SONY

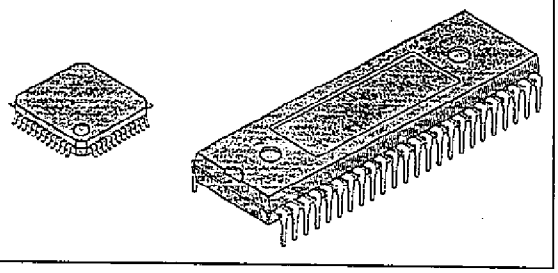
# CXA1182Q-Z/S

## Servo Signal Processor for CD Player

**For the availability of this product, please contact the sales office.**

CXA1182Q-Z
48 pin QFP (Plastic)

CXA1182S
48 pin SDIP (Plastic)



### Description

CXA1182 is a bipolar IC designed for the servo control of compact disc players.

### Features

- Single power supply, 5V
  Dual power supply, ±5V
- Low power consumption
  ±5V: 165mW (Typ.), 5V: 100mW (Typ.)
- Servo functions same as the CX20108 (focus, tracking, and sled servo)
- Built-in LPF for spindle servo
- Built-in loop filter and VCO for EFM clock reproduction PLL
- Few external parts
- Built-in circuit to prevent sled runaway
- Built-in circuit for disc defects
- Built-in anti-shock circuit
- High-speed access through linear motor
- Microcomputer serial data bus common with CX23035 or CXD1135Q types
- Upword compatible with CX20108 for microcomputer software
- Peaks of focus search, track jump, and sled kick pulse can be set through external resistors.

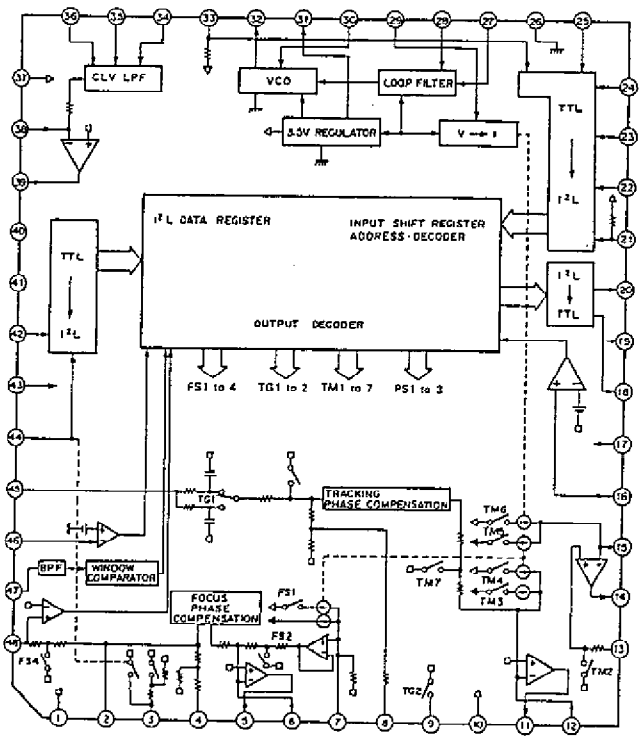
### Functions

- Focus servo control
- Tracking servo control
- Sled servo control
- Spindle servo
  LPF, drive amplifier
- EFM clock reproduction PLL
  Loop filter, 8.64 MHz VCO

### Structure

Bipolar silicon monolithic IC

### Block Diagram



## Absolute Maximum Ratings (Ta = 25°C)

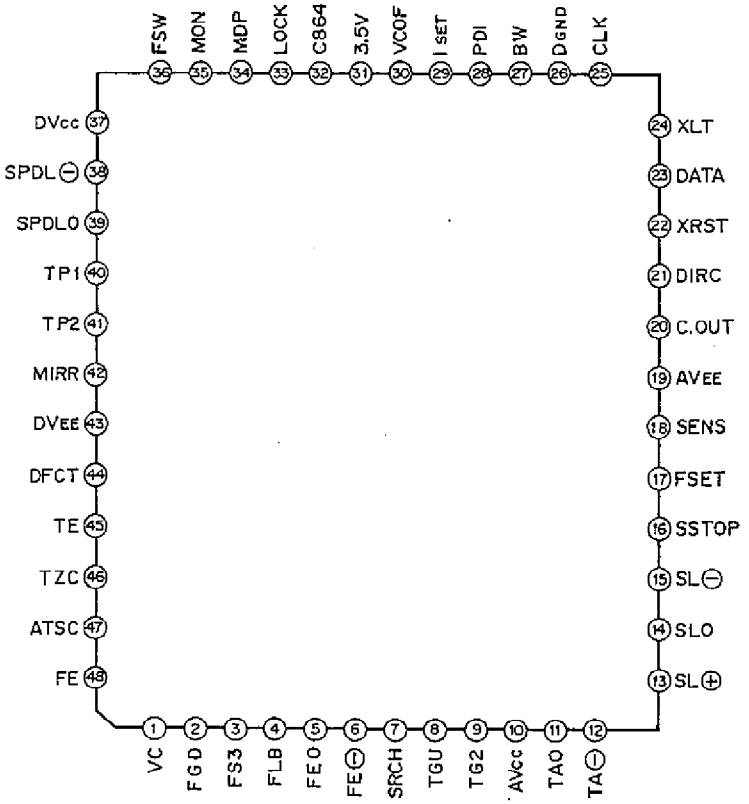
| | | | |
|---|---|---|---|
| • Supply voltage | VCC — VEE | 12 | V |
| • Operating temperature | Topr | −20 to +75 | °C |
| • Storage temperature | Tstg | −55 to +150 | °C |
| • Allowable power dissipation | PD CXA1182Q | 833 | mW |
| | CXA1182S | 1330 | mW |

## Recommended Operating Conditions

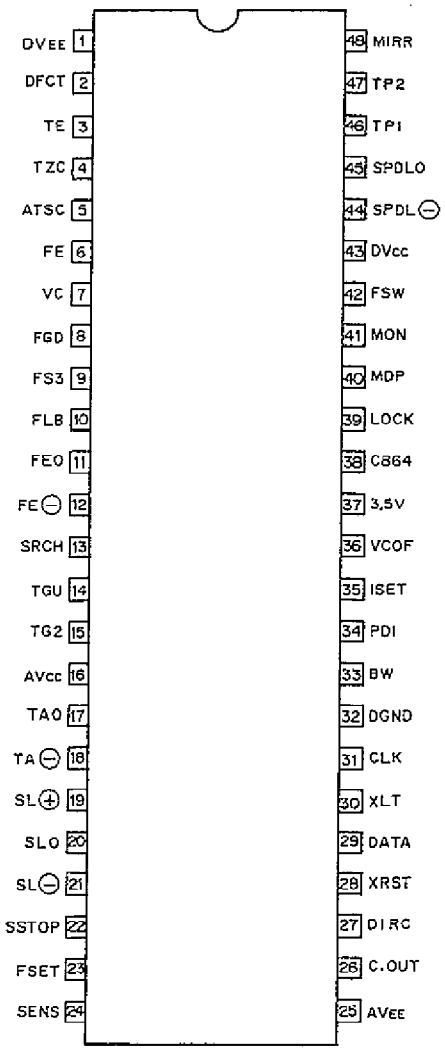
| | | | |
|---|---|---|---|
| • Supply voltage | VCC — VEE | 4 to 11 | V |
| | VCC — DGND | 4 to 5.5 | V |

