## *SERVO CONTROLLER for VCR*

KA8334B is a servo controller with built-in digital servo function and analog amplifiers, can select the head specifications and search speed that is able to correspond to multi function VCR.

60 - QFP - 1414A

## *ORDER INFORMATION*

| DEVICE | PACKAGE | OPERATING TEMPERATURE |
|---|---|---|
| KA8334B | 60 QFP | - 10 ℃ ~ + 75 ℃ |

## *FEATURES*

- Using the limit amplifier for D-FG signal, the AM variation is minimum.
- Built-in D-PG amplifier.
- 4HD switching logic output.
- Wide aspect VISS write, rewrite.
- Head switching point is controlled by the analog M.M. & the serial data 8 bits.
- Contains a C-FG frequency doubling block.
- ASB(asemble) mark writing & detecting.
- 9H & 12H mode selection
- 6.5H detect output between video head switching and V-sync.
- The D-P / D & C-P/D outputs are fixed by serial data.
- SW D & SW E are controlled by serial data.
- The output of skip data ( When CTL signal is skipped.) & Compensation of Capatan phase.
- 4 step switching for P.CTL schmitt width.
- ½ VDD is charged to the capacitor of P/D filter when supply voltage is applied.
- Wide aspect discretion data ( full mode & letterbox mode) writing

***MAXIMUM RATING*** *( Ta = 25 ℃ )*

| | Parameter | Symbol | Value | Unit |
|---|---|---|---|---|
| 1 | Power supply | VCC | 6.0 | V |
| 2 | Operating voltage | $V_{OPR}$ | 4.5 ~ 5.5 | V |
| 3 | Storage temperature | $T_{STG}$ | - 40 ~ 125 | ℃ |
| 4 | Operating temperature | $T_{OPR}$ | - 10 ~ 70 | ℃ |
| 5 | Power dissipation | $P_T$ | 500 | ㎽ |

***ELECTRO - STATIC DISCHARGE***

| | CONDITION | VALUE | UNIT |
|---|---|---|---|
| ALL PIN | R = 1.5K C = 100pF | + / - 1500 and over | VOLT |

Previous condition: Human Body Electrostatic Mode 1

***ELECTRICAL CHARACTERISTICS*** *( Ta = 25 ℃,Vcc= 5V )*

| Parameter | SYM-BOL | TEST CONDITIONS | SPECIFICATIONS | | | Unit | APPLICATION TERMINAL |
|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | | |
| Quiscent current | $I_{CC}$ | No load<br>Pin23 & Pin 33 Sum | 8.0 | 30 | 42 | mA | 23,33 |
| 2 value output voltage | $V_{OL}$ | No load | - | 0.0 | 0.05 | V | 40 ~ 43.45<br>51 ~ 57 |
| 2 value output voltage | $V_{OH}$ | No load | 4.9 | 5.0 | - | V | 40 ~ 43.45<br>51 ~ 57 |
| 2 value output voltage | $V_{IL}$ | Load current = 2mA | - | 0.6 | 1.2 | V | 40 ~ 43.45<br>51 ~ 57 |
| 2 value output voltage | $V_{IH}$ | Load current = 2mA | 3.8 | 4.4 | - | V | 40 ~ 43.45<br>51 ~ 57 |
| PULL UP output voltage | $V_{OL}$ | No load | 0.0 | 0.1 | 0.3 | V | 34 |
| PULL UP output voltage | $V_{OH}$ | No load | 4.9 | 5.0 | - | V | 34 |
| PULL UP output voltage | $V_{IL}$ | Load current = 1mA | - | 0.6 | 1.2 | V | 34 |
| PULL UP resistance | $R_H$ | | 6.0 | 9.0 | 13.0 | kΩ | 34 |
| 3 value output voltage | $V_{OL}$ | No load | 0.0 | 0.2 | 0.4 | V | 44 |

***ELECTRICAL CHARACTERISTICS*** *( Continued )*

| Parameter | SYM-BOL | TEST CONDITIONS | SPECIFICATIONS | | | Unit | APPLICATION TERMINAL |
|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | | |
| 3 value output voltage | $V_{OM}$ | No load | 2.3 | 2.5 | 2.8 | V | 44 |
| 3 value output voltage | $V_{OH}$ | No load | 4.6 | 4.8 | 5.0 | V | 44 |
| 3 value output voltage | $V_{IL}$ | Load current = 1mA | - | 0.6 | 1.2 | V | 44 |
| 3 value output voltage | $V_{IH}$ | Load current = 1mA | 3.8 | 4.4 | - | V | 44 |
| 3 value M level output impedance | $R_M$ | | 6.0 | 9.0 | 13.0 | kΩ | 44 |
| REC CTL output pin to pin voltage | $V_{CTL}$ | No load, Potential between pin24 & pin 25 | 4.6 | 4.8 | 5.0 | V | 24, 25 |
| REC CTL out-put impedance | $R_{CTL}$ | $1 \leq I_{LOAD} \leq 2mA$ 24pin & 25pin Sum | - | 250 | 500 | Ω | 24, 25 |
| 2 value input $V_{TH}$ | $V_{TH}$ | | 1.5 | 2.5 | 3.5 | V | |
| 2 value input VTH | $V_{TH}$ | | 1.0 | -- | 4.0 | V | 49, 50 |
| 2 value input pull up resistance | $R_{H1}$ | | 6.0 | 9.0 | 13.0 | kΩ | 48 ~ 50 |
| 3 value input $V_{TH}$ | $V_{TH1}$ | VTH of L / M | 1.0 | 1.4 | 1.9 | V | 3, 4 |
| 3 value input $V_{TH}$ | $V_{TH2}$ | VTH of M / H | 3.1 | 3.5 | 4.0 | V | 3, 4 |
| 3 value input voltage | $V_M$ | | 2.0 | 2.5 | 2.9 | V | 3, 4 |
| 3 value input input resistance | $R_{M1}$ | | 18.5 | 28.0 | 42.0 | kΩ | 3, 4 |
| fsc Amp. Gain | $A_{fsc}$ | Internal OSC | 20 | - | - | dB | 35, 36 |
| fsc input senstivity | $V_{fsc}$ | Internal OSC | - | - | 150 | mVpp | 37 |
| CTLP schmitt input voltage | $V_{m31}$ | | 2.2 | 2.5 | 2.8 | | 31 |

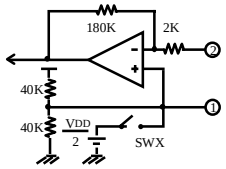
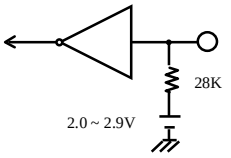
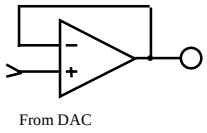
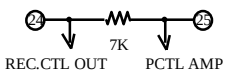
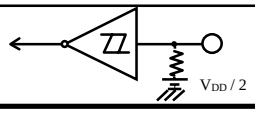
***ELECTRICAL CHARACTERISTICS*** *( Continued )*

| Parameter | SYM-BOL | TEST CONDITIONS | SPECIFICATIONS | | | Unit | APPLICATION TERMINAL |
|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | | |
| CTLP schmitt input $V_{TH}$ | VP TH1 | normal speed | 105 | 150 | 180 | $mV_{OP}$ | 31 |
| CTLP schmitt input $V_{TH}$ | VM TH1 | normal speed | -180 | -150 | -105 | $mV_{OP}$ | 31 |
| CTLP schmitt input $V_{TH}$ | VP TH2 | medium speed search | 240 | 300 | 360 | $mV_{OP}$ | 31 |
| CTLP schmitt input $V_{TH}$ | VM TH2 | medium speed search | -360 | -300 | -240 | $mV_{OP}$ | 31 |
| CTLP schmitt input $V_{TH}$ | VP TH3 | high speed search | 520 | 600 | 680 | $mV_{OP}$ | 31 |
| CTLP schmitt input $V_{TH}$ | VM TH3 | high speed search | -680 | -600 | -520 | $mV_{OP}$ | 31 |
| CTLP schmitt input $V_{TH}$ | VP TH4 | During VISS detect | 900 | 1000 | 1100 | $mV_{OP}$ | 31 |
| PCTL schmitt input $V_{TH}$ | VM TH4 | During VISS detect | -1100 | -1000 | -900 | $mV_{OP}$ | 31 |
| C.FG Input volt. | VM32 | | 2.2 | 2.5 | 2.8 | V | 32 |
| C.FG schmitt width | VP TH5 | | 105 | 150 | 180 | $mV_{PP}$ | 32 |
| C.FG schmitt width | VM TH5 | | -180 | -150 | -105 | $mV_{PP}$ | 32 |
| D.PG schmitt input $V_{TH}$ | VP TH5 | Input external resistor = 100kΩ | 350 | 480 | 700 | $mV_{OP}$ | 60 |
| D.PG schmitt input $V_{TH}$ | VM TH5 | difference with VP TH5 | 150 | 310 | 520 | $mV_{OP}$ | 60 |
| D.FG. AMP. Input voltage | VM2 | | 2.2 | 2.5 | 2.8 | V | 2 |
| D.FG AMP input senstivity | VLMA | | - | - | 10 | $mV_{PP}$ | 2 |
| D.PG Input voltage | VM60 | | 2.2 | 2.5 | 2.8 | V | 60 |

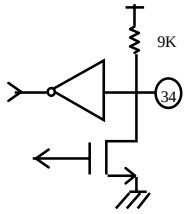
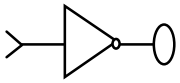
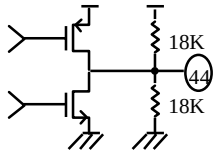
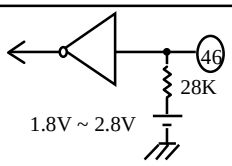
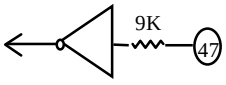
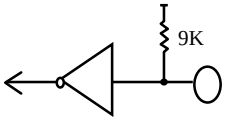
***ELECTRICAL CHARACTERISTICS*** *( Continued )*

| Parameter | SYM BOL | TEST CONDITIONS | SPECIFICATIONS | | | Unit | APPLICATION TERMINAL |
|---|---|---|---|---|---|---|---|
| | | | MIN | TYP | MAX | | |
| Power on reset input VTH | V39TH | | 2.9 | 3.5 | 4.1 | V | 39 |
| Power on reset input current | IM39 | | 1.0 | 2.0 | 5.0 | uA | 39 |
| Sync input $V_{TH}$ | V46TH | at DC input | 1.5 | 2.5 | 3.5 | V | 46 |
| Sync input pin voltage | V46 | | 1.8 | 2.4 | 2.8 | V | 46 |
| Sync input senstivity | VSYC | DUTY 10% square At coupling cap, measure peak value | 50 | 100 | 200 | mVpp | 46 |
| Sync input Input impedance | R46 | | 18.5 | 28.0 | 42.0 | kΩ | 46 |
| D.PG M.M $V_{TH}$ | VMMT | D.PG M.M pin | 2.2 | 2.5 | 2.8 | V | 59 |
| CTLP amp gain | ACTL | f=4KHz | 37 | 40 | 43 | dB | 24,25,28,30 |
| Drum mix amp gain | AD | f=4KHz | 37 | 40 | 43 | dB | 5,6,9 |
| CAP. mix amp gain | AC | f=4KHz | 37 | 40 | 43 | dB | 15,20,22 |
| Analog SW off leakage current | ILK | | -1.0 | 0.0 | 1.0 | uA | SWA - SWM |
| Analog SW on resistance | RASW | | - | 400 | 1000 | Ω | SWA - SWL |

