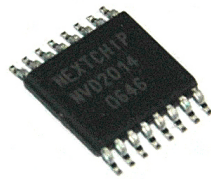


NVD2014

Data Sheet Vertical Driver for 4-Phase CCD Sensors



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Make sure to check and use an updated version of the Data sheet.

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2006.12.06.

REV 0.0



Description

: NVD2014 is a clock driver for 4-Phase CCD Image Sensor.

Features

- 3 Levels Output Driver × 2
- 2 Levels Output Driver × 2
- 2 Levels Sub Driver × 1

Ordering Information

Device	Package	Temperature Range
NVD2014	16-TSSOP	- 20°C ~ + 85°C

Applications

- CCD Image Sensors

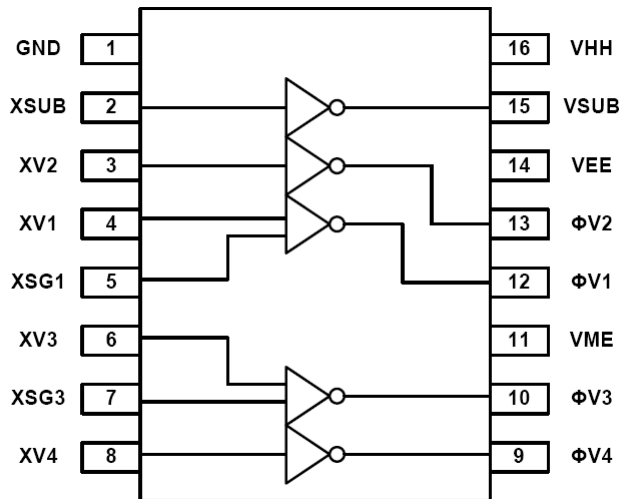
Related Products

- NVD2004, NVD2006
- NVP2000A, NVP2000E

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Functional Block Diagram

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1. Pin Description

Pin	Symbol	I/O	Description	Remark
1	GND	-	Ground	
2	XSUB	I	Output Control (V _{SUB})	
3	XV2	I	Output Control (Φ V2)	
4	XV1	I	Output Control (Φ V1)	
5	XSG1	I	Output Control (Φ V1)	
6	XV3	I	Output Control (Φ V3)	
7	XSG3	I	Output Control (Φ V3)	
8	XV4	I	Output Control (Φ V4)	
9	Φ V4	O	High Voltage Output (2 level : V _{ME} , V _{EE})	
10	Φ V3	O	High Voltage Output (3 level : V _{ME} , V _{EE} , V _H H)	
11	V _{ME}	-	Power (0V)	
12	Φ V1	O	High Voltage Output (3 level : V _{ME} , V _{EE} , V _H H)	
13	Φ V2	O	High Voltage Output (2 level : V _{ME} , V _{EE})	
14	V _{EE}	-	Power (-8.5V)	
15	V _{SUB}	O	High Voltage Output (2 level : V _H H, V _{EE})	
16	V _H H	-	Power (15V)	

2. Absolute Maximum Ratings (T_a=25°C)

Characteristics	Symbol	Value	Unit
Supply Voltage	V _H H	-0.3 ~ V _{EE} +29	V
	V _{ME}	V _{EE} -0.3 ~ 3.0	
	V _{EE}	0 ~ -10	
Input Voltage	V _I	-0.3 ~ V _H H +0.3	
Output Voltage	Φ V1, Φ V2, Φ V3, Φ V4, V _{SUB}	V _{EE} -0.3 ~ V _H H +0.3	
Operating Temperature	T _{OPR}	-20 ~ +85	mA
Storage Temperature	T _{STG}	-45 ~ +120	°C

3. Logic Function Table

INPUT				OUTPUT		
XV1,3	XSG1,3	XV2,4	XSUB	Φ V1,3	Φ V2,4	V _{SUB}
L	L	-	-	V _H H	-	-
H	L	-	-	Z	-	-
L	H	-	-	V _{ME}	-	-
H	H	-	-	V _{EE}	-	-
-	-	L	-	-	V _{ME}	-
-	-	H	-	-	V _{EE}	-
-	-	-	L	-	-	V _H H
-	-	-	H	-	-	V _{EE}

4. AC Characteristics

(V_{HH}=15V, V_{ME}=GND, V_{EE}=-8.5V ; T_a=25°C)

