

DATA SHEET

Part No.	AN20113A
Package Code No.	HQFN064-P-0808A

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AN20113A

Vertical driver IC for motion picture CCD image sensors

■ Overview

AN20113A is an IC which controls CCD vertical register and has eight 2-level output channels, nine 3-level output channels, and one shutter driver channel. MODESEL pin allows selection of the 3 : 1 interlace drive, 9-pixel addition drive or the 4 : 1 interlace drive, 4-pixel addition drive.

■ Features

- 17ch. vertical driver (3 : 1 interlace drive, 9-pixel addition drive)

MODESEL = GND

Output drivers

2-level 20 Ω outputs	3 channels
2-level 50 Ω outputs	1 channel
2-level 1 280 Ω outputs	4 channels
3-level 20 Ω outputs	9 channels
VOD shutter driver 38 Ω	1 channel

- 14ch. vertical driver (4 : 1 interlace drive, 4-pixel addition drive)

MODESEL = VDC

Output drivers

2-level 20 Ω outputs	4 channels
2-level 1 280 Ω outputs	2 channels
3-level 20 Ω outputs	8 channels
VOD shutter driver 38 Ω	1 channel

■ Applications

- For digital still cameras

■ Package

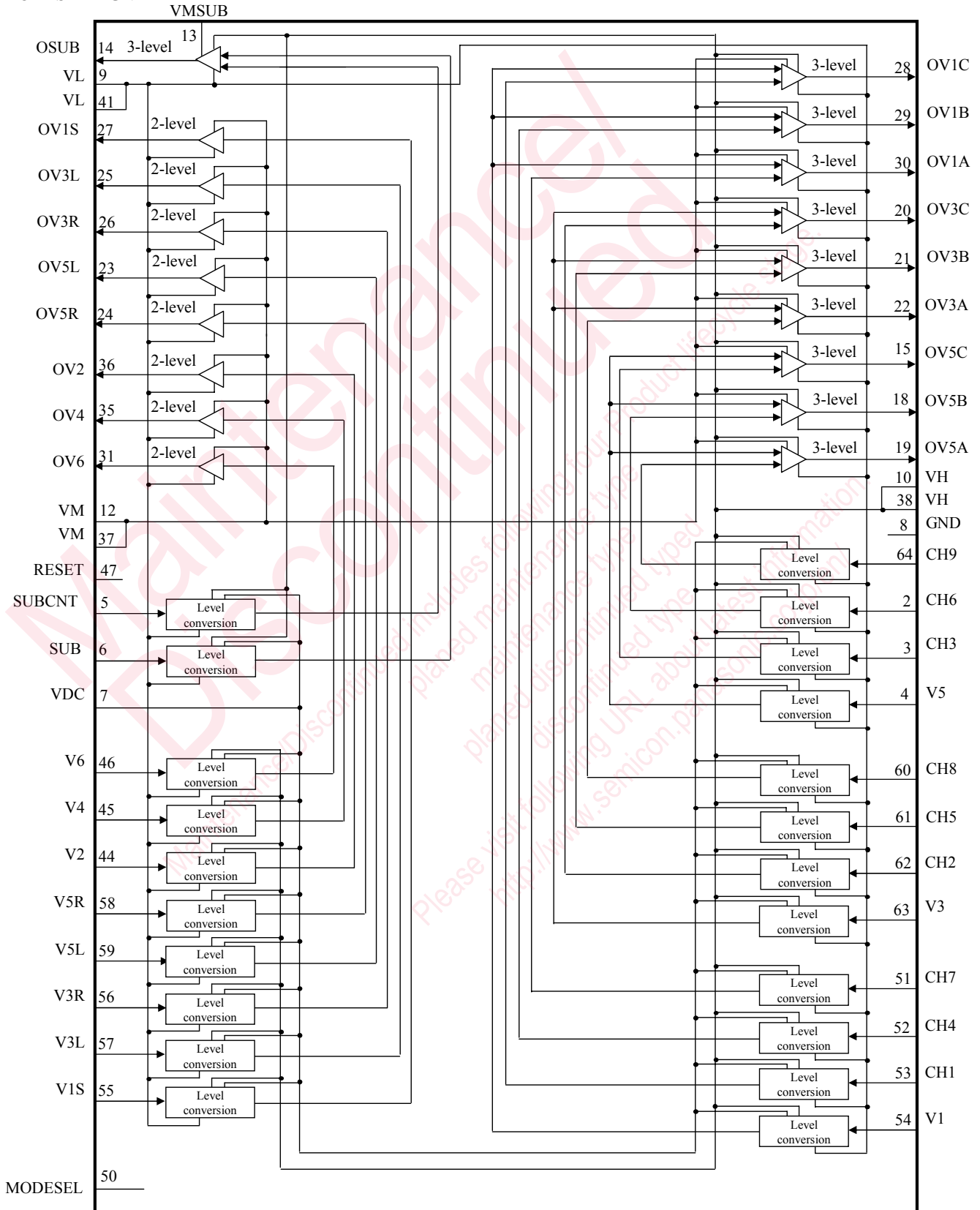
- 64-pin plastic quad flat non-leaded package heat slug down (QFN type)

