1 General Description

1.1 Introduction

WSC2800 series is an advanced video format converter, which converts digital inputs into multiple formats. The series has two members.　WSC2800 converts into analog output (CVBS and RGB).　WSC2810 outputs digital forms (RGB and YUV).　The series supports a wide range of configurable formats, with both SD (standard definition) and HD (high definition) input supported.　So that, the series can be applied to many high-speed and high-quality video conversion applications

1.2 Features

Input Format

- 24-bit interface in total
- 24/16-bit ITU-R601/709 YUV/YCrCb
- 24/16-bit ITU-R601/709 YPrPb
- 8/16-bit ITU-R656/709 YCrCb
- 24-bit RGB
- Pixel sample rate up to 165M pixels/sec
- Input video format auto detection
- Input clock phase correction
- ATSC format support
- Support up to 1600x1200@60Hz (UXGA)
- Non-standard input formats supported

Display Format

- 18/24 bit RGB/YUV digital output[1]
- ITU-R BT.656 output[1]
- Support Sync-on-channel mode output (YPBPR / RGB and Analog)
- 10-bit DAC embedded, support analog output[2]
- Resolution up to UXGA (1600x1200) and 1080p (1920x1080) [3]
- Dither reduction[1]
- Line frequency enhancement
- Support user-defined format
- Programmable timing signal (sync and DE)

Processing Features

- Programmable color space conversion (sRGB, ITU-R BT.709 YUV/YPbPr, ITU-R BT.601 YUV/YCbCr）
- 8bit gamma LUT
- CTI / LTI
- BCHS (brightness, contrast, hue, saturation)
- White / black / blue expanding
- White balance adjustment
- Color temperature correction
- 3D Motion-adaptive color collusion elimination
- 3D Motion-adaptive white noise reduction
- Peak / White noise reduction
- Frame rate conversion

- Improved motion-based de-interlacing
- De-interlace support NTSC / PAL / SECAM / 1080I
- Film mode (3:2/2:2 pull down) auto-optimizing for NTSC / PAL / 1080I
- Auto-switching between film mode and de-interlace

- Support multi-region, non-linear scalar
- Poly-phase programmable scalar filter
- Muti-window (4, 9, 16)
- Conversion between 4:3 and 16:9 aspects
- Zoom and panning for user-defined area
- Muti-region keystone correction
- Interlace scalar phase correction

- 16-bit DDR SDRAM memory address up to 32M byte (32M x 16bit)
- Memory clock speed up to 200 MHz (T.B.D.)

