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Market Report on High-Speed & High-Frequency Copper Clad Laminates(CCLs) and Printed Circuit Boards(PCBs)

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Focal Points of the Survey

- Estimates and analyzes the 2023 market size of high-speed (low-loss) CCLs based on value and volume, classified by loss levels, applications and manufacturers. Forecasts the market size up to 2033.
 - By Low Loss Levels: Extreme Low Loss(<0.0015), Ultra Low Loss(0.0016-0.003), Very Low Loss(0.0031-0.0055), Low Loss(0.0056-0.0079), Mid Loss(0.008-0.099) ※Df@10GHz
 - By Applications: AI Server, General Server, Switch & Router, Base Station(BBU), Others
- Estimates and analyzes the 2023 market size of Multi-layer PCBs (High-Speed) based on value and volume, classified by layer-counts, applications and manufacturers. Forecasts the market size up to 2033.
 - By Layer-counts: 4-10L, 12-20L, 22+L
 - By Applications: AI Server, General Server, Switch & Router, Base Station(BBU), Others
- Estimates and analyzes the 2023 market size of High-Frequency(Low Dk) CCLs based on value and volume, classified by materials, applications and manufacturers. Forecasts the market size up to 2033.
 - By Materials: PTFE, Hydrocarbon, PPE, PPO &Others
 - By Applications: Base Station(RU and RRH), mmWave Radar, AiP, Others
- Estimates and analyzes the 2023 market size of RF Antenna PCBs based on value and volume, classified by materials, applications and manufacturers. Forecasts the market size up to 2033.
 - By Layer-counts: Double-sided, 4-10L, 12-20L, 22+L
 - By Applications: Base Station(RU and RRH), mmWave Radar, AiP, Others
- High-Speed & High-Frequency CCL Manufacturers' Case Studies (16 Companies)

Research Items -1

Research Products and Target Manufacturers

Classification			Manufacturers
CCLs	High-Speed (Low Loss)		Panasonic, EMC, TUC, ITEQ, Doosan, Shengyi, AGC, Nan Ya NMT, ISOLA, NanYa, Resonac, Wazam, Kingboard, MGC, Others
	High-Frequency (Low Dk)		Rogers, EMC, AGC, Panasonic, Shengyi, CZZYST, ISOLA, MGC, ITEQ, Nanya NMT, Doosan, TUC, NanYa, Wazam, Resonac, Others
PCBs	Multi-layer PCBs (for High-Speed)		WUS Group, Shennan, Gold Circuit, TTM, ISUPETASYS, Tripod, Fastprint, LINCSTECH, MULTEK, Aoshikang, Shengyi, SANMINA, SUNTAK, Delont, Unimicron, VictoryGiant, Kingboard, Kinwong, Hannstar, ZDT, Nan Ya, Simmtech, ACCL, Daeduck, Others
	RF Antenna PCBs (for High-Frequency)	Base Station	Shennan, Shengyi, TTM, WUS, Somacis, Isu Petasys, Kinwong, Others
		mmWave Radar	TTM, ZDT, Unitech PCB, Kyocera, Multek, Schweizer, CCTC, Others
		AiP	Samsung, LGI, Unimicron, Kinsus, Others

*CCLs: including Prepregs

Research Items -2

1. High-Speed CCLs (Low Loss)

	Extreme Low Loss	Ultra Low Loss	Very Low Loss	Low Loss	Mid Loss
Df @10GHz	<0.0015	0.0016-0.003	0.0031-0.0055	0.0056-0.0079	0.008-0.099

2. High-Frequency CCLs (Low Dk)

	PTFE	Hydrocarbon	PPE, PPO and Others
Dk & Df@10GHz	Dk@10GHz:2.2-2.9, Df@10GHz:0.0013-0.003	Dk@10GHz:3.0-3.5, Df@10GHz:0.0026-0.0036	Dk@10GHz:3.3-3.9, Df@10GHz:0.002-0.0045

3. High-Speed & High-Frequency PCBs

Application	PCB Type	Application Field
High-Speed	Multi-layer PCBs	AI Server, General Type Server, Switch & Router, Base Station(BBU) and Others
High-Frequency	RF Antenna PCBs	Base Station (RU and RRH), mmWave Radar, AiP and others

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