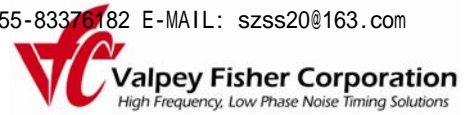
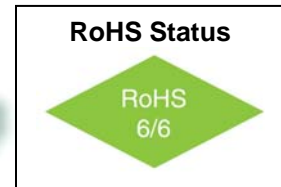
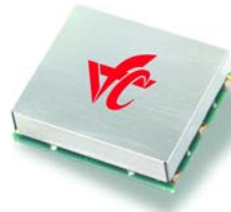


# VFJA410 Quad Input Jitter Attenuator to 200 MHz



## Features

- 10 MHz to 200MHz Output Frequency Range
- 8 KHz to 800 MHz Input Frequency Range
- Ultra Low Jitter and Phase Noise: -120 dBc/Hz @ 1KHz
- Low Power: < 150mW typical

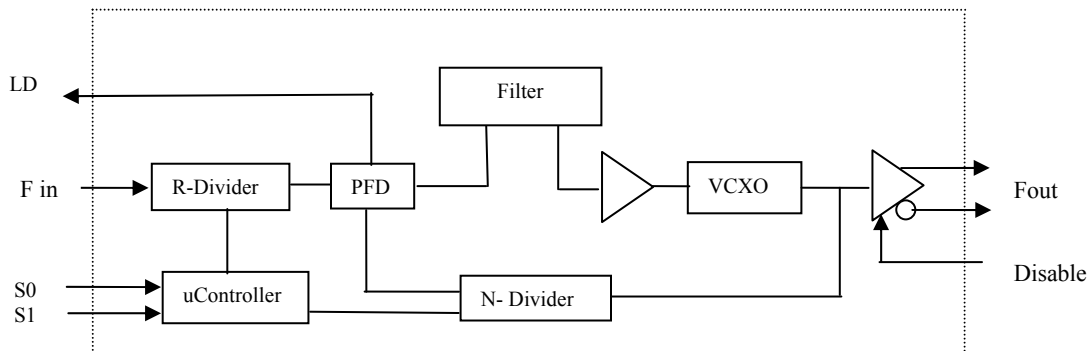


## Applications

- Sonet / SDH / ATM
- 10 Gigabit Ethernet
- Wireless Infrastructure

## Description

The VFJA410 is a Jitter Attenuator capable of providing an output frequency up to 200 MHz. Two select inputs [S1,S0] allow the user to select 1 of 4 preset input frequencies. A Lock Detect signal indicates when the output signal is frequency locked to the input. Operating with a +3.3 volt power supply the device typically consumes 150 mW. The output is configured as a differential LVPECL signal and requires external termination resistors. The VFJA410 is available in a 19.5mm x 15.5 mm surface mount package.

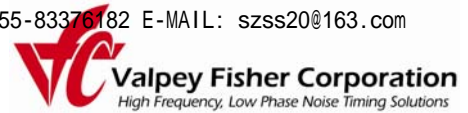


**Block Diagram**



# VFJA410

## Quad Input Jitter Attenuator to 200 MHz



### Absolute Maximum Ratings

| Parameter                 | Symbol | Condition | Min  | Typ | Max   | Unit | Note |
|---------------------------|--------|-----------|------|-----|-------|------|------|
| Supply Break Down Voltage | Vcc    |           | -0.5 |     | 5.5   | V    |      |
| Storage Temperature       | Ts     |           | -55  |     | +105° | °C   |      |

