



2024 全球电子纸技术及应用高峰论坛

Global Electronic Paper Technology and Application Summit Forum and Industry Research Conference 2024

📅 2024年11月6日10:00-17:30

📍 深圳国际会展中心10/12号馆(二层) 会议室10-B

指导单位：中国电子视像行业协会PID分会、广东省电子纸产业促进会

主办单位：励展博览集团

协办单位：国家新型显示技术创新中心-反射式显示创新平台、洛图科技(RUNTO)

支持媒体：中华液晶网、电子纸行业网、新型显示、Runto 洛图科技观研

汉王EMC磁容触控技术交流

目录

01 公司简介

02 磁容触控

03 EM-PEN

04 结束

公司简介



- 1995年，汉王研发出第一只具有自主知识产权的电磁笔
- 2002年，汉王获得无线无源专利技术
- 2004年，汉王绘画板问世，并获得国外专利
- 2010年，汉王在深交所中小企业板正式挂牌上市
- 2013年，汉王推出主动电容笔
- 2021年，汉王鹏芯科技成立，从事芯片设计，应用与推广
- 2024年，汉王推出EMC磁容触控芯片HW0888

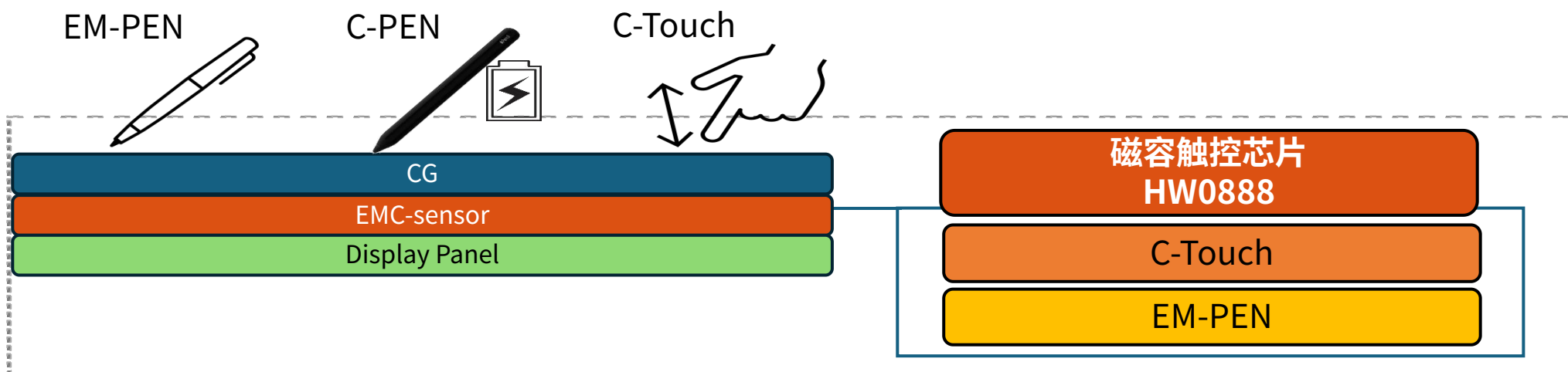
公司简介



- 北京汉王鹏芯科技（原属汉王科技研发中心芯片部，2008年起），从事芯片设计、应用与推广。
- 优势领域，无源电磁笔、电磁/电容触控、电容式压力传感器。
- 公司位于北京市海淀区中关村软件园汉王大厦，是汉王科技（股票代码 002362）全资子公司。