■ Type

- CMOS IC

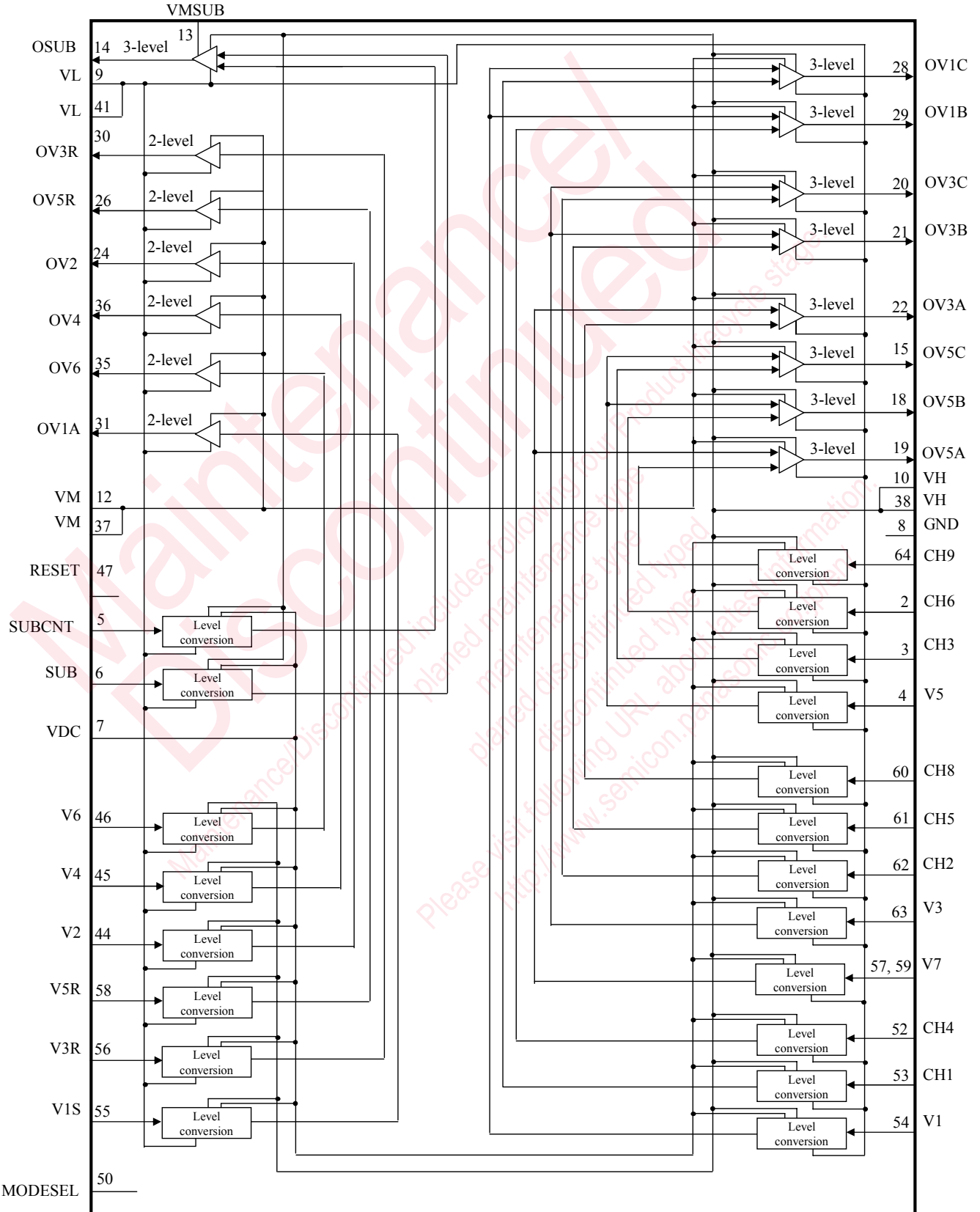
■ Block Diagram

- 17ch. vertical driver (3 : 1 interlace