Description	Symbol	Test Condition	Min	Typ	Max	Unit
Delay Time	TPLM	No Load (*1)	10	40	70	ns
	TPMH	No Load (*1)	10	30	70	
	TPLH	No Load (*1)	10	40	100	
	TPML	No Load (*1)	10	100	200	
	TPHM	No Load (*1)	10	100	180	
	TPHL	No Load (*1)	10	60	100	
Rising Time	TTLM	V _{EE} → V _{ME} (*1)	400	700	930	ns
	TTMH	V _{ME} → V _{HH} (*1)	400	650	930	
	TTLH	V _{EE} → V _{HH} (*1)	10	50	100	
Falling Time	TTML	V _{ME} → V _{EE} (*1)	200	300	500	ns
	TTHM	V _{HH} → V _{ME} (*1)	400	600	820	
	TTHL	V _{HH} → V _{EE} (*1)	10	50	100	
Output Noise Voltage	VCLH, VCLL VCMH, VCML	(*2)	-	-	0.5	V

(*1) Refer Timing Diagram

(*2) Refer Noise Diagram

5. DC Characteristics

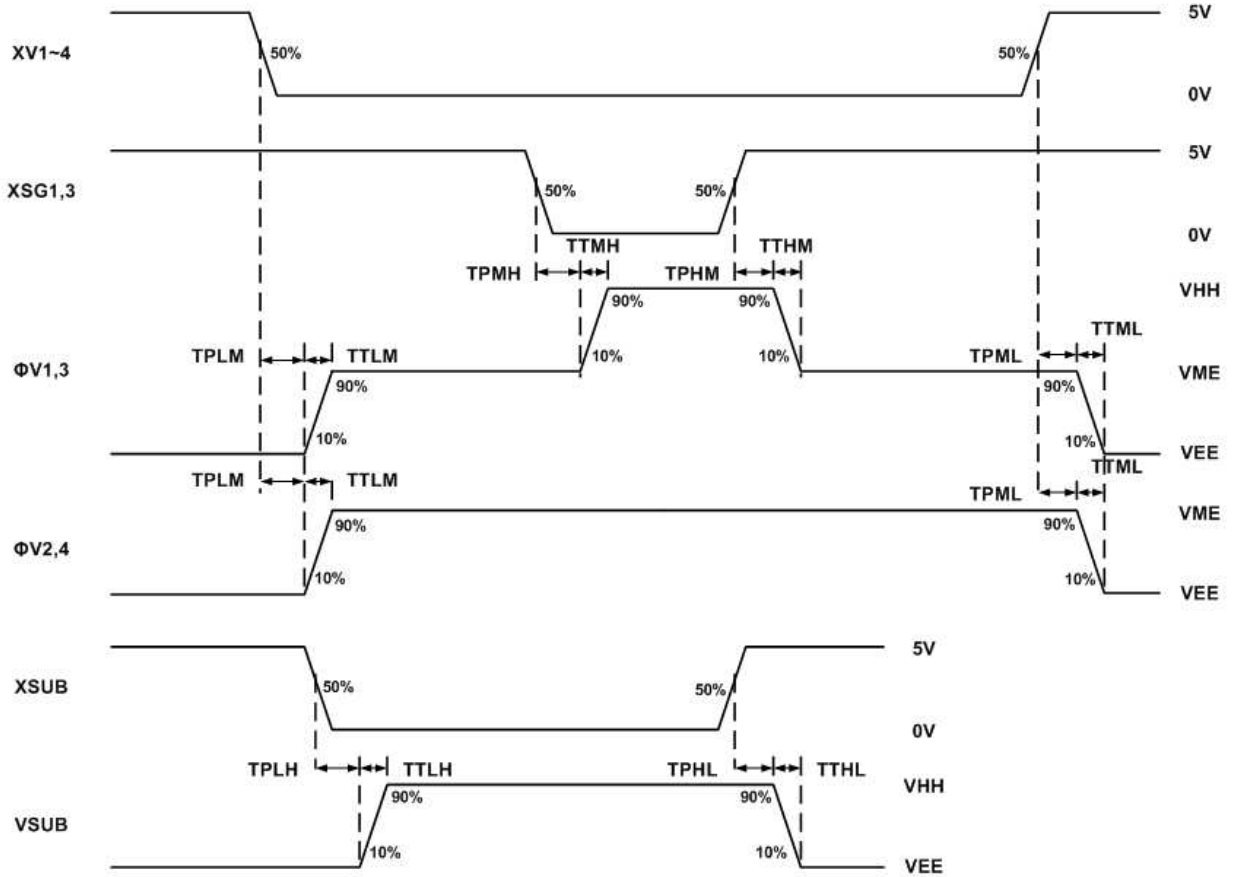
(V_{HH}=15V, V_{ME}=GND, V_{EE}=-8.5V ; T_a=25°C)

