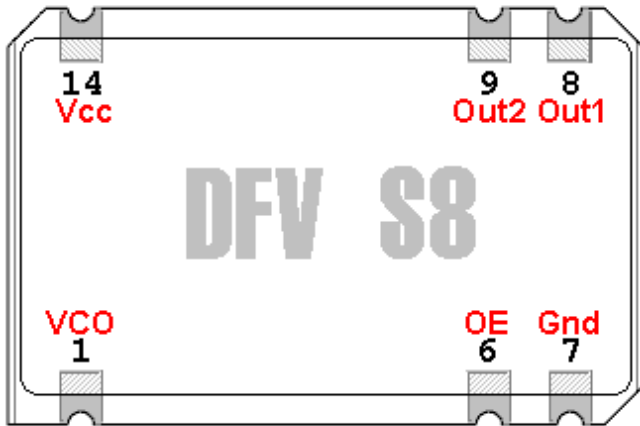
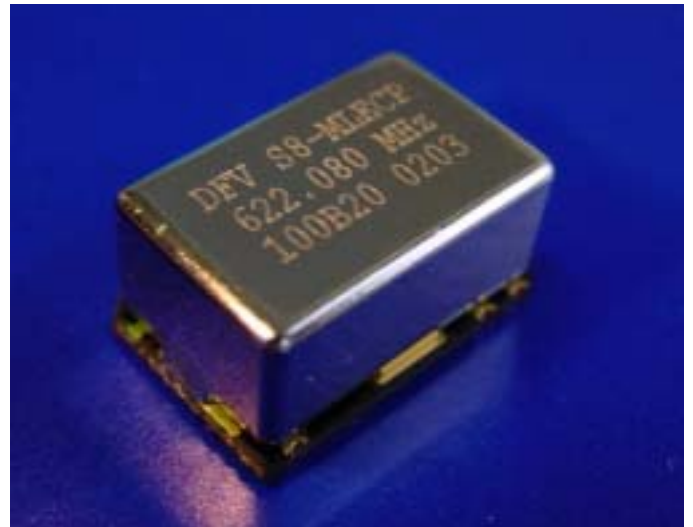