drive, 9-pixel addition drive)
- MODESEL = GND



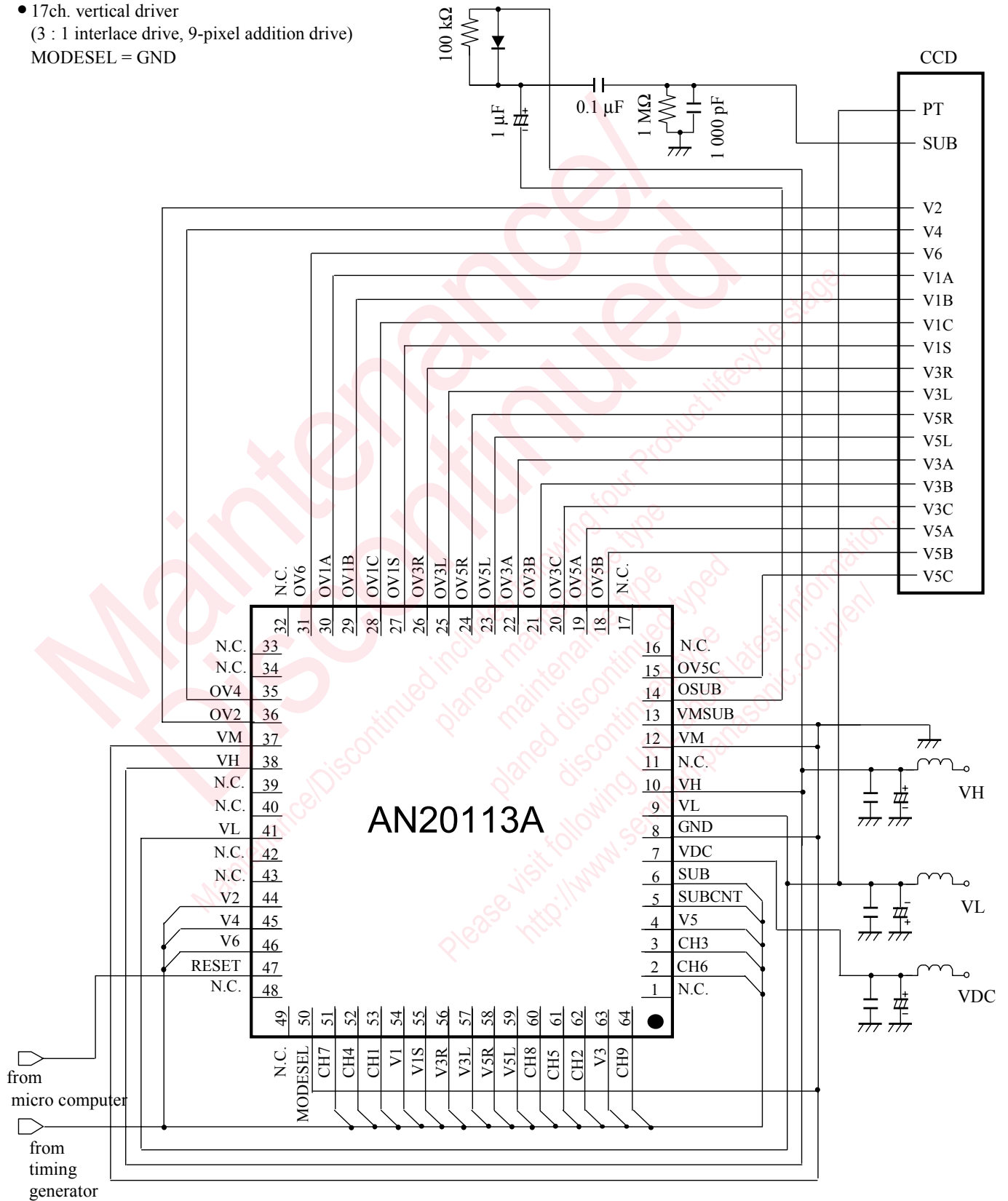
■ Block Diagram (continued)

