

Progressive scan monochrome CCD camera

(Frame shutter)

KP-F200SCL

Specifications

www.avsupply.com

E400002625

1/18

DWN	S. Hatanaka	Apr-26-'06	KP-F200SCL Specifications	Hitachi Kokusai Electric	E400002625		
DSGN	K. Ueno	Apr-26-'06			Rev.	0	1 / 18
CHKD	K. Kanemoto	Apr-26-'06					
APPD	M. Suzuki	APR26-'06					

1. Outline

Hitachi's KP-F200SCL is a 1/1.8-inch size black and white CCD camera designed for high resolution and versatile functions. Progressive scan with full pixel independent readout and full frame shutter provide images of unparalleled quality at 15 frames per second non-interlaced output. Effective picture elements number 2.01 million, while the broad array of functions includes digital output, multi-step electronic shutter and frame on demand. The square lattice pixel format also provides excellent suitability for image processing applications.

2. Outstanding features

(1) High resolution

High grade CCD with 1628 (H) x 1236 (V) effective pixels.

(2) Small-sized camera

The camera has small SDR connector for digital outputs.

Therefore, the camera has the realization of small-sized shape of 29x29x29mm.

(3) Frame shutter

The frame shutter function improves vertical resolution of moving objects.

(4) Multi-step electronic shutter

The shutter speed can be selected in 8 steps from 1/15 second to 1/50,000 second.

(5) Frame on demand

An external trigger signal input can be used to capture an image at a desired timing for instant view or processing. The capture time can be adjusted by the trigger and shutter.

(6) Various functions can be set by a remote control.

(7) Digital output

Camera Link

E400002625

2 /

DWN		.	.	KP-F200SCL Specifications	Hitachi Kokusai Electric	E400002625	
DSGN		.	.				
CHKD		.	.			Rev.	
APPD		.	.				2 /

3. Specifications

(1) Imaging device	1/1.8-inch interline CCD
Total pixels	1688 (H) x 1248(V)
Effective pixels	1628 (H) x 1236(V)
Pixel size	4.4 (H) x 4.4 (V) μ m (square lattice)
(2) Sensing area	7.16 (H) x 5.44 (V) mm
(3) Scanning system	Non-interlaced
(4) Aspect ratio	4 : 3
(5) Frame rate	15frames/second (full pixel readout)
(6) Horizontal scanning frequency	18.75 kHz
(7) Vertical scanning frequency	15 Hz
(8) Sync system	Internal
(9) Lens mount	C mount
(10) Flange focal distance	17.526 mm
(11) Video output	Digital output Camera Link Data : Base configuration 10bit x 1 Cik = 36.0000MHz
(12) VD reset	VD LVDS level, 14.97 Hz or less
(13) Resolution	Horizontal 1200TV lines Vertical 1200TV lines
(14) Sensitivity	400 lx, F4, 3200 K
(15) Minimum lamination	1.0 lx, F1.4, MAX GAIN, without IR cut filter
(16) Signal noise to ratio	50 dB
(17) Electronic shutter speed	1/15, 1/60, 1/125, 1/250, 1/1000, 1/2000,1/10000, 1/50000 second. Factory setting is off (1/15 second) or changeable by variable shutter (Minimum 1/100000 second)
(18) Gamma compensation	$\gamma = 1$
(19) Frame on demand	Remote setting (fixed shutter and one trigger). Factory setting is all off.
(20) Partial scan	Selectable start position and width of picture grabbing from 1H to 1236H by 1H step.
(21) Power supply voltage	12 $\pm$ 1 VDC
(22) Current consumption	Approx. 170 mA

E400002625 3/

DWN		.	.	KP-F200SCL Specifications	Hitachi Kokusai Electric	E400002625		F
DSGN		.	.					
CHKD		.	.			Rev.		
APPD		.					3 /	

(23) Ambient, operating 0 to + 40°C (+32 to ; 104 F), less than 90 % RH
 Ambient, storage -10 to + 50°C(+14 to +122 F), less than 70 % RH
 Note: If operated continuously, be sure to use at less than +40°C(104 F)
 for long term stable performance.

(24) Vibration endurance 98 m/s² (Acceleration: constant)
 (10 to 200Hz,sweep:10 min,XYZ,30 min)
 (25) Shock endurance 686 m/s²
 (Drop test, once each top, bottom, left and right)

(26) External dimensions 29 (W) x 29 (H) x 29 (D) mm

(27) Mass Approx. 53 g

(28) Remote control

(a) Signal system

Control system Start-stop synchronization system

Transmission rate 9600 bps

Data length 8 bits

Start bit 1bit

Stop bit 1bit

Parity None

Bit transfer LSB first

(b) Communications control system

Full control by remote control software, data send/receive by text data transfer to camera microprocessor (BSC system handshake)

(c) Control items

1. Shutter speed 1/15, 1/60, 1/125, 1/250, 1/1000,
 1/2000, 1/10000, 1/50000 second

2. Variable shutter Minimum 1/100000 second

3. Mode Fixed shutter, one trigger

4. Gain 0 to 18.5 dB(Approx. 0.04 dB step)

5. VD/FVAL Factory setting: VD

6. HD/LVAL Factory setting: HD

7. 8bit/10bit Factory setting: 10bit

8. HD reset/NON reset Factory setting: HD reset

9. Partial scan mode

10. VD reset mode

11. Trigger pulse polarity Factory setting: POS

E400002625 4/

DWN		.	.	KP-F200SCL Specifications	Hitachi Kokusai Electric	E400002625	
DSGN		.	.				
CHKD		.	.			Rev.	
APPD		.	.				4 /

4. Composition

- (1) Camera (with IR cut filter)
- (2) Operating instructions

5. Optional accessories

- (1) 12 pin plug HR10A-10P-12S(01) or equivalent
- (2) Junction box JU-M1A, JU-F30
- (3) Dummy glass (AR coated) ARC1214
- (4) Camera cable

	Molded type	Shield type
2 m	C-201KSM	C-201KSS
5 m	C-501KSM	C-501KSS
10 m	C-102KSM	C-102KSS

In the CE Marking region ,use the shield type.