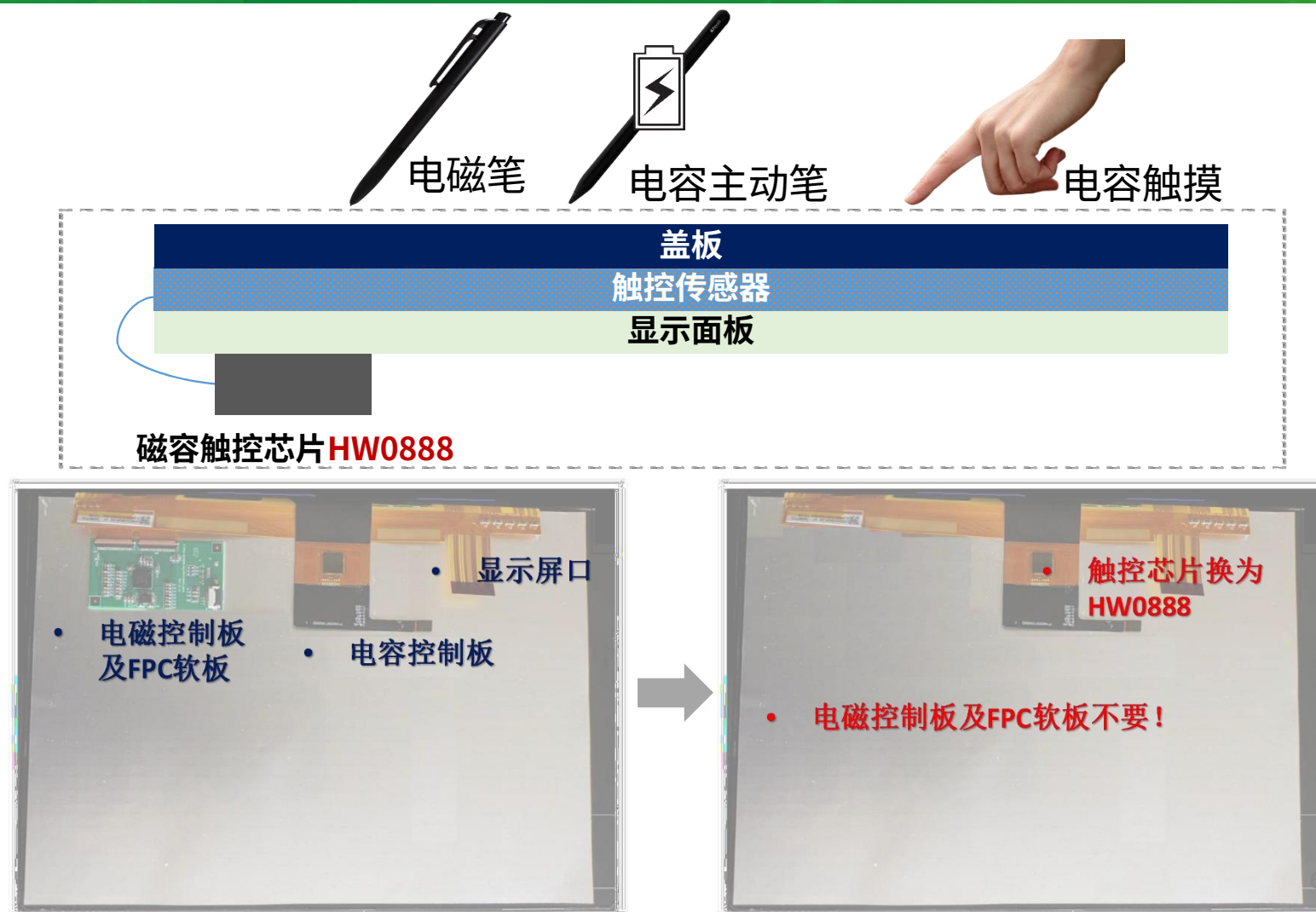
EMC磁容触控方案

$$EMC = EMR + C-Touch$$



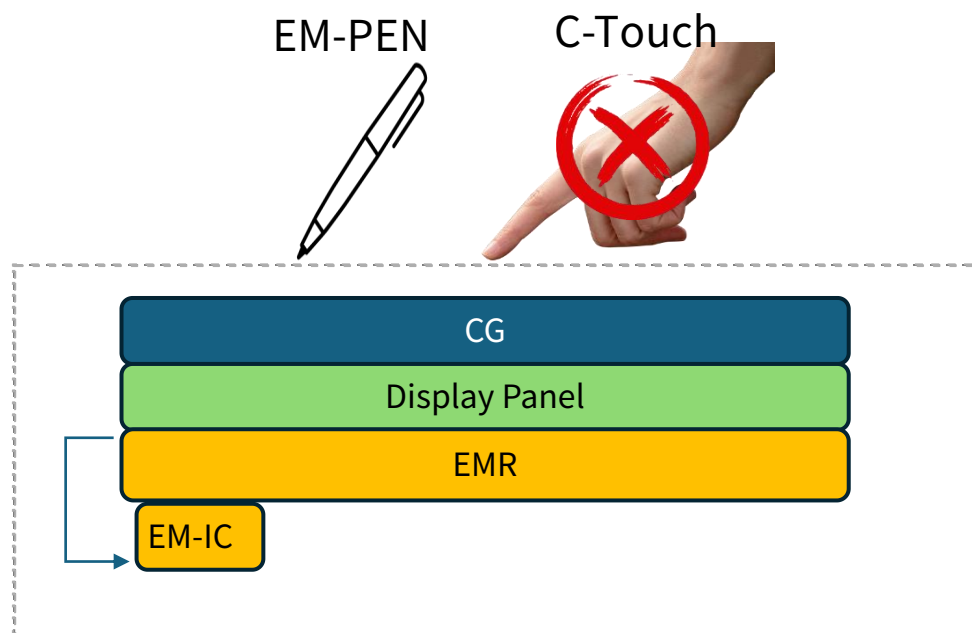
1. 一颗芯片HW0888，电磁电容共用同一层sensor
2. 支持EM-PEN，无源电磁笔，无电池，不需充电
3. 支持C-PEN和电容式手指触控功能
4. 笔和手分别为电磁和电容，具有更优秀的防误触性能

