Shengyi S1170G Halogen-Free High Tg FR4 PCB Laminate

Meta Description: Can S1170G improve high Tg FR4 PCB reliability? Learn its datasheet, uses, S1150G comparison, and EBest fabrication support.

Can S1170G improve high Tg FR4 PCB reliability for your next electronic product? Shengyi S1170G is designed for projects that need halogen-free performance, lead-free process support, strong heat resistance, and stable rigid PCB fabrication.

This guide explains what this laminate is, what its datasheet shows, where it is commonly used, and how it differs from S1150G. It also shows how EBest supports PCB fabrication from material review to finished board delivery.

What is S1170G?

S1170G is a halogen-free, lead-free compatible FR4 PCB laminate from Shengyi Technology. It belongs to Shengyi's rigid material family for FR-4.1 and FR-15.1 applications. The material is designed for printed circuit boards that require better heat resistance than mid-Tg FR4 laminates.

This laminate is free of halogen, antimony, and red phosphorus. It also supports lead-free processing, which makes it suitable for modern PCB production and PCBA assembly. Its high thermal rating helps the board maintain better dimensional stability during heat stress.

A major reason to use this material is its Tg180°C by DMA rating. Shengyi also lists Td as 390°C, T260 as 60 minutes, and T288 as 60 minutes. These values help the material fit many multilayer boards and electronics exposed to lead-free soldering temperatures.

In practical PCB fabrication, material selection should be reviewed together with layer count, board thickness, copper weight, drill design, surface finish, and assembly process. A strong laminate needs a controlled production flow to deliver stable finished boards.

What Are Features of Shengyi S1170G?

This laminate is built for halogen-free PCB projects that need stronger heat resistance than common FR4. It is also useful when the board requires AOI compatibility, lower Z-axis expansion, and steady performance through lead-free assembly.

- **Halogen-free FR4 material** The laminate is free of halogen, antimony, and red phosphorus. This helps meet halogen-free PCB requirements and material compliance needs.
- **Lead-free process compatibility** It is designed for lead-free PCB production and assembly, supporting many modern electronics manufacturing flows.
- **Higher thermal performance** Shengyi lists Tg as 180°C by DMA, placing this laminate above mid-Tg FR4 materials.
- **Lower Z-axis CTE** Lower Z-axis expansion helps support plated through-hole reliability, especially in multilayer PCB fabrication.
- **UV blocking and AOI compatible** Shengyi lists UV Blocking/AOI compatibility as one of the material features, supporting inspection and production control.
- **Stable thermal resistance** The material data lists Td 390°C, T260 60 minutes, and T288 60 minutes, making it suitable for boards exposed to demanding thermal processes.
- **UL94 V-0 flame rating** Shengyi lists the material flammability rating as V-0, supporting common safety-related PCB requirements.

Shengyi S1170G Datasheet & Technical Specifications

The Shengyi S1170G datasheet provides thermal, electrical, and mechanical values for PCB material review. The table below keeps only relevant laminate specifications.