## Pin Description

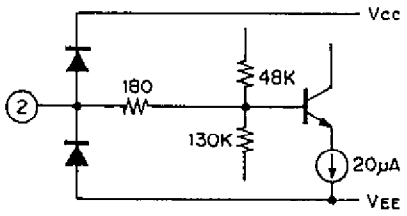
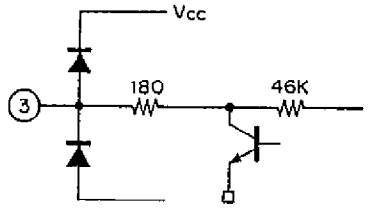
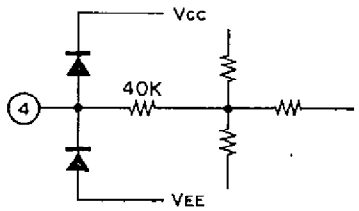
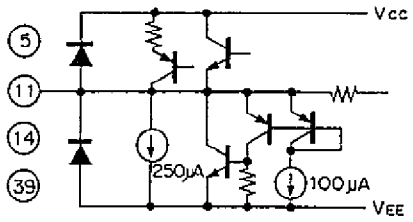
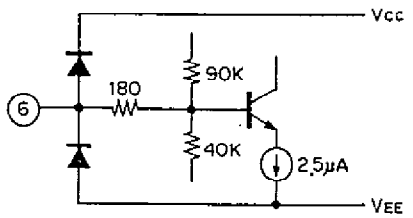
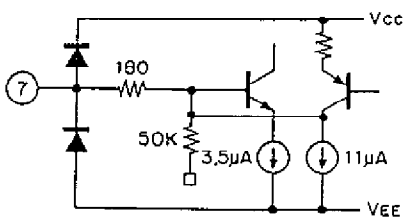
CXA1182Q-Z

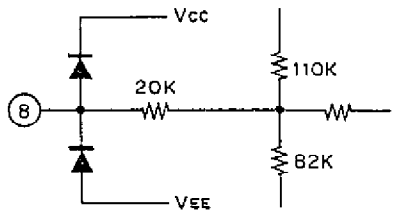
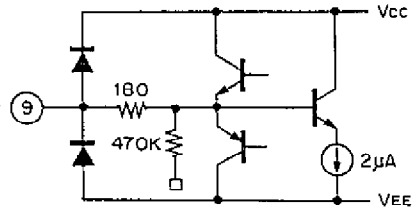
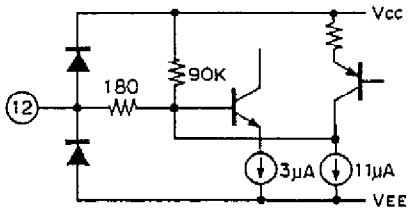
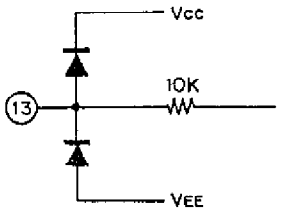
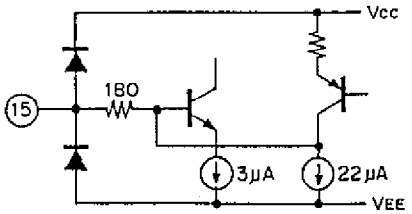
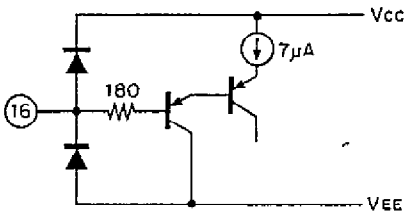


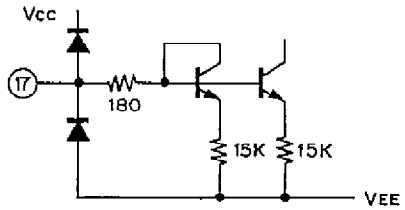
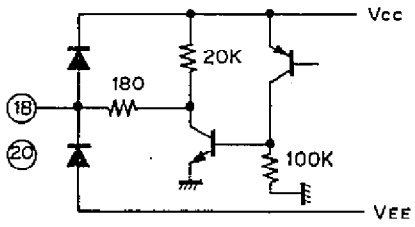
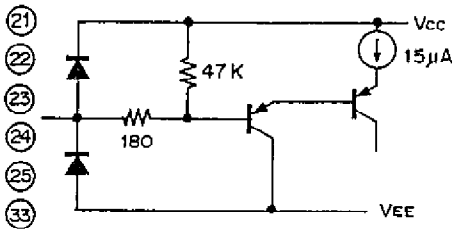
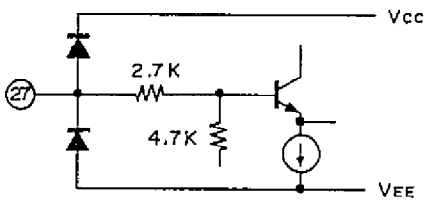
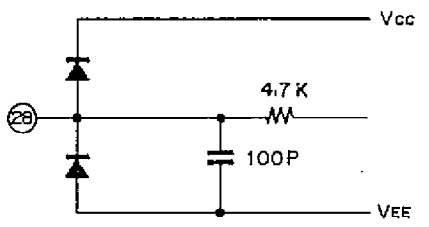
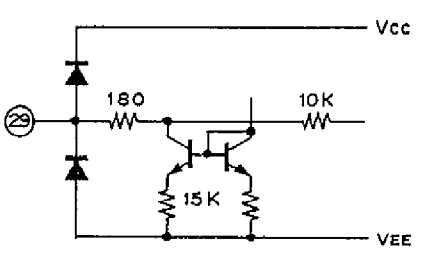

CXA1182S

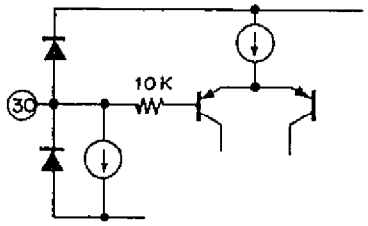
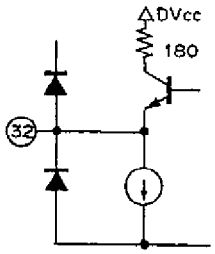
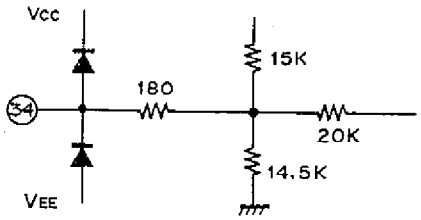
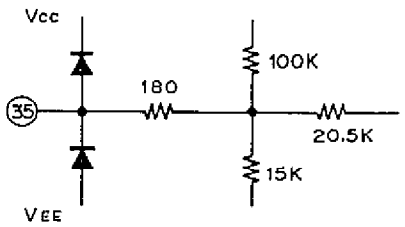
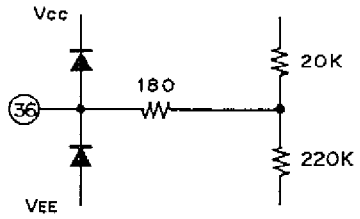
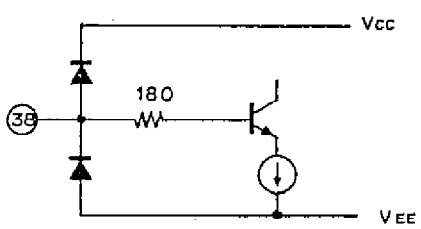


