



Hydrocarbon polymer ceramic copper-clad laminates series

Hydrocarbon polymer ceramic copper laminates with woven fiberglass is a thermosetting resin system, which has better insulation performance and heat treatment ability, especially suitable for lead-free welding process. Excellent heat conduction.

Low thermal expansion coefficient improves the reliability and dimensional stability of the plating through hole.

Besides, the laminates compatible with most PP films, especially suitable for the manufacturing of multilayer of PCB. WL-CT300/WL-CT330/WL-CT338 are ideal materials for antenna, sensor, LBN and other products. WL-CT350 is an ideal material for power amplifier, radar and other products. The dielectric constant of WL-CT440 is consistent with that of FR4, which is a preferred material between high frequency and FR4.

Applications: 4G/5G base station antenna, WIMAX antenna network, automotive radar, sensor, Power amplifier, high reliability radar, LNB, measurement and mapping antenna, distributed antenna, RF device, microwave device, coupling device, combiner, UAV, navigation antenna, small base station antenna, etc.



Product	Material Composition		Dk(ϵ_r)@10G HZ &Tolerance	Tg	Td	TcDk (ppm/°C) (Typical)	Df Loss Tangent,Df @10GHZ	Peel Strength (N/cm) (1OZ)	Thermal Conductivity (W/m/°k)	Coefficient of Thermal Expansion -50°~260°C (ppm/°C)			Volume Resistivity (Mohm.cm)	Surface Resistivity (Mohm)	Moisture Absorption (%)	Density (g/cm ³)	Flamma bility Rating UL 94	Halogen	PIM (dBc)
	Dielectric layer	Copper foil		°C	°C					X	Y	Z							
WL-CT338	Hydrocarbon/Ceramic/Woven glass	ED	3.38±0.05	>280	421	45	0.0029	10.0	0.70	14	16	50	≥6×10 ⁹	≥7.0×10 ⁸	0.04	1.78	NON FR	NO	/
		RTF																	7.2
WL-CT350	Hydrocarbon/Ceramic/Woven glass	ED	3.48±0.05	>280	386	52	0.0040	8.5	0.70	11	14	34	≥1×10 ⁹	≥4.0×10 ⁸	0.05	1.90	V-0	YES	/
		RTF																	7.2



Prepreg and Bonding Film

Product	Material Composition	Thickness(mm)&Tolerance	Size (mm)	Dk(ϵ_r)@10G HZ &Tolerance	Tg	Td	Df Loss Tangent, Df @10GHZ	Peel Strength (N/cm) (1OZ)	Thermal Conductivity (W/m/°k)	Coefficient of Thermal Expansion -50°~260°C (ppm/°C)			Volume Resistivity (Mohm.cm)	Surface Resistivity (Mohm)	Moisture Absorption (%)	Density (g/cm ³)	Flammability Rating UL 94	Halogen	Lead free treatment compatible
					°C	°C				X	Y	Z							
WL-PP350	Hydrocarbon /Ceramic/Woven glass	0.10±0.01	460*610	3.50±0.05	>280	386	0,0042	8.0	0.7	20	18	52	6×10 ⁸	1.0×10 ⁷	0.09	1.85	V-0	-	-



Thickness Tolerance Copper Size

Product	Standard Dielectric thickness and Tolerance		Available Copper foil	Standard Panel Sizes	
WL-CT338	(Choosing ED Copper): 0.102mm(4mil)±0.01mm(0.4mil) 0.305mm(12mil)±0.025mm(1mil) 0.508mm(20mil)±0.038mm(1.5mil) 0.813mm(32mil)±0.05mm(2mil)	0.203mm(8mil)±0.025mm(1mil) 0.406mm(16mil)±0.038mm(1.5mil) 0.711mm(28mil)±0.05mm(2mil) 1.524mm(60mil)±0.1mm(4mil)	0.508 (20mil), 0.1mm (4mil), 3.05mm (120mil) (Non-standard thickness starts from 0.508(20mil) increasing. More than 3.05 mm (120mil), please contact us.)	0.5oz(18μm), 1oz(35μm) ED Copper Foil	460mm*610mm (18" X 24") 915mm*1220mm (36" X 48")
	(Choosing RTF Copper): 0.526mm(20.71mil)±0.038mm(1.5mil) 1.542mm(60.7mil)±0.1mm(4mil)	0.831mm(32.7mil)±0.05mm(2mil) 2.05mm(80.7mil)±0.127mm(5mil)		0.5oz(18μm), 1oz(35μm) Reverse Treated Copper Foil(RTF)	
WL-CT350	(Choosing ED Copper): 0.102mm(4.0mil)±0.018mm(0.7mil) 0.254mm(10mil)±0.0254mm(1mil) 0.422mm(16.6mil)±0.038mm(1.5mil) 0.762mm(30mil)±0.05mm(2mil) 1.524mm(60mil)±0.1mm(4mil)	0.168mm(6.6mil)±0.018mm(0.7mil) 0.338mm(13.3mil)±0.038mm(1.5mil) 0.508mm(20mil)±0.038mm(1.5mil) 1.016mm(40mil)±0.076mm(3mil) 3.05mm(120mil)±0.15mm(6mil)	0.508 (20mil), 0.0838 (3.3mil), 6.1mm (240mil) (Non-standard thickness starts from 0.508(20mil), with 0.0838(3.3 Mil) increase. More than 6.1 mm (240mil), please contact us.)	0.5oz(18μm), 1oz(35μm) ED Copper Foil	460mm*610mm (18" X 24") 915mm*1220mm(36" X 48")
	(Choosing RTF Copper): 0.272mm(10.7mil)±0.0254mm(1mil) 0.78mm(30.7mil)±0.05mm(2mil) 1.542mm(60.7mil)±0.1mm(4mil)	0.526mm(20.7mil)±0.038mm(1.5mil) 1.034mm(40.7mil)±0.076mm(3mil) 3.066mm(120mil)±0.127mm(6mil)		0.5oz(18μm), 1oz(35μm) Reverse Treated Copper Foil(RTF)	