- (5) Tripod adaptor TA-F200S

6. Signal connection to connector

(1) Signal connection to DC IN

PIN No.	Internal SYNC mode	PIN No.	Internal SYNC mode
1	GND	7	-
2	+12V	8	-
3	-	9	-
4	-	10	GND
5	-	11	+12V
6	-	12	-

- Connector (camera side) Hirose HR10A-10R-12PB(01) or equivalent
- Plug (matching cable plug) Hirose HR10A-10P-12S(01) or equivalent

Please do not unplug and insert cable(camera cable) with a power supplied to a camera.

E400002625

5/

DWN		.	.	KP-F200SCL Specifications	Hitachi Kokusai Electric	E400002625	Rev.		5 /
DSGN		.	.						
CHKD		.	.						
APPD		.	.						

(2) Signal connection to DIGITAL OUT

Pin No.	Signal	Pin No.	Signal
1	GND	14	GND
2	TxOUT0(-)	15	TxOUT0(+)
3	TxOUT1(-)	16	TxOUT1(+)
4	TxOUT2(-)	17	TxOUT2(+)
5	TxCLKOUT0(-)	18	TxCLKOUT0(+)
6	TxOUT3(-)	19	TxOUT3(+)
7	Rx(+)[SERTC(+)]	20	Rx(-)[SERTC(-)]
8	Tx(-)[SERTFG(-)]	21	Tx(+)[SERTFG(+)]
9	TRIG-A/VD(-)[CC1(-)]	22	TRIG-A/VD(+)[CC1(+)]
10	NC[CC2(+)]	23	NC[CC2(-)]
11	NC[CC3(-)]	24	NC[CC3(+)]
12	NC[CC4(+)]	25	NC[CC4(-)]
13	GND	26	GND

Connector (camera side)

Sumitomo 3M 1226-1100-00PL or equivalent

- The digital out cable should be comprised of a twisted pair of wires having 100Ω characteristic impedance and an outer sheath shield type conductor.
- Connect the shield (ground) of the digital out cable to the ground terminal of the video equipment, frame grabber, etc.
- Install clamp filter (ZCAT3035-1330 TDK) at both ends(camera and video processor ends) in the CE making region.
- Tx: Transmit data from camera to PC
- Rx: Transmit data from PC to camera

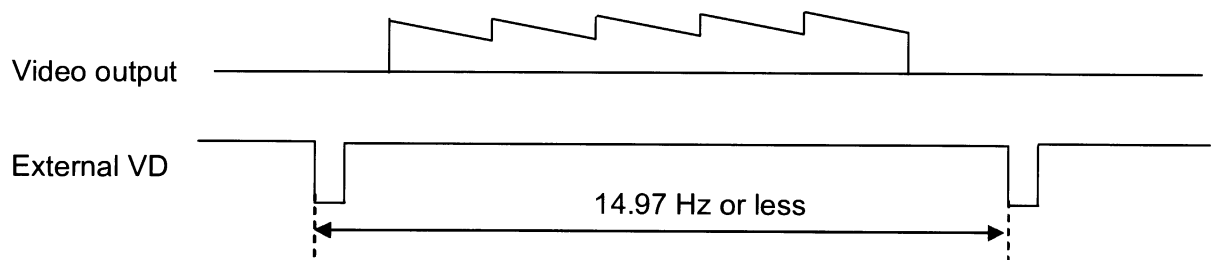
(Note)

Please do not unplug and insert cable(digital out cable) with a power supplied to a camera.

7. VD reset mode

When external VD pulse is inputted, internal HD/VD is reset.

External VD specification: 14.97 Hz or less



(Note) When external VD of 14.97Hz or more is input, electronic shutter has an equation between external VD and 14.97Hz.

E400002625

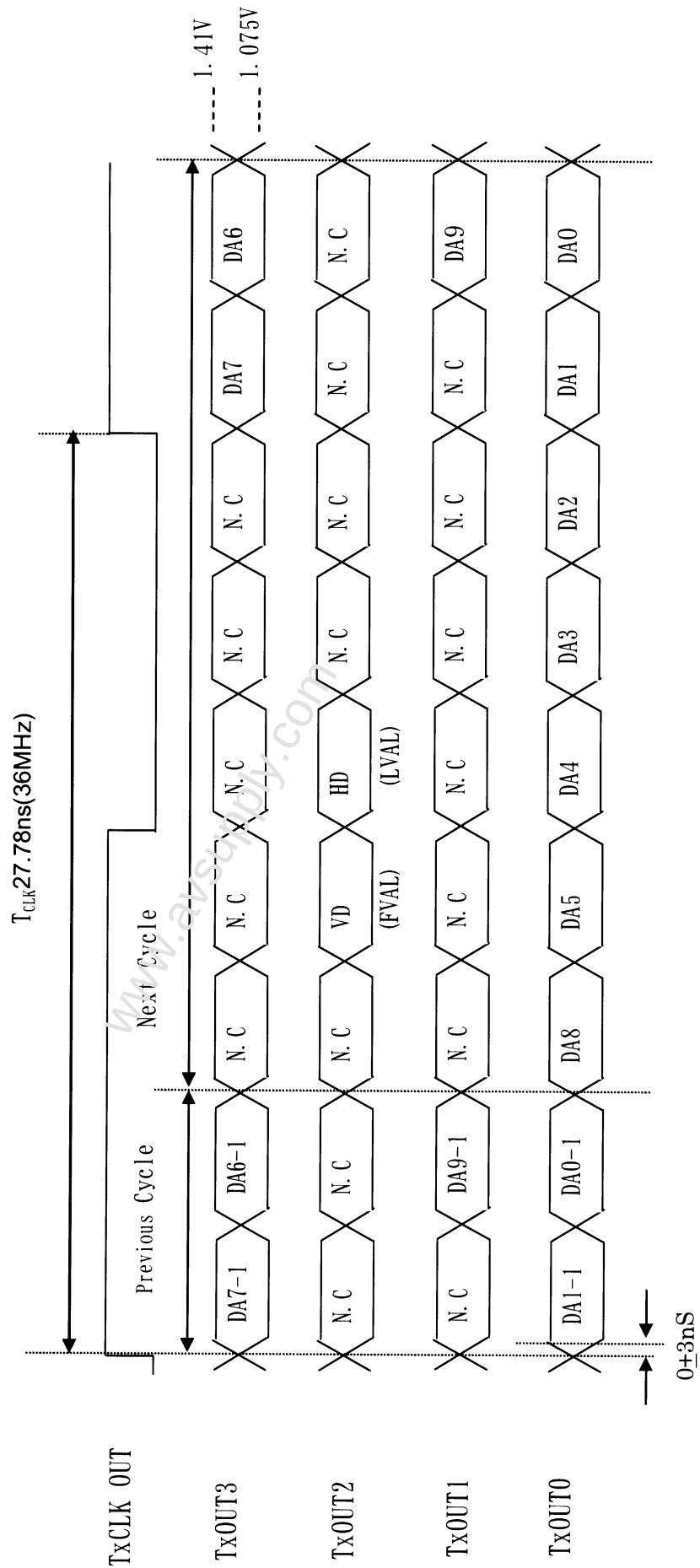
6 /

DWN		.	.	KP-F200SCL Specifications	Hitachi Kokusai Electric	E400002625		Rev.	6 /
DSGN		.	.						
CHKD		.	.						
APPD		.	.						

