

**SONY****CXB1160Q-Y****Dual Comparator***T-73-53**Preliminary***Description**

The CXB1160Q-Y is an ultra high-speed comparator which features a clocking/pass-through mode switchover function and variable input hysteresis.

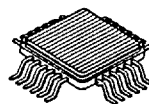
This IC is suitable for applications such as high-speed testers, instrument input level determination, and synchronous detection.

**Features**

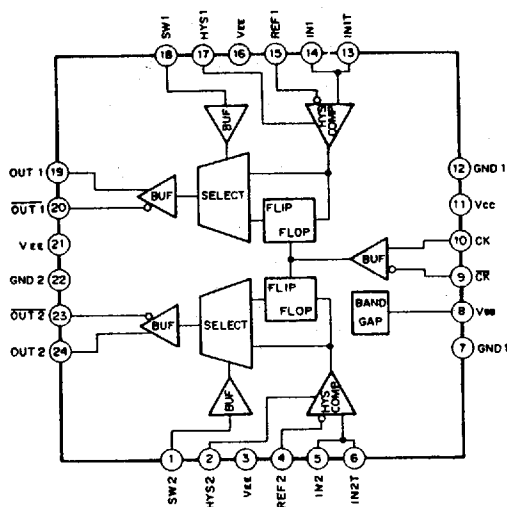
- Switchover between clocking mode and pass-through mode
- Ultra high-speed operation
 

|                                  |                                           |
|----------------------------------|-------------------------------------------|
| Clock input for clocking mode    | $f_{\text{CMAX}}=2.5\text{GHz}$           |
| Data input for pass-through mode | $f_{\text{DMAX}}=1.0\text{GHz}$<br>(-3dB) |
- Input conversion hysteresis 0 to 80mV

24 pin QFP (Metal)

**Structure**

Bipolar silicon monolithic IC

**Block Diagram and Pin Configuration**

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## Pin Description

| Pin No.              | Symbol                       | Description                                                           |
|----------------------|------------------------------|-----------------------------------------------------------------------|
| 14<br>5              | IN1<br>IN2                   | Data inputs                                                           |
| 13<br>6              | IN1T<br>IN2T                 | Data input termination                                                |
| 15<br>4              | REF1<br>REF2                 | Reference inputs                                                      |
| 10<br>9              | CK<br>$\overline{\text{CK}}$ | Clock inputs                                                          |
| 17<br>2              | HYS1<br>HYS2                 | Hysteresis control inputs                                             |
| 18<br>1              | SW1<br>SW2                   | Mode switchover inputs ( L : Clocking mode<br>H : Pass-through mode ) |
| 19<br>20<br>24<br>23 | OUT1<br>OUT1<br>OUT2<br>OUT2 | Data outputs                                                          |
| 11                   | Vcc                          | Positive power supply                                                 |
| 3, 16, 21            | VEE                          | Negative power supplies                                               |
| 7, 12                | GND1                         | Power supply GND                                                      |
| 22                   | GND2                         | Output transistor power GND                                           |
| 8                    | VBB                          | Reference voltage output                                              |

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# Electrical Characteristics

## Absolute Maximum Ratings

| Item                                  | Symbol           | Pins                | Range                   | Unit |
|---------------------------------------|------------------|---------------------|-------------------------|------|
| Power supply                          | V <sub>CC</sub>  | 11                  | -0.3 to +7.0            | V    |
|                                       | V <sub>EE</sub>  | 3, 16, 21           | -7.0 to +0.3            |      |
| Data input voltage                    | V <sub>ID</sub>  | 4, 5, 6, 13, 14, 15 | -3.0 to +2.5            |      |
| Hysteresis control input voltage      | V <sub>HIS</sub> | 2, 17               | V <sub>EE</sub> to +0.3 |      |
| ECL input voltage                     | V <sub>I</sub>   | 1, 9, 10, 18        | V <sub>EE</sub> to +0.3 |      |
| Comparator differential input voltage | V <sub>SI</sub>  |                     | 0 to 2.5                |      |
| Operating case temperature            | T <sub>C</sub>   |                     | -55 to +125             | °C   |
| Storage temperature                   | T <sub>stg</sub> |                     | -65 to +150             |      |