Description	Symbol	Test Condition	Min	Typ	Max	Unit
Supply Voltage	V _{HH}		14.5	15	15.5	V
	V _{EE}		-9.5	-8.5	-7.5	
High Level Input Voltage	V _{IH}	(*3)	2.3	-	-	V
Low Level Input Voltage	V _{IL}	(*3)	-	-	1.2	
Input Current	I _I	V _{IN} = 0 ~ 5V (*3)	-1.0	0.0	1.0	uA
Operation Current	I _{HH}	(*4)	-	2.0	3.5	mA
	I _{ME}	(*4)	-	4.5	5.0	
	I _{EE}	(*4)	-8.5	-6.5	-	
Output Current	I _{OL}	ΦV1~4 = -8.0V	25	37	-	mA
	I _{OM1}	ΦV1~4 = -0.5V	-	-15	-10	
	I _{OM2}	ΦV1,3 = 0.5V	9	13.5	-	
	I _{OH}	ΦV1,3 = 14.5V	-	-18	-12	
	I _{OSL}	V _{SUB} = -8.0V	12	18	-	
	I _{OSH}	V _{SUB} = 14.5V	-	-10.5	-7	

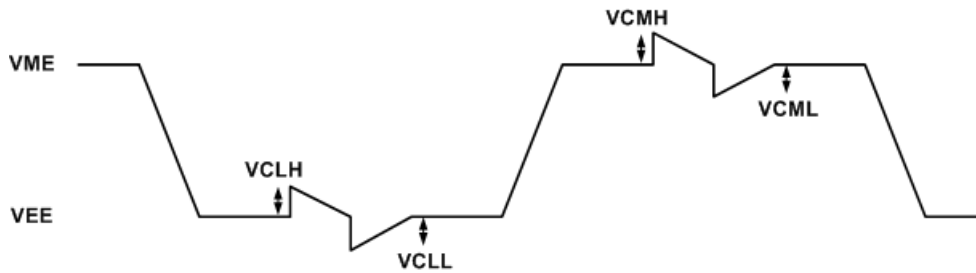
(*3) XV1~4, XSG1, XSG3, XSUB Pin

(*4) Refer the Test Circuit.

