

**Data Sheet**

**Ultra-low transmission loss, highly heat-resistant  
multi-layer circuit board materials**

**MEGTRON8**

**Laminate R-5795**  
**Prepreg R-5690**

Any letters with parentheses ( ) at the end of a part number are for identification code in our company and are not included in the part numbers registered for UL certification.

Jul. 2024 No.240724

# General Properties / Laminate R-5795(N) & R-5795(U)

| Items            | Units                           | Test Method  | Condition         | Typical Values               |                                    |         |         |
|------------------|---------------------------------|--------------|-------------------|------------------------------|------------------------------------|---------|---------|
|                  |                                 |              |                   | R-5795(N)<br>Low-Dk<br>glass | R-5795(U)<br>Ultra Low-Df<br>glass |         |         |
| THERMAL          | Glass Transition Temp (Tg)      |              | C                 | DMA                          | As received                        | 220     | 220     |
|                  | Thermal Decomposition Temp (Td) |              | C                 | TGA                          | As received                        | 370     | 370     |
|                  | Time to Delam<br>(T288)         | With Cu      | Min               | IPC TM-650 2.4.24.1          | As received                        | > 120   | > 120   |
|                  | CTE : $\alpha 1$                | X – axis     | ppm / C           | IPC TM-650 2.4.24            | < Tg                               | 17~20   | 17 - 20 |
|                  |                                 | Y – axis     | ppm / C           | IPC TM-650 2.4.24            | < Tg                               | 17~20   | 17 - 20 |
|                  |                                 | Z – axis     | ppm / C           | IPC TM-650 2.4.24            | < Tg                               | 50      | 50      |
| CTE : $\alpha 2$ | Z – axis                        | ppm / C      | IPC TM-650 2.4.24 | > Tg                         | 270                                | 270     |         |
| ELECTRICAL       | Dielectric Constant<br>(Dk)     | @ 14GHz      | -                 | * Note 1                     | C-24/23/50                         | 3.13    | 3.08    |
|                  | Dissipation Factor<br>(Df)      | @ 14GHz      | -                 | * Note 1                     | C-24/23/50                         | 0.0016  | 0.0012  |
| PHYSICAL         | Water Absorption                |              | %                 | IPC TM-650 2.6.2.1           | D-24/23                            | 0.06    | 0.06    |
|                  | Peel Strength                   | 1oz (H-VLP3) | kN / m            | IPC TM-650 2.4.8             | As Received                        | 0.7     | 0.7     |
|                  | Flammability                    |              | -                 | UL 94V                       | C-48/23/50                         | 94V-0+1 | 94V-0+1 |

†1 The value represents Panasonic internal test results based on the UL94 test method for flammability and is NOT intended to indicate that the product is UL certified. If UL certification is required, use R-579Y(N) and R-579Y(U) for the UL recognized grades.

Sample thickness : 30 mil = 0.750 mm (1078 x 10ply)

Note 1 : Balanced-type Circular Disk Resonance Method [ IEC 63185 (2020) ]

\* The data in the above table represents typical values for your reference and are not guaranteed values.

# Dielectric Properties / Laminate R-5795(N) : Low-Dk glass

14-60GHz ; Balanced-type Circular Disk Resonance Method [ IEC 63185 (2020) ]

