

**SONY****CXB112Q/Q-Y***T-50-17***Phase Frequency Detector with Differential I/O****Description**

The CXB112Q is an ultra high speed monolithic ECL Phase Frequency Detector capable of 800MHz operation.

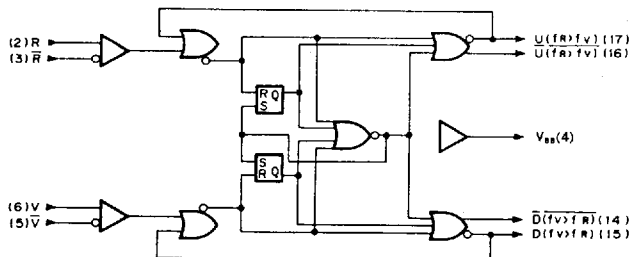
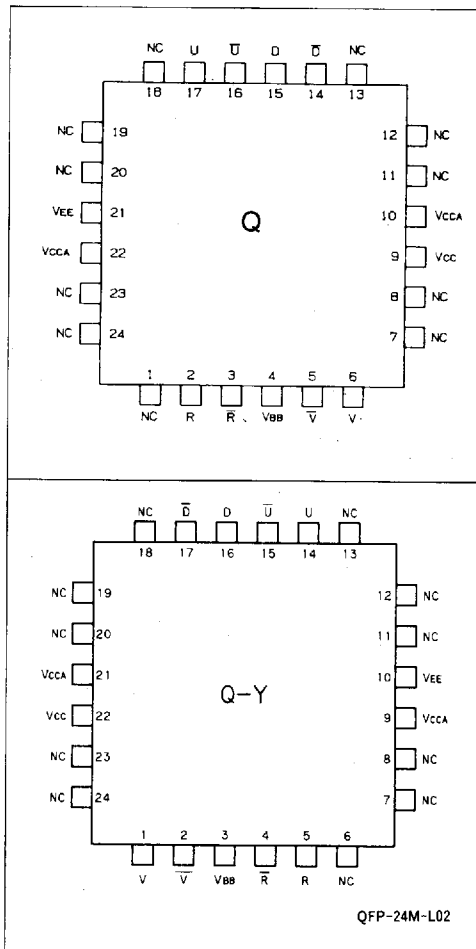
The IC detects the difference of both phase and frequency between the data present at two differential input pins, R and V. In combination with a voltage controlled oscillator, this IC is used in an application for Phase-Locked-Loop.

**Features**

- Typical Data rate up to 800MHz
- Differential inputs and outputs
- Built-in reference voltage for single ended input operation
- Internal pull down resistors on input pins to maintain logic LOW level with the pins left open
- ECL 100K compatible I/O levels

**Pin Names**

|                             |                            |
|-----------------------------|----------------------------|
| V, $\bar{V}$ , R, $\bar{R}$ | Data inputs                |
| U, $\bar{U}$                | Outputs ( $f_R > f_V$ )    |
| D, $\bar{D}$                | Outputs ( $f_V > f_R$ )    |
| V <sub>BB</sub>             | Reference voltage output   |
| V <sub>CC</sub>             | Circuit ground             |
| V <sub>CCA</sub>            | Circuit ground for outputs |
| V <sub>EE</sub>             | Negative power supply      |

**Logic Diagram****Pin Assignment**

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CXB1112Q/QY

**Truth Table (for Test)***T-50-17*

| Input |   | Output |   |           |           |  |
|-------|---|--------|---|-----------|-----------|--|
| R     | V | U      | D | $\bar{U}$ | $\bar{D}$ |  |
| L     | L | X      | X | X         | X         |  |
| L     | H | X      | X | X         | X         |  |
| H     | H | X      | X | X         | X         |  |
| L     | H | X      | X | X         | X         |  |
| H     | H | H      | L | L         | H         |  |
| L     | H | H      | L | L         | H         |  |
| H     | H | H      | L | L         | H         |  |
| H     | L | H      | L | L         | H         |  |
| H     | H | L      | L | H         | H         |  |
| H     | L | L      | L | H         | H         |  |
| H     | H | L      | H | H         | L         |  |
| H     | L | L      | H | H         | L         |  |
| H     | H | L      | H | H         | L         |  |
| L     | H | L      | H | H         | L         |  |
| H     | H | L      | L | H         | H         |  |

Note: H; HIGH voltage  
 L; LOW voltage  
 X; Don't care

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CXB1112Q/QY

T-50-17

## DC Characteristics

 $V_{EE} = -4.5 \pm 0.3V$ ,  $V_{CC} = V_{CCA} = GND$ ,  $V_{TT} = -2.0V$ ,  $T_C = 0^\circ C$  to  $+85^\circ C$ 

| Item                 | Symbol   | Test Condition | Min. | Typ. | Max. | Unit |
|----------------------|----------|----------------|------|------|------|------|
| Power supply current | $I_{EE}$ |                | -134 | -98  | -68  | mA   |

Note: Other DC characteristics; See pages 3-3 and 3-4.

