

MS1851

CVBS/S-Video to Analog RGB Converter

Datasheet

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General Description

MS1851 can automatically detect standard analog baseband television signals compatible with worldwide NTSC and PAL standard and convert them into analog RGB signals. MS1851 consists of 3D video decode, gamma correction, POP, high performance OSD, channel scan and high speed analog switch. It also provides frame rate conversion and progressive scan conversion with de-interlace.

Features

Video Input

- ◆ Support CVBS/S-Video input
- ◆ Support NTSC(J,M,443) and PAL(B,D,G,H,I,M,N,Nc,60)
- ◆ Support VGA input for POP mode

Auto Mode Detection

Frame Rate Conversion

- ◆ Independent horizontal and vertical scaling
- ◆ Flexible frame rate conversion

De-interlace

- ◆ Support NTSC/PAL to 480P/576P conversion
- ◆ Edge correction de-interlace
- ◆ Global noise reduction

- ◆ 3:2/2:2 pull-down detection

Video Enhancement

- ◆ Black/White level expansion
- ◆ Color transition improvement
- ◆ Dynamic peaking
- ◆ Brightness, Saturation, Contrast, HUE adjustment

Embedded OSD

Video Output

- ◆ Resolution up to 1920x1200@60Hz

Package

- ◆ 10mmX10mm 64-pin plastic LQFP
- ◆ PB-free and RoHS compliant

Applications

- ◆ PCTV-BOX
- ◆ Security Monitoring