[1] Available in WSC2810 only

[2] Available in WSC2800 only

[3] For analog output, consider of the panel limitation, digital output will be up to 1366x768
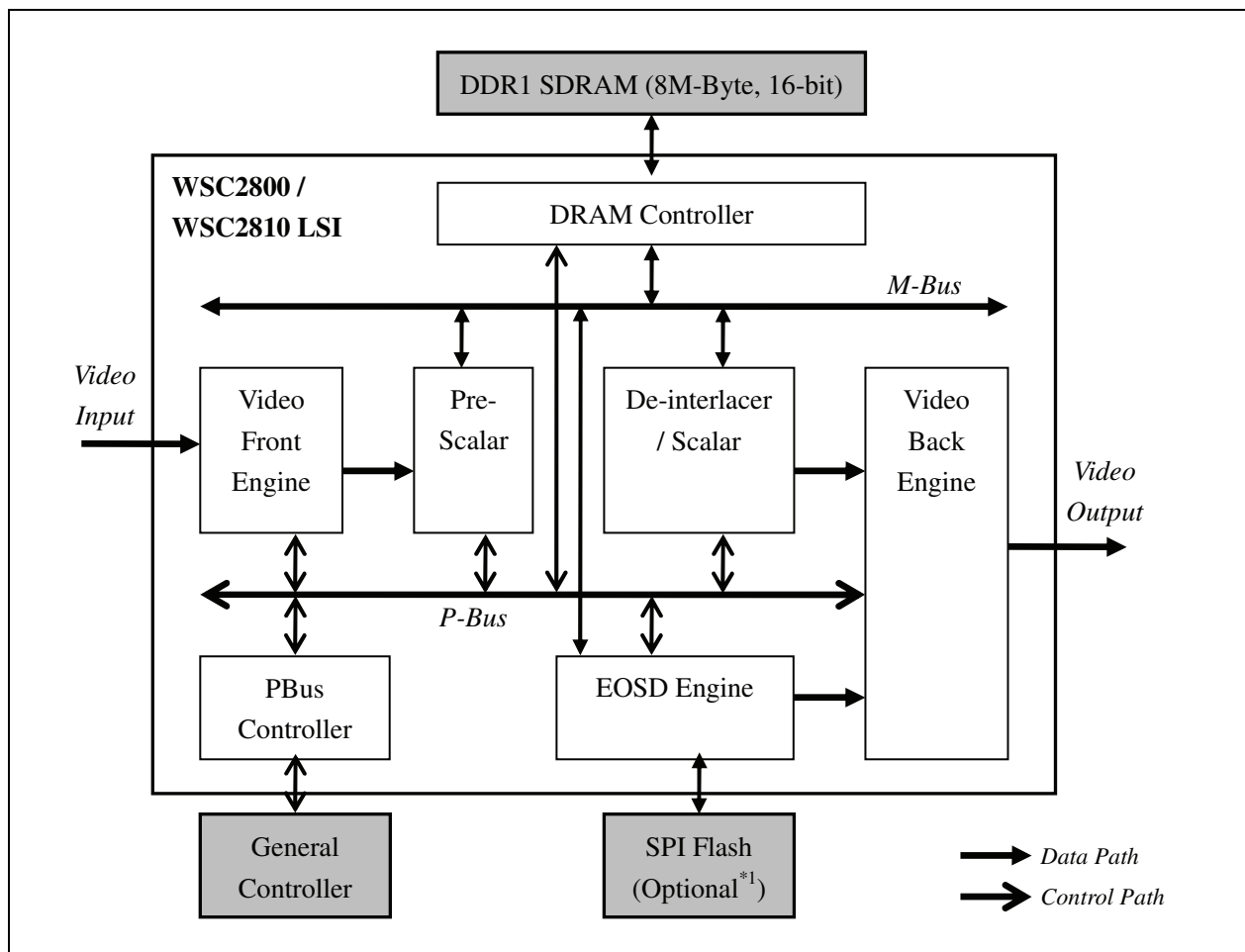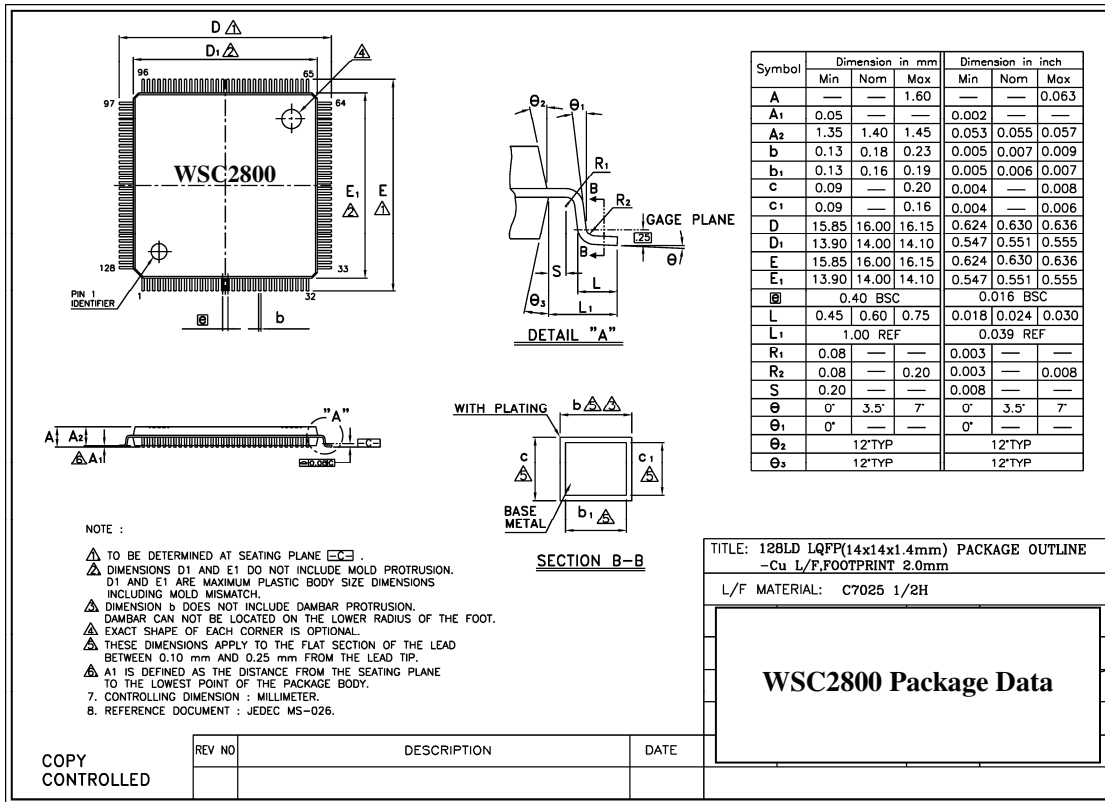
1.3 System Block Diagram

Figure 1-1 System Block Diagram

[1] Refer to Chapter 5 OSD Engine for details.