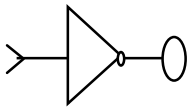
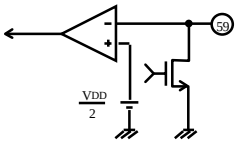
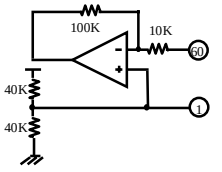
## *PIN DESCRIPTIONS*

<table>
<tr><th>Pin No</th><th>Function</th><th>Descriptions</th><th>Input/Output form</th></tr>
<tr><td>1</td><td>DRUM<br>Common</td><td>The common pin of D-FG and D-PG signal.<br>Bias voltage : about 2.5V</td><td rowspan="2"> 
</td></tr>
<tr><td>2</td><td>DRUM FG IN</td><td>D-FG Input minimum level : 10mV.<br>note) Refer to 멱ead switching timing chart</td></tr>
<tr><td>3<br><br>4</td><td>DRUM A<br>SELECT<br>B</td><td>3 value input<br>OPEN = 밠<br>Note)Refer to head switching timing chart
<table>
<tr><th>B A</th><th>H</th><th>M</th><th>L</th></tr>
<tr><td>H</td><td>2 HEAD ①</td><td>2 HEAD ②</td><td>2 HEAD ③</td></tr>
<tr><td>M</td><td>DA4 - ①</td><td>DA4 - ②</td><td>DA4 - ③</td></tr>
<tr><td>L</td><td>DA4-①TEST</td><td>DA4-②TEST</td><td>DA4-③TEST</td></tr>
</table></td><td> 
</td></tr>
<tr><td>5<br>6<br>9<br>15<br>20<br>22</td><td>D.MIX OUT<br>D.MIX (-)<br>D.MIX (+)<br>C.MIX (+)<br>C.MIX (-)<br>C.MIX OUT</td><td>Drum mix amp, capstan mix amp<br>Open loop gain ----------><br>At the full feedback, no oscillation<br>Output dynamic range: 0~ 5V ( No load )<br>Output impedance ≤ 2kΩ</td><td>——</td></tr>
<tr><td>7<br>11<br>14<br>16</td><td>D.F/V OUT<br>D.P/D OUT<br>C.P/D OUT<br>C.F/V OUT</td><td>SW capacitor DA output.<br>Output dynamic range: 0.5 ~ 4.3V<br>Output impedance ≤ 500Ω</td><td> 
</td></tr>
<tr><td>8</td><td>N.C ( GND )</td><td>GND Connected.</td><td>——</td></tr>
<tr><td colspan="2">10 ( SW I ), 12 ( SW J ), 13 ( SW M ),<br>17 ( SW H ),18 ( SW G ),19 ( SW F ),21 ( SW E )</td><td>Analog switch., Switch resistance ≤ 500ohm<br>Leakage current ≤ 1uA</td><td>——</td></tr>
<tr><td>24<br>25</td><td>CTL Head -<br>CTL Head +</td><td>REC CTL ouput<br>Output impedance ≤ 500ohm</td><td> 
</td></tr>
<tr><td>27<br>28<br>29<br>30</td><td>CTL Amp Bias<br>CTL Amp (-)<br>SW D<br>CTL Amp out</td><td>Open loop gain ---------- ><br>At the full feedback, no oscillation.<br>Output dynamic range : 0~5V<br>Output impedance ≤ 2kΩ</td><td>——</td></tr>
<tr><td>31</td><td>PCTL IN</td><td>Schmitt bias VTH: 4 point. Internal bias = about 2.5</td><td>——</td></tr>
<tr><td>32</td><td>CFG IN</td><td>Schmitt width = ±150mV.<br>Built - in the frequency doubling block.</td><td> 
</td></tr>
</table>

***PIN DESCRIPTIONS*** *( Continued )*

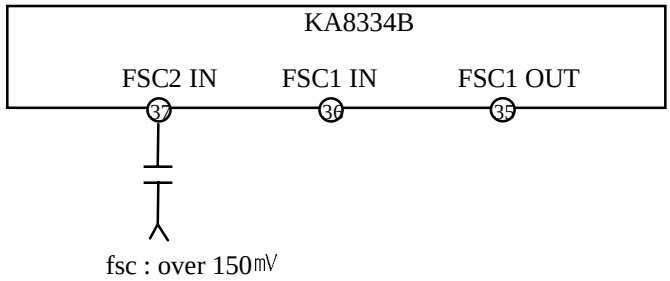
<table>
<tr><th>Pin No</th><th>Function</th><th>Descriptions</th><th>Input/Output form</th></tr>
<tr><td>34</td><td>Duty I/O</td><td>2 value input/output, pull - up. note) Refer to 몇ISS-VASS?
<table>
<tr><th></th><th>ASB Mark</th><th>At Duty mode</th><th>At VISS mode</th></tr>
<tr><td>H</td><td>No mark, Duty=60%</td><td>Data=?? Duty=60%</td><td>VISS undetection</td></tr>
<tr><td>L</td><td>Mark, Duty=70%</td><td>Data=?? Duty=27%</td><td>VISS detection</td></tr>
</table></td><td> 
</td></tr>
<tr><td>35<br>36<br>37</td><td>FSC1 OUT<br>FSC1 IN<br>FSC2 IN</td><td>The internal OSC. block & the external OSC. block is<br>selected by serial data. Built-in clock amp for int osc : gain > 20 dB<br>The external OSC. block senstivity ≥ 150mV.</td><td>——</td></tr>
<tr><td>38</td><td>N.C</td><td>GND Connected.</td><td>——</td></tr>
<tr><td>39</td><td>Power on reset</td><td>Connects the capacitor ( 0.047uF).</td><td>——</td></tr>
<tr><td>40</td><td>REF 30</td><td>Servo reference signal</td><td rowspan="5">  </td></tr>
<tr><td>41</td><td>VFF</td><td>Video head switching pulse</td></tr>
<tr><td>42</td><td>AFF</td><td>Audio head switching pulse</td></tr>
<tr><td>43</td><td>EFF</td><td>Extra head switching pulse</td></tr>
<tr><td>45</td><td>HA-SLT</td><td>4-head amp select output</td></tr>
<tr><td>44</td><td>VP</td><td>Quasi V-pulse 3 value output</td><td> 
</td></tr>
<tr><td>46</td><td>Composite<br>Sync.</td><td>2 value input : Digital input<br>At PB mode, synchronizes to internal reference,<br>at REC, INST, ASB mode, separated and synchronizes to V sync.</td><td> 
</td></tr>
<tr><td>47</td><td>ENV-DET</td><td>2 value input<br>Envelop detect input. note) Attention to 4-head logic timing</td><td> 
</td></tr>
<tr><td>48</td><td>SUB-H</td><td>2 value input<br>4-head changing logic support input.</td><td rowspan="3"> 
</td></tr>
<tr><td>49</td><td>Serial Data</td><td>2 value input ( schmitt )<br>Pull-up resistor = 9 Kohm. Note) Refer to serial input</td></tr>
<tr><td>50</td><td>Serial CLK</td><td>2 value input ( Schmitt )<br>Pull-up Resistor = 9 Kohm Note) Refer to serial input</td></tr>
</table>

***PIN DESCRIPTIONS***

<table>
<tr><th>Pin No</th><th>Function</th><th>Descriptions</th><th>Input/Output form</th></tr>
<tr><td>51<br>52<br>53</td><td>Mode D<br>Output E<br>F</td><td>
<table>
<tr><th>BIT 4 3 2 1 0</th><th>D</th><th>E</th><th>F</th></tr>
<tr><td>0 1 1 1</td><td>CFG C/D</td><td>CTL C/D</td><td>-</td></tr>
<tr><td>1 1 1 1</td><td>CFG</td><td>CFG30, CTL</td><td>-</td></tr>
<tr><td>0 1 1 1</td><td>-</td><td>-</td><td>6.5H DET.</td></tr>
<tr><td>1 1 1 1</td><td>-</td><td>-</td><td>CTL DET.</td></tr>
</table>
CFG C/D: CFG count- downed signal output by search speed.<br>
CTL C/D: CTL count- downed signal output by search speed.<br>
CFG 30(REC) : At REC, the compared signal of CAPSTAN phase input<br>
The output of CFG count down 30 Hz (PAL:25Hz)<br>
CTL(PB) : At PB, CTL signal (squar ware) output.
</td><td rowspan="2">  </td></tr>
<tr><td>54</td><td>C - ROT</td><td>Color rotation output. note) Refer to ?-head rotation logic</td></tr>
<tr><td>55<br>56<br>57</td><td>MODE C<br>OUTPUT B<br>A</td><td>
<table>
<tr><th>BIT</th><th>5 4 2 1 0</th><th>A</th><th>B</th><th>C</th></tr>
<tr><td></td><td>0 0 1 1 1</td><td>SP</td><td>SP</td><td>LP</td></tr>
<tr><td></td><td>0 1 1 1 1</td><td>SP</td><td>EP</td><td>LP</td></tr>
<tr><td></td><td>1 0 1 1 1</td><td>CTL DELAY COUNTER</td><td>H - OSC</td><td>NOISE DET.</td></tr>
<tr><td></td><td>1 1 1 1 1</td><td>CAP PD REF</td><td>DRUM FG</td><td>DRUM PG</td></tr>
</table>
CTL DELAY COUNTER → Refer to 멥IME CHART<br>
H - OSC → Refer to 멖 - OSC<br>
NOISE DET. → Refer to 멚OISE DET
</td><td></td></tr>
<tr><td>59</td><td>PG M.M</td><td>Time constant: 0 - 60 ° DEG<br>Non retriggerable note) refer to ?-Head SW timing?</td><td>  </td></tr>
<tr><td>60</td><td>DRUM PG IN</td><td>Built-in input amp schmitt. Input resistor : 10㏀.<br>Feedback resistor: 100㏀.<br>note) Refer to 멖ead switching timing?</td><td>  </td></tr>
</table>

