Chip Solution for Surveillance System

Jan, 2012

Marketing Gr./SIC Center

LG Electronics

Product Roadmap

Market Position

Value Created

XDI-I/S/II/V

- 760H/960H Single/Double Scan CCD
- 520 ~ 650 TVL
- Competitor
  - Sony SS II/III, Effio-E/P
  - Panasonic SD5
  - Samsung Winner 5/SV 5
  - NextChip Hawk

WDR/3D-DNR
570TVL

XDI-I
LGDM2001

2007

Single Chip
(MCU & SDRAM)
600TVL

XDI-S
LG1900

2008

960H CCD
650TVL+

XDI-II
LG1910

2010

960H CCD
650TVL+

XDI-V
LG1911

2011

Convergence

XDI-II/VII

- Mega Pixel CMOS
- Competitor
  - Sony I-Pella
  - Panasonic
  - Hitachi(Renesas R8A DSP)

Full HD
CMOS WDR

XDI-II
LG1905

2010

XDI-VII
LG1921

2012

Super resolution
Smart CC
HD-SDI

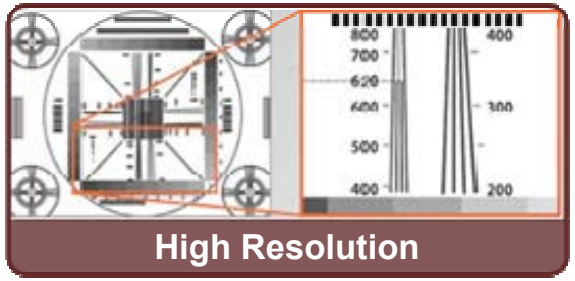
Product Roadmap

	'08~'09	'10	'11
Camera	**LG2001(XDI)** -760H CCD -WDR -DSS, 3D DNR	**LG1905B** - Full HD(1080P 30f/s) - WDR/DSS/3D DNR - including MCU/512KB Flash & SDRAM	**LG19xx** - ~5M pixel - Ultra High Resolution - Smart Contrast & Color
	LG1900(XDI-S) - one chip MCU/512KB Flash & SDRAM	**LG1910** - 960H CCD - WDR/DSS/3D DNR	**LG1911** - 960H CCD - Low Power
DVR	**LG1701** - 4Ch. Video Decoder - 1ch. Video Encoder - 4Ch. Audio CODEC	**LG1702** - Enhanced 4Ch. Video Decoder with Video Encoder & 5Ch. Audio CODEC	
			LG1721/1722 - HD SDI Tx/Rx