### Electrical Specifications

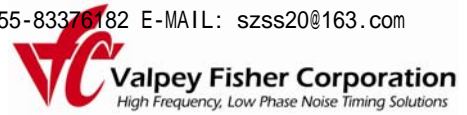
| Parameter                   | Symbol   | Condition  | Min        | Typ                          | Max          | Unit    | Note                         |         |
|-----------------------------|----------|--|------------|------------------------------|--------------|---------|------------------------------|---------|
| Output Frequency Range      | Fout     |  | 10         |                              | 200          | MHz     |                              |         |
| Input Frequency Range       | Fin      |  | 0.008      |                              | 800          | MHz     |                              |         |
| Input Level                 | Vin      | AC coupled internally  | 0.4        |                              | 3.3          | V p-p   |                              |         |
| Output Level Logic "1"      | Voh      | 50 Ohm to Vcc-2V or Thevenin Equivalent  | Vcc-0.96   |                              | Vcc-0.81     | V       |                              |         |
| Output Level Logic "0"      | Vol      |  | Vcc-1.85   |                              | Vcc-1.65     | V       |                              |         |
| Phase Jitter                |          | 12KHz to 20MHz   |            | 0.20                         | 0.5          | ps(rms) |                              |         |
| SSB Phase Noise             | $\phi_n$ | 100Hz<br>1KHz<br>10KHz<br>100KHz   |            | -100<br>-130<br>-145<br>-150 |              | dBc/Hz  | @<br>155.52MHz               |         |
| APR                         |          |  | ± 32       |                              |              | ppm     |                              |         |
| Modulation BW               |          |  | 10         |                              |              | Hz      | Note 1                       |         |
| Duty Cycle                  |          | @ 50%  | 45         | 50                           | 55           | %       |                              |         |
| Rise / Fall Time            | Tr/Tf    | 20% to 80%   |            |                              | 0.6          | ns      |                              |         |
| Start up time               |          |  |            | 2                            | 10           | ms      |                              |         |
| Supply Voltage              | Vcc      |  | 3.15       | 3.30                         | 3.45         | V       |                              |         |
| Input Current               | Icc      |  |            | 45                           | 55           | mA      |                              |         |
| Operating Temperature Range | Ta       |  | 0°<br>-40° |                              | +70°<br>+85° | °C      | Order code B<br>Order code G |         |
| Lock Detect                 | LD       | Output HIGH (> 2.5 V) : In Lock; Output LOW (< .5V): Out of Lock                     |            |                              |              |         |                              | LVC MOS |
| Enable / Disable Function   |          | Input HIGH (>2.5V): Output Disabled<br>Input LOW (<0.5V) or floating: Output Enabled |            |                              |              |         |                              | LVC MOS |
| Enable / Disable Time       | Te/Td    |  |            |                              | 100          | ns      |                              |         |

Notes:

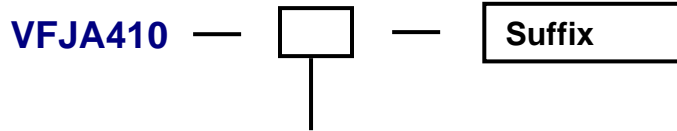
1. Consult factory for Bandwidth options



# VFJA410 Quad Input Jitter Attenuator to 200 MHz



## How to Order



### Temperature Range

| Code | Specification |
|------|---------------|
| B    | 0°C to 70°C   |
| G    | -40°C to 85°C |

Once Input and Output frequencies have been submitted and approved, the Factory will assign a part number.

**Sample Frequencies Table 2**

| P/N suffix | S1:S0 | Input Frequency (MHz) | Output Frequency (MHz) | P/N suffix | S1:S0 | Input Frequency (MHz) | Output Frequency (MHz) |
|------------|-------|-----------------------|------------------------|------------|-------|-----------------------|------------------------|
| -001       | 00    | 622.080               | 19.44                  | -002       | 00    | 622.080               | 38.88                  |
|            | 01    | 644.5314              | 19.44                  |            | 01    | 644.5314              | 38.88                  |
|            | 10    | 669.32658             | 19.44                  |            | 10    | 669.32658             | 38.88                  |
|            | 11    | 693.48315             | 19.44                  |            | 11    | 693.48315             | 38.88                  |
| -003       | 00    | 622.080               | 77.76                  | -004       | 00    | 622.080               | 155.52                 |
|            | 01    | 644.5314              | 77.76                  |            | 01    | 644.5314              | 155.52                 |
|            | 10    | 669.32658             | 77.76                  |            | 10    | 669.32658             | 155.52                 |
|            | 11    | 693.48315             | 77.76                  |            | 11    | 693.48315             | 155.52                 |
| -005       | 00    | .008                  | 25.00                  | -006       | 00    | .008                  | 125.00                 |
|            | 01    | 19.44                 | 25.00                  |            | 01    | 19.44                 | 125.00                 |
|            | 10    | 25                    | 25.00                  |            | 10    | 25                    | 125.00                 |
|            | 11    | 125                   | 25.00                  |            | 11    | 125                   | 125.00                 |

