





The New Technology Solutions for Advanced SiP Devices

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Adv Package & Technology Integration

Agenda

Selection of SiP

Market Trend by 5G

Current SiP Solution

Discrimination of SiP

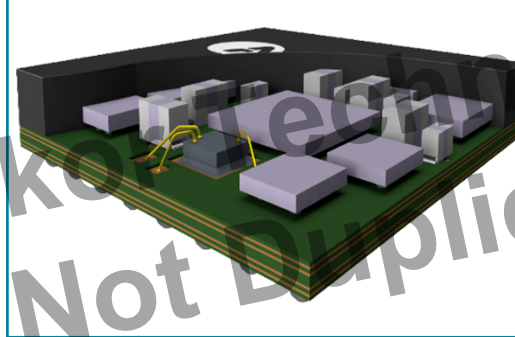
Integration for System

SoC



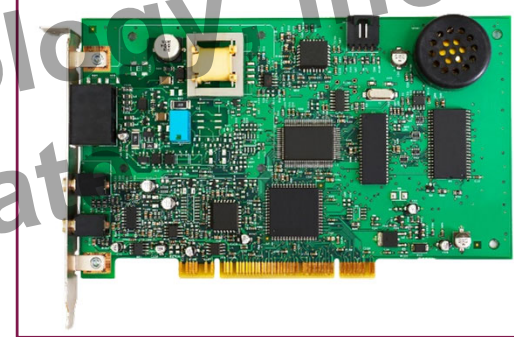
- ▶ High NRE
- ▶ Long time to develop
- ▶ High technical threshold

SiP



- ▶ Assembly package yield loss

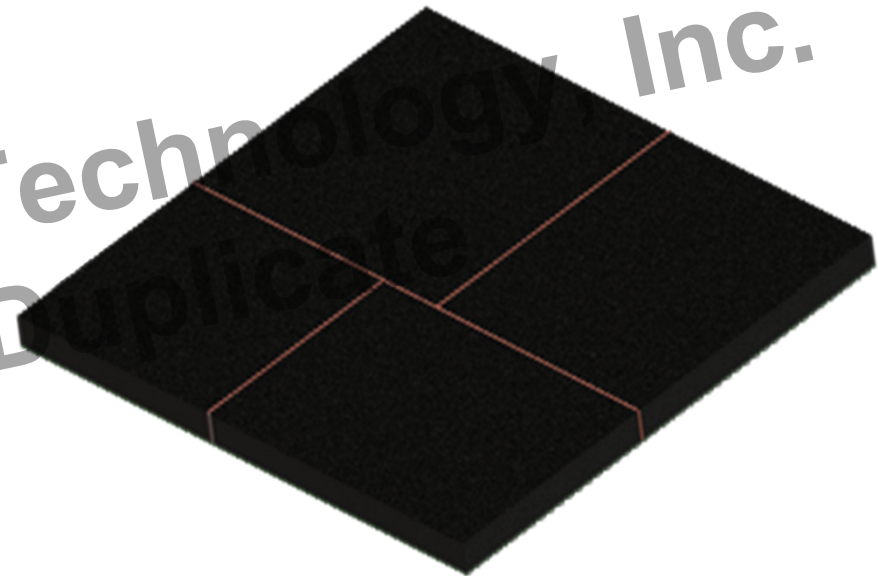
SoB



- ▶ More area needed
- ▶ Board SMT yield loss

Enabling the Future Transformation to SiP

- ▶ Time to market
 - ▷ RF device
- ▶ Integrated function with good yield
 - ▷ Divide reject ratio into package unit
- ▶ Miniaturization
 - ▷ Possible to reduce
- ▶ Cost saving
 - ▷ Applied to chip shooter
- ▶ Reliability
 - ▷ Drop test for portable and wearable products



Market Trends of 5G

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Major Package Trends

Mobility

- ▶ Ultra thin, small
- ▶ Integration, **SiP**
- ▶ **5G**
- ▶ Envelope tracker
- ▶ AR/Streaming

IoT

- ▶ Miniaturization, **SiP**
- ▶ **5G**
- ▶ Security
- ▶ Power – Connected
- ▶ Home/Factory/Auto

