ROGERS CORPORATION

Data Sheet

RT/duroid® 6035HTC

High Frequency Laminate

RT/duroid® 6035HTC high frequency circuit materials are ceramic filled PTFE composites for use in high power RF and microwave applications.

With a thermal conductivity of almost 2.4 times the standard RT/duroid 6000 products, and copper foil (electrodeposited and reverse treat) with excellent long term thermal stability, RT/duroid 6035HTC laminates are an exceptional choice for high power applications.

Rogers advanced filler system enables excellent drill ability, reducing drilling costs as compared to standard high thermally conductive laminates which use alumina fillers.

Features/Benefits:

High Thermal conductivity
- Improved dielectric heat dissipation enables lower operating temperatures for high power applications

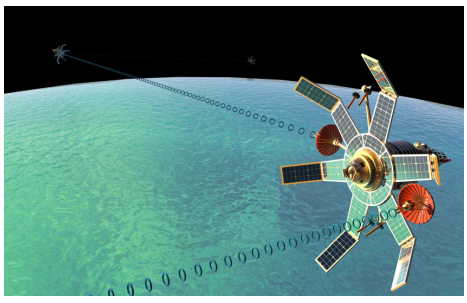
Low loss tangent
- Excellent high frequency performance

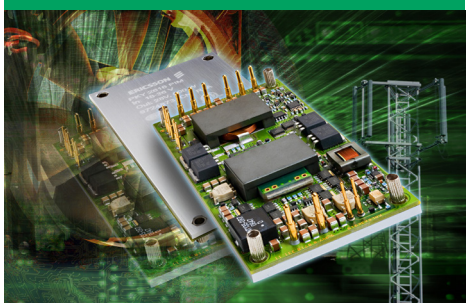
Thermally stable low profile and reverse treat copper foil
- Lower insertion loss and excellent thermal stability of traces

Advanced filler system
- Improved drill ability and extended tool life compared to alumina-containing circuit materials

Some Typical Applications:

- High power RF and microwave amplifiers
- Power amplifiers, couplers, filters, combiners, power dividers





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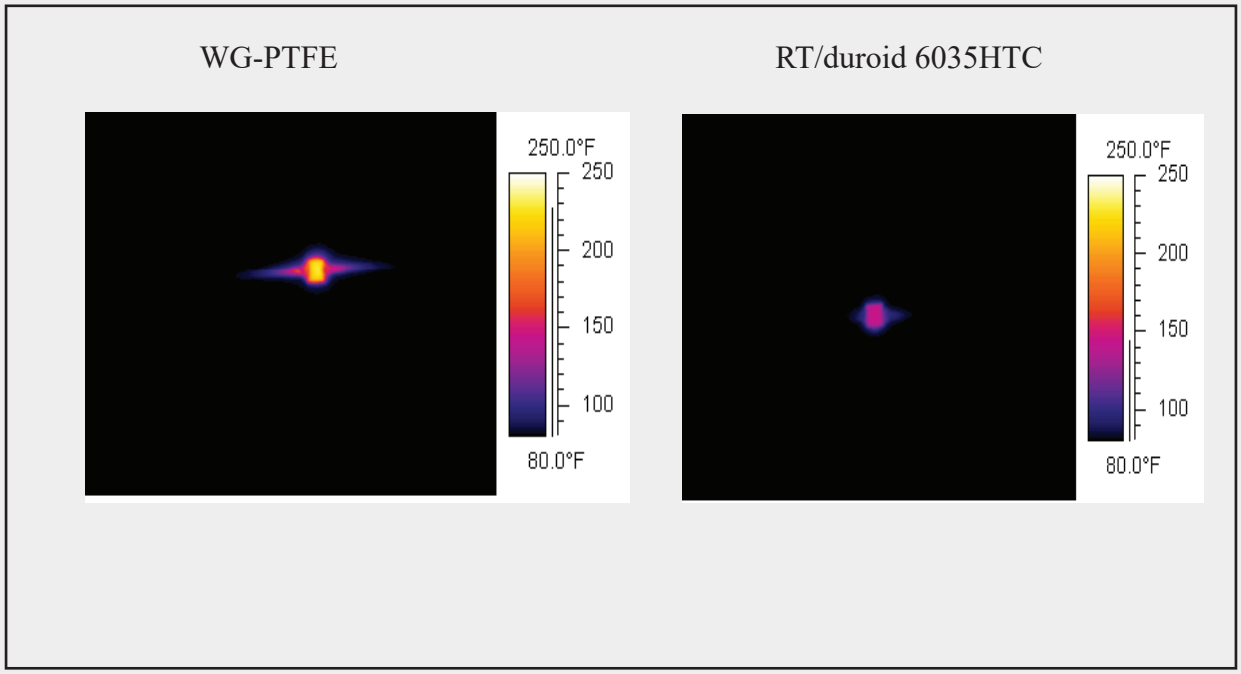
At increasing power levels, Rogers measured the heat rise of a resistor placed on a microstrip circuit attached to a controlled heat sink. Thermal imaging was used to generate temperature rise data.

