PnpNetwork Technologies, Inc.

9-Nov-21

未来移动智能半导体

用于智能汽车的媒体接收芯片 (SoC) 和模块 (RTM) 解决方案

www.pnpnetwork.com



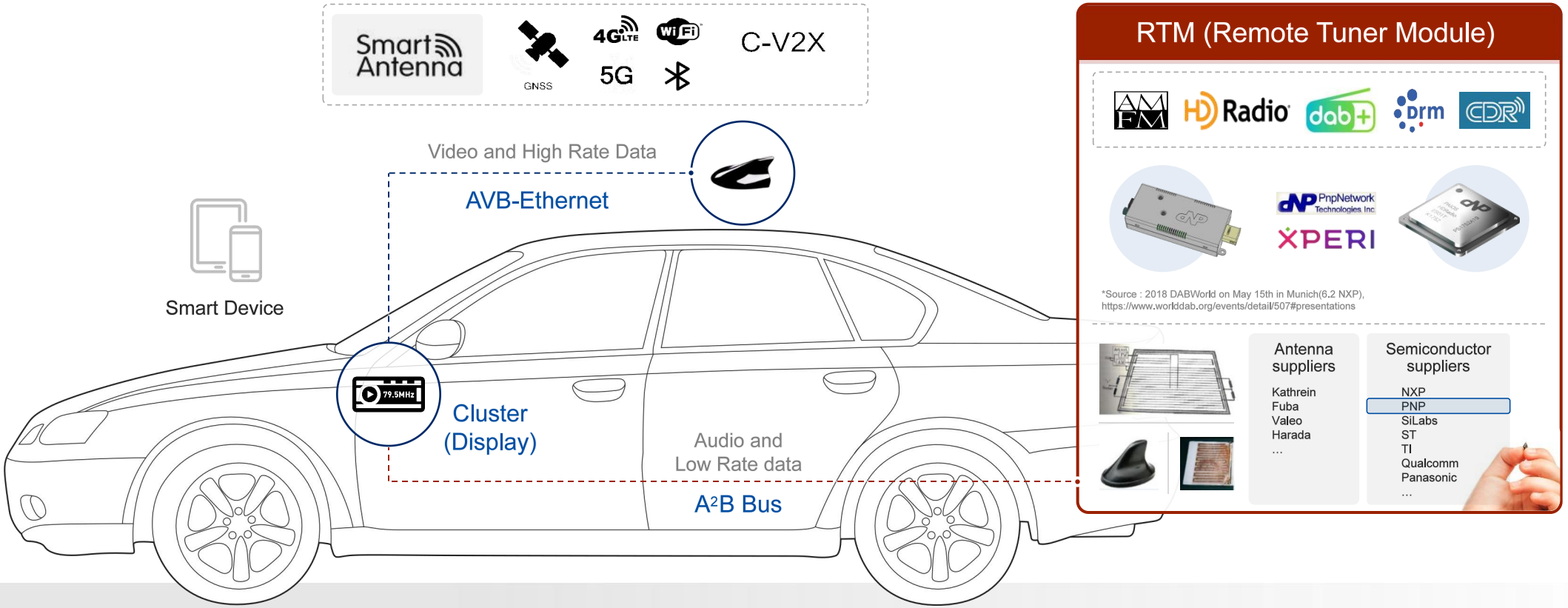
业务领域 | 智能汽车用移动媒体接收半导体和模块解决方案 (R²M for RTM)

PNPNETWORK TECHNOLOGIES,INC.

互联智能汽车内部网络(In-Vehicle Network of Connected Smart Car)

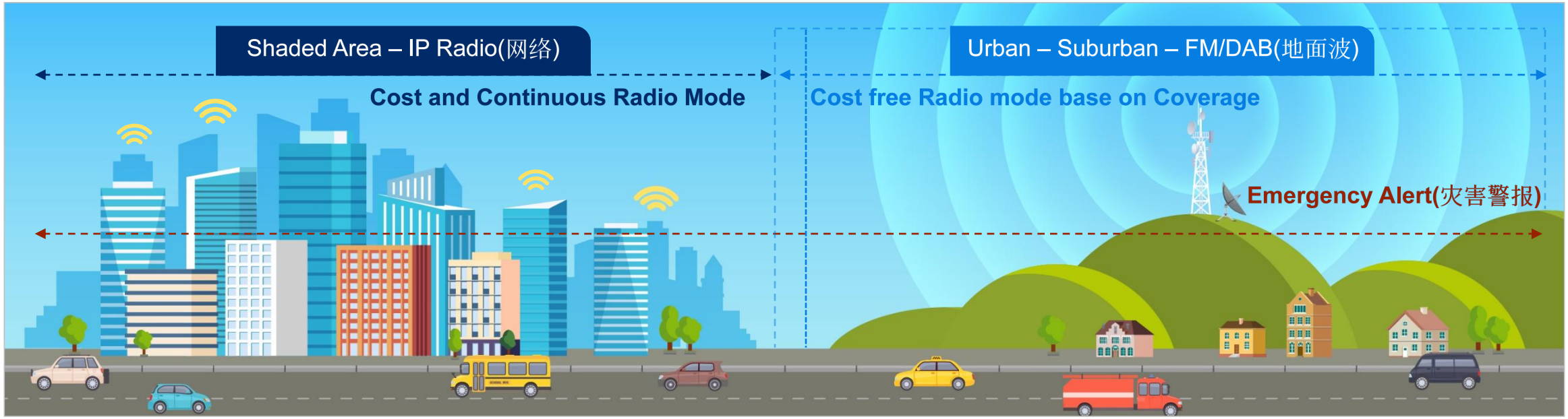
AVB-Ethernet for Smart Antenna 高速和视频数据传输/接收