Mass Production | **Under Development**

Inside Camera

XDI is one chip solution including MCU, Flash Memory, SDRAM, ADC & DAC…



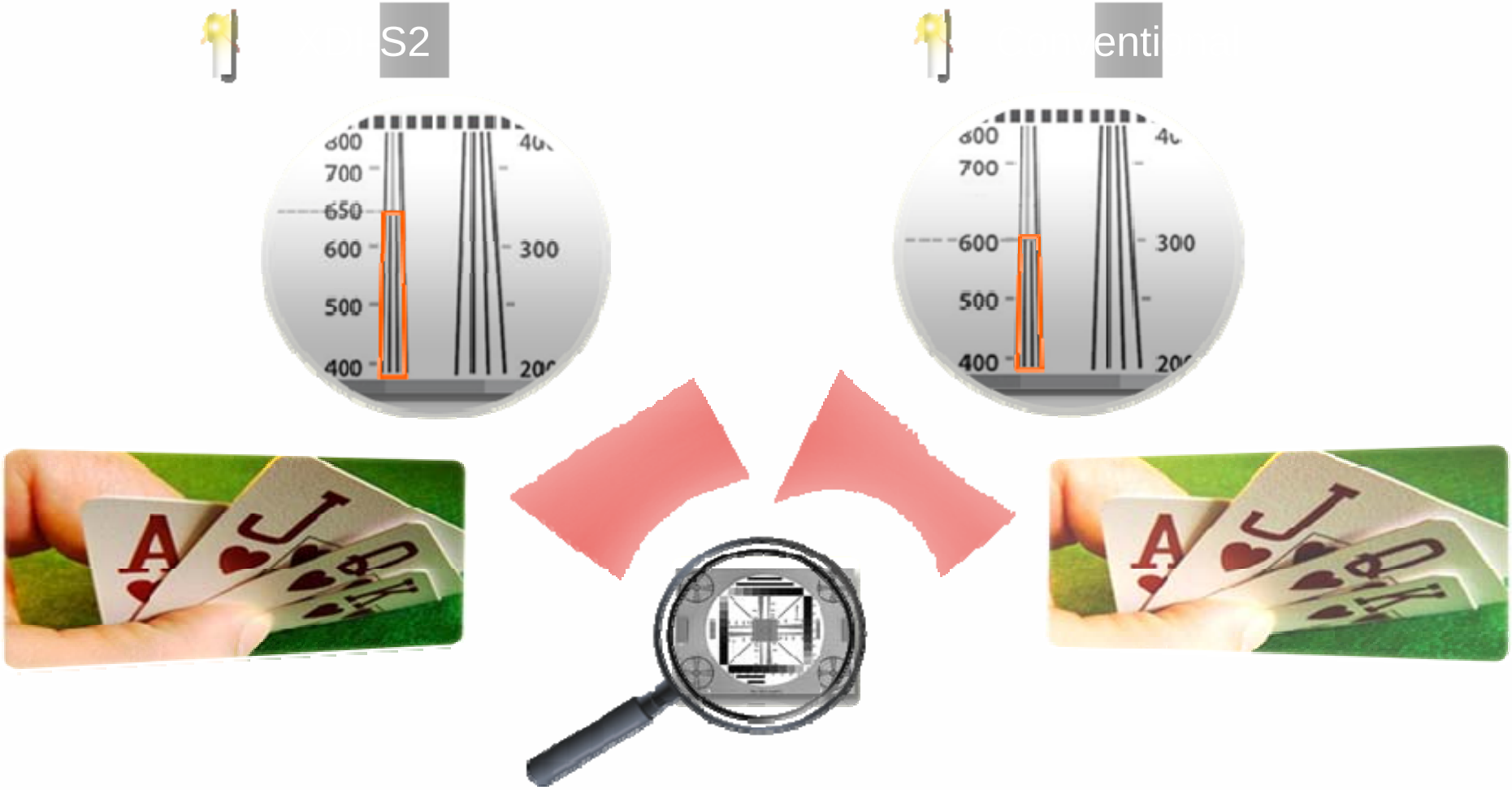
Product Line Up

Items		LG1900	LG1910	LG1911	LG1905B
Sensor		1/3”~1/4” 760H ICX 638/639 ICX 212/213	1/3”~1/4” 960H ICX 662/663 ICX 672/673	Up to 960H Sensor = =	Up to 1920x1080 30P IMX036/035
Resolution(# of TV lines @color)		600	650+	650+	Over 800
WDR	D. WDR	O	O	O	O
	Single Scan WDR	X	O	O	O
	Double Scan WDR	O	O	O	O
Digital Slow Shutter/3D DNR		O	O	O	O
Privacy Mask		24 Rectangle/ Transparency	64 Rectangle/ 8 Polygon/8Circle	=	=
De-interlacer		X	3D Motion Adaptive	X	3D Motion Adaptive
Lens Correction (Lens & Color Shading)		O	25 mesh points (4x4 blocks)	=	=
OSD		256 characters	512 characters	=	=
Smart LED Control		△	O	O	O
Bad Pixel Compensation		Up to 64 pixels	=	=	=
Digital Zoom		X1 to x20	X1 to x20 polyphase algorithm	=	=
PKG		308 BGA(12x18㎟)	308 BGA(12x18㎟)	144 BGA(10x10 ㎟)	308 BGA(12x18㎟)

Core Features

Resolution

The world best resolution of 650TV Lines is realized by combined technology of 3 Line filter, Edge Enhancement and 520K/610K sensor.