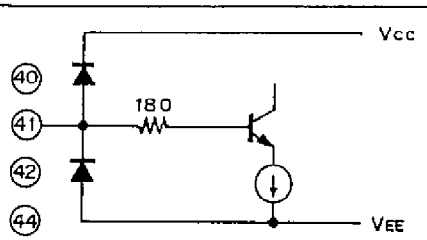
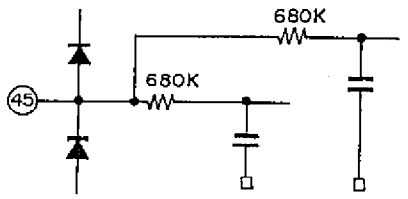
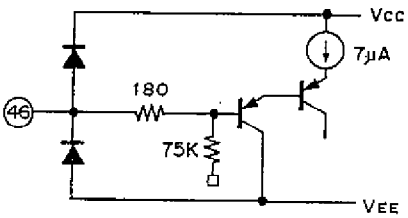
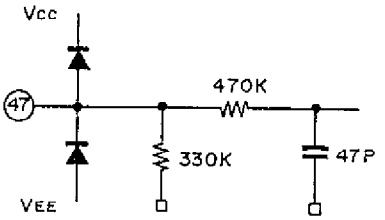
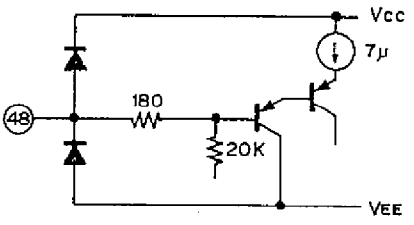
Numbers in ( ) show CXA1182S

| No. Q-Z | No. S | Symbol | Equivalent Circuit | Description |
|---|---|---|---|---|
| 2 | 8 | FGD |  | Connect a capacitor between this pin and pin 3 (9) to reduce the high-frequency gain. |
| 3 | 9 | FS3 |  | The high-frequency gain of the focus servo can be changed by switching FS3 ON or OFF. |
| 4 | 10 | FLB |  | External time constant setting pin to raise the low bandwidth of the focus servo. |
| 5 | 11 | FEO |  | Focus drive output |
| 11 | 19 | TAO | | Tracking drive output |
| 14 | 20 | SLO | | Sled drive output |
| 39 | 45 | SPDLO | | Spindle drive output |
| 6 | 12 | FE — |  | Inverse input pin for the focus amplifier. |
| 7 | 13 | SRCH |  | External time constant setting pin to generate focus search waveforms. |

| No. Q-Z | No. S | Symbol | Equivalent Circuit | Description |
|---|---|---|---|---|
| 8 | 14 | TGU |  | External time constant setting pin to switch the tracking high-frequency gain. |
| 9 | 15 | TG2 |  | External time constant setting pin to change the tracking high-frequency gain. |
| 12 | 18 | TA − |  | Inverse input pin for the tracking amplifier. |
| 13 | 19 | SL + |  | Non-inverse input pin for the sled amplifier. |
| 15 | 21 | SL − |  | Inverse input pin for the sled amplifier. |
| 16 | 22 | SSTOP |  | Signal pin for detecting for the ON/OFF limit switch of the innermost part of the disc. |

| No. Q-Z | No. S | Symbol | Equivalent Circuit | Description |
|---|---|---|---|---|
| 17 | 23 | FSET |  | Setting pin for the peak frequency of the focus and/or the tracking phase compensation and the f0 of CLV LPF. |
| 18 | 24 | SENS |  | Pin to output FZC, AS, TZC, and SSTOP by command from CPU. |
| 20 | 26 | C. OUT | | Signal output for track number count |
| 21 | 27 | DIRC |  | Pin for one-track jump<br>Contains a 47 kΩ pull-up resistor. |
| 22 | 28 | XRST | | Reset input pin, reset at "L" |
| 23 | 29 | DATA | | Serial data input from CPU |
| 24 | 30 | XLT | | Latch input from CPU |
| 25 | 31 | CLK | | Serial data transfer clock input from CPU |
| 33 | 39 | LOCK | | Pin for the operation of the sled runaway prevention circuit at "L"<br>Contains a 47 kΩ pull-up resistor. |
| 27 | 33 | BW |  | External time constant setting pin for the loop filter. |
| 28 | 34 | PDI |  | Input pin for the CX23035/CXD1135 phase comparator output PDO. |
| 29 | 35 | ISET |  | Input current to determine the peaks of focus search, track jump, and sled kick. |

| No. Q-Z | No. S | Symbol | Equivalent Circuit | Description |
|---|---|---|---|---|
| 30 | 36 | VCOF |  | The free-running frequency of VCO is almost proportional to the resistance value between this pin and pin 31 (37). |
| 32 | 38 | C864 |  | VCO output pin of 8.64 MHz. |
| 34 | 40 | MDP |  | Connecting pin to the CX23035/CXD1135 MDP pin. |
| 35 | 41 | MON |  | Connecting pin to the CX23035/CXD1135 MON pin. |
| 36 | 42 | FSW |  | LPF time constant setting external pin for the CLV servo error signal. |
| 38 | 44 | SPDL — |  | Inverse input pin for the spindle drive amplifier. |

| No. Q-Z | No. S | Symbol | Equivalent Circuit | Description |
|---|---|---|---|---|
| 40 | 46 | TP1 |  | Pins 40 and 41 are equivalent to CXA1082's WDCK and FOK. However with CXA1182, they do not function. Here, set either DVEE and DGND to open or use WDCK and FOK. |
| 41 | 47 | TP2 | | |
| 42 | 48 | MIRR | | Mirror signal input pin |
| 44 | 2 | DFCT | | Defect signal input pin. The defect counter-measure circuit operates at "H". |
| 45 | 3 | TE |  | Input pin for tracking error signals. |
| 46 | 4 | TZC |  | Input pin for the zero-cross tracking comparator. |
| 47 | 5 | ATSC |  | Input pin of the window comparator for ATSC detection. |
| 48 | 6 | FE |  | Input pin for focus error signals. |