A²B for RTM 低速和音频数据的传输和接收



业务领域 | 智能汽车用移动媒体接收半导体和模块解决方案(Hybrid Radio)

PNPNETWORK TECHNOLOGIES,INC.



CDR | drm | INTERNET RADIO

FM RADIO | HD Radio | dab+

RadioDNS HYBRID RADIO

DTS AUTOSTAGE™

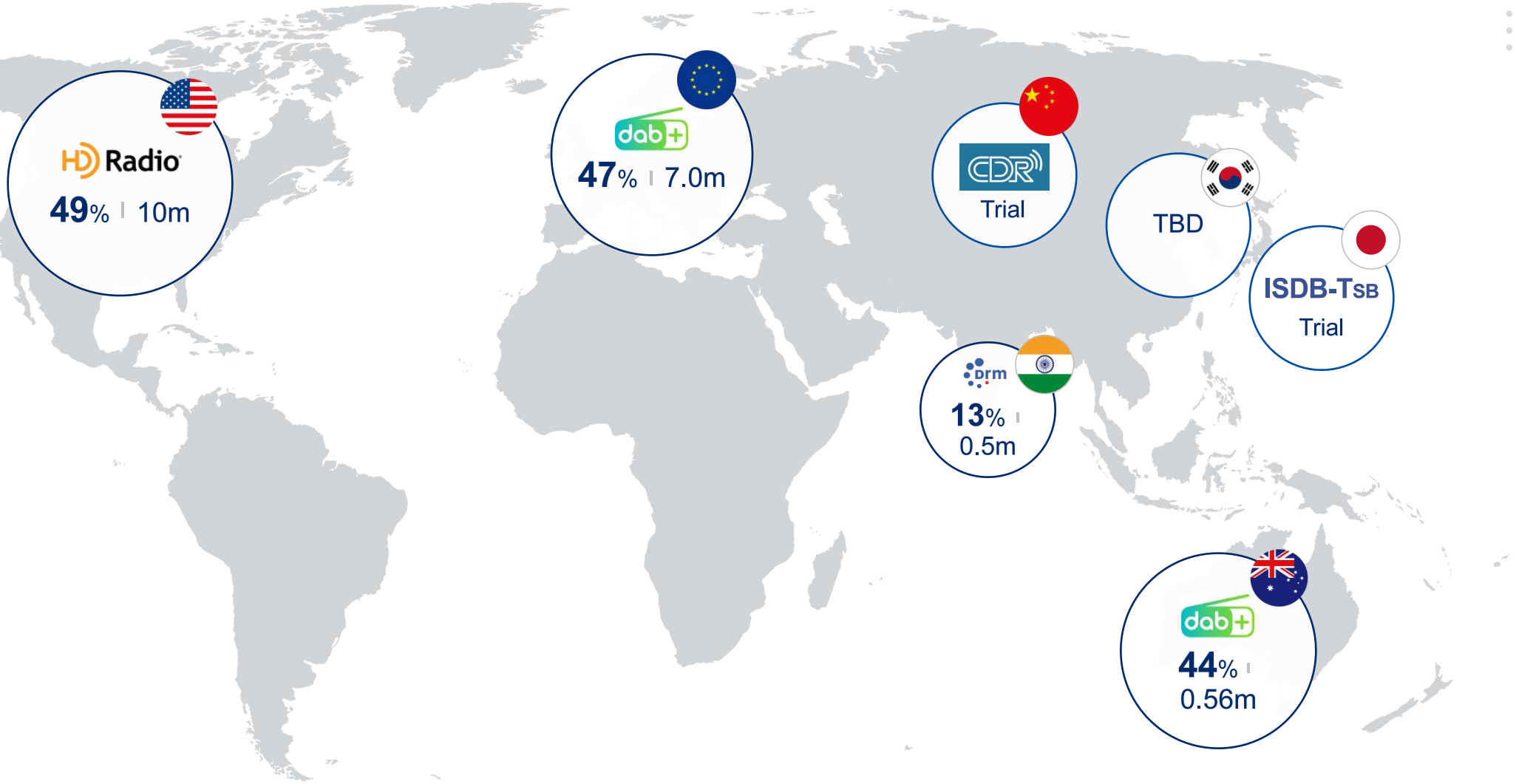
客户需求

- 支持全世界媒体 (AM/FM/DAB/HD/DRM/CDR)
- 支援灾难广播 (EWS : Emergency Warning System)
- 随时随地接收媒体 (Seamless Linking)

