



天通控股股份有限公司

TDG HOLDING CO., LTD.

天通控股股份有限公司(股票代码:600330)创建于1984年, 于2001年在上海证券交易所挂牌上市, 是国内首家由自然人控股的上市公司, 经过四十多年的艰苦创业, 目前已经形成电子材料, 电子模组、智能装备、绿色能源四大业务板块, 业务涵盖电子信息材料产业链上下游, 是集科研、制造、销售于一体的国家高新技术企业。

TDG Holding Co., Ltd. (Stock Code: 600330) was founded in 1984 and listed on the Shanghai Stock Exchange in 2001. It was the first publicly listed company in China controlled by individual shareholders. After more than four decades of dedicated development, the company has established four major business divisions: electronic materials, electronic modules, intelligent equipment, and green energy. Its operations cover both the upstream and downstream sectors of the electronic materials industry chain. TDG Holding is a High-Tech Enterprise integrating research and development, manufacturing, and sales.

天通精美科技有限公司

TDG Jingmei Technology Co., Ltd.

天通精美科技有限公司成立于2023年, 是天通控股股份有限公司全资子公司, 主营产品为压电薄膜晶圆, 公司聚集高端技术团队, 依托天通集团垂直供应链资源整合, 实现了从晶体到薄膜加工的全链条生产自主可控。公司产品主要应用于射频微波, 光通讯, 量子信息, 集成存储和传感探测领域。

TDG Jingmei Technology Co., Ltd., established in 2023, is a wholly-owned subsidiary of TDG Holding Co., Ltd. Its main product is piezoelectric thin-film wafers. The company brings together a high-end technical team and leverages the vertically integrated supply chain resources of the TDG Group to achieve full-chain, self-controlled production from crystal growth to thin-film processing. Its products are primarily used in RF/microwave, optical communications, quantum information, integrated storage, and sensing and detection applications.

天通精美科技有限公司

TDG Jingmei Technology Co., Ltd.

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TDG HOLDING CO., LTD.

股票代码 (Stock Code) : 600330

异质集成晶圆

POI/TFLN Heterogeneous
Integration Wafers



产品简介

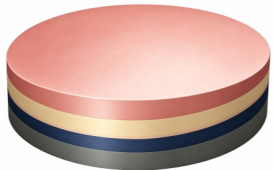
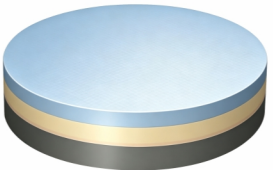
Product Overview

POI/TFLN异质晶圆由压电薄膜层（如LiTaO₃、LiNbO₃）与SiO₂/TR层/Sapphire/SiC等支撑衬底通过异质集成技术结合，形成多层结构，可显著降低热失配应力并提升器件性能，广泛应用于射频滤波器、传感器及光电子集成芯片。

POI/TFLN heterogeneous wafers are fabricated by bonding piezoelectric thin films such as LT and LN with intermediate layers of silicon dioxide and polysilicon, as well as supporting substrates including silicon, sapphire and SiC via heterogeneous integration technology to form multilayer structures. They effectively reduce thermal mismatch stress and improve device performance, and are widely used in SAW filters, sensors and optoelectronic integrated chips.

产品结构及技术参数

Products Specification

Items	POI	TFLN
Structure	 LiTaO₃ Buried oxide layer Trap rich layer Si substrate	 LiNbO₃ Buried oxide layer Si substrate
Diameter	150/200±0.2mm	150/200±0.2mm
LT Crystal Orientation	Y42/36/50°±0.3° etc.	X°±0.3°
LT/LN Layer Thickness	300-1000nm±20nm	300-900nm±20nm
Front side Roughness	<0.3nm	<0.3nm
Buried Oxide Layer Thickness	0.3-1um±50nm	5~15um±20nm
Trap-Rich Layer Average Thickness	0.5-1.5um±0.1um	Can be customized
Si Orientation	<100>	<100>
TTV	≤5um	≤5um
BOW	-40~40um	-40~40um
Warp	≤50um	≤50um
Total Thickness	400~675/725um±25um	400~675/725um±25um

● 实际规格可以根据客户需求订制
The actual specifications can be customized according to customer requirements.

产品优势

Product Advantages

POI	TFLN
1 高Q · 低损耗 High Q · Low Loss 异质衬底增强声能约束，减少声波向衬底泄漏，实现更高Q值与更低插入损耗，提升射频前端性能。 Heterogeneous substrates enhance acoustic energy confinement and reduce acoustic leakage into the substrate, enabling higher Q factors and lower insertion loss for improved RF front-end performance.	1 极高带宽 >100GHz Ultra-High Bandwidth >100 Ghz 轻松支持单通道400G传输，是3.2T光模块的核心引擎。 Effortlessly supports 400G per-lane transmission, serving as a key enabling technology for 3.2T optical transceivers.
2 大带宽 · 高频化 Wide Bandwidth · High-Frequency Operation 依托钽酸锂的高机电耦合能力，支持宽带滤波；通过晶向、膜厚及结构设计，可进一步向更高工作频率拓展。 Leveraging the high electromechanical coupling of lithium tantalate, POI supports wideband filtering and can be extended to higher operating frequencies through optimized crystal orientation, film thickness, and device structure.	2 低驱动电压 · 低功耗 Low Drive Voltage · Low Power Consumption 较硅光方案功耗降低40%-60%，完美契合数据中心能耗要求。 Reduces power consumption by 40%-60% compared with silicon photonics solutions, ideally meeting the stringent energy-efficiency requirements of data centers.
3 高稳定性 · 高功率耐受 High Stability · High Power Handling 异质层堆栈可优化温度频率系数，同时高导热衬底改善器件散热能力，提升高温及高功率工作稳定性。 Heterogeneous layer stacks enable optimized temperature coefficient of frequency (TCF), while high-thermal-conductivity substrates improve heat dissipation, enhancing stability under high-temperature and high-power operation.	3 极低损耗（卓越线性度） Ultra-Low Loss · Excellent Linearity 失真极低，支持256QAM等高阶调制，提升信号质量与传输距离。 Extremely low distortion enables advanced modulation formats such as 256QAM, improving signal quality and transmission reach.
4 高集成度 · 低杂散 High Integration Density · Low Spurious Response 薄膜化平台适合高频、小型化声学器件，通过异质结构与模态工程抑制寄生响应，提升带外抑制并支持高密度射频集成。 The thin-film platform enables compact, high-frequency acoustic devices. Heterogeneous structures and mode engineering suppress parasitic responses, improve out-of-band rejection, and support high-density RF integration.	4 高集成度（易于异质集成） High Integration Density · Heterogeneous Integration Ready 尺寸缩小90%，支持晶圆级量产与大规模光子集成（PIC）。 Enables up to 90% footprint reduction while supporting wafer-scale manufacturing and large-scale photonic integrated circuits (PICs).

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