1.4 Package

WSC2800: LQFP-128 (14mm x 14mm, 0.40mm pitch)

Symbol	Dimension in mm Min	Nom	Max	Dimension in inch Min	Nom	Max
A	—	—	1.60	—	—	0.063
A1	0.05	—	—	0.002	—	—
A2	1.35	1.40	1.45	0.053	0.055	0.057
b	0.13	0.18	0.23	0.005	0.007	0.009
b1	0.13	0.16	0.19	0.005	0.006	0.007
c	0.09	—	0.20	0.004	—	0.008
c1	0.09	—	0.16	0.004	—	0.006
D	15.85	16.00	16.15	0.624	0.630	0.636
D1	13.90	14.00	14.10	0.547	0.551	0.555
E	15.85	16.00	16.15	0.624	0.630	0.636
E1	13.90	14.00	14.10	0.547	0.551	0.555
e	0.40 BSC			0.016 BSC		
L	0.45	0.60	0.75	0.018	0.024	0.030
L1	1.00 REF			0.039 REF		
R1	0.08	—	—	0.003	—	—
R2	0.08	—	0.20	0.003	—	0.008
S	0.20	—	—	0.008	—	—
θ	0°	3.5°	7°	0°	3.5°	7°
θ1	0°	—	—	0°	—	—
θ2	12°TYP			12°TYP		
θ3	12°TYP			12°TYP		

TITLE: 128LD LQFP(14x14x1.4mm) PACKAGE OUTLINE —Cu L/F,FOOTPRINT 2.0mm
L/F MATERIAL: C7025 1/2H

WSC2800 Package Data

NOTE :
1. TO BE DETERMINED AT SEATING PLANE [C].
2. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD PROTRUSION. D1 AND E1 ARE MAXIMUM PLASTIC BODY SIZE DIMENSIONS INCLUDING MOLD MISMATCH.
3. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. DAMBAR CAN NOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT.
4. EXACT SHAPE OF EACH CORNER IS OPTIONAL.
5. THESE DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.10 mm AND 0.25 mm FROM THE LEAD TIP.
6. A1 IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT OF THE PACKAGE BODY.
7. CONTROLLING DIMENSION : MILLIMETER.
8. REFERENCE DOCUMENT : JEDEC MS-026.

COPY CONTROLLED

REV NO	DESCRIPTION	DATE

WSC2810: QFP-160 (28mm x 28mm, 0.65mm pitch)

Symbol	Dimension in mm Min	Nom	Max	Dimension in inch Min	Nom	Max
A	—	—	4.07	—	—	0.160
A1	0.25	—	—	0.010	—	—
A2	3.15	3.22	3.30	0.124	0.127	0.130
b	0.25	—	0.35	0.010	—	0.014
b1	0.30 REF			0.012 REF		
c	0.13	—	0.23	0.005	—	0.009
c1	0.15 REF			0.006 REF		
D	30.95	31.20	31.45	1.219	1.228	1.238
D1	27.90	28.00	28.10	1.098	1.102	1.106
E	30.95	31.20	31.45	1.219	1.228	1.238
E1	27.90	28.00	28.10	1.098	1.102	1.106
e	0.65 BSC			0.026 BSC		
L	0.70	0.85	1.00	0.028	0.033	0.039
L1	1.60 REF			0.063 REF		
R	0.15 REF			0.006 REF		
R1	0.15 REF			0.006 REF		
S	0.46 REF			0.018 REF		
θ	0°	—	7°	0°	—	7°
θ1	5° REF			5° REF		
θ2	15° REF			15° REF		
θ3	10° REF			10° REF		

NOTE :
1. TO BE DETERMINED AT SEATING PLANE [C].
2. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD PROTRUSION. D1 AND E1 ARE MAXIMUM PLASTIC BODY SIZE DIMENSIONS INCLUDING MOLD MISMATCH.
3. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. DAMBAR CAN NOT BE LOCATED ON THE LOWER RADIUS OF THE FOOT.
4. EXACT SHAPE OF EACH CORNER IS OPTIONAL.
5. THESE DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN 0.10 mm AND 0.25 mm FROM THE LEAD TIP.
6. A1 IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT OF THE PACKAGE BODY.
7. CONTROLLING DIMENSION : MILLIMETER.
8. REFERENCE DOCUMENT : JEDEC MS-022 DD-1.

TITLE: 160LD QFP (28x28mm) PACKAGE OUTLINE —Cu L/F,FOOTPRINT 3.2mm
L/F MATERIAL: C7025 1/2H

WSC2810 Package Data

REV NO	DESCRIPTION	DATE
D	1. Comply with JEDEC format. 2. Take off "A" min.	May,12'97
C	1. L/F Material modify.	Oct,29
B	1. A2,b Revised.	Apr,28

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