Automotive

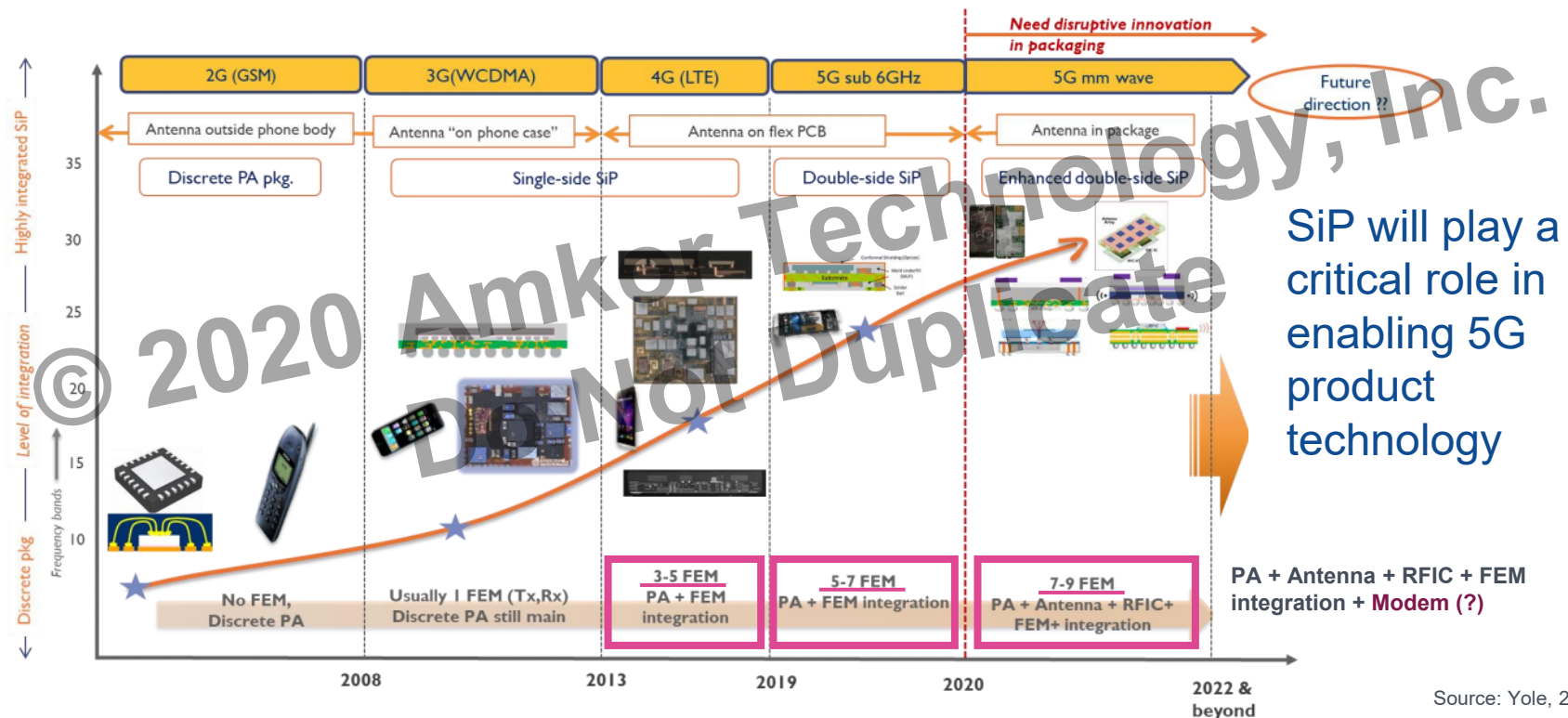
- ▶ Reliability G0/G1
- ▶ Integration, **SiP**
- ▶ **5G**
- ▶ ADAS – Connected
- ▶ Infotainment, ECU

HPC/ Networking

- ▶ Performance
- ▶ Integration, **SiP**
- ▶ Thermal, Power
- ▶ AI/AR
- ▶ Data center/Cloud

Generation of Wireless Communication Technology

Market Outlook for Smart Smartphone Pkgs – SiP



5G Technology

- ▶ What is different so far
 - ▷ Low latency
 - ▷ Mass connection technology
- ▶ Required to provide solution in assembly package
 - ▷ Downsizing the package
 - ▷ Function integration
 - ▷ Faster development time
 - ▷ Material optimization