Comparison table of Wangling materials

Product Type		Resin System Система смол	DK	DF	Foreign Manufacturers	
					ROGERS	TACONIC
F4BM(E)-2	F4BM(E)-2-A	PTFE+Woven glass	2.17~3.0 (Between 2.17 and 3.0)	0.001~0.0015 (Between 0.001 and 0.0015)	Cuclad (series) : cuclad217 DK2.17 2.2 cuclad233 DK2.33 cuclad250 DK2.4~2.55	TLY-3 DK2.33, TLX-0, 9, 8, 7, 6 DK2.45~2.65, TLA-6 DK2.62
Di clad (series) : diclad880(B) DK2.17 2.2 diclad870(B) DK2.33 diclad527(B) DK2.4~2.6						
AD (series) : AD250C DK2.5 AD255C DK2.55 AD260C DK2.6 AD300A DK3.0						
F4BTM(E)-2		PTFE+Ceramic + Woven glass	2.55~6.15 (Between 2.55 and 6.15)	0.0015~0.003 (Between 0.0015 and 0.003)	AD (series) : AD250C DK2.5 AD255C DK2.55 AD260C DK2.6 AD300C DK3.0 AD320A DK3.2 AD350A DK3.5 AD410L DK4.1 AD430L DK4.3 AD450L DK4.5	RF-30A DK2.97 RF-30 DK3.0 RF-35 DK3.5 RF-41,43,45 DK4.1~4.5 TLC-30,32,33,35 TLF-35A DK3.5
TP-2		PPO+Ceramic	3.0~25 (Between 3.0 and 25)	0.001~0.0015 (Between 0.001 and 0.0015)	Unique materials of Wangling	
TF-2		PTFE+Ceramic	3.0~25 (Between 3.0 and 25)	0.001~0.0015 (Between 0.001 and 0.0015)		
TFA	TFA294	PTFE+Ceramic	2.94	0.001	RT6002	/
	TFA300		3	0.001	RO3003	NF30
	TFA615		6.15	0.0022	RT6006 RO3006	RF60 RF-60A
	TFA1020		10.2	0.0025	RT6010 RO3010	RF10 CER-10 DK10.0
F4BTMS	F4BTMS220	PTFE+Superfine woven glass	2.2	0.0009	RT5880	TLY-5
	F4BTMS294		2.94	0.0012	CLTE-XT	TSM-DS3M
	F4BTMS300	PTFE+Ceramic +Superfine woven glass	3	0.0013	CLTE, CLTE-AT	TSM-DS3
WL-CT	WL-CT300	Hydrocarbon+ Ceramic+ Woven glass	3	0.003	RO4730G3	/
	WL-CT330		3.3	0.0026	RO4533	/
	WL-CT338		3.38	0.0029	RO4003C	/
	WL-CT350		3.48	0.004	RO4350B	/
	WL-CT440		4.4	0.005	KAPPA438	/

	WL-CT615		6.15	0.004	RO4360G2	/
	WL-PP300		3	0.0028	/	/
	WL-PP350		3.5	0.004	RO4450F	/

Серия ламинатов из углеводородной полимерной керамики с медным покрытием

Ламинаты из углеводородной полимерной керамики с медным покрытием с тканым стекловолокном представляют собой структуру термореактивной смолы, которая обладает лучшими изоляционными характеристиками и способностью к термообработке, отлично подходит для процесса бессвинцовой пайки. Обладает отличной теплопроводностью.