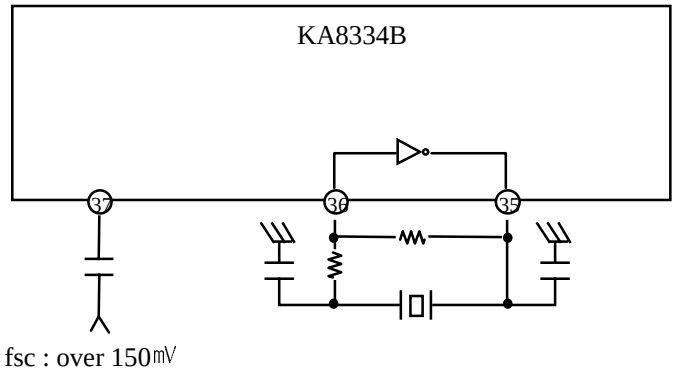
## *fsc INPUT CIRCUIT*

⑴ Case 1 : using single system clock



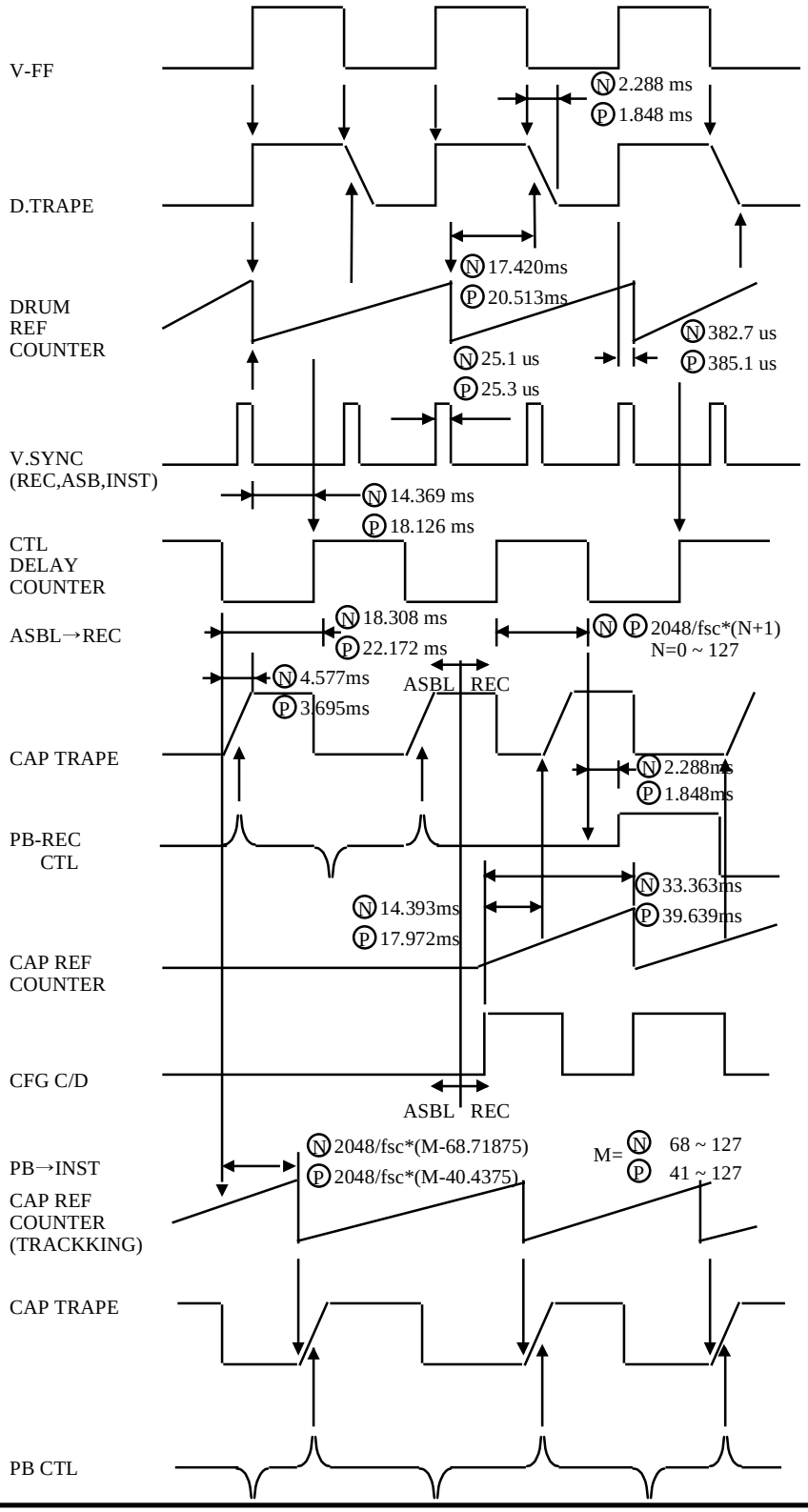

* Serial data selection : FSC2 → ON, FSC1 → OFF (cf. S-DATA table)

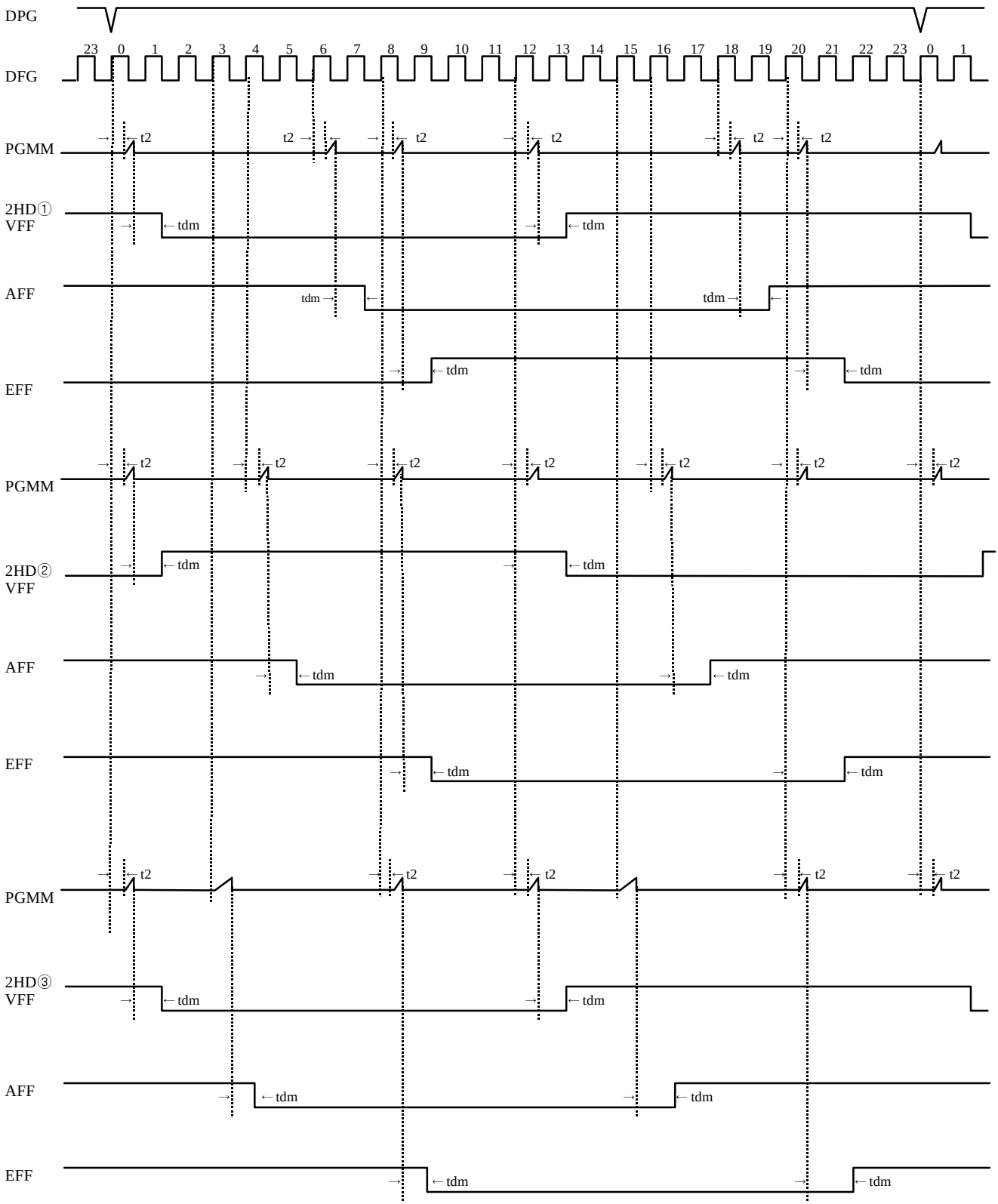
⑵ Case 2 : using two kinds of system clock (multi-mode)