## Recommended Operating Conditions

| Item                  | Symbol          | Rated value | Unit |
|-----------------------|-----------------|-------------|------|
| Supply voltage        | V <sub>CC</sub> | 5.0 ± 5%    | V    |
|                       | V <sub>EE</sub> | -5.2 ± 5%   |      |
| Operating temperature | T <sub>C</sub>  | 0 to 85     | °C   |

## DC Characteristics

(V<sub>CC</sub>=5.0V ± 5%, V<sub>EE</sub>= -5.2 ± 5%, T<sub>C</sub>=0 to 85°C, R<sub>T</sub>=50Ω to V<sub>TR</sub>)

| Item                                           | Symbol           | Input pins   | Output pins    | Measurement conditions | Min.   | Typ.  | Max.  | Unit |
|------------------------------------------------|------------------|--------------|----------------|------------------------|--------|-------|-------|------|
| Supply current                                 | I <sub>CC</sub>  | 11           |                |                        | 18.0   | 25.2  | 35.0  | mA   |
|                                                | I <sub>EE</sub>  | 3, 16, 21    |                |                        | -135.0 | -96.9 | -70.0 |      |
| Input offset voltage                           | V <sub>OS</sub>  | 5, 14        |                |                        | -10    |       | +10   | mV   |
| Data input current                             | I <sub>D</sub>   | 5, 14        |                |                        |        |       | 55    | μA   |
| Variable range for input conversion hysteresis | V <sub>HIS</sub> |              |                |                        | 0      |       | 80    | mV   |
| Data input voltage range                       | V <sub>ID</sub>  | 5, 14        |                |                        | -2     |       | +2    | V    |
| ECL input "H" level                            | V <sub>IH</sub>  | 1, 9, 10, 18 |                |                        | -1130  |       | -810  | mV   |
| ECL input "L" level                            | V <sub>IL</sub>  | 1, 9, 10, 18 |                |                        | -1950  |       | -1480 |      |
| Output voltage "H" level                       | V <sub>OH</sub>  |              | 19, 20, 23, 24 |                        | -1020  |       | -700  |      |
| Output voltage "L" level                       | V <sub>OL</sub>  |              | 19, 20, 23, 24 |                        | -1980  |       | -1680 |      |
| Reference voltage                              | V <sub>BB</sub>  |              | 8              |                        | -1450  | -1350 | -1200 |      |

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## AC Characteristics

(V<sub>CC</sub>=5.0V ± 5%, V<sub>EE</sub>=−5.2 ± 5%, T<sub>C</sub>=25°C, R<sub>T</sub>=50Ω to V<sub>TT</sub>)

