

To our customers,

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Renesas Electronics Corporation

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# Renesas Starter Kit LCD Application Board V2

User's Manual

Renesas Starter Kit

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# Chapter 1. Preface

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## Glossary

CPU	Central Processing Unit	E8A	E8a On-chip debugger module
HEW	High-performance Embedded Workshop	LCD	Liquid Crystal Display
PC	Program Counter	RSK	Renesas Starter Kit
RSO	Renesas Solutions Organisation	RTE	Renesas Technology Europe Ltd.

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## Chapter 2. Purpose

This RSK Application Board is an evaluation tool for Renesas microcontrollers with an LCD driver interface. It is used in conjunction with the RSK for the microcontroller to be evaluated.

Features include:

- Simple mounting connections for LCD to fit on top of RSK.
- Interface to standard RSK LCD expansion connector and RSK expansion connections.
- LCD is powered straight from the MCU, requiring no extra connections
- 176 segment display, consisting of:
  - Large 3 digit numerical display, with decimal point
  - 5 digit numerical display, with decimal point & clock colon
  - 6 digit alphanumerical display
  - 4 bar battery gauge, and 6 bar graph
  - Day of the week indicators
  - 17 miscellaneous symbols

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# Chapter 3. Board Layout

## 3.1. Component References

The following diagram shows the component references for the board.