市场 | 智能汽车用移动半导体和解决方案

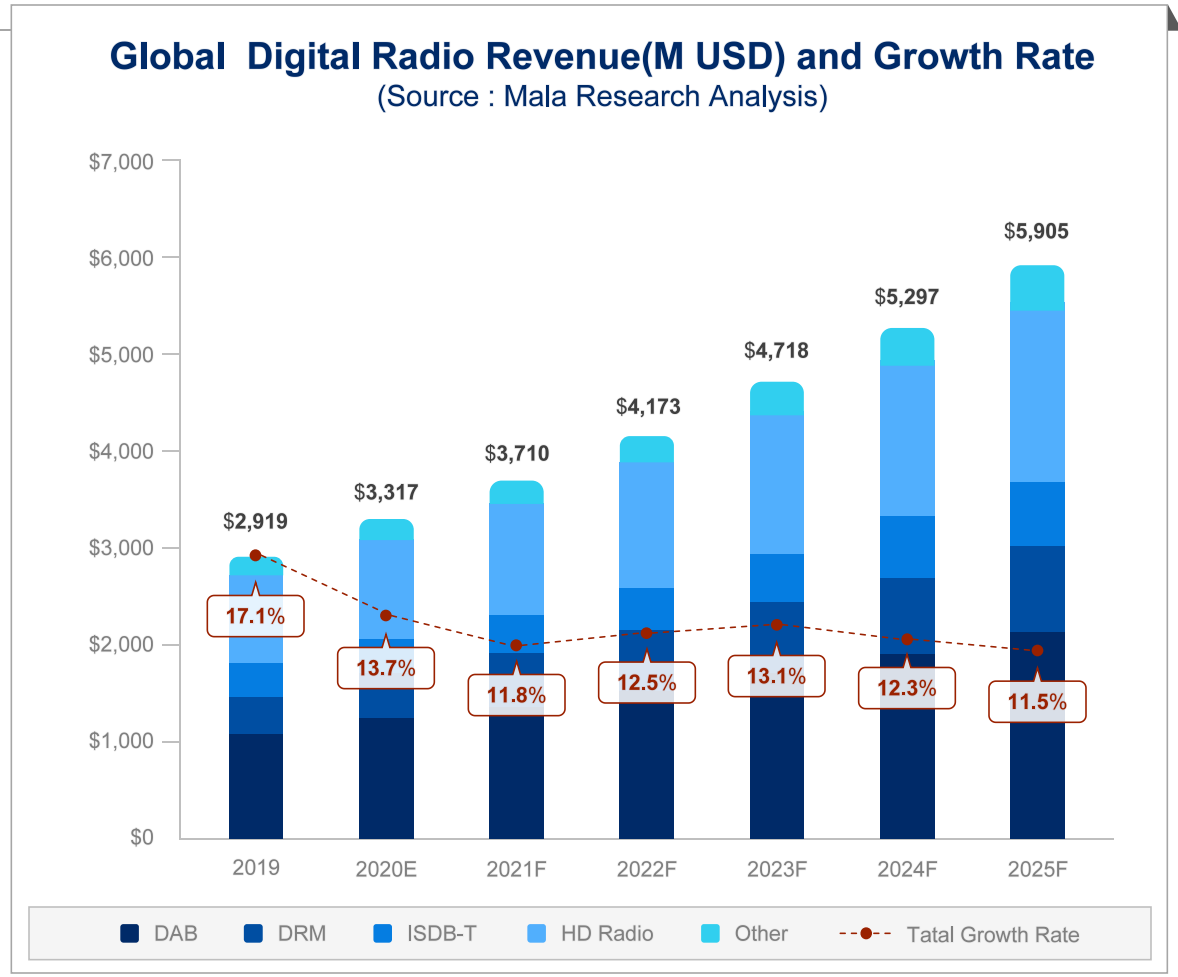
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Standards



市场 | 调查报告(2020yr) – 增长率 13.7%(2020~2025)

PNPNETWORK TECHNOLOGIES,INC.



