHz	6GHz	8GHz	10GHz
1067	66	4.0	4.0	3.9	3.9	3.9	0.013	0.014	0.015	0.016	0.016
1080	65	4.0	4.0	3.9	3.9	3.9	0.013	0.014	0.015	0.016	0.016
3313	57	4.2	4.1	4.1	4.1	4.1	0.012	0.014	0.014	0.015	0.016
2116	56	4.2	4.2	4.1	4.1	4.1	0.012	0.014	0.014	0.015	0.015
1501	51	4.3	4.3	4.2	4.2	4.2	0.012	0.013	0.014	0.014	0.015