Core Features

3D DNR

3 Dimensional Digital Noise Reduction algorithm has been used in LGE DTV system
LGE's know-how realizes less noise and less ghost

Motion vector

3D Filter

New Image

Core Features

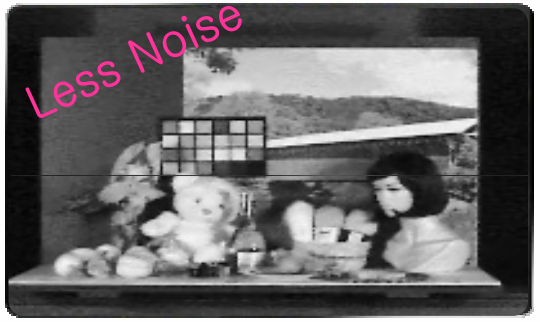
3D DNR

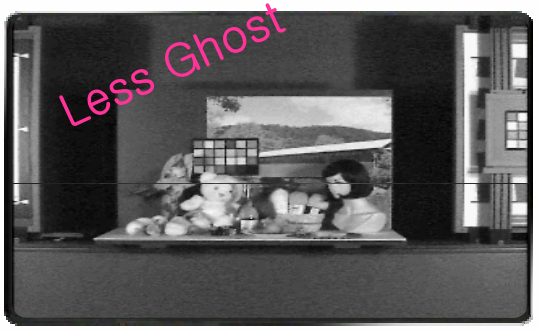
3D-DNR Experiment

- Condition : Low light environment of 0.5 Lux , '3D-DNR On w/o Sens-up' & the same DVR
- Result : LG shows less Noise and ghost.

Competitor 1 (SV5)

LGE (LG1911)