HW0888应用示意图



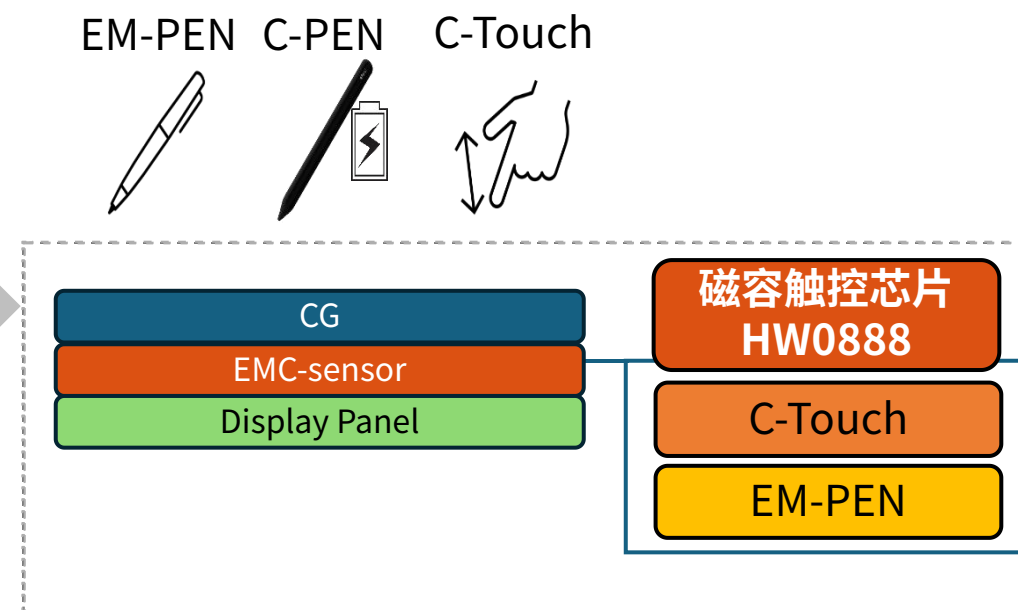
市场方案 Vs EMC磁容方案

方案一：EMR



无源电磁笔，不支持**手触**！

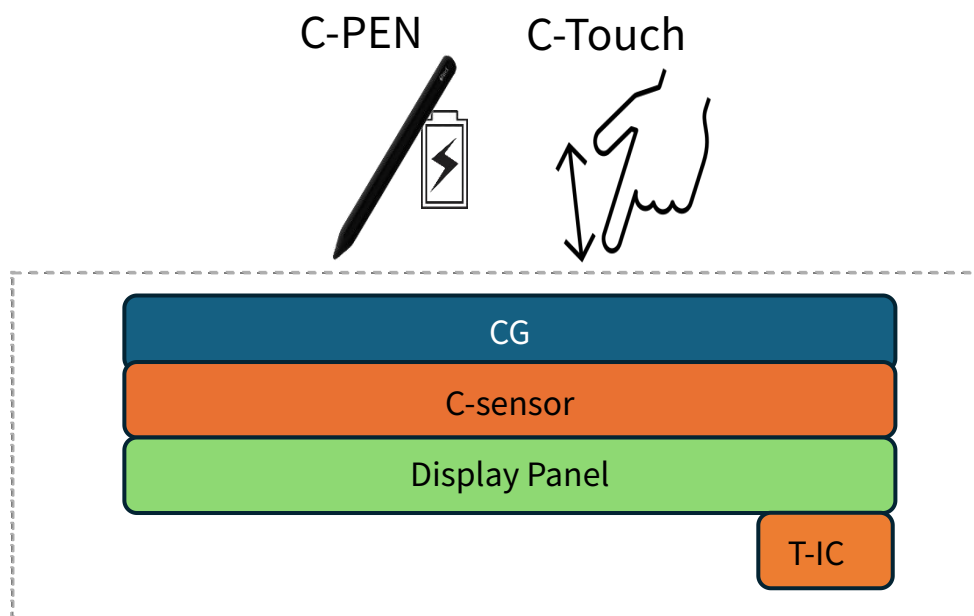
汉王方案：EMC磁容触控



一颗IC,同时支持无源电磁笔，**手指触控**！

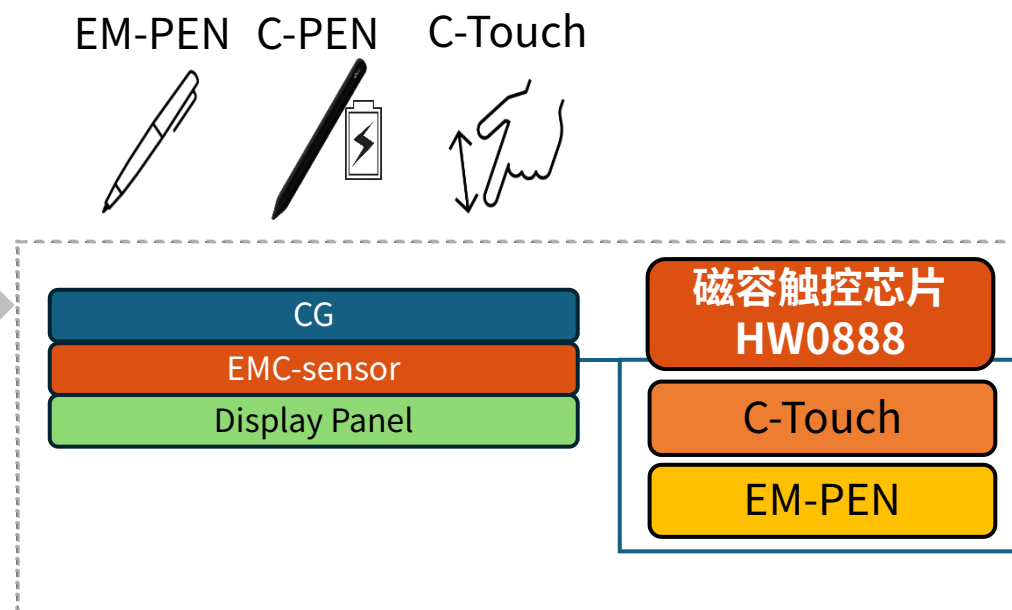
市场方案 Vs EMC磁容方案

方案二：C-PEN + C-Touch



主动电容笔，需要**电池**！

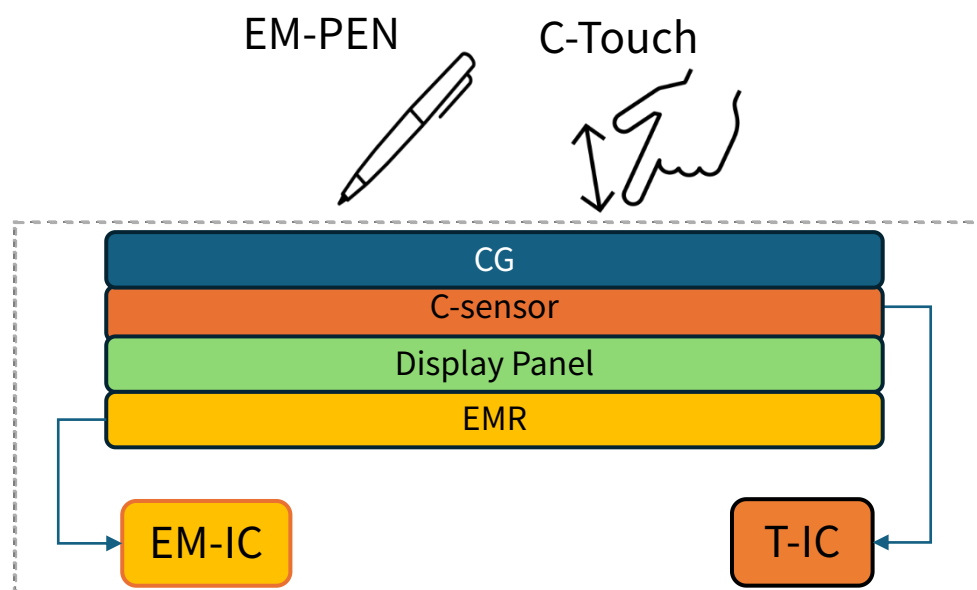
汉王方案：EMC磁容触控



一颗IC,同时支持无源电磁笔，**手指触控**！

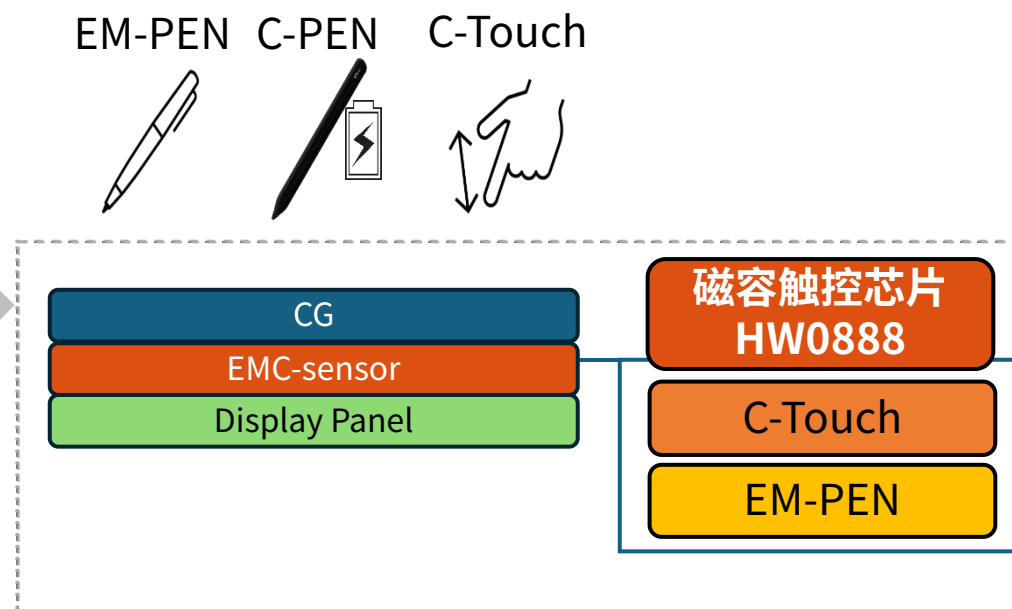
市场方案 Vs EMC磁容方案

方案三：EM-PEN + C-Touch



2个IC，2层sensor,分别支持无源电磁笔和手指触控！

汉王方案：EMC磁容触控

