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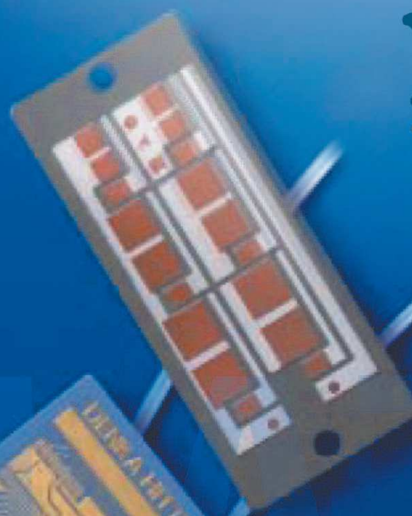
Denka HITTPLATE



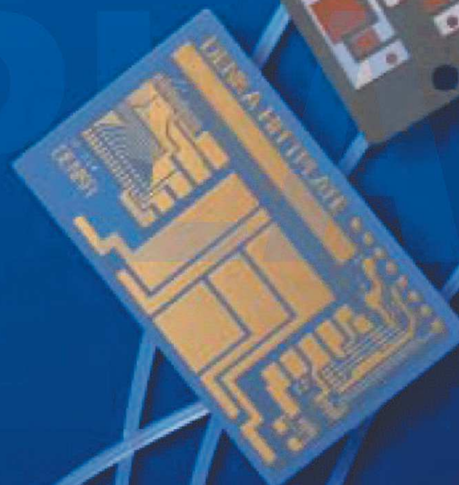


表2.　絶縁伝熱層の一般的特性（代表値）　General characteristics of thermally conductive dielectric layer (typical values)

物性項目	単　位 Unit	汎用grade K-1	汎用高耐熱grade M-2	高熱伝導grade TH-1	超高熱伝導grade B-1	高信頼性grade EL-1
熱伝導率 Thermal conductivity	W/mK (RT)	2.0	2.0	4.0	8.0	2.5
体積抵抗率 Volume resistivity	Ω·cm (RT)	$>10^{13}$	$>10^{13}$	$>10^{13}$	$>10^{13}$	$>10^{12}$
熱膨張率 Coefficient of thermal expansion	$\times10^{-5}$/℃ (RT~400℃)	7.8	7.0	6.7	3.3	8.9
ヤング率 Young's modulus	$\times10^{10}$Pa (20℃)	1.3	1.2	2.3	3.3	1.1
ポアソン比 Poisson's ratio	—	0.3	0.27	0.34	0.26	0.38 (calculation vale)
ガラス転移点 Glass transition point	℃	104	120	165	165	57

UL規格　UL regulation

表3.

	E84531 積層板　Laminated plate			E94793 プリント基板　Printed wiring board		
	難燃性 Flame resistance	TI	CTI	難燃性 Flame resistance	最高使用温度 Maximum operating temp.	Multiple solder limits
K-1	94V-0	115℃	500+	94V-0	115℃	100℃/1min 200℃/2min 270℃/1min 200℃/1min
M-2	94V-0	155℃	600	94V-0	155℃	270℃/2min 300℃/1min 200℃/2min 200℃/1min
TH-1	94V-0	105℃	600	94V-0	105℃	100℃/1min 200℃/2min 270℃/1min 200℃/1min
B-1	94V-0	—	—	94V-0	—	270℃/2min 300℃/1min 200℃/2min 200℃/1min

試験項目 Test items		処理条件 Treatment conditions	K-1 80μm	M-2 80μm	TH-1 125μm	B-1 125μm	EL-1 110μm
1. 熱抵抗 Thermal resistance (℃/W)	常態 Normal condition	C-95/20/65	0.53	0.50	0.45	0.36	0.49
2. 絶縁破壊電圧 Dielectric breakdown voltage (JIS C 2110) (AC kV)	常態 Normal condition	C-95/20/65	>3.0	>3.0	>4.0	>4.0	>4.0
	高温処理 High temperature	E-1000/125	>3.0	>3.0	>4.0	>3.0	>3.0
	高温処理 High temperature	Floating on solder bath, 260℃,30min	>3.0	>3.0	>4.0	>3.0	>3.0
	ヒートショック Heat shock	+150℃,30min⇄-50℃, 30min:1000cycles	>3.0	>3.0	>4.0	>3.0	>3.0
	吸湿処理 Moisture absorption	C-1000/85/85	>3.0	>3.0	>4.0	>3.0	>3.0
3. 銅箔ピール強度 Cu-foil peeling strength (JIS C 6481) (N/cm)	常態 Normal condition	C-95/20/65	17.6	17.6	17.6	17.6	17.6
	高温処理 High temperature	E-1000/150	17.6	17.6	17.6	17.6	17.6
	高温処理 High temperature	Dipping in solder bath, 260℃,30min	17.6	17.6	17.6	17.6	17.6
	ヒートショック Heat shock	+150℃,30min⇄-50℃, 30min:1000cycles	17.6	17.6	17.6	17.6	17.6
	吸湿処理 Moisture absorption	C-500/85/85	17.6	17.6	17.6	17.6	13.6
4. 半田耐熱 Solder heat resistance	高温処理 High temperature	C-95/20/85+Floating on solder bath,260℃,30min	外観異常なし No abnormality in appearance	外観異常なし No abnormality in appearance	外観異常なし No abnormality in appearance	外観異常なし No abnormality in appearance	外観異常なし No abnormality in appearance
5. 耐薬品性 Chemical resistance (in accordance with JIS C 6481)	フロン Freon	A Dipping,25℃,5min	//	//	//	//	//
		A Leaving,46.5℃ (vapor),30min	//	//	//	//	//
	トリクレン Trichlene	A Dipping,25℃,5min	//	//	//	//	//
6. 吸水量 Water absorbing capacity (in accordance with JIS C 5020) (mg/80×80)		C-15/23/90	<4	測定中 Under measurement	<4	測定中 Under measurement	<4
		C-24/23/90	<4	測定中 Under measurement	<4	測定中 Under measurement	<4
7. 端子引張強度 Terminal tensile strength (N/4mm²)	常態 Normal condition	C-96/23/65	>98	>98	>98	>98	>98
8. 比誘電率 Dielectric constant	常態 Normal condition	C-96/25/65,at100kHz	7.1	4.4	7.7	7.5	7.4
9. 誘電正接 Dielectric loss tangent	常態 Normal condition	C-96/25/55,at100kHz	0.004	0.004	0.005	0.007	0.024
10. 静電容量 Capacitance (μF/m²)	常態 Normal condition	C-96/25/65	73	44	55	53	53
11. 表面抵抗 Surface resistance (Ω)	常態 Normal condition	C-96/25/65	$>10^{13}$	$>10^{13}$	$>10^{13}$	$>10^{13}$	$>10^{12}$
	吸湿処理 Moisture absorption	C-500/85/85	$>10^{12}$	$>10^{12}$	$>10^{12}$	$>10^{12}$	$>10^{11}$
12. 体積抵抗率 Volume resistibility (Ω・cm)	常態 Normal condition	C-96/25/65	$>10^{13}$	$>10^{13}$	$>10^{13}$	$>10^{13}$	$>10^{12}$
	吸湿処理 Moisture absorption	C-1000/85/85	$>10^{12}$	$>10^{12}$	$>10^{12}$	$>10^{12}$	$>10^{10}$

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