PECL Output VCXOs : Frequency Range 600 – 800 MHz

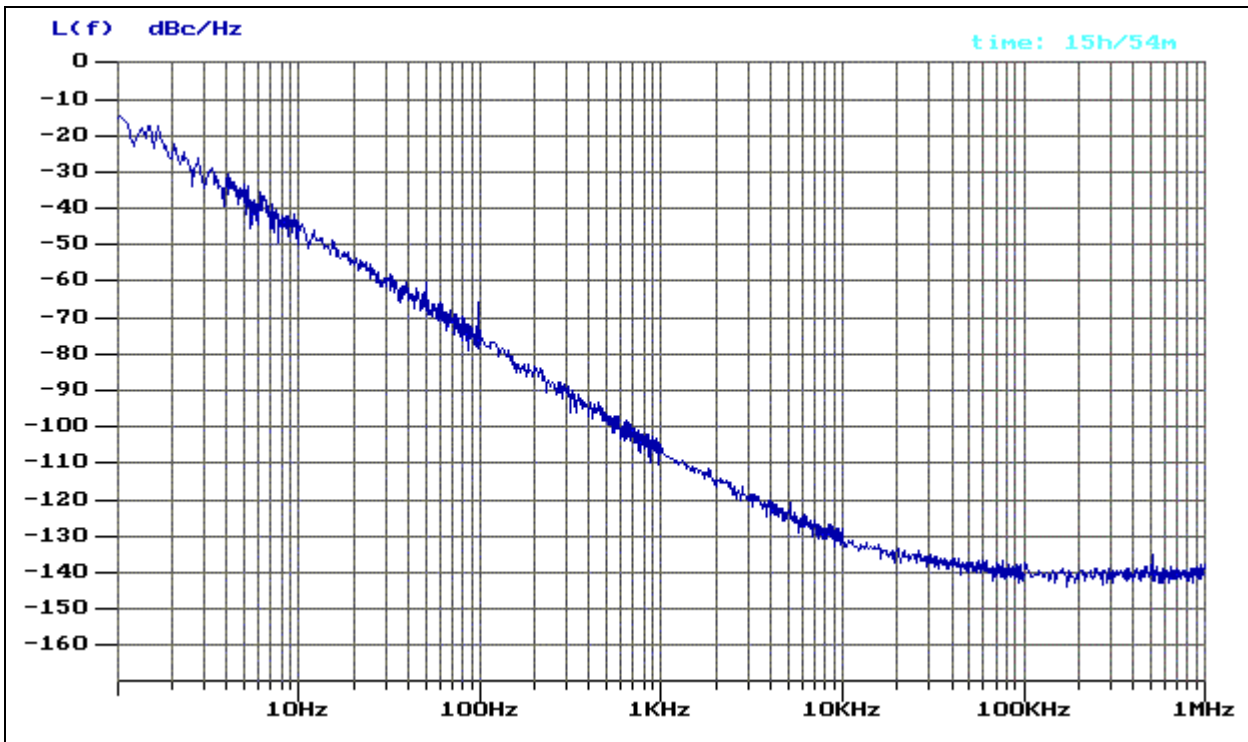
1. S8 Package



Top View



2. Typical Phase Noise Data



Note: The phase noise data is taken with one model DFV S8-MLECP 622.08MHz device versus another similar model reference device.

3. Test Circuit – Oscilloscope Measurement Example

There are two types of circuit measurements for LVPECL output oscillators that can be used depending upon the measurement accuracy of the equipment. A comparison of these results between the test and the oscillator in your application can then be performed. This can be done with or without a unique power supply.

- **Test Procedure 1**

Test Procedure 1 is more accurate because the oscillator signal is not affected. Procedure 1 is used only when two power supplies are needed. All parameters with symmetrical loads can be very precisely measured using this technique. For example:

- Wave form, voltage levels, duty cycle, jitter

- **Test Procedure 2**

Test Procedure 2 measures only one part of the output parameters of an oscillator with the same precision as Test Procedure 1 (for example, jitter). Care must be taken so that the shape of the output waveform is not affected by the output coupling capacitor.

The advantage of Test Procedure 2 is that it can be used to check the signals in your application since only one power supply is needed.

The best way to characterize oscillator parameters is to try both Test Procedure 1 and Test Procedure 2. Next, compare the results to determine if you accurately measured the parameter, for example:

| | |
|---------------------------------|-----------------------------------|
| - Wave form, levels, duty cycle | (affected by the procedure) |
| - jitter | (not affected by the procedure) |

Note:

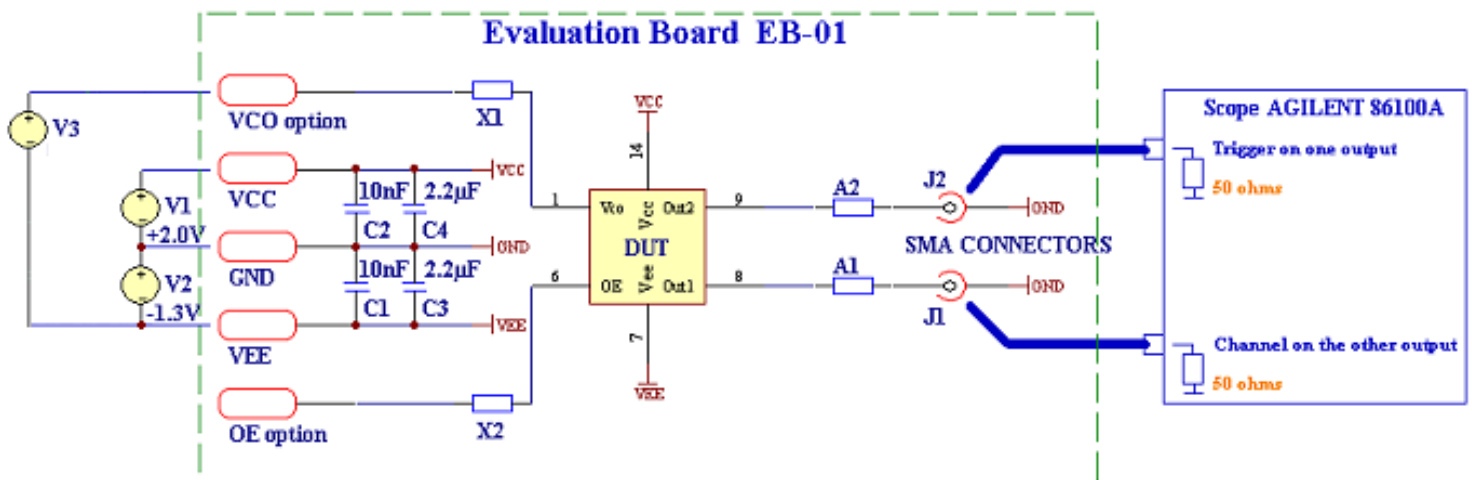
Symmetrical loads must be connected to the outputs to show the best results for all parameters.