## Electrical Characteristics

$T_a = 25℃$ $AV_{CC}$, $DV_{CC} = 2.5V$ $AV_{EE}$, $DV_{EE} = -2.5V$ DGND $= -2.5V$

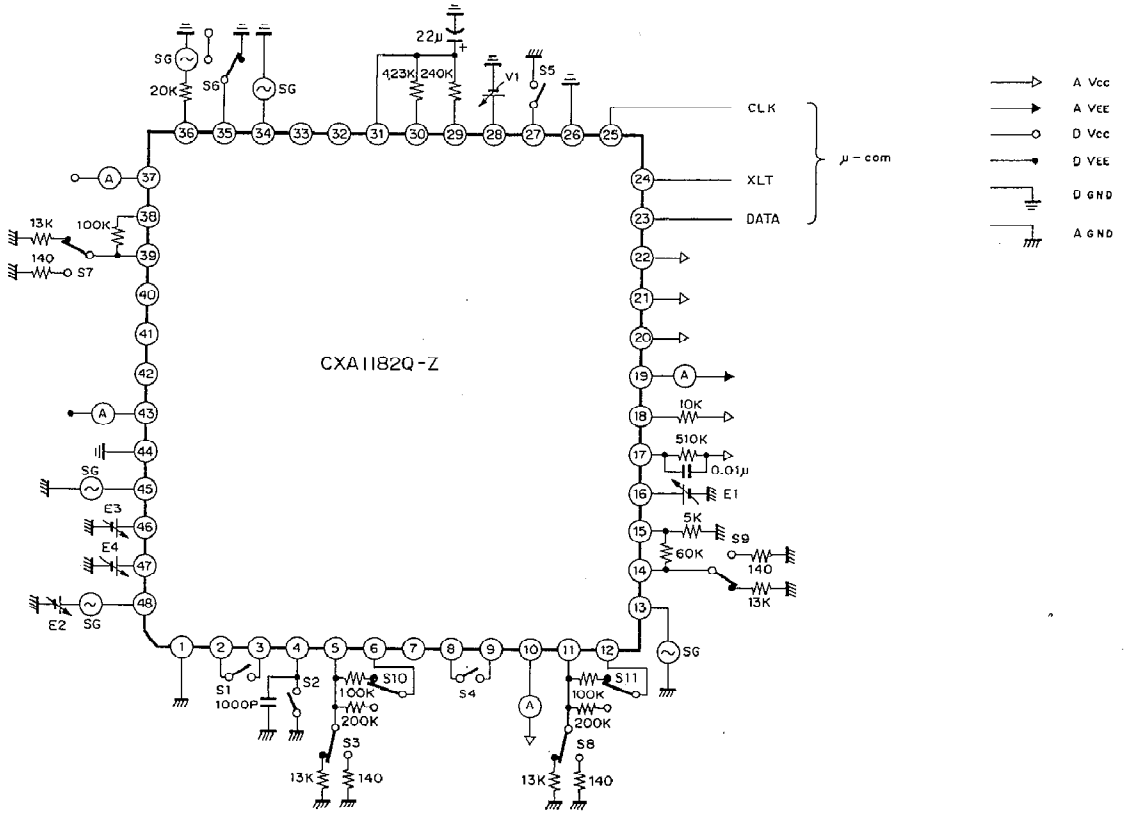
| Test No. | Test items | | Symbol | SW conditions | | | | | | | | | | | * SD | Bias conditions | | | | Input point | Test point | Description of output waveform and test method | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | | E1 | E2 | E3 | E4 | | | | | | | |
| 1 | Supply current 1 | | AICC | | | | | | | | | | | | 00 | 0 | 0 | 0 | 0 | | 10 | Measure after resetting | 2.8 | 5.5 | 8.2 | mA |
| 2 | Supply current 2 | | DICC | | | | | | | | | | | | | | | | | | 37 | | 10.8 | 15.0 | 19.2 | mA |
| 3 | Supply current 3 | | A. DIEE | | | | | | | | | | | | | | | | | | 19<br>43 | | 9.8 | 13.0 | 16.2 | mA |
| 4 | Supply current 4 | | IDGND | | | | | | | | | | | | | | | | | | 26 | | 4.8 | 7.5 | 10.2 | mA |
| 5 | Focus servo | DC voltage gain | GFEO | | | | | | | | | | | | 08 | | | | | 48 | 5 | SG = 10 Hz, 200mVp-p | 18.0 | 21.0 | 24.0 | dB |
| 6 | | Feedthrough | VFEOF | O | O | | | | | | | | | | | | | | | | | SG=10kHz, 40mVp-p, Gain difference between 08 and 00 of SD | | | -35 | dB |
| 7 | | Max. output voltage 1 | VFEO1 | | | | | | | | | | O | | 08 | | | | | | | SG = 0.5VDC | 1.98 | | | V |
| 8 | | Max. output voltage 2 | VFEO2 | | | | | | | | | | O | | 08 | | | | | | | SG = −0.5VDC | | | -1.98 | V |
| 9 | | Max. output voltage 3 | VFEO3 | | | O | | | | | | | O | | 08 | | | | | | | SG = 0.5VDC | 1.18 | | | V |
| 10 | | Max. output voltage 4 | VFEO4 | | | O | | | | | | | O | | 08 | | | | | | | SG = −0.5VDC | | | -1.18 | V |
| 11 | | Search output voltage 1 | VSRCH1 | | | | | | | | | | | | 02 | | | | | | | | -0.64 | -0.55 | -0.36 | V |
| 12 | | Search output voltage 2 | VSRCH2 | | | | | | | | | | | | 03 | | | | | | | | 0.36 | 0.55 | 0.64 | V |
| 13 | Tracking servo | DC voltage gain | GTEO | | | | O | | | | | | | | 25 | | | | | 45 | 11 | SG = 10 Hz, 500mVp-p | 11.6 | 14.6 | 17.6 | dB |
| 14 | | Feedthrough | VTEOF | | | | O | | | | | | | | 13 | | | | | | | SG=10kHz, 100mVp-p, Gain difference between 25 and 20 of SD | | | -39 | dB |
| 15 | | Max. output voltage 1 | VTEP1 | | | | | | | | | | | O | 25 | | | | | | | SG = −1.5VDC | 1.98 | | | V |
| 16 | | Max. output voltage 2 | VTEP2 | | | | | | | | | | | O | 25 | | | | | | | SG = 1.5VDC | | | -1.98 | V |
| 17 | | Max. output voltage 3 | VTEP3 | | | | | | | | O | | | O | 25 | | | | | | | SG = −1.5VDC | 1.18 | | | V |
| 18 | | Max. output voltage 4 | VTEP4 | | | | | | | | O | | | O | 25 | | | | | | | SG = 1.5VDC | | | -1.18 | V |
| 19 | | Jump output voltage 1 | VJUMP1 | | | | | | | | | | | | 2C | | | | | | | | -0.64 | -0.55 | -0.36 | V |
| 20 | | Jump output voltage 2 | VJUMP2 | | | | | | | | | | | | 28 | | | | | | | | 0.36 | 0.55 | 0.64 | V |
| 21 | Sled servo | DC voltage gain | GSLO | | | | | | | | | | | | 25 | | | | | 13 | 14 | SG = 10 Hz<br>Openloop gain | 50 | 56 | 62 | dB |
| 22 | | Max. output voltage 1 | VSLP1 | | | | | | | | | | | | 25 | | | | | | | SG = 0.4VDC | 1.98 | | | V |
| 23 | | Max. output voltage 2 | VSLP2 | | | | | | | | | | | | 25 | | | | | | | SG = −0.4VDC | | | -1.98 | V |
| 24 | | Max. output voltage 3 | VSLP3 | | | | | | | | | O | | | 25 | | | | | | | SG = 0.4VDC | 1.18 | | | V |

*Serial data (hex)

| Test No. | Test items | | Symbol | SW conditions | | | | | | | | | | | * SD | Bias conditions | | | | Input point | Test point | Description of output waveform and test method | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | | E1 | E2 | E3 | E4 | | | | | | | |
| 25 | Sled servo | Max. output voltage 4 | VSLP4 | | | | | | | | | O | | | 25 | 0 | 0 | 0 | 0 | 13 | 14 | SG = −0.4VDC | | | −1.18 | V |
| 26 | | Feed through | VSLOF | | | | | | | | | | | | | | | | | | | SG = 10kHz, 200mVp-p, Gain difference between 25 and 20 of SD | | | −34 | dB |
| 27 | | Kick output voltage 1 | VKICK1 | | | | | | | | | | | | 22 | | | | | | | | −0.75 | −0.6 | −0.45 | V |
| 28 | | Kick output voltage 2 | VKICK2 | | | | | | | | | | | | 23 | | | | | | | | 0.45 | 0.6 | 0.75 | V |
| 29 | Spindle servo | Spindle servo gain | GSPO | | | | | | O | | | | | | | | | | | 34 | 39 | SG = 10Hz, 200mVp-p | 14 | 16.5 | 19 | dB |
| 30 | | Max. output voltage 1 | VSPP1 | | | | | | O | | | | | | | | | | | | | SG = 1.0VDC | 1.78 | | | V |
| 31 | | Max. output voltage 2 | VSPP2 | | | | | | O | | | | | | | | | | | | | SG = −1.0VDC | | | −1.78 | V |
| 32 | | Max. output voltage 3 | VSPP3 | | | | | | O | O | | | | | | | | | | | | SG = 1.0VDC | 1.13 | | | V |
| 33 | | Max. output voltage 4 | VSPP4 | | | | | | O | O | | | | | | | | | | | | SG = −1.0VDC | | | −1.13 | V |
| 34 | PLL | PLL Reg. output voltage | Vreg | | | | | | | | | | | | | | | | | | 31 | DC voltage | 3.3 | 3.5 | 3.85 | V |
| 35 | | Self-running frequency | FVCO | | | | | | | | | | | | | | 0 | | | | 32 | V1 = 0mV | 7.4 | 8.6 | 9.7 | MHz |
| 36 | | Frequency deviation 1 | ΔF1 | | | | | | | | | | | | | | | | | | | Frequency deviation from FVCO, V1 = 148mV | 7 | 11 | 15 | % |
| 37 | | Frequency deviation 2 | ΔF2 | | | | | | | | | | | | | | | | | | | V1 = −148mV | −15 | −11 | −7 | % |
| 38 | SENS low level | | VSENS | | | | | | | | | | | | | | | | | | 18 | | | | −1.98 | V |
| 39 | COUT low level | | VCOUT | | | | | | | | | | | | | | | | | | 20 | | | | −1.98 | V |
| 40 | FZC threshold value | | VTZC | | | | | | | | | | | | 00 | | * | | | 48 | 18 | | 39 | 50 | 61 | mV |
| 41 | ATSC threshold value | | VATSC1 | | | | | | | | | | | | 10 | | 0 | | * | 47 | | * Value of E when SENS becomes High (≈1.1V) by E1 to E4 varying | −45 | −26 | −7 | mV |
| 42 | ATSC threshold value | | VATSC2 | | | | | | | | | | | | 10 | | | | * | 47 | | | 7 | 26 | 45 | mV |
| 43 | TZC threshold value | | VTZC | | | | | | | | | | | | 20 | | | * | 0 | 46 | | SG = 0V | −20 | 0 | 20 | mV |
| 44 | SSTOP threshold value | | VSSTOP | | | | | | | | | | | | 30 | * | | 0 | | 16 | | | −65 | −50 | −35 | mV |