8. Timing chart

8-1 Transmitter LVDS Output Pulse Position Measurement

(a) 10bit



DWN		.	.
DSGN		.	.
CHKD		.	.
APPD		.	.

KP-F200SCL Specifications

Hitachi Kokusai Electric

E400002625

Rev.

7 /

DWN		.	.
DSGN		.	.
CHKD		.	.
APPD		.	.

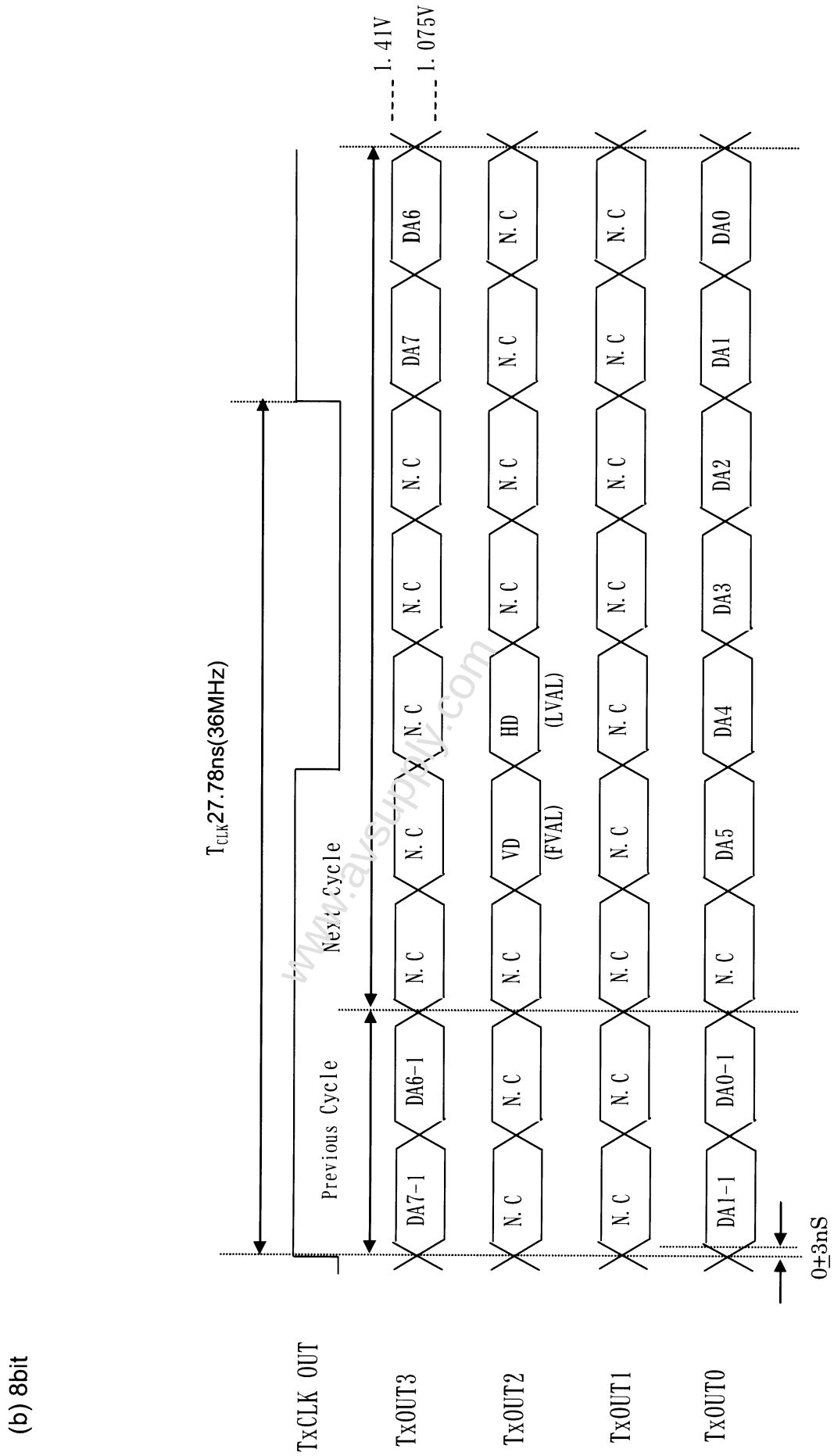
KP-F200SCL Specifications

