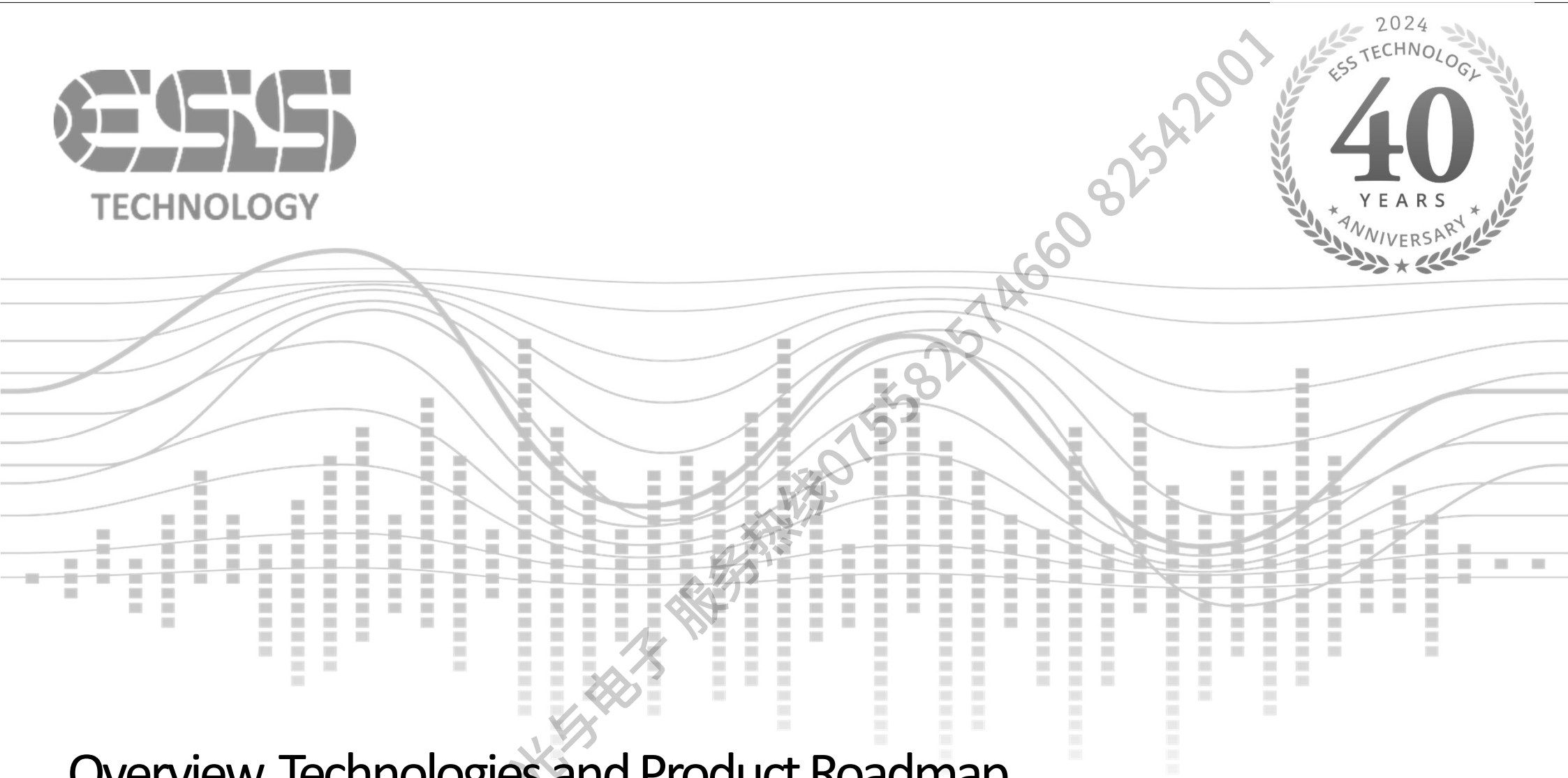


Overview, Technologies and Product Roadmap

October 2024

Company Confidential

ESS Technology, Inc

- Founded in 1984. Four decades of Audio excellence.
- Headquartered in San Jose, CA (Silicon Valley) with R&D centers in US, Canada and China.
- The leader in premium audio playback and recording
- Designs and markets ICs for the Consumer, Audiophile, Automotive & Professional audio markets.
- Broad patent portfolio, strong IP cores, and unique design methodologies.

