



Automotive Product Road Map

2016 Q1

Product Planning Center

CPT Automotive Product Target

Quality

- Increase module automated production scale.
- All products pass AOI (Automatic Optic Inspection).
- Specific automotive production line.

DPPM

Technology

- Improve HFFS weakness. Ex. Low temp. RT, Contrast Ratio.
- Enhance Image Quality. Ex. Resolution, NTSC.
- Reliable design with reliable verification like Image sticking.

TN**HFFS**

Cost

- CPT manufacturing from panel, module to TSP bonding.
- In house key component like Color filter and back light.
- Implement multi channel Source IC from 800 to 2400 channels.

Cost

Product Matrix

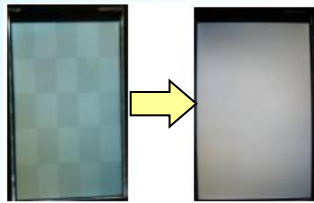
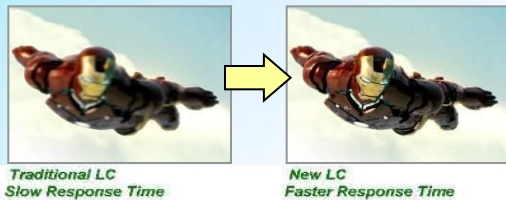
- Complete HFFS product line
- Total solution product development
- Support every applications in cars from CID, RSE to Cluster.

LCM**TTS**

CPT Core Technology

車載

LT Response
Image sticking
Long Life Time



Free Form
Customized



Reliability
upgrade

Integrated
Touch
Function

CPT Core
Technology

Free
Form
Module

High
Display
Performance

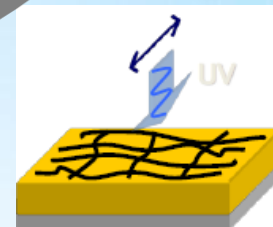
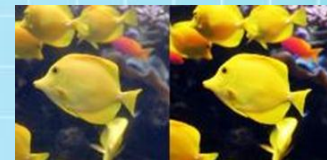
Wide Screen

Total Solution
Touch on Cell

GG	PG
Coverlens	PMMA
OCA	OCA
Sensor	Sensor
Glass	Glass
OCA / OCR / Air Bond	OCA / OCR / Air Bond
Display	Display