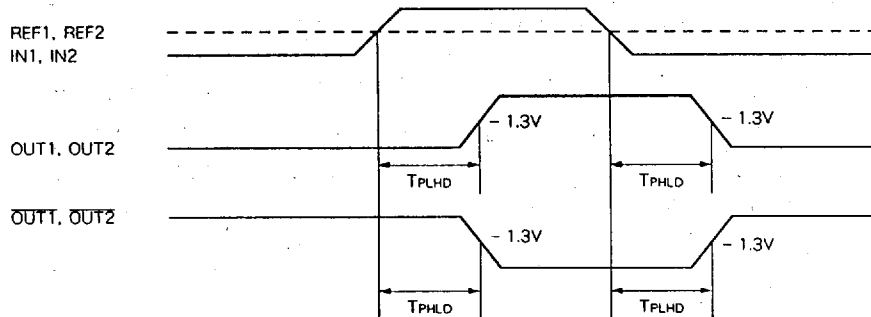
| Item                     | Symbol             | Input pins | Output pins    | Measurement conditions                  | Min. | Typ. | Max. | Unit |
|--------------------------|--------------------|------------|----------------|-----------------------------------------|------|------|------|------|
| Propagation delay time   | T <sub>PLHD</sub>  | 5, 14      | 19, 20, 23, 24 | No load for pass-through mode           | 620  | 790  | 1030 | ps   |
|                          | T <sub>PHLD</sub>  |            |                |                                         | 610  | 775  | 1010 |      |
|                          | T <sub>PLHC</sub>  | 9, 10      | 19, 20, 23, 24 | No load for clocking mode               | 520  | 655  | 790  |      |
|                          | T <sub>PHLC</sub>  |            |                |                                         | 500  | 645  | 780  |      |
| Mode switchover time     | T <sub>MOD</sub>   | 1, 18      | —              |                                         | 460  | 625  | 850  |      |
| Rise time                | T <sub>TLH</sub>   |            | 19, 20, 23, 24 | 20 to 80%                               |      | 200  |      |      |
| Fall time                | T <sub>THL</sub>   |            |                |                                         |      | 200  |      |      |
| Set-up time              | T <sub>S</sub>     |            |                |                                         | 350  |      |      |      |
| Hold time                | T <sub>H</sub>     |            |                |                                         | −100 |      |      |      |
| Max. operating frequency | f <sub>C</sub> MAX | 9, 10      | 19, 20, 23, 24 | Clocking mode                           | 2.5  |      |      | GHz  |
|                          | f <sub>D</sub> MAX | 5, 14      |                | For pass-through mode<br>At −3dB output | 1.0  |      |      |      |

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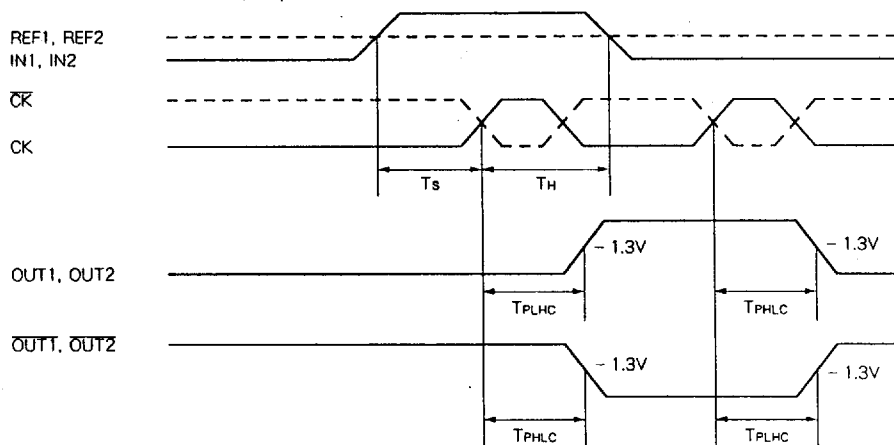
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## &lt;Pass-through mode&gt; (SW1=SW2=HIGH)



## &lt;Clocking mode&gt; (SW1=SW2=LOW)



## Package Data

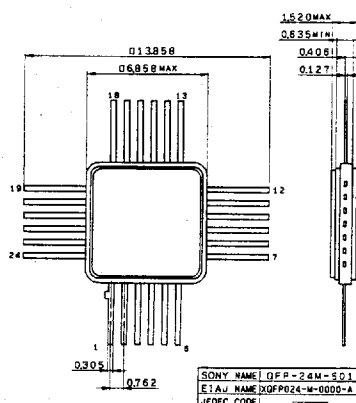
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## Package Outline