Comparison of WG-PTFE and RT/duroid 6035HTC laminate Thermal Images at 4 Watts:



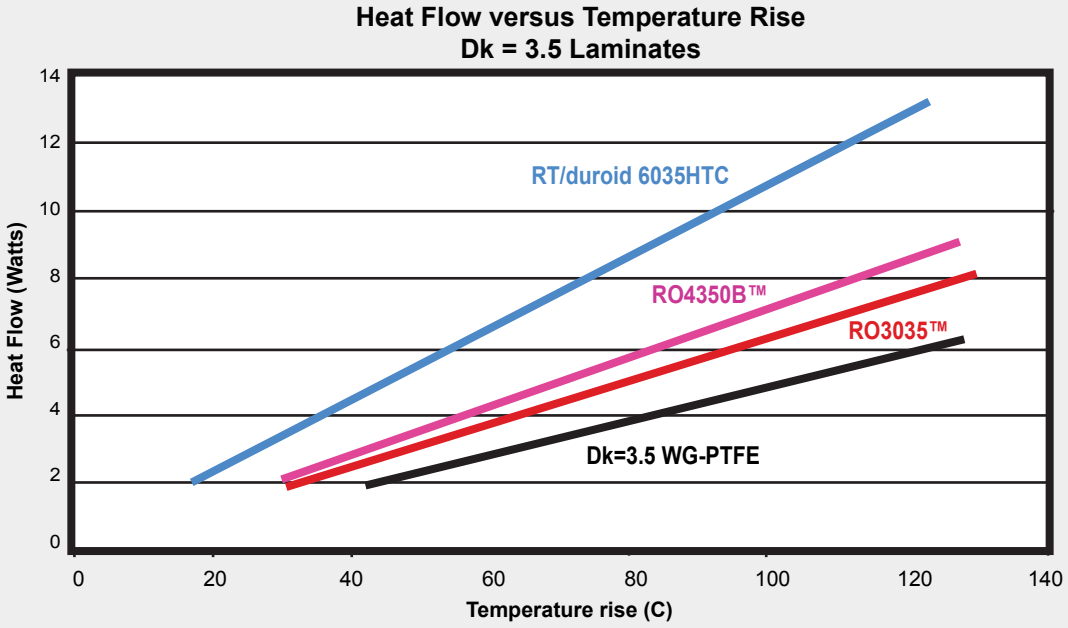


Chart 1. Four different 3.5 Dk laminate materials were tested, and the RT/duroid 6035HTC laminate most effectively dissipated heat away from the resistor to enable the lowest temperature rise.