Hitachi Kokusai Electric

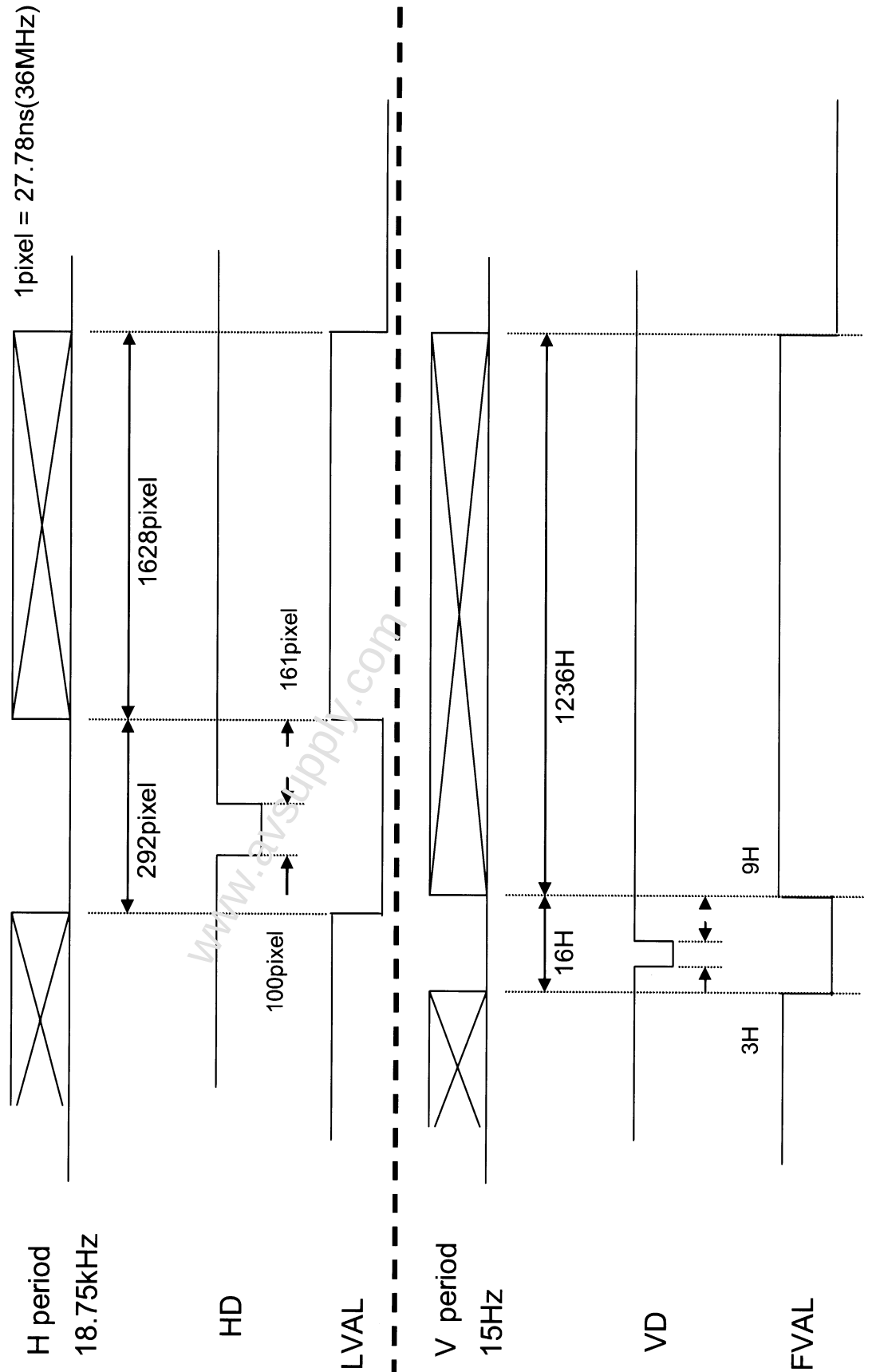
E400002625

Rev.

8 /



8-2 Output signal levels and timing



E400002625 9 /

DWN			
DSGN			
CHKD			
APPD			

KP-F200SCL
Specifications

Hitachi Kokusai Electric

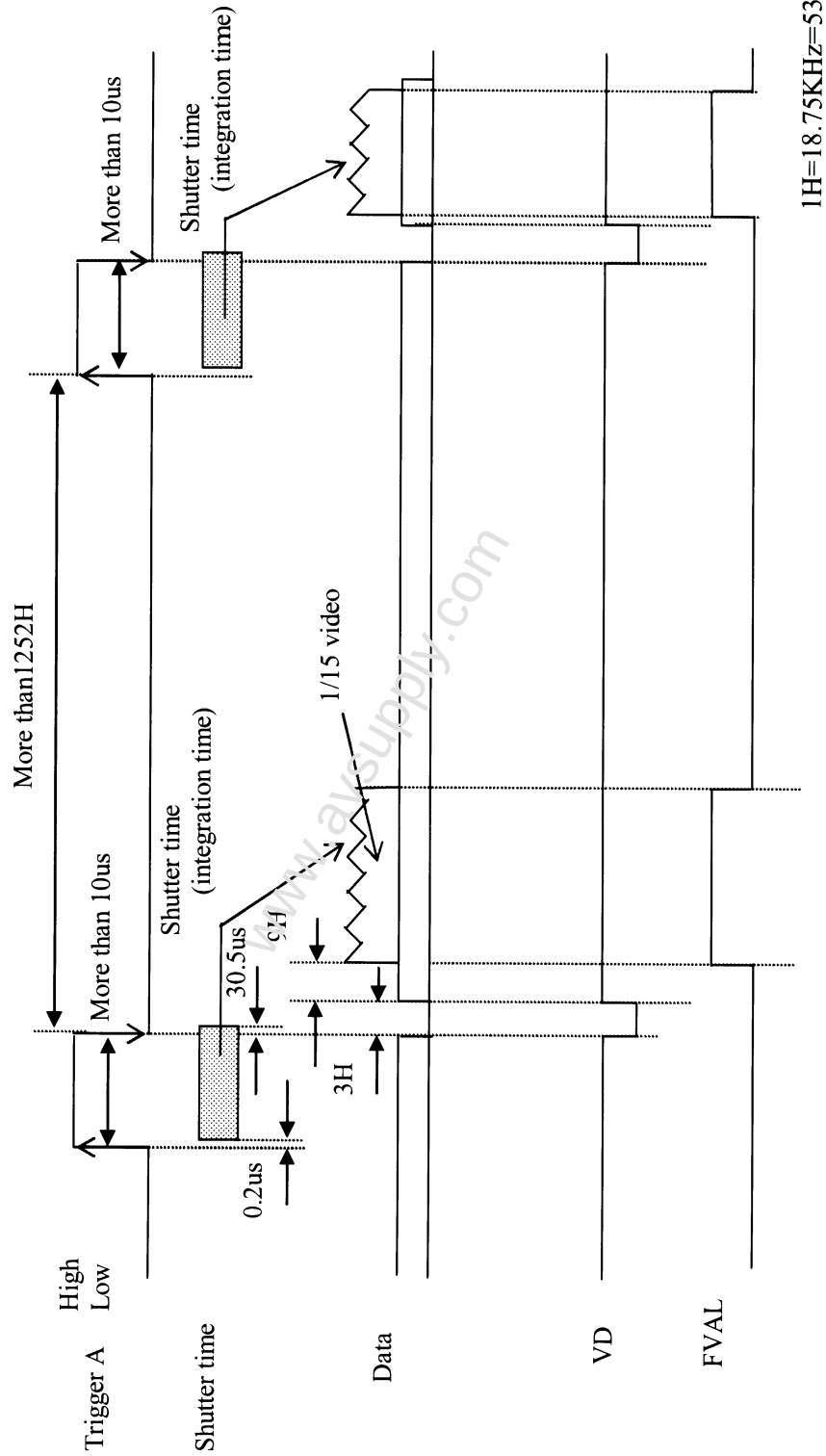
E400002625

Rev.

