isola®

THE BASE FOR INNOVATION®

2024

PRODUCT GUIDE

HIGH PERFORMANCE LAMINATE & PREPREG MATERIALS FOR PCB MANUFACTURING

CONTENTS

GLOBAL HEADQUARTERS, CHANDLER AZ

ABOUT US

The highest quality raw materials, supported by truly global, holistic teams of professionals. Isola products are The Base for Innovation®, and it's our goal to foster breakthroughs that make a difference every day.

COMPANY OVERVIEW

Isola is a leader in global material sciences. We design, develop, manufacture, and qualify copper-clad laminates and dielectric prepregs used to fabricate multilayer printed circuit boards (PCBs).

GLOBAL PRESENCE

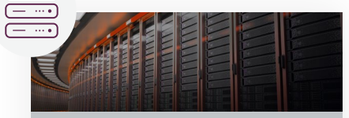
Isola has manufacturing, research and development, technical support and sales teams across Asia, Europe, and the United States. Why is that important? It allows us to service customers all around the world from start to finish. Knowledge sharing and collaboration is at the heart of our values, and our global teams work closely together to deliver our very best solutions, every single time.

OUR MISSION

Enable innovation and technology with valued products, services, and technological solutions developed through a deep understanding of customer needs and investments in a highly talented, committed and motivated workforce.

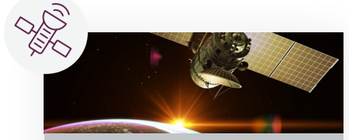
MARKETS

Dive into the markets we've served the most and see how we address the priorities of customers in vastly different worlds with the same consistent, high-performing products, vetted and tested before they ever leave our facilities.



NETWORKING & COMMUNICATION

Isola helps connect the world with highly reliable and thermally robust materials.

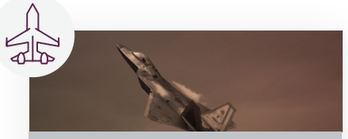


RADIO FREQUENCY & MICROWAVE

Isola helps designers achieve smaller, more powerful and durable and less power hungry products.

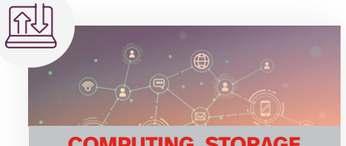
AUTOMOTIVE & TRANSPORTATION

Isola drives innovation into automobile, railway and aircraft electronics with thermally reliable laminate materials.



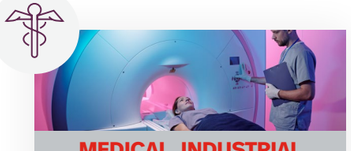
AEROSPACE & DEFENSE

Isola offers high reliability and superior performance laminate materials for extreme conditions



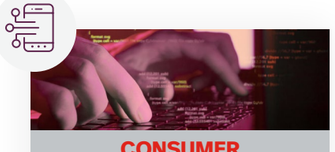
COMPUTING, STORAGE & PERIPHERALS

Isola's high-speed digital materials are the base for the internet of things.



MEDICAL, INDUSTRIAL & INSTRUMENTATION

Isola's materials help cost savings for today's advanced electronics.



CONSUMER ELECTRONICS

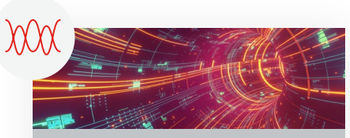
Isola's materials help put the consumer in control of their electronic devices.

ATTRIBUTES

We possess an extensive portfolio of patent and other intellectual property rights covering our proprietary resin formulations, and have pioneered the development of several product categories with ''best in class'' technology.

5G APPLICATIONS

Isola 5G materials are designed for low moisture uptake and stable electrical performance across a wide range of temperatures to handle anticipated environmental conditions.

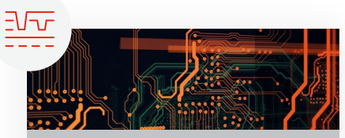


HIGH SPEED DIGITAL (HSD)

Isola offers a wide range of HSD materials that deliver superior performance and CAF resistance.

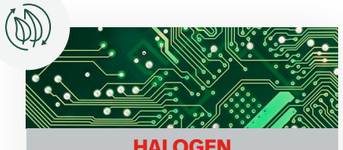
HIGH THERMAL RELIABILITY

Isola offers several products with different levels of electrical performance that all possess excellent thermal reliability.



HIGH DENSITY INTERCONNECT (HDI)

HDI attributes are PCB designs that employ increased feature density to achieve lighter weight, reduced layer count, and thinner stack ups.



HALOGEN FREE

Isola offers a variety of non-halogenated materials to meet the industry's increased performance demands for eco-friendly designs.

HIGH TEMPERATURE

Isola offers materials designed for demanding high temperature printed circuit applications.

RADIO FREQUENCY & MICROWAVE

Today's designers are challenged with the task of achieving an optimal balance between cost and performance when selecting base materials.

HIGH SPEED DIGITAL

Isola offers a wide range of High-speed Digital (HSD) materials that deliver superior performance and CAF resistance. These low-loss materials are targeted for applications that require high reliability and signal integrity. Isola also offers halogen-free HSD materials for green electronics.

TERRAGREEN® 400G2

Halogen-Free, Extremely Low Loss Material

TerraGreen® 400G2 laminate materials are our most advanced ultra-high speed, halogen-free extremely-low loss design solution.

TerraGreen® 400G2 is our halogen-free material solution for next generation 5G infrastructure, data center systems, high end computing, wired & wireless communications and AI applications. Our novel resin system, using ultra smooth HVLP3 (VLP1) copper foil and 2nd generation ultra low Dk glass has been engineered for very high data rates of >100 Gb/s with excellent cost for loss performance.

The TerraGreen 400G2 resin system has proven superior CAF performance on tight pitch testing. CAF performance is enhanced by the resin systems excellent interlaminar and bond line adhesion strength.

TerraGreen 400G2 is lead free compatible and sequential lamination capable and can be processed utilizing standard PCB equipment and processing steps. TerraGreen 400G2 meets UL94 V-0.