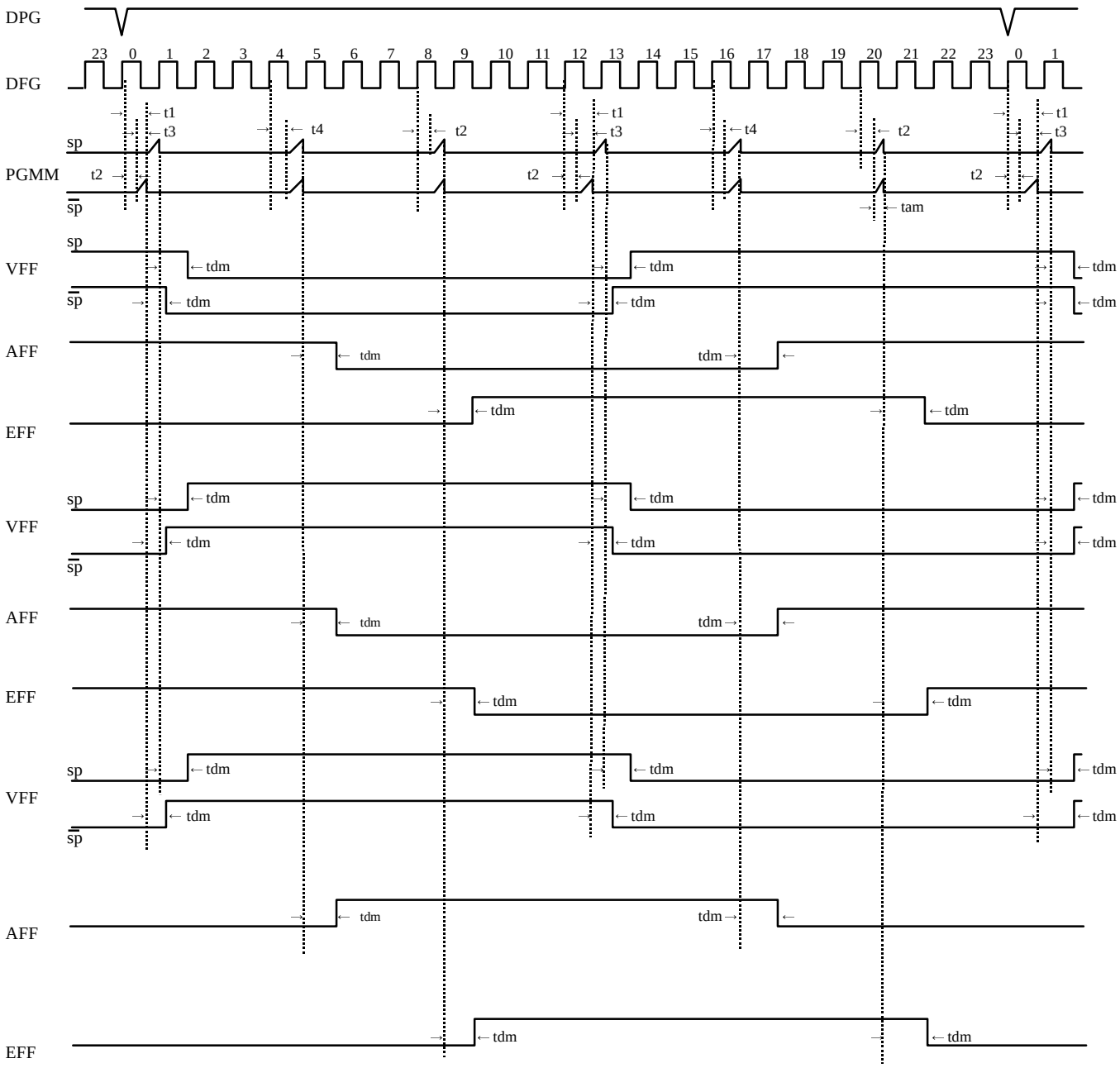



* Serial data selection : FSC1, FSC2
* Oscillation frequency minute adjust by C1, C2 (cf. X-tal electrical characteristics spec)
* Amplitude of oscillation frequency adust by R1, R2
* In case of interference between FSC1 and FSC2, a resistor of several ㏀ connection both between pin 37 and capacitor and between pin 36 and R1

***TIMING CHART***




DPG
DFG
23 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 0 1
PGMM
t2
2HD①
VFF
tdm
AFF
EFF
PGMM
2HD②
VFF
AFF
EFF
PGMM
2HD③
VFF
AFF
EFF




| | t1 | t2 | t3 | t4 |
|---|---|---|---|---|
| NTSC | 402.29 | 277.13 | 125.16 | 339.71 |
| PAL | 461.93 | 332.01 | 129.92 | 389.80 |

tdm = (N+1) * 32 / fsc
N = 0 ~ 255
tam : Analog MM Delay Time

(Unit : ㎲)

***FUNCTION GUIDE***

*1) The constant of DRUM speed block*

| | DEG freq. | S/H freq. | Counter clock | Counter bit number | FV-Gain | Drum PD ADJ. |
|---|---|---|---|---|---|---|
| NTSC | 719.36Hz | 719.36Hz | fsc / 2 | 11 BIT | 60.75mV/% | 596Hz ~ 906H |
| PAL | 600.00Hz | 600.00Hz | fsc / 3 | 11 BIT | 60.13mV/% | 496Hz ~ 758Hz |

*2) The constant of DRUM phase block*

| | | S / W frequency | Counter clock | Counter bit number | Drum PD gain | |
|---|---|---|---|---|---|---|
| | | | | | KP 1 | KP 2 |
| NTSC | At phase DET | 29.97 Hz | fsc / 4 | 11 BIT | 1.092 V/ ms | 3.277 V/ms |
| | At $f_H$ COMP | 3.93 KHz | fsc / 4 | 11 BIT | 1.092 V/ ms | 3.277 V/ms |
| PAL | At phase DET | 25 Hz | fsc / 4 | 11 BIT | 1.353 V/ ms | 4.059 V/ms |
| | At $f_H$ COMP | 3.91 KHz | fsc / 4 | 11 BIT | 1.353 V/ ms | 4.059 V/ms |

*3) The constant of Capstan phase block*

| | | S / W frequency | Counter clock | Counter bit number | Drum PD gain | |
|---|---|---|---|---|---|---|
| | | | | | KP 1 | KP 2 |
| | | | | NORMAL | NORMAL | NORMAL |
| NTSC | | 29.97 Hz | fsc / 8 | 11 BIT | 0.546 | 1.639 |
| PAL | PB | 25.00 Hz | fsc / 8 | 11 BIT | 0.677 | 2.030 |
| | REC | 25.22 Hz | | | | |

*4) Conversion of CAPSTAN gain*

| SWH | SWG | SWF | NTSC SP | NTSC LP(9H) | NTSC EP(12H) | PAL SP | PAL LP |
|---|---|---|---|---|---|---|---|
| OFF | OFF | OFF | SLOW | SLOW | SLOW | SLOW | SLOW |
| OFF | OFF | OFF | - | X1 | X1, 2, 3 | - | X1 |
| ON | OFF | OFF | X1, 2 | X2 ~ X5 | X4 ~ X9 | X1 ~ X2 | X2 ~ X5 |
| ON | ON | OFF | X3 ~ X8 | X16 ~ X17 | X10 ~ X27 | X3 ~ X8 | X6 ~ X17 |
| ON | ON | ON | X9 ~ | X18 ~ | X28 ~ | X9 ~ | X18 ~ |

*5) The constant of CAPSTAN speed block*

| | | | | CFG freq. | S/H freq. | Counter clock | COUNT. BIT Numb | FV gain |
|---|---|---|---|---|---|---|---|---|
| NTSC | Noraml & Search | | SP | Refer to 믾apstan F/V frequency | 2157.8 Hz | fsc | 11 BIT | 40.50 mV/% |
| | | | LP | | 1079.2 Hz | fsc / 2 | | |
| | | | EP | | 719.2 Hz | fsc / 3 | | |
| | | | 9H | | 479.5 Hz | fsc / 4 | 11 BIT | 45.56 mV/% |
| | | | 12H | | 359.6 Hz | fsc / 6 | 11 BIT | 40.50 mV/% |
| | SLOW | SLOW A | SP | 809.1 Hz | 1618.2 Hz | fsc | 11 BIT | 54.0 mV/% |
| | | | LP | 404.6 Hz | 809.2 Hz | fsc / 2 | | |
| | | | EP | 269.7 Hz | 539.4 Hz | fsc / 3 | | |
| | | | 9H | 179.85 Hz | 359.7 Hz | fsc / 4 | 11 BIT | 60.74 mV/% |
| | | | 12H | 134.85 Hz | 269.7 Hz | fsc / 6 | 11 BIT | 54.0 mV/% |
| | | SLOW B | SP | 581.7 Hz | 1163.4 Hz | fsc | 11 BIT | 54.0 mV/% |
| | | | LP | 404.6 Hz | 809.2 Hz | fsc / 2 | | |
| | | | EP | 269.7 Hz | 539.4 Hz | fsc / 3 | | |
| | | | 9H | 179.85 Hz | 359.7 Hz | fsc /4 | 11 BIT | 60.74 mV/% |
| | | | 12H | 134.85 Hz | 269.7 Hz | fsc / 6 | 11 BIT | 54.0 mV/% |
| PAL | Noraml | NORMAL | SP | Refer to 믾apstan F/V C frequency | 1513.4 Hz | fsc / 2 | 11 BIT | 35.76 mV/% |
| | | | LP | | 756.7 Hz | fsc / 4 | | |
| | SLOW | SLOW A | SP | 567.5 Hz | 1135.5 Hz | fsc / 2 | 11 BIT | 47.68 mV/% |
| | | | LP | 283.7 Hz | 567.5 Hz | fsc / 4 | | |
| | | SLOW B | SP | 378.4 Hz | 756.7 Hz | fsc / 2 | 11 BIT | 71.52 mV/% |
| | | | LP | 283.7 Hz | 567.5 Hz | fsc / 4 | | 47.68 mV/% |

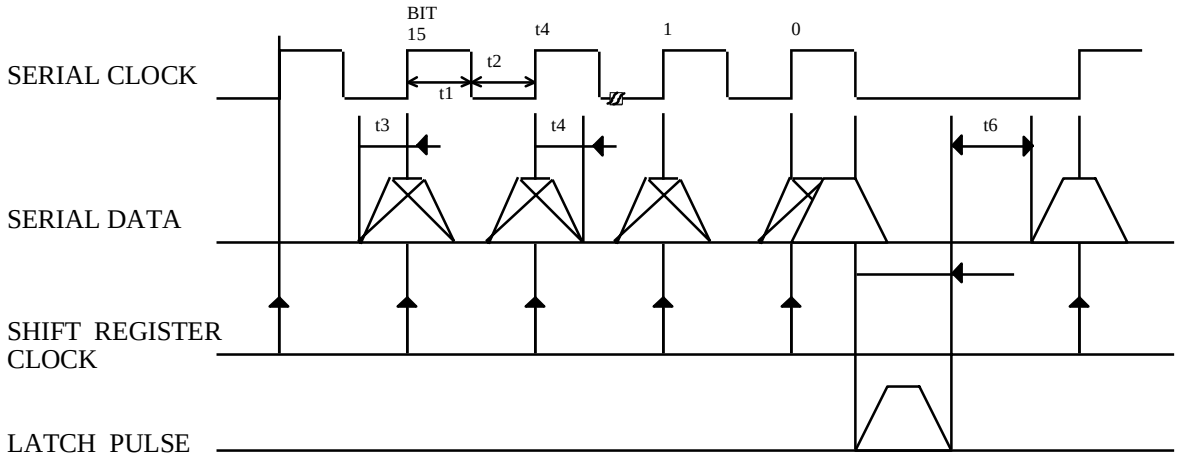
*6) Conversion of CTL schmitt VTH*

| VTH | NTSC SP | NTSC LP(9H) | NTSC EP(12H) | PAL SP | PAL LP |
|---|---|---|---|---|---|
| ±150 mV<br>±30 mV | - | SLOW<br>X1 | SLOW<br>X1 | SLOW | SLOW |
| ±300 mV<br>±60 mV | SLOW<br>X1, 2 | X2, 3, 4, 5 | X2, 3, 4, 7 | X1 , 2 | X2, 3, 4, 5 |
| ±600 mV<br>±80 mV | X3, 4, 5, 7, 8, 9,11, 12,13, 14, 15, 21 | X7, 9, 13, 15, 17, 21,22, 24, 26 | X9, 10, 13, 15 17, 21, 27, 33 35, 39 | X3, 4, 5, 7, 8, 9,11, 12,13, 14, 15, 21 | X7, 9, 13, 15, 17, 21,22, 24, 26 |
| ±1000 mV<br>±100mV | At fixed C.P / D output | | | | |