TOC
Coverlens
OCA / OCR / Air Bond
Sensor
Display

FFS
High CR
High NTSC



UV irradiation



Technical Roadmap

Start develop→

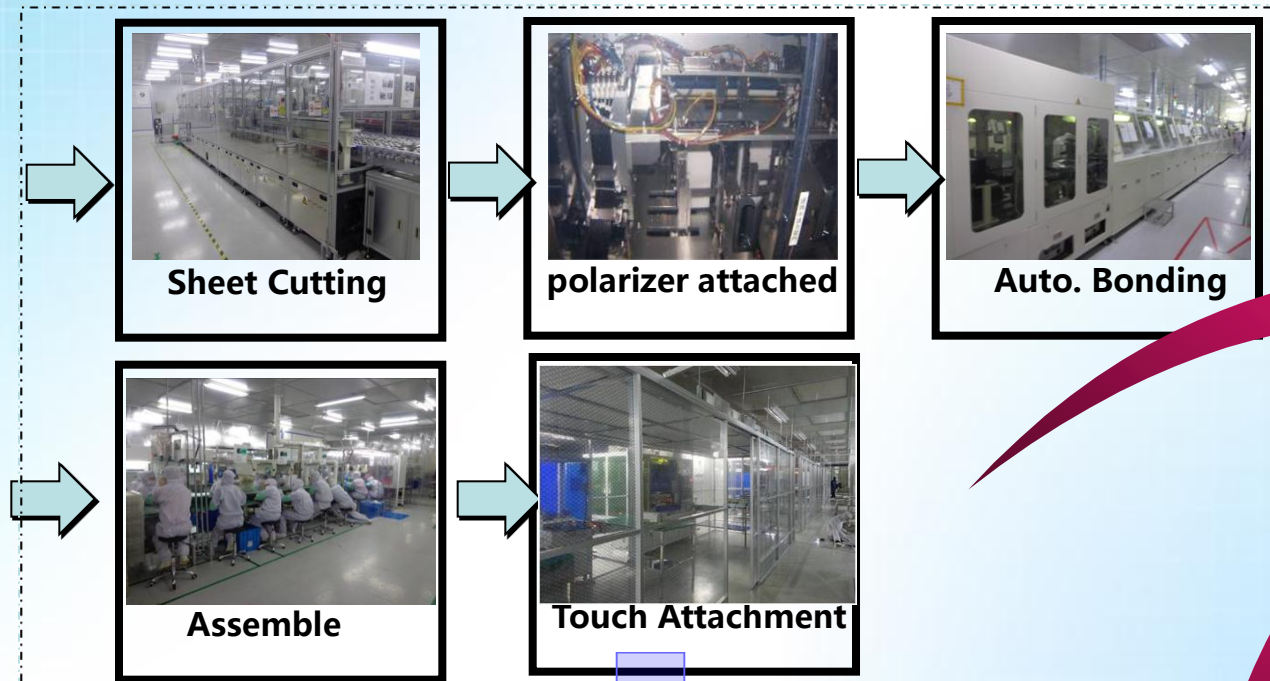
← MP

Characteristics		2016	2017	2018	2019	2020
High Resolution		PPI~200	PPI 250~300			
High T%		T%:5% UP	T%:10% UP		T%:15% UP	
NTSC (CIE 1931)		NTSC 70%	NTSC 95/100%			
High CR		CR ~1200	CR 1500~1800		CR ~2000	
Low Temp. RT	-20℃	<150ms	<140ms		<130ms	
	-30℃	<350ms			<330ms	
Touch function		ToC	TiC			
		Out cell with gloves / hover	ToC with gloves/hover			
		2D/2.5D/3D				
Free Form		Free Form Display Corner-Cut Shape	Free Form Display Curved Shape			

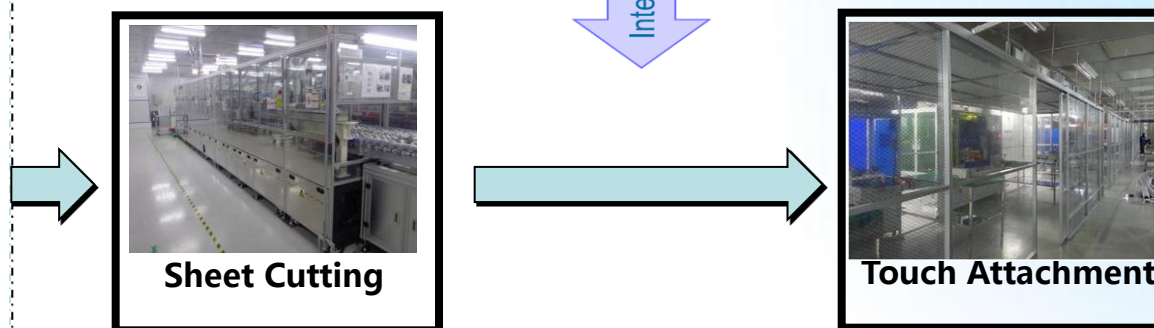
* PPI reference: 7" WVGA: 133 8" HD: 184 9" FHD: 245 12.3" FHD: 167

CPT Integrate Process

■ MLCM & FDT



■ FDT



Output

Advantages:

- Shorter lead time
- Better process straight rate
- Better quality control
- Reduce transportation risk
- Reduce panel damage and scrap
- Reduce packing costs
- Reduce shipping costs

TFT LCD Automotive Application



8:3



12.x"



3:4



16:9



Combined (Ex. 7"+4.2")