Function Block Diagram

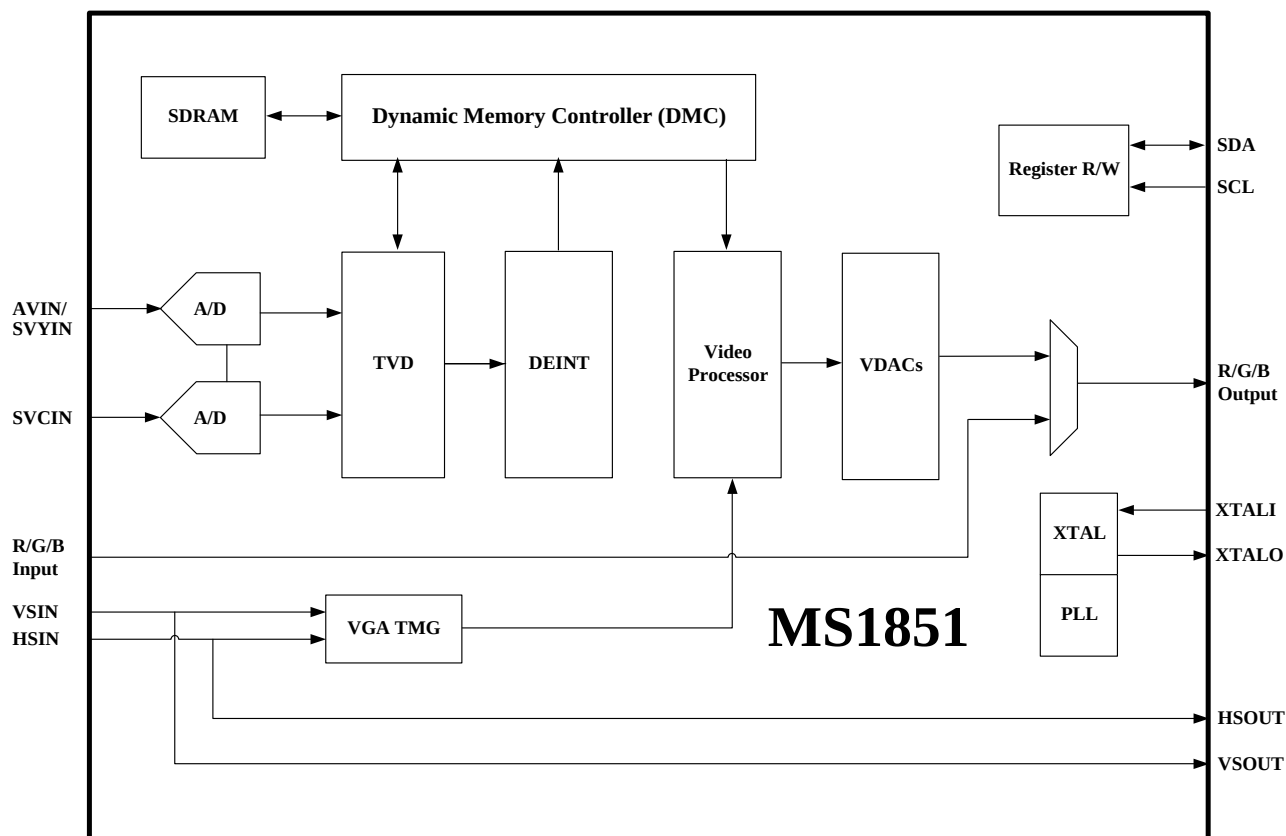


Figure 1. Function Block Diagram

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PIN MAP

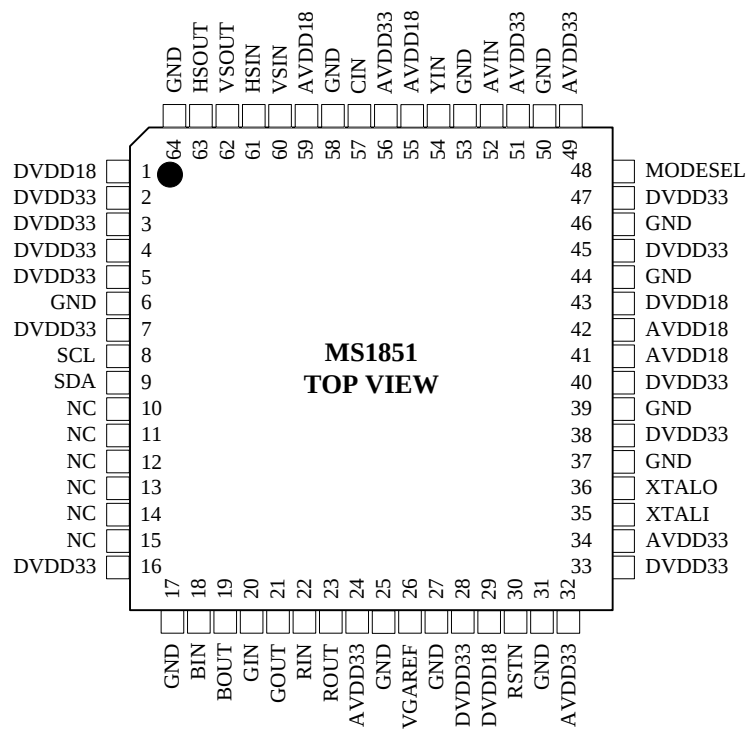


Figure 2. Pin Map

Pin Description

Table 1. Pin Description

Pin Name	Pin #	Type	Description
Video ADC			
AVIN	52	AI	CVBS input
YIN	54	AI	S-Video Y channel input
CIN	57	AI	S-Video C channel input
RIN	22	AI	VGA R channel input
GIN	20	AI	VGA G channel input
BIN	18	AI	VGA B channel input
HSIN	61	DI	VGA HSYNC input
VSIN	60	DI	VGA VSYNC input
System			
SCL	8	DI	Serial bus clock input
SDA	9	DIO	Serial bus data output
MODESEL	48	DI	MODESEL connect to GND, MS1851 will be programmed by External MCU
XTALO	36	AO	27MHz crystal output
XTALI	35	AI	27MHz crystal input
RSTN	30	DI	External RST, active low
VDAC			
ROUT	23	AO	VGA R channel output
GOUT	21	AO	VGA G channel output
BOUT	19	AO	VGA B channel output
HSOUT	63	DO	VGA HSYNC output
VSOUT	62	DO	VGA VSYNC output
VGAREF	26	AO	VDAC reference pin, the pin require a 1.5k Ω resistor connect to GND
System Power & Ground			
DVDD18	1,29,43	P	Core Power
AVDD18	41,42,55,59	P	Analog Power
DVDD33	2,3,4,5,7,16,28,33,38,40,45,47	P	I/O Power
AVDD33	24,32,34,49,51,56	P	Analog Power
GND	6,17,25,27,31,37,39,44,46,50,53,58,64	G	Ground
NC	10,11,12,13,14,15		No Connect