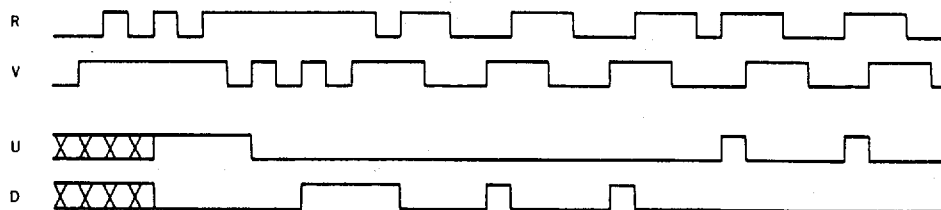
## AC Characteristics

 $V_{EE} = -4.5 \pm 0.3V$ ,  $V_{CC} = V_{CCA} = GND$ ,  $V_{TT} = -2.0V$ ,  $T_C = 0^\circ C$  to  $+85^\circ C$ ,  $R_T = 50\Omega$  to  $V_{TT}$ 

| Item                   | Symbol           | Input | Output | Test Condition | Min. | Typ. | Max. | Unit |
|------------------------|------------------|-------|--------|----------------|------|------|------|------|
| Propagation delay time | T <sub>PLH</sub> | R     | U      |                | 450  | 640  | 840  | ps   |
|                        | T <sub>PHL</sub> |       |        |                | 450  | 640  | 850  |      |
|                        | T <sub>PLH</sub> |       | D      |                | 590  | 780  | 980  |      |
|                        | T <sub>PHL</sub> |       |        |                | 590  | 780  | 990  |      |
|                        | T <sub>PLH</sub> | V     | U      |                | 590  | 780  | 980  |      |
|                        | T <sub>PHL</sub> |       |        |                | 590  | 780  | 990  |      |
|                        | T <sub>PLH</sub> |       | D      |                | 450  | 640  | 840  |      |
|                        | T <sub>PHL</sub> |       |        |                | 450  | 640  | 850  |      |
| Max. Clock frequency   | f <sub>MAX</sub> | R, V  | U, D   | 20% to 80%     | 600  | 800  |      | MHz  |
| Rise time              | T <sub>TLH</sub> |       |        |                |      | 340  | 430  | ps   |
| Fall time              | T <sub>THL</sub> |       |        |                |      | 200  | 250  |      |

Note: AC test circuit; See page 4-5.

## Timing Diagram



## Package Data

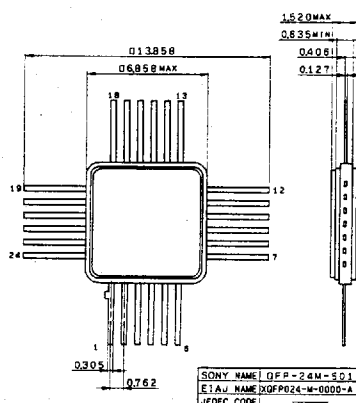
T-90-20

## Package Outline

Unit: mm

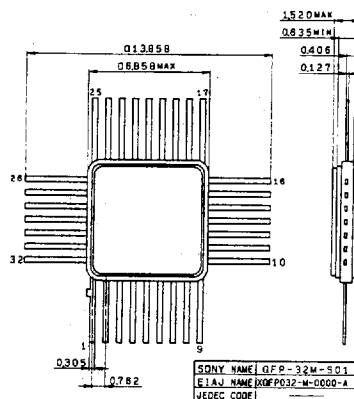
## 24pin QFP (QFP-24M-S01)

24pin QFP (Metal) 0.3g



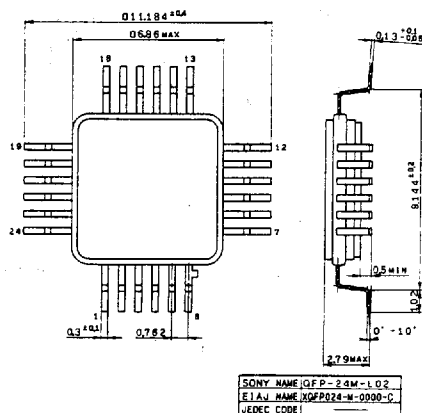
## 32pin QFP (QFP-32M-S01)

32pin QFP (Metal) 0.2g



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

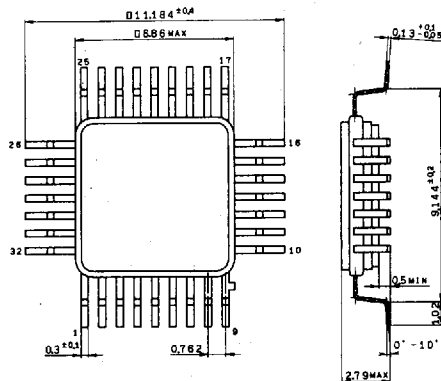
24pin QFP (Metal) 0.3g



T-90-20

32pin QFP (QFP-32M-L02)

