

# LR36683N

## Vertical Driver LSI for CCD

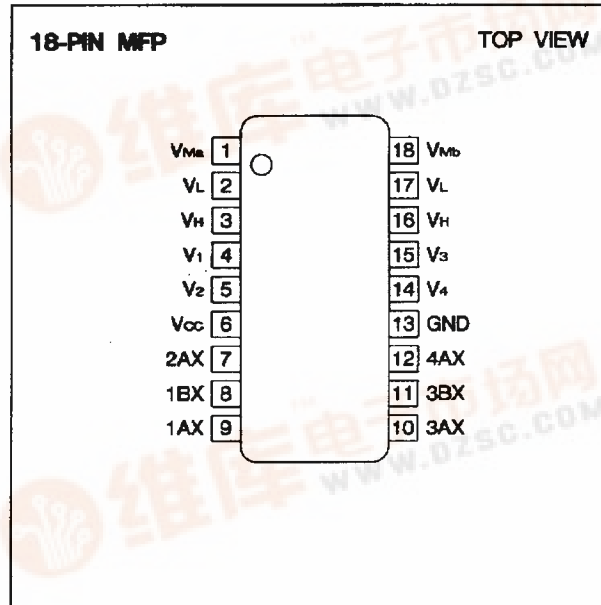
### DESCRIPTION

The LR36683N is a vertical clock driver designed for use with CCD area sensors. The driver transforms voltage levels from CMOS level (0 to 5 V) to 27 Vp-p (MAX.) and impedance conversion.

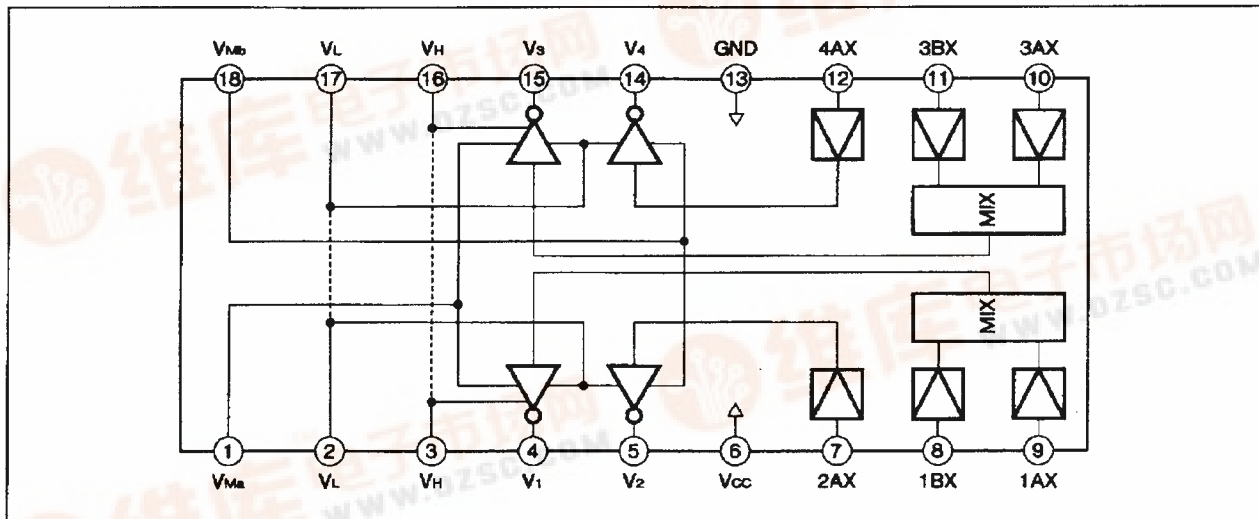
### FEATURES

- Two bi-level output circuits  
Two tri-level output circuits
- Supply voltage :  $V_{CC}=5.0\text{ V}$  (TYP.)  
 $V_H-V_L=27\text{ Vp-p}$  (MAX.)  
 $V_H=20.0\text{ V}$  (MAX.)  
 $V_L=-5.0\text{ V}$  (MAX.)  
 $V_M=0\text{ to }4.0\text{ V}$  (independently controllable with bi- or tri-level outputs)
- Switchable between NTSC (EIA) and PAL (CCIR) systems
- Package : 18-pin MFP(MFP018-P)

### PIN CONNECTIONS



### BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING	UNIT	NOTE
Supply voltage	$V_{CC}$	$V_{SS} - 0.3 \text{ V}$ to $V_{SS} + 6.0$	V	1
	$V_{H-VL}$	29.0		
	$V_{Ma}, V_{Mb}$	$V_L$ to $V_H$		
Input voltage	$V_{IN} V_{SS}$	$-0.3$ to $V_{CC} + 0.3$	V	
DC load current	$I_{OCC}$	$\pm 3$	mA	
Power dissipation	$P_D$	300 (70°C)	mW	
Storage temperature	$T_{STG}$	$-55$ to $+150$	°C	