- 14ch. vertical driver (4 : 1 interlace drive, 4-pixel addition drive)
- MODESEL = VDC



Application Circuit Example

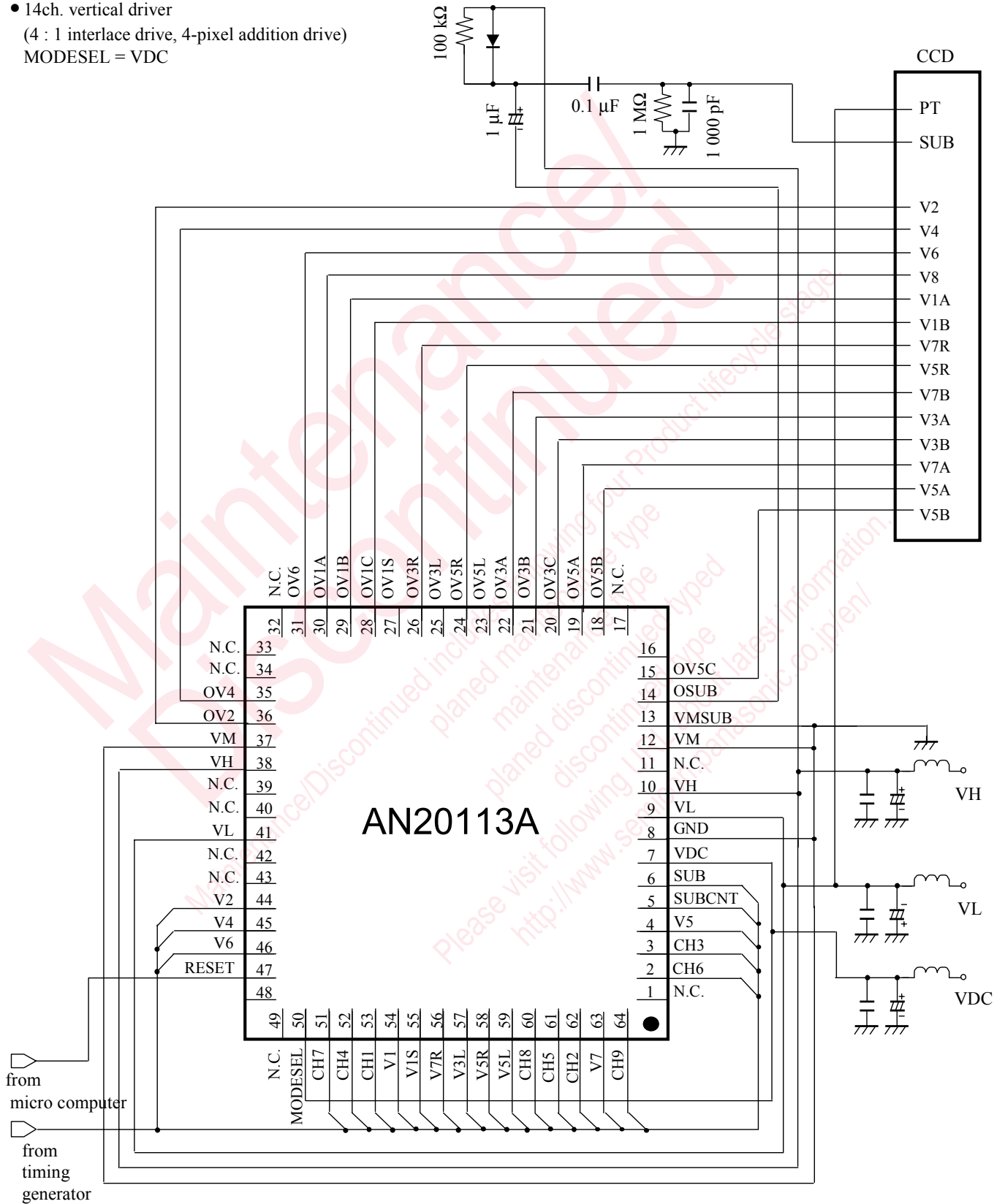
- 17ch. vertical driver
(3 : 1 interlace drive, 9-pixel addition drive)
MODESEL = GND



