Support Group Application Note
Number: 259
Issue: 0.07
Author:Dean Murphy

Acorn

Choosing SIMMs for use with the Acorn Risc PC and A7000

Applicable Hardware :	Acorn Risc PC Acorn A7000	Related Application Notes:	None

Support Group
Acorn Computers Limited
Acorn House
Vision Park
Histon, Cambridge
CB4 4AE

Memory modules (SIMMs) for the Acorn Risc PC and A7000

Introduction

This document has been written as a specification to help purchasers of SIMMs for the Risc PC and A7000 ensure that the correct devices are used. The document is by it's very nature quite technical, this cannot be avoided.

The Acorn Risc PC was the first of Acorn's ARM based RISC OS platforms to allow the use of SIMMS (Single-In-Line Memory Modules). The Risc PC has Two SIMM slots and any combination of 32bit SIMMs can be used. On the A7000, only one SIMM slot is available, the main DRAM being present on the PCB. On either machine, the operating system will always need at least 2 MBytes of DRAM to operate.

Overview

- The SIMM must have a 72 pin connector with 32 bit data (36 bit DRAM devices should not be used as they may exceed bus loading).
- The SIMM must not have more than 16 devices (DRAM chips) on board.
- Devices must be 70ns (or faster).
- Devices must be **Square Array** (Described later in this document)**.**
- Devices must support 'fast paged mode' and CAS before RAS refresh.

Memory Sizes

2 MBytes (512K * 32bits)	
4 MBytes (1M * 32bits)	
8 MBytes (2M * 32bits)	
16 MBytes (4M * 32bits)	
32 MBytes (8M * 32bits)	
64 MBytes (16M * 32bits)	When available
128 MBytes (32M * 32bits)	When available

On the Risc PC, either or both SIMM sockets may be used, with any mix of sizes provided a minimum of 2MBytes is fitted.

NOTE: The Risc PC was designed to take up to two SIMMS. All Risc PCs are shipped with only one slot populated. When the A7000 is shipped, the DRAM is soldered directly to the board leaving the single SIMM slot free.

Detailed Specifications

There are a number of other specifications that are required, although many SIMMs meet them:

- The maximum physical size is 108mm long, 36.2mm (Risc PC) or 30.0mm (A7000) wide and 9.4mm thick

- The DRAM must use the same number of bits for both row and column address (square array) ie.

Ra<8:0>	for 2 MByte
Ra<9:0>	for 4 or 8 MByte
Ra<10:0>	for 16 or 32 MByte.

There are a few 16 MByte and 32 MByte SIMMs that use Ra<11:0> for the row address and Ra<9:0> for the column address. Although these parts are sometimes sold for use with Apple equipment, they are non-standard, and are unsuitable for use with the Acorn Risc PC or A7000 as they will appear to the computer as a 4 or 8 Mbytes.

As a guide the Hitachi 16 & 32 MByte SIMMs use 5117400 parts which are correct. Some makes of 16/32 MByte SIMM use unsuitable 5116400 parts.

Another way of differentiating between the two types of SIMM is the number of refresh cycles required. The correct parts used in the 16 & 32 MByte SIMMs require 2048 refresh cycles, where as the incompatible parts (with an additional address line Ra<11:0>) require 4096 refresh cycles.

- Acorn do not recommend the use of SIMMs that are made from more than 16 memory devices (eg 8 on each side) as they are likely to exceed the maximum load specification:

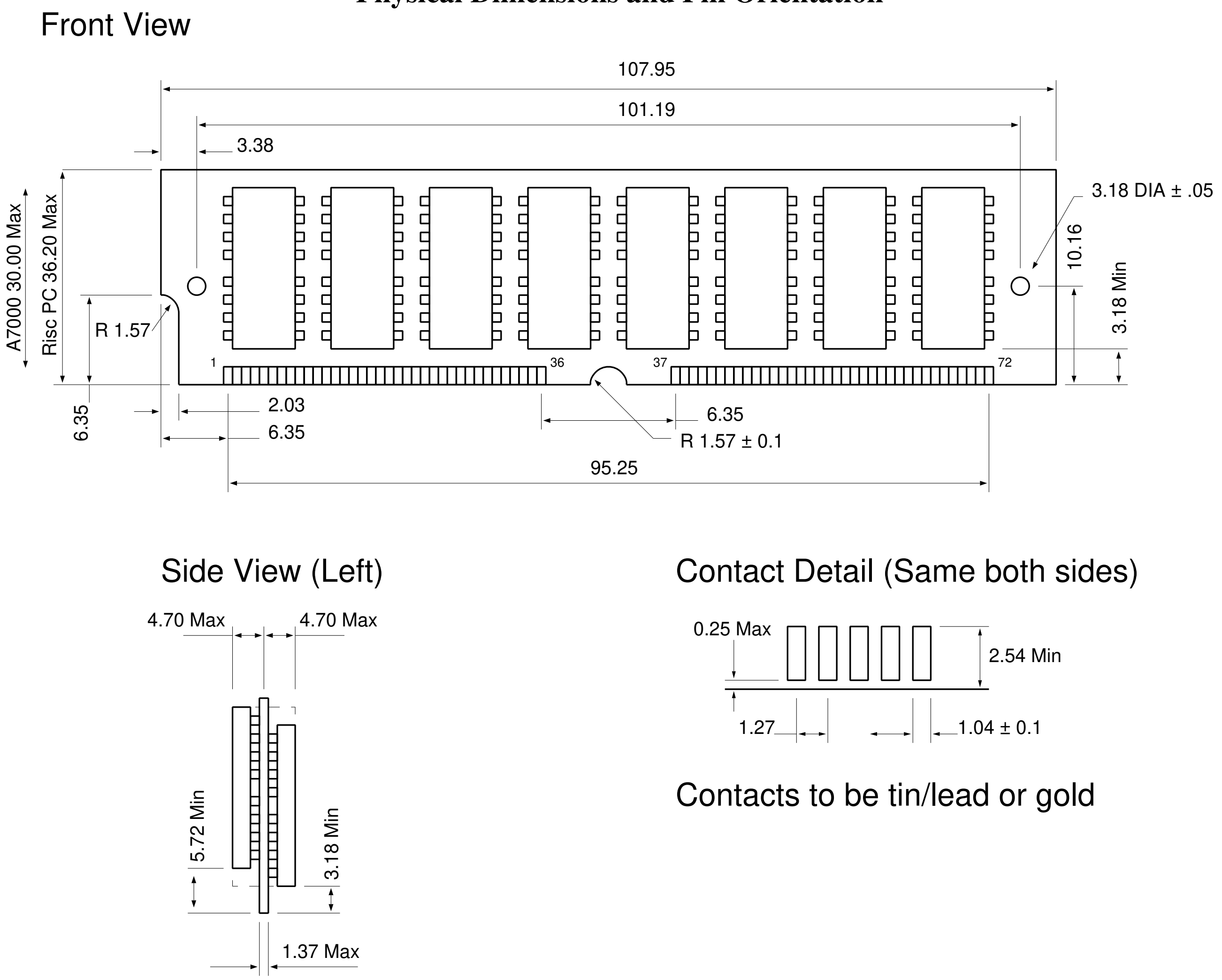
Address	128pF
WE	140pF
CAS or RAS	59pF
Data bus	29pF

Older 'composite' SIMMs that are made from more than 16 devices should be avoided.

- The DRAM devices used on the SIMM must support 'fast page mode' and 'CAS before RAS' refresh

- The 4 ID bits on pin 67, 68, 69 & 70 are not used, and so may be in any state on the SIMM. However, non-standard SIMMs with 5 (or more) ID bits should not be used. (eg Samsung 32 MByte KMM5328100)

Physical Dimensions and Pin Orientation



All dimensions in mm
Tolerances: ± 0.13 unless specified

The number & orientation of ICs on this module is for guidance only

Checklist for purchasing DRAM:

- Is the SIMM 72 pin with 32 bit data?
- Is the speed 70ns or faster?
- Is the physical size correct?

  The SIMM **must** be 108mm long, 36.2mm (or 30.0mm on A7000) wide, 9.4mm thick and have clearances of 3.18mm and 5.72mm respectively for the front and back of the SIMM between the DRAM devices and the bottom of the connector.
- Is the DRAM a square array?
- Does the SIMM contain 16 or less devices?
- Do the DRAM devices support 'fast page mode' and 'CAS before RAS' refresh?

SIMM Suppliers

Below are the names of some suppliers who supply Risc PC and A7000 compatible SIMMs.

Atomwide Ltd. (Acorn Developer)
7 The Metro Centre
Bridge Road
Orpington
Kent
BR5 2BE

TEL: 0689 838852

Simtec Electronics (Acorn Developer)
Avondale Drive
Tarleton
Near Preston
Lancashire
PR4 6AX

TEL: 0772 812863

Please note that when ordering SIMMs from the following suppliers, you may need to quote the SIMM specification.

Comptex Electronics Ltd.
16 Cranbrook Rd.
Thornton Heath
Surrey
CR7 8PP

TEL: 081 6538802

Performance Direct
27 Station Road
Egham
Surry
TW20 9LD

TEL: 0784 477477

Kingsway
18 Foxfield Close
Northwood
Middlesex
HA6 3NU

TEL: 0923 836473

Memory Direct
31 - 33 Grosvenor Road
Aldershot
Hants
GU11 3DP

TEL: 0252 316060

Richnight Ltd.
106 Brighton Road
Purley
Surrey
CR8 4DB

TEL: 081 6684199