Property	Typical Value	Test Condition / Method
Tg	180°C	DMA, IPC-TM-650 2.4.24.4
Td	390°C	5% wt. loss, IPC-TM-650 2.4.24.6
Z-axis CTE before Tg	45 ppm/°C	IPC-TM-650 2.4.24
Z-axis CTE after Tg	210 ppm/°C	IPC-TM-650 2.4.24
Z-axis expansion, 50-260°C	2.3%	IPC-TM-650 2.4.24
T260	60 min	TMA, IPC-TM-650 2.4.24.1
T288	60 min	TMA, IPC-TM-650 2.4.24.1
Thermal Stress	Pass	288°C solder dip, IPC-TM-650 2.4.13.1
Volume Resistivity	5.65 x 10^7 MΩ·cm	After moisture resistance, IPC-TM-650 2.5.17.1
Volume Resistivity	2.71 x 10^7 MΩ·cm	E-24/125, IPC-TM-650 2.5.17.1
Surface Resistivity	5.99 x 10^6 MΩ	After moisture resistance, IPC-TM-650 2.5.17.1
Surface Resistivity	4.44 x 10^6 MΩ	E-24/125, IPC-TM-650 2.5.17.1
Arc Resistance	180 s	D-48/50 + D-4/23, IPC-TM-650 2.5.1
Dielectric Breakdown	45+ kV NB	D-48/50 + D-4/23, IPC-TM-650 2.5.6
Dk at 1GHz	4.4	RC52%, IPC-TM-650 2.5.5.9
Df at 1GHz	0.010	RC52%, IPC-TM-650 2.5.5.9
Peel Strength, 1oz HTE copper foil	1.3 N/mm	After thermal stress, 288°C / 10s
Peel Strength, 1oz HTE copper foil	1.1 N/mm	125°C
Flexural Strength, LW	550 MPa	IPC-TM-650 2.4.4
Flexural Strength, CW	450 MPa	IPC-TM-650 2.4.4
Water Absorption	0.12%	E-1/105 + D-24/23, IPC-TM-650 2.6.2.1
Flammability	UL94 V-0	C-48/23/50 and E-24/125

What Applications Use S1170G High TG FR4 PCB Material?

S1170G high TG FR4 PCB material is used where halogen-free chemistry, lead-free process support, and stronger heat resistance are needed. Common application areas include consumer electronics, smartphones, automotive electronics, computers, instruments, and multilayer PCB builds.

- **Automotive electronics PCB** Suitable for control modules, electronic units, and boards that need better heat resistance than standard FR4.
- **Industrial control PCB** Useful for control boards, automation modules, power management boards, and equipment that may face long operating cycles.
- **Consumer electronics PCB** Suitable for compact electronic products that need halogen-free FR4 and stable production performance.
- **Smartphone and handheld device PCB** Suitable for selected compact electronic boards where material compliance and process stability matter.
- **Computer and instrument PCB** Suitable for computing equipment, instruments, and measurement-related boards that need high thermal FR4 laminate.
- **Multilayer PCB fabrication** Its lower Z-axis expansion and high Tg rating make it suitable for multilayer structures when stackup and lamination are properly controlled.

Difference between S1170G vs S1150G

S1170G and S1150G are both Shengyi halogen-free FR4 materials, but they serve different thermal performance levels. S1170G is stronger for high Tg needs, while S1150G is a mid-Tg material for general halogen-free FR4 PCB fabrication.

Item	Shengyi S1170G	Shengyi S1150G
Material type	Halogen-free high Tg FR4	Halogen-free mid-Tg FR4
IPC sheet reference	IPC-4101/130	IPC-4101/128
UL ANSI type	FR-15.1	FR-4.1
Tg	180°C by DMA	155°C by DSC
Td	390°C	355°C

Z-axis CTE before Tg	45 ppm/°C	40 ppm/°C
Z-axis CTE after Tg	210 ppm/°C	230 ppm/°C
Z-axis expansion, 50-260°C	2.3%	2.8%
T260	60 min	>60 min
T288	60 min	45 min
Dk at 1GHz	4.4	4.5
Df at 1GHz	0.010	0.011
Water absorption	0.12%	0.10%
Flammability	UL94 V-0	UL94 V-0
Typical fit	Higher thermal stress, halogen-free boards	Mid-Tg halogen-free boards

S1170G gives higher Tg, higher Td, lower Z-axis expansion, and better T288 performance than S1150G. S1150G may still be practical when a mid-Tg halogen-free FR4 laminate is enough for the product requirement.

How Does EBest Support S1170G PCB Fabrication?

EBest supports S1170G PCB fabrication from material review to finished board delivery. Our service helps each project use the right laminate, reduce production risk, and move smoothly from sample build to batch production.

