



## MERCURY 小型SMD OCXO評価ボード ユーザーマニュアル

### Approvals

*(The personnel who have approved the contents of this document to enable release)*

Date	Revision	Name	Title	Signature
28-May-2012	1.0	Ajaib Hussain	UK Engineering Manager	AH
16-Jul-2012	2.0	Ajaib Hussain	UK Engineering Manager	AH
18-Jul-2012	2.1	Ajaib Hussain	UK Engineering Manager	AH

### Reviewer History

*(The personnel who have reviewed the contents of this document prior to approval and release)*

Date	Revision	Reviewer	Reviewed (Y/N)
22-May-12	1.0	Derek Read	y
16-Jul-12	2.0	Derek Read	y
18-Jul-12	2.1	Derek Read	y

### Revision History

*(The versions of this document that have been in circulation around Rakon)*

Date	Revision	Description	Author
21-May-2012	0.01	Initial Draft for Team feedback	Anis Alnajar
22-May-2012	0.02	Draft updated to accommodate Team feedback	Anis Alnajar
22-May-2012	1	Initial Release	Anis Alnajar
13-Jul-2012	2	Incorporate changes from cross-functional review	Anis Alnajar
18-Jul-2012	2.1	Clarification of correct test loads	Anis Alnajar



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### 2.2 Output Configuration Options

The output from the device can be:

1. Directly Coupled Output:

To configure for directly coupled Output (to the SMA out) a zero Ohm link is fitted at LK4 with no link is fitted at R5. This link configuration is valid for both HCMOS and CLIPPED SINE output waveforms. Unless otherwise specified the default configuration is with directly coupled output (to SMA connector).

**Important note: Directly coupled devices (HCMOS and Clipped Sine) are not designed for 50 Ohm load. Load in accordance with device data sheet specification.**

Buffered HCMOS or Buffered Clipped Sine output configurations (to SMA connector) can be supplied if required.

2. Buffered Output:

To configure for buffered output (to the SMA out) no link is fitted at LK4. Different buffer IC's and matching components are needed for HCMOS and Clipped Sine output types as described below:

- a. To configure the evaluation board for HCMOS output devices a NC7SZ126 is fitted in position IC3 (IC1 is not fitted). For this configuration R5=0 Ohms, R7=0 Ohms and C10=0 Ohms.

**Important Note: The HCMOS buffer is not designed for 50 Ohm load. High impedance load is required.**

- b. To configure the evaluation board for clipped sine output devices a MAX4125 is fitted in position IC1 (IC3 is not fitted). For this configuration R5=0 Ohms, C10=10nF and R7= 50 Ohms for a matched output load.

**Important Note: Clipped Sine Output buffer is capable to drive a 50 Ohm load**

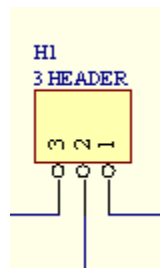


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**Important Note: The direct output from the oscillator is connected to test pad Osc. O/P (see Figure1) for all evaluation boards configurations (direct coupled, Buffered HCMOS & Buffered Clipped Sine) and can be probed with a suitable high impedance probe (eg. FET probe).**

### 2.3 VCXO Configuration Options

A three way header (H1 Figure 1) is provided to select VCXO options. This must be configured to match requirements as described below:



1. Link pin 1 & pin 2 to enable an external voltage supply via the (optional) SMA connector (P6).

**Note: This option must be used for measurement of VCXO devices in a varying temperature environment.**

2. Link pin 3 & pin 2 to fix the VCXO voltage at half the regulated supply voltage (=1.65V). Use this option when operating in a fixed temperature.