Note) Insert bypass capacitors between each of the AN20113A power supply pins (VH, VL, VDC) and a ground with the lowest possible impedance. Connect the AN20113A PT pin directly to the CCD PT pin.

■ Application Circuit Example (continued)

- 14ch. vertical driver
(4 : 1 interlace drive, 4-pixel addition drive)
MODESEL = VDC



Note) Insert bypass capacitors between each of the AN20113A power supply pins (VH, VL, VDC) and a ground with the lowest possible impedance. Connect the AN20113A VL pin directly to the CCD PT pin.

■ Pin Descriptions

- 17ch. vertical driver (MODESEL = GND)

Pin No.	Pin name	Type	Description
1	N.C.	—	No connection
2	CH6	Input	Charge pulse OV5B input (3.3 V CMOS level)
3	CH3	Input	Charge pulse OV5C input (3.3 V CMOS level)
4	V5	Input	Transfer pulse OV5A, OV5B, OV5C input (3.3 V CMOS level)
5	SUBCNT	Input	Pixel addition pulse OSUB input (3.3 V CMOS level)
6	SUB	Input	E-shutter pulse OSUB input (3.3 V CMOS level)
7	VDC	Power supply	Logic system power supply
8	GND	Ground	Logic system GND
9	VL	Power supply	Output low level power supply
10	VH	Power supply	Output high level power supply
11	N.C.	—	No connection
12	VM	Power supply	Output middle level power supply
13	VMSUB	Power supply	Output middle level power supply
14	OSUB	Output	Transfer pulse 3-level output (VH, VMSUB, VL)
15	OV5C	Output	Transfer pulse 3-level output (VH, VM, VL)
16	N.C.	—	No connection
17	N.C.	—	No connection
18	OV5B	Output	Transfer pulse 3-level output (VH, VM, VL)
19	OV5A	Output	Transfer pulse 3-level output (VH, VM, VL)
20	OV3C	Output	Transfer pulse 3-level output (VH, VM, VL)
21	OV3B	Output	Transfer pulse 3-level output (VH, VM, VL)
22	OV3A	Output	Transfer pulse 3-level output (VH, VM, VL)
23	OV5L	Output	Transfer pulse 2-level output (VM, VL)
24	OV5R	Output	Transfer pulse 2-level output (VM, VL)
25	OV3L	Output	Transfer pulse 2-level output (VM, VL)
26	OV3R	Output	Transfer pulse 2-level output (VM, VL)
27	OV1S	Output	Transfer pulse 2-level output (VM, VL)
28	OV1C	Output	Transfer pulse 3-level output (VH, VM, VL)
29	OV1B	Output	Transfer pulse 3-level output (VH, VM, VL)
30	OV1A	Output	Transfer pulse 3-level output (VH, VM, VL)
31	OV6	Output	Transfer pulse 2-level output (VM, VL)
32	N.C.	—	No connection
33	N.C.	—	No connection
34	N.C.	—	No connection
35	OV4	Output	Transfer pulse 2-level output (VM, VL)

■ Pin Descriptions (continued)

- 17ch. vertical driver (MODESEL = GND) (continued)