- **Material requirement review** We can check whether Shengyi S1170G matches the drawing note, high Tg requirement, halogen-free requirement, lead-free process, board thickness, and layer structure.
- **DFM review before production** Our team reviews Gerber files, drill files, copper spacing, solder mask clearance, annular rings, routing design, panelization, and special process notes before fabrication starts.
- **Multilayer stackup support** For multilayer PCB builds, we can review laminate and prepreg matching, dielectric thickness, copper balance, impedance needs, lamination feasibility, and warpage risk.
- **Sample to batch production** EBest supports sample runs, small batches, and mass production, helping keep material choice, process control, and quality standards consistent.
- **Controlled PCB manufacturing process** We support drilling, copper plating, solder mask, surface finish, routing, electrical testing, and final inspection for halogen-free FR4 boards with higher thermal requirements.
- **PCBA assembly and component sourcing** Beyond bare board fabrication, EBest can provide component sourcing, SMT assembly, through-hole assembly, functional testing, and turnkey PCBA support.
- **Quality inspection and testing** Our quality process can include incoming material checks, AOI, electrical testing, impedance testing when required, X-ray inspection for assembled boards, and final inspection.
- **Traceability and stable delivery** For automotive electronics, industrial control, medical-related electronics, communication equipment, and LED products, EBest can support production traceability and steady delivery from trial build to repeat orders.
- **Practical technical response** If your drawing only says FR4 S1170G or S1170G material, EBest can help confirm whether extra details are needed, such as Tg method, copper thickness, surface finish, soldering profile, impedance, and material documentation.

FAQs About Shengyi S1170G High Tg FR4 PCB Laminate

Q1: Why do many PCB drawings specify FR4 S1170G?

A1: FR4 S1170G is often used when a board needs halogen-free material, lead-free process support, and stronger heat resistance than mid-Tg FR4. It is suitable for rigid PCB designs that require stable performance through fabrication and assembly.

Q2: Is this laminate only used for demanding electronic products?

A2: Not only. It can be used in automotive electronics, industrial control, consumer electronics, computers, instruments, and multilayer PCB builds. The final choice depends on board structure, soldering process, thermal exposure, and documentation requirements.

Q3: Why does this laminate usually cost more than common FR4?

A3: This laminate offers higher Tg, halogen-free chemistry, stronger thermal resistance, and better suitability for lead-free processing. These material properties usually make it more expensive than basic FR4, but they can also support better production stability.

Q4: Can S1170G PCB material be used for multilayer boards?

A4: Yes. Its high Tg rating and controlled Z-axis expansion make it suitable for multilayer PCB fabrication. For better results, stackup, prepreg matching, copper balance, lamination, drilling, and final testing should be reviewed before production.

Q5: Does this laminate replace RF or microwave laminates?

A5: No. This material is a halogen-free high Tg FR4 laminate. For RF antenna, radar, microwave, or very low-loss signal applications, a dedicated low-loss laminate may be more suitable.

Q6: What should be checked before using this material?

A6: Board thickness, copper weight, layer count, Tg method, surface finish, impedance needs, soldering profile, testing requirements, and material documentation should be checked before production.

Q7: How is it different from S1150G in simple terms?

A7: S1170G has higher Tg, higher Td, lower Z-axis expansion, and better T288 performance. S1150G is a mid-Tg halogen-free FR4 laminate, while this material is better for builds that need stronger heat resistance.

Q8: What files should be sent for a fast S1170G PCB quote?

A8: Please send Gerber files, stackup, finished board thickness, copper thickness, quantity, surface finish, solder mask color, impedance needs, assembly details, and material certificate requirements.

Q9: Can EBest support both bare board fabrication and PCBA?

A9: Yes. EBest can support S1170G PCB fabrication, DFM review, multilayer PCB production, component sourcing, SMT assembly, through-hole assembly, testing, and prototype-to-production delivery.

Get a Fast Quote for S1170G PCB

Looking for a reliable S1170G PCB fabrication partner for halogen-free FR4 boards with higher thermal requirements? Send your Gerber files, stackup, board thickness, copper thickness, quantity, surface finish, and assembly requirements to sales@bestpcbs.com.

EBest will review the material callout, check manufacturability, and provide a fast quotation with practical suggestions for Shengyi S1170G PCB fabrication and assembly. From material confirmation to finished board delivery, our team helps keep your project clear, controlled, and ready for production.