ESS Worldwide Locations

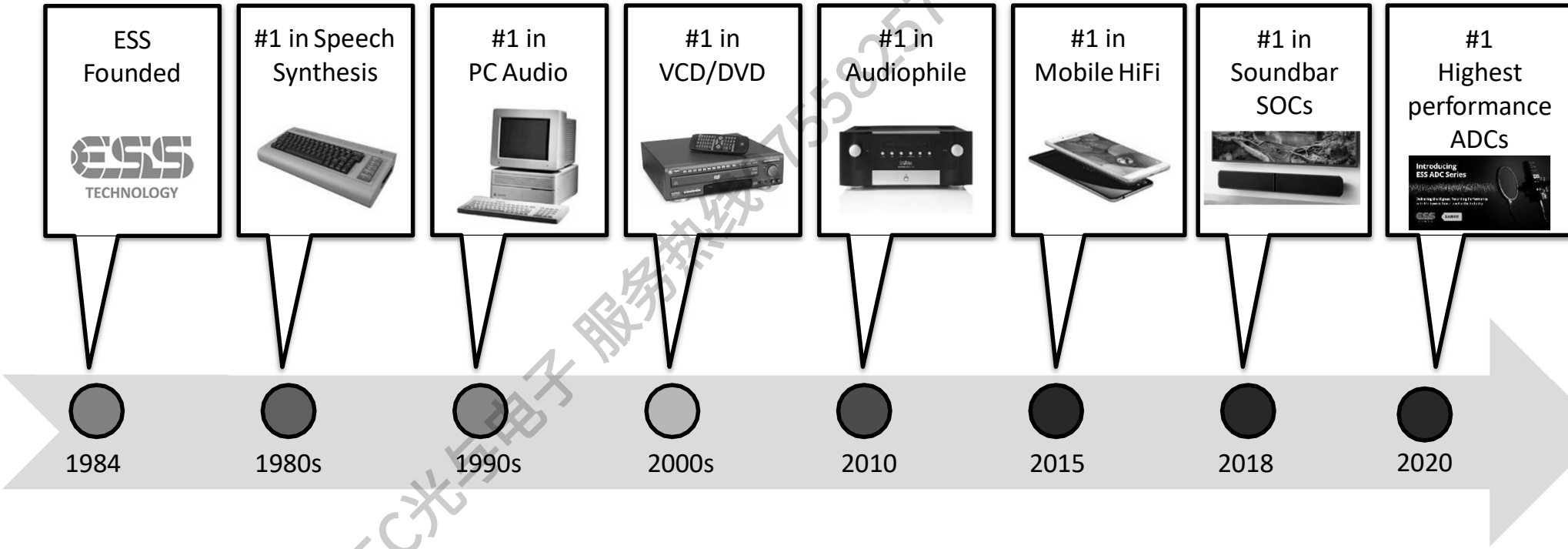
Global Distribution

China – Ricore and Weikeng
Japan and SE Asia - GEC
Taiwan - Weikeng
Korea- CNJ
Europe- Ismosys/Astute
USA - Shaw
Global - Mouser

