



ESS Technology, Inc.

Swan™ ES4118 Super VCD Processor Product Brief

DESCRIPTION

The Swan™ ES4118 processor is a single-chip solution for Super Video Compact Disk (SVCD) players that integrates MPEG audio and video decoding, as well as system control software. The fully programmable The ES4118 offers the best feature set compared to existing SVCD chips and includes a glueless interface to various peripheral components. The ES4118 is the most cost-effective solution in its class, with levels of integration and quality that establish new benchmarks.

The ES4118 processor is capable of decoding MPEG-2 audio simultaneously with MPEG-1 or MPEG-2 video. For embedded applications, the RISC processor core of the ES4118 can be used in place of a microcontroller to provide a rich set of system control features. On-chip, multitap filters provide arbitrary scaling with state-of-the-art SmartScale™ technology that is useful for video standards conversion. SmartStream™ provides video error concealment and video postprocessing, ensuring the highest playability and video quality.

The ES4118 connects directly with both 8- and 16-bit ROM and with either 16-bit SDRAM ICs or with EDO DRAM ICs. An 8-bit YUV video interface supports many TV encoders. General-purpose auxiliary pins are provided to control various peripheral devices. A standard I²S interface supports popular audio DACs and ADCs. Figure 1 shows a block diagram of a typical standalone system, using the ES4118 with the glueless SDRAM interface.

The SVCD data system stream from a CD disc is passed to the ES4118 through the I²S interface. The ES4118 parses the system layer and demultiplexes the audio and video streams. Audio is decoded and passed through the I²S audio serial bus to an external audio DAC and then to the speakers. Video is decoded and output as YUV pixels to an NTSC or PAL video encoder. Onchip system control and housekeeping functions (keypad and remote control) are also provided.

FEATURES

- Single-chip SVCD decoder in a 208-pin plastic quad flat package (PQFP)
- Supports MPEG-1 system and MPEG-2 program streams
- Programmable multimedia processor architecture
- Compatible with Audio CD, Video CD 1.1, 2.0, Interactive VCD 3.0, and Super Video CD

Video

- Trick modes, including Slow, Fast Forward, Fast Reverse, Step, and Goto
- 4-bit onscreen display (OSD) with 4-bit blending
- 8-bit YUV output

Audio

- Karaoke function
- Supports 256/384ifram sync audio system clock
- Bidirectional I²S audio interface

Smart Technology

- SmartScale™ for NTSC to PAL conversion and vice versa
- SmartStream™ for video error concealment

Peripheral

- Independent audio bit clock for transmit and receive port
- Direct servo/loader interface
- Supports up to 4 MB of SDRAM and/or 4 MB of EDO DRAM
- Eight general-purpose auxiliary ports
- Single 27-MHz clock input
- Power management

BLOCK DIAGRAM

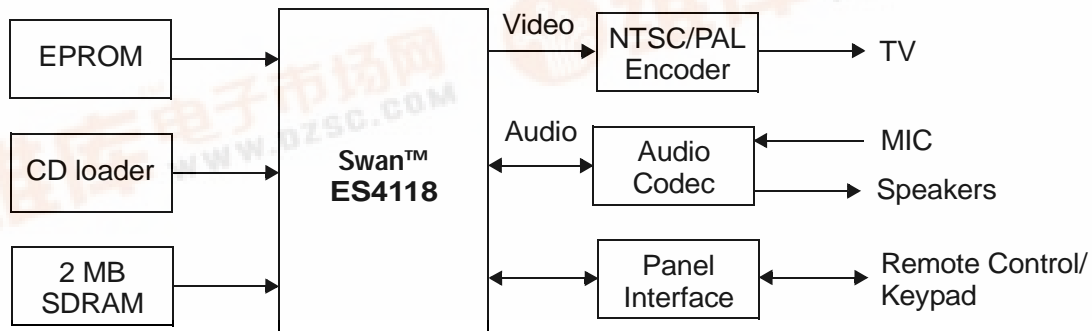


Figure 1 Typical ES4118 System Block Diagram





ES4118 PINOUT

Figure 2 shows the ES4118 device pinout.