停止发送欧洲模拟媒体

- DSO(Digital Radio Switch Off)
- 挪威 2017年 12月 13日
- 转换意大利2018年 埃特伦蒂诺



100% 大概所需

2025年标准

- Commercial $1,138M
- Residential $827M
- Automobile $1,288M
- Mobile $1,611M



多标准兼容产品

- 支持DAB/DAB+, DRM, HDRadio的完美的Digital Radio
  All in One SoC



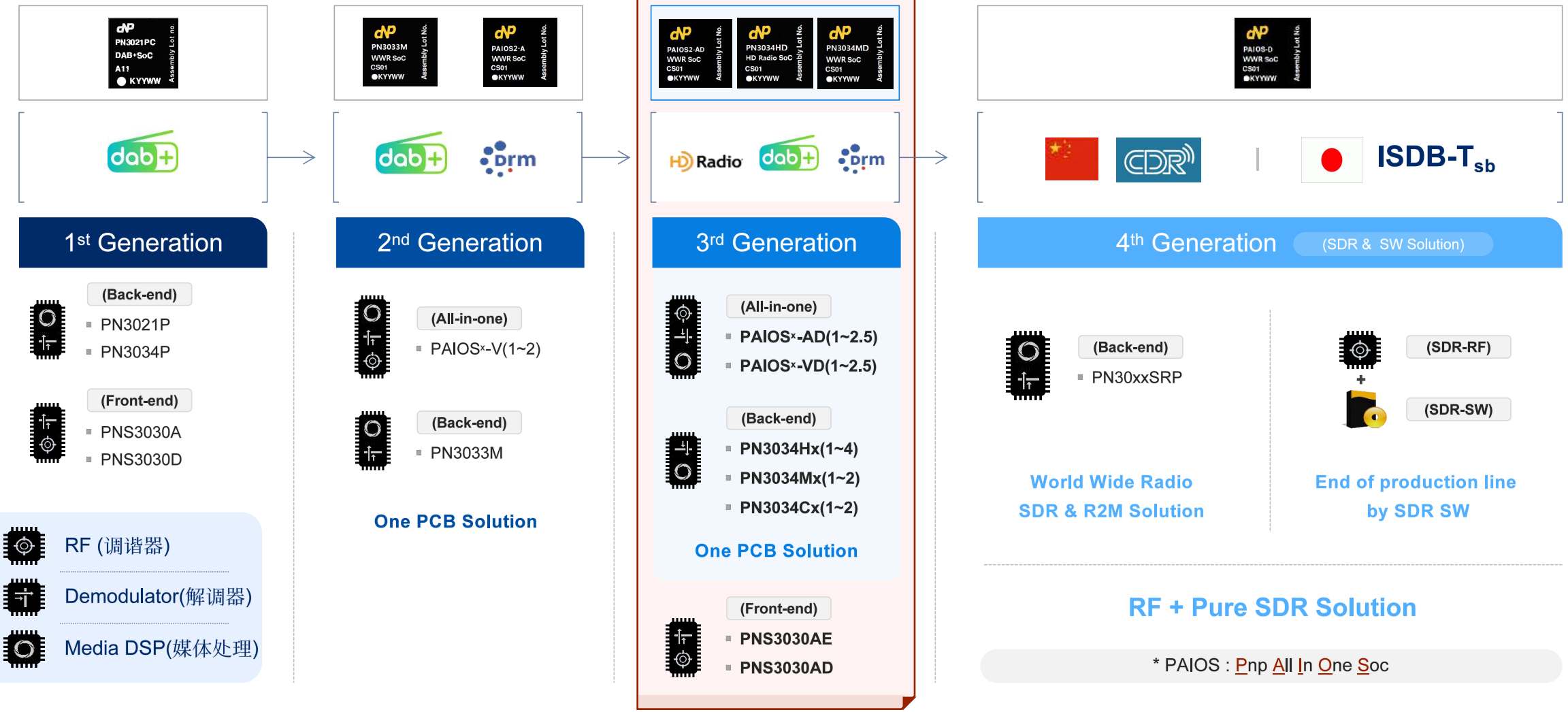
高技术壁垒产品

- 拥有在汽车市场独占市场的NXP
  唯一竞争对象国家普及技术



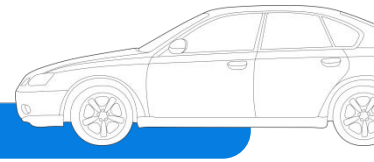
产品文件夹 | 面向智能汽车的全球媒体接收半导体

PNPNETWORK TECHNOLOGIES,INC.



产品 | 选择指南(Chipset Selection Guide)

PNPNETWORK TECHNOLOGIES,INC.