## Electrical Characteristics Test Circuit

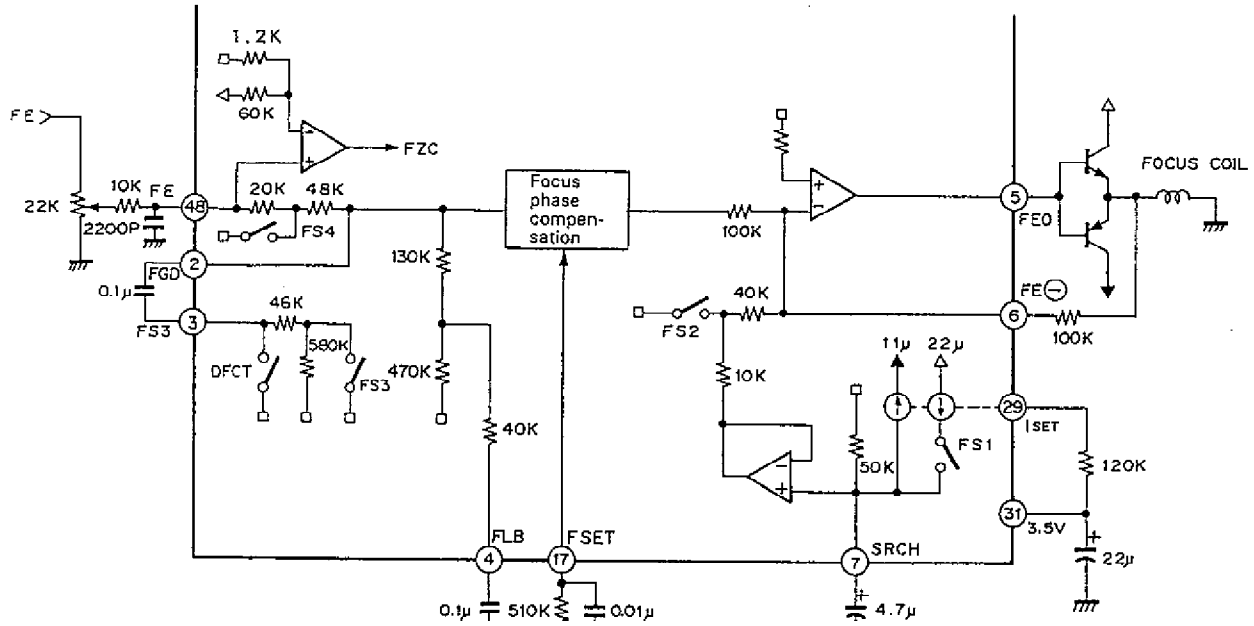
(See the Pin Configuration for CXA1182S)



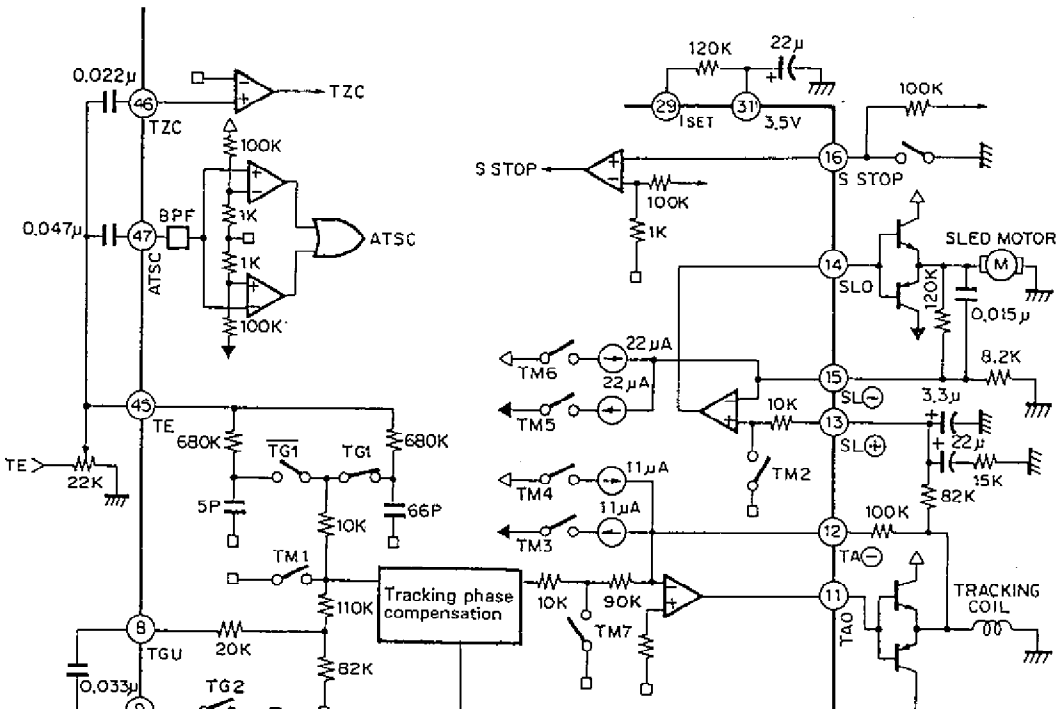
## Description of Functions

### Focus servo system

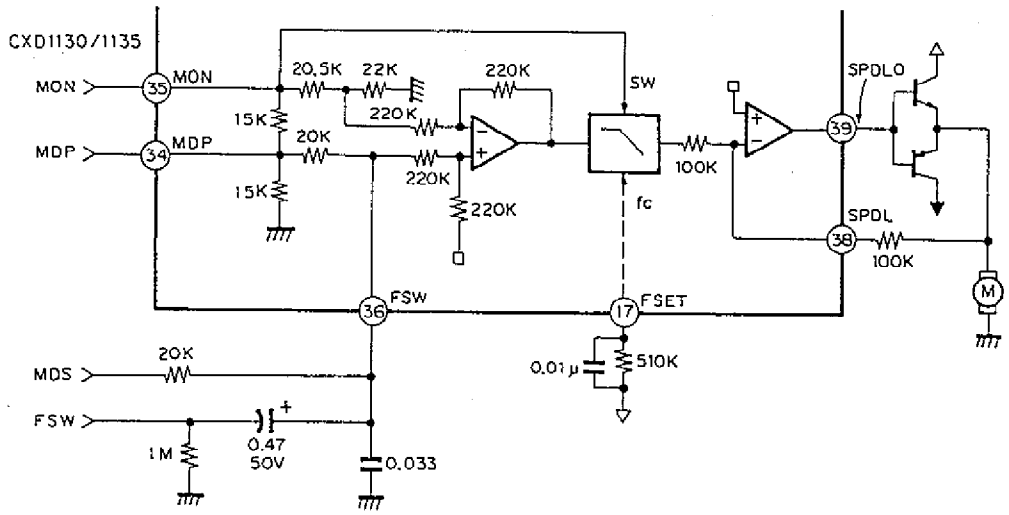
(See the Pin Configuration for CXA1182S)



## Tracking sled servo system



**Spindle servo and LPF**




The 200 Hz LPF is formed with 0.033 µF and 20 kΩ connected to pin 36. The secondary LPF is formed with the built-in LPF (fc up to 200 Hz with 510 kΩ for pin 17), and the carrier component of the CLV servo error signals MDS and MDP is eliminated.

In the CLV-S mode, FSW becomes L and pin 36 LPF fc lowers, strengthening the filter further. By connecting the pin 17 resistor to Vcc, even if stability is not achieved, fc does not vary with power supply voltage fluctuations.

**Note)** Use the phase compensation instead of MDS when CX23035 is used.

**Commands**

The input data that activates this IC consists of 8 bits. It shall be represented as $XX in two hexadecimal digits. (X Denotes 0 to F). Commands for the CXA1082AQ are classified into 4 types — $0X to 3X.