Additional recommendations :

- **Use the same value of loads for both outputs.**
- **Use the same length of wires.**
- **Use short lines.**
- **Use impedance adapted lines (copper wave guides, micro strip lines).**
- **Connect the proper loads (dependent of your application).**

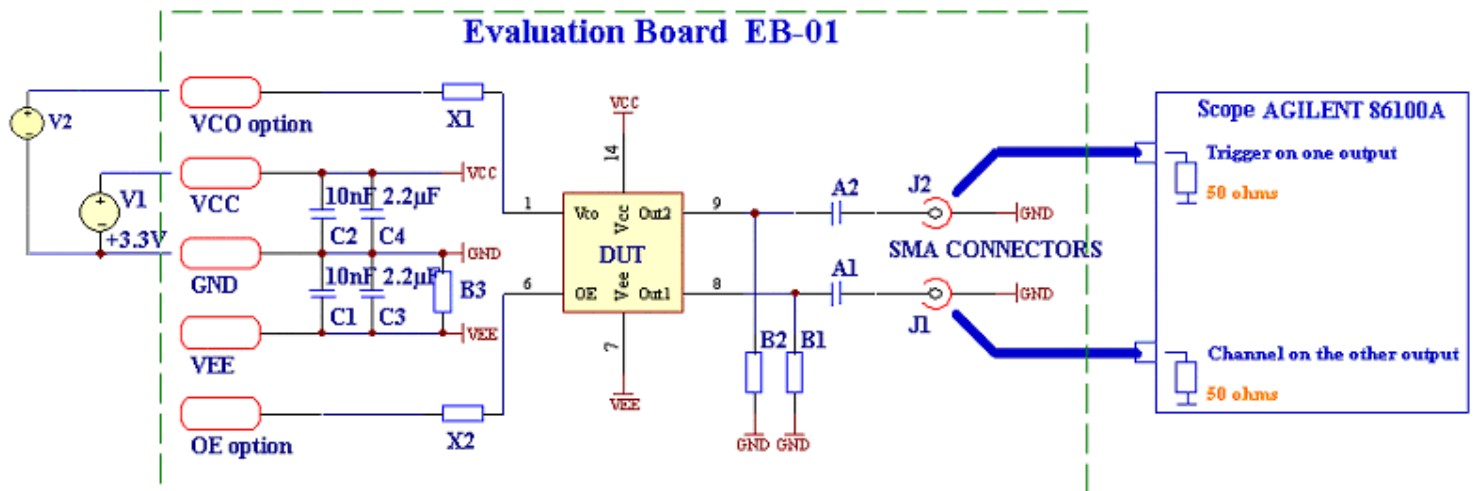
It is possible to create an evaluation board (please see the information following at the end of this Application Note) that allows both Test Procedure 1 and Test Procedure 2 types of measurement.

- Measurement With Test Procedure 1 (Example)