9 /

MODE TIMING CHART

8-3 ONE trigger mode



Trigger polarity are selectable by remote control.
(Factory setting: POS)

E400002625 10 /

DWN		.	.
DSGN		.	.
CHKD		.	.
APPD		.	.

KP-F200SCL
Specifications

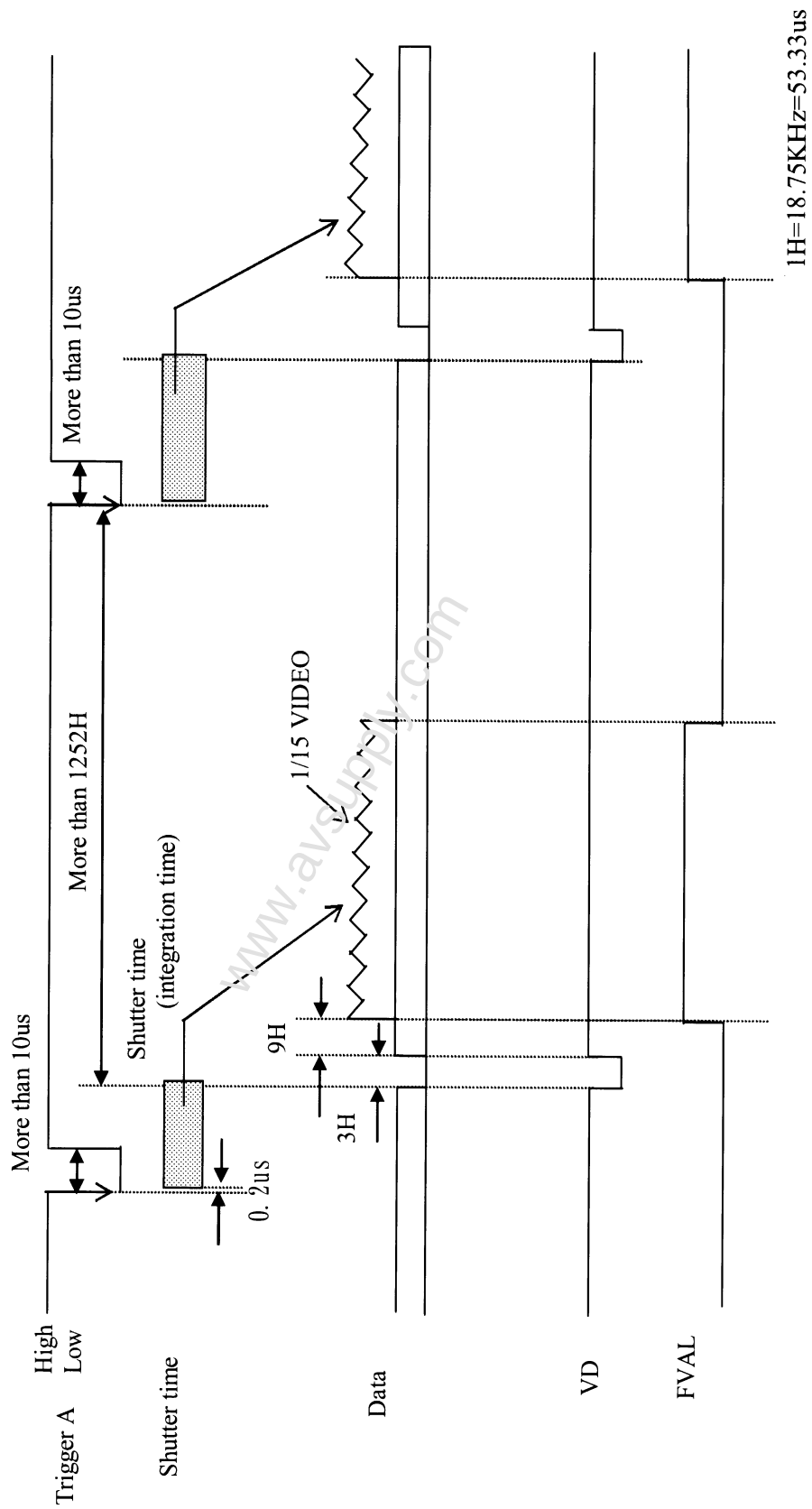
Hitachi Kokusai Electric

E400002625

Rev.

10 /

8-4 Fixed shutter mode



Trigger polarity are selectable by remote control.
(Factory setting: POS)

E400002625 11 /

DWN		.	.
DSGN		.	.
CHKD		.	.
APPD		.	.