1. $0X [SENSE Pin 18 is "FZC"]

This command is related to the focus servo control.

The bit configuration is as follows:

| D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | FS4 | FS3 | FS2 | FS1 |

The four switches FS1 to FS4 are related to focusing, and correspond to D0 to D3.

$00 At FS1 = 0, Pin 7 is charged to (22μA − 11μA) × 50 kΩ = 0.55 V).
If FS2 = 0, this voltage is not output and the output of Pin 5 remains 0 V.

$02 From the above state, FS2 only becomes 1 and a negative output is output to Pin 5. This voltage level is stipulated as follows:

$$(22\ \mu A - 11\ \mu A) \times 50\ k\Omega \times \frac{\text{Resistance value between Pin 5 and Pin 6}}{50\ k\Omega} \quad \cdots\cdots (1)$$

$03 From the above state, FS1 becomes 1 and the current supply of +22 μA is separated. Then, the CR charge/discharge circuit is formed and Pin 7 voltage decreases as time passes, as shown in Fig. 1.

1) Description of FS4

This switch placed between focus error input 48 and the focus phase compensation, serves to switch on and off the focus servo.

| $00 | → | $08 |
|---|---|---|
| Focus off | ← | Focus on |

2) Focusing procedure

Assume the polarity is as follows:

a) The searching lens moves away or toward the disc.
b) At the same time, the output voltage of Pin 5 varies from negative to positive.
c) Further on, the focus S-curve changes as follows:

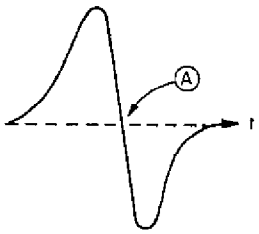



**Fig. 3 S-curve**

The focus servo is activated at the operating point Ⓐ shown in Fig. 3. Generally, focus servo is switched on for focus searching while passing that Ⓐ point. Moreover, a logical product (AND) is used with the Focus-OK signal to prevent malfunction.

Note here that $08 should be commanded in the shortest time after FZC changes from H to L. For this purpose, the (b) sequence required for software is better than (a).

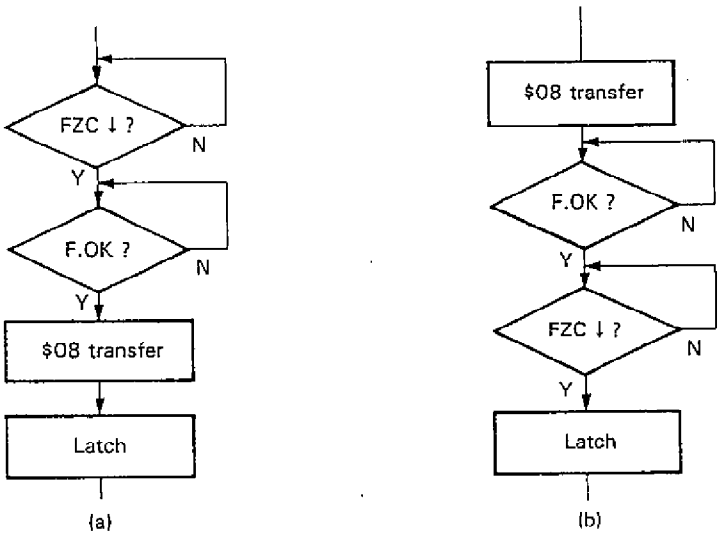



**Fig. 5 Bad Sequence and Good Sequence**

3) Sense Pin (Pin 18)

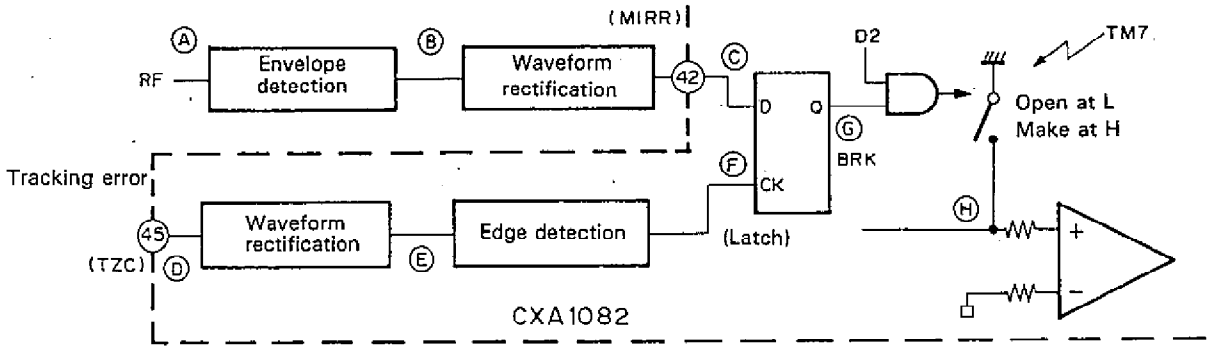
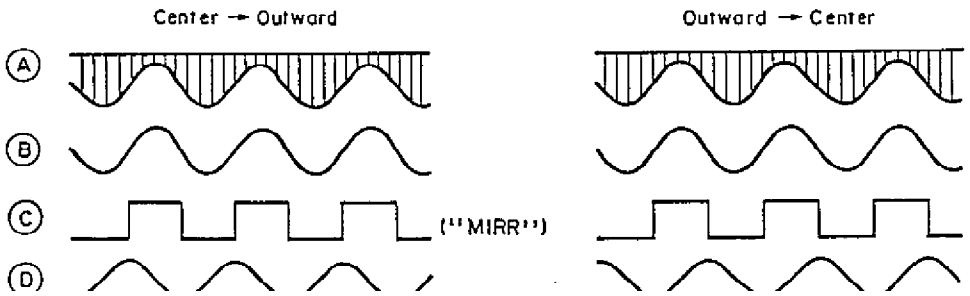



**Fig. 6 TM7 Movement (Break Circuit)**



DIRC Pin 21 and 1 Track Jump

Generally, for a 1-track jump, an acceleration pulse is added, then a deceleration pulse is given for a specified time from the moment the tracking error passes the 0 point after that, the tracking servo is switched on again. For the 100-track jump to be explained in the next item, as long as the number of tracks is about 100 there is no problem. But for the 1-track jump it must be exactly one. This is why the above complicated procedure is required. For the 1-track jump of a CD player, both the acceleration and deceleration take about 300 to 400 µs. When software is used to execute this operation, the flow chart will be as shown in Fig. 9. Practically however, it takes time to transfer data.

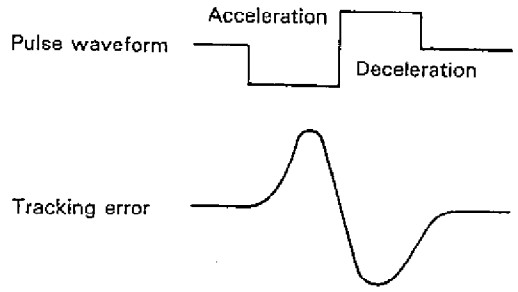



**Fig. 8 Pulse Waveform and Tracking Error of 1-Track Jump**

4. $3X

This command is used for switching the Focus search and Sled kick peak value.