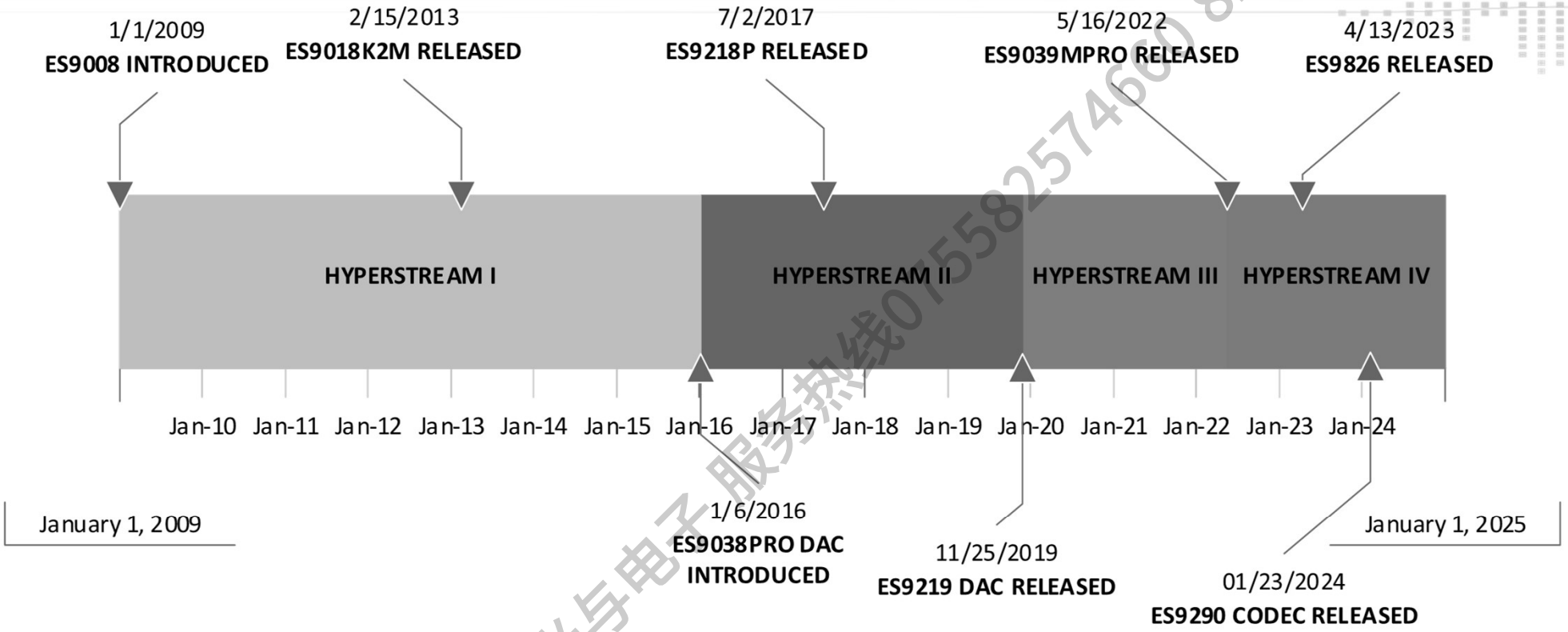
Bringing Music to Life

SABRE ESS SAB

ESS has a Long History of Market Leadership



ESS Technology HYPERSTREAM® Architecture



ESS Technology Hyperstream® Architecture Timeline

ESS Technology HYPERSTREAM® Architecture

Progression of Hyperstream:

- **Hyperstream® I** Original Patented Architecture
- **Hyperstream® II** Updated with reduced noise floor modulation and clocking improvements
- **Hyperstream® III** Improved dynamic loop response resulting in better noise result
- **Hyperstream® IV** New modulator architecture helping reduce power consumption and linearizing THD curve