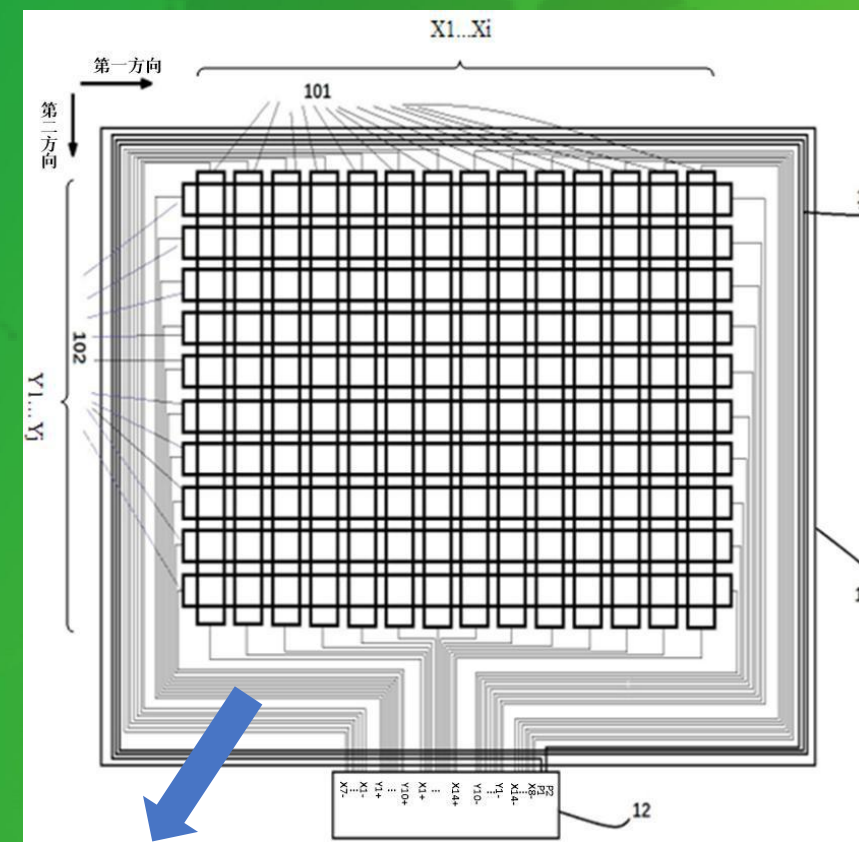


一颗IC,同时支持无源电磁笔，手指触控！

磁容触控专利体系

• 《触控面板、触控系统以及触控面板的控制方法》

专利卷号	专利申请号	专利中文名称	当前程序
00229-1CN	200810115839.4	透明天线板的电磁式触摸装置	专利维持
00459-1CN	201010192227.2	电磁手写装置及其天线的多路扫描方法	专利维持
00590-1CN	201010299356.1	双模输入设备和双模输入方法	专利维持
00880-1CN	201110181941.6	双模输入装置及其发送数据的方法	专利维持
00961-1CN	201110304867.2	双模输入方法及装置	专利维持
00963-1CN	201110328216.7	兼容电容定位和电磁定位的输入装置及其输入方法	专利维持
1401-2CN	201920073315.7	电磁电容双触控显示装置	专利维持
1402-2CN-1397	201920073334.X	一种双触控感应模组及双触控显示装置	专利维持
1405-2CN-1400	201920073375.9	双模式触控显示装置	专利维持