PRODUCT AVAILABILITY

Standard Material Offering: Laminate
- 2 to 10 mil (0.05 to 0.25 mm)

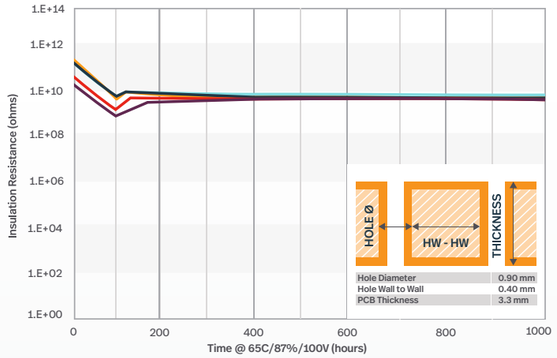
Copper Foil Type
- HLVP3 (VLP1) ≤1.1 micron Rz JIS

Copper Weight
- ½, 1 oz (18 and 35 µm) available
- Thinner copper foil available

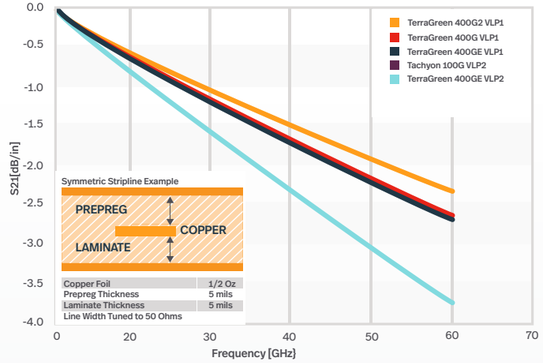
Standard Material Offering: Prepreg
- Tooling of prepreg panels available
- Moisture barrier packaging

Glass Fabric Availability
- Ultra Low Dk glass
- Mechanically spread glass
- Square weave glass
- Mechanically spread glass

CAF Resistance Data - MRTV



Insertion Loss Over Frequency



Tg	Td	T-260	T-288	Dk		Df		TYPICAL PEEL STRENGTH	MOISTURE ABSORPTION	UL	CTI
°C	°C	min	min	2GHz	10GHz	2GHz	10GHz	LB/IN	%	RTI °C	UL CLASS
200	380	≥60	≥60	3.10	3.10	0.0015	0.0015	4.10	<0.1	140	2

MARKETS

ATTRIBUTES

TERRAGREEN® 400G

Halogen-Free, Extremely Low Loss Laminate and Prepreg

TerraGreen® 400G laminate materials are our most advanced ultra high speed, extremely low loss design solution.

TerraGreen® 400G is our halogen-free material solution for next generation 5G infrastructure, data center systems, high end computing, wired & wireless communications and AI applications. Our novel resin system using ultra smooth HVLP3 (VLP1) copper foil and Low Dk glass has been engineered for very high data rates of >100 Gb/s with excellent cost for loss performance.

The TerraGreen 400G resin system has proven superior CAF performance on tight pitch testing. CAF performance is enhanced by the resin systems excellent interlaminar and bond line adhesion strength. TerraGreen 400G is lead free compatible and sequential lamination capable and can be processed utilizing standard PCB equipment and processing steps. TerraGreen 400G meets UL94 V-0.

PRODUCT AVAILABILITY

Standard Material Offering: Laminate
- 2 to 10 mil (0.05 to 0.25 mm)

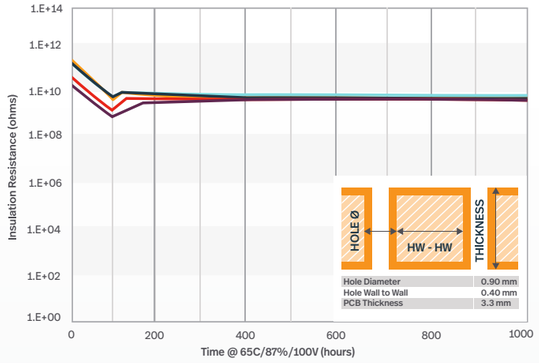
Copper Foil Type
- HLVP3 (VLP1) ≤1.1 micron Rz JIS
- Advanced RTF ≤2.1 micron Rz JIS

Copper Weight
- ½, 1 and 2 oz (18, 35 and 70 µm) available
- Thinner copper foil available

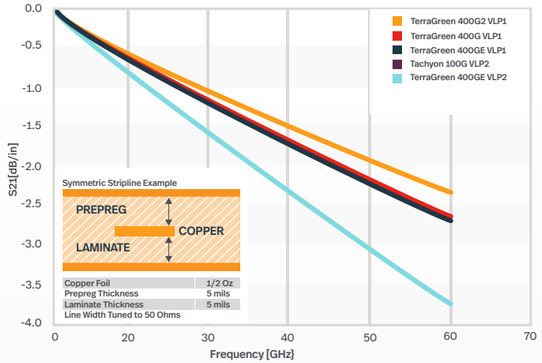
Standard Material Offering: Prepreg
- Tooling of prepreg panels available
- Moisture barrier packaging

Glass Fabric Availability
- Low Dk glass
- Square weave glass
- Mechanically spread glass

CAF Resistance Data - MRTV



Insertion Loss Over Frequency



Tg	Td	T-260	T-288	Dk		Df		TYPICAL PEEL STRENGTH	MOISTURE ABSORPTION	UL	CTI
°C	°C	min	min	2GHz	10GHz	2GHz	10GHz	LB/IN	%	RTI °C	UL CLASS
200	380	≥60	≥60	3.15	3.15	0.0017	0.0017	4.10	<0.1	140	2

MARKETS

ATTRIBUTES

TERRAGREEN® 400GE

Halogen-Free, Ultra Low Loss Material

TerraGreen® 400GE laminate materials are our most advanced ultra-high speed, halogen-free ultra-low loss design solution.

TerraGreen® 400GE is our halogen-free material solution for next generation 5G infrastructure, data center systems, high end computing, wired & wireless communications with data rates >100 Gb/s. Our novel resin system using RTF3 (<2.5 µm Rz JIS) copper foil and e-glass is our lowest cost member of the TerraGreen® 400G family of products.