Standard(标准)	SoC(产品)	Function Description(功能)
HD Radio	PN3034H	1-ch HD Radio Receiver Back-end[Demodulator + DSP]SoC for Audio/Data/Scan
	PN3034HD	2-ch HD Radio Receiver Back-end[Demodulator + DSP]SoC for MRC or Audio and Data or BGS
	PN3034HT	3-ch HD Radio Receiver Back-end[Demodulator + DSP]SoC for MRC Audio and Data or BGS
	PN3034HQ	4-ch HD Radio Receiver Back-end[Demodulator + DSP]SoC for 2*MRC Audio and Data or BGS
DAB+	PAIOS-A	1-ch DAB Receiver All In One[RF + Demod + DSP]SoC with One DAB Tuner for Audio or Data or BGS
DRM	PN3034M	1-ch DRM Receiver Back-end[Demodulator + DSP]SoC for Audio or Data or BGS
	PN3034MD	2-ch DRM Receiver Back-end[Demodulator + DSP]SoC for MRC or Audio and Data or BGS
DAB+	PAIOS-AD	1-ch DAB Receiver All In One[RF + Demod + DSP]SoC with One DAB Tuner for Audio or Data or BGS
DRM, DAB+, HD DAB	PAIOS²-AD	2-ch DAB Receiver All In One[RF + Demod + DSP]SoC with Two DAB Tuner for MRC or Audio and Data or BGS
	PAIOS³-AD	3-ch DAB Receiver All In One[RF + Demod + DSP]SoC with Two DAB Tuner for MRC Audio and Data or BGS
DAB+, DRM	PAIOS-VD	1-ch DAB or DRM Receiver All In One[RF + Demod + DSP]SoC with One DAB Tuner for Audio or Data or BGS
DRM, DAB+, HD DAB	PAIOS²-VD	2-ch DAB or 2-ch DRM or DAB and DRM Receiver All In One[RF + Demod + DSP] SoC with Two DAB Tuner for MRC or Audio and Data or BGS
	PAIOS³-VD	3-ch DAB or 2-ch DRM or DAB and DRM Receiver All In One[RF + Demod + DSP] SoC with Two DAB Tuner for MRC Audio and Data or BGS
DAB+, HD DAB	PNS3030AE	1-ch DAB Front-end(RF + Demodulator)SoC for Audio or Data or BGS with AP Embedded SW
	PNS3030AD	2-ch DAB Front-end(RF + Demodulator)SoC for MRC or Dual Audio and Data or BGS with AP Embedded SW

Confidential only for “Customer”

产品 | 特征 – 支持全世界传媒收信功能(Scalable DAB/DRM/HD Radio SoC & Solution)

PNPNETWORK TECHNOLOGIES,INC.

Features(特征)

01 Scalable/Flexible solution with Any AM/FM SoC(兼容任何模拟产品)

- Pin to Pin Compatible with all DAB/DRM and HD Radio SoC
  - One-PCB : 1-ch or 2-ch Receiver (使用一个PCB可接收一个或者两个频道)
  - Another One-PCB : 3-ch or 4-ch Receiver

02 Cost effective SoC and Solution (提供价格竞争力)

- Highly integrated All In one SDR SoC for DAB/DRM
- Hybrid SDR design with XPERI for HD Radio

03 Stable SW and Field Proven Performance (验证的产品)

- Simplified host interface using one SPI for all configuration
- Mass production of more than 17million DAB SoC
- Lab and Field Proven HD Radio SoC with XPERI
- More than 12yr digital radio SoC and Solution provider

04 Compliant with Various Automotive application (支持各种应用)

- Operation temperature up to 95 ℃
  (85 ℃ for infotainment and 95 ℃ smart antenna or Remote Tuner Module)
- Embedded Antenna repeater for dual with single antenna



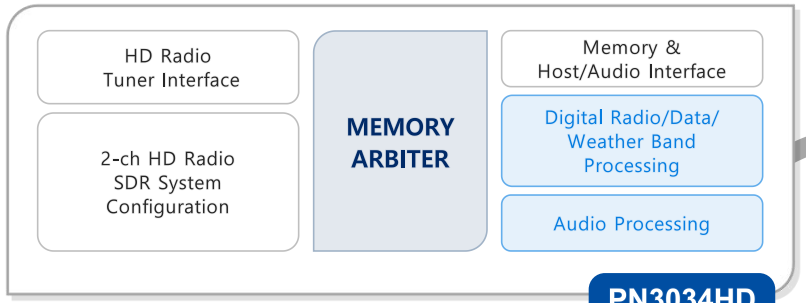
产品| 差异化 – 提供具有竞争力的双解决方案

PNPNETWORK TECHNOLOGIES,INC.

Cost Effective HD Radio/DAB /DRM/CDR SoC

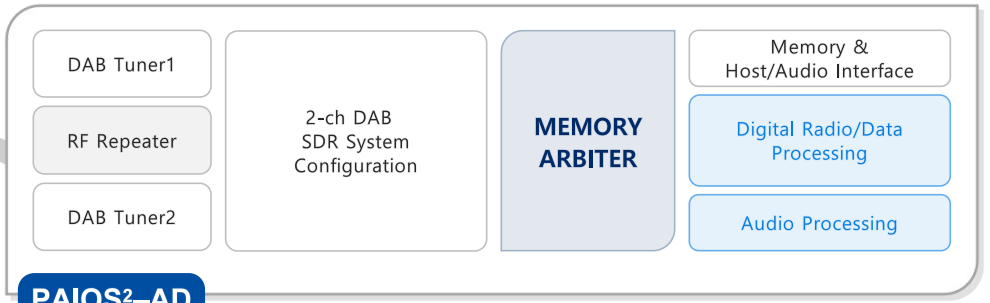
PN3034HD (北美的HD Radio)

- [HD Radio 2-ch Receiver Back-end SOC For AAA (Triple-A) Audio and Data/BGS or MRC AAA Audio]



PAIOS²-AD (欧洲的 DAB)

