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# Designing in Split Power Supply Support for AT94KAL/AX and AT94SAL/AX Devices

## Features

- Outlines AT94K/AT94S Power Supply Setup Required for the AX Device
- Explains the Difference between Core and I/O Voltages
- Provides Pin Locations for the AT94KAX/AT94SAX Split Power Supply

## Introduction

The AT94K Field Programmable System Level Integrated Circuit (FPSLIC™) and the AT94S Secure FPSLIC exists in two different power families, the AL and AX. The AL Family is a 3.3-volt device on a 0.35 $\mu$  process, while the AX Family is a 1.8-volt device on a 0.18 $\mu$  process. The primary difference between the two families, aside from the process, is that the AX device requires a split power supply.

## Description

On the AL device, both the FPSLIC core and FPSLIC I/Os are powered from a single 3.3V supply. Furthermore, the AL device also supports 5V-tolerant I/Os due to the thick oxide coating being used. However, on the AX device a split power supply provides separate supplies for the FPSLIC core and FPSLIC I/Os. On the AX device,  $V_{DD}$  is 1.8V, powering the FPSLIC core, while  $V_{CC}$  is 3.3V, which powers the 3.3V-tolerant I/Os. The split power supply became necessary on the AX device because the AX FPSLIC core operates at a much lower voltage than the FPSLIC I/O.

On the target system both voltages must be supplied. There is no voltage regulator within the FPSLIC device to implement the split power. This becomes important for customers who are currently designing with the AT94KAL/AT94SAL Family with intentions of migrating designs to the AT94KAX/AT94SAX Family. This application note provides the  $V_{DD}$  and  $V_{CC}$  pin locations (see Table 1 and Figure 1 through Figure 5) for the AT94KAX/AT94SAX Family for the PC84, VQ100, TQ144, PQ208 and BG256 packages.



**Programmable  
SLI  
AT94K/AT94S  
Series**

**Application  
Note**

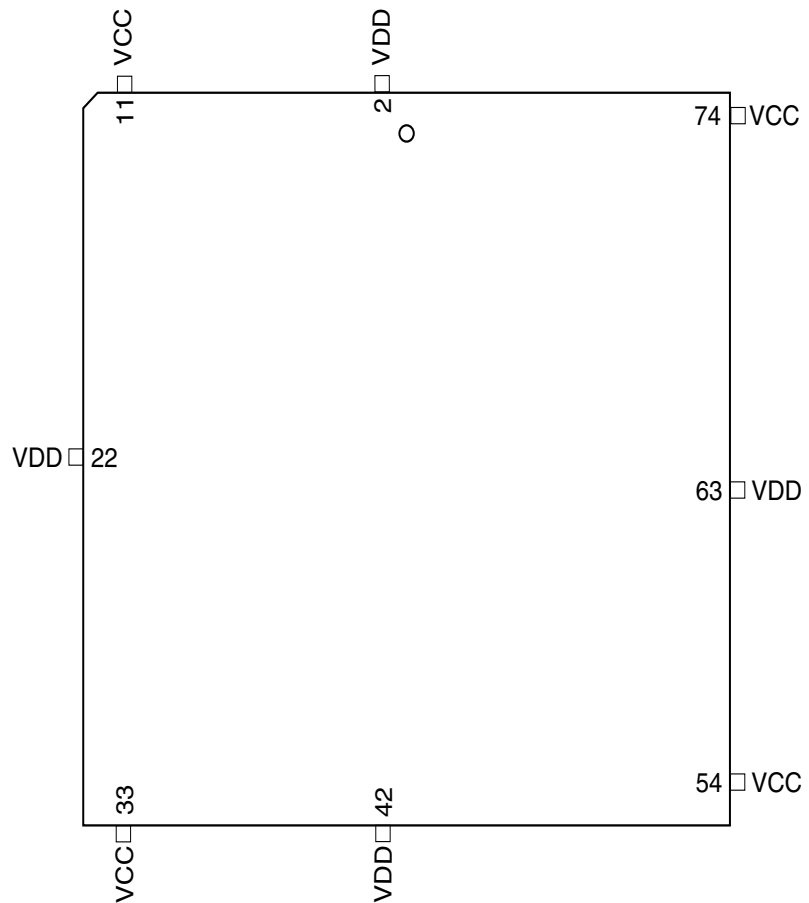
Rev. 2308B-11/01



**Table 1.** AT94KAX/AT94SAX Split Power Supply Pin Locations

Package	VCC	VDD
PC84	11, 33, 54, 74	2, 22, 42, 63
VQ100	25, 51, 75, 100	12, 37, 63, 89
TQ144	37, 73, 108, 144	18, 54, 90, 128
PQ208	55, 106, 154, 205	26, 78, 130, 183
BG256	B2, G8, G13, H10, T3, K13, L3, M10, R14, T7	D14, E7, F12, G3, H9, K10, L13, M13, P4, T9

**Figure 1.** AT94KAX-PC84 Split Power Supply Diagram



# Split Power Supply for AT94K/AT94S Series Devices

Figure 2. AT94KAX-VQ100 Split Power Supply Diagram

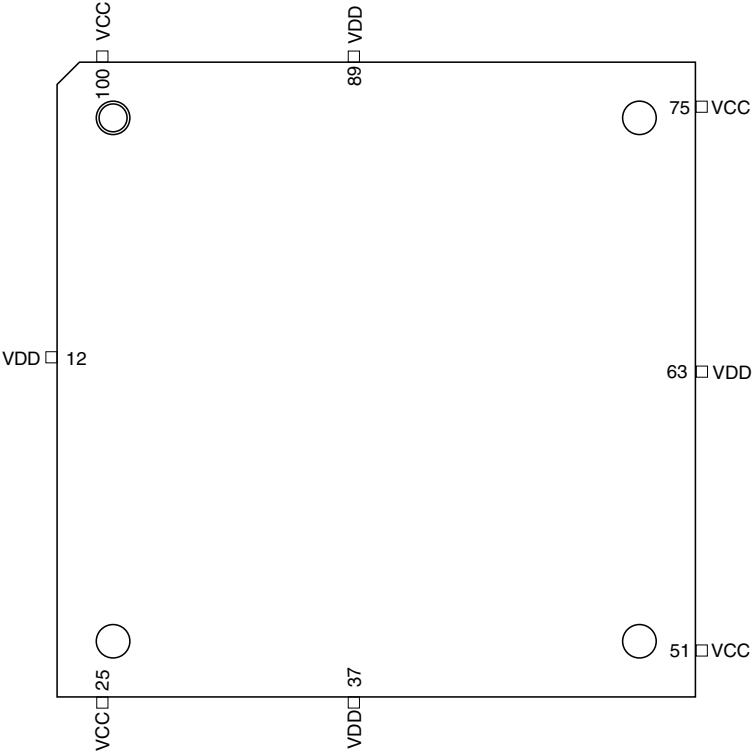
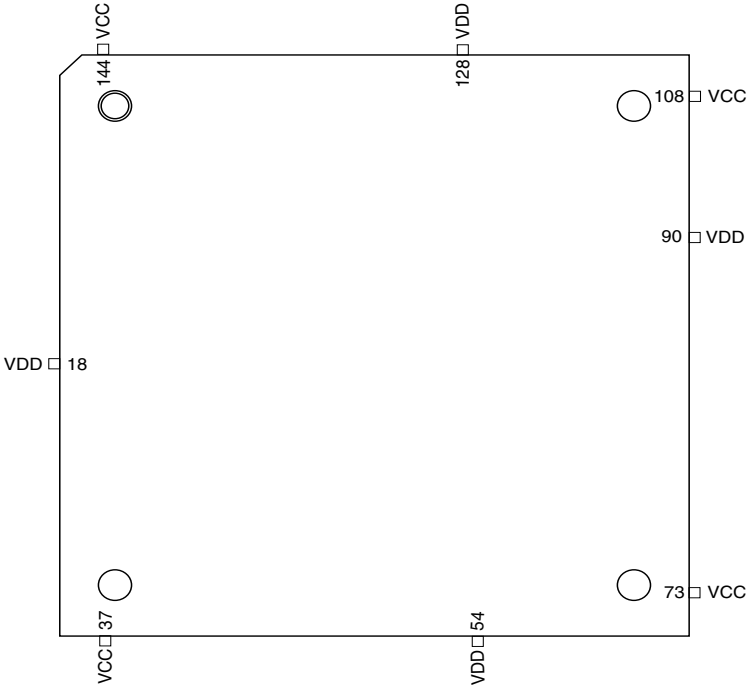