Низкий коэффициент теплового расширения повышает надежность и стабильность параметров металлизации сквозного отверстия.

Кроме того, ламинаты, совместимые с большинством PP пленок, отлично подходят для изготовления многослойных печатных плат. WL-CT300/WL-CT330/WL-CT338 являются идеальными материалами для изготовления антенн, датчиков, LBN и других изделий. WL-CT350 — идеальный материал для усилителей мощности, радаров и других изделий. Диэлектрическая проницаемость WL-CT440 соответствует диэлектрической проницаемости FR4, который является предпочтительным материалом при выборе между высокочастотным материалом и FR4.

Области применения: антенна базовой станции 4G/5G, антенная сеть WIMAX, автомобильный радар, датчик, усилитель мощности, высоконадежный радар, LNB, измерительная и картографическая антенна, распределенная антенна, радиочастотное устройство, микроволновое устройство, соединительное устройство, сумматор, БПЛА, навигационная антенна, небольшая антенна базовой станции и т. д.

Продукт	Состав материала		Dk(εr)@10 GHz и допуск	Tg	Td	TcDk (ppm/°C) (Типичное значение)	Тангенс угла потерь Df, Df @ 10 GHz	Прочность на отрыв (N/cm) (1OZ)	Теплопроводность (W/m/°k)	Коэффициент температурного расширения -50°~260°C (ppm /°C)			Объемное удельное сопротивление (Mohm.cm)	Удельное поверхностное сопротивление (Mohm)	Поглощение влаги (%)	Плотность (g/cmt)	Рейтинг воспламеняемости и UL 94	Галоген	PIM (dBc)
	Слой диэлектрика	Медная фольга		°C	°C					X	Y	Z							
WL-CT338	Hydrocarbon/Ceramic/Woven glass Углеводород/керамика/тканое волокно	ED	3.38±0.05	>280	421	45	0.0029	10.0	0.70	14	16	50	≥6×10 ⁹	≥7.0×10 ⁸	0.04	1.78	NON FR	NO	/
		RTF						7.2											≤-157
WL-CT350	Углеводород/керамика/тканое волокно	ED	3.48±0.05	>280	386	52	0.0040	8.5	0.70	11	14	34	≥1×10 ⁹	≥4.0×10 ⁸	0.05	1.90	V-0	YES	/
		RTF						7.2											≤-157

Препрег и связующая пленка

Продукт	Состав материала	Толщина (mm) и допуск	Размер (mm)	Dk(εr)@10 GHz и допуск	Tg	Td	Тангенс угла потерь Df, Df @ 10 GHz	Прочность на отрыв (N/cm) (1OZ)	Теплопроводность (W/m/°k)	Коэффициент температурного расширения -50°~260°C (ppm /°C)			Объемное удельное сопротивление (Mohm.cm)	Удельное поверхностное сопротивление (Mohm)	Поглощение влаги (%)	Плотность (g/cm ³)	Рейтинг воспламеняемости и UL 94	Галогены
					°C	°C				X	Y	Z						
WL-PP350	Hydrocarbon/Ceramic/Woven glass	0.10±0.01	460*610	3.50±0.05	>280	386	0,0042	8.0	0.7	20	18	52	6×10 ⁸	1.0×10 ⁷	0.09	1.85	V-0	-