- [DAB 2-ch All In One SoC for SL (Seamless Linking) Audio and Data/BGS Or MRC SL Audio]





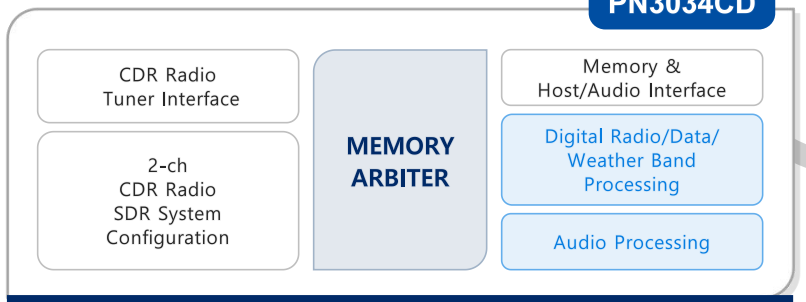
PN3034HD

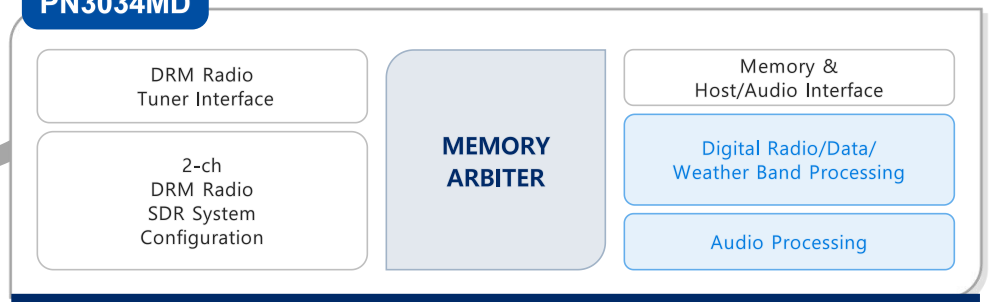
PN3034CD

PAIOS²–AD

PN3034MD

PIN to PIN Compatible





PN3034CD (中国的 CDR)

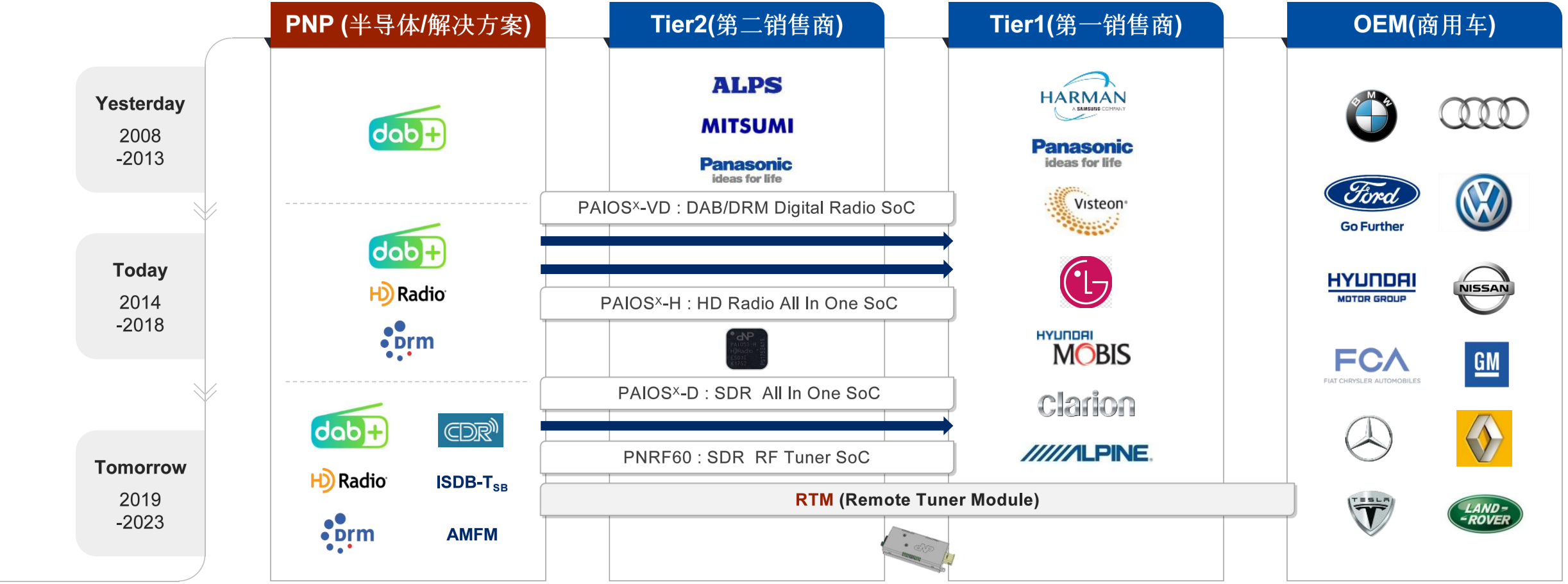
PN3034MD (印度的DRM)

顾客 | 满足顾客要求事项的产品和解决方案

PNPNETWORK TECHNOLOGIES,INC.