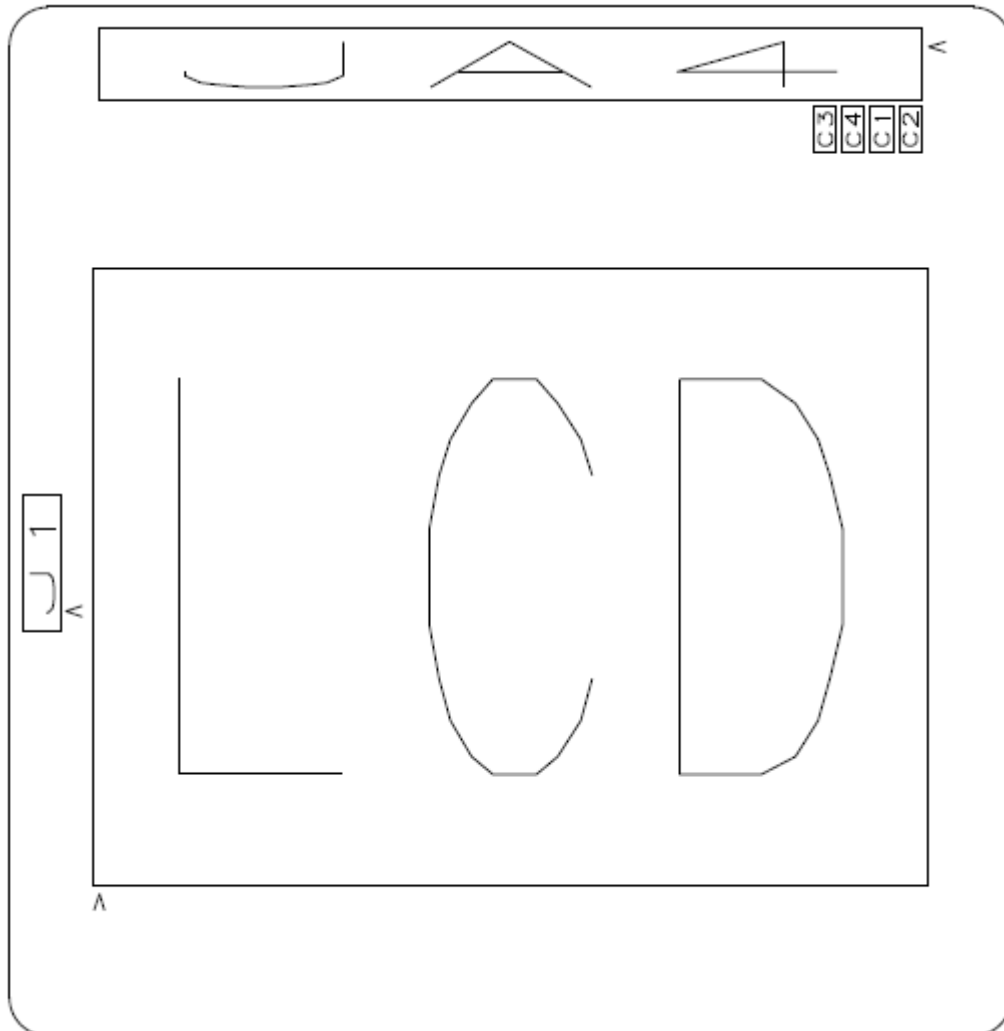


Figure 3-1: Component References

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## 3.2. Board Component functions

The following diagram the shows the functions of the components on the board.