Components: A1, A2, X1, X2 0 Ω Resistor

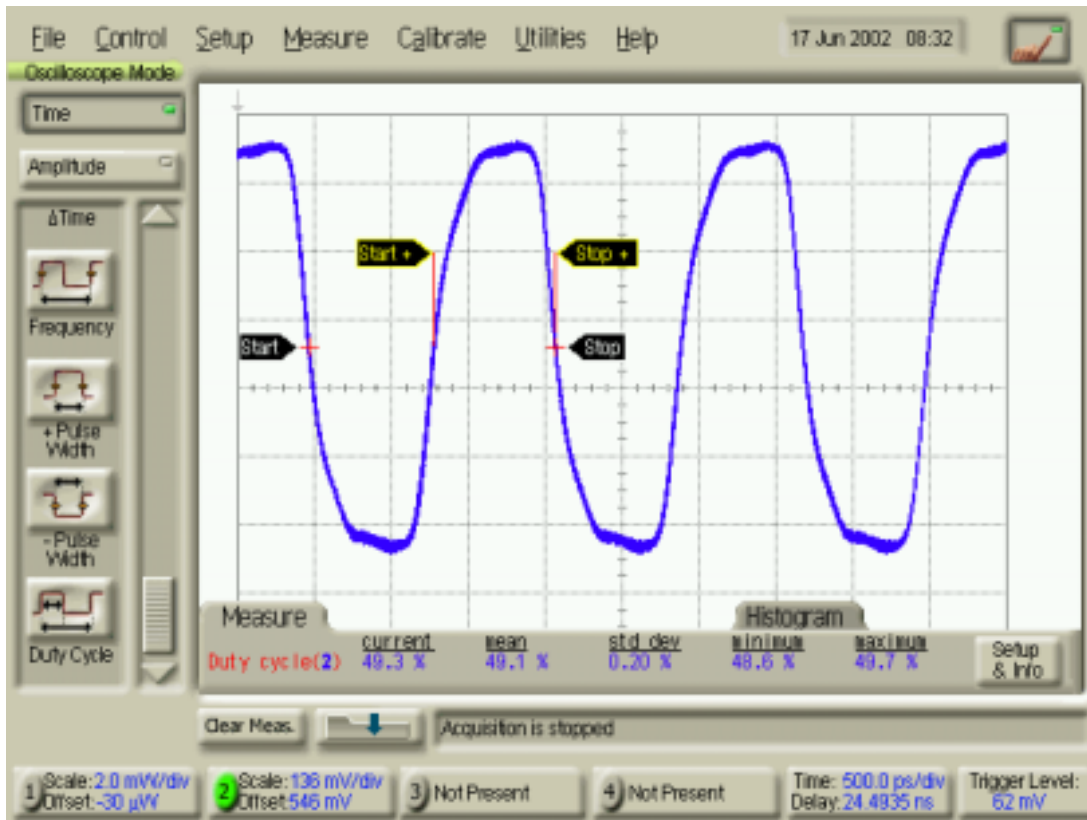
- Measurement With Test Procedure 2 (Example)



Components: A1, A2 100pF Ceramic Capacitor
 B1, B2 180Ω Resistor
 B3, X1, X2 0Ω Resistor

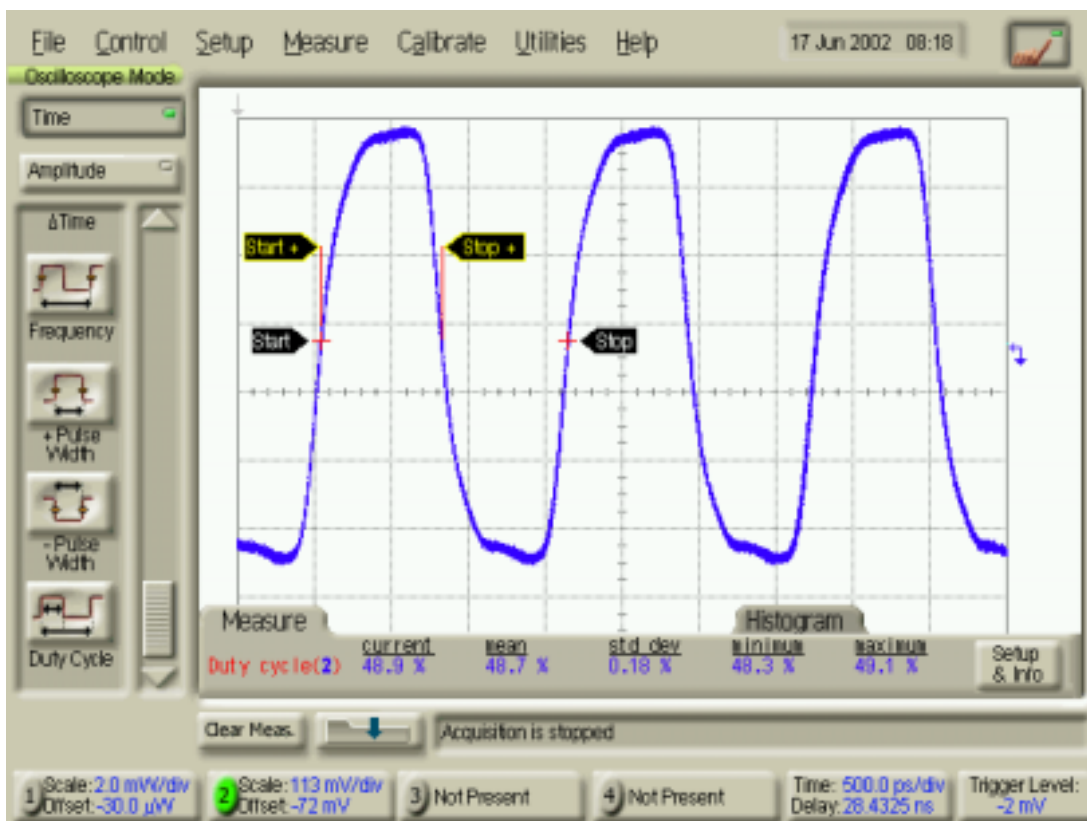
Note: When measuring with a high speed oscilloscope, it may be necessary to insert an attenuator at the inputs depending of the sensitivity of the instrument. In our case, we inserted a **50 Ohm - 20 dB** attenuator.