| Core Type | Actual Thickness |       | Cloth Style | ply | Typical Resin Content (%) | Typical Dk |       |       |       |       |
|-----------|------------------|-------|-------------|-----|---------------------------|------------|-------|-------|-------|-------|
|           | mil              | mm    |             |     |                           | 14GHz      | 25GHz | 37GHz | 49GHz | 60GHz |
| 2         | 2.0              | 0.050 | 1035        | 1   | 67                        | 3.11       | 3.11  | 3.11  | 3.11  | 3.11  |
| 2.6       | 2.6              | 0.065 | 1078        | 1   | 61                        | 3.19       | 3.19  | 3.19  | 3.19  | 3.19  |
| 3         | 3.0              | 0.075 | 1078        | 1   | 65                        | 3.13       | 3.13  | 3.13  | 3.13  | 3.13  |
| 3         | 3.0              | 0.075 | 1035        | 1   | 77                        | 2.99       | 2.99  | 2.99  | 2.99  | 2.99  |
| 3.5       | 3.5              | 0.090 | 1078        | 1   | 70                        | 3.07       | 3.07  | 3.07  | 3.07  | 3.07  |
| 4         | 3.9              | 0.100 | 1035        | 2   | 67                        | 3.11       | 3.11  | 3.11  | 3.11  | 3.11  |
| 4         | 3.9              | 0.100 | 1078        | 1   | 73                        | 3.03       | 3.03  | 3.03  | 3.03  | 3.03  |
| 4         | 3.9              | 0.100 | 2013        | 1   | 56                        | 3.26       | 3.26  | 3.26  | 3.26  | 3.26  |
| 4.5       | 4.5              | 0.114 | 1035        | 2   | 70                        | 3.07       | 3.07  | 3.07  | 3.07  | 3.07  |
| 5         | 5.0              | 0.127 | 1078        | 2   | 61                        | 3.19       | 3.19  | 3.19  | 3.19  | 3.19  |
| 5         | 5.1              | 0.130 | 1035        | 2   | 74                        | 3.02       | 3.02  | 3.02  | 3.02  | 3.02  |
| 5         | 4.9              | 0.125 | 2116        | 1   | 55                        | 3.27       | 3.27  | 3.27  | 3.27  | 3.27  |
| 6         | 5.7              | 0.146 | 1078        | 2   | 65                        | 3.13       | 3.13  | 3.13  | 3.13  | 3.13  |
| 6         | 5.9              | 0.150 | 1035        | 2   | 77                        | 2.99       | 2.99  | 2.99  | 2.99  | 2.99  |
| 7         | 7.0              | 0.178 | 1078        | 2   | 70                        | 3.07       | 3.07  | 3.07  | 3.07  | 3.07  |
| 8         | 7.9              | 0.200 | 2013        | 2   | 56                        | 3.26       | 3.26  | 3.26  | 3.26  | 3.26  |
| 10        | 9.8              | 0.250 | 2116        | 2   | 55                        | 3.27       | 3.27  | 3.27  | 3.27  | 3.27  |
| 12        | 11.8             | 0.300 | 2013        | 3   | 56                        | 3.26       | 3.26  | 3.26  | 3.26  | 3.26  |
| 16        | 15.7             | 0.400 | 2013        | 4   | 56                        | 3.26       | 3.26  | 3.26  | 3.26  | 3.26  |
| 20        | 19.7             | 0.500 | 2116        | 4   | 55                        | 3.27       | 3.27  | 3.27  | 3.27  | 3.27  |
| 25        | 24.6             | 0.625 | 2116        | 5   | 55                        | 3.27       | 3.27  | 3.27  | 3.27  | 3.27  |
| 30        | 29.5             | 0.750 | 2116        | 6   | 55                        | 3.27       | 3.27  | 3.27  | 3.27  | 3.27  |

\* The data in the above table represents typical values for your reference and are not guaranteed values.

# Dielectric Properties / Laminate R-5795(N) : Low-Dk glass

14-60GHz ; Balanced-type Circular Disk Resonance Method [ IEC 63185 (2020) ]