Roof Mounted



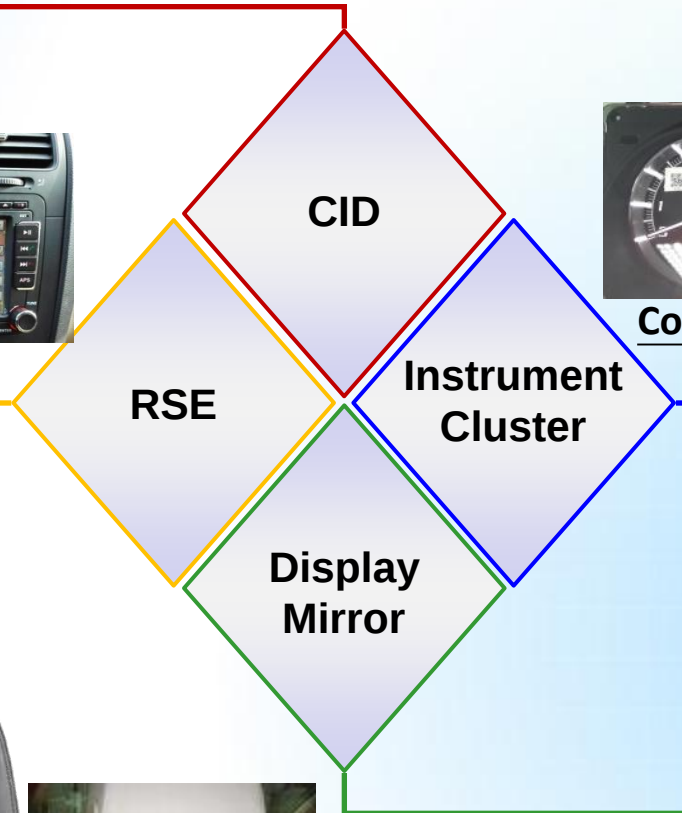
Headrest

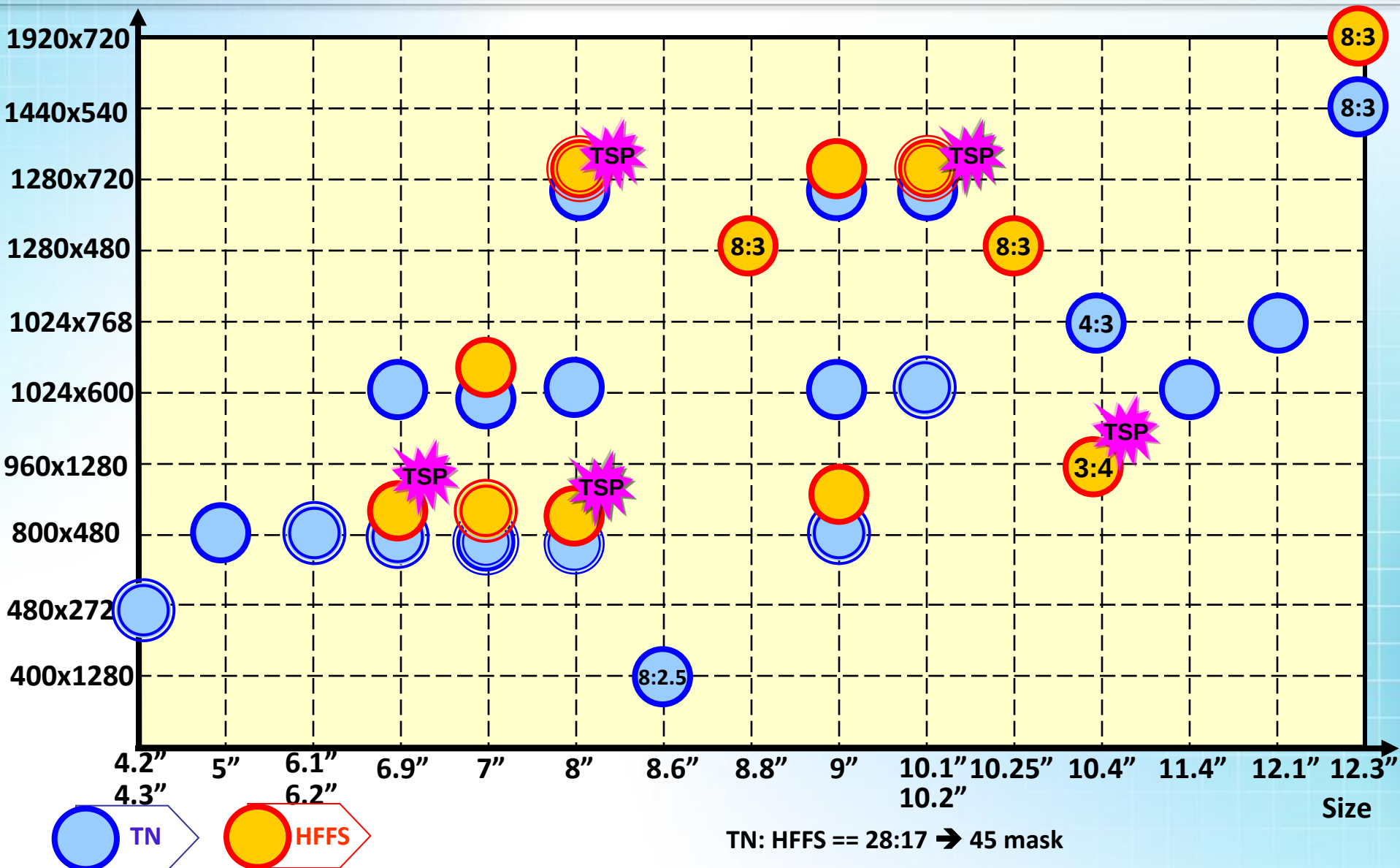


Rear set



Rear View Mirror





CPT Total Solution Products

Item	069LA0A05	069LA	080NA2301	080LQ	080WK	101Wx	080Wx	104EA	080WK61
LCM Tech.	TN	TN		HFFS			HFFS		HFFS
TSP TYPE	GG	FG		GG			PF	PG	ToC
Bonding	Air Bond	Air Bond		DB (OCA)			DB (OCA)		DB (OCA)
Structure	ASF Glass CL DB(OCR) Glass Sensor Air Bond Display	ASF Glass Sensor Air Bond Display	ASF Glass Sensor Air Bond Display	Cover lens DB(OCR) Glass Sensor DB(OCA) Display	Cover lens DB(OCR) Glass Sensor DB(OCA) Display	Cover lens DB(OCA) Glass Sensor DB(OCA) Display	Plastic CL DB(OCA) Films Sensor DB(OCA) Display	Plastic CL DB(OCA) Glass Sensor DB(OCA) Display	ASF Cover lens DB(OCA) Sensor Display
Touch IC	COB (Cypress)	COF (ITE)	COF (Atmel)	COF (Atmel)	COF (Atmel)	COF (Atmel)	COB (Atmel)	COB (Cypress)	COF (Focal Tech)
Operating Temp.	-30 ~ 85℃	-20 ~ 70℃	-30 ~ 85℃	-30 ~ 85℃	-30 ~ 85℃	-30 ~ 85℃	-30 ~ 85 ℃	-30 ~ 85 ℃	-20 ~ 70 ℃
