ROGERS CORPORATION

Advanced Circuit Materials

Advanced Circuit Materials Division
100 N Dobson Road
Chandler, AZ 85224
Tel: 480-961-1382, Fax: 480-917-5256
www.rogerscorporation.com

Preliminary Data Sheet

R/flex JADE™ Series

Halogen-Free Adhesive System
Flexible Copper Clad Laminate Materials

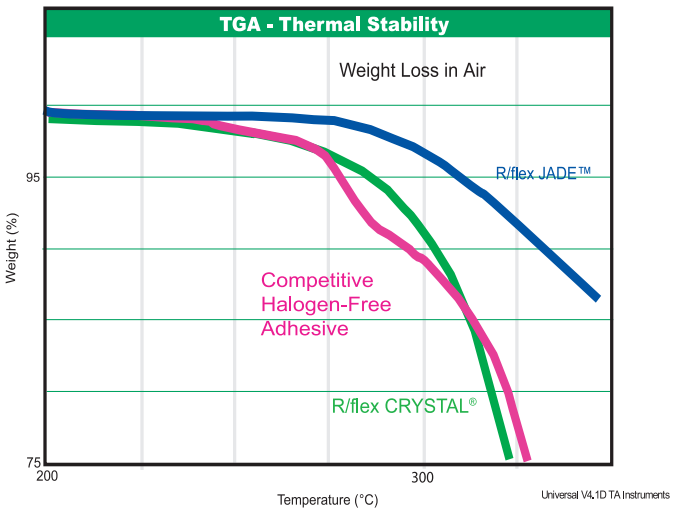
R/flex JADE™ series of flexible copper clad laminate material is the next generation of the industry-leading R/flex CRYSTAL® epoxy product line. R/flex JADE halogen-free flame retardant flexible material was developed to allow our customers to meet the increasing environmental requirements imposed upon commercial applications worldwide without compromising the performance required in today's demanding flexible circuit designs.

R/flex JADE laminate materials display superior thermal stability and are robust enough to withstand multiple passes through lead-free processing. Like the traditional R/flex CRYSTAL product line, R/flex JADE materials offer increased yields and better results in fine-line, tight tolerance designs due to the superior dimensional stability.

The R/flex JADE epoxy adhesive system is specially formulated to process similar to the original R/flex CRYSTAL adhesive. Please contact your Rogers Sales Representative or visit our website at http://www.rogerscorporation.com/acm for detailed fabrication guidelines.

Product Features & Benefits:

- RoHS compliant halogen-free epoxy system.
- High Tg (glass transition temperature) allows for higher temperature exposures, higher yields in multilayer builds, and better flex life despite rigorous processing conditions.
- Superior thermal stability allows R/flex JADE flexible copper laminate to withstand multiple passes through lead-free soldering.
- Superior dimensional stability allows for ease of processing and higher yields in fabrication.
- Transparent adhesive system facilitates optical inspection.