| Core Type | Actual Thickness |       | Cloth Style | ply | Typical Resin Content(%) | Typical Df |        |        |        |        |
|-----------|------------------|-------|-------------|-----|--------------------------|------------|--------|--------|--------|--------|
|           | mil              | mm    |             |     |                          | 14GHz      | 25GHz  | 37GHz  | 49GHz  | 60GHz  |
| 2         | 2.0              | 0.050 | 1035        | 1   | 67                       | 0.0015     | 0.0017 | 0.0019 | 0.0021 | 0.0023 |
| 2.6       | 2.6              | 0.065 | 1078        | 1   | 61                       | 0.0017     | 0.0019 | 0.0021 | 0.0023 | 0.0025 |
| 3         | 3.0              | 0.075 | 1078        | 1   | 65                       | 0.0016     | 0.0018 | 0.0020 | 0.0022 | 0.0024 |
| 3         | 3.0              | 0.075 | 1035        | 1   | 77                       | 0.0014     | 0.0015 | 0.0017 | 0.0019 | 0.0020 |
| 3.5       | 3.5              | 0.090 | 1078        | 1   | 70                       | 0.0015     | 0.0017 | 0.0019 | 0.0021 | 0.0022 |
| 4         | 3.9              | 0.100 | 1035        | 2   | 67                       | 0.0015     | 0.0017 | 0.0019 | 0.0021 | 0.0023 |
| 4         | 3.9              | 0.100 | 1078        | 1   | 73                       | 0.0014     | 0.0016 | 0.0018 | 0.0020 | 0.0022 |
| 4         | 3.9              | 0.100 | 2013        | 1   | 56                       | 0.0018     | 0.0020 | 0.0022 | 0.0024 | 0.0026 |
| 4.5       | 4.5              | 0.114 | 1035        | 2   | 70                       | 0.0015     | 0.0017 | 0.0019 | 0.0021 | 0.0022 |
| 5         | 5.0              | 0.127 | 1078        | 2   | 61                       | 0.0017     | 0.0019 | 0.0021 | 0.0023 | 0.0025 |
| 5         | 5.1              | 0.130 | 1035        | 2   | 74                       | 0.0014     | 0.0016 | 0.0018 | 0.0020 | 0.0021 |
| 5         | 4.9              | 0.125 | 2116        | 1   | 55                       | 0.0018     | 0.0020 | 0.0022 | 0.0025 | 0.0027 |
| 6         | 5.7              | 0.146 | 1078        | 2   | 65                       | 0.0016     | 0.0018 | 0.0020 | 0.0022 | 0.0024 |
| 6         | 5.9              | 0.150 | 1035        | 2   | 77                       | 0.0014     | 0.0015 | 0.0017 | 0.0019 | 0.0020 |
| 7         | 7.0              | 0.178 | 1078        | 2   | 70                       | 0.0015     | 0.0017 | 0.0019 | 0.0021 | 0.0022 |
| 8         | 7.9              | 0.200 | 2013        | 2   | 56                       | 0.0018     | 0.0020 | 0.0022 | 0.0024 | 0.0026 |
| 10        | 9.8              | 0.250 | 2116        | 2   | 55                       | 0.0018     | 0.0020 | 0.0022 | 0.0025 | 0.0027 |
| 12        | 11.8             | 0.300 | 2013        | 3   | 56                       | 0.0018     | 0.0020 | 0.0022 | 0.0024 | 0.0026 |
| 16        | 15.7             | 0.400 | 2013        | 4   | 56                       | 0.0018     | 0.0020 | 0.0022 | 0.0024 | 0.0026 |
| 20        | 19.7             | 0.500 | 2116        | 4   | 55                       | 0.0018     | 0.0020 | 0.0022 | 0.0025 | 0.0027 |
| 25        | 24.6             | 0.625 | 2116        | 5   | 55                       | 0.0018     | 0.0020 | 0.0022 | 0.0025 | 0.0027 |
| 30        | 29.5             | 0.750 | 2116        | 6   | 55                       | 0.0018     | 0.0020 | 0.0022 | 0.0025 | 0.0027 |

\* The data in the above table represents typical values for your reference and are not guaranteed values.