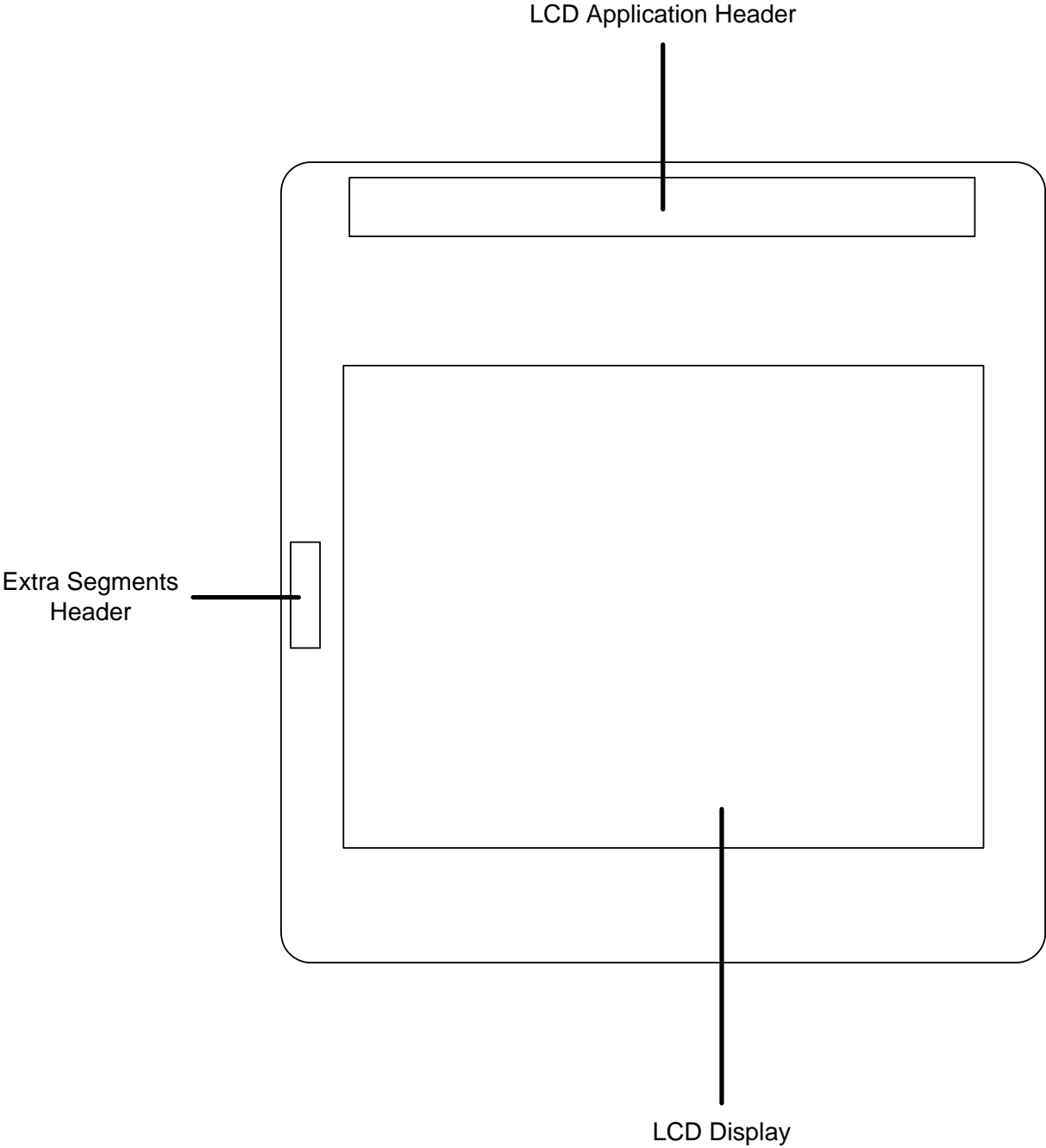


Figure 3-2: Board Layout

### 3.3. Board Dimensions

The following diagram gives the board dimensions and connector positions. All through hole connectors are on a common 0.1" grid for easy interfacing.