**Note: This option is provided for convenience and sets the VCXO at mid supply rail level. It is not suitable for measurement of VCXO devices in a varying temperature environment.**

3. For fixed frequency devices (No VCXO) no link is required.

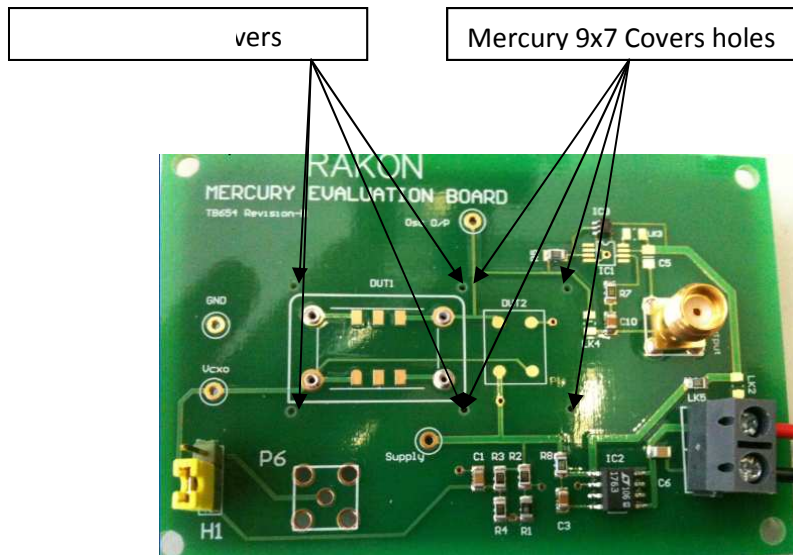


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### 2.4 Draft Covers / Environmental Isolation

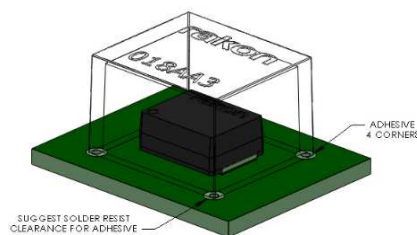
Mercury devices are tested in production in their native format (9x7, 14x9 and DIL). Customers may wish to use the device under high air flow and in this condition it is recommended to fit a draft cover.

Holes to locate the draft cover are positioned around board locations DUT1 & DUT2 (Device Under Test 1 & 2).



Picture 2 DUT Covers

Two sizes are available (9x7 and 14x9) package formats depending on the size of the DEVICE UNDER TEST.



Picture 3 Draft Cover packaged DEVICE UNDER TEST



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### 2.5 Mercury Evaluation Board Schematic