The TerraGreen 400GE resin system has proven superior CAF performance on tight pitch testing. CAF performance is enhanced by the resin systems excellent interlaminar and bond line adhesion strength.

TerraGreen 400GE is lead free compatible and sequential lamination capable and can be processed utilizing standard PCB equipment and processing steps. TerraGreen 400GE meets UL94 V-0.

PRODUCT AVAILABILITY

Standard Material Offering: Laminate
- 2 to 10 mil (0.05 to 0.25 mm)

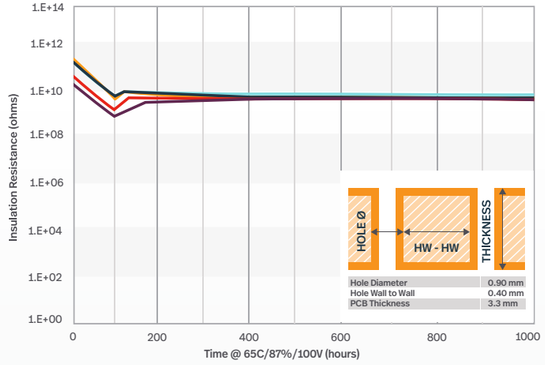
Copper Foil Type
- HVLP3 (VLP1) ≤1.1 micron Rz JIS
- Advanced RTF ≤2.1 micron Rz JIS

Copper Weight
- ½, 1 and 2 oz (18, 35 and 70 µm) available
- Thinner copper foil available

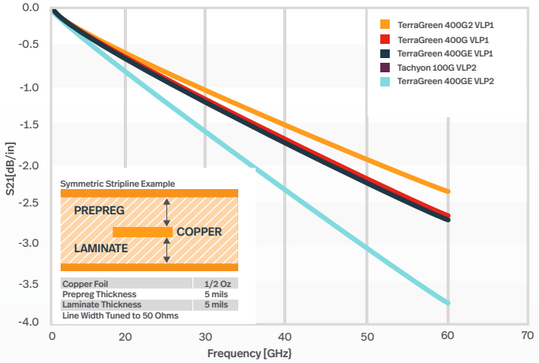
Standard Material Offering: Prepreg
- Tooling of prepreg panels available
- Moisture barrier packaging

Glass Fabric Availability
- E-glass
- Square weave glass
- Mechanically spread glass

CAF Resistance Data - MRTV



Insertion Loss Over Frequency



Tg	Td	T-260	T-288	Dk		Df		TYPICAL PEEL STRENGTH	MOISTURE ABSORPTION	UL	CTI
°C	°C	min	min	2GHz	10GHz	2GHz	10GHz	LB/IN	%	RTI °C	UL CLASS
200	380	≥60	≥60	3.29	3.29	0.0026	0.0026	4.10	<0.1	140	2

MARKETS

ATTRIBUTES

TACHYON® 100G

Ultra Low Loss Laminate and Prepreg

Tachyon® 100G laminate materials are designed for very high-speed digital applications up to and beyond data rates of 100 Gb/s.

Tachyon® 100G materials exhibit exceptional electrical properties that are very stable over a broad frequency and temperature range between -55°C and +125°C up to 100 GHz. These electrical properties provide designers a scalable solution for next generation designs of backplanes and daughter cards, enabling 10x improvements from 10 Gb/s data rates.

Tachyon 100G has the highest level of thermal performance for high layer count line cards. The very low Z-axis CTE makes it a perfect choice for fine pitch BGA applications of 0.8 mm or less. The material is optimized with the use of spread glass to mitigate skew, improve rise times, reduce jitter, and increase eye width/height and that use ultra smooth HVLP (VLP2) 2um Rz copper that significantly reduces conductor losses.

PRODUCT AVAILABILITY

Standard Material Offering: Laminate
- 2 to 20 mil (0.05 to 0.50 mm)

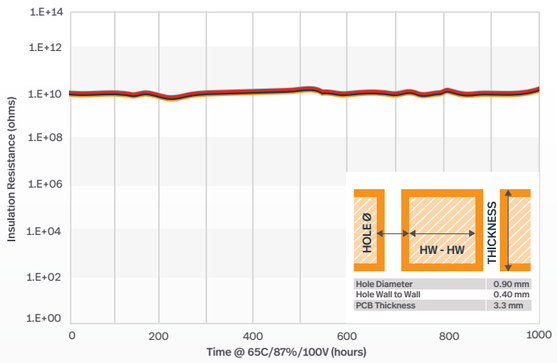
Copper Foil Type
- HLVP3 (VLP1) ≤1.1 micron Rz JIS
- HVLP (VLP2) ≤2.5 micron Rz JIS
- Advanced RTF ≤2.1 micron Rz JIS
- Embedded resistor foil

Copper Weight
- ½, 1 and 2 oz (18, 35 and 70 µm) available
- Heavier copper foil available
- Thinner copper foil available

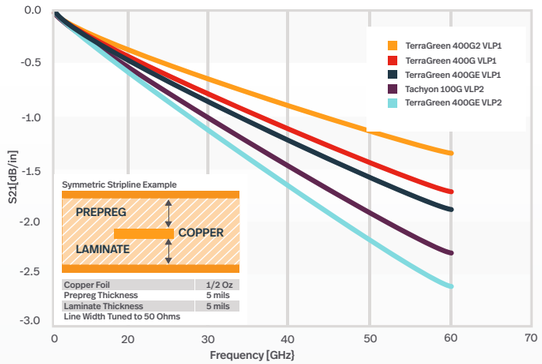
Standard Material Offering: Prepreg
- Moisture barrier packaging
- Tooling of prepreg panels available

Glass Fabric Availability
- Low Dk Glass
- Square weave glass
- Mechanically spread glass

CAF Resistance Data - MRTV



Insertion Loss Over Frequency



Tg	Td	T-260	T-288	Dk		Df		TYPICAL PEEL STRENGTH	MOISTURE ABSORPTION	UL	CTI
°C	°C	min	min	2GHz	10GHz	2GHz	10GHz	LB/IN	%	RTI °C	UL CLASS
215	360	≥60	≥60	3.04	3.02	0.0021	0.0021	5.50	<0.1	130	3

MARKETS

ATTRIBUTES

I-TERA® MT40

Very Low Loss Laminate and Prepreg

I-Tera® MT40 is suitable for many of today's high speed digital and RF/microwave printed circuit designs. I-Tera MT40 features a dielectric constant (Dk) that is stable between -55°C and +125°C up to W-band frequencies. In addition, I-Tera MT40 offers a lower dissipation factor (Df) of 0.0031 making it a cost effective alternative to PTFE and other commercial microwave and high-speed digital laminate materials.