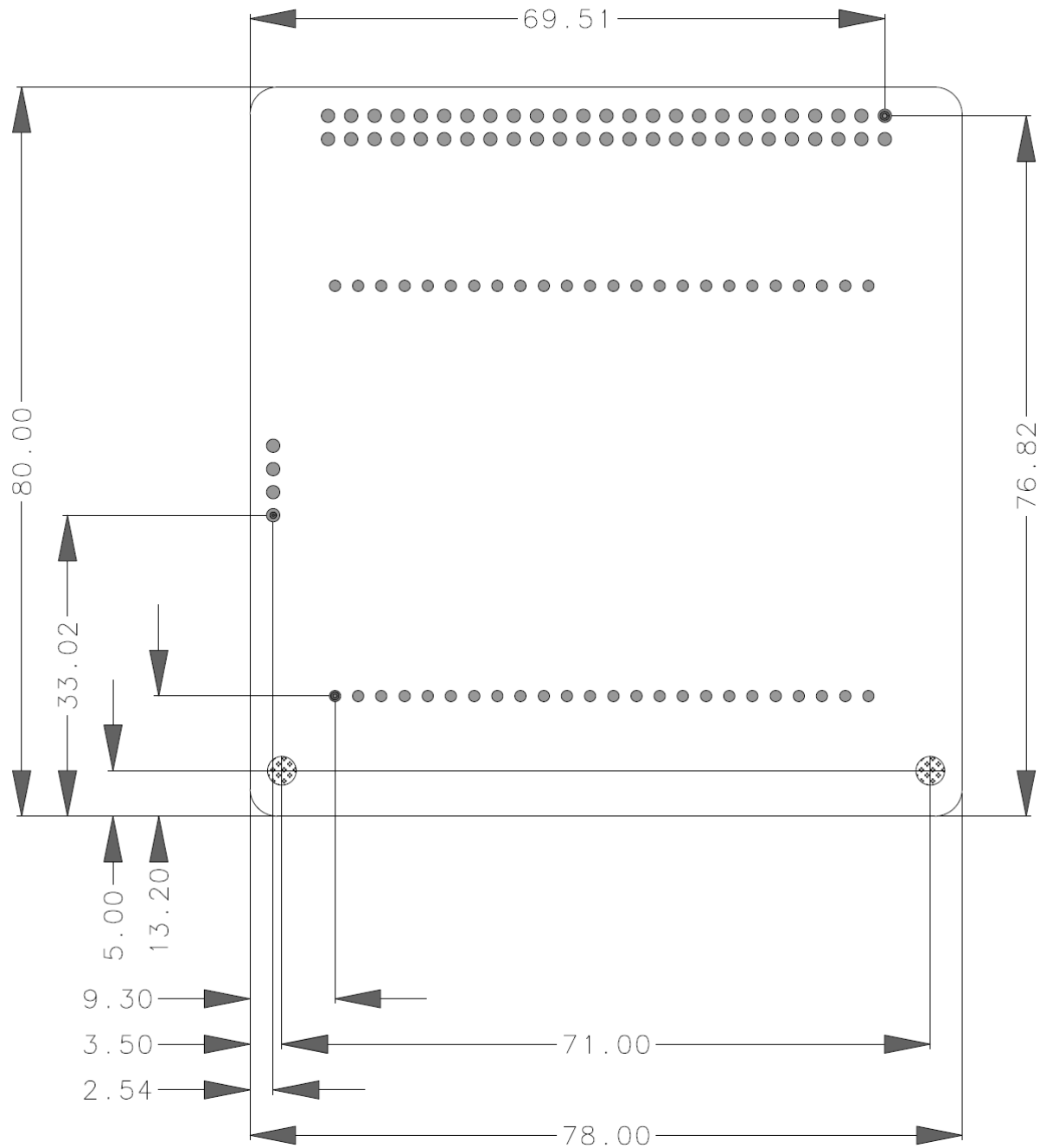


Figure 3-3 : Board Dimensions

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# Chapter 4. Installation & Specifications

## 4.1. Assembly and Interfacing

The LCD application board is fitted with a 50 way header marked as 'JA4' and RSK board is fitted with a 50 way socket marked as 'JA4'. The nylon pillars should be screwed onto the LCDAPPV2 board via the two wholes located at the bottom of the PCB. The LCD Applications board should plug into the fitted socket on the topside of the RSK. Please refer to figure 4-1 for further details regarding assembly, and 4-2 for fitting details.

