TMC57253 DRIVFR

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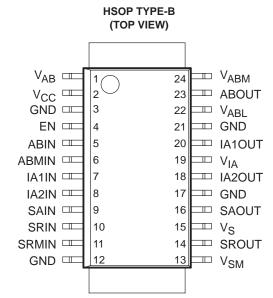
- **TTL-Compatible Inputs**
- **CCD-Compatible Outputs**
- **Adjustable Clock Levels**
- **High-Speed Clear**
- Serial-Gate Midlevel for CDS Operation
- Solid-State Reliability

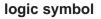
description

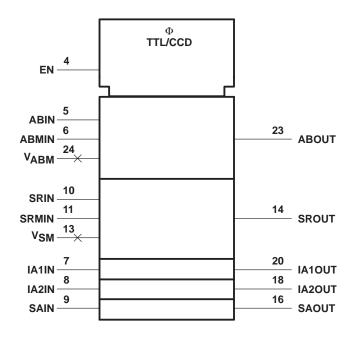
The TMC57253 is a monolithic CMOS integrated circuit designed to drive image-area gates (IAG1, IAG2), antiblooming gate (ABG), storage-area gate (SAG), and serial-register gate (SRG) of the Texas Instruments (TI™) TC255 CCD image sensor. The TMC57253 interfaces the CCD image sensor to the TI TMC57751 ASIC or user-defined timing generator; it receives TTL-input signals from the timing generator and outputs levelshifted signals to the image sensor.

ABOUT follows ABIN and ABMIN and switches between V_{ABL} , V_{AB} , and V_{ABM} . IA1OUT and IA20UT follow IA1IN and IA2IN, respectively, and switch between GND and VIA. The SAOUT output follows the SAIN and switches GND and V_S. SROUT follows SRIN and SRMIN and switches between GND, V_{SM}, and V_S.

The TMC57253 is available in a 24-pin HSOP-B surface-mount package and is characterized for operation from -20°C to 45°C.









This device contains circuits to protect its inputs and outputs against damage due to high static voltages or electrostatic fields. These circuits have been qualified to protect this device against electrostatic discharges (ESD) of up to 2 kV according to MIL-STD-883C, Method 3015; however, it is advised that precautions be taken to avoid application of any voltage higher than maximum-rated voltages to these high-impedance circuits. During storage or handling, the device leads should be shorted together or the device should be placed in conductive foam. In a circuit, unused inputs should always be connected to an appropriated logic voltage level, preferably either V_{CC} or ground. Specific guidelines for handling devices of this type are contained in the publication Guidelines for Handling Electrostatic-Discharge-Sensitive (ESDS) Devices and Assemblies available from Texas Instruments.

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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

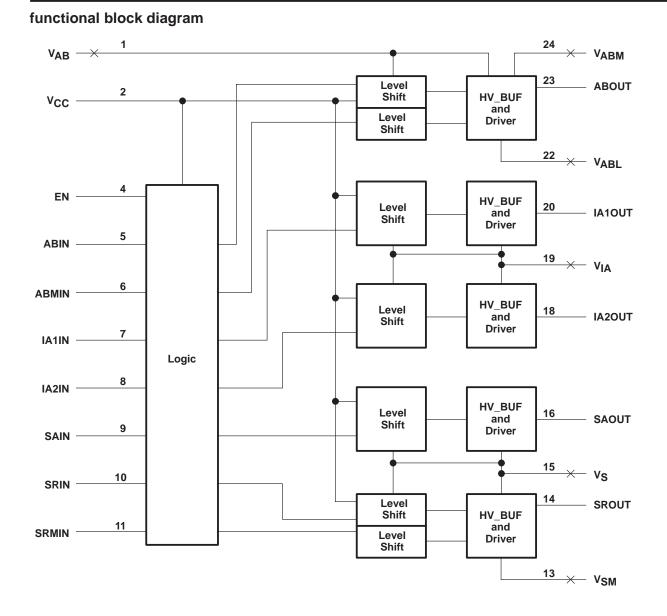
TERMINAL			DECODUCTION		
NAME	NO.	I/O	DESCRIPTION		
ABIN	5	I	Antiblooming input		
ABMIN	6	I	Antiblooming midlevel input		
ABOUT	23	0	Antiblooming output		
EN	4	I	Enable control input		
GND	3, 12, 17, 21		Ground		
IA1IN	7	I	Image area 1 input		
IA1OUT	20	0	Image area 1 output		
IA2IN	8	I	Image area 2 input		
IA2OUT	18	0	Image area 2 output		
SAIN	9	I	Storage area input		
SAOUT	16	0	Storage area output		
SRIN	10	I	Serial register input		
SRMIN	11	Ι	Serial register mid input		
SROUT	14	0	Serial register output		
V _{AB}	1		High-level antiblooming supply voltage		
VABL	22		Low-level antiblooming supply voltage		
V _{ABM}	24		Midlevel antiblooming supply voltage		
V _{CC}	2		Supply voltage		
VIA	19		Image supply voltage		
VS	15		Serial and storage-gate supply voltage		
VSM	13		Midlevel serial-gate supply voltage		