1466-2CN	201922203685.0	一种透明电磁天线挂装结构	专利维持
1472-2CN	201920065930.3	电磁电容双触控线路结构	专利维持
1539-1CN	202110180437.8	一种触控输入装置、方法、电子设备及可读存储介质	专利维持
01008-1CN	201110442344.4	电容式输入装置及其确定有效触摸点的方法	专利维持
01020-1CN	201110459381.6	电容式输入装置及其多触摸跟踪方法	专利维持
1161-2CN	201520431850.7	电容式触控设备及系统	专利维持
1162-2CN	201520430938.7	电容式触控设备及系统	专利维持



光刻铜金属网格工艺
2T2R引线

HW0888

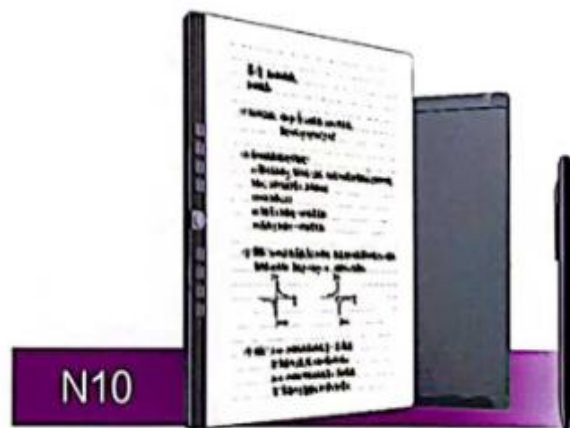
➤ 应用前景

应用于平板、手机、电子书、绘画屏等领域场景，
实现无电池节能环保、高精度书写效果。

- 支持无源电磁笔
- 支持电容触控
- 支持SPI/UART/I2C接口
- 磁容双模单IC支持尺寸：<11”