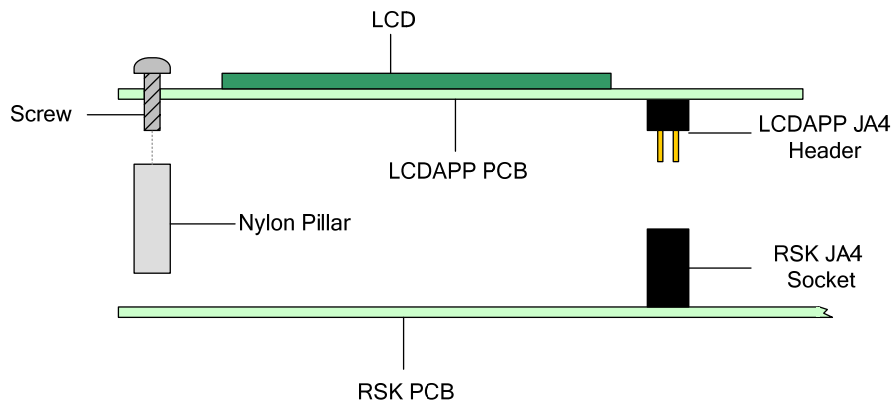


Figure 4-1: Assembly Diagram

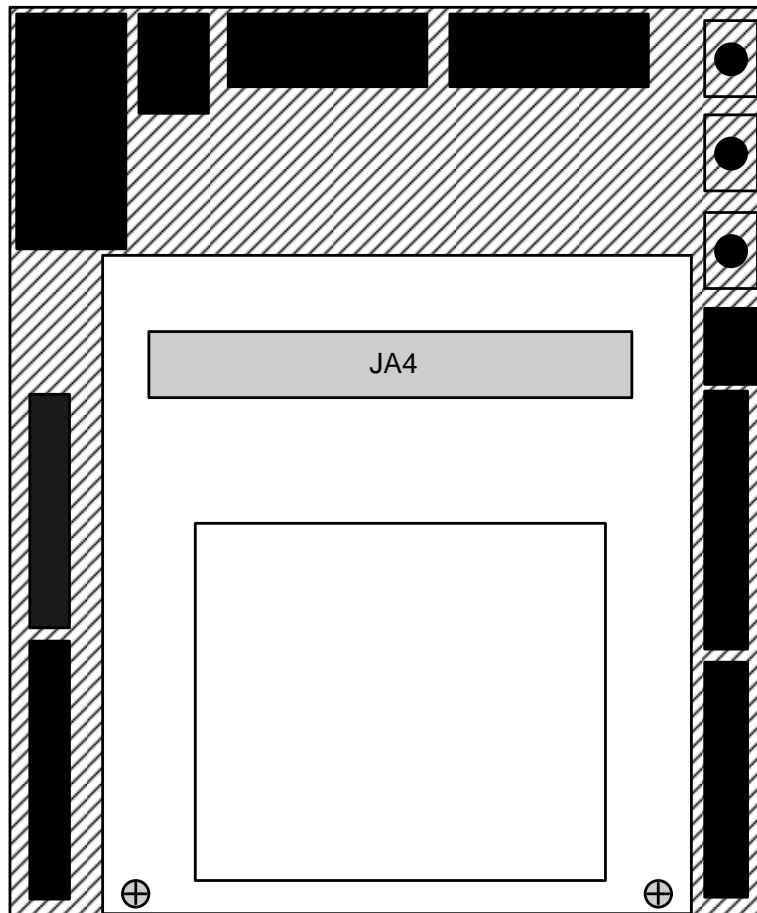


Figure 4-2: Board Fitting Diagram



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# Chapter 5.Headers

## 5.1. LCD Application Header

Due to technical limitations, the connection between the LCDAPPV2 and RSK devices does not preserve net names. The header details are listed here, and should be used as a lookup table when attempting to access specific segments on the LCDAPPV2 board manually.

JA4					
Pin	Generic Header Name	LCDAPPV2	Pin	Generic Header Name	LCDAPPV2
1	V1	V1	2	V2	V2
3	V3	V3	4	V4	V4
5	GROUND	GND	6	GROUND	GND
7	COM1	COM1	8	COM2	COM2
9	COM3	COM3	10	COM4	COM4
11	SEG1	SEG3	12	SEG2	SEG4
13	SEG3	SEG5	14	SEG4	SEG6
15	SEG5	SEG7	16	SEG6	SEG8
17	SEG7	SEG9	18	SEG8	SEG10
19	SEG9	SEG11	20	SEG10	SEG12
21	SEG11	SEG13	22	SEG12	SEG14
23	SEG13	SEG15	24	SEG14	SEG16
25	SEG15	SEG17	26	SEG16	SEG18
27	SEG17	SEG19	28	SEG18	SEG20
29	SEG19	SEG21	30	SEG20	SEG22
31	SEG21	SEG23	32	SEG22	SEG24
33	SEG23	SEG25	34	SEG24	SEG26
35	SEG25	SEG27	36	SEG26	SEG28
37	SEG27	SEG29	38	SEG28	SEG30
39	SEG29	SEG31	40	SEG30	SEG32
41	SEG31	SEG33	42	SEG32	SEG34
43	SEG33	SEG35	44	SEG34	SEG36
45	SEG35	SEG37	46	SEG36	SEG38
47	SEG37	SEG39	48	SEG38	SEG40
49	SEG39	SEG41	50	SEG40	SEG42

Table 7-1: JA4 LCD Expansion connector

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## Chapter 6. Modifications

### 6.1. Using the Unconnected Segments

Due to limitations in the LCD Application Header (JA4), 4 of the LCD segment pins have been disconnected. The pins unconnected are 5, 6, 47 & 48. They can however be accessed via J1 on the LCDAPPV2 board. By connecting the pins to unused LCD segment pins on the RSK, unsupported segments can be used.

### 6.2. Capacitors

Pads are supplied to allow 0603 capacitors to be placed on the LCD drive voltages V1 – V4 (Components C1, C2, C3, C4 marked DNF)

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## Chapter 7. Additional Information

For details on how to use High-performance Embedded Workshop (HEW), refer to the HEW manual available on the CD or from the web site.

Online technical support and information is available at: [http://www.renesas.com/renesas\\_starter\\_kits](http://www.renesas.com/renesas_starter_kits)

### Technical Contact Details

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General information on Renesas Microcontrollers can be found on the Renesas website at: <http://www.renesas.com/>

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