# Dielectric Properties / Prepreg R-5690(N) : Low-Dk glass

14-60GHz ; Balanced-type Circular Disk Resonance Method [ IEC 63185 (2020) ]

| Cloth Style | Resin Content(%) | Typical Thickness | Typical Dk |       |       |       |       |
|-------------|------------------|-------------------|------------|-------|-------|-------|-------|
|             |                  |                   | 14GHz      | 25GHz | 37GHz | 49GHz | 60GHz |
| 1035        | 69*              | 54um              | 3.08       | 3.08  | 3.08  | 3.08  | 3.08  |
|             | 72               | 60um              | 3.04       | 3.04  | 3.04  | 3.04  | 3.04  |
|             | 75               | 68um              | 3.01       | 3.01  | 3.01  | 3.01  | 3.01  |
|             | 77               | 75um              | 2.99       | 2.99  | 2.99  | 2.99  | 2.99  |
| 1078        | 66               | 78um              | 3.12       | 3.12  | 3.12  | 3.12  | 3.12  |
|             | 70               | 90um              | 3.07       | 3.07  | 3.07  | 3.07  | 3.07  |
|             | 74               | 105um             | 3.02       | 3.02  | 3.02  | 3.02  | 3.02  |
|             | 77               | 121um             | 2.99       | 2.99  | 2.99  | 2.99  | 2.99  |
| 2013        | 57               | 101um             | 3.24       | 3.24  | 3.24  | 3.24  | 3.24  |
|             | 60               | 110um             | 3.20       | 3.20  | 3.20  | 3.20  | 3.20  |
| 2116        | 58               | 134um             | 3.23       | 3.23  | 3.23  | 3.23  | 3.23  |

\*This construction is under development.

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# Dielectric Properties / Prepreg R-5690(N) : Low-Dk glass

14-60GHz ; Balanced-type Circular Disk Resonance Method [ IEC 63185 (2020) ]

| Cloth Style | Resin Content(%) | Typical Thickness | Typical Df |        |        |        |        |
|-------------|------------------|-------------------|------------|--------|--------|--------|--------|
|             |                  |                   | 14GHz      | 25GHz  | 37GHz  | 49GHz  | 60GHz  |
| 1035        | 69*              | 54um              | 0.0015     | 0.0017 | 0.0019 | 0.0021 | 0.0023 |
|             | 72               | 60um              | 0.0014     | 0.0016 | 0.0018 | 0.0020 | 0.0022 |
|             | 75               | 68um              | 0.0014     | 0.0016 | 0.0017 | 0.0019 | 0.0021 |
|             | 77               | 75um              | 0.0014     | 0.0015 | 0.0017 | 0.0019 | 0.0020 |
| 1078        | 66               | 78um              | 0.0016     | 0.0017 | 0.0020 | 0.0022 | 0.0023 |
|             | 70               | 90um              | 0.0015     | 0.0017 | 0.0019 | 0.0021 | 0.0022 |
|             | 74               | 105um             | 0.0014     | 0.0016 | 0.0018 | 0.0020 | 0.0021 |
|             | 77               | 121um             | 0.0014     | 0.0015 | 0.0017 | 0.0019 | 0.0020 |
| 2013        | 57               | 101um             | 0.0017     | 0.0020 | 0.0022 | 0.0024 | 0.0026 |
|             | 60               | 110um             | 0.0017     | 0.0019 | 0.0021 | 0.0023 | 0.0025 |
| 2116        | 58               | 134um             | 0.0017     | 0.0019 | 0.0022 | 0.0024 | 0.0026 |

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# Dielectric Properties / Laminate R-5795(U) : Ultra Low Df glass