The Architecture is applied to both SABRE DACs and ADCs

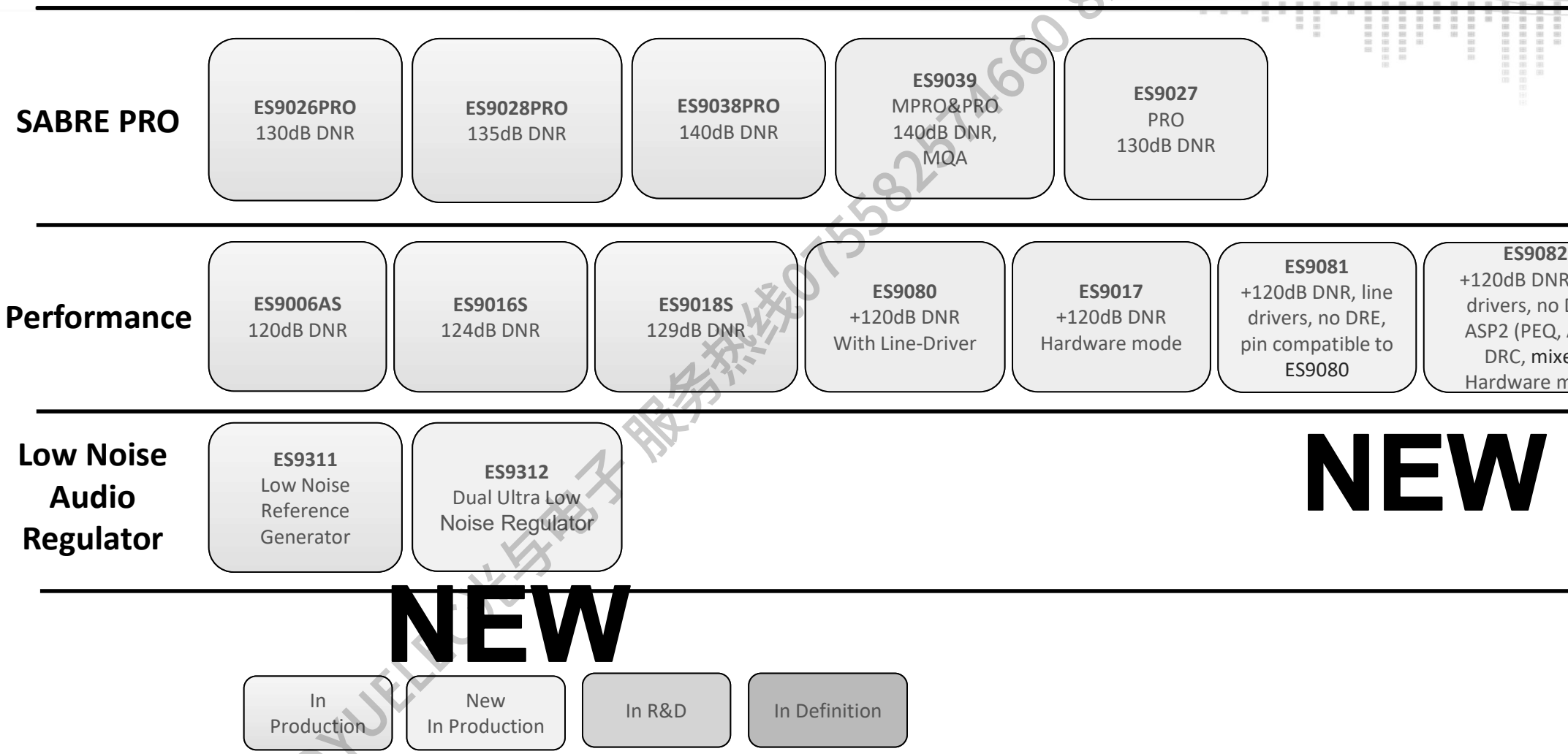
ADC Product & Regulator Offering and Roadmap

SABRE PRO	**ES9842 PRO** +122dB DNR -116dB THD 4 Channel	**ES9822 PRO** +125dB DNR -117dB THD stereo	**ES9843PRO** +124dB DNR -117dB THD 4CH/HW mode ASP2	**ES9823PRO** +127dB DNR (+130dB Mono) -118dB THD 2CH/HW mode ASP2, MQA	Q4	
Cost/ Performance	**ES9840** +116dB DNR -108dB THD 4 Channel	**ES9820** +116dB DNR -108dB THD stereo	**ES9821** +120dB DNR -112dB THD Stereo/HW mode	**ES9826** +123dB DNR -105dB THD MIC Bias/PGA,PLL Stereo/HW mode	**ES9841** +120B DNR -112dB THD 4CH/HW mode	Q1' 25
Low Noise Audio Regulator	**ES9311** Low Noise Reference Generator	**ES9312** Dual Ultra Low Noise Regulator		**NEW**		