D0, D1 ..... Sled, NORMAL feed, high-speed feed

D2, D3 ..... Focus search peak switching

| D7 | D6 | D5 | D4 | Focus search peak | | Sled kick peak | | Relative value |
|---|---|---|---|---|---|---|---|---|
| | | | | D3 (PS3) | D2 (PS2) | D1 (PS1) | D0 (PS0) | |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | ± 1 |
| | | | | 0 | 1 | 0 | 1 | ± 2 |
| | | | | 1 | 0 | 1 | 0 | ± 3 |
| | | | | 1 | 1 | 1 | 1 | ± 4 |

## Others

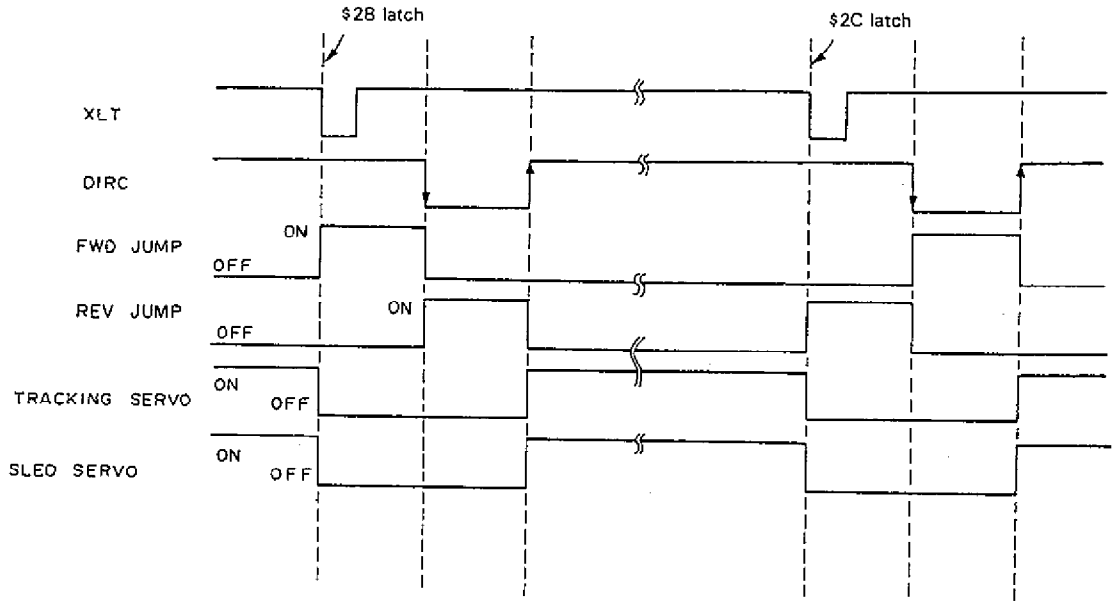
1. Connection of the power supply pin

| | Vcc | Vss | VC |
|---|---|---|---|
| ±5V dual power supply | +5V | −5V | 0V |
| 5V single power supply | +5V | 0V | VC* |

*CXA1081

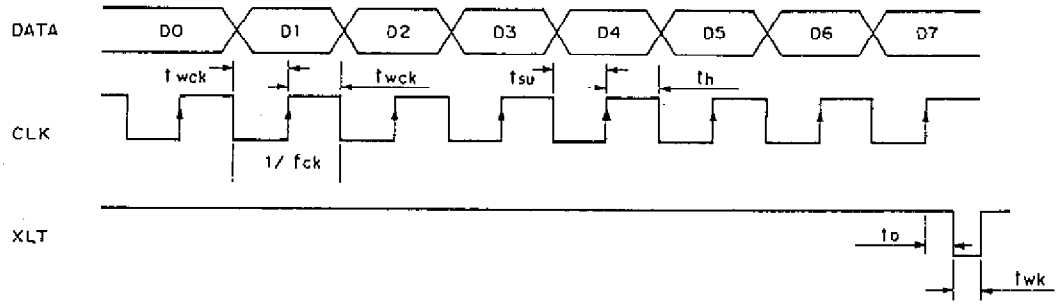
## Parallel Direct Interface

1. DIRC




2. LOCK (Sled runaway prevention circuit)

## CPU Serial Interface Timing Chart




DVcc — DGND = 4.5 to 5.5V

| Item | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Clock frequency | $f_{ck}$ | | | 1 | MHz |
| Clock pulse width | $f_{wck}$ | 500 | | | ns |
| Hold time | $t_{su}$ | 500 | | | ns |
| Setup time | $t_h$ | 500 | | | ns |
| Delay time | $t_D$ | 500 | | | ns |
| Latch pulse width | $t_{WL}$ | 1000 | | | ns |

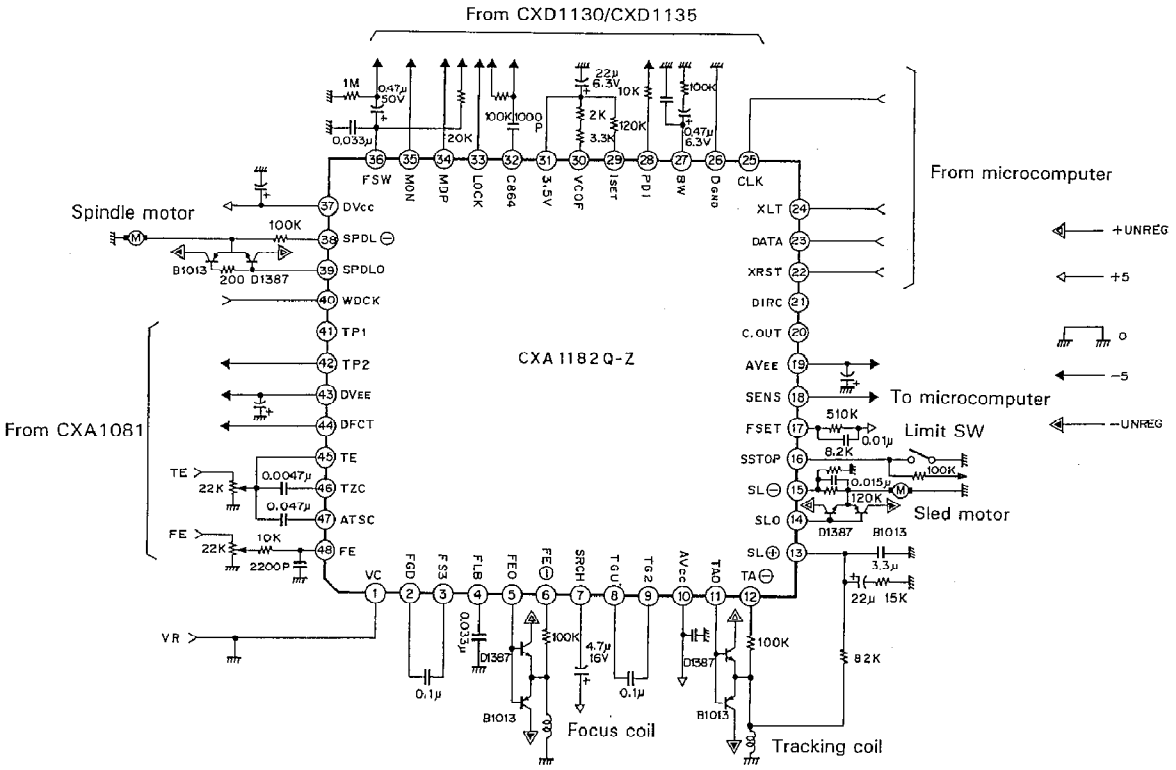
## Serial Data Truth Table

| Serial data | Hexa. | Function |
|---|---|---|
| FOCUS CONTROL | | FS=4321 |
| 0 0 0 0 0 0 0 0 | $00 | 0 0 0 0 |
| 0 0 0 0 0 0 0 1 | $01 | 0 0 0 1 |
| 0 0 0 0 0 0 1 0 | $02 | 0 0 1 0 |
| 0 0 0 0 0 0 1 1 | $03 | 0 0 1 1 |
| 0 0 0 0 0 1 0 0 | $04 | 0 1 0 0 |
| 0 0 0 0 0 1 0 1 | $05 | 0 1 0 1 |
| 0 0 0 0 0 1 1 0 | $06 | 0 1 1 0 |
| 0 0 0 0 0 1 1 1 | $07 | 0 1 1 1 |
| 0 0 0 0 1 0 0 0 | $08 | 1 0 0 0 |
| 0 0 0 0 1 0 0 1 | $09 | 1 0 0 1 |
| 0 0 0 0 1 0 1 0 | $0A | 1 0 1 0 |
| 0 0 0 0 1 0 1 1 | $0B | 1 0 1 1 |
| 0 0 0 0 1 1 0 0 | $0C | 1 1 0 0 |
| 0 0 0 0 1 1 0 1 | $0D | 1 1 0 1 |
| 0 0 0 0 1 1 1 0 | $0E | 1 1 1 0 |
| 0 0 0 0 1 1 1 1 | $0F | 1 1 1 1 |
| TRACKING CONTROL | | AS=0 AS=1 |
| | | TG= 2 1 TG= 2 1 |