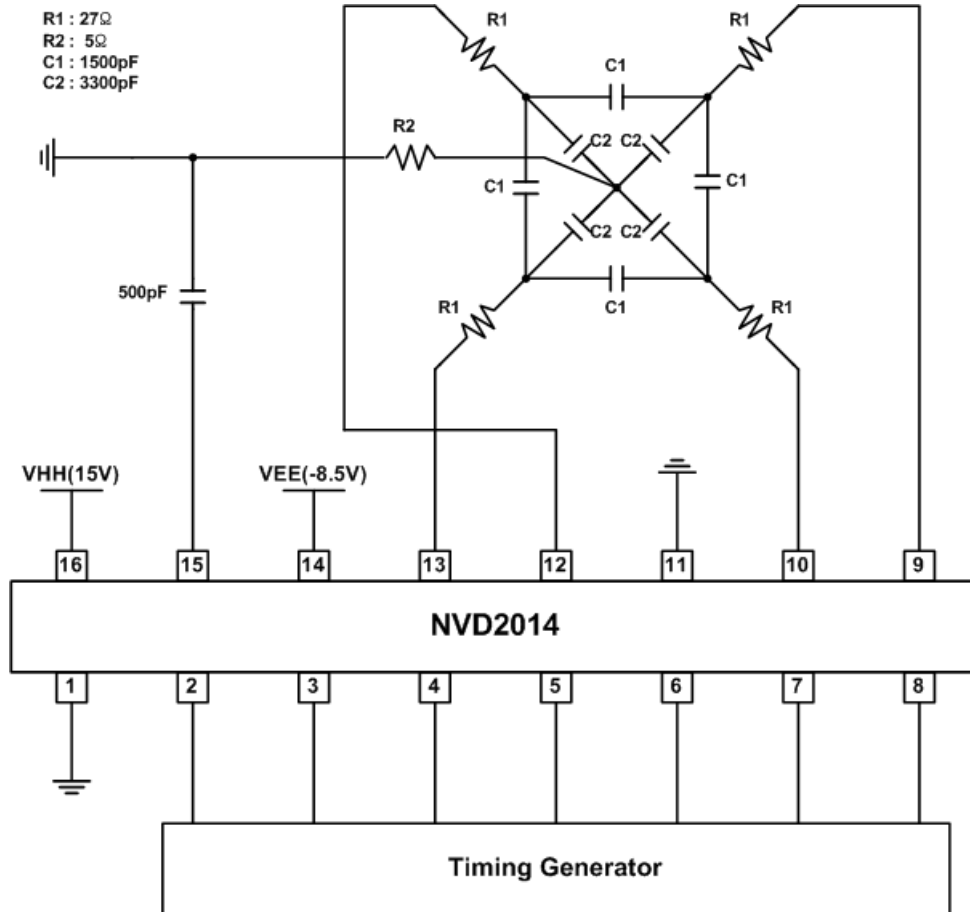
6. Timing Diagram



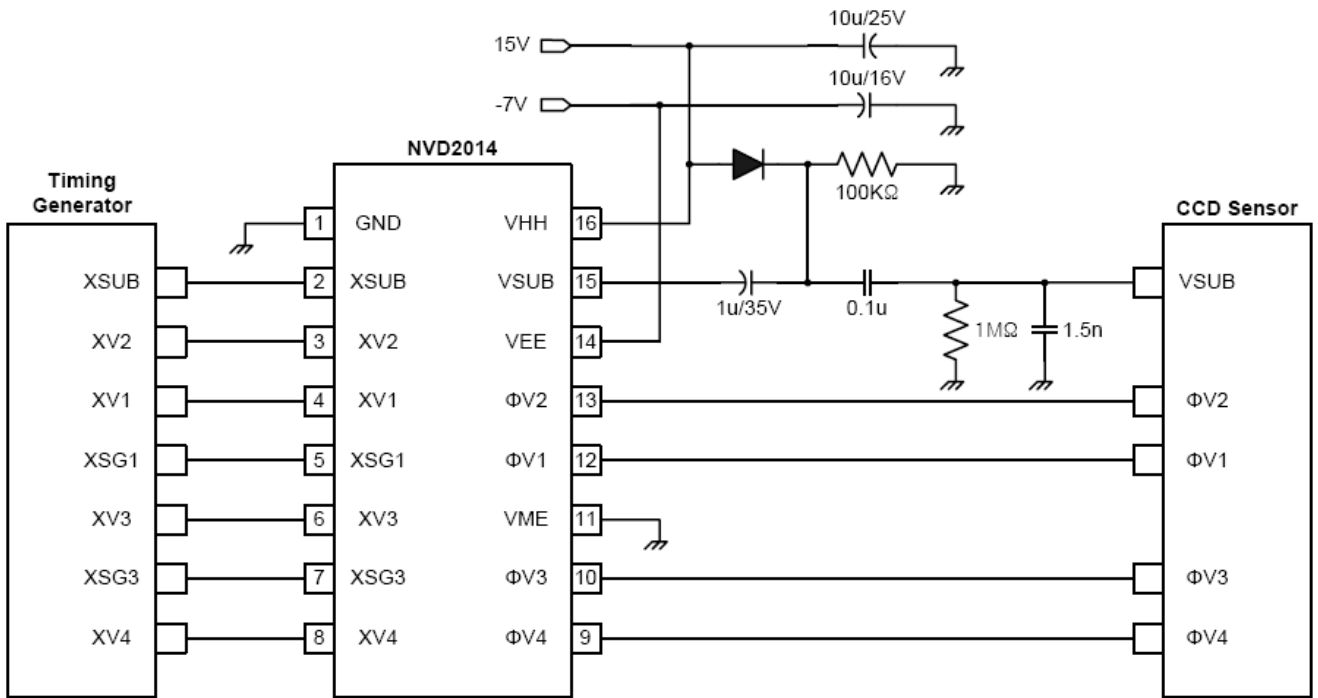
7. Noise Diagram



8. Test Circuit



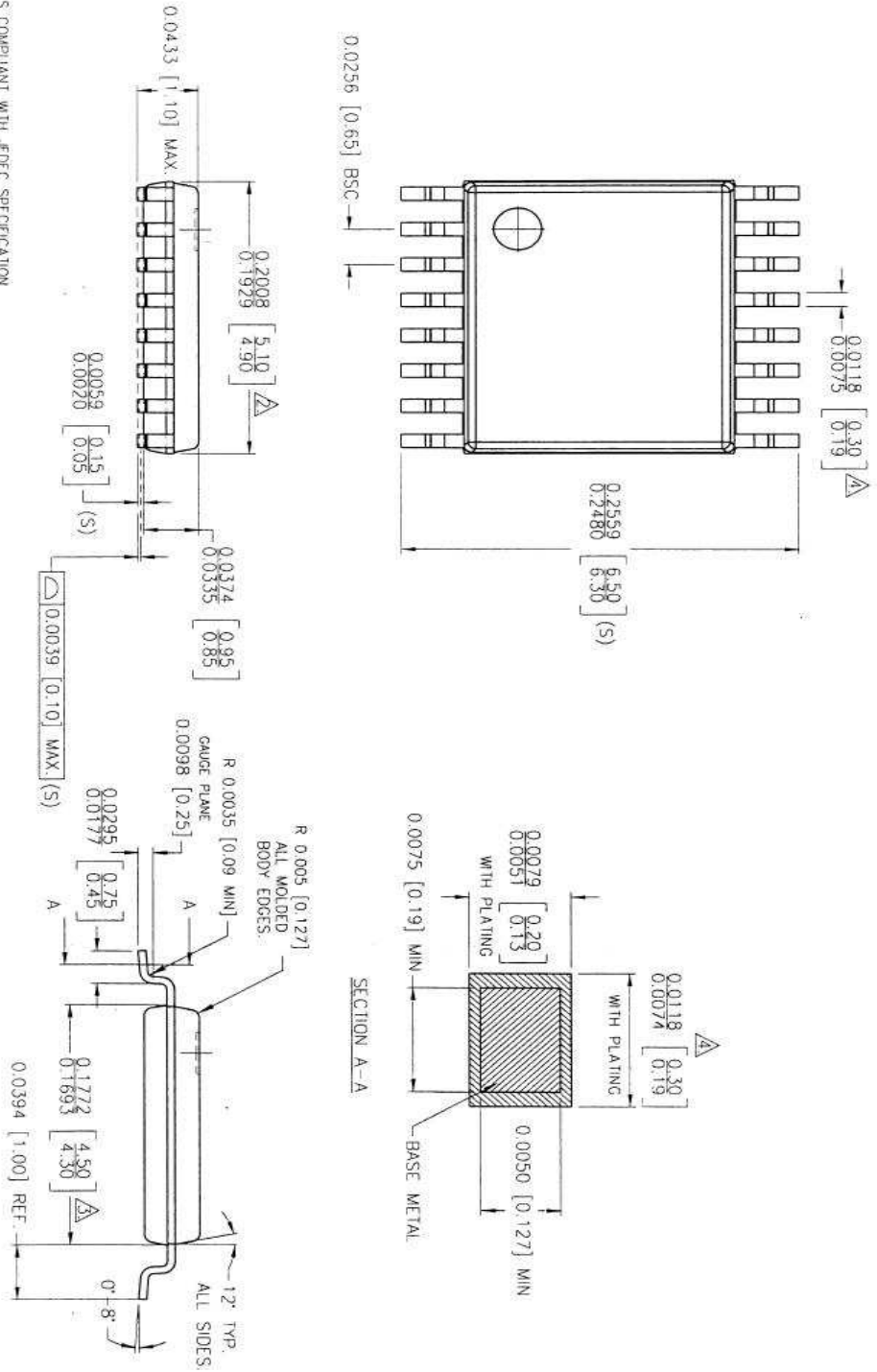
9. Application Circuit (Example)



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10. Package Dimension

- NOTE :**
- 1. THIS PART IS COMPLIANT WITH JEDEC SPECIFICATION MO-153 VARIATIONS AB
 - △ DOES NOT INCLUDE MOLD FLASH, PROTRUSION OR GATE BURRS, MOLD FLASH, PROTRUSIONS
 - ▽ OR GATE BURRS SHALL NOT EXCEED 0.15 mm. PER SIDE
 - △ DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION, INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 mm PER SIDE
 - △ DOES NOT INCLUDE DAMBAR PROTRUSION, ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 mm
 - 5. LEAD SPAN/STAND OFF HEIGHT/COPLANARITY ARE CONSIDERED AS SPECIAL CHARACTERISTIC(S)
 - 6. CONTROLLING DIMENSIONS IN INCHES [mm]



11. Revision History

REV	Date	Description
Version 0.0	2006. 12. 13.	1 st release

12. Contact Information

- Homepage : www.nextchip.com
- E-mail : sales@nextchip.com
- TEL : 82-2-3460-4700

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