Table 2. Abbreviation of Pin Description

Abbreviation	Description
AI	Analog Input
AO	Analog Output
DI	Digital Input
DO	Digital Output
DIO	Digital Bi-direction
P	Power
G	Ground
NC	No connect

Electrical Characteristics

Absolute Maximum Ratings

Table 3. Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Maximum Operating Voltage	V33	3.6	V
Voltage On Any Pin With Respect to Ground	V _I	-0.5 to DVDD33+0.5	V
Ambient Operating Temperature	TA	0 to 70	°C
Storage Temperature	T _{sto}	-55 to +125	°C
ESD Ratings	V _{sed}		
Human Body Model		2000	V
Machine Model		200	V

Note2: Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability. (ESD Ratings condition: GND = 0V, TA = +25°C unless otherwise noted)

ESD CAUTION: Electrostatic charges accumulate on the human body and test equipment and can discharge without detection. Although this product features has dedicated ESD protection circuitry, permanent damage may occur on devices subjected to high energy electrostatic discharges. Therefore, proper ESD precautions are recommended to avoid performance degradation or loss of functionality.

DC Characteristics

Table 4. DC Characteristics

Parameter	MIN	Typical	MAX	Unit	Condition
AVDD33	3.0	3.3	3.6	V	GND = 0V, TA = +25°C unless otherwise noted
DVDD33	3.0	3.3	3.6	V	
AVDD18	1.64	1.8	1.98	V	
DVDD18	1.64	1.8	1.98	V	
Input Low Voltage	GND		0.2×DVDD33	V	
Input High Voltage	0.7×DVDD33		DVDD33	V	1080P@60Hz resolution
V33 Work Current		71.8		mA	
V18 Work Current		133		mA	

Video ADC Characteristics

Table 5. Video ADC Characteristics

Parameter	MIN	Typical	MAX	Unit	Condition
Resolution		9		bit	GND = 0V, TA = +25°C unless otherwise noted
Channel		2			
Normal Work Current		73		mA	
INL		0.76		LSB	
DNL		0.54		LSB	

Video DAC Characteristics

Table 6. Video DAC Characteristics

Parameter	MIN	Typical	MAX	Unit	Condition
Resolution		9		bit	GND = 0V, TA = +25°C unless otherwise noted
Channel		3			
Normal Work Current		60		mA	
INL		TBD		LSB	
DNL		TBD		LSB	