Storage Temp.	-40 ~ 90℃	-30 ~ 80℃	-40 ~ 90℃	-40 ~ 90℃	-40 ~ 90℃	-40 ~ 90℃	-40 ~ 90℃	-40 ~ 90℃	-30 ~ 80℃
Cover Lens	Standard	NA	NA	Customize	Customize	Customize	Customize	Customize	Standard
Mode	MOP	AM	BM	MOP	MOP	MOP	MOP	MOP	AM
MP Schedule	2014	2016 (SL ready)	2016 (SL ready)	2017	2017	2017	2018 (SL ready)	2016 (SL ready)	2016 (SL ready)
LCM	069LA	069LA	080NA	080LQ	080WK	Customize	Customize	104EA	080WK
Remark	Out-cell sensor and Cover lens are outsourcing								

Automotive Product Matrix – Total Solution

Size	Model	TSP Type	Cover Lens	Sensor	IC	FPC	Bonding 1	Bonding 2	Reliability	MP	Note
6.95"	069LA0A05	GG	Glass	Glass	Cypress	COB	OCR	Air Bond	-30~85 °C/1000hr	V	069LA Series
	069LB0301	FG	X	Glass	ITE	COF	X	Air Bond	-20~70 °C/240hr	2016	069LA Series
8"	080NA2301	FG	X	Glass	Atmel	COB	X	Air Bond	-30~85 °C/240hr	2016	080NA Series
	080WK61xx	ToC	Glass	Glass	Focal	COF	X	OCA	-20~70 °C/240hr	2016	080WK Series
10.4"	104EAxxxx	PG	PC	Glass	Cypress	COB	OCR	OCA	-30~85 °C/240hr	2017	104EA series