I-Tera MT40 laminate materials are currently being offered in both laminate and prepreg form in typical thicknesses and standard panel sizes. This provides a complete materials solution package for high-speed digital multilayer, hybrid, RF/microwave, multilayer and double-sided printed circuit designs. I-Tera MT40 does not require any special through hole treatments commonly needed when processing PTFE-based laminate materials.

PRODUCT AVAILABILITY

Standard Material Offering: Laminate
- 2 to 24 mil (0.05 to 0.61 mm)

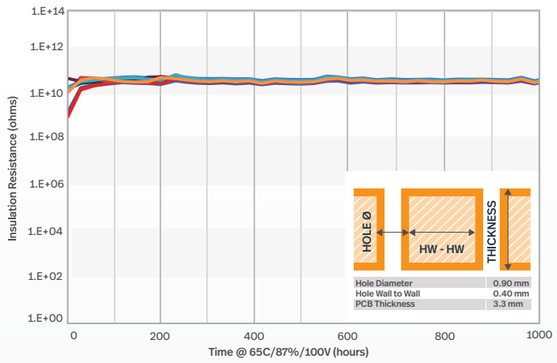
Copper Foil Type
- HVLP (VLP2) ≤2.5 micron Rz JIS
- Advanced RTF ≤2.1 micron Rz JIS
- RTF (Reverse Treat Foil)
- Embedded resistor foil

Copper Weight
- ½ to 2 oz (18, 35 and 70 µm) is standard
- Heavier copper foil available
- Thinner copper foil available

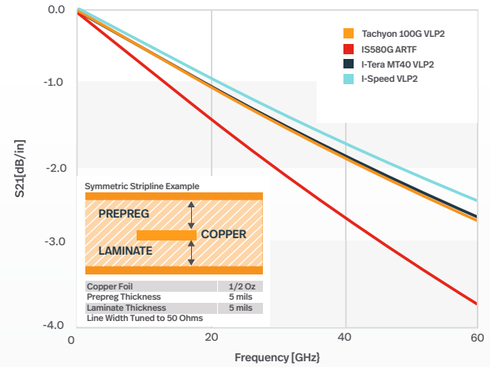
Standard Material Offering: Prepreg
- Tooling of prepreg panels
- Moisture barrier packaging

Glass Fabric Availability
- E-glass
- Square weave glass
- Mechanically spread glass

CAF Resistance Data - MRTV



Insertion Loss Over Frequency



Tg	Td	T-260	T-288	Dk		Df		TYPICAL PEEL STRENGTH	MOISTURE ABSORPTION	UL	CTI
°C	°C	min	min	2GHz	10GHz	2GHz	10GHz	LB/IN	%	RTI °C	UL CLASS
215	360	≥60	≥60	3.45	3.45	0.0031	0.0031	5.70	<0.1	130	3

MARKETS

ATTRIBUTES

IS580G

Halogen-Free, Very Low Loss Material

IS580G is a halogen-free 195° C Tg resin system for multilayer PWB applications where maximum thermal performance and reliability are required.

IS580G laminate and prepreg products are manufactured with Isola's high performance, low loss, multi-functional resin system, reinforced with electrical grade (e-glass) glass fabric. The unique resin system delivers a >25% improvement in Z-axis expansion while maintaining good flow and fill properties. These properties, coupled with superior moisture resistance at reflow, result in a halogen-free product with an industry-leading combination of thermal and electrical performance.

PRODUCT AVAILABILITY

Standard Material Offering: Laminate
- 2 to 30 mil (0.05 to 0.75 mm)

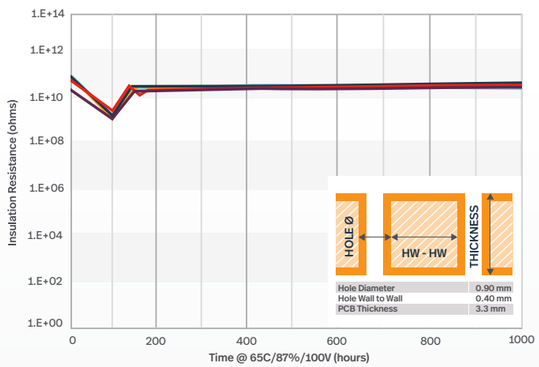
Copper Foil Type
- Advanced RTF ≤2.5 micron Rz JIS

Copper Weight
- ½, 1 and 2 oz (18, 35 and 70 µm) available

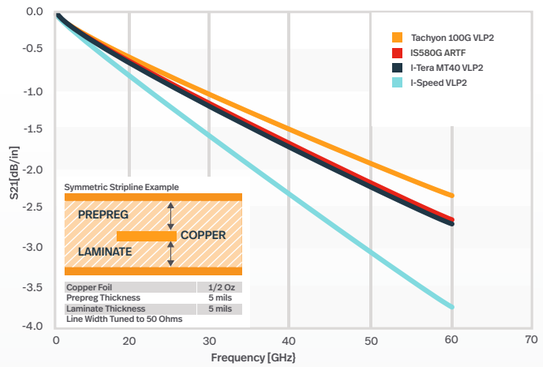
Standard Material Offering: Prepreg
- Roll or panel form
- Moisture barrier packaging
- Tooling of prepreg panels

Glass Fabric Availability
- E-glass
- Square weave glass
- Mechanically spread glass

Caf Resistance Data - MRTV (6xReflow)



Insertion Loss Over Frequency



Tg	Td	T-260	T-288	Dk		Df		TYPICAL PEEL STRENGTH (HTE)	MOISTURE ABSORPTION	UL	CTI
°C	°C	min	min	2GHz	10GHz	2GHz	10GHz	LB/IN	%	RTI °C	UL CLASS
195	385	≥60	≥60	3.80	3.80	0.006	0.006	4.30	<0.1	160	2

MARKETS

ATTRIBUTES

I-SPEED®

Low Loss, Epoxy Laminate and Prepreg

I-Speed® is a 180° C Tg FR-4 resin system for multilayer PWB applications where maximum thermal performance and reliability are required.