14-60GHz ; Balanced-type Circular Disk Resonance Method [ IEC 63185 (2020) ]

| Core Type | Actual Thickness |       | Cloth Style | ply | Typical Resin Content(%) | Typical Dk |       |       |       |       |
|-----------|------------------|-------|-------------|-----|--------------------------|------------|-------|-------|-------|-------|
|           | mil              | mm    |             |     |                          | 14GHz      | 25GHz | 37GHz | 49GHz | 60GHz |
| 2         | 2.0              | 0.050 | 1035        | 1   | 68                       | 3.05       | 3.05  | 3.05  | 3.05  | 3.05  |
| 2.6       | 2.6              | 0.065 | 1078        | 1   | 62                       | 3.12       | 3.12  | 3.12  | 3.12  | 3.12  |
| 3         | 3.0              | 0.075 | 1078        | 1   | 66                       | 3.08       | 3.08  | 3.08  | 3.08  | 3.08  |
| 3         | 3.0              | 0.075 | 1035        | 1   | 78                       | 2.95       | 2.95  | 2.95  | 2.95  | 2.95  |
| 3.5       | 3.5              | 0.090 | 1078        | 1   | 71                       | 3.02       | 3.02  | 3.02  | 3.02  | 3.02  |
| 4         | 3.9              | 0.100 | 1035        | 2   | 68                       | 3.05       | 3.05  | 3.05  | 3.05  | 3.05  |
| 4         | 3.9              | 0.100 | 1078        | 1   | 74                       | 2.99       | 2.99  | 2.99  | 2.99  | 2.99  |
| 4.5       | 4.5              | 0.114 | 1035        | 2   | 71                       | 3.02       | 3.02  | 3.02  | 3.02  | 3.02  |
| 5         | 5.0              | 0.127 | 1078        | 2   | 62                       | 3.12       | 3.12  | 3.12  | 3.12  | 3.12  |
| 5         | 5.1              | 0.130 | 1035        | 2   | 75                       | 2.98       | 2.98  | 2.98  | 2.98  | 2.98  |
| 6         | 5.7              | 0.146 | 1078        | 2   | 66                       | 3.08       | 3.08  | 3.08  | 3.08  | 3.08  |
| 6         | 5.9              | 0.150 | 1035        | 2   | 78                       | 2.95       | 2.95  | 2.95  | 2.95  | 2.95  |
| 7         | 7.0              | 0.178 | 1078        | 2   | 71                       | 3.02       | 3.02  | 3.02  | 3.02  | 3.02  |

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# Dielectric Properties / Laminate R-5795(U) : Ultra Low Df glass

14-60GHz ; Balanced-type Circular Disk Resonance Method [ IEC 63185 (2020) ]

| Core Type | Actual Thickness |       | Cloth Style | ply | Typical Resin Content(%) | Typical Df |        |        |        |        |
|-----------|------------------|-------|-------------|-----|--------------------------|------------|--------|--------|--------|--------|
|           | mil              | mm    |             |     |                          | 14GHz      | 25GHz  | 37GHz  | 49GHz  | 60GHz  |
| 2         | 2.0              | 0.050 | 1035        | 1   | 68                       | 0.0012     | 0.0014 | 0.0016 | 0.0018 | 0.0020 |
| 2.6       | 2.6              | 0.065 | 1078        | 1   | 62                       | 0.0013     | 0.0015 | 0.0017 | 0.0019 | 0.0021 |
| 3         | 3.0              | 0.075 | 1078        | 1   | 66                       | 0.0012     | 0.0014 | 0.0016 | 0.0018 | 0.0020 |
| 3         | 3.0              | 0.075 | 1035        | 1   | 78                       | 0.0011     | 0.0013 | 0.0015 | 0.0017 | 0.0018 |
| 3.5       | 3.5              | 0.090 | 1078        | 1   | 71                       | 0.0012     | 0.0014 | 0.0016 | 0.0018 | 0.0019 |
| 4         | 3.9              | 0.100 | 1035        | 2   | 68                       | 0.0012     | 0.0014 | 0.0016 | 0.0018 | 0.0020 |
| 4         | 3.9              | 0.100 | 1078        | 1   | 74                       | 0.0012     | 0.0013 | 0.0015 | 0.0017 | 0.0019 |
| 4.5       | 4.5              | 0.114 | 1035        | 2   | 71                       | 0.0012     | 0.0014 | 0.0016 | 0.0018 | 0.0019 |
| 5         | 5.0              | 0.127 | 1078        | 2   | 62                       | 0.0013     | 0.0015 | 0.0017 | 0.0019 | 0.0021 |
| 5         | 5.1              | 0.130 | 1035        | 2   | 75                       | 0.0012     | 0.0013 | 0.0015 | 0.0017 | 0.0019 |
| 6         | 5.7              | 0.146 | 1078        | 2   | 66                       | 0.0012     | 0.0014 | 0.0016 | 0.0018 | 0.0020 |
| 6         | 5.9              | 0.150 | 1035        | 2   | 78                       | 0.0011     | 0.0013 | 0.0015 | 0.0017 | 0.0018 |
| 7         | 7.0              | 0.178 | 1078        | 2   | 71                       | 0.0012     | 0.0014 | 0.0016 | 0.0018 | 0.0019 |