Unit: mm

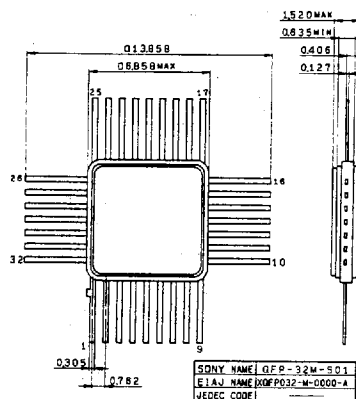
## 24pin QFP (QFP-24M-S01)

24pin QFP (Metal) 0.3g



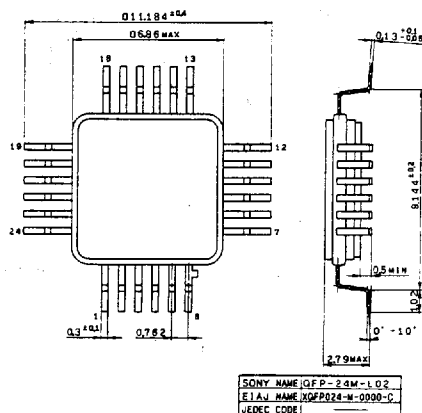
## 32pin QFP (QFP-32M-S01)

32pin QFP (Metal) 0.2g



## 24pin QFP (QFP-24M-L02)

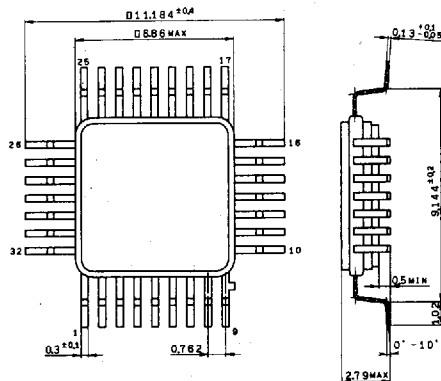
24pin QFP (Metal) 0.3g



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32pin QFP (QFP-32M-L02)

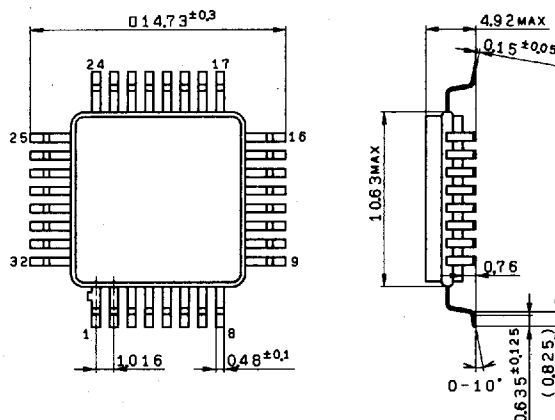
32pin QFP (Metal) 0.2g



|            |                  |
|------------|------------------|
| SONY NAME  | QFP-32M-L02      |
| EIAJ NAME  | XQFP032-M-0000-C |
| JEDEC CODE |                  |

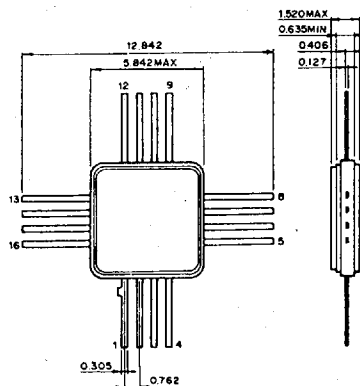
32pin QFP (QFP-32C-L01)

32pin QFP (Ceramic)



|            |                  |
|------------|------------------|
| SONY NAME  | QFP-32C-L01      |
| EIAJ NAME  | XQFP032-G-0000-A |
| JEDEC CODE |                  |

16pin QFP



**Package Data**

| Package Data                   | Page |
|--------------------------------|------|
| 1. 16 pin QFP                  | 6-3  |
| 2. 24 pin QFP                  | 6-3  |
| 3. 32 pin QFP                  | 6-3  |
| 4. 24 pin QFP with formed lead | 6-4  |
| 5. 32 pin QFP with formed lead | 6-4  |