I-Speed® laminate and prepreg products are manufactured with Isola's patentable high performance multi-functional resin system, reinforced with electrical grade (e-glass) glass fabric. This system delivers a low Z-axis expansion and offers 25% reduction in loss compared to our mid-loss products. These properties coupled with superior moisture resistance at reflow, result in a product that bridges the gap from both a thermal and electrical perspective.

The I-Speed resin system is laser fluorescing and UV blocking for maximum compatibility with Automated Optical Inspection (AOI) systems, optical positioning systems and photo imagable solder mask imaging.

PRODUCT AVAILABILITY

Standard Material Offering: Laminate
- 2 to 28 mil (0.05 to 0.71 mm)

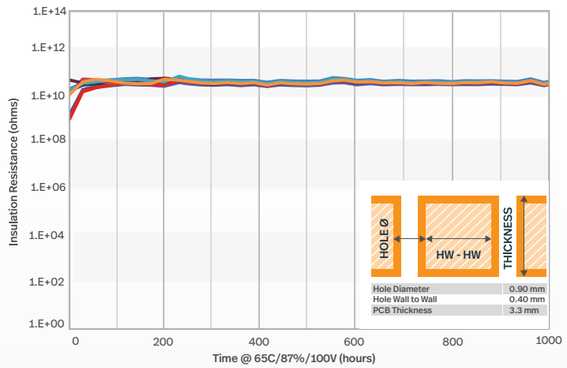
Copper Foil Type
- HTE Grade 3
- HVLP (VLP2) ≤2.5 micron Rz JIS
- RTF (Reverse Treat Foil)
- Embedded resistor foil

Copper Weight
- ½ to 2 oz (18,35 and 70 µm) is standard
- Heavier copper foil available
- Thinner copper foil available

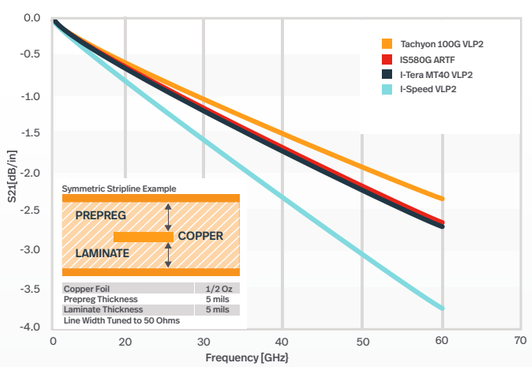
Standard Material Offering: Prepreg
- Tooling of prepreg panels
- Moisture barrier packaging

Glass Fabric Availability
- E-glass
- Square weave glass
- Mechanically spread glass

CAF Resistance Data - MRTV



Insertion Loss Over Frequency



Tg	Td	T-260	T-288	Dk		Df		TYPICAL PEEL STRENGTH	MOISTURE ABSORPTION	UL	CTI
°C	°C	min	min	2GHz	10GHz	2GHz	10GHz	LB/IN	%	RTI °C	UL CLASS
180	360	>60	≥60	3.64	3.63	0.0059	0.0060	5.50	<0.06	130	2

MARKETS

ATTRIBUTES

RADIO FREQUENCY & MICROWAVE

Today's RF/Microwave and Millimeter Wave designers are challenged more than ever with the task of achieving an optimal balance between cost and performance when selecting base materials.

ASTRA®MT77

Ultra Low Loss Laminate and Prepreg

Astra® MT77 materials are a breakthrough, very low-loss dielectric constant (Dk) product for millimeter wave frequencies and beyond.

Astra® MT77 laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range. Astra MT77 is suitable for many of today's commercial RF/microwave printed circuit designs. It features a dielectric constant (Dk) that is stable between -40°C and +140°C at up to W-band frequencies. In addition, Astra MT77 offers an ultra-low dissipation factor (Df) of 0.0017, making it a cost-effective alternative to PTFE and other commercial microwave laminate materials.

Key applications include long antennas and radar applications for automobiles, such as adaptive cruise control, pre-crash, blind spot detection, lane departure warning and stop and go systems.

PRODUCT AVAILABILITY

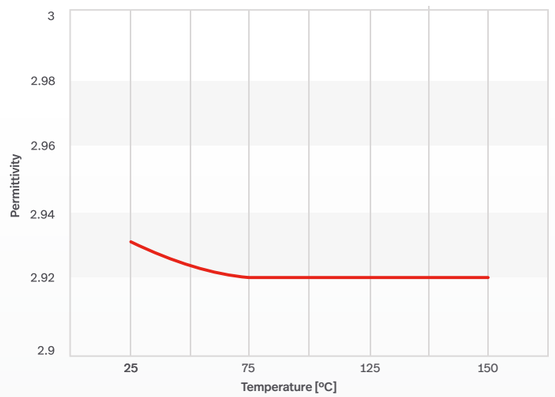
Standard Material Offering: Laminate
- 2.5, 5, 7.5, 10, 12.5, 15, 20, 30, 60 mil (0.0635, 0.127, 0.1905, 0.254, 0.3175, 0.381, 0.510, 0.760, 1.50 mm)

Copper Foil Type
- HVLP (VLP2) ≤2.5 micron Rz JIS
- Embedded resistor foil

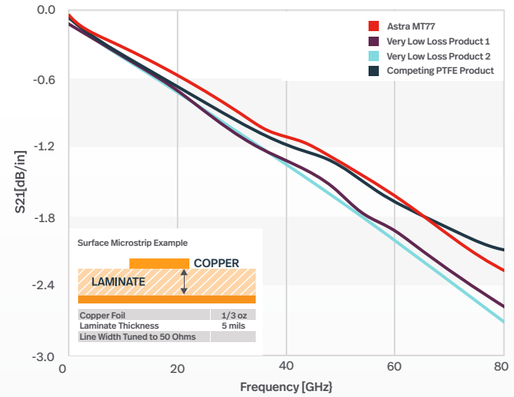
Copper Weight
- ½ to 2 oz (18,35 and 70 µm) is standard
- Thinner copper foil available