## NOTE :

- $V_H$  (MIN.)= $V_{CC}$ ,  $V_L$  (MAX.)= $GND$

## AC CHARACTERISTICS

( $V_{CC}=5.0 \text{ V}$ ,  $V_H=15.0 \text{ V}$ ,  $V_L=-9.0 \text{ V}$ ,  $V_{Ma}=V_{Mb}=0$  to  $4 \text{ V}$ ,  $T_a=-20$  to  $70^\circ\text{C}$ )

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_M$ level transition raise delay	$t_{TRM}$	$V_{IN}$ to $V_L \rightarrow V_M - 1.0 \text{ V}$ Applied to $V_1-V_4$		600	1200	ns
$V_L$ level transition fall delay	$t_{TFL}$	$V_{IN}$ to $V_M \rightarrow V_L + 1.0 \text{ V}$ Applied to $V_1-V_4$		600	1200	ns
$V_H$ level transition raise delay	$t_{TRH}$	$V_{IN}$ to $V_M \rightarrow V_H - 1.0 \text{ V}$ Applied to $V_1$ and $V_3$		600	1200	ns
$V_M$ level transition fall delay	$t_{TFM}$	$V_{IN}$ to $V_H \rightarrow V_M + 1.0 \text{ V}$ Applied to $V_1$ and $V_3$		600	1200	ns
Supply current	$I_{DYN}$	During operation		9	18	mA

## NOTES :

- The maximum applicable voltage on any pin with respect to  $GND$ .
- Referenced to the "TIMING DIAGRAM".
- Applied to "EQUIVALENCE CIRCUIT".
- Applied to "PRECAUTION" 1 and 3.

## DC CHARACTERISTICS

( $V_{CC} = 5.0$  V,  $V_H = 15.0$  V,  $V_L = -9.0$  V,  $V_{Ma} = V_{Mb} = 0$  to 4 V, referenced to GND,  $T_a = -20$  to  $70^\circ\text{C}$ )

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT	NOTE
Low level input voltage	$V_{IL}$		0		1.0	V	
High level input voltage	$V_{IH}$		4.0		5.0	V	
Low level input current	$ I_{IH} $	$V_{IL} = 0$ V			1.0	$\mu\text{A}$	
High level input current	$ I_{IH} $	$V_{IH} = 5$ V			1.0	$\mu\text{A}$	
Low level output voltage	$V_{OL}$	$I_{OL} < 1 \mu\text{A}$			-8.95	V	
High level output voltage	$V_{OH}$	$I_{OH} < 1 \mu\text{A}$	14.95			V	2
INTermediate level output voltage	$V_{OMLa}$	$I_{OMLa} < 1 \mu\text{A}$	-0.05			V	2
	$V_{OMHa}$	$I_{OMHa} < 1 \mu\text{A}$			0.05	V	2
	$V_{OMLb}$	$I_{OMLb} < 1 \mu\text{A}$	-0.05			V	1
	$V_{OMHb}$	$I_{OMHb} < 1 \mu\text{A}$			0.05	V	1
Low level output current	$I_{OL}$	$V_{OL} = V_L + 0.1$ V	1.0			mA	
High level output current	$I_{OH}$	$V_{OH} = V_H - 0.1$ V	1.0			mA	2
INTermediate-level output current	$I_{OMLa}$	$V_{OMLa} = V_M - 0.1$ V	1.0			mA	2
	$I_{OMHa}$	$V_{OMHa} = V_M + 0.1$ V	1.0			mA	2
	$I_{OMLb}$	$V_{OMLb} = V_M - 0.1$ V	1.0			mA	1
	$I_{OMHb}$	$V_{OMHb} = V_M + 0.1$ V	1.0			mA	1
Output on resistance	$R_{ONH}$	$I_{OH} = 30$ mA		20		$\Omega$	2
	$R_{ONM}$	$I_{OH} = 30$ mA		20		$\Omega$	
	$R_{ONL}$	$I_{OH} = 30$ mA		20		$\Omega$	
Static current	$I_{CC}$				200	$\mu\text{A}$	
	$I_H$				200	$\mu\text{A}$	
	$I_M$				200	$\mu\text{A}$	
	$I_L$				200	$\mu\text{A}$	

- The current must be specified with the absolute value.
- Applied to "PRECAUTION" 1 and 3.

## NOTES :

1. Applied to pins  $V_2$  and  $V_4$ .
2. Applied to pins  $V_1$  and  $V_3$ .

CCD sensor imaging area sensor pattern recognition timing generator vertical driver white balance