*7) Capstan FV center frequency (KHz)*

| | Forward | | | | | Reverse | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Serial Bit | NTSC | | | PAL | | NTSC | | | PAL | |
| 11 10 9 8 | SP | LP | EP | SP | LP | SP | LP | EP | SP | LP |
| 0 0 0 0 | 1.079 | 0.539 | 0.360 | 0.757 | 0.378 | 1.079 | 0.539 | 0.360 | 0.757 | 0.378 |
| 0 0 0 1 | 2.158 | 1.079 | 0.719 | 1.513 | 0.757 | 2.158 | 1.079 | 0.079 | 1.513 | 0.757 |
| 0 0 1 0 | 3.236 | 1.618 | 1.079 | 2.270 | 1.135 | 3.236 | 1.618 | 1.079 | 2.270 | 1.135 |
| 0 0 1 1 | 4.455 | 2.158 | 1.438 | 3.109 | 1.513 | 4.138 | 2.158 | 1.438 | 2.921 | 1.513 |
| 0 1 0 0 | 5.569 | 2.697 | 2.517 | 3.886 | 1.891 | 5.174 | 2.697 | 2.517 | 3.651 | 1.891 |
| 0 1 0 1 | 7.796 | 3.898 | 3.236 | 5.441 | 2.720 | 7.242 | 3.621 | 3.236 | 5.111 | 2.556 |
| 0 1 1 0 | 10.024 | 5.012 | 10.024 | 6.996 | 3.498 | 9.312 | 4.655 | 9.312 | 6.572 | 3.286 |
| 0 1 1 1 | 20.852 | 23.169 | 3.712 | 14.488 | 16.098 | 17.977 | 19.975 | 3.449 | 12.765 | 14.183 |
| 1 0 0 0 | 12.743 | 12.743 | 12.743 | 8.854 | 8.854 | 10.986 | 10.986 | 10.986 | 7.801 | 7.801 |
| 1 0 0 1 | 24.326 | 13.901 | 13.515 | 16.903 | 9.659 | 20.975 | 11.985 | 11.652 | 14.893 | 8.510 |
| 1 0 1 0 | 15.060 | 15.060 | 15.060 | 10.464 | 10.464 | 12.984 | 12.984 | 12.984 | 9.219 | 9.219 |
| 1 0 1 1 | 21.010 | 18.535 | 4.826 | 15.293 | 12.878 | 18.976 | 15.980 | 4.483 | 13.474 | 11.346 |
| 1 1 0 0 | 17.376 | 8.353 | 5.569 | 12.074 | 5.830 | 14.981 | 7.759 | 5.173 | 10.637 | 5.494 |
| 1 1 0 1 | 19.693 | 16.218 | 7.796 | 13.683 | 11.269 | 16.978 | 13.983 | 7.242 | 12.056 | 9.928 |
| 1 1 1 0 | SLOW | | | | | | | | | |
| 1 1 1 1 | Refer to ?Constant of CAPSTAN speed block | | | | | | | | | |
| Capstan PD ADJ | NTSC<br>Capstan F/ V frequency뭘 about<br>- 7.2% ~ + 8.4% | | | | | PAL<br>Capstan F / V frequency뭘 about<br>- 8.0% ~ + 9.6% | | | | |

*Serial Input Timing Chart*




t2≥1 us, t2≥1 us, t3≥0.3 us, t4≥ 0.3 us, t5≥0.5 us, t6≥0.5 us

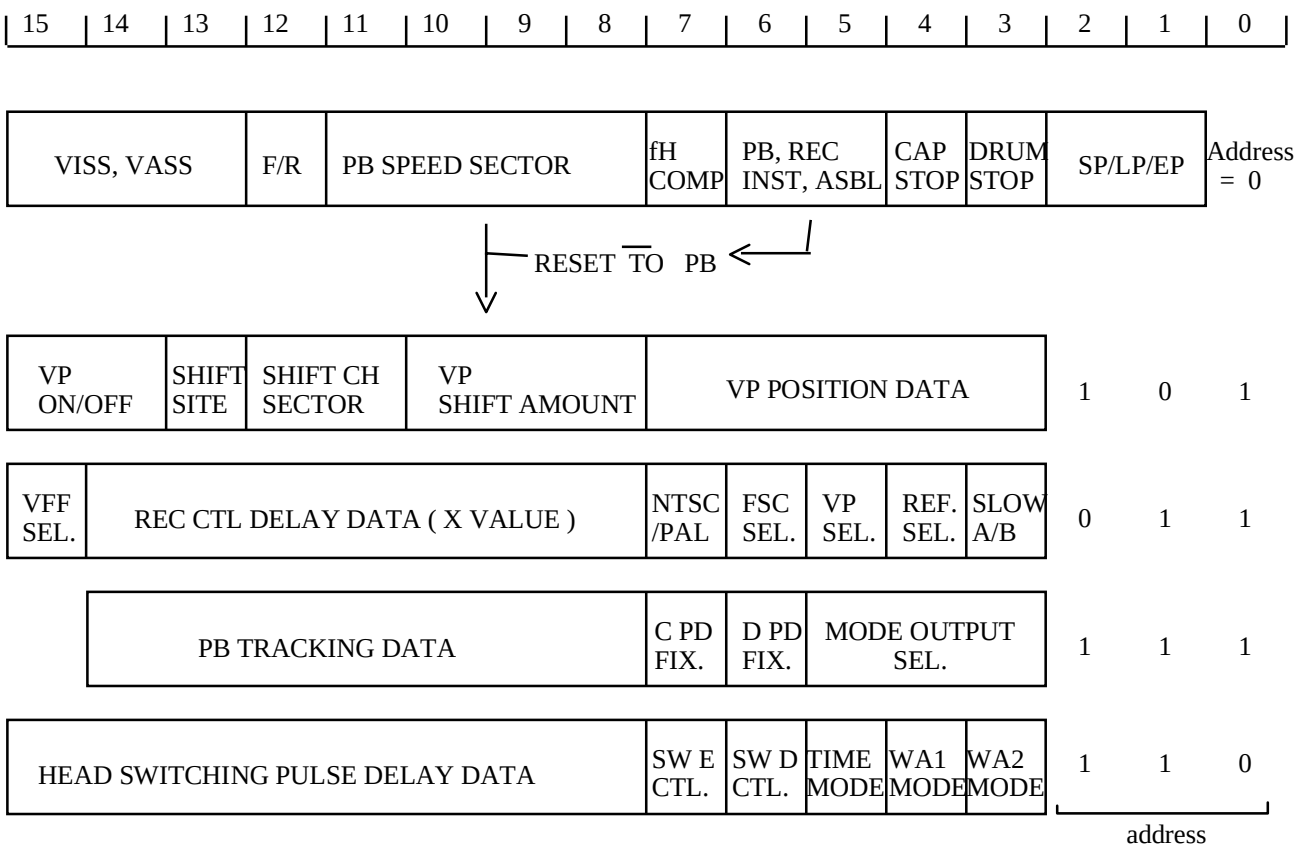
① When Serial data is ?? at serial clock negative adge.
Latch pulse in LSI is then generated and the previous 16-bit data is effective.

② $T_6$ is the time when serial data after data latch and clock are both ?? and absolutely specified at over 500ns.

③ Serial input is pulled-up of about 10㏀. Care should be taken of the time delay of waveform. External pull-up presister is required at higher speed.

*Serial Data Input Register*

BIT




① The Servo IC includes a register for the previous 79-bit serial data
The tail end bits ( Bit 2-0, or only 0 Bit ) are addressed at each register웰 row address and the provious bit becomes input data of register of the address.

② All bits of registers are reset during power on.
On preset mode, all bits except for bits selecting PB in mode are 0.

③ Each register is automatically reset when the registers of PB speed, $f_H$ compensation, $V_H$ control are implemented into all modes but PB.

*10) SERIAL DATA TABLE 1*

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | 0 | 0 | 0 | SP |
| | | | | | | | | | | | | | 0 | 1 | 0 | LP(9H MODE) |
| | | | | | | | | | | | | | 1 | 0 | 0 | EP(12H MODE) |
| | | | | | | | | | | | | 0 | | | 0 | DRUM STOP & CAP P/D FIX |
| | | | | | | | | | | | | 1 | | | 0 | DRUM ON |
| | | | | | | | | | | | 0 | | | | 0 | CAPSTN STOP |
| | | | | | | | | | | | 1 | | | | 0 | CAPSTN ON |
| | | | | | | | | | 0 | 0 | | | | | 0 | REC |
| | | | | | | | | | 0 | 1 | | | | | 0 | ASBL |
| | | | | | | | | | 1 | 0 | | | | | 0 | INST |
| | | | | | | | | | 1 | 1 | | | | | 0 | PB |
| | | | | | | | | 0 | 1 | 1 | | | | | 0 | NOR |
| | | | | | | | | 1 | 1 | 1 | | | | | 0 | fH conpensation on |
| 0 | 0 | 0 | | | | | | | | | | | | | 0 | DUTY DET. MODE |
| 0 | 0 | 1 | | | | | | | | | | | | | 0 | DUTY DET. MODE<br>VISS REC FF RESET |
| 0 | 1 | 0 | | | | | | | | | | | | | 0 | VISS MODE |
| 0 | 1 | 1 | | | | | | | | | | | | | 0 | VISS MODE,VISS REC FF RESET |
| 1 | 0 | 0 | | | | | | | | | | | | | 0 | VISS MODE,VISS DET FF RESET |
| 1 | 0 | 1 | | | | | | | | | | | | | 0 | VISS MODE,VISS DET FF RESET<br>VISS REC FF RESET |
| 1 | 1 | 0 | | | | | | | | | | | | | 0 | VISS MODE, VISS WRITE |
| 1 | 1 | 1 | | | | | | | | | | | | | 0 | WRITE MODE,VISS REC FF RESET |