Размер допуска по толщине меди

Продукт	Стандартная толщина и допуск диэлектрика		Медная фольга в наличии	Стандартные размеры панелей	
WL-CT338	(Choosing ED Copper): 0.102mm(4mil)±0.01mm(0.4mil) 0.305mm(12mil)±0.025mm(1mil) 0.508mm(20mil)±0.038mm(1.5mil) 0.813mm(32mil)±0.05mm(2mil)	0.203mm(8mil)±0.025mm(1mil) 0.406mm(16mil)±0.038mm(1.5mil) 0.711mm(28mil)±0.05mm(2mil) 1.524mm(60mil)±0.1mm(4mil)	0.508 (20mil), 0.1mm (4mil), 3.05mm (120mil) (Non-standard thickness starts from 0.508(20mil) increasing. More than 3.05 mm (120mil), please contact us.)	0.5oz(18µm), 1oz(35µm) ED Copper Foil	460mm*610mm (18" X 24") 915mm*1220mm (36" X 48")
	(Choosing RTF Copper): 0.526mm(20.71mil)±0.038mm(1.5mil) 1.542mm(60.7mil)±0.1mm(4mil)	0.831mm(32.7mil)±0.05mm(2mil) 2.05mm(80.7mil)±0.127mm(5mil)		0.5oz(18µm), 1oz(35µm) Reverse Treated Copper Foil(RTF)	
WL-CT350	(Choosing ED Copper): 0.102mm(4.0mil)±0.018mm(0.7mil) 0.254mm(10mil)±0.0254mm(1mil) 0.422mm(16.6mil)±0.038mm(1.5mil) 0.762mm(30mil)±0.05mm(2mil) 1.524mm(60mil)±0.1mm(4mil)	0.168mm(6.6mil)±0.018mm(0.7mil) 0.338mm(13.3mil)±0.038mm(1.5mil) 0.508mm(20mil)±0.038mm(1.5mil) 1.016mm(40mil)±0.076mm(3mil) 3.05mm(120mil)±0.15mm(6mil)	0.508 (20mil), 0.0838 (3.3mil), 6.1mm (240mil) (Non-standard thickness starts from 0.508(20mil), with 0.0838(3.3 Mil) increase. More than 6.1 mm (240mil), please contact us.)	0.5oz(18µm), 1oz(35µm) ED Copper Foil	460mm*610mm (18" X 24") 915mm*1220mm(36" X 48")
	(Choosing RTF Copper): 0.272mm(10.7mil)±0.0254mm(1mil) 0.78mm(30.7mil)±0.05mm(2mil) 1.542mm(60.7mil)±0.1mm(4mil)	0.526mm(20.7mil)±0.038mm(1.5mil) 1.034mm(40.7mil)±0.076mm(3mil) 3.066mm(120mil)±0.127mm(6mil)		0.5oz(18µm), 1oz(35µm) Reverse Treated Copper Foil(RTF)	

Сравнительная таблица материалов Wangling

Тип продукта		Система смол	DK	DF	Иностранные производители	
					ROGERS	TACONIC
F4BM(E)-2	F4BM(E)-2-A	PTFE+Woven glass	2.17~3.0 (Between 2.17 and 3.0)	0.001~0.0015 (Between 0.001 and 0.0015)	Cuclad (series) : cuclad217 DK2.17 2.2 cuclad233 DK2.33 cuclad250 DK2.4~2.55	TLY-3 DK2.33, TLX-0, 9, 8, 7, 6 DK2.45~2.65, TLA-6 DK2.62
Diclad (series) : diclad880(B) DK2.17 2.2 diclad870(B) DK2.33 diclad527(B) DK2.4~2.6						
AD (series) : AD250C DK2.5 AD255C DK2.55 AD260C DK2.6 AD300A DK3.0						
F4BTM(E)-2	PTFE+Ceramic + Woven glass	2.55~6.15 (Between 2.55 and 6.15)	0.0015~0.003 (Between 0.0015 and 0.003)	AD (series) : AD250C DK2.5 AD255C DK2.55 AD260C DK2.6 AD300C DK3.0 AD320A DK3.2 AD350A DK3.5 AD410L DK4.1 AD430L DK4.3 AD450L DK4.5	RF-30A DK2.97 RF-30 DK3.0 RF-35 DK3.5 RF-41,43,45 DK4.1~4.5 TLC-30,32,33,35 TLF-35A DK3.5	
TP-2	PPO+Ceramic	3.0~25 (Between 3.0 and 25)	0.001~0.0015 (Between 0.001 and 0.0015)	Уникальные материалы Wangling		
TF-2	PTFE+Ceramic	3.0~25 (Between 3.0 and 25)	0.001~0.0015 (Between 0.001 and 0.0015)			
TFA	TFA294	PTFE+Ceramic	2.94	0.001	RT6002	/
	TFA300		3	0.001	RO3003	NF30
	TFA615		6.15	0.0022	RT6006 RO3006	RF60 RF-60A
	TFA1020		10.2	0.0025	RT6010 RO3010	RF10 CER-10 DK10.0
F4BTMS	F4BTMS220	PTFE+Superfine woven glass	2.2	0.0009	RT5880	TLY-5
	F4BTMS294		2.94	0.0012	CLTE-XT	TSM-DS3M
	F4BTMS300	PTFE+Ceramic +Superfine woven glass	3	0.0013	CLTE, CLTE-AT	TSM-DS3
WL-CT	WL-CT300	Hydrocarbon+ Ceramic+ Woven glass	3	0.003	RO4730G3	/
	WL-CT330		3.3	0.0026	RO4533	/
	WL-CT338		3.38	0.0029	RO4003C	/
	WL-CT350		3.48	0.004	RO4350B	/
	WL-CT440		4.4	0.005	KAPPA438	/

	WL-CT615		6.15	0.004	RO4360G2	/
	WL-PP300		3	0.0028	/	/
	WL-PP350		3.5	0.004	RO4450F	/