- Example of a Measurement at 622.08 MHz - Test Procedure 1



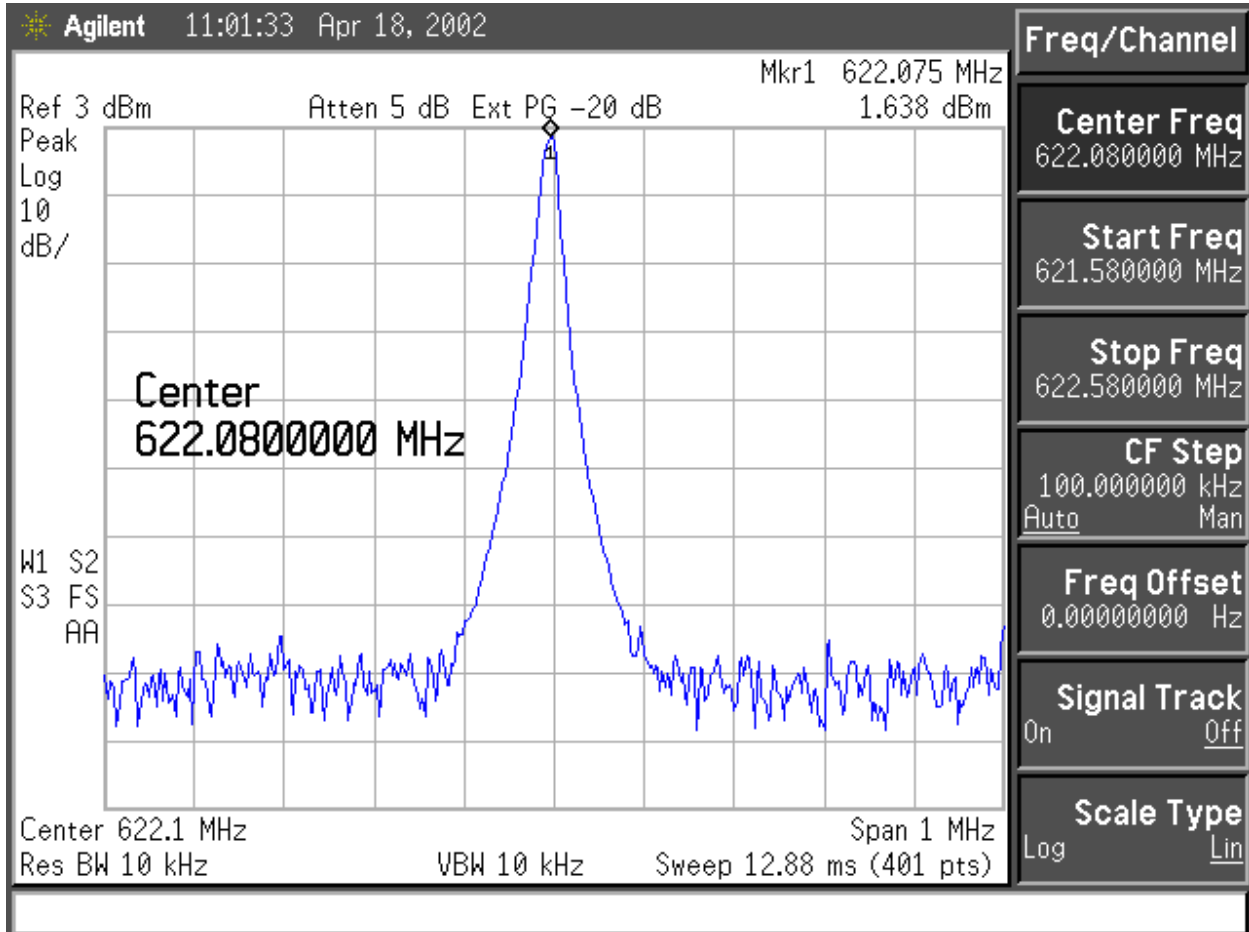
- Example of a Measurement at 622.08 MHz –Test Procedure 2

(This example shows the differences in measurement produced with Test Procedure 2.)