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | NTSC | | | PAL | |
| | | | | | | | | | | | | | | | | SP | LP (9H) | EP (12H) | SP | LP |
| | | | | 0 | 0 | 0 | 0 | | 1 | 1 | | | | | 0 | X1 | X1 | X1 | X1 | X1 |
| | | | | 0 | 0 | 0 | 1 | | 1 | 1 | | | | | 0 | 2 | 2 | 2 | 2 | 2 |
| | | | | 0 | 0 | 1 | 0 | | 1 | 1 | | | | | 0 | 3 | 3 | 3 | 3 | 3 |
| | | | | 0 | 0 | 1 | 1 | | 1 | 1 | | | | | 0 | 4 | 4 | 4 | 4 | 4 |
| | | | | 0 | 1 | 0 | 0 | | 1 | 1 | | | | | 0 | 5 | 5 | 7 | 5 | 5 |
| | | | | 0 | 1 | 0 | 1 | | 1 | 1 | | | | | 0 | 7 | 7 | 9 | 7 | 7 |
| | | | | 0 | 1 | 1 | 0 | | 1 | 1 | | | | | 0 | 9 | 9 | 27 | 9 | 9 |
| | | | | 0 | 1 | 1 | 1 | | 1 | 1 | | | | | 0 | 18 | 40 | 10 | 18 | 40 |
| | | | | 1 | 0 | 0 | 0 | | 1 | 1 | | | | | 0 | 11 | 22 | 33 | 11 | 22 |
| | | | | 1 | 0 | 0 | 1 | | 1 | 1 | | | | | 0 | 21 | 24 | 35 | 21 | 24 |
| | | | | 1 | 0 | 1 | 0 | | 1 | 1 | | | | | 0 | 13 | 26 | 39 | 13 | 26 |
| | | | | 1 | 0 | 1 | 1 | | 1 | 1 | | | | | 0 | 19 | 32 | 13 | 19 | 32 |
| | | | | 1 | 1 | 0 | 0 | | 1 | 1 | | | | | 0 | 15 | 15 | 15 | 15 | 15 |
| | | | | 1 | 1 | 0 | 1 | | 1 | 1 | | | | | 0 | 17 | 28 | 21 | 17 | 28 |
| | | | | 1 | 1 | 1 | 0 | | 1 | 1 | | | | | 0 | SLOW① CAP P/D FIX | | | | |
| | | | | 1 | 1 | 1 | 1 | | 1 | 1 | | | | | 0 | SLOW② CAP P/D FIX, DRUM P/D FIX | | | | |
| | | 0 | | | | | | | | | | | | | 0 | FWD | | | | |
| | | 1 | | | | | | | | | | | | | 0 | REV | | | | |

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | 0 | 0 | 1 | 1 | 0 | WIDE ASPECT NORMAL MODE |
| | | | | | | | | | | | 0 | 1 | 1 | 1 | 0 | WIDE ASPECT NORMAL MODE |
| | | | | | | | | | | | 1 | 0 | 1 | 1 | 0 | WIDE ASPECT 1 ON MODE |
| | | | | | | | | | | | 1 | 1 | 1 | 1 | 0 | WIDE ASPECT 2 ON MODE |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | 0 | | | 1 | 1 | 0 | 9H, 12H MODE OFF |
| | | | | | | | | | | 1 | | | 1 | 1 | 0 | 9H, 12H MODE ON |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | 0 | | | | 1 | 1 | 0 | SW D OFF |
| | | | | | | | | | 1 | | | | 1 | 1 | 0 | SW D ON |
| | | | | | | | | 0 | | | | | 1 | 1 | 0 | SW E OFF |
| | | | | | | | | 1 | | | | | 1 | 1 | 0 | SW E ON |
| MSB | | | | | | LSB | | | | | | | | | | |
| * | * | * | * | * | * | * | * | | | | | | 1 | 1 | 0 | HEAD SW PULSE DELAY DATA |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MSB | | | | | | LSB | | | | | | | | | | | | | |
| | * | * | * | * | * | * | * | | | | | | 1 | 1 | 1 | PB. TRACKING DATA | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | ( Mode output CTL ) | | | | |
| | | | | | | | | | | | | | | | | A | B | C | D | E |
| | | | | | | | | | | | | 0 | 1 | 1 | 1 | | | | CFG C/D | CTL C/D |
| | | | | | | | | | | | | 1 | 1 | 1 | 1 | | | | CFG | CFG30 (REC) |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | A | B | C | F | |
| | | | | | | | | | | 0 | 0 | | 1 | 1 | 1 | SP | SP | LP | 6.5H DET | |
| | | | | | | | | | | 0 | 1 | | 1 | 1 | 1 | SP | EP | LP | CTL missing | |
| | | | | | | | | | | 1 | 0 | | 1 | 1 | 1 | CTL DELAY COUNTER | H-OSC | NOISE DET. | V SYNC (SYNC. separated) | |
| | | | | | | | | | | 1 | 1 | | 1 | 1 | 1 | CAP PD Rf. | DRUM FG | DRUM PG | missing CTL signal DET | |
| | | | | | | | | 0 | | | | | 1 | 1 | 1 | C. PD output normal operation<br>P.CTL schmitt 3 value selection | | | | |
| | | | | | | | | 1 | | | | | 1 | 1 | 1 | FIXED C.PD OUTPUT<br>P. CTL schmitt width = ±1000mV | | | | |
| | | | | | | | | | 0 | | | | 1 | 1 | 1 | D.PD output: Normal | | | | |
| | | | | | | | | | 1 | | | | 1 | 1 | 1 | Fixed D.PD output | | | | |
| | | | | | | | | | | | | | | | | | | | | |

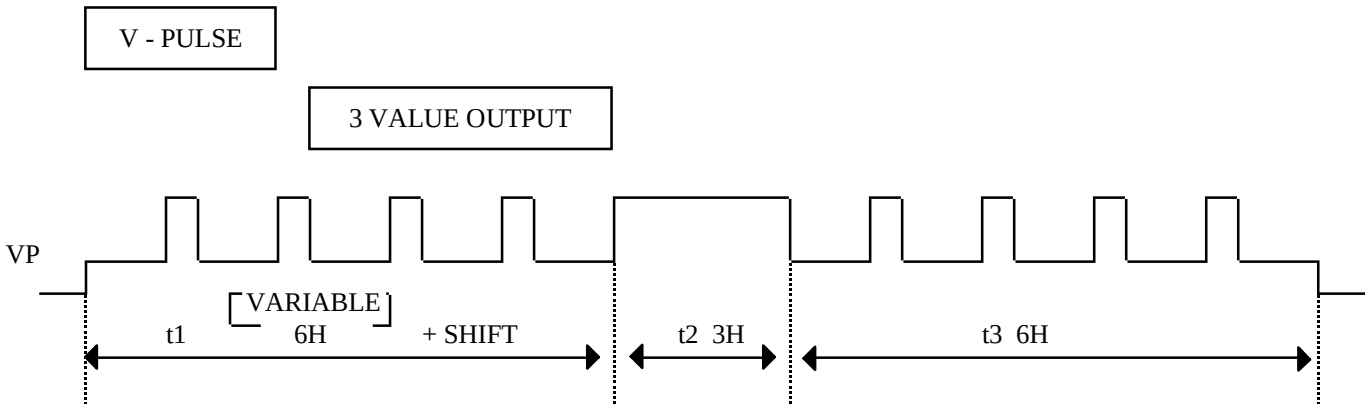
*11) SERIAL DATA TABLE 2*

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | MSB | | | | LSB | | | | | | |
| | | | | | | | | * | * | * | * | * | 1 | 0 | 1 | VP POSITION DATA | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | 0 | 0 | 0 | | | | | | 1 | 0 | 1 | VP SHIFT 0.0H | | |
| | | | | | 0 | 0 | 1 | | | | | | 1 | 0 | 1 | VP SHIFT 0.5H | | |
| | | | | | 0 | 1 | 0 | | | | | | 1 | 0 | 1 | VP SHIFT 1.0H | | |
| | | | | | 0 | 1 | 1 | | | | | | 1 | 0 | 1 | VP SHIFT 1.5H | | |
| | | | | | 1 | 0 | 0 | | | | | | 1 | 0 | 1 | VP SHIFT 2.0H | | |
| | | | | | 1 | 0 | 1 | | | | | | 1 | 0 | 1 | VP SHIFT 2.5H | | |
| | | | | | | | | | | | | | | | | | CH -1 | CH -2 |
| | | | 0 | 0 | | | | | | | | | 1 | 0 | 1 | VP SHIFT SEL | FIX.ED | FIX.ED |
| | | | 0 | 1 | | | | | | | | | 1 | 0 | 1 | VP SHIFT SEL | FIX.ED | SHIFT |
| | | | 1 | 0 | | | | | | | | | 1 | 0 | 1 | VP SHIFT SEL | SHIFT | FIX.ED |
| | | | 1 | 1 | | | | | | | | | 1 | 0 | 1 | VP SHIFT SEL | SHIFT | SHIFT |
| | | | | | | | | | | | | | | | | | | |
| | | 0 | | | | | | | | | | | 1 | 0 | 1 | VP SHIFT Direction (+) | | |
| | | 1 | | | | | | | | | | | 1 | 0 | 1 | VP SHIFT Direction (-) | | |
| | | | | | | | | | | | | | | | | | | |
| 0 | 0 | | | | | | | | | | | | 1 | 0 | 1 | VP OFF ( L LEVEL OUTPUT) | | |
| 0 | 1 | | | | | | | | | | | | 1 | 0 | 1 | VP 3 VALUE (M LEVEL OUTPUT) | | |
| 1 | 0 | | | | | | | | | | | | 1 | 0 | 1 | VP ON ( 3 VALUE OUTPUT) | | |
| 1 | 1 | | | | | | | | | | | | 1 | 0 | 1 | VP MONITOR CUT(H LEVEL OUT.) | | |
| | | | | | | | | | | | | | | | | | | |

*12) SERIAL DATA TABLE 3*

| 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MSB | | | | | LSB | | | | | | | | | | | | |
| | * | * | * | * | * | * | * | | | | | | 0 | 1 | 1 | REC CTL DELAY DATA (X VALUE COMPENSATION) | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | 0 | | 0 | 1 | 1 | REF SEL NOR | | |
| | | | | | | | | | | | 1 | | 0 | 1 | 1 | REF SEL FILD DET | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | 0 | | | 0 | 1 | 1 | VP SEL NOR | | |
| | | | | | | | | | | 1 | | | 0 | 1 | 1 | VP SEL + 6H | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | 0 | | | | 0 | 1 | 1 | CLOCK SEL(fsc1:ON, fsc2:OFF) | | |
| | | | | | | | | | 1 | | | | 0 | 1 | 1 | CLOCK SEL(fsc1:OFF,fsc2:ON) | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | 0 | 0 | 1 | 1 | SLOW A | | |
| | | | | | | | | | | | | 1 | 0 | 1 | 1 | SLOW B | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | 0 | | | | | 0 | 1 | 1 | PAL | | |
| | | | | | | | | 1 | | | | | 0 | 1 | 1 | NTSC | | |
| | | | | | | | | | | | | | | | | | CH1 | CH2 |
| 0 | | | | | | | | | | | | | 0 | 1 | 1 | VFF | SHIFT | SHIFT |
| 1 | | | | | | | | | | | | | 0 | 1 | 1 | VFF | FIXED | SHIFT |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | 0 | 0 | 0 | 1 | TEST MODE | | |