Terminal Functions



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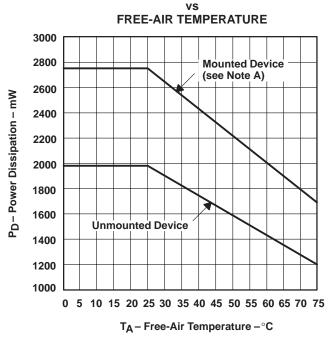
absolute maximum ratings over operating free-air temperature range (unless otherwise noted)[†]

Supply voltage range, V _{CC} (see Note 1) $0 \vee to 20 \vee Continuous$ total power dissipation at (or below) T _A = 25°C:
Unmounted device (see Figure 1)
Mounted device (see Figure 1)
Operating free-air temperature range, T _A –20°C to 45°C
Storage temperature range, T _{STG} – 55°C to 125°C
Lead temperature: 1,6 mm (1/16 inch) from case for 10 seconds
1,6 mm (1/16 inch) from case for 3 seconds

[†] Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

POWER DISSIPATION

NOTE 1: All voltages are with respect to GND.



NOTE A: The mounted-device derating curve of Figure 1 is obtained under the following conditions: The board is 50 mm by 50 mm by 1.6 mm thick.

The board material is glass epoxy.

The copper thickness of all the etch runs is 35 microns.

 $\label{eq:Etch-run dimensions-All twenty etch runs are 0.4 \ \text{mm by 22 mm}.$

Each chip is soldered to the board.

An aluminum cooling fin 10 mm by 10 mm by 1 mm thick is coupled to the chip with thermal paste.

Figure 1



recommended operating conditions

		MIN	NOM	MAX	UNIT
Supply voltage, V _{CC}		4.5	5	5.5	V
Antiblooming supply voltage, VAB		8		18	V
Low-level antiblooming supply voltage, V_{ABL}		0		3	V
Midlevel antiblooming supply voltage, VABM		3		10	V
Image-gate supply voltage, VIA		8		14	V
Serial and storage-gate supply voltage, V _S				14	V
Serial-gate midlevel supply voltage, V _{SM}				7	V
High-level input voltage, VIH					V
Low-level input voltage, VIL				0.9	V
	IA1OUT, IA2OUT (fast clear)			25	MHz
	IA1OUT, IA2OUT (transfer)			12.5	MHz
Frequency, f _{clock}	SAOUT (transfer)			12.5	MHz
	ABOUT			12.5	MHz
	SROUT			12.5	MHz
	IA1OUT, IA2OUT, SAOUT		1%		
Drive mode (on ratio)	ABOUT		23%		
	SROUT		85%		
Operating free-air temperature, T _A				45	°C

electrical characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted)

