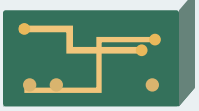


PCB & Electronic Substrate Materials

Rigid & flex laminates | RF dielectrics | chip-package build-up | thermal-management boards

FR-4



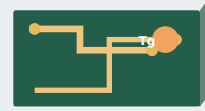
FR-4 glass-epoxy

rigid | Dk ~4.5

Low-cost PCBs, test boards and prototype die carriers.

Variable resin/Tg | not a high heat-spreading substrate

High Tg



High-Tg FR-4

Tg 180 C example

High-reliability multilayers and repeated reflow.

370HR example | Tg is not a continuous-use limit

Cu / PI



Polyimide flex

Cu / PI | flexible

Flex circuits, chip-on-flex and compact interposers.

Adhesiveless variants | control bend strain & copper fatigue

RF lines



Rogers RO4003C

Dk 3.38 | Df .0027

Microwave lines, RF filters and matching networks.

Values @ 10 GHz | model with design Dk and stackup

RF lines



Rogers RO4350B

Dk 3.48 | Df .0037

RF modules with familiar board fabrication processes.

Values @ 10 GHz | UL94 V-0 grade

PTFE RF



PTFE RF laminate

RT/duroid 5880

Very-low-loss antennas and broadband microwave circuits.

Dk 2.20 / Df .0009 @ 10 GHz | special fab care

LCP flex



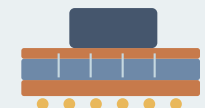
Liquid crystal polymer

LCP | flexible RF

Fine, flexible RF lines, antenna modules and sensors.

Low moisture uptake | qualify lamination and vendor

BGA



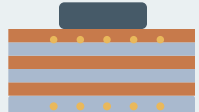
BT resin laminates

BT / glass | IC pkg

CSP, BGA, flip-chip and system-in-package carriers.

Low-CTE grades help limit package warpage

microvias



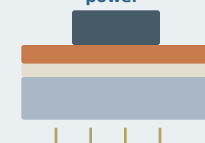
ABF build-up film

dielectric | HDI pkg

Fine-line multilayer IC substrates and microvia layers.

Specialty package processing | not a PCB base core

power



Metal-core / IMS

Al core | insulated

Power electronics and LED heat-spreading circuit boards.

Dielectric controls thermal resistance; usually simpler routing

QUICK PICK: General: FR-4 | Flex: PI | RF: RO4003C/4350B | Lowest RF loss: PTFE | Chip packages: BT/ABF | Power: IMS

Illustrations schematic. Dk/Df depend on frequency & test method. Bonding requires a qualified Cu finish (e.g., ENEPIG) and substrate prep.

Sources: Rogers, Isola, DuPont, Kuraray, Mitsubishi Gas Chemical, Ajinomoto, TCLAD manufacturer literature.