\* The data in the above table represents typical values for your reference and are not guaranteed values.

# Dielectric Properties / Prepreg R-5690(U) : Ultra Low Df glass

14-60GHz ; Balanced-type Circular Disk Resonance Method [ IEC 63185 (2020) ]

| Cloth Style | Resin Content(%) | Typical Thickness | Typical Dk |       |       |       |       |
|-------------|------------------|-------------------|------------|-------|-------|-------|-------|
|             |                  |                   | 14GHz      | 25GHz | 37GHz | 49GHz | 60GHz |
| 1035        | 70*              | 54um              | 3.03       | 3.03  | 3.03  | 3.03  | 3.03  |
|             | 73               | 61um              | 3.00       | 3.00  | 3.00  | 3.00  | 3.00  |
|             | 76               | 69um              | 2.97       | 2.97  | 2.97  | 2.97  | 2.97  |
|             | 78               | 76um              | 2.95       | 2.95  | 2.95  | 2.95  | 2.95  |
| 1078        | 67               | 77um              | 3.07       | 3.07  | 3.07  | 3.07  | 3.07  |
|             | 71               | 89um              | 3.02       | 3.02  | 3.02  | 3.02  | 3.02  |
|             | 75               | 104um             | 2.98       | 2.98  | 2.98  | 2.98  | 2.98  |
|             | 78               | 120um             | 2.95       | 2.95  | 2.95  | 2.95  | 2.95  |

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# Dielectric Properties / Prepreg R-5690(U) : Ultra Low Df glass

14-60GHz ; Balanced-type Circular Disk Resonance Method [ IEC 63185 (2020) ]

| Cloth Style | Resin Content(%) | Typical Thickness | Typical Df |        |        |        |        |
|-------------|------------------|-------------------|------------|--------|--------|--------|--------|
|             |                  |                   | 14GHz      | 25GHz  | 37GHz  | 49GHz  | 60GHz  |
| 1035        | 70*              | 54um              | 0.0012     | 0.0014 | 0.0016 | 0.0018 | 0.0020 |
|             | 73               | 61um              | 0.0012     | 0.0014 | 0.0015 | 0.0017 | 0.0019 |
|             | 76               | 69um              | 0.0012     | 0.0013 | 0.0015 | 0.0017 | 0.0019 |
|             | 78               | 76um              | 0.0011     | 0.0013 | 0.0015 | 0.0017 | 0.0018 |
| 1078        | 67               | 77um              | 0.0012     | 0.0014 | 0.0016 | 0.0018 | 0.0020 |
|             | 71               | 89um              | 0.0012     | 0.0014 | 0.0016 | 0.0018 | 0.0019 |
|             | 75               | 104um             | 0.0012     | 0.0013 | 0.0015 | 0.0017 | 0.0019 |
|             | 78               | 120um             | 0.0011     | 0.0013 | 0.0015 | 0.0017 | 0.0018 |

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**Panasonic**  
INDUSTRY