PARAMETER			TEST CONDITIONS		MIN	TYP	MAX	UNIT
VOH	/OH High-level output voltage		I _{OH} = 0.5 mA			12		V
VOL	Low-level output voltage		IOT = 0			0		V
Iн	High-level input current		$V_{IH} = 5 V$				±10	μΑ
Ι _{ΙL}	Low-level input current		$V_{IL} = 0$				±10	μΑ
ICC			V _{CC} = 5 V			0.1		mA
IIA			V _{IA} = 12 V			5		mA
I _{AB}	Antiblooming supply current		V _{AB} = 12 V			15		mA
IABL	Low-level antiblooming supply current					15		mA
IABM	ABM Midlevel antiblooming supply current					0.5		mA
ISM	ISM Midlevel serial-gate supply current		V _S = 12 V			2		mA
IS	Serial-gate supply current					2		mA
r _o C	Output resistance	IA1OUT, IA2OUT, SAOUT	I _O = 10 mA, V _I = V _{CC} , GND	V _{IA} = 8 V		5		
		ABOUT	I_{O} = 10 mA, V_{SM} = 4 V, V_{I} = V_{CC} , GND	V _{AB} = 8 V, V _{ABM} = 4 V V _{ABL} = 0 V		10		Ω
		SROUT	I _O = 10 mA, V _{SM} = 4 V,	V _S = 8 V, V _I = V _{CC} , GND		50		



switching characteristics for ABOUT, IA1OUT, IA2OUT, SAOUT, and SROUT, $V_{AB} = 13$ V, $V_{ABI} = 1.5$ V, $V_{ABM} = 6.5$ V, $V_{IA} = 11$ V, $V_{SM} = 5$ V, $V_S = 11$ V, $T_A = 25^{\circ}C$ (unless otherwise noted)[†]

	PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	MAX	UNIT
^t pd	Propagation delay time	IA1IN	IA1OUT	See Figure 3			
		IA2IN	IA2OUT			85	
		SAIN	SAOUT				ns
		SRIN	SROUT	See Figure 4	40	80	
		SRMIN					
		ABIN	ABOUT	See Figure 5		90	
		ABMIN				90	
tPLZ Disable		EN	IA1OUT	See Figure 6			
			IA2OUT				
	Disable time		SAOUT			1	ns
			SROUT				
			ABOUT				
t _{PZH} E		EN	IA1OUT	See Figure 6			
			IA2OUT				
	Enable time		SAOUT			1	ns
			SROUT				
			ABOUT				
Duty cycle‡		IA1OUT		See Figure 3, t _C = 80 ns			
		IA2OUT			40% 6	60%	
		SAOUT					
		ABOUT		See Figure 3, t _c = 160 ns	40%	60%	

[†] The load is a Texas Instruments TC255 CCD image sensor.

⁺ Duty cycle =
$$\frac{t_{WH}}{(t_{WH} + t_{WL})} \times 100$$

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PARAMETER MEASUREMENT INFORMATION

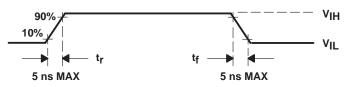
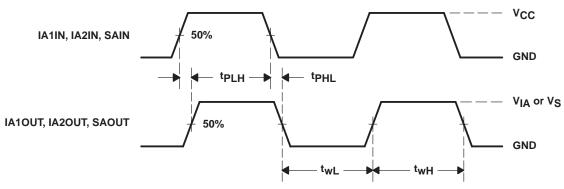
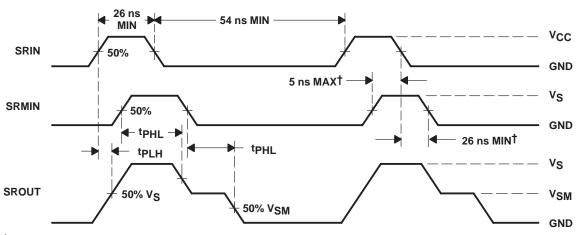