NEW

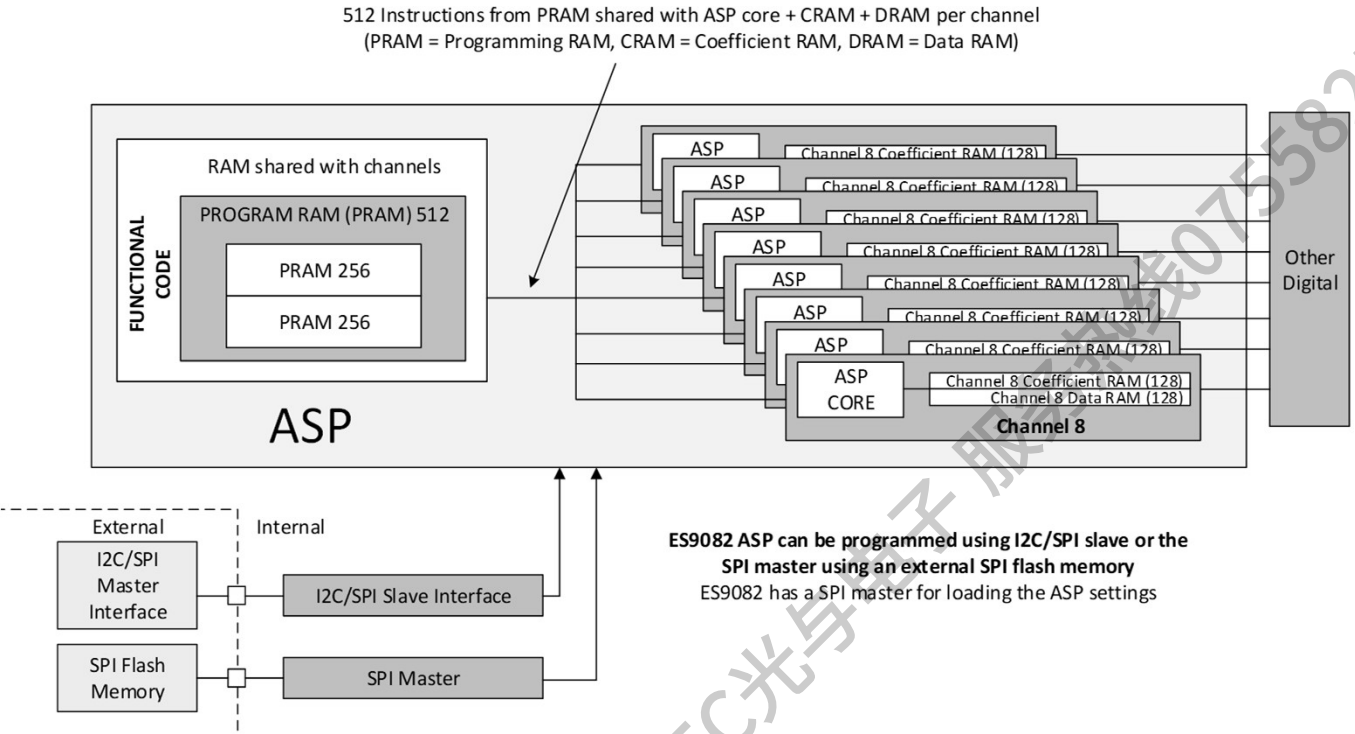
In Production	New In Production	In R&D	In Definition

8 Channel DAC Product Offering and Roadmap



2nd Generation ES9082 SMART DAC Audio Signal Processor (ASP2)

ES9082 DAC ASP2 improves on previous designs



Less Instructions required for most operations including full biquad

- The 32-bit ASP can be programmed to represent
  - MIXERs
  - Parametric Equalizers (PEQ)
  - Dynamic Range Compression (DRC)
  - Automatic Gain Limiters (AGL)

As well as other functions including de-emphasis and RIAA filters. SPI master is integrated for using SPI Flash devices

- **Reduces requirements on the System Processor**

2 Channel DAC Product Offering and Roadmap

With Integrated AMP

- **ES9023P** 112dB DNR
- **ES9033** +122dB DNR +PLL

SABRE

- **ES9018K2M** 127dB DNR
- **ES9028Q2M** 128dB DNR
- **ES9038Q2M** 128dB DNR, DSD
- **ES9068AS** 128dB DNR, + MQA
- **ES9039Q2M** **130dB DNR, TDM, HW mode**
- **ES9069Q** **130dB DNR, MQA, TDM, HW mode**

Cost/ Performance

- **ES9010K2M** 116dB DNR
- **ES9016K2M** 122dB DNR
- **ES9020Q** **122dB DNR, PLL, HW mode, TDM**

NEW

SABRE Headphone AMP

- **ES9601** 1VRMS
- **ES9603** 2V RMS

NEW

In Production | New In Production | In R&D | In Definition

2 Channel Stereo CODEC and Integrated Headphone Amp Product Offering and Roadmap

SABRE PRO USB

ES9280APRO
SABRE Pro USB2.0 Audio SoC
124 DNR +32bit/384KHz
ES9281APRO w/MQA, PEQ

ES9281APRO
SABRE Pro USB2.0 Audio SoC
124 DNR +32bit/384KHz
MQA, PEQ

Performance USB

ES9270
USB2.0 Audio SoC
DNR 117 dB
+32bit/384KHz

ES9260
USB1.1 Audio SoC
DNR 112 dB
+24bit/96KHz

Performance

ES9118
+ AVC + Switch
+ 1Vrms HPA
DNR 120

ES9218P
+ AVC + Switch
+ 2Vrms HPA
DNR 121

ES9219Q
+ 2Vrms HPA
+PLL
+MQA
DNR 121

ES9290Q
2CH ADC/DAC,
DNR 116,
PGA, Mic Bias,
PLL, Direct
Monitor

ES9291Q
2CH ADC/ DAC,
DNR 123, HPA,
PLL, Direct
Monitor, ASP2

1Q25

NEW

In Production | New In Production | In R&D | In Definition

Audio Processing Product Offering and Roadmap

Audio Processing Chip

Crescendo III+
+Embedded 8MB SDRAM
+ 2xAudio DSP w/ 96kB SRAM
+ 5.1ch PWM/DAC, 3ch w/ FB
+ ADC w/ 103dB DNR
+ 2x FS USB host/dev
+ SQI/SPI Flash I/F
+ 128-eLQFP