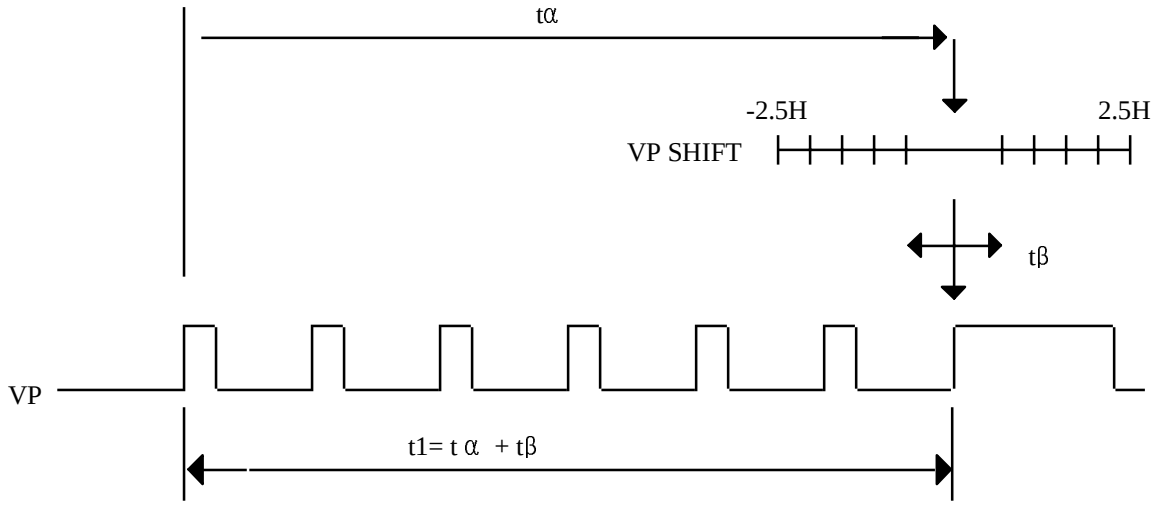
*13) V - PULSE*




V.Head Switching Pulse
Edge

- The output is through PB * VP ON
- Refer to ?t1 variation? 멿HIFT
- When t3 is specified as Vp+6H, it is output and when not fixed, t3 will be 밚

V.H.SW EDGE
VP Value



| tα | VP Value |
|---|---|

At Slow & X2 Mode, the above channel is variable.
At the other mode, CH1 & CH2 are simultaneously fixed.

| MODE | | CH - 1 | CH - 2 |
|---|---|---|---|
| 2 HEAD | | FIXED | SHIFT |
| DA - 4 | SP | FIXED | SHIFT |
| | SP | SHIFT | FIXED |

Shift Quantity ( By serial data 5 bit = N )

| | | |
|---|---|---|
| NTSC | 64 ( 41.5-N ) / fsc | about 3.0H ~ 11.7H |
| PAL | 64 ( 43.75-N ) / fsc | about 2.9H ~ 9.9H |

Fix Quanty = About 6.0H

| tβ | VP SHIFT |
|---|---|

By serial data, the quantity of VP shift, shift channel and shift direction is varied as follows :

VP Shift Quantity

| BIT | 13 | 12 | 11 | 10 | 9 | 8 | | 3 | 2 | 1 | Shift Quantity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | - | - | - | 0 | 0 | 0 | | 1 | 0 | 1 | 0.0 H |
| | | | | 0 | 0 | 1 | | | | | 0.5 H |
| | | | | 0 | 1 | 0 | | | | | 1.0 H |
| | | | | 0 | 1 | 1 | | | | | 1.5 H |
| | | | | 1 | 0 | 0 | | | | | 2.0 H |
| | | | | 1 | 0 | 1 | | | | | 2.5 H |

VP Shift Channel & Shift Direction ( ?+ ? is delayed direction )

| BIT | 13 | 12 | 11 | 10 | 9 | 8 | | 3 | 2 | 1 | CH -1 | CH -2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0<br>1 | 0 | 0 | - | | | | | | | FIXED | FIXED |
| | 0 | 0 | 1 | - | | | | | | | FIXED | + SHIFT |
| | 1 | 0 | 1 | - | | | | 1 | 0 | 1 | FIXED | - SHIFT |
| | 0 | 1 | 0 | - | | | | | | | + SHIFT | FIXED |
| | 1 | 1 | 0 | - | | | | | | | - SHIFT | FIXED |
| | 0 | 1 | 1 | - | | | | | | | - SHIFT | + SHIFT |
| | 1 | 1 | 1 | - | | | | | | | + SHIFT | - SHIFT |

14 - 1) VISS / VASS / ASB MARK.

| SERIAL | | | MODE | REC | ASB | PB / INST |
|---|---|---|---|---|---|---|
| 15 | 14 | 13 | | | | |
| 1 | 1 | 1 | VASS | ASB MARK RECORD | ASB MARK DETECT | VASS DATA WRITE |
| 0 | 0 | 0 | | According to Duty<br>I/O input | | VASS DATA 1BIT DET.<br>OUTPUT TO DUTY I/O |
| 0 | 0 | 1 | | VASS record | | |
| 0 | 1 | 0 | VISS | NO ACTION | VISS CODE DETECT | VISS CODE DETECT |
| 0 | 1 | 1 | | According to Duty | Latch VISS code output | |
| 1 | 0 | 0 | | I/O input | Distinguish between F/F and VISS code | |
| 1 | 0 | 1 | | VASS record | F/F reset | |
| 1 | 1 | 0 | | VISS CODE WRITE (AUTO) | VISS CODE REWRITE ( AUTO ) | |

14 - 2) VISS / VASS / ASB MARK RECORD.

| Wide Aspect | OPERATION | DUTY I/O | CTL DUTY(%) | Remark |
|---|---|---|---|---|
| NORMAL | ASB MARK RECORD | H ( IN ) | 62.5 | - |
| | | L ( IN ) | 70.0 | ASB MARK |
| | VASS DATA RECORD | H ( IN ) | 62.5 | - |
| | | L ( IN ) | 30.0 | - |
| | VISS CODE RECORD | H ( OUT ) | 62.5 | VISS CODE AUTO RECORD |
| | | L ( OUT) | 30.0 | |
| WIDE ASPECT 1 | ASB MARK RECORD | H ( IN ) | 57.5, 62.5 | LLSS PATTERN RECORD |
| | | L ( IN ) | 70.0 | ASB MARK |
| | VASS DATA RECORD | H ( IN ) | 57.5, 62.5 | LLSS PATTERN RECORD |
| | | L ( IN ) | 25.0, 30.0 | |
| | VISS CODE RECORD | H ( OUT ) | 57.5, 62.5 | VISS CODE AUTO RECORD<br>LLSS PATTERN RECORD |
| | | L ( OUT) | 25.0, 30.0 | |

* Wide aspect 2 mode operation is same as that of wide aspect 1 mode, but the record pattern is ?LLLS?

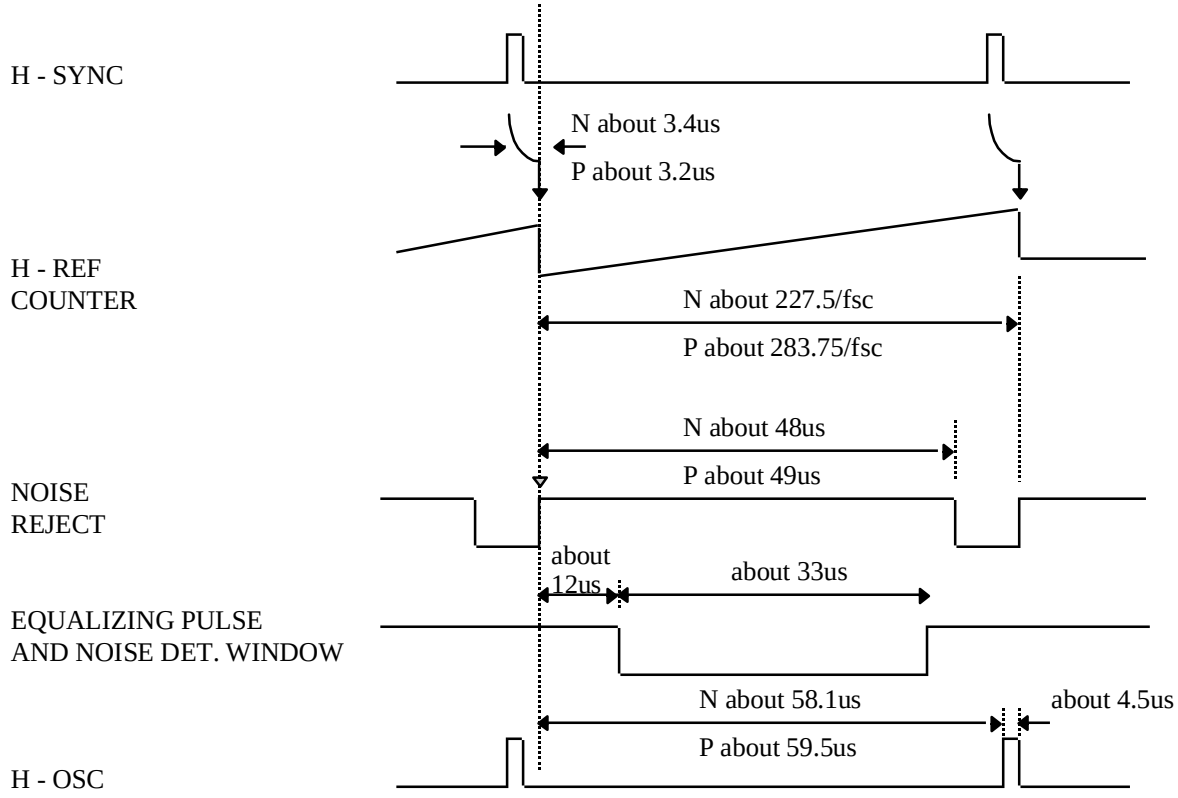
14-3) VISS/VASS/ASB MARK DETECT OPERATION

- Whenever the CTL signal of duty 66.7% over is inputted, the ASB mark is detected and 밟?level is outputted to the DUTY I/O.
- Whenever the CTL signal of duty 40.0% below is inputted, the 밢ISS DATA 1?is detected and 밟?level is outputted to the DUTY I/O.
- Whenever the CTL signal of duty 40.0% below is inputted consecutively as much as over 32, 밟?level is outputted to the DUTY I/O.
- Otherwise 믹?level is outputted to the DUTY I/O.
- 밟?means 30.0% and 62.5% duty pulses, 밪?means 25.0% and 57.5% duty pulses.