Figure 2. Rise and Fall Time Requirements for Input Signals



NOTE A: t_{pd} = t_{PLH} or t_{PHL}

Figure 3. Duty Cycle and Propagation Delay

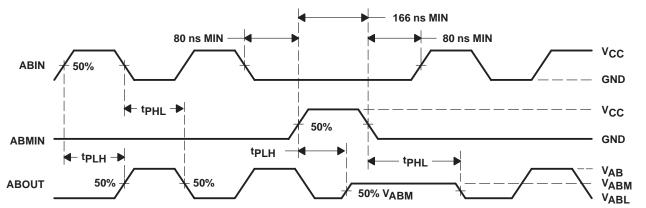


 † If SRIN and SRMIN are both high, SROUT follows SRIN. NOTE A: t_{pd} = t_{PLH} or t_{PHL}

Figure 4. Serial-Register-Driver Waveforms



PARAMETER MEASUREMENT INFORMATION



NOTES: A. V_{AB} and V_{ABM} are in a short-circuit condition if ABIN and ABMIN are held high at the same time. This short-circuit condition can destroy the device.

B. $t_{pd} = t_{PLH} \text{ or } t_{PHL}$



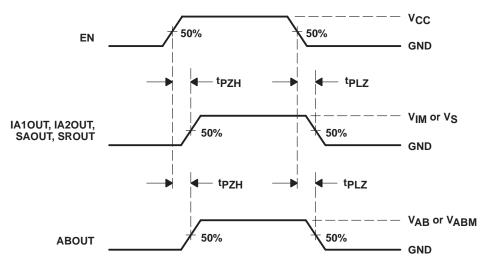


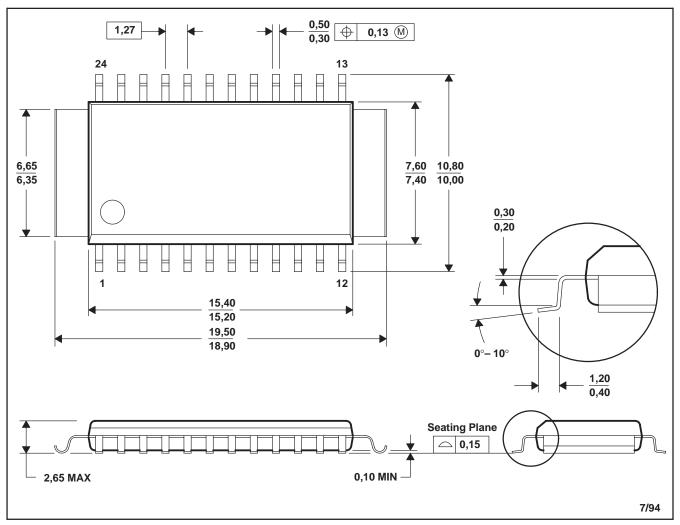
Figure 6. Enable Waveforms



MECHANICAL DATA

HSOP-B plastic small-outline package

This small-outline package consists of a circuit mounted on a lead frame and encapsulated within a plastic compound. The compound will withstand soldering temperature with no deformation, and circuit performance characteristics will remain stable when operated in high-humidity conditions. Leads require no additional cleaning or processing when used in soldered assembly.

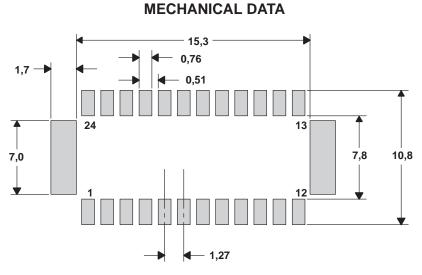


NOTES: A. All linear dimensions are in millimeters.

B. This drawing is subject to change without notice.

C. Body dimensions do not include mold flash or protrusion.





ALL LINEAR DIMENSIONS ARE IN MILLIMETERS

Figure 7. 24-Pin/375-mil HSOP Land Design



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