KP-F200SCL
Specifications

Hitachi Kokusai Electric

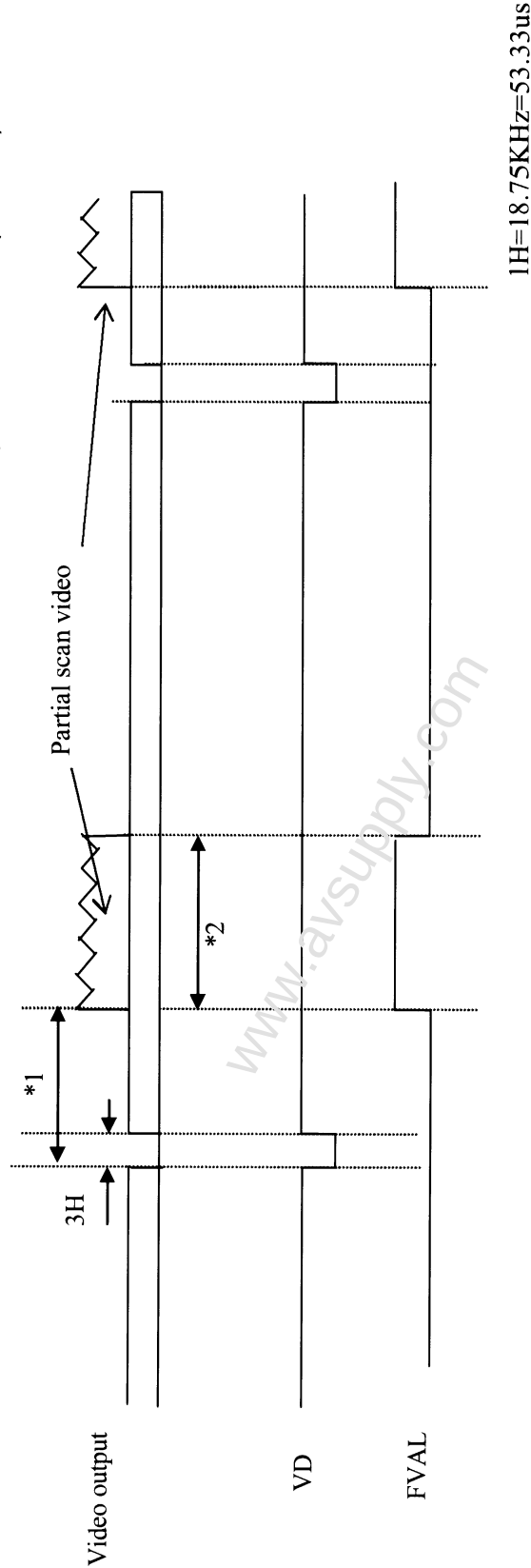
E400002625

Rev.

11 /

8-5 Partial Scan NORMAL mode

1pixel = 27.78ns(36MHz)



*1: Variable by start position of picture grabbing

*2: Selectable start position and width of picture grabbing from 1H to 1236H by 1H step.
Frame rate will not be changed by difference in start position of picture grabbing.

Note1: Cannot use the partial scan in following condition.

Start position of picture grabbing + Width of picture grabbing $\geq$ 1236H

Note2: Please use FVAL in the partial scan.

E400002625 12 /

DWN			
DSGN			
CHKD			
APPD			

KP-F200SCL
Specifications

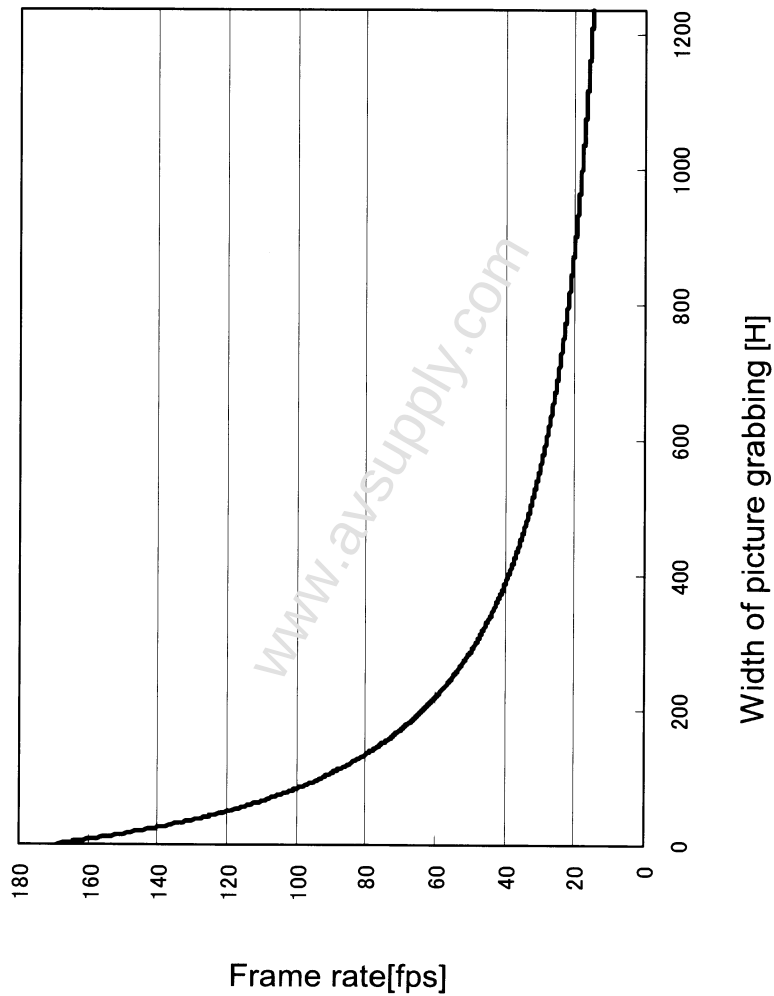
Hitachi Kokusai Electric

E400002625

Rev.

12 /

Graph following shows frame rate in each width of picture grabbing



Note: Please ask your sales representative more detail information about frame rate in each width of picture grabbing

E400002625 13 /

DWN		.	.
DSGN		.	.
CHKD		.	.
APPD		.	.