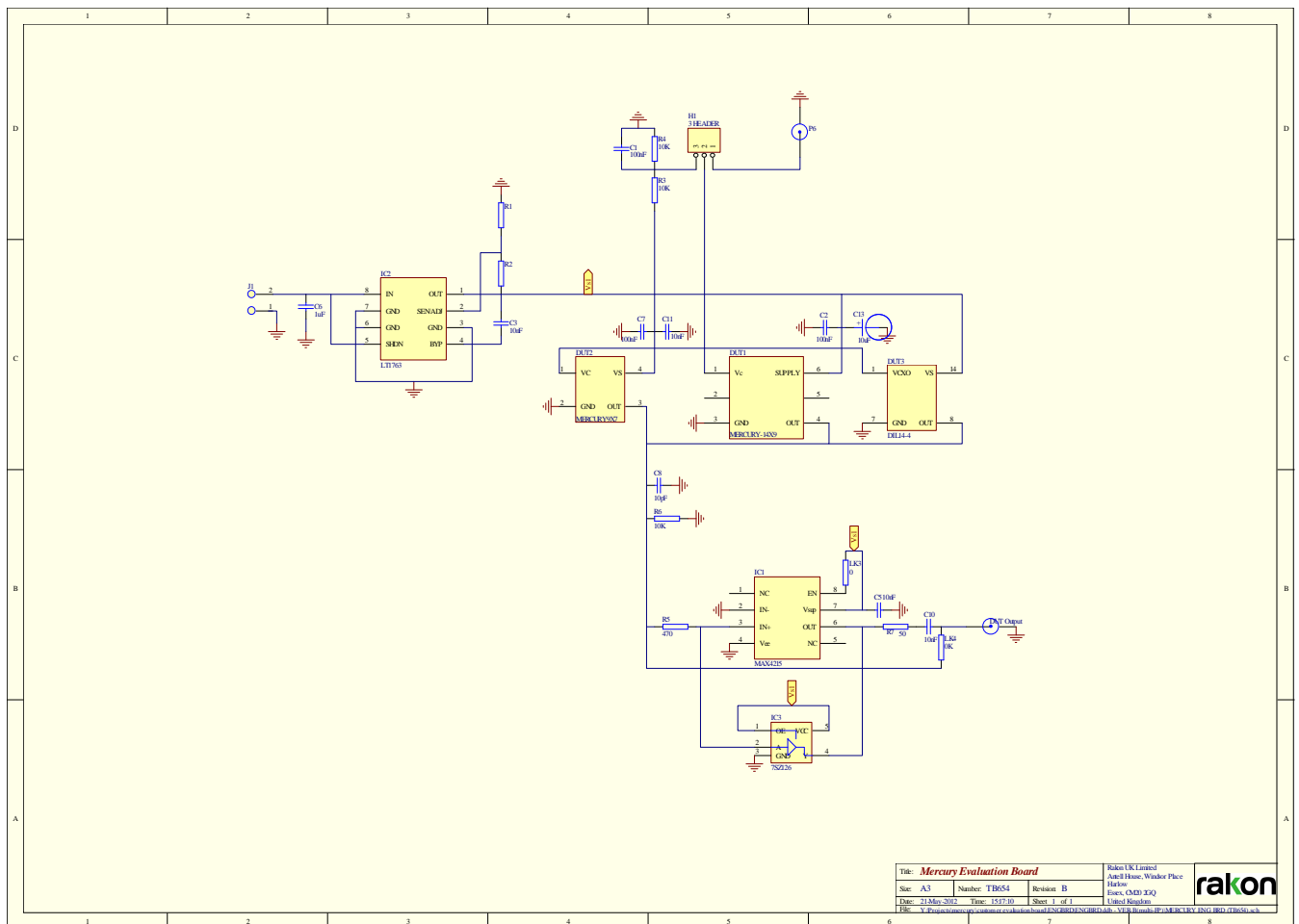


Figure 2 Board Schematic

### 2.6 DEVICE UNDER TEST Packages

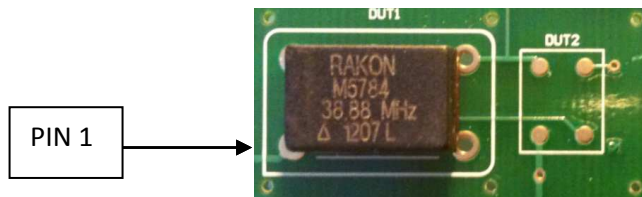
The board can accommodate 9 x 7, 14 x 9 and DIL package format options. Draft covers are available for the 9 x 7 and 14 x 9 type packages only. Samples in 9x7 and the 14x9 formats are supplied soldered to the board as shown (1 & 2) below. Sample devices in DIL format can be soldered directly to the board or alternatively plugged into a 4 x 0.5mm sockets (3).

The DUT1 (DIL) position is suitable for an adaptor board that can accommodate other test socket or device package outlines, example is shown below (4).

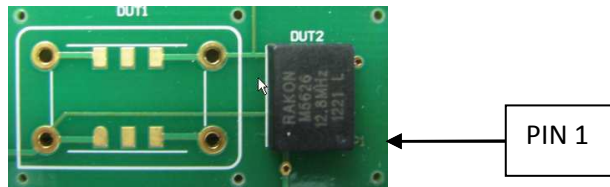


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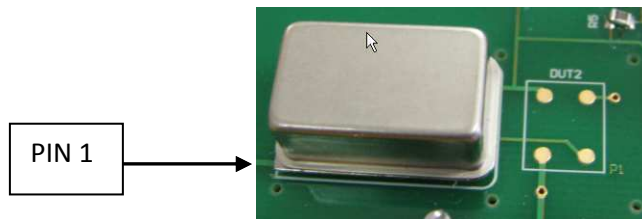
1. 14x9



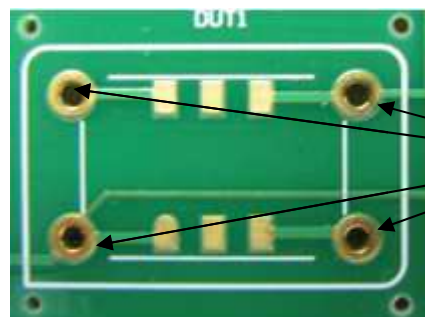
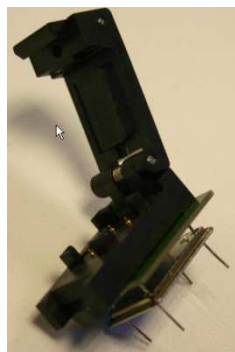
2. 9x7



3. DIL



4. An example of a 9x7 or a 14x9 Socket DIL'ed base can be mounted when a 4 x 5.00mm socket connectors are inserted in the via's shown below.