Crescendo VII
+ Low power
+ HS USB 2.0 Host
+ fast UART
+ 3xAudio DSP w/ 144kB SRAM
+ Network Processor
+ Linux kernel
+ DSD Decoder
+ 8ch I2S out w/ AGL

Crescendo IX
+ ARM cortex V7-A architecture CPU A5, Up to 800MHz
+VLIW & SIMD Architecture CEVA DSP X2, Up to 350MHz
+Embedded 32MB DDR @200MHz

System Solution Crescendo VII/IX

+ DTS Virtual X
+ karaoke
C7 Processor

3D Audio
C9 Processor
+ DTS X
+ Dolby Atmos

Smart Audio
(Voice Activated)
+ WiFi
+ Voice Command

In Production | New In Production | In R&D | In Definition

SABRE ESS SAB

A picture is worth a thousand words!

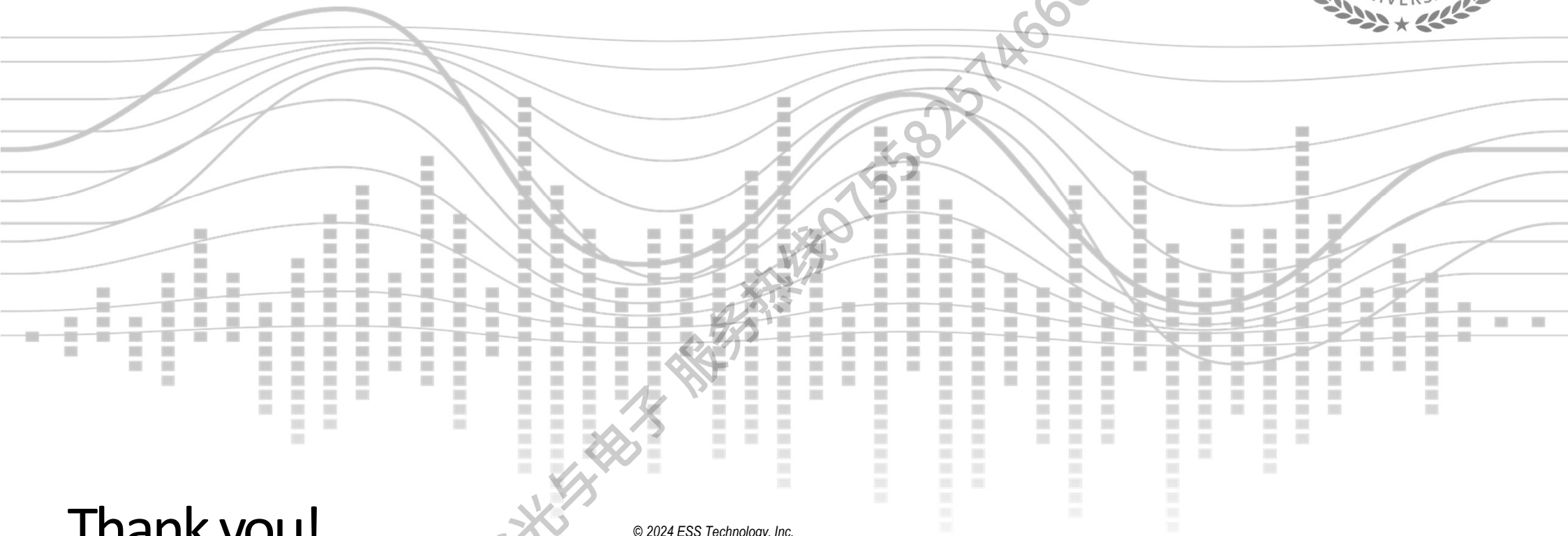
Leading Audio Brands Depend on ESS…

… Winning Multiple Awards With Our SABRE Sound Quality

Our products are best-in-class!

Bringing Music to Life

SABRE ESS SAB



Thank you!

Company Confidential