KP-F200SCL
Specifications

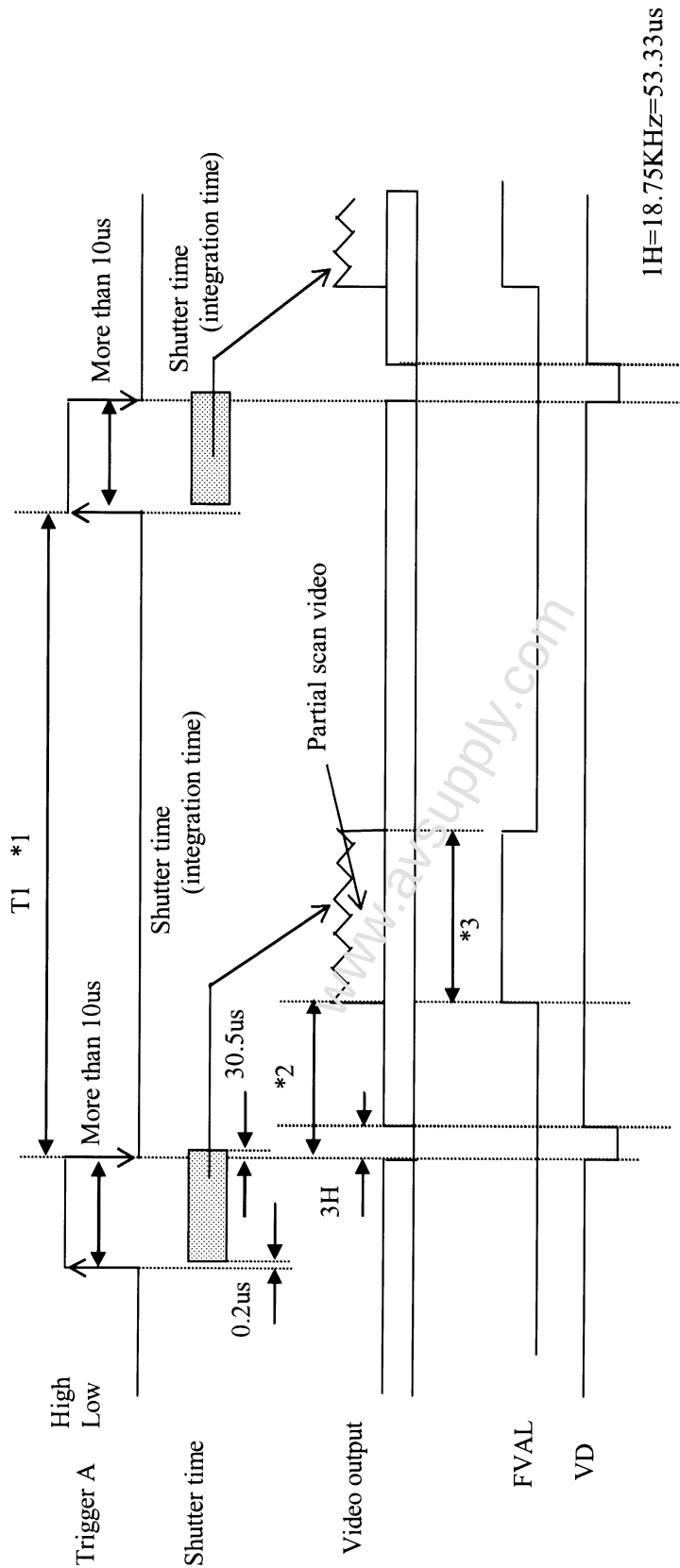
Hitachi Kokusai Electric

E400002625

Rev.

13 /

8-6 Partial Scan ONE Trigger mode



*1: Please set X to be following condition
 $X < T1 < 66.7ms$

X: Variable by width of picture grabbing(Refer to chart written in left side)

*2: Variable by start position of picture grabbing

*3: Selectable start position and width of picture grabbing from 1H to 1236H by 1H step.

Note1: Cannot use the partial scan in following condition.

Start position of picture grabbing + Width of picture grabbing $\geq 1236H$

Note2: Please use FVAL in the partial scan.

Trigger polarity are selectable by remote control. (Factory setting: POS)

Example

Width of picture grabbing[H]	X(Minimum of T1)[ms]
1H	6.0
100H	10.2
500H	30.5
1000H	55.1

DWN		.	.
DSGN		.	.
CHKD		.	.
APPD		.	.

KP-F200SCL
Specifications

Hitachi Kokusai Electric

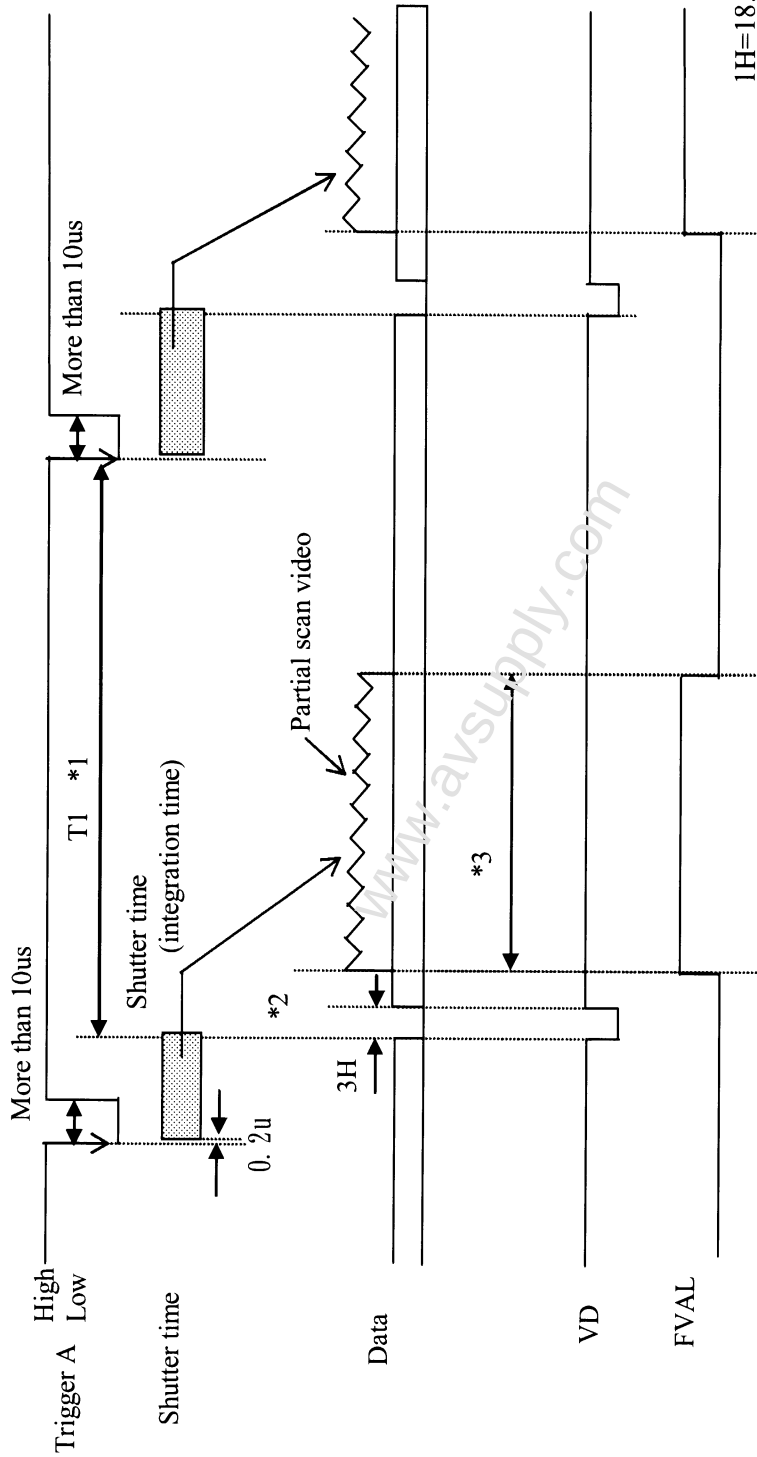
E400002625

Rev.