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### 2.7 Mercury Evaluation Board Layout and Parts Lists

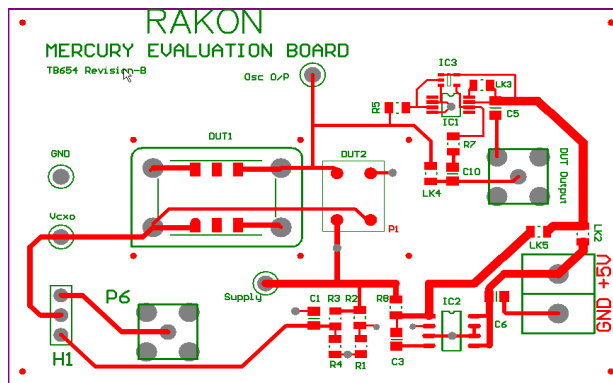


Figure 1 EVB Layout (Front)

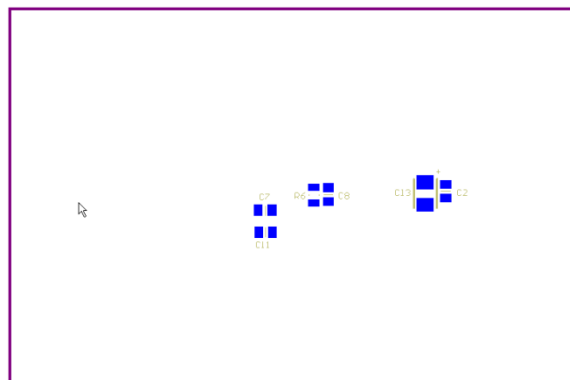


Figure 2 EVB Layout (Back)



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Table 1 Part List

Designator	HCMOS DUT	Clipped Sine DUT	Direct Coupled DUT	Part Type
IC1	X	✓	X	MAX4215
IC2	✓	✓	✓	LT1763
IC3	✓	X	X	7SZ126
H1	✓	✓	✓	3 Way HEADER
B1*	✓	✓	✓	Terminal Block
C6	✓	✓	✓	1uF
C13	✓	✓	✓	10uF C
C8	✓	✓	✓	10pF
C11	✓	✓	✓	10nF
C3	✓	✓	✓	10nF
C10	Link	✓	X	10nF
C5	✓	✓	✓	100nF
R1	✓	✓	✓	100K
R2	✓	✓	✓	169K
R6	✓	✓	✓	10K
R3	✓	✓	✓	10K
R4	✓	✓	✓	10K
C2	✓	✓	✓	100nF
C1	✓	✓	✓	100nF
C7	✓	✓	✓	100nF
LK4	X	X	✓	0 OHM
LK5	✓	✓	X	0 OHM
LK2	X	X	X	
R5	Link	0 ohm	X	
R7	Link	50 ohm	X	
R8	✓	✓	✓	0 OHM
LK3	X	✓	X	0 OHM
DUT OUTPUT	✓	✓	✓	Molex SMA
P6	✓	✓	✓	Molex SMA
M3x8mm*	✓	✓	✓	Nylon Spacer
TB654	✓	✓	✓	Board

\* Not suitable for reflow solder assembly

## 2.8 Mercury Evaluation Board Operating Ratings

Supply Voltage 5V ± 10%

Operating Temperature Range -40 / 85°C

External VCXO Voltage In accordance with device data sheet specification

**Important Note: Current and power consumption measured on the evaluation board may exceed product data sheet specification due to additional current needed for buffer circuitry and load.**

### End of Document