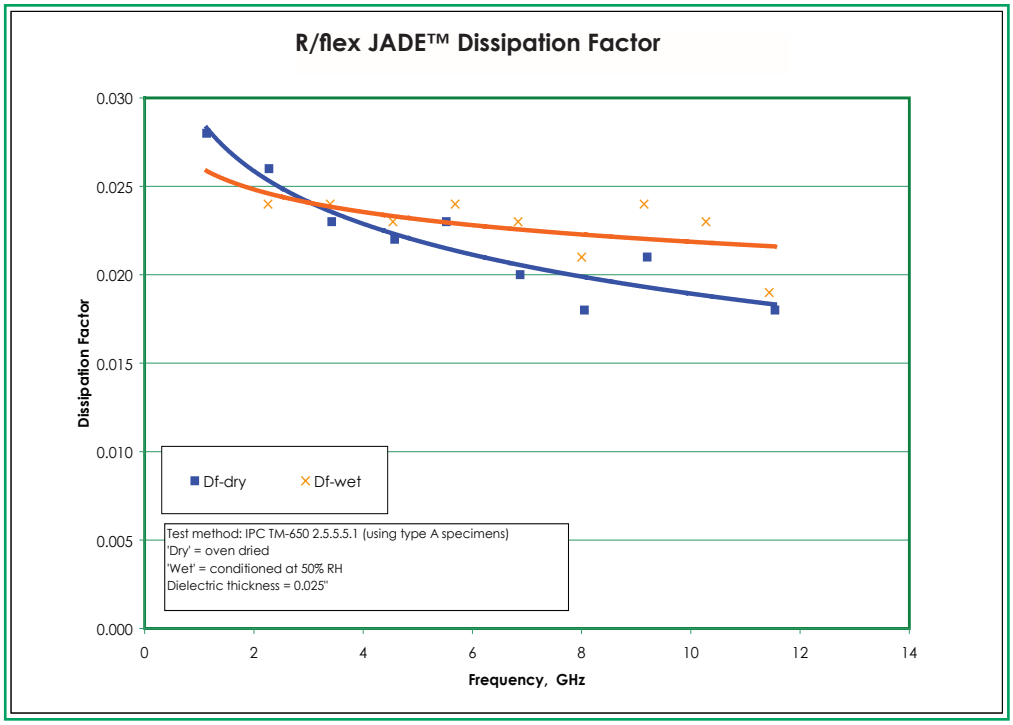
Applications:

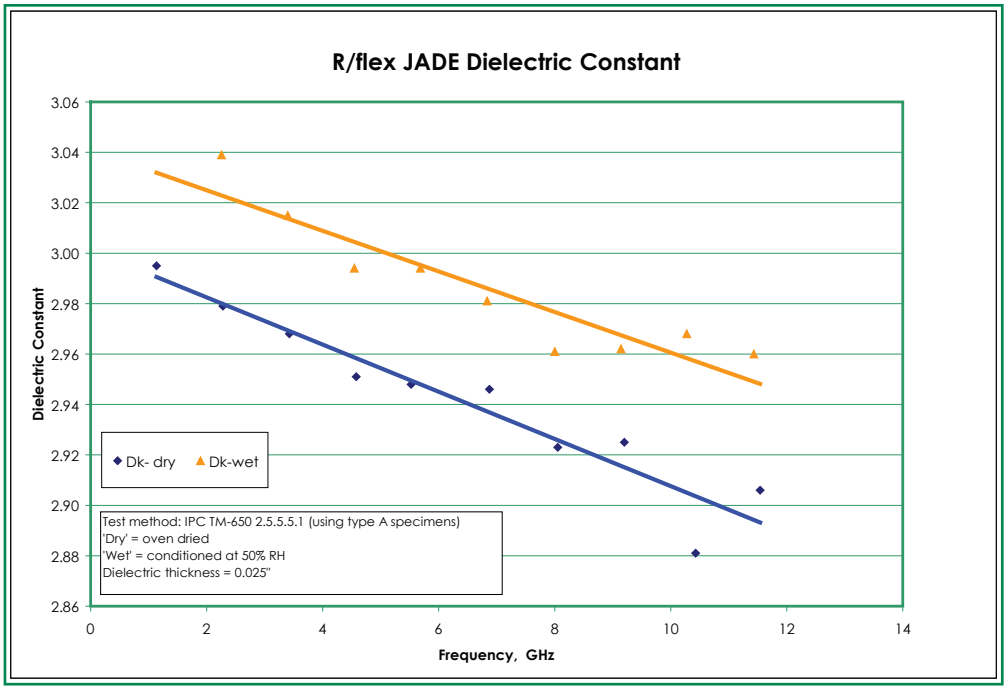
R/flex JADE material is formulated to accomodate the most technically demanding circuit applications: hard disk drives, cellular phones, laptop computers, personal digital assistants, semiconductor packages, and many other uses.