Automotive Product Matrix – Special aspect ratio

Size	Res.	Model	Fab.	Type	Square pixel	NTSC	Tcon	I/F	Color depth	Lum.	Reliability	MP	Note
8.6"	400x1280	086WA01	G4.5	TN	No	70%	O	LVDS	888	--	-20~70 °C/240hr	Q2	Aspect ratio: 8:2.5 FOG type
8.8"	1280x480	088WA01	G4.5	HFFS	Yes	70%	O	LVDS	888	500	-20~70 °C/240hr	V	Aspect ratio: 8:3
10.25"	1280x480	103WA01	G4.5	HFFS	Yes	70%	O	LVDS	888	600	-20~70 °C/240hr	V	Aspect ratio: 8:3
	1920x720	103FA01	--	HFFS	--	70%	O	LVDS	--	700	-30~85 °C/1000hr	Plan	Aspect ratio: 8:3 2016 plan
10.4"	960x1280	104EA01	G4.5	HFFS	Yes	70%	O	LVDS	888	765	-30~85 °C/1000hr	Q3	Aspect ratio: 3:4
	1024x768	104XA12	G4.5	TN	Yes	47%	O	LVDS	666	400	20~70 °C/240hr	Q1	Aspect ratio: 4:3 3 O'clock
12.1"	1024x768	121XA02	G4	TN	Yes	70%	O	LVDS	6+2	600	-30~85 °C/240hr	Q3	Aspect ratio: 4:3 9 O'clock W/Circuit Board
12.3"	1440x540	123PA01	G4	TN	Yes	70%	O	LVDS	888	800	-30~85 °C/240hr	Q4	Aspect ratio: 8:3 W/Circuit Board
	1920x720	123FBA1	G4	HFFS	Yes	70%	O	LVDS	888	700	-30~85 °C/1000hr	2017	Aspect ratio: 8:3 W/Circuit Board

Automotive Product Matrix

Size	Res.	Model	Fab.	Type	Square pixel	NTSC	Tcon	I/F	Color depth	Lum.	Reliability	MP	Note
4.2"	480 x 272	042JB01	G4	TN	Yes	55%	O	TTL	666	--	-30~85 °C/1000hr	V	FOG
4.3"	480 x 272	043JD02	G4	TN	Yes	50%	O	TTL	6+2	600	-20~70°C/240hr	V	
5"	800 x 480	050LA0A	G4.5	TN	Yes	50%	O	TTL	6+2	500	-20~70 °C/240hr	V	
6.1"	800 x 480	061LA0Q	G4	TN	No	70%	X	TTL	666	500	-30~85 °C/1000hr	V	
		061LA0M								500	-20~70 °C/240hr	V	
6.2"	800 x 480	062LA01	G6	TN	No	50%	O	TTL	6+2	500	-20~70 °C/240hr	V	
		062LA11				70%				500	-20~70 °C/240hr	V	
6.94"	840x480	069LR01	G4.5	TN	No	70%	O	LVDS	888	550	-20~70 °C/240hr	Q2	
6.95"	800 x 480	069LA0A	G4.5	TN	No	70%	X	TTL	666	500	-30~85 °C/1000hr	V	- The Same Active Area - TSP: GG MP/ FG SPL
		069LA0T								500	-20~70 °C/240hr	V	
		069LD01	G4.5	HFFS	No	70%	X	TTL	666	500	-30~85 °C/1000hr	Q4	
	1024 x 600	069NA01	G4.5	TN	No	50%	O	LVDS	666	500	-20~70 °C/240hr	V	
7"	800x480	070LD0D	G4.5	TN	Yes	45%	O	TTL	6+2	500	-30~85 °C/240hr	V	
		070LF0B	G6	TN	No	50%	O	TTL	6+2	450	-20~70 °C/240hr	V	
		070LFA1								450	-30~85 °C/240hr	V	
		070LM01	G4.5	HFFS	Yes	70%	O	TTL	888	600	-30~85 °C/1000hr	Q4	
		070LQ01	G4.5	HFFS	Yes	70%	O	LVDS	6+2	760	-30~85 °C/1000hr	Q4	
	1024x600	070NJ05	G6	TN	No	50%	O	LVDS	6+2	500	-20~70 °C/240hr	V	- The Same AA and OD
		070NJ07								600	-20~70 °C/240hr	V	
		070NQ08		HFFS	No	50%	O	LVDS	6+2	600	-20~70 °C/240hr	Q2	