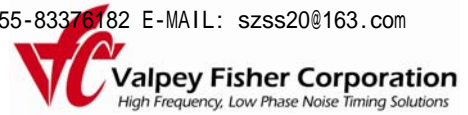
## Environmental and Mechanical



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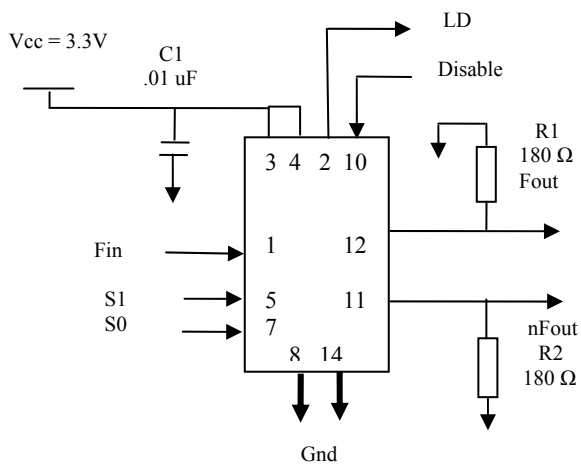
# VFJA410

## Quad Input Jitter Attenuator to 200 MHz

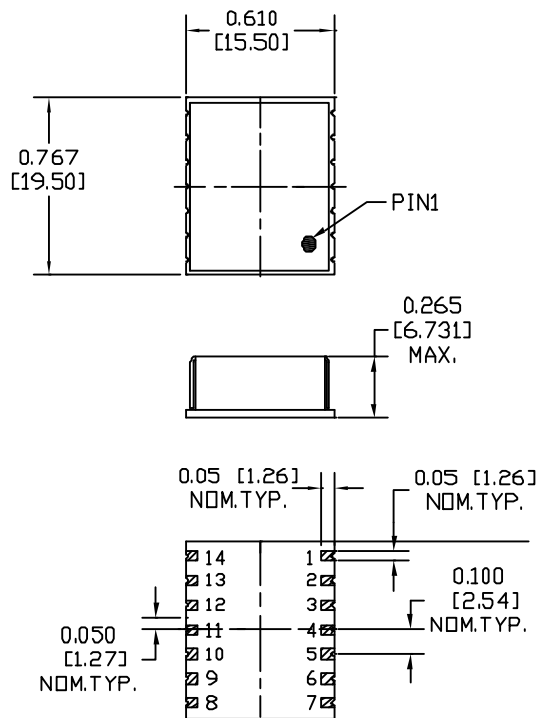


| Parameter                   | Specification  |
|-----------------------------|--|
| <b>Mechanical Shock</b>     | Per MIL-STD-202, Method 213, Condition E                                 |
| <b>Thermal Shock</b>        | Per MIL-STD-883, Method 1011, Condition A                                |
| <b>Vibration</b>            | Per MIL-STD-883, Method 2007, Condition A                                |
| <b>Soldering Conditions</b> | 260°C for 10s max  |
| <b>Hermetic Seal</b>        | Leak rate less than $5 \times 10^{-8}$ atm.cc/s of helium (crystal only) |

**Connection Diagram**



**Mechanical Outline**



| Pin # | Description |
|-------|-------------|
| 1     | Fin         |
| 2     | Lock Detect |
| 3     | Vcc         |
| 4     | Vcc         |
| 5     | S1          |
| 6     | DNC         |
| 7     | S0          |
| 8     | Gnd         |
| 9     | N/C         |
| 10    | Disable     |
| 11    | nFout       |
| 12    | Fout        |
| 13    | N/C         |
| 14    | Gnd         |