14 /

E400002625 15 /

8-7 Partial Scan Fixed shutter mode



1H=18.75KHz=53.33us

*1: Please set X to be following condition
 $X < T1 < 66.7ms$

X: Variable by width of picture grabbing(Refer to chart written in left side)

*2: Variable by start position of picture grabbing

*3: Selectable start position and width of picture grabbing
 from 1H to 1236H by 1H step.

Example

Width of picture grabbing[H]	X(Minimum of T1)[ms]
1H	6.0
100H	10.2
500H	30.5
1000H	55.1

Note1: Cannot use the partial scan in following condition.

Start position of picture grabbing + Width of picture grabbing $\geq 1236H$

Note2: Please use FVAL in the partial scan.

Trigger polarity are selectable by remote control. (Factory setting: POS)

DWN			
DSGN			
CHKD			
APPD			

KP-F200SCL
 Specifications

Hitachi Kokusai Electric

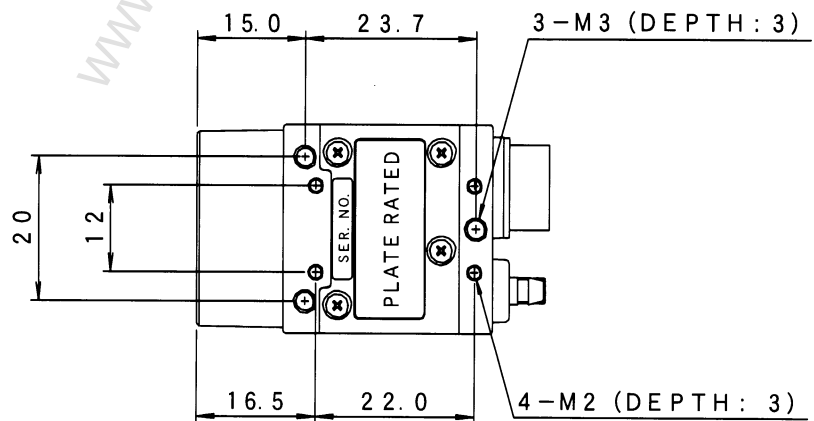
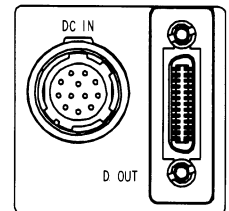
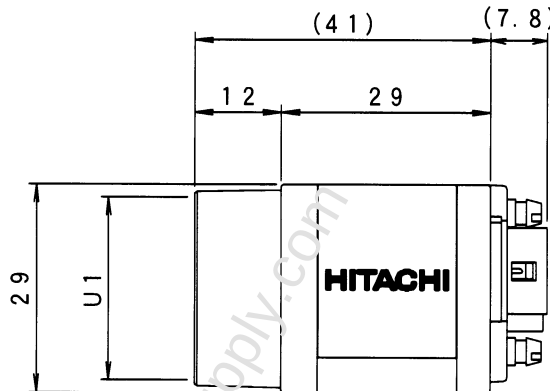
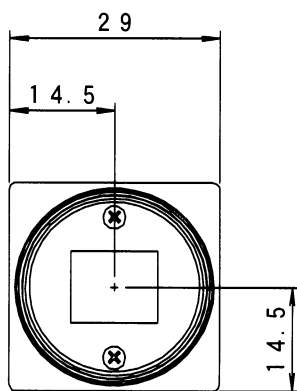
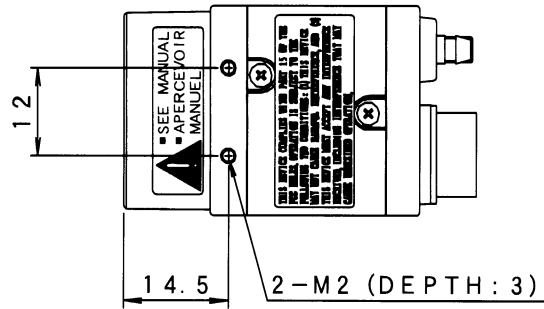
E400002625

Rev.

15 /

External view

- MASS : APPROX 53 g
- COLOR : BLACK
- TORERANCE : ± 0.5



E400002625 16/

DWN			KP-F200SCL Specifications	Hitachi Kokusai Electric	E400002625		
DSGN					Rev.		16 /
CHKD							
APPD							

Notice:

These specifications are subject to change without prior notice due to product improvement.

Confirm the most recent specifications at time of order.

Hitachi Kokusai certifies this product complies with the standard warranty conditions of Hitachi Kokusai, and that quality control is implemented to the extent required to comply with these conditions.

Warranty and service:

- (1) The guarantee period is one year after the date purchase.
However, the defects due to erroneous use or intentional act are excluded.
- (2) As the defect after expiration of the guarantee period, where product repair is possible, repair will be performed at charge. .
- (3) The present Warranty pertains only to the camera unit. Secondary malfunctions attributable to camera failure as well as expenses incurred by disassembly and reassembly of the related system, are beyond the scope of this Warranty.
- (4) Compensation for loss of business, loss or damage to software, database and other contingent losses are beyond the scope of this Warranty.
- (5) Hitachi Kokusai Electric Inc. is not liable for the losses caused when the equipment is used in a system, use for business trades, production process, medical fields, crime prevention applications, etc.
- (6) The parts used in the equipment have their respective lives. The lives of such parts will be shortened under the environments of high temperature or high humidity.
When the stable operation is required for a long time, it is recommended to perform periodical maintenance and inspection every year or every two years.
- (7) In the case of camera trouble by miss wiring of cable, it will be considered as out of warranty.

E400002625 17/

DWN		.	.	KP-F200SCL Specifications	Hitachi Kokusai Electric	E400002625	
DSGN		.	.				
CHKD		.	.			Rev.	
APPD		.	.				17 /

A

B

C

D

E

F

DWN		.	.
DSGN		.	.
CHKD		.	.
APPD		.	.

Hitachi Kokusai Electric

E400002625

Rev.

18 / 18