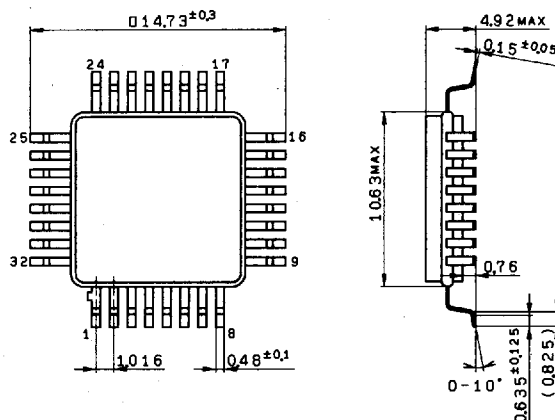
32pin QFP (Metal) 0.2g



|            |                  |
|------------|------------------|
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| EIAJ NAME  | XQFP032-M-0000-C |
| JEDEC CODE |                  |

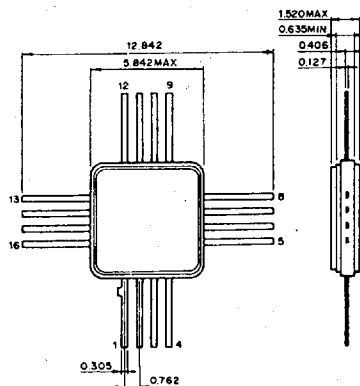
32pin QFP (QFP-32C-L01)

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

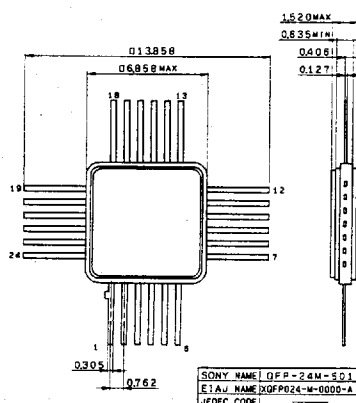
T-90-20

## Package Outline

Unit: mm

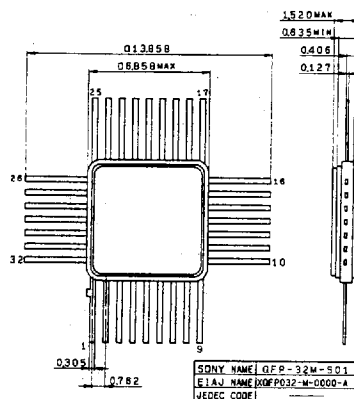
## 24pin QFP (QFP-24M-S01)

24pin QFP (Metal) 0.3g



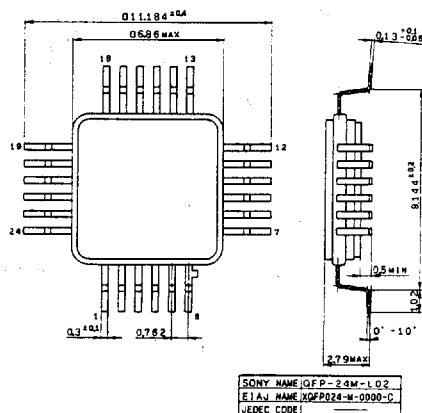
## 32pin QFP (QFP-32M-S01)

32pin QFP (Metal) 0.2g



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

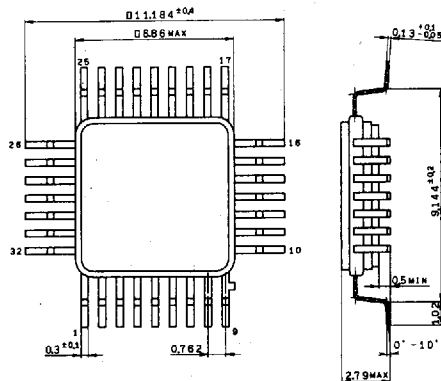
24pin QFP (Metal) 0.3g



T-90-20

32pin QFP (QFP-32M-L02)

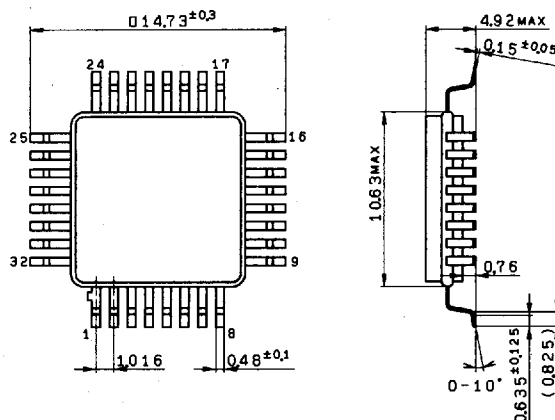
32pin QFP (Metal) 0.2g



|            |                  |
|------------|------------------|
| 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