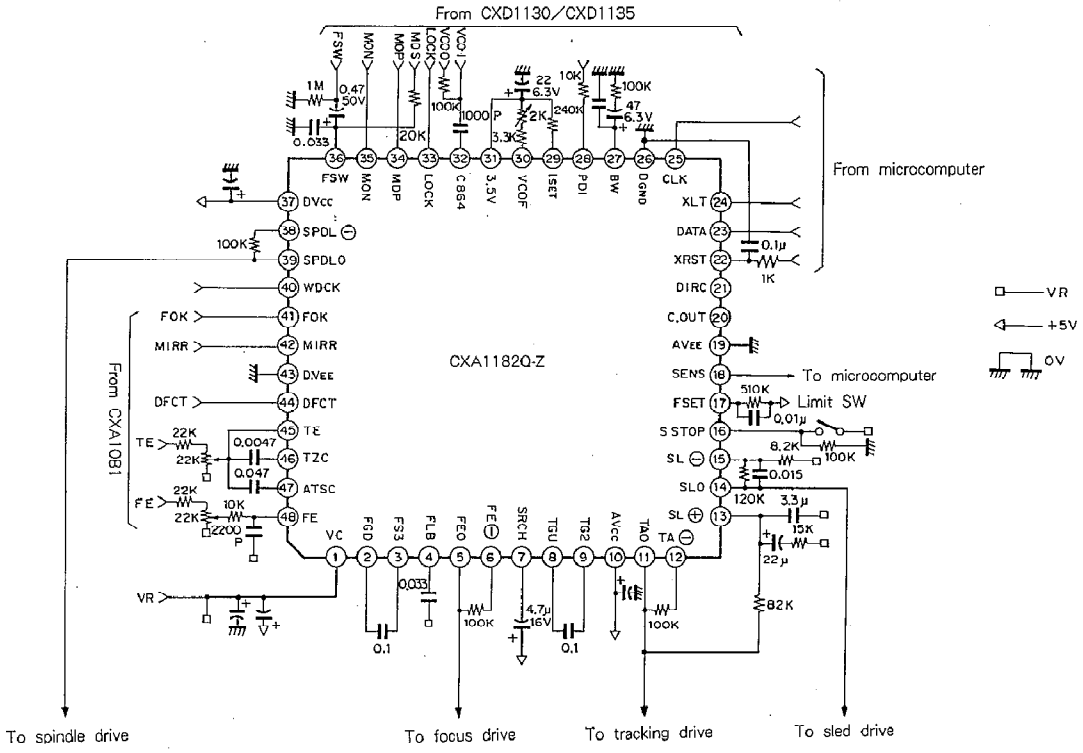
| Serial data | Hexa. | Function | | |
|---|---|---|---|---|
| TRACKING MODE | | DIRC=1<br>TM= 654321 | DIRC=0<br>654321 | DIRC=1<br>654321 |
| 0 0 1 0 0 0 0 0 | $20 | 000000 | 001000 | 000011 |
| 0 0 1 0 0 0 0 1 | $21 | 000010 | 001010 | 000011 |
| 0 0 1 0 0 0 1 0 | $22 | 010000 | 011000 | 100001 |
| 0 0 1 0 0 0 1 1 | $23 | 100000 | 101000 | 100001 |
| 0 0 1 0 0 1 0 0 | $24 | 000001 | 000100 | 000011 |
| 0 0 1 0 0 1 0 1 | $25 | 000011 | 000110 | 000011 |
| 0 0 1 0 0 1 1 0 | $26 | 010001 | 010100 | 100001 |
| 0 0 1 0 0 1 1 1 | $27 | 100001 | 100100 | 100001 |
| 0 0 1 0 1 0 0 0 | $28 | 000100 | 001000 | 000011 |
| 0 0 1 0 1 0 0 1 | $29 | 000110 | 001010 | 000011 |
| 0 0 1 0 1 0 1 0 | $2A | 010100 | 011000 | 100001 |
| 0 0 1 0 1 0 1 1 | $2B | 100100 | 101000 | 100001 |
| 0 0 1 0 1 1 0 0 | $2C | 001000 | 000100 | 000011 |
| 0 0 1 0 1 1 0 1 | $2D | 001010 | 000110 | 000011 |
| 0 0 1 0 1 1 1 0 | $2E | 011000 | 010100 | 100001 |
| 0 0 1 0 1 1 1 1 | $2F | 101000 | 100100 | 100001 |

## Application Circuit

1. ±5 V dual power supply for CXA1182Q (48 pin QFP)
(See the Pin Configuration for CXA1182S)



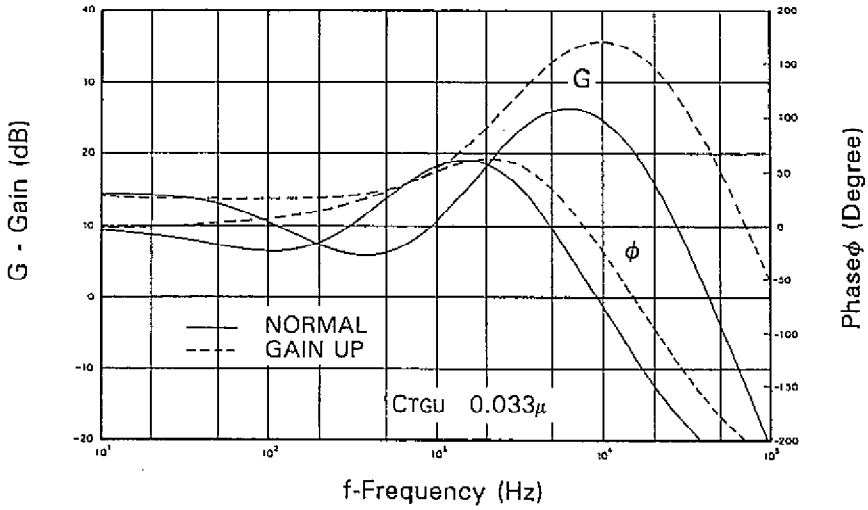
## 2. +5V single power supply for CXA1182Q (See the Pin Configuration CXA1182S)



## Internal Phase Compensation Standard Circuit Design Data

| Mode | Item | Symbol | SW conditions | | | | | | | | | SD | Bias conditions | | | | Input point | Test point | Output waveform and description of test methods | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | | | | | | | | | | | | |
| Focus | 1. 2 kHz gain | | O | O | | | | | | | | 08 | | | | | 48 | 5 | | | 21.5 | | dB |
| | 1. 2 kHz phase | | O | O | | | | | | | | 08 | | | | | ↓ | ↓ | | | 63 | | deg |
| | 1. 2 kHz gain | | O | O | | | | | | | | 0C | | | | | | | | | 16 | | dB |
| | 1. 2 kHz phase | | O | O | | | | | | | | 0C | | | | | | | | | 63 | | deg |
| Tracking | 1. 2 kHz gain | | | | | O | | | | | | 25 | | | | | 45 | 11 | | | 13 | | dB |
| | 1. 2 kHz phase | | | | | O | | | | | | 25 | | | | | ↓ | ↓ | | | -125 | | deg |
| | 2. 7 kHz gain | | | | | O | | | | | | 25 | | | | | | | | | 26.5 | | dB |
| | 2. 7 kHz phase | | | | | O | | | | | | 25 | | | | | | | | | -130 | | deg |
| Spindle | 100 Hz phase | | | | | | | | | | | | | | | | 34 | 39 | | | -30 | | deg |
| | 2 kHz gain | | | | | | | | | | | | | | | | ↓ | ↓ | | | -3.5 | | dB |
| | | | | | | | | | | | | | | | | | | | | | | | |

Tracking frequency characteristics




FOCUS frequency characteristics

## Package Outline

Unit : mm

CXA1182Q-Z

48pin QFP (Plastic) 0.7g