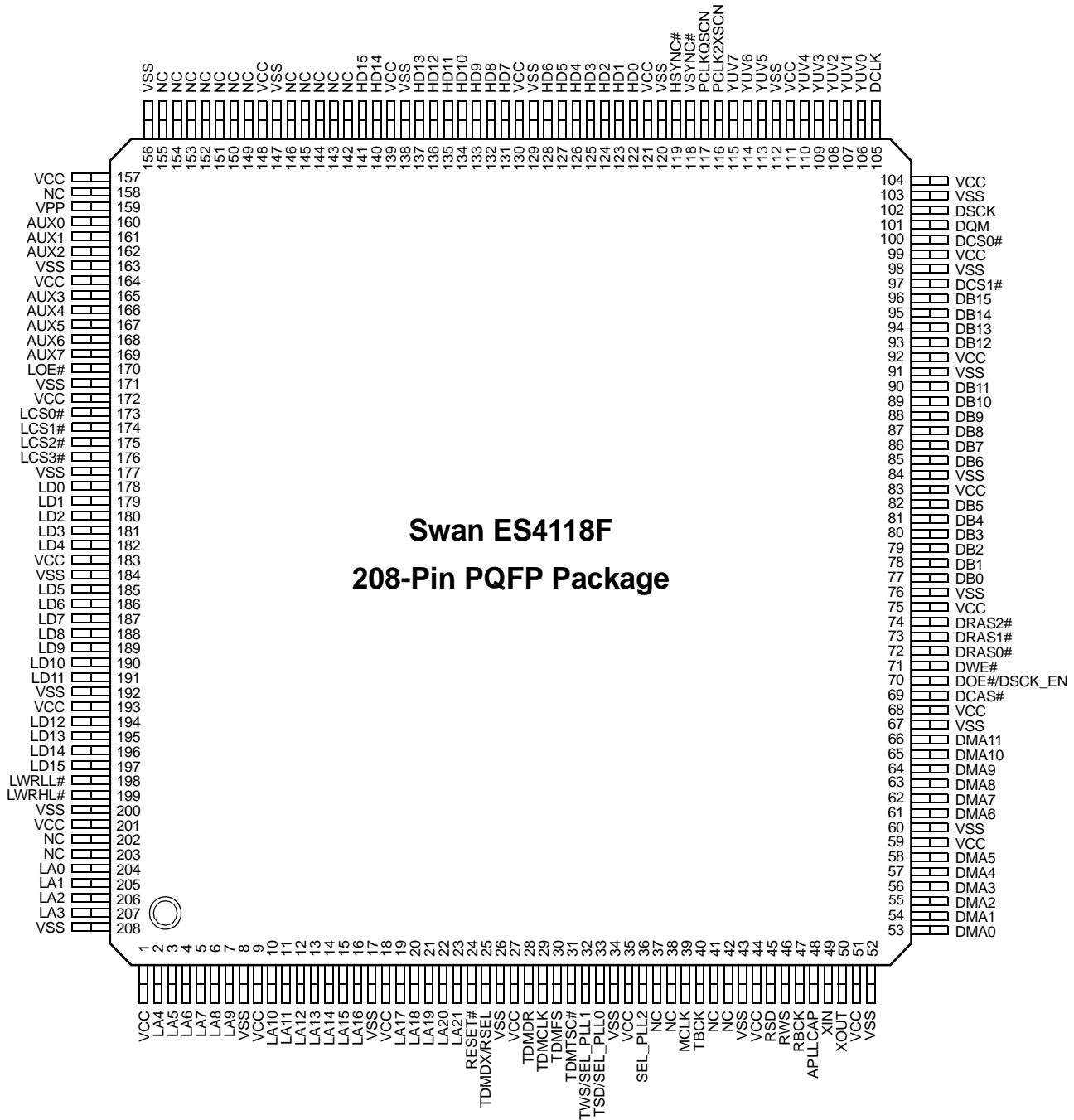


Figure 2 ES4118 Device Pinout



ES4118 PIN DESCRIPTION

Table 1 lists the ES4118 pin descriptions.