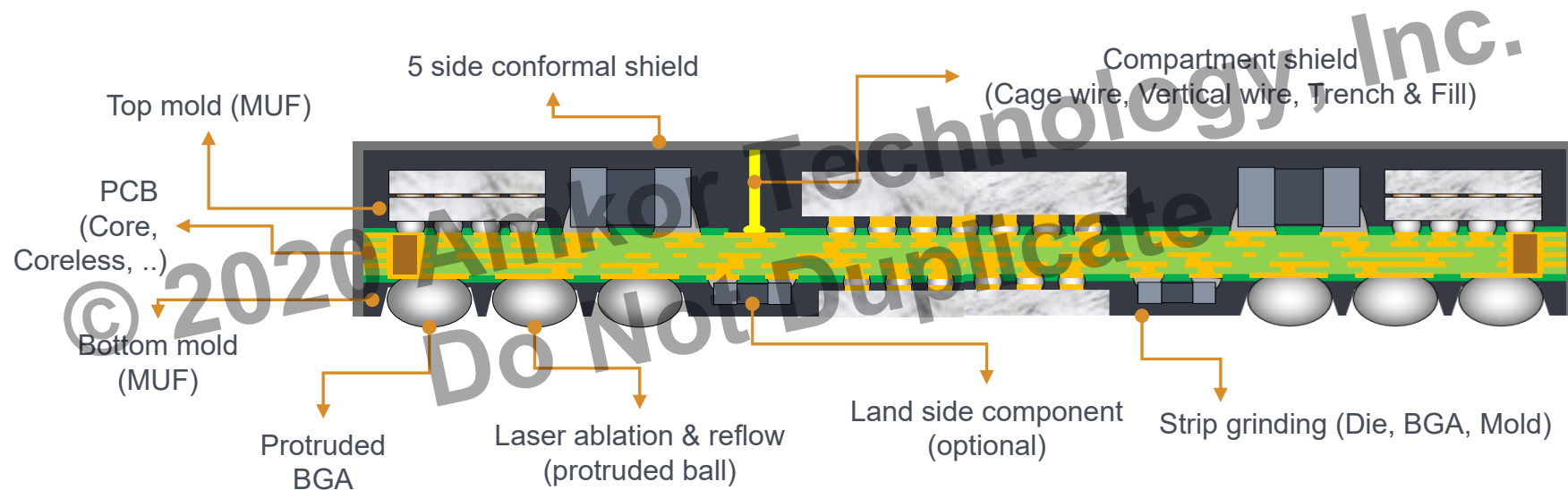


Current SiP Solution

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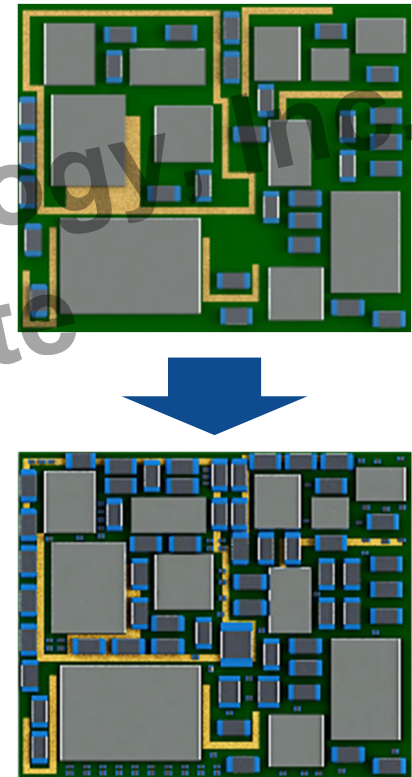


Advanced SiP Package – DSMBGA



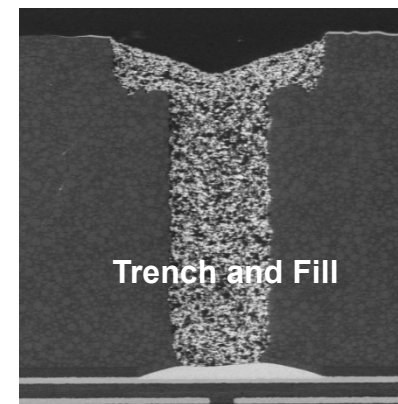
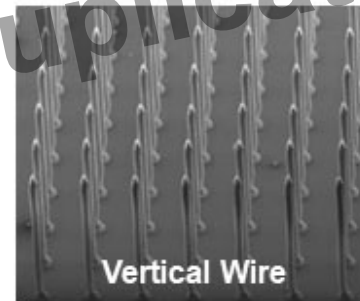
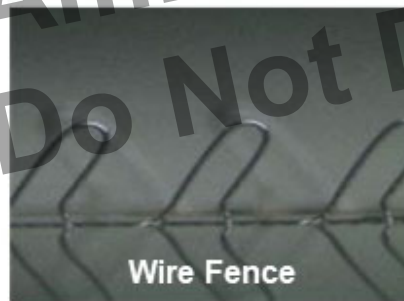
Advanced Design Rules