4. Spectrum for a 622 MHz PXO with Test Equipment Type E4408B from Agilent :

- VBW = 10kHz
- Span = 1MHz



Note: When measuring with a spectrum analyzer, it may be necessary to eliminate the serial decoupling capacitor at the measured oscillator's output, however, this depends on the type of instrument used. There may already be a serial capacitor at the input of the spectrum analyzer. When measuring with the spectrum analyzer, remember to balance the other oscillator output with a 50 ohm resistor.

5. Decoupling Capacitors on PCB

Two ceramic capacitors should be mounted in parallel near each of the oscillator's supply voltages for the best results.

Values:

- 1 ea. 10 nF ceramic capacitor
- 1 ea. 100 nF (or higher) ceramic capacitor

6. Washing Conditions

The Fordahl internal construction uses a hermetically sealed quartz crystal that ensures thermal and long-term stability requirements. Use care with cleaning solutions/solvents because it is possible for liquid cleaning solutions to penetrate the base-to-cap seal:

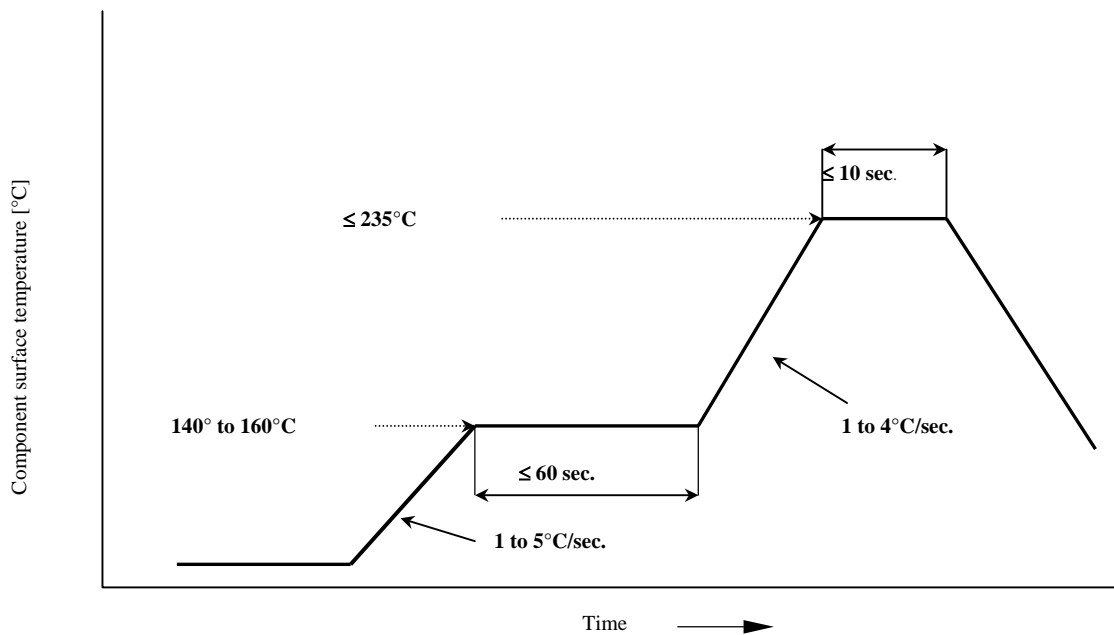
- **Do not clean with solvents or water-based cleaning solutions.**
- **Do not use an ultrasound washing process.**

CFC, HCFC or low-residue cleaning is allowed. No-wash type flux is highly recommended. Consult the factory for any other cleaning processes. (NOTE: CFC and HCFC should be defined.)