Table 1 ES4118 Pin Descriptions List

Name	Number	I/O	Definition																			
VCC	1, 9, 18, 27, 35, 44, 51, 59, 68, 75, 83, 92, 99, 104, 111, 121, 130, 139, 148, 157, 164, 172, 183, 193, 201	I	3.3V power supply.																			
LA[21:0]	7:2, 16:10, 23:19, 207:204	O	Device address output.																			
VSS	8, 17, 26, 34, 43, 52, 60, 67, 76, 84, 91, 98, 103, 112, 120, 129, 138, 147, 156, 163, 171, 177, 184, 192, 200, 208	I	Ground.																			
RESET#	24	I	Reset input, active low.																			
TDMDX	25	O	TDM transmit data.																			
RSEL		I	ROM Select. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>RSEL</th> <th>Selection</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>16-bit ROM</td> </tr> <tr> <td>1</td> <td>8-bit ROM.</td> </tr> </tbody> </table>	RSEL	Selection	0	16-bit ROM	1	8-bit ROM.													
RSEL	Selection																					
0	16-bit ROM																					
1	8-bit ROM.																					
TDMDR	28	I	TDM receive data.																			
TDMCLK	29	I	TDM clock input.																			
TDMFS	30	I	TDM frame sync.																			
TDMTSC#	31	O	TDM output enable.																			
TWS	32	O	Audio transmit frame sync.																			
TSD	33	O	Audio transmit serial data port.																			
SEL_PLL0		I	Select PLL0: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>SEL_PLL2</th> <th>SEL_PLL1</th> <th>SEL_PLL0</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>0</td> <td></td> <td>0</td> <td>2.5 x DCLK</td> </tr> <tr> <td>0</td> <td></td> <td>1</td> <td>3 x DCLK</td> </tr> <tr> <td>1</td> <td></td> <td>0</td> <td>3.5 x DCLK</td> </tr> <tr> <td>1</td> <td></td> <td>1</td> <td>4 x DCLK.</td> </tr> </tbody> </table>	SEL_PLL2	SEL_PLL1	SEL_PLL0	Notes	0		0	2.5 x DCLK	0		1	3 x DCLK	1		0	3.5 x DCLK	1		1
SEL_PLL2	SEL_PLL1	SEL_PLL0	Notes																			
0		0	2.5 x DCLK																			
0		1	3 x DCLK																			
1		0	3.5 x DCLK																			
1		1	4 x DCLK.																			
SEL_PLL2	36	I	Select PLL2. (Refer to the definitions table in pin number 33.)																			
NC	37, 38, 41, 42, 142:146, 149:155, 158, 202, 203		No connect.																			
MCLK	39	I/O	Audio master clock for audio DAC.																			
TBCK	40	I/O	Audio transmit bit clock.																			
RSD	45	I	Audio receive serial data.																			
RWS	46	I	Audio receive frame sync.																			
RBCK	47	I	Audio receive bit clock.																			
APLLCAP	48	I	Analog PLL capacitor.																			
XIN	49	I	Crystal input.																			
XOUT	50	O	Crystal output.																			
DMA[11:0]	53:58, 61:66	O	DRAM address bus.																			
DCAS#	69	O	DRAM column address strobe.																			
DOE#	70	O	DRAM output enable.																			
DSCK_EN		O	DRAM clock enable																			
DWE#	71	O	DRAM write enable.																			
DRAS[2:0]#	74:72	O	DRAM row address strobe.																			
DB[15:0]	77:82, 85:90, 93:96	I/O	DRAM data bus.																			
DCS[1:0]#	97, 100	O	SDRAM chip select [1:0], active low.																			
DQM	101	O	Data input/output mask.																			
DSCK	102	O	Clock to SDRAM.																			

Table 1 ES4118 Pin Descriptions List (Continued)

Name	Number	I/O	Definition
DCLK	105	I	Clock input (bypass/test mode).
YUV[7:0]	106:110, 113:115	O	8-bit YUV output.
PCLK2XSCN	116	I/O	27 MHz doubled pixel clock.
PCLKQSCN	117	I/O	13.5 MHz pixel clock.
VSYNC#	118	I/O	Vertical sync.
HSYNC#	119	I/O	Horizontal sync.
HD[15:0]	122:128, 131:137, 140:141	I/O	Host data bus.
VPP	159	I	5V power supply.
AUX[7:0]	160:162, 165:169	I/O	Auxiliary ports.
LOE#	170	O	Device output enable.
LCS[3:0]#	173:176	O	Chip select [3:0].
LD[15:0]	178:182, 185:191, 194:197	I/O	Device data bus.
LWRLL#	198	O	Device write enable.
LWRHL#	199	O	Device write enable.

ORDERING INFORMATION

Part Number	Description	Package
ES4118F	Super VCD Processor	208-pin PQFP



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