- ▶ State of art SMT module configuration
 - ▷ Remove the manual handling
- ▶ Advanced inspection tool for quality control
 - ▷ Realtime monitoring by SPI and AOI
- ▶ Traceability of parts
- ▶ Printed solder control



EMI Shielding – Compartment Shielding

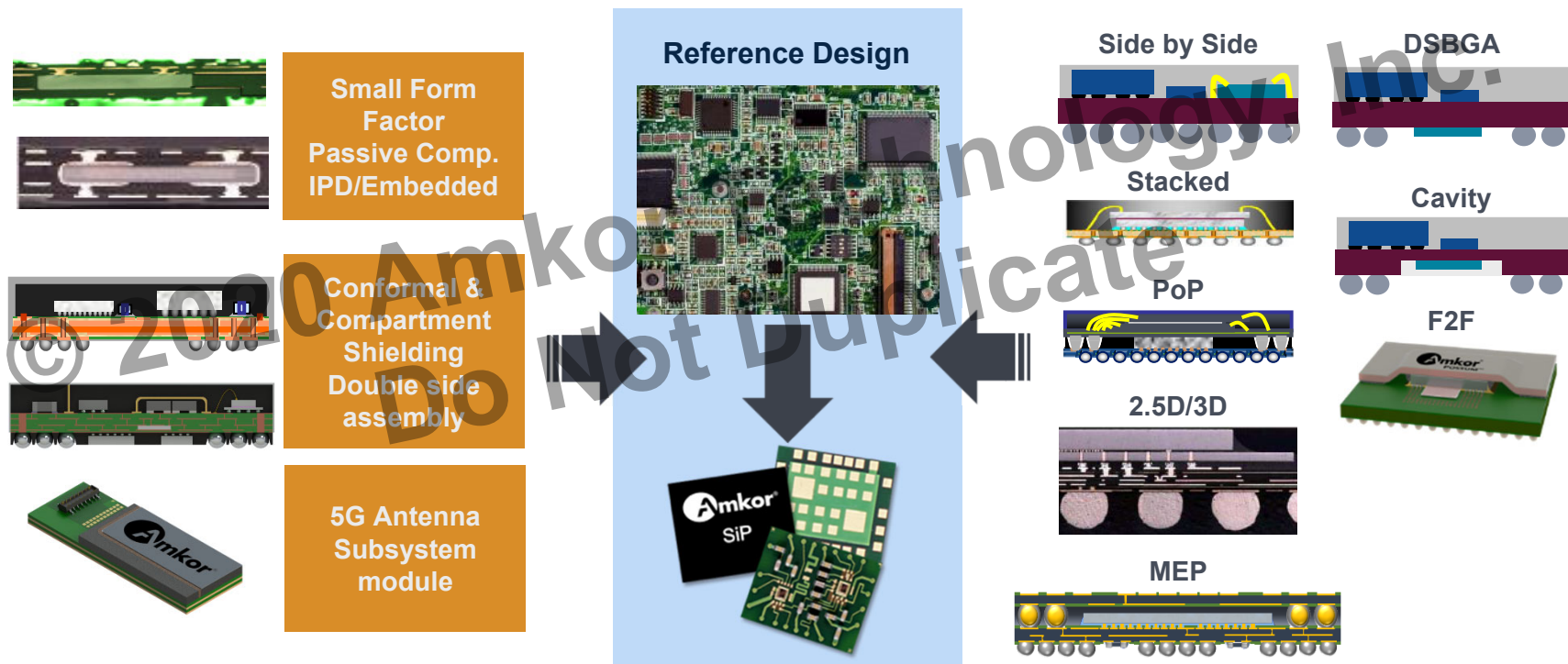
- ▶ Possible to integrate various function in SiP
 - ▷ Selection by shield performance and geometry design
 - ▷ Need to finetuning after reviewing the performance
 - » Wire cage/Wire Fence/Vertical wire



Discrimination of SiP

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Toolkit for Reducing the SiP Size





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