7. Soldering Considerations

Surface mount devices are designed primarily for mass production using pick and place technology and reflow soldering. Take the following precautions during the soldering process:

Reflow Soldering (See the Following Example)



Additional recommendations:

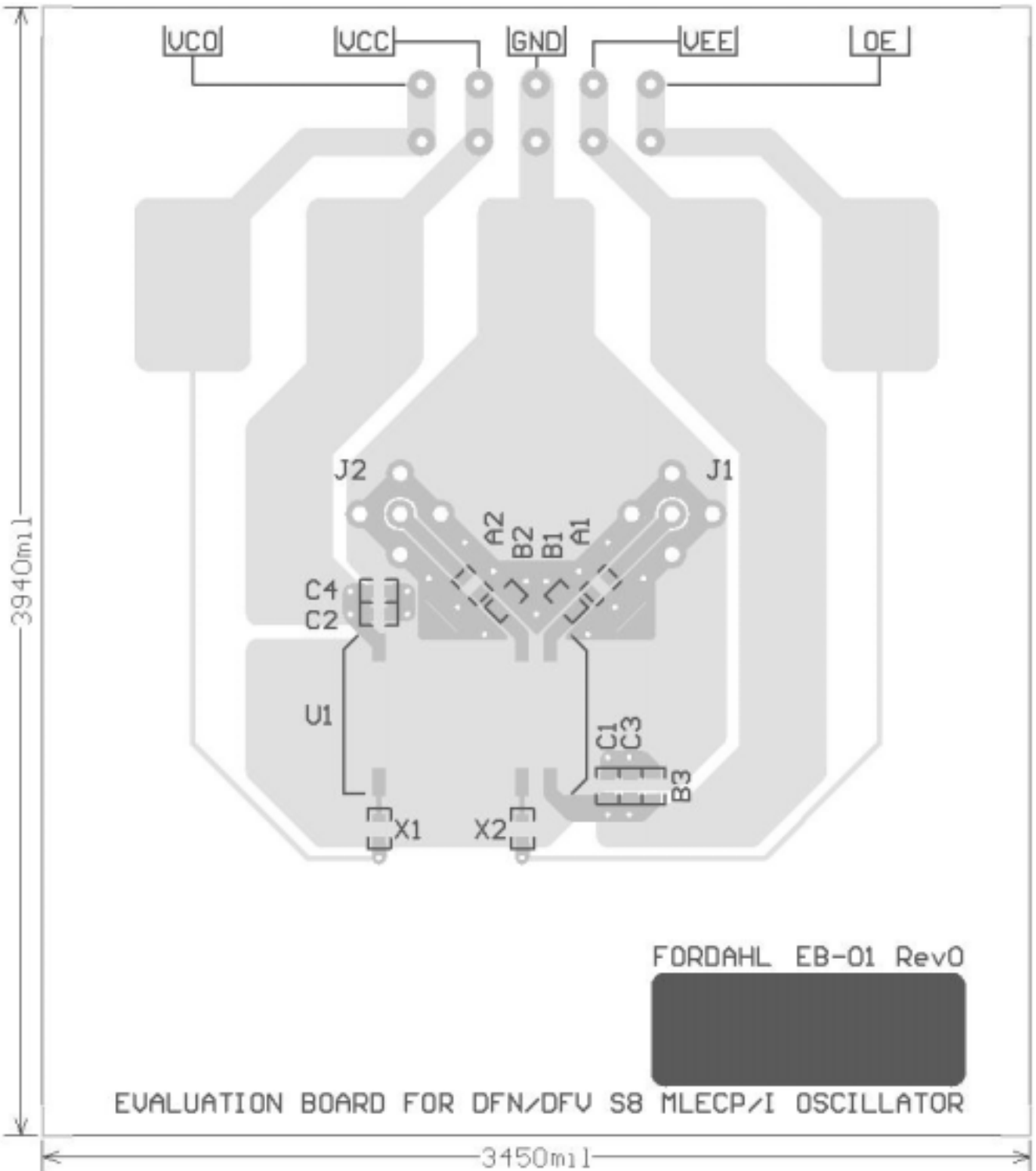
- **Do not vibrate during reflow soldering.**
- **Do not reflow solder on the back side.**
- **Solder adhesion may vary depending on motherboard thermal capacity and other factors.**

Consult the factory for details.

8. Hand Soldering

- Maximum temperature 300°C/5 sec.
- Fine tipped soldering iron recommended.

9. Evaluation Board Example



Size of all the components : **0805** (.080" x .050")