价值链

- From Fabless(PNP) to End-Customers(OEMs) (半导体 /解决方案 – 第一销售商-商务车)

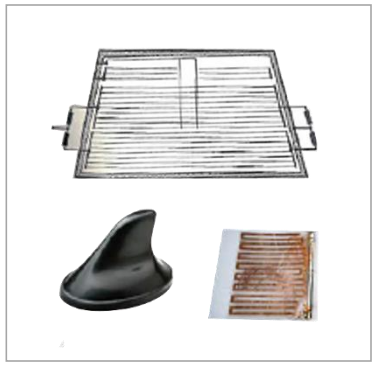


※ To get advanced development project with Tier1 from OEM is the best way

产品 | 竞争公司NXP对策方案 (NXP's Alternatives - 2018 DABWorld on May 15th in Munich)

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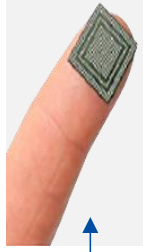
NXP视PNP为竞争公司– 2018年在DABWorld发表



Antenna suppliers

Kathrein
Fuba
Valeo
Harada
…

Semiconductor suppliers



NXP
PNP
SiLabs
ST
TI

Qualcomm
Panasonic
…

Software suppliers, IP suppliers

Tier-1's

Visteon	Denso-ten	Alpine	Hangsheng	Clarion
Harman	Continental	LG	Panasonic	Mobis
Aptiv	Bosch	Desay	Melco	…