Automotive Product Matrix

Size	Res.	Model	Fab.	Type	Square pixel	NTSC	Tcon	I/F	Color depth	Lum.	Reliability	MP	Note
8"	800x480	080LG02	G4.5	TN	Yes	70%	X	TTL	666	550	-30~85 ℃/1000hr	V	
		080LJ01	G6	TN	No	50%	O	TTL	6+2	450	-20~70 ℃/240hr	V	
		080LJA1		600						-30~85 ℃/240hr	V		
		080LQ01	G4.5	HFFS	Yes	70%	O	TTL	888	1000	-30~85 ℃/1000hr	Q4	
	1024x600	080NA12	G4	TN	No	50%	O	LVDS	6+2	600	-20~70 ℃/240hr	V	12 O’Clock
		080NA32		TN						600	-20~70 ℃/240hr	V	
		080NA23		TN						670	-30~85 ℃/240hr	V	
	1280x720	080WK03	G4.5	HFFS	Yes	70%	O	LVDS	6+2	600	-30~85 ℃/1000hr	V	
		080WK05								500	-20~70 ℃/240hr	Q4	
		080WK61	G4.5	ToC	Yes	70%	O	LVDS	6+2	450	-20~70 ℃/240hr	2016	W/Vcom
		080WM01	G4.5	HFFS	Yes	70%	O	LVDS	888	765	-30~85 ℃/1000hr	Q2	
		080WN01	G4	TN	Yes	70%	O	LVDS	888	550	-20~70 ℃/240hr	Q2	
	1920x1080	--	--	HFFS	Yes	70%	O	LVDS	888	600	-30~85 ℃/1000hr	Plan	2016 plan

Automotive Product Matrix

Size	Res.	Model	Fab.	Type	Square pixel	NTSC	Tcon	I/F	Color depth	Lum.	Reliability	MP	Note
9"	800x480	090LC41	G4	TN	No	70%	O	TTL	666	450	-30~85 °C/1000hr	V	12 O'clock
		090LC51	G4	TN	No	70%	O	TTL	666	450	-30~85 °C/1000hr	V	
		090LN01	G4	TN	Yes	70%	O	TTL	888	500	-30~85 °C/240hr	Q4	
	1024x600	090NA06	G6	TN	No	50%	O	LVDS	6+2	500	-20~70 °C/240hr	V	
	1280x720	090WB01	G4.5	HFFS	Yes	70%	O	LVDS	6+2	600	-30~85 °C/1000hr	V	
		090WK05								500	-20~70 °C/240hr	Q4	
	1920x1080	--	--	HFFS	--	70%	O	LVDS	888	600	-30~85 °C/1000hr	Plan	2016 plan
10.1"	1024x600	101ND06	G6	TN	No	50%	O	LVDS	6+2	500	-20~70 °C/240hr	V	
	1280x720	101WL01	G4.5	TN	Yes	50%	O	LVDS	6+2	500	-20~70 °C/240hr	Q4	
		101WK01	G4.5	HFFS	Yes	70%	O	LVDS	6+2	600	-30~85 °C/1000hr	Q4	
		101WK05								500	-20~70 °C/240hr	Q4	
		101WM01	G4.5	HFFS	Yes	70%	O	LVDS	888	550	20~70 °C/240hr	Q4	
	1920x1080	--	--	HFFS	--	70%	O	LVDS	888	600	-30~85 °C/1000hr	Plan	2016 plan
10.2"	1024x600	102NDA1	G4.5	TN	Yes	70%	O	LVDS	6+2	600	-30~85 °C/240hr	Q4	
11.4"	1024x600	114NA13	G6	TN	Yes	50%	O	LVDS	6+2	500	-20~70 °C/240hr	Q4	

