

# DuPont™ Interra® HK04M

All-Polyimide Embedded Capacitor Laminate

Flexible Circuit Materials

## Product Description

DuPont™ Interra® HK04M Capacitor Laminate is designed to function as a thinner and more efficient power and ground planes in printed wiring boards (PWBs). This double-sided copper-clad laminate features an adhesive-less, all-polyimide dielectric layer, specifically formulated to reinforce thinner constructions and afford excellent resilience during processing and fabrication. Interra™ HK04M is compatible with existing PWB processes, including double-sided processing and its thin design maximizes capacitance density, reduces inductance, and decreases board or package thickness.

## Key Features and Benefits

- Cost reduction via reducing surface mounted capacitors
- Reduced inductance for efficient low noise power delivery
- High initiation and propagation tear strengths provide superior handling and facilitate fabrication
- Balanced and unbalanced constructions available
- Certified to IPC-4821/1
- UL 94 V-0, UL File E124294
- RoHS Compliant

## Packaging

Interra® HK04M Capacitor Laminate is supplied in sheet form, with standard dimensions of 18 x 24 in (457 x 610 mm).

## Storage

DuPont™ Interra® HK04M Capacitor Laminate should be stored in original packaging at temperatures of 4 - 29 °C (40 - 85 °F) and below 70% relative humidity. The product should not be frozen and should be kept dry, clean, and well-protected. Subject to compliance with the foregoing handling and storage recommendations, DuPont's warranties as provided in the DuPont Standard Conditions of Sale shall remain in effect for a period of two years following the date on the Certificate of Analysis.

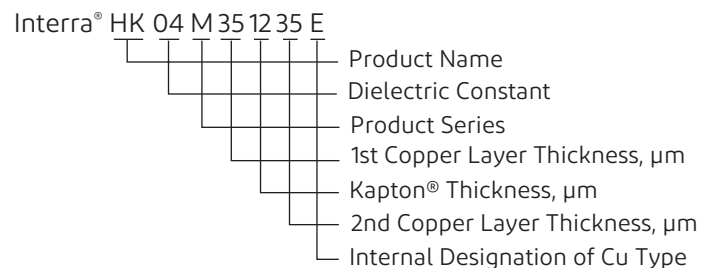
## Processing

DuPont™ Interra® HK04M Capacitor Laminate is fully compatible with all conventional PWB processes, including double-sided processing. Interra® HK04M processing guide available from your DuPont sales representative.

**Table 1 - Standard Interra® HK04M Capacitor Laminate Offerings**

| Product Code | Capacitance Density (pF/cm <sup>2</sup> ) | Copper Thickness (oz/ft <sup>2</sup> ) | Polyimide Thickness (μm (mil)) | Copper Thickness (μm (oz/ft <sup>2</sup> )) |
|--------------|---|--|--------------------------------|---|
| HK04M351235E | 240                                       | 35 (1.0)                               | 12 (0.5)                       | 35 (1.0)                                    |
| HK04M701270E | 240                                       | 70 (2.0)                               | 12 (0.5)                       | 70 (2.0)                                    |
| HK04M182518E | 125                                       | 18 (0.5)                               | 25 (1.0)                       | 18 (0.5)                                    |
| HK04M352535E | 125                                       | 35 (1.0)                               | 25 (1.0)                       | 35 (1.0)                                    |
| HK04M702570E | 125                                       | 70 (2.0)                               | 25 (1.0)                       | 70 (2.0)                                    |
| HK04M182535E | 125                                       | 18 (0.5)                               | 25 (1.0)                       | 35 (1.0)                                    |
| HK04M352570E | 125                                       | 35 (1.0)                               | 25 (1.0)                       | 70 (2.0)                                    |

## Product Code Key



## Safe Handling

Prior to handling, DuPont recommends referencing the Interra® Safe Handling Guide available at [interra.dupont.com](http://interra.dupont.com).

## Quality and Traceability

DuPont™ Interra® HK04M Capacitor Laminate is manufactured under a certified ISO9001:2015 Quality Management System facility. Complete material and manufacturing records, which include archive samples of finished product, are maintained by DuPont. Each manufactured lot is identified for reference traceability. The packaging label serves as the primary tracking mechanism in the event of customer inquiry and includes the product name, batch number, size, and quantity.

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**Table 2 - DuPont™ Interra® HK04M Capacitor Laminate Properties**

| Property  | HK04M351235E Typical Value | HK04M352535E Typical Value | Test Method        |
|---|----------------------------|----------------------------|--------------------|
| Capacitance Density, pF/cm <sup>2</sup> (nF/in <sup>2</sup> )                 | 240 (1.5)                  | 125 (0.8)                  | DuPont Method      |
| Dielectric Thickness, μm  | 12                         | 25                         | ASTM D6988         |
| Dielectric Constant (Dk)  |                            |                            |                    |
| 1 MHz   | 3.5                        | 3.5                        | IPC-TM-650 2.5.5.3 |
| 2 GHz   | 3.5                        | 3.5                        | ASTM D2520         |
| Loss Tangent (Df)   |                            |                            |                    |
| 1 MHz   | 0.007                      | 0.007                      | IPC-TM-650 2.5.5.3 |
| 2 GHz   | 0.007                      | 0.007                      | ASTM D2520         |
| Peel Strength (Adhesion to Copper)  |                            |                            |                    |
| As Received, N/mm (lb/in)   | 2.0 (11)                   | 1.9 (11)                   | IPC-TM-650 2.4.9   |
| After Solder, N/mm (lb/in)  | 1.8 (10)                   | 1.9 (11)                   |                    |
| Solder Float, 288 °C for 10 s   | Pass                       | Pass                       | IPC-TM-650 2.4.13  |
| Temperature and Humidity Bias (THB)<br>85 °C/85% RH and 50 V <sub>dcr</sub> h | 1,000                      | 1,000                      | DuPont Method      |

Data within this table are typical values for the listed product. Performance can vary depending on construction and processing.



[interra.dupont.com](http://interra.dupont.com)

For more information on Interra® HK04M Capacitor Laminate or other DuPont products, please visit our website.

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CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see "DuPont Medical Caution Statement," H-50102-5 and "DuPont Policy Regarding Medical Applications" H-50103-5.

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