Typical Values

R/flex JADE™ Laminates

Property		Test	Details		Units	Copper Clad Laminates	
						Single Sided	Double Sided
						J590L8H0	J590L8H8
Mechanical Properties							
Peel Strength		IPC-TM-650 method 2.4.9	Method A (as received)		kN/m	1.1	1.1
			After solder float			1.1	1.2
Solder Resistance		IPC-TM-650 method 2.4.13	288°C, 10 sec			PASS	PASS
			288°C, 10 min				
Dimensional Stability		IPC-TM-650 method 2.2.4	Method B	MD	%	0.021	0.058
				CMD		0.081	0.059
			Method C	MD		0.01	0.06
				CMD		0.08	0.05
Flexural Endurance		JIS C 6471	MIT Test R= 0.38mm, Load=500g	w/out CF	Cycles	193	
				w/CF		3955	
Electrical Properties							
Dielectric Constant		IPC-TM-650 method 2.5.5.3	@1MHz		-	3.15	3.2
			@1GHz		-	3.15	3.2
Dissipation Factor			@1MHz		-		0.02
Surface Resistance		IPC-TM-650 method 2.5.17	-		megohms	$>10^9$	10^9
Volume Resistivity			-		megohms- cm	$>10^7$	$>10^7$
Dielectric Strength		ASTM D-149			V/mil	5490	4300
Physical Properties							
Adhesive Tg					°C	>85	>85
Chemical Resistance		IPC-TM-650 Method 2.3.2 Rev. F			%		
Flammability		UL94	File#E122972		-	VTM-0	VTM-0
Polyimide Performance	Tensile Modulus	ASTM D-882	@20°C		GPa	4.1	
	Tensile Strength				MPa	303	
	Elongation				%	90	
	CTE	TMA	100 to 200°C		ppm/°C	16	
	CHE	HMA	@50°C		ppm/%RH	13	
	Moisture Absorption	ASTM D-570	D-24/20		%	2.5	





Environmental Standards:

R/flex JADE™ products contain no cadmium, lead, mercury, hexavalent chromium compounds, PBBs, PBDE's and meet or exceed the following industry standards:

- IEC and JPCA halogen-free requirements
- Emerging RoHS directives

RoHS Compliant

Part Number Description:

Laminate	R/flex J590-L-XXX

Side 1 copper thickness *in oz./ft* ^{2}
Polyimide film thickness in mils
Side 2 copper thickness *in oz./ft*^{2}

Laminate Type	Rogers Part Number	Copper Thickness		Polyimide Thickness	
		oz	µm	mil	µm
Single Sided	J590L8HO	0.5	18	0.5	12.5
Double Sided	J590L8H8	0.5	18	0.5	12.5

Available Configurations:

Many additional configurations are available as non-standards. Please check with your Rogers representative.

Material Construction Information:

R/flex JADE copper clad laminates are constructed with a base dielectric polyimide of Kaneka APICAL® NP film and rolled annealed copper with a standard adhesive thickness of 0.5 mils. The family of R/flex® flexible circuit material is manufactured under rigorous process control. Process capabilities are continuously monitored for critical properties such as peel strength and dimensional stability.

Storage Conditions:

Copper clad laminates do not change physical properties during storage and therefore do not have a shelf life. Long exposure to moisture and elevated temperatures may cause copper surface oxidation. Storage in original packaging, located in a dry, cool environment is recommended.

Applicable Specifications:

Copper Clad Laminates: IPC 4204/4

CONTACT INFORMATION:

USA:	Rogers Advanced Circuit Materials, ISO 9002 Certified	Tel: 480-961-1382	Fax: 480-917-5256
Belgium:	Rogers N.V. - Gent	Tel: +32-9-2353611	Fax: +32-9-2353658
Japan:	Rogers Japan Inc.	Tel: 81-3-5200-2700	Fax: 81-3-5200-0571
Taiwan:	Rogers Taiwan Inc.	Tel: 886-2-86609056	Fax: 886-2-86609057
Korea:	Rogers Korea Inc.	Tel: 82-31-716-6112	Fax: 82-31-716-6208
Singapore:	Rogers Technologies Singapore Inc.	Tel: 65-747-3521	Fax: 65-747-7425
China:	Rogers (Shanghai) International Trading Co. Ltd.	Tel: 86-21-63916088	Fax: 86-21-63915060

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