Standard Material Offering: Prepreg
- Tooling of prepreg panels
- Moisture barrier packaging

Permittivity @60GHz



Insertion Loss Over Frequency



Tg	Td	T-260	T-288	Dk		Df		TYPICAL PEEL STRENGTH	MOISTURE ABSORPTION	UL	CTI
°C	°C	min	min	2GHz	10GHz	2GHz	10GHz	LB/IN	%	RTI °C	UL CLASS
200	360	≥60	≥60	3.00	3.00	0.0017	0.0017	5.70	<0.1	130	3

MARKETS

ATTRIBUTES

I-TERA® MT40 (RF/MW)

Very Low Loss Laminate

I-Tera® MT40 laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range.

I-Tera® MT40 is suitable for many of today's high speed digital and RF/microwave printed circuit designs. I-Tera MT40 features a dielectric constant (Dk) that is stable between -40°C and +140°C up to W-band frequencies. In addition, I-Tera MT40 offers a very low dissipation factor (Df) of 0.0028 - 0.0035 making it a cost effective alternative to PTFE and other commercial microwave and high-speed digital laminate materials.

I-Tera MT40 laminate materials are currently being offered in both laminate and prepreg form in typical thicknesses and standard panel sizes. This provides a complete materials solution package for high-speed digital multilayer, hybrid, RF/microwave, multilayer and double-sided printed circuit designs. I-Tera MT40 does not require any special through hole treatments commonly needed when processing PTFE-based laminate materials.

PRODUCT AVAILABILITY

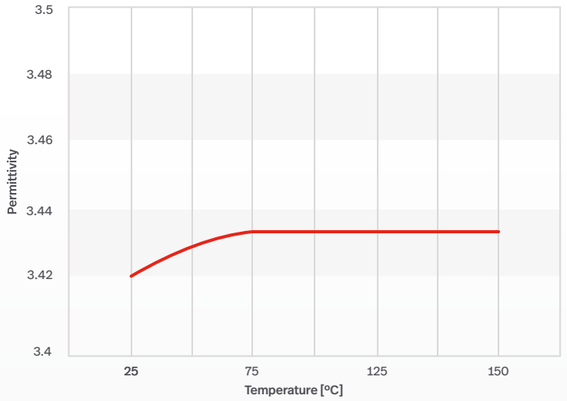
Standard Material Offering: Laminate
- 5, 10, 20, 30, 40, 60 mil (0.13, 0.25, 0.51, 0.76, 1.02, 1.5 mm)

Copper Foil Type
- HTE Grade 3
- HVLP (VLP2) ≤2.5 micron Rz JIS
- Advanced RTF ≤2.1 micron Rz JIS
- RTF (Reverse Treat Foil)
- Embedded resistor foil

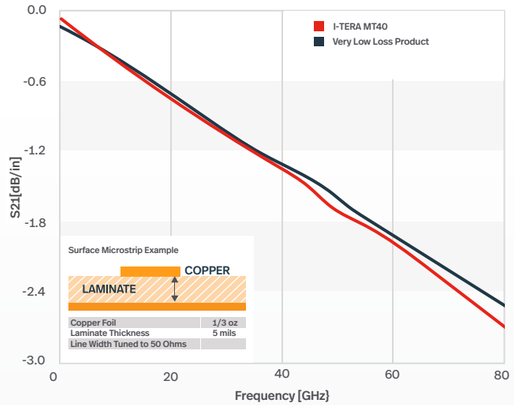
Copper Weight
- ½ to 2 oz (18,35 and 70 µm) is standard
- Thinner copper foil available

Glass Fabric Availability
- Square weave glass
- Mechanically spread glass

Permittivity @60GHz



Insertion Loss Over Frequency



Tg	Td	T-260	T-288	Dk		Df		TYPICAL PEEL STRENGTH (HTE)	MOISTURE ABSORPTION	UL	CTI
°C	°C	min	min	2GHz	10GHz	2GHz	10GHz	LB/IN	%	RTI °C	UL CLASS
215	360	≥60	≥60	3.38, 3.45, 3.60, 3.75	3.38, 3.45, 3.60, 3.75	0.0028 to 0.0035	0.0028 to 0.0035	5.7	<0.1	130	3

MARKETS

ATTRIBUTES

HIGH THERMAL RELIABILITY

Thermal reliability requirements can be separated into two categories. The first involves survival of a PCB through assembly without defects such as blisters or delamination. The second category involves thermal reliability in the operating environment over a product's lifetime. Both types of thermal reliability are critical.

IS550H

High Reliability Laminate and Prepreg

IS550H is our halogen-free laminate solution for high power & voltage applications that require extreme thermal stability.

IS550H was developed in conjunction with a consortium of industry experts for high power & high voltage applications and PEV & HEV automotive electrification. The resulting solution addresses critical application needs for use in a harsh environment where very demanding, long term thermal reliability performance, extreme thermal cycling and very high voltage CAF & electro-migration resistance are required.