15) The usage of C.SYNC

Internal REF synchronizing at PB, SYNC is seperated and synchronized by V.SYNC at REC, ASB and INST mode.

*16) H - OSC*




. H - OSC is output in quasi-V - PULSE and able to output through mode B output.

. Even if external H - OSC is stable, there is the jitter of about fsc 1 clock.

*17) NOISE DET. & FIELD DET.*

| REF SEL Mode | NOR PB | $f_H$ Compensation on PB | REC ASBL INST |
|---|---|---|---|
| NOR | - Noise DET.<br>- H - Sync DET. | - Noise DET.<br>- H - Sync DET. | - Noise DET.<br>- V - Sync DET. |
| FIELD DET. | - Field DET. | - Noise DET.<br>- H - Sync DET. | - Field DET. |

In the modes except the field Det. of the previous table, it detects noise in the composite Sync. The detecting method is as follows :

① Noise Detection

It detects more amount of noise than specified between H sync.

② H - Sync Detection

It detects more jitter of H-sync than specified.

③ V - Sync Detection

It detects whether there is V-sync jitter or not.

If the noise detector is operated ( that is, if noise is detected ), the operations are as follows :

① High is output through mode C output

② It make the Sync reset from V-sync to REF 30 out of function.

③ It adjusts fH compensation error in fH compensation mode.

18) Operation of SW A ~ K ( Refer to Block Diagram )

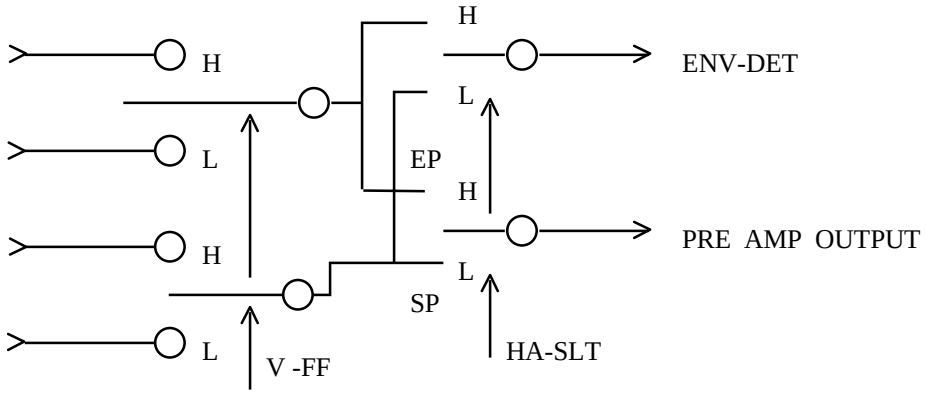
| SW | Description |
|---|---|
| A<br>B<br>C | At CTLP Amp operation: A = OFF, B = ON, C = ON<br>At CTLP recording: A = ON, B = OFF, C = OFF |
| D | ON/ OFF is controlled by S-DATA |
| E | ON/ OFF is controlled by S-DATA. But, auto ON at slow |
| F<br>G<br>H | Capstan loop gain selection mode SW ( Refer to capstan gain selection ) |
| I | After the fH compensation mode off, it lasts on-stage about 70 ~ 100ms.<br>After the power on reset, on time has 40 ~ 120mS.<br>(But, a 0.047㎌ capacitor should be connected between pin 39 and GND) |
| J | At fH compention Mode = ON |
| K<br>L | At Drum PD ADJ = ON. ON/ OFF is controlled by S-DATA |
| M | After the power on reset, on time has 40 ~ 120mS.<br>(But, a 0.047㎌ capacitor should be connected between pin 39 and GND) |

### *19) 4-Head Selection Logic*

| MODE | | | SUB - HL | HA - SLT | C - ROT | REMARK |
|---|---|---|---|---|---|---|
| DA 4HD | SP | X1 | 0 | 0 | V - FF | |
| | | X2, SLOW | 0 | $\overline{\text{V- FF}}$ | 1 | |
| | | SEARCH | 0 | ENV - DET | ENV - DET ⊕ V - FF | FSC2 selection |
| | | SEARCH | 0 | 0 | V - FF | FSC1 selection |
| | | - | 1 | ENV - DET | ENV - DET ⊕ V - FF | |
| | EP LP | X1 | 0 | 1 | $\overline{\text{V - FF}}$ | |
| | | X2, SLOW | 0 | V - FF | 0 | |
| | | SEARCH | 0 | 1 | $\overline{\text{V - FF}}$ | |
| | | SLOW | 1 | 1 | $\overline{\text{V - FF}}$ | |
| | | OUTSIDE OF SLOW | 1 | 1 | $\overline{\text{V - FF}}$ | NTSC |
| | | OUTSIDE OF SLOW | 1 | ENV - DET | ENV-DET ⊕ V-FF | PAL |
| 2HD | | | 0 | 1 | V - FF | |
| | | | 1 | 1 | $\overline{\text{V - FF}}$ | |

* Slow means that operate FORWARD SLOW

※ PRE AMP BLOCK OF KA8334B 4HD SELECTION LOGIC

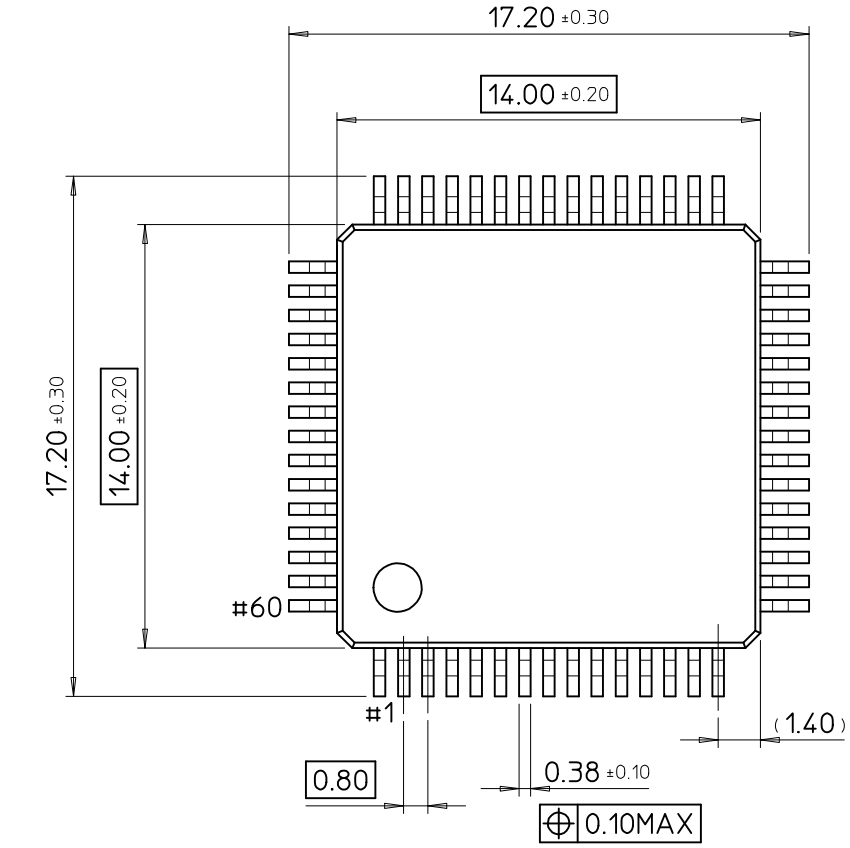


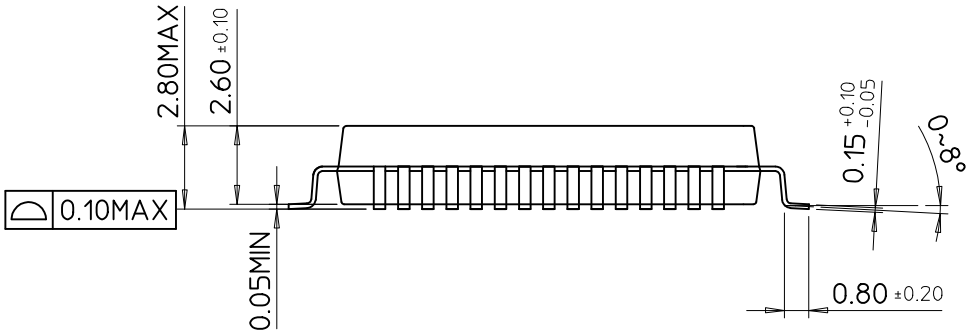
CAP CENTER FREQUENCY OF 9H, 12H MODE

| SERIAL BIT | FORWARD NTSC | | REVERSE NTSC | |
|---|---|---|---|---|
| 11 10 9 8 | 9H MODE | 12H MODE | 9H MODE | 12H MODE |
| 0 0 0 0 | 0.240 | 0.180 | 0.240 | 0.180 |
| 0 0 0 1 | 0.480 | 0.360 | 0.480 | 0.360 |
| 0 0 1 0 | 0.720 | 0.540 | 0.720 | 0.540 |
| 0 0 1 1 | 0.960 | 0.720 | 0.960 | 0.720 |
| 0 1 0 0 | 1.200 | 1.260 | 1.200 | 1.260 |
| 0 1 0 1 | 1.680 | 1.620 | 1.680 | 1.620 |
| 0 1 1 0 | 2.160 | 5.012 | 2.160 | 4.656 |
| 0 1 1 1 | 5.040 | 1.856 | 5.040 | 1.725 |
| 1 0 0 0 | 5.280 | 6.371 | 5.280 | 5.493 |
| 1 0 0 1 | 5.760 | 6.758 | 5.760 | 5.826 |
| 1 0 1 0 | 6.240 | 7.530 | 6.240 | 6.492 |
| 1 0 1 1 | 3.120 | 2.413 | 3.120 | 2.242 |
| 1 1 0 0 | 3.600 | 2.785 | 3.600 | 2.587 |
| 1 1 0 1 | 4.080 | 3.898 | 4.080 | 3.621 |
| 1 1 1 0 | SLOW | | | |
| 1 1 1 1 | REFER TO CAPSTAN SPEED CONSTANT | | | |
| CAPSTAN PD ADJ | About 7.2% ~ 8.4% of the above frequency | | | |

# 60-QFP-1414A

Dimensions in Milimeters

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