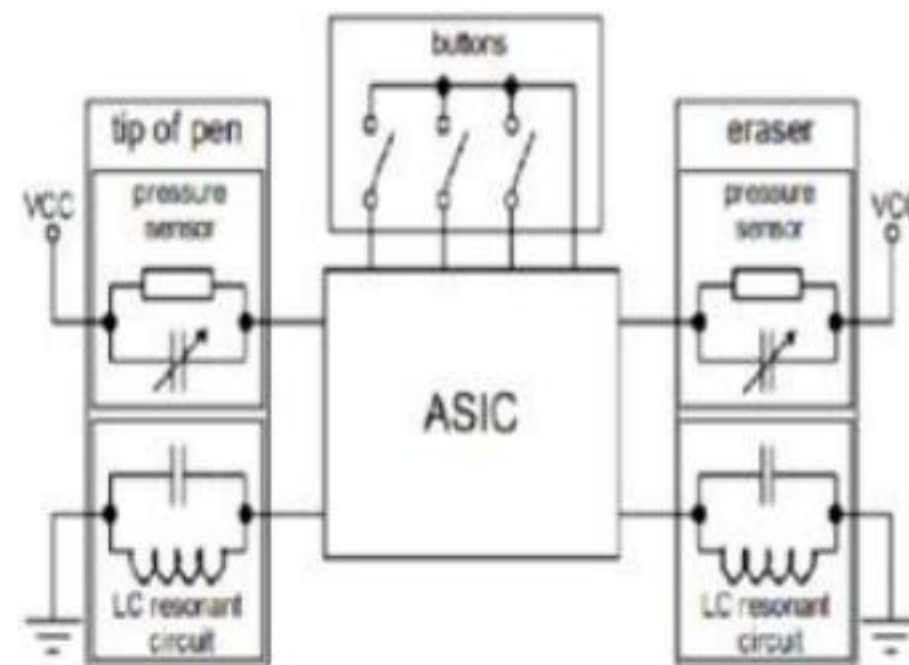


HANVON PENCHIP 芯片



无源电磁笔芯片MD4502

- 汉王自研数字笔芯片：MD4502
- 无源电磁笔设计：无电池，不需充电
- 低功耗设计：<2uA
- 支持8192级压感
- 支持笔ID

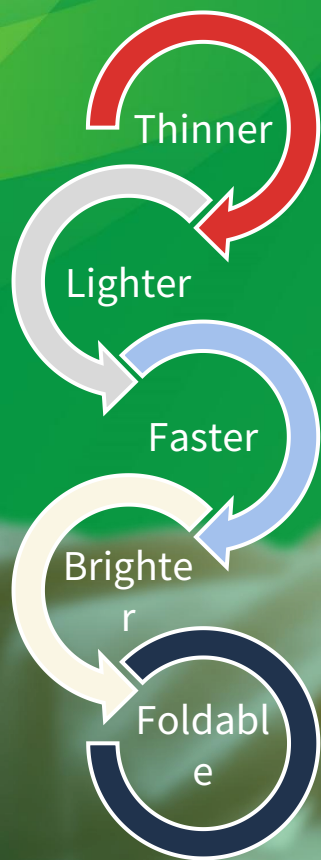


Simplified pen circuit



Thanks

- Wechat:S5160606
- E-mail:shangyanfeng@hanwang.com.cn
- 汉王鹏芯科技有限公司



EMC Touch

An Optimized Touch Solution

2024-11



FlexTouch Milestone

- 2024.1 Double production capacity
- 2023.12 Product qualified for mass production for several more major brand-name customers
- 2022.10 First MP client(s): notebook computer: 14" & 16"
- 2021.12 Passed tests of brand name clients with superior performance
- 2021.8 Passed QS ISO9001 & ISO14000 certifications
- 2021.1 Released first functional product
- 2020.10 Completed factory construction, production line ready
- 2019.3 FlexTouch was founded
- prior to 2019 Core technical team came from Silicon Valley



About FlexTouch

- FlexTouch Technologies Co. specializes in the next-generation flexible metal mesh touch sensors. FlexTouch's innovative copper metal mesh production line is in mass production for world's top-tier brand customers.
- FlexTouch's headquarter is in Silicon Valley and its manufacturing facility is in Wuzhen, China.



FlexTouch Metal Mesh Advantages

High
screen
ratio

Narrower Border:

- L/S for phone 8/8 μm
- L/S for tablet/laptop 10/10 μm
- Larger display area

Thinner
Lighter

Thinner Structure:

- Thinner substrate:
25 μm , 36 μm , 50 μm
- Compatible with thin OCA (6~10 μm)
- Compatible with Ultra-Thin Glass (UTG)
- Works w/o cover lens (HC)