PRODUCT AVAILABILITY

Standard Material Offering: Laminate
- 2 to 59 mil (0.05 to 1.5 mm)

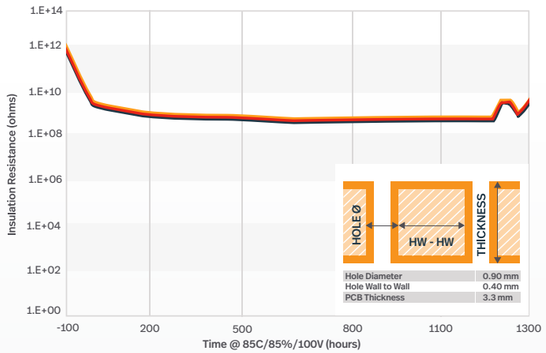
Copper Foil Type
- HTE Grade 3
- RTF (Reverse Treat Foil)

Copper Weight
- ½, 1 and 2 oz (18, 35 and 70 µm) is standard
- Heavier copper available

Standard Material Offering: Prepreg
- Tooling of prepreg panels
- Moisture barrier packaging

Glass Fabric Availability
- E-glass
- Square weave glass
- Mechanically spread glass

CAF Resistance Data - MRTV



Tg	Td	T-260	T-288	Dk		Df		TYPICAL PEEL STRENGTH (HTE)	MOISTURE ABSORPTION	UL	CTI
°C	°C	min	min	2GHz	10GHz	2GHz	10GHz	LB/IN	%	RTI °C	UL CLASS
200	400	≥60	≥60	4.50	4.43	0.014	0.016	8.2	<0.25	150	3

MARKETS

ATTRIBUTES

370HR

Industry Leading Epoxy Laminate and Prepreg

370HR is the industry's "best in class" lead-free compatible product for high-reliability applications across a wide range of markets.

370HR laminates and prepregs, designed by Polyclad, are made using a patented high performance 180°C Tg FR-4 multifunctional epoxy resin system that is designed for multilayer Printed Wiring Board (PWB) applications where maximum thermal performance and reliability are required. We manufacture 370HR laminates and prepregs with high quality E-glass glass fabric for superior Conductive Anodic Filament (CAF) resistance. 370HR provides superior thermal performance with low Coefficient of Thermal Expansion (CTE) and the mechanical, chemical and moisture resistance properties that equal or exceed the performance of traditional FR-4 materials.

370HR is used in thousands of PWB designs and has proven to be best in class for thermal reliability, CAF performance, ease of processing and proven performance on sequential lamination designs.

PRODUCT AVAILABILITY

Standard Material Offering: Laminate
- 2 to 125 mil (0.05 to 3.2 mm)

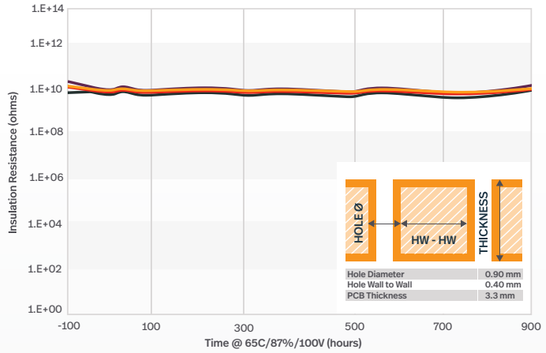
Copper Foil Type
- HTE Grade 3
- RTF (Reverse Treat Foil)
- Embedded resistor foil

Copper Weight
- ½ to 2 oz (18,35 and 70 µm) is standard
- Heavier copper available
- Thinner copper foil available

Standard Material Offering: Prepreg
- Tooling of prepreg panels
- Moisture barrier packaging

Glass Fabric Availability
- E-glass
- Square weave glass
- Mechanically spread glass

CAF Resistance Data - MRTV



Tg	Td	T-260	T-288	Dk		Df		TYPICAL PEEL STRENGTH (HTE)	MOISTURE ABSORPTION	UL	CTI
°C	°C	min	min	2GHz	10GHz	2GHz	10GHz	LB/IN	%	RTI °C	UL CLASS
180	340	≥60	≥30	4.04	3.92	0.021	0.025	7.00	<0.15	130	3

MARKETS

ATTRIBUTES

PCB LAMINATE & PREPREG MATERIALS

Isola high-performance laminate products feature proprietary resin formulations that are engineered to meet your design specifications and exceed your expectations.

RF / MICROWAVE

I-TERA® MT40 (RF/MW)
Very Low Loss Material
Tg: 215°C **Dk:** 3.38/3.45/3.60/3.75
Td: 360°C **Df:** 0.0028 - 0.0035

ASTRA® MT77
Ultra Low Loss, RF/MW Laminate and Prepreg
Tg: 200°C **Dk:** 3.00
Td: 360°C **Df:** 0.0017

TERRAGREEN® 400G RF/MW
Extremely Low Loss Material
Tg: 210°C **Dk:** 3.07
Td: 400°C **Df:** 0.0018

HIGH SPEED DIGITAL

I-SPEED®
Low Loss, Epoxy Laminate and Prepreg
Tg: 180°C **Dk:** 3.64
Td: 360°C **Df:** 0.0060

I-TERA® MT40
Very Low Loss Laminate and Prepreg
Tg: 215°C **Dk:** 3.45
Td: 360°C **Df:** 0.0031

TACHYON® 100G
Very Low Loss Laminate and Prepreg
Tg: 215°C **Dk:** 3.02
Td: 360°C **Df:** 0.0021

TERRAGREEN® 400G2
Extremely Low Loss Laminate and Prepreg
Tg: 200°C **Dk:** 3.10
Td: 380°C **Df:** 0.0015

IS580G
Very Low Loss Material
Tg: 195°C **Dk:** 3.80
Td: 385°C **Df:** 0.0060

TERRAGREEN® 400GE
Extremely Low Loss Laminate and Prepreg
Tg: 200°C **Dk:** 3.29
Td: 380°C **Df:** 0.0026

TERRAGREEN® 400G
Extremely Low Loss Laminate and Prepreg
Tg: 200°C **Dk:** 3.10
Td: 380°C **Df:** 0.0018

FR408HR
Lead Free, Mid Loss Laminate and Prepreg
Tg: 190°C **Dk:** 3.68
Td: 360°C **Df:** 0.0092

THERMAL RELIABILITY

IS550H
Low CTE, Very High Thermal Reliability Laminate and Prepreg
Tg: 200°C **Dk:** 4.43
Td: 400°C **Df:** 0.016

185HR
Standard Loss, Thermally Robust Epoxy Laminate and Prepreg
Tg: 180°C **Dk:** 4.01
Td: 340°C **Df:** 0.020

370HR
Standard Loss, Thermally Robust Epoxy Laminate and Prepreg
Tg: 180°C **Dk:** 4.04
Td: 340°C **Df:** 0.021