0 Lux 3D-DNR Off

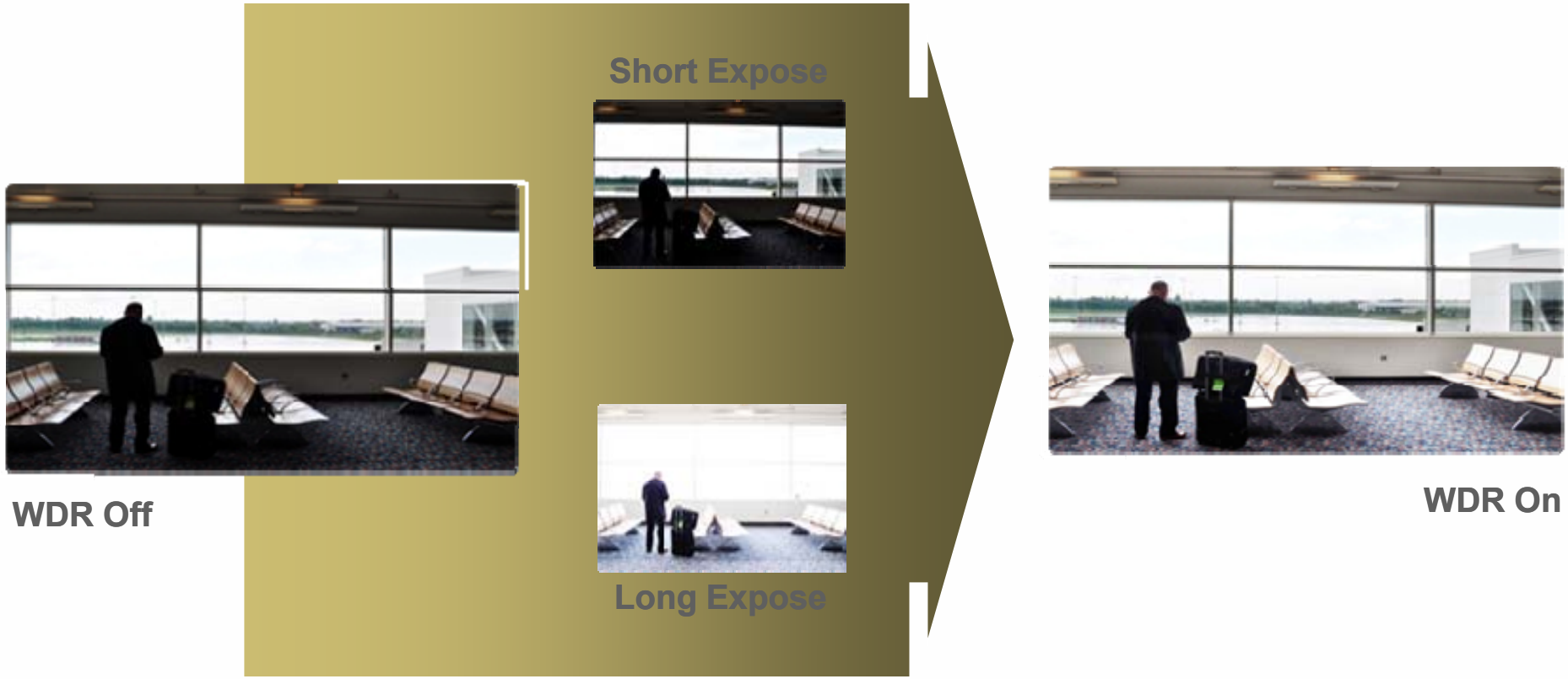
0 Lux 3D-DNR On

0 Lux 3D-DNR On

Core Features

WDR

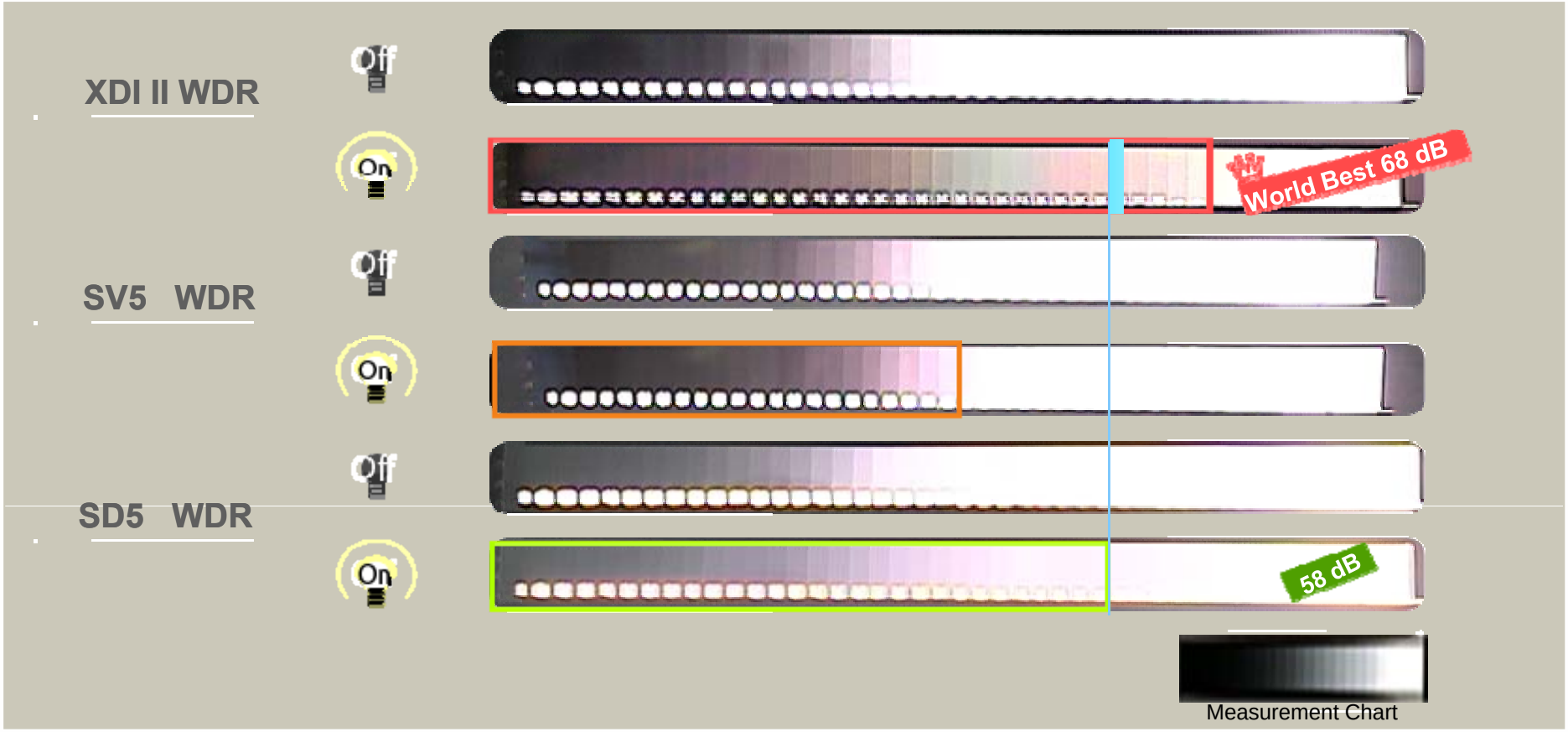
Our WDR performance has been proven for more than 4 years in the market.