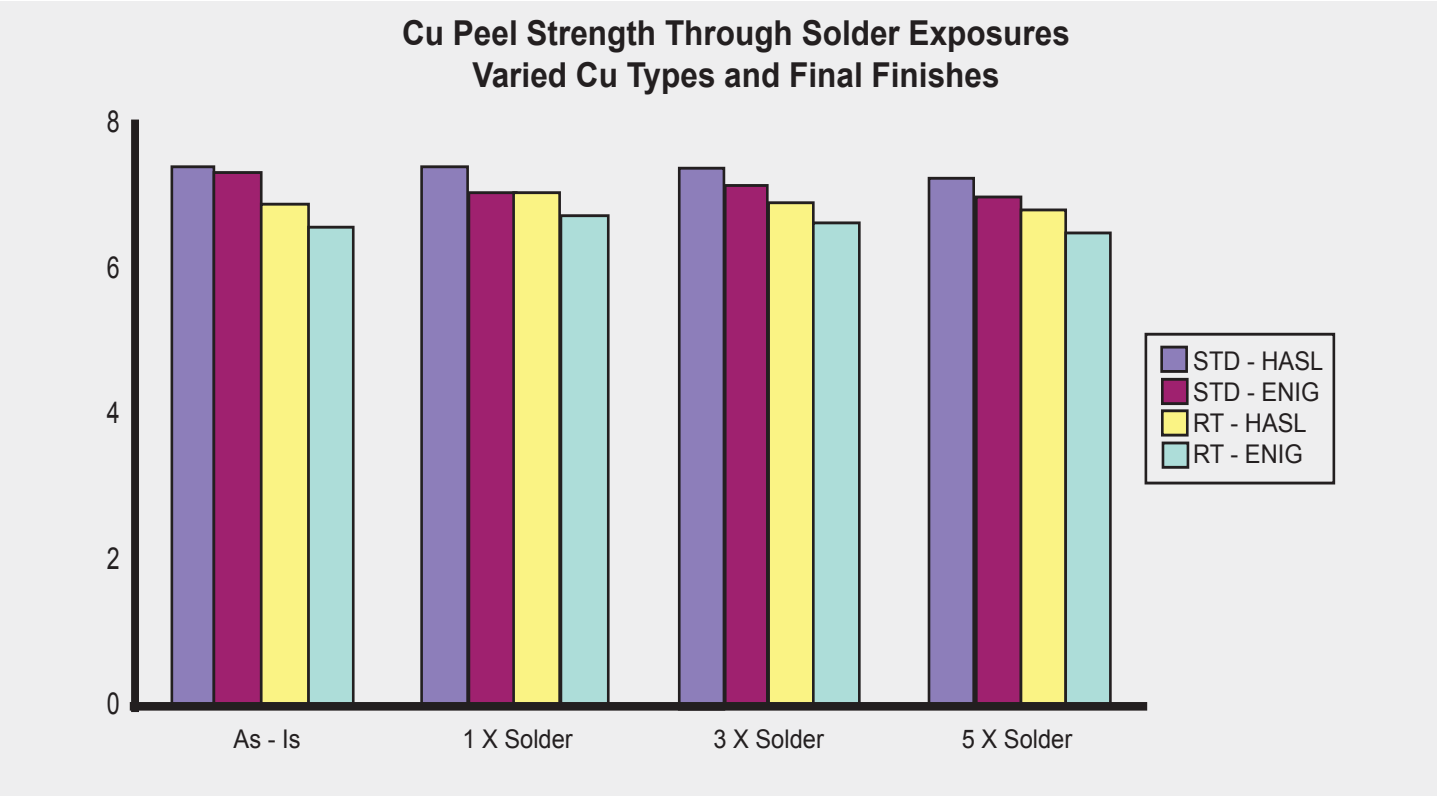


Chart 2. Illustrates the stable copper peel strength maintained on 0.125" copper trace widths after multiple sixty-second exposures to 288°C(550°F) solder. Rogers matched copper foils to RT/duroid 6035HTC, which exhibit excellent thermal stability after multiple high temperature exposures enabling long-term reliability of circuitry for high power, high temperature applications.

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Property	Typical Value [1] RT/duroid 6035HTC	Direction	Units	Condition	Test Method
Dielectric Constant, ε_r Process	3.50 ± 0.05	Z	-	10 GHz/23°C	IPC-TM-650 2.5.5.5 Clamped Stripline
[2]Dielectric Constant, ε_r Design	3.6	Z	-	8 GHz - 40 GHz	Differential Phase Length Method
Dissipation Factor,	0.0013	Z	-	10 GHz/23°C	IPC-TM-650, 2.5.5.5
Thermal Coefficient of ε_r	-66	Z	ppm/°C	-50°C to 150°C	mod IPC-TM-650, 2.5.5.5
Dielectric Strength	835	-	V/Mil	15 mil thickness	IPC-TM-650, 2.5.6.2
Breakdown Voltage	12.59	-	kV	15 mil thickness	IPC-TM-650, 2.5.6
Volume Resistivity	10^8	-	MΩ•cm	COND A	IPC-TM-650, 2.5.17.1
Surface Resistivity	10^8	-	MΩ	COND A	IPC-TM-650, 2.5.17.1
Tensile Modulus	329 244	MD CMD	kpsi	40 hrs @ 23°C/50RH	ASTM D638
Dimensional Stability	-0.11 -0.08	CMD MD	mm/m (mils/inch)	0.030" 1 oz EDC foil Thickness after etch +E4/105	IPC-TM-650, 2.4.39A
Coefficient of Thermal Expansion (-55 to 288 °C)	19	X	ppm/°C	23°C/50% RH	IPC-TM-650 2.4.41
	19	Y			
	39	Z			
Thermal Conductivity	1.44	-	W/m/K	80°C	ASTM C518
Moisture Absorption	0.06	-	%	D24/23	IPC-TM-650 2.6.2.1 ASTM D570
Density	2.2	-	gm/cm^3	23°C	ASTM D-792
Copper Peel Strength	7.9	-	pli	20 sec.@ 288°C	IPC-TM-650 2.4.8
Flammability	V-0	-	-	-	UL 94
Lead-Free Process Compatible	YES				

[1] Typical values are a representation of an average value for the population of the property. For specification values contact Rogers Corporation.
[2] The design Dk is an average number from several different tested lots of material and on the most common thickness/s. If more detailed information is required, please contact Rogers Corporation. Refer to Rogers' technical paper "Dielectric Properties of High Frequency Materials" available at https://www.rogerscorp.com.

Standard Thickness	Standard Panel Size:	Standard Copper Cladding
0.010" (0.254mm) 0.020" (0.508mm) 0.030" (0.762mm) 0.060" (1.524mm)	12" X 18" (305 X457mm) 24" X 18" (610 X 457mm)	½ oz. (18µm) Electrodeposited copper foil (HH/HH)
		1 oz. (35µm) Electrodeposited copper foil (H1/H1)
		2 oz. (70µm) Electrodeposited copper foil (H2/H2)
		½ oz. (18µm) Reverse treat copper foil (SH/SH)
		1 oz. (35µm) Reverse treat copper foil (S1/S1)

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