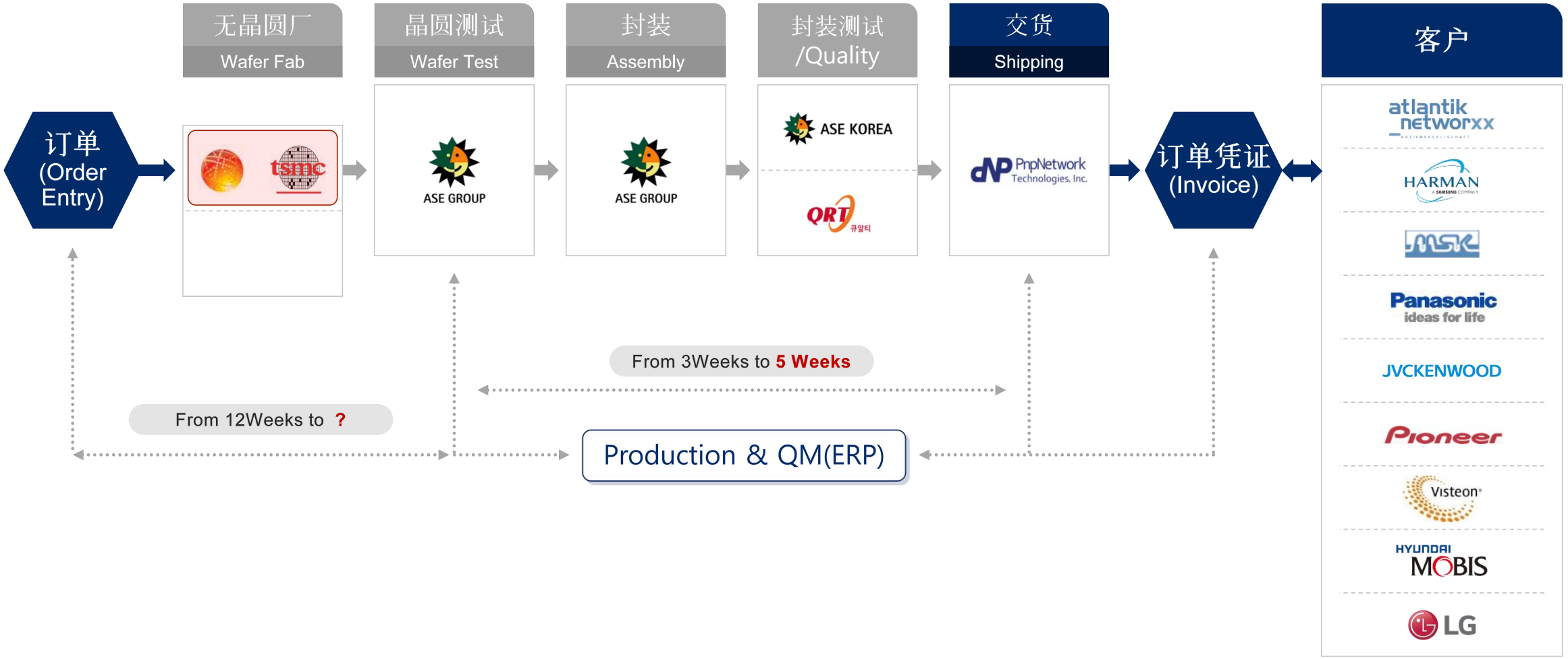
Automotive OEMS



https://www.worlddab.org/events/detail/507#presentations

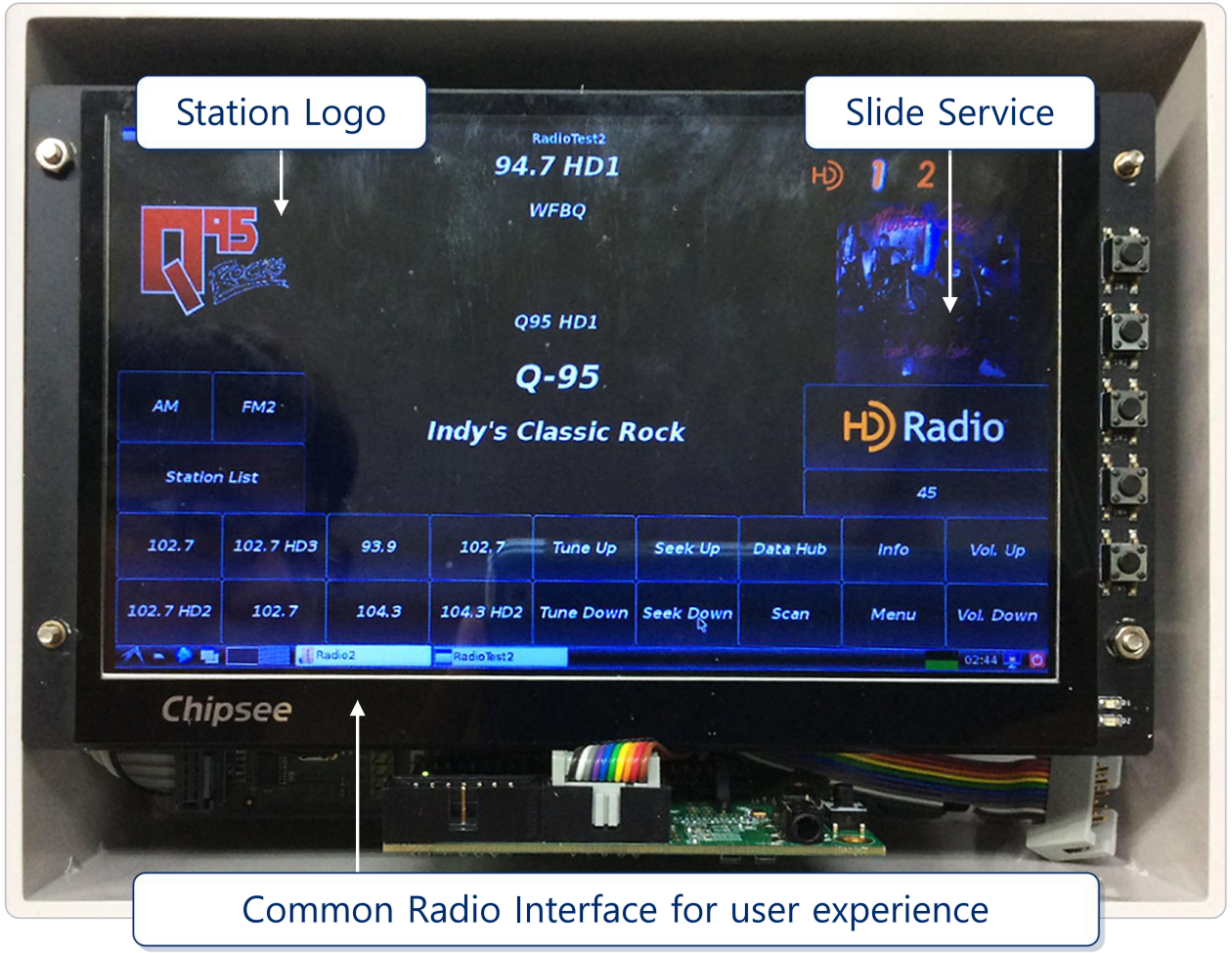
供应链 | 确保稳定的质量和供应链(Reliable Value Chain & Networking)

PNPNETWORK TECHNOLOGIES,INC.



评估板 | 北美HD Radio评估板(HD Radio Eval-Box : Single or Dual/MRC)

PNPNETWORK TECHNOLOGIES,INC.





解决方案 | R²M MCU促进内部化和差异化 PNP

PNPNETWORK TECHNOLOGIES,INC.

R²M (Remote Radio Module)提供解决方案

- AM/FM
- DAB
  HD Radio
  DRM
  CDR
- R²M
  MCU
  [PN30RM]
- Serial Flash
- A2B
  Slave

A2B BUS :: GPIO — Control & API

A2B BUS :: I2C

A2B BUS :: I2S — Audio

A2B BUS :: I2S — Data

IVI(In-Vehicle Infotainment) System

- A2B
  Master
- IVI
  CPU
- Radio
  SW
- HMI
- AUDIO System
- Engineering Mode & F/W Update