Package Outline

LQFP64 OUTLINE DIMENSIONS

Dimensions Shown in millimeters

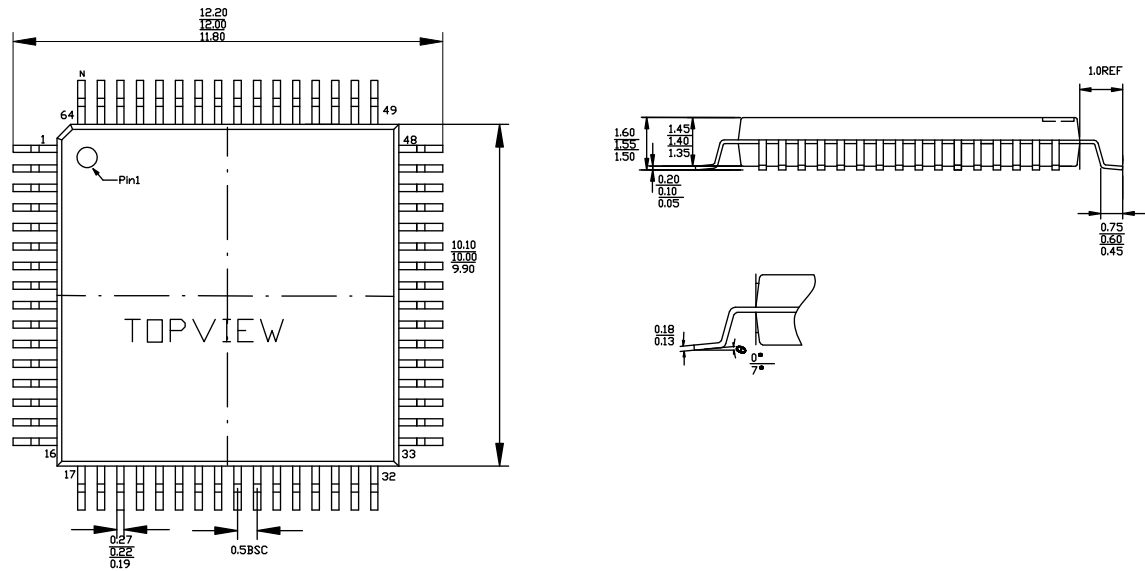


Figure 3. LQFP64 Package Diagram

Top Mark

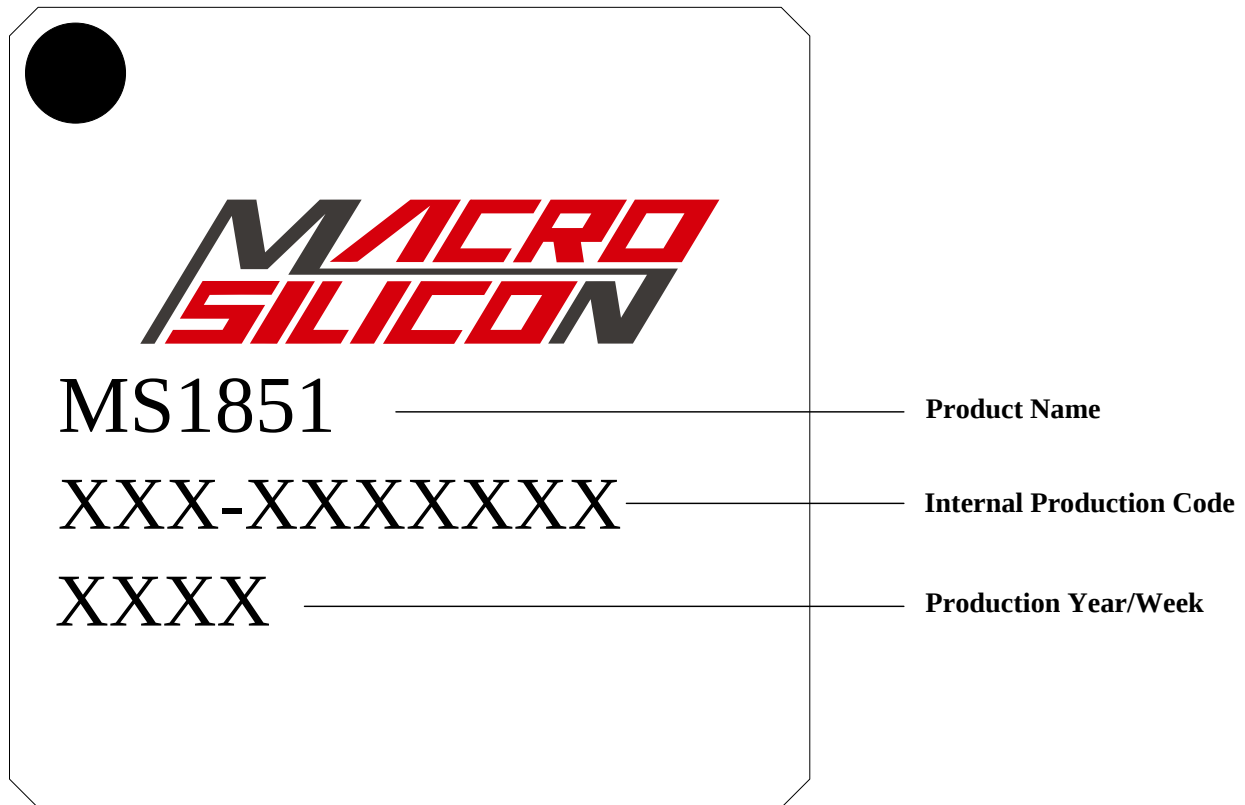


Figure 4. MS1851 Top Mark Diagram

Revision History

Date	Version	Author	Comments
2018-10	V1.0	WH Zhou	Initial Version
2018-10	V1.0.1	WH Zhou	Update datasheet format
2019-9	V1.1	AG Ding	Add V33、 V18 Work Current, Update datasheet format Update pin24,32,34,41,42,49,51,55,56,59 name