## Package Data

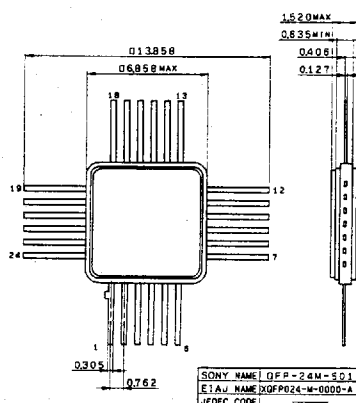
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## Package Outline

Unit: mm

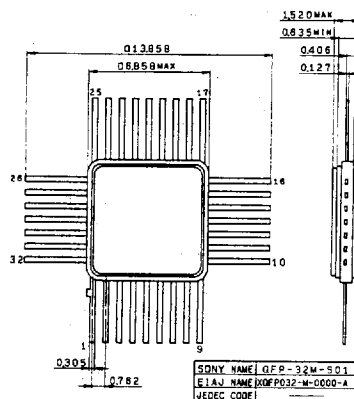
## 24pin QFP (QFP-24M-S01)

24pin QFP (Metal) 0.3g



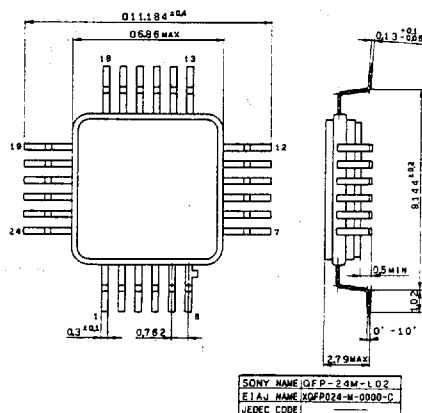
## 32pin QFP (QFP-32M-S01)

32pin QFP (Metal) 0.2g



## 24pin QFP (QFP-24M-L02)

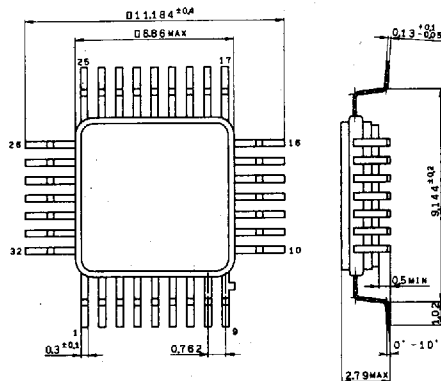
24pin QFP (Metal) 0.3g



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32pin QFP (QFP-32M-L02)

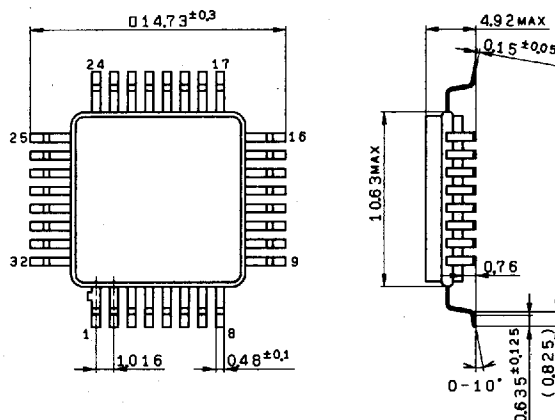
32pin QFP (Metal) 0.2g



|            |                  |
|------------|------------------|
| SONY NAME  | QFP-32M-L02      |
| EIAJ NAME  | XQFP032-M-0000-C |
| JEDEC CODE |                  |

32pin QFP (QFP-32C-L01)

32pin QFP (Ceramic)



|            |                  |
|------------|------------------|
| SONY NAME  | QFP-32C-L01      |
| EIAJ NAME  | XQFP032-G-0000-A |
| JEDEC CODE |                  |

16pin QFP