Pin No.	Pin name	Type	Description
36	OV2	Output	Transfer pulse 2-level output (VM, VL)
37	VM	Power supply	Output middle level power supply
38	VH	Power supply	Output high level power supply
39	N.C.	—	No connection
40	N.C.	—	No connection
41	VL	Power supply	Output low level power supply
42	N.C.	—	No connection
43	N.C.	—	No connection
44	V2	Input	Transfer pulse OV2 input (3.3 V CMOS level)
45	V4	Input	Transfer pulse OV4 input (3.3 V CMOS level)
46	V6	Input	Transfer pulse OV6 input (3.3 V CMOS level)
47	RESET	Input	Reset input. Active Low reset (3.3 V CMOS level)
48	N.C.	—	No connection
49	N.C.	—	No connection
50	MODESEL	Input	Channel selection (3.3 V CMOS level)
51	CH7	Input	Charge pulse OV1A input (3.3 V CMOS level)
52	CH4	Input	Charge pulse OV1B input (3.3 V CMOS level)
53	CH1	Input	Charge pulse OV1C input (3.3 V CMOS level)
54	V1	Input	Transfer pulse OV1A, OV1B, OV1C input (3.3 V CMOS level)
55	V1S	Input	Transfer pulse OV1S input (3.3 V CMOS level)
56	V3R	Input	Transfer pulse OV3R input (3.3 V CMOS level)
57	V3L	Input	Transfer pulse OV3L input (3.3 V CMOS level)
58	V5R	Input	Transfer pulse OV5R input (3.3 V CMOS level)
59	V5L	Input	Transfer pulse OV5L input (3.3 V CMOS level)
60	CH8	Input	Charge pulse OV3A input (3.3 V CMOS level)
61	CH5	Input	Charge pulse OV3B input (3.3 V CMOS level)
62	CH2	Input	Charge pulse OV3C input (3.3 V CMOS level)
63	V3	Input	Transfer pulse OV3A, OV3B, OV3C input (3.3 V CMOS level)
64	CH9	Input	Charge pulse OV5A input (3.3 V CMOS level)

■ Pin Descriptions (continued)

- 14ch. vertical driver (MODESEL = VDC)

Pin No.	Pin name	Type	Description
1	N.C.	—	No connection
2	CH6	Input	Charge pulse OV5B input (3.3 V CMOS level)
3	CH3	Input	Charge pulse OV5C input (3.3 V CMOS level)
4	V5	Input	Transfer pulse OV5B, OV5C input (3.3 V CMOS level)
5	SUBCNT	Input	Pixel addition pulse OSUB input (3.3 V CMOS level)
6	SUB	Input	E-shutter pulse OSUB input (3.3 V CMOS level)
7	VDC	Power supply	Logic system power supply
8	GND	Ground	Logic system GND
9	VL	Power supply	Output low level power supply
10	VH	Power supply	Output high level power supply
11	N.C.	—	No connection
12	VM	Power supply	Output middle level power supply
13	VMSUB	Power supply	Output middle level power supply
14	OSUB	Output	Transfer pulse 3-level output (VH, VMSUB, VL)
15	OV5C	Output	Transfer pulse 3-level output (VH, VM, VL)
16	N.C.	—	No connection
17	N.C.	—	No connection
18	OV5B	Output	Transfer pulse 3-level output (VH, VM, VL)
19	OV5A	Output	Transfer pulse 3-level output (VH, VM, VL)
20	OV3C	Output	Transfer pulse 3-level output (VH, VM, VL)
21	OV3B	Output	Transfer pulse 3-level output (VH, VM, VL)
22	OV3A	Output	Transfer pulse 3-level output (VH, VM, VL)
23	OV5L	—	No connection
24	OV5R	Output	Transfer pulse 2-level output (VM, VL)
25	OV3L	—	No connection
26	OV3R	Output	Transfer pulse 2-level output (VM, VL)
27	OV1S	—	No connection
28	OV1C	Output	Transfer pulse 3-level output (VH, VM, VL)
29	OV1B	Output	Transfer pulse 3-level output (VH, VM, VL)
30	OV1A	Output	Transfer pulse 2-level output (VM, VL)
31	OV6	Output	Transfer pulse 2-level output (VM, VL)
32	N.C.	—	No connection
33	N.C.	—	No connection
34	N.C.	—	No connection
35	OV4	Output	Transfer pulse 2-level output (VM, VL)