IS400
Lead Free, Mid Tg Epoxy Laminate and Prepreg
Tg: 150°C **Dk:** 3.90
Td: 330°C **Df:** 0.022

NO FLOW

FR406N
No-Flo® and Lo-Flo® Specialty Prepreg
Tg: 170°C **Dk:** 4.3
Td: 300°C **Df:** 0.025

P25N
Polyimide UL HB No Flow Prepreg
Tg: 250°C **Dk:** 3.67
Td: 383°C **Df:** 0.018

HIGH TEMPERATURE

P95/P25
Polyimide UL HB Laminate and Prepreg
Tg: 260°C **Dk:** 3.76
Td: 416°C **Df:** 0.017

P96/26
Polyimide UL V-0 Laminate and Prepreg
Tg: 260°C **Dk:** 3.76
Td: 396°C **Df:** 0.017

ATTRIBUTES		HALOGEN FREE	Tg °C	Td °C	T-260 min	T-288 min	Z-Axis CTE Pre-Tg PPM/°C	Z-Axis CTE Post-Tg PPM/°C	Z-Axis CTE 50 to 260 °C %	Dk 2GHz	Dk 10GHz	Df 2GHz	Df 10GHz	TYPICAL PEEL STRENGTHS	MOISUTRE ABSORPTION	UL RTI °C	UL CLASS	CTI
RF/MICROWAVE	TERRAGREEN® 400G RF/MW	●	210	400	≥60	≥60	37	170	3.1	3.07	3.07	0.0018	0.0018	3.5	0.10%	130	2	
	I-TERA® MT40 (RF/MW)		215	360	≥60	≥60	55	290	2.8	3.38 to 3.75	3.38 to 3.75	0.0028 to 0.0035	0.0028 to 0.0035	5.7	0.10%	130	3	
	ASTRA® MT77		200	360	≥60	≥60	50-70	250-350	2.25-3.15	3.00	3.00	0.0017	0.0017	5.7	0.10%	130	3	
HIGH SPEED DIGITAL	FR408HR		190	360	≥60	>30	55	230	2.8	3.68	3.65	0.0092	0.0095	5.5	0.06%	130	2	
	I-SPEED®		180	360	≥60	≥60	60	230	2.7	3.64	3.63	0.0059	0.006	5.5	0.06%	130	2	
	IS580G	●	195	385	≥60	≥60	30	190	1.8	3.80	3.80	0.006	0.006	4.3	0.05%	160	2	
	I-TERA® MT40		215	360	≥60	≥60	55	290	2.8	3.45	3.45	0.0031	0.0031	5.7	0.10%	130	3	
	TACHYON® 100G		215	360	≥60	≥60	45	250	2.5	3.04	3.02	0.0021	0.0021	5.5	0.10%	130	3	
	TERRAGREEN® 400G	●	200	380	≥60	≥60	37	170	1.8	3.15	3.15	0.0017	0.0017	4.1	0.10%	140	2	
	TERRAGREEN® 400GE	●	200	380	≥60	≥60	37	170	1.8	3.29	3.29	0.0026	0.0026	4.1	0.10%	140	2	
	TERRAGREEN® 400G2	●	200	380	≥60	≥60	37	170	1.8	3.10	3.10	0.0015	0.0015	4.1	0.10%	140	2	
THERMAL RELIABILITY	IS400		150	330	≥60	>10	50	250	3.3	3.90	3.80	0.021	0.026	9.0	0.18%	130	3	
	185HR		180	340	≥60	>15	40	220	2.7	4.01	3.88	0.020	0.024	4.5	0.15%	130	3	
	370HR		180	340	≥60	≥30	45	230	2.8	4.04	3.92	0.021	0.025	7.0	0.15%	130	3	
	IS550H	●	200	400	≥60	≥60	38	210	202	4.50	4.43	0.014	0.016	8.2	0.25%	150	3	
SPECIALTY PRODUCTS	P95/P25		260	416	≥60	≥60	55	N/A	1.5	3.76	3.73	0.018	0.021	7.0	0.50%	170	2	
	P96/P26		260	396	≥60	≥60	55	N/A	1.5	3.76	3.73	0.018	0.021	7.0	0.50%	170	4	

ACCORDING TO **IPC-4101**

		/40	/41	/97	/98	/99	/101	/102	/126	/129	/134	/140
THERMAL RELIABLE	IS400			●	●	●	●					
	185HR				●	●	●		●			
	370HR				●	●	●		●			
	IS550H											●
HIGH SPEED DIGITAL	IS415				●	●	●		●			
	FR408HR				●	●	●		●			
	I-SPEED®				●	●	●		●			
	IS580G											●
	I-TERA® MT40							●				
	TACHYON® 100G							●				
	TERRAGREEN® 400GE										●	
	TERRAGREEN® 400G										●	
	TERRAGREEN® 400G2										●	
SPECIALTY PRODUCTS	P95/P25	●	●									
	P96/P26	●	●									

ACCORDING TO **IPC-4103**

		/17
HIGH SPEED DIGITAL	IS580G®	●
	I-TERA® MT40	●
	TACHYON® 100G	●
RF/MICROWAVE	I-TERA® MT40 (RF/MW)	●
	ASTRA® MT77	●

EXPLORE **MORE**

HYBRID

STACKUPS

Buidling hybrid stackups is easy with Isola laminate & prepreg materials.

MIX & MATCH

- High Speed Digital + RF/ Microwave parts of I-Tera® MT40
- Tachyon® 100G + I-Tera® MT40
- Mix Astra® MT77, I-Tera® MT40, Tachyon® 100G, materials with 370HR

isola
THE BASE FOR INNOVATION

GLOBAL

NETWORK

Whether you're just figuring out what you need or you're ready to start building, we're here to collaborate and get your product to market fast.

OUR REACH

- **3** GLOBAL HEADQUARTERS
- **3** RESEARCH LABORATORIES
- **6** MANUFACTURING FACILITIES

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PRODUCT GUIDE 2024

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Revisions:
A: Initial release - 1/23
B: NEW Products - TerraGreen® 400G2, TerraGreen® 400GE, IS580G - 1/24