Faster

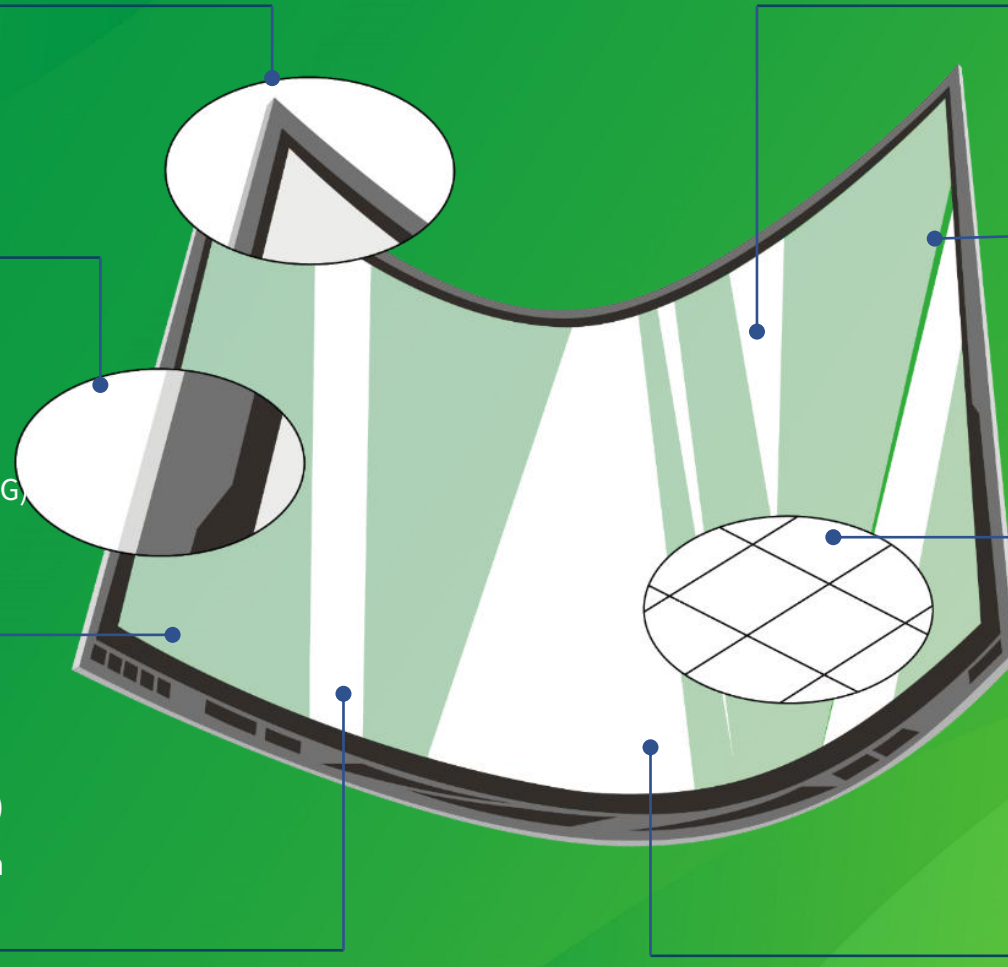
Lower Sheet Resistance:

- Trace sheet resistance $< 0.1 \Omega / \square$
- Mesh sheet resistance $< 8 \Omega / \square$
- Channel resistance 1.4 k Ω (70 nodes)
- Support both finger and stylus touch

Green
Solution

Eco-friendly:

- Additive process, saves material
- Lowest sheet resistance, lowest power consumption



Foldable:

- Support flexible display
>200k times R2 bending tests

Foldable

High SNR:

- Mitigate re-transmission
- Support gloves, touch with moisture on surface

High SNR

Better Cosmetic and Optical:

- Mesh line width:
2 μm , 2.5 μm , 3 μm
- Transmittance $> 89\%$
- Mesh blocking density $< 2\%$
- Low Haze $< 1.5\%$, highly clear

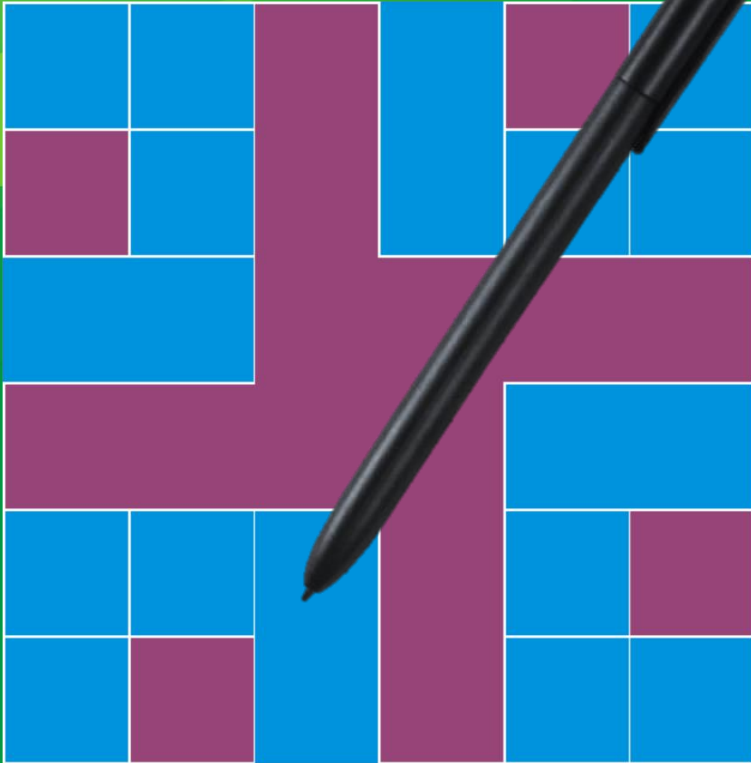
Brighter

Better Reliability:

- Copper metal mesh
- Over-coat protection
- Sulphur resistant

Reliability

Patented Design Pattern for High Performance EMC Touch



FlexTouch Patented Pattern

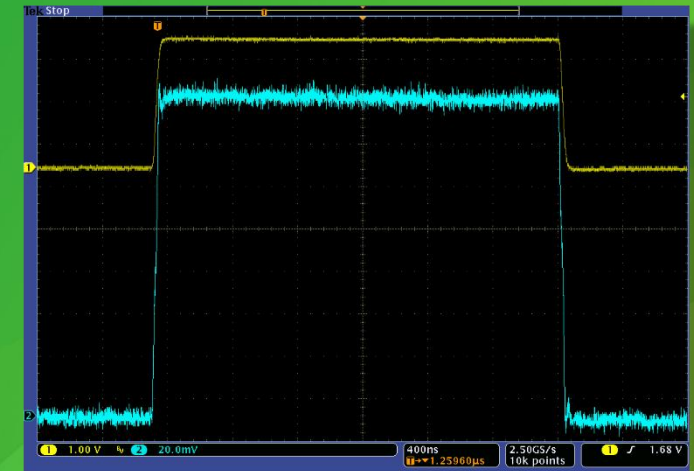
FlexTouch Pattern Advantages

- Superior Linearity and Accuracy
- Fast Response Time
- Noise Robustness
- Low Power Consumption

Ref. Electrical Characteristics

- Sheet Resistance $8\Omega/\square$
- Node Resistance 16Ω
- Charge Time $< 100\text{ns}$

Fast Charge



FlexTouch Advantages for EMC Touch



Material

- Double-sided Cu metal mesh provides ultra-low resistance
- Ultra thin and clear substrate material



Design

- Innovative pattern and trace design
- Optimized stack design compatible for EMR and capacitive touch



Optical

- Substrate and stack optimized for excellent optical performance
- Narrow mesh enables high transmittance



Integration

- Excellent integration technique and test capability

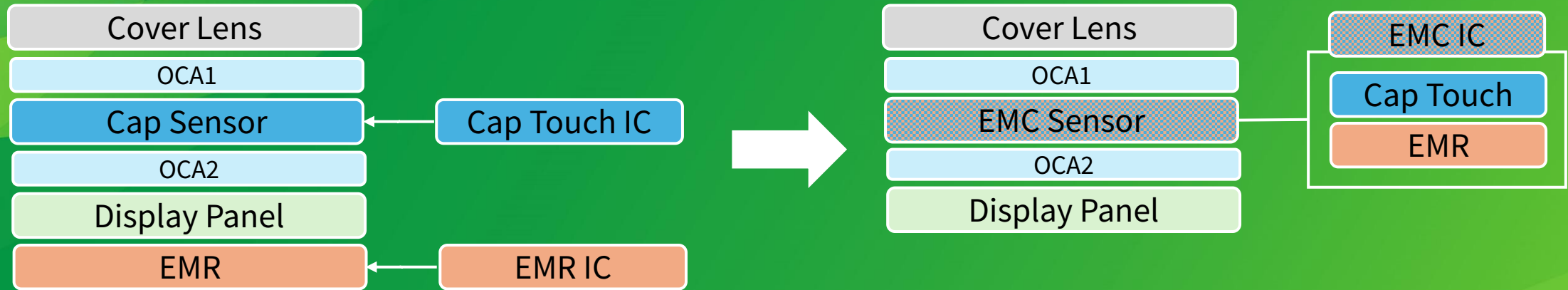
EMC Touch – The Optimized Touch Solution



EMC provides the integrated functionality of

- EMR for stylus
- Capacitive Touch for finger operation

EMC Touch Solutions – Architecture



EMC combines the advantages of EMR and Capacitive Touch

- Simultaneous finger and stylus touch
- Best stylus performance with noise tolerance
- Best palm rejection capability
- Thinner stack
- Lower cost

Performance Capability Comparison

	EMR	Capacitive Touch (ITO-Based)	EMC Touch
Finger Touch	✗	✓	✓
Stylus Touch	✓	✓	✓
Stylus Accuracy	Excellent	Good	Excellent
Palm Rejection	✓	✗	✓
Noise Tolerance	✓	✗	✓
Stylus Battery	✗	✓	✗
Stylus Cost	Low	High	Low
Thinner Stack	✗	✓	✓
Touch Controller	Discrete	Discrete	Integrated EMR Capacitive

THANK YOU

FlexTouch Technologies Co., Ltd.

www.flextouchtech.com

USA: 160 E. Tasman Dr., San Jose, CA 95134, USA

China: #908 East Huanhe Rd., Wuzhen, Jiaxing, Zhejiang