■ Pin Descriptions (continued)

- 14ch. vertical driver (MODESEL = VDC) (continued)

Pin No.	Pin name	Type	Description
36	OV2	Output	Transfer pulse 2-level output (VM, VL)
37	VM	Power supply	Output middle level power supply
38	VH	Power supply	Output high level power supply
39	N.C.	—	No connection
40	N.C.	—	No connection
41	VL	Power supply	Output low level power supply
42	N.C.	—	No connection
43	N.C.	—	No connection
44	V2	Input	Transfer pulse OV2 input (3.3 V CMOS level)
45	V4	Input	Transfer pulse OV4 input (3.3 V CMOS level)
46	V6	Input	Transfer pulse OV6 input (3.3 V CMOS level)
47	RESET	Input	Reset input. Active Low reset (3.3 V CMOS level)
48	N.C.	—	No connection
49	N.C.	—	No connection
50	MODESEL	Input	Channel selection (3.3 V CMOS level)
51	CH7	—	No connection (fixed to VDC or GND)
52	CH4	Input	Charge pulse OV1B input (3.3 V CMOS level)
53	CH1	Input	Charge pulse OV1C input (3.3 V CMOS level)
54	V1	Input	Transfer pulse OV1B ,OV1C input (3.3 V CMOS level)
55	V1S	Input	Transfer pulse OV1A input (3.3 V CMOS level)
56	V3R	Input	Transfer pulse OV3R input (3.3 V CMOS level)
57	V3L	Input	Transfer pulse OV3A input (3.3 V CMOS level)
58	V5R	Input	Transfer pulse OV5R input (3.3 V CMOS level)
59	V5L	Input	Transfer pulse OV5A input (3.3 V CMOS level)
60	CH8	Input	Charge pulse OV3A input (3.3 V CMOS level)
61	CH5	Input	Charge pulse OV3B input (3.3 V CMOS level)
62	CH2	Input	Charge pulse OV3C input (3.3 V CMOS level)
63	V3	Input	Transfer pulse OV3B, OV3C input (3.3 V CMOS level)
64	CH9	Input	Charge pulse OV5A input (3.3 V CMOS level)

■ Absolute Maximum Ratings

A No.	Parameter	Symbol	Rating	Unit	Note
1	Supply voltage	VH-VL	23	V	*1
		VL	-8.0		
		VMSUB	-5.5 to +6.0		
		VDC	6.0		
2	Supply current	I(VH)	2.0	mA	—
		I(VL)	16		
		I(VMSUB)	-2.0 to +2.0		
		I(VDC)	4		
3	Power dissipation	P_D	230.5	mW	*2
4	Operating ambient temperature	T_{opr}	-20 to +75	°C	*3
5	Storage temperature	T_{stg}	-50 to +125	°C	*3
6	Input voltage	VI	-0.3 to (VDC + 0.3)	V	—
7	Maximum load capacitance	CL	8 880	pF/pin	—

Note) *1: The values under the condition not exceeding the above absolute maximum ratings and the power dissipation.

*2: The power dissipation shown is the value at $T_a = 75^\circ\text{C}$ for the independent (unmounted) IC package without a heat sink.

*3: Except for the power dissipation, operating ambient temperature, and storage temperature, all ratings are for $T_a = 25^\circ\text{C}$.

■ Operating Supply Voltage Range

Parameter	Symbol	Range	Unit	Note
Supply voltage range	VH	9.5 to 14.0	V	*1
	VDC	2.7 to 5.5		
	VL	-7.5 to -4.5		
	VM	—		*1, 2
	VMSUB	VL+2 to 5.0		*1, 3

Note) *1: The values under the condition not exceeding the above absolute maximum ratings and the power dissipation.

*2: VM should be used at the same potential as the ground pins.

*3: VMSUB should be used at the same potential as the ground pins.

The IC will operate in the above VMSUB range. However, since testing is performed with connecting VMSUB pin to ground, full and thorough testing is recommended before use.

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