Core Features

WDR Experiment 1

- Measurement condition : Transmission stuffer T4110 chart.
- Result : XDI II's new WDR engine realized up to 68dB.



Core Features

WDR Experiment 2

Competitor

LGE

WDR Off

WDR On

Core Features

Privacy Mask

Advanced Privacy Zone Masking

User can set 12 privacy masking zones to prevent the invasion of privacy.
Also the zones can be set in various shapes such as circle and polygon, colors and transparency

- ✓ Various Color
- ✓ Various shape
  - 64 Rectangles
  - 8 Polygons
  - 8 Circles
- ✓ Transparency

Core Features

XDI-V(LG1911)

- Sensor Input : 960H/760H NTSC/PAL CCD sensor
- Output : NTSC/PAL CVBS, ITU-R.656 digital output (36MHz/28.636MHz/28.375MHz)
- 12bit video processing
- True WDR for dual scan CCD and single scan CCD
- 3D noise reduction (control level : 100 steps)
- On Screen Display(OSD) w/ multi-language(upto 15 languages)
- Digital Slow Shutter(DSS) or Sens-up upto x256
- Privacy Mask 14 zones(8 rectangels, 4 circles, 2 polygon) w/ Mosaic and Transparency
- Bad Pixel Correction (Static: 256 points, Dynamic:∞)
- Digital Zoom w/ high quality image upto 16x (Full view in picture-in-picture)
- Digital Effect (H/V Mirror)
- Auto Exposure, Auto White Balance
- On-chip Optical Detector for AF data
- On-chip 16bit RISC CPU w/ 512KB Flash Memory
- On-chip 10bit Video and IRIS D/A Converter
- On-chip 8 ADCs for AD keys and photo sensors
- Motion Detection (8 regions) or Smart MD (8x6 Windows)
- Resolution Improvement Engine
- Serial Communication (UART/I2C/SPI)
- Coaxial Communication
- Supports External Sync - Digital Line-lock Function
- True Progressive Scan (double scan CCD only)
- 3.3V / 1.0V operation, 144 pins FBGA(10x10㎟) package