查询CM2010供应商

VGA Port Protection with Integrated Sync Buffers

Features

- 3 channels of ESD protection for RGB output pins meeting IEC-61000-4-2 Level 4 ESD requirements (8kV contact discharge)
- Very low loading capacitance from ESD protection diodes on VIDEO lines, 4pF typical
- 3.3/5V 24mA buffer drivers for HSYNC and VSYNC lines
- VESA Video Signal Standard (VSIS) - Version 1, Rev. 2 Compatible Outputs
- Compact 10-lead MSOP package
- Lead-free version available

Applications

- VGA and DVI-I ports in:
  - Desktop and Notebook PCs
  - Graphics Cards
  - Set Top Boxes

Product Description

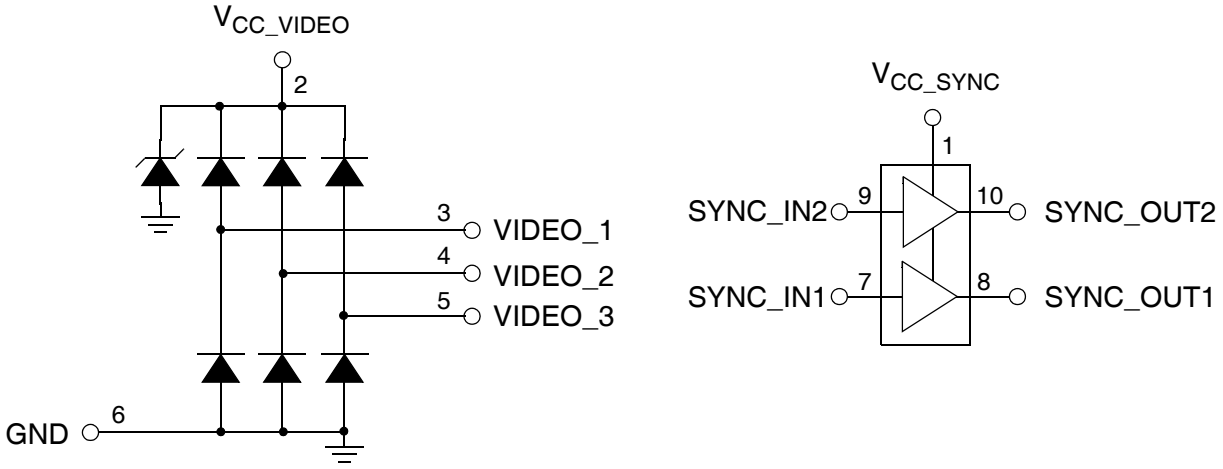
The CM2010 connects between a video graphics controller, embedded in a PC or in a graphics adapter card, and the VGA port connector. The CM2010 integrates ESD protection for 3 VGA output signals implemented with low-capacitance current steering diodes such that an ESD pulse is diverted into either the positive supply rail or ground, where it may be safely dissipated.

All ESD diodes are designed to safely handle the high current spikes specified by IEC61000-4-2 Level 4 ESD (8kV contact discharge).

Two 24mA non-inverting drivers provide buffering for the HSYNC and VSYNC signals from the video controller IC (SYNC1, SYNC2). These buffers accept low voltage input levels and convert them to CMOS output levels that swing between Ground and V_{CC_SYNC}, which is typically 5V for Legacy VESA compatibility, but can be operated at 3.3V. Additionally, the output impedance of the drivers can be discretely adjusted via external series termination resistors (R_T) for maximum flexibility. The output impedance of the drivers can be adjusted over a wide range from 15Ω to over 100Ω.

The CM2010 is supplied in a 10-lead MSOP package and is available with optional lead-free finishing.

Simplified Electrical Schematic



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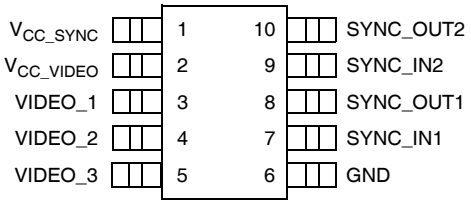
PACKAGE / PINOUT DIAGRAM

TOP VIEW



10-PIN MSOP

Note: This drawing is not to scale.

Ordering Information

PART NUMBERING INFORMATION

Pins	Package	Standard Finish		Lead-free Finish	
		Ordering Part Number[1]	Part Marking	Ordering Part Number[1]	Part Marking
10	MSOP	CM2010-02MS	2010 02MS	CM2010-02MR	2010 02MR

Note 1: Parts are shipped in Tape & Reel form unless otherwise specified.

Pin Descriptions

PIN DESCRIPTIONS

LEAD(s)	NAME	DESCRIPTION
1	V_{CC_SYNC}	This is an isolated supply input for the SYNC_1 and SYNC_2 level shifters and their associated ESD protection circuits.
2	V_{CC_VIDEO}	This is a supply pin specifically for the VIDEO_1, VIDEO_2 and VIDEO_3 ESD protection circuits.
3	VIDEO_1	Video signal ESD protection channel. This pin is typically tied one of the video lines between the VGA controller device and the video connector.
4	VIDEO_2	Video signal ESD protection channel. This pin is typically tied one of the video lines between the VGA controller device and the video connector.
5	VIDEO_3	Video signal ESD protection channel. This pin is typically tied one of the video lines between the VGA controller device and the video connector.
6	GND	Ground reference supply pin.
7	SYNC_IN1	Sync signal buffer input. Connects to the VGA controller side of one of the sync lines.
8	SYNC_OUT1	Sync signal buffer output. Connects to the video connector side of one of the sync lines.
9	SYNC_IN2	Sync signal buffer input. Connects to the VGA controller side of one of the sync lines.
10	SYNC_OUT2	Sync signal buffer output. Connects to the video connector side of one of the sync lines.

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Specifications

ABSOLUTE MAXIMUM RATINGS		
PARAMETER	**RATING**	**UNITS**
V_{CC_VIDEO} and V_{CC_SYNC} Supply Voltage Inputs	6.0	V
ESD Clamp Diode Forward DC Current (applies only to SYNC drivers)	8	mA
DC Voltage at any channel Input	[GND - 0.5] to [V_{CC} + 0.5]	V
Operating Temperature Range	-40 to +85	°C
Storage Temperature Range	-40 to +150	°C

ELECTRICAL OPERATING CHARACTERISTICS (SEE NOTE 1)

SYM-BOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
I_{CC}	V_{CC} Supply Current	V_{CC_SYNC} = 5V; SYNC inputs at GND or V_{CC_SYNC}; SYNC outputs unloaded			50	µA
		V_{CC_SYNC} = 5V; SYNC inputs at 3.0V; SYNC outputs unloaded			2.0	mA
V_F	Diode Forward Voltage	I_F = 10mA			1.0	V
V_{IH}	Logic High Input Voltage	V_{CC_SYNC} = 5.0V; Note 2	1.5			V
V_{IL}	Logic Low Input Voltage	V_{CC_SYNC} = 5.0V; Note 2			0.5	V
V_{OH}	Logic High Output Voltage	I_{OH} = 8mA, V_{CC_SYNC} = 3.0V; Note 2	2.0			V
		I_{OH} = 12mA, V_{CC_SYNC} = 5.0V; Note 2	2.0			V
		I_{OH} = 24mA, V_{CC_SYNC} = 5.0V; Note 2	2.0			V
V_{OL}	Logic Low Output Voltage	I_{OL} = 8mA, V_{CC_SYNC} = 3.3V; Note 2			0.8	V
		I_{OL} = 12mA, V_{CC_SYNC} = 5.0V; Note 2			0.8	V
		I_{OL} = 24mA, V_{CC_SYNC} = 5.0V; Note 2			0.8	V
R_{OUT}	SYNC Driver Output Resistance	V_{CC_SYNC} = 5.0V; SYNC Inputs at GND or 3.0V		15		Ω
I_{IN}	Input Current VIDEO Inputs	V_{CC_VIDEO} = 5.0V; V_{IN} = V_{CC_VIDEO} or GND; T_A=25°C			±1	µA
	SYNC_IN1, SYNC_IN2 Inputs	V_{CC_SYNC} = 5.0V; V_{IN} = V_{CC_SYNC} or GND; T_A=25°C			±1	µA
C_{IN_VID}	VIDEO Input Capacitance	V_{CC_VIDEO} = 5.0V; V_{IN} = 2.5V; f = 1MHz; Note 4			4.0	pF
		V_{CC_VIDEO} = 2.5V; V_{IN} = 1.25V; f = 1MHz; Note 4			4.5	pF
t_{PLH}	SYNC Driver L => H Propagation Delay	C_L = 10pF; V_{CC} = 5.0V; Input t_R and $t_F \leq$ 5ns			12	ns
t_{PHL}	SYNC Driver H => L Propagation Delay	C_L = 10pF; V_{CC} = 5.0V; Input t_R and $t_F \leq$ 5ns			12	ns
t_R, t_F	SYNC Driver Output Rise & Fall Times	C_L = 10pF; V_{CC} = 5.0V; Input t_R and $t_F \leq$ 5ns; Notes 2, 4 & 5			3	ns
V_{ESD}	ESD Withstand Voltage	V_{CC_VIDEO} = V_{CC_SYNC} = 5V; Notes 3, 4	±8			kV
V_{CL}	Clamping Voltage during ESD Discharge MIL-STD-883 (Method 3015), 8kV Positive Transients Negative Transients	Notes 3 and 4		 +13 -13		 V V

Note 1: All parameters specified over standard operating conditions unless otherwise noted.
Note 2: These parameters apply only to the SYNC drivers.
Note 3: Per the IEC-61000-4-2 International ESD Standard, Level 4 contact discharge method. BYP, V_{CC} must be bypassed to GND via a low impedance ground plane with a 0.22µF, low inductance, chip ceramic capacitor at each supply pin. ESD pulse is applied between the applicable pins and GND. ESD pulses can be positive or negative with respect to GND. Applicable pins are: VIDEO_1, VIDEO_2 and VIDEO_3. All other pins are ESD protected to the industry standard ±2kV Human Body Model (MIL-STD-883, Method 3015).
Note 4: This parameter is guaranteed by design and characterization.
Note 5: Rise and fall times measured between 0.5V and 2.4V.

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Mechanical Details

MSOP Mechanical Specifications:

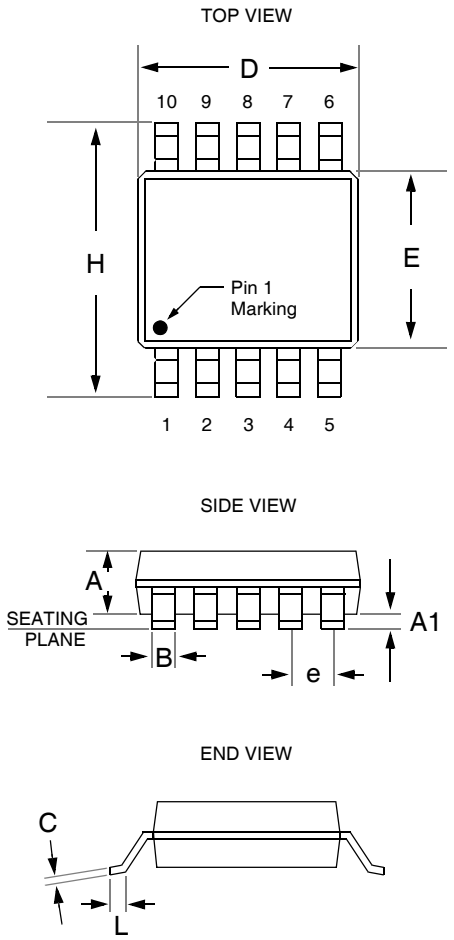
CM2010 devices are supplied in 10-pin MSOP packages. Dimensions are presented below.

For complete information on the MSOP-10 package, see the California Micro Devices MSOP Package Information document.

PACKAGE DIMENSIONS				
Package	MSOP			
Pins	10			
Dimensions	**Millimeters**		**Inches**	
	Min	**Max**	**Min**	**Max**
A	0.75	0.95	0.028	0.038
A1	0.05	0.15	0.002	0.006
B	0.18	0.40	0.006	0.016
C	0.18		0.007	
D	2.90	3.10	0.114	0.122
E	2.90	3.10	0.114	0.122
e	0.50 BSC		0.0196 BSC	
H	4.76	5.00	0.187	0.197
L	0.40	0.70	0.0137	0.029
# per tube	80 pieces*			
# per tape and reel	4000			
Controlling dimension: inches				

* This is an approximate number which may vary.

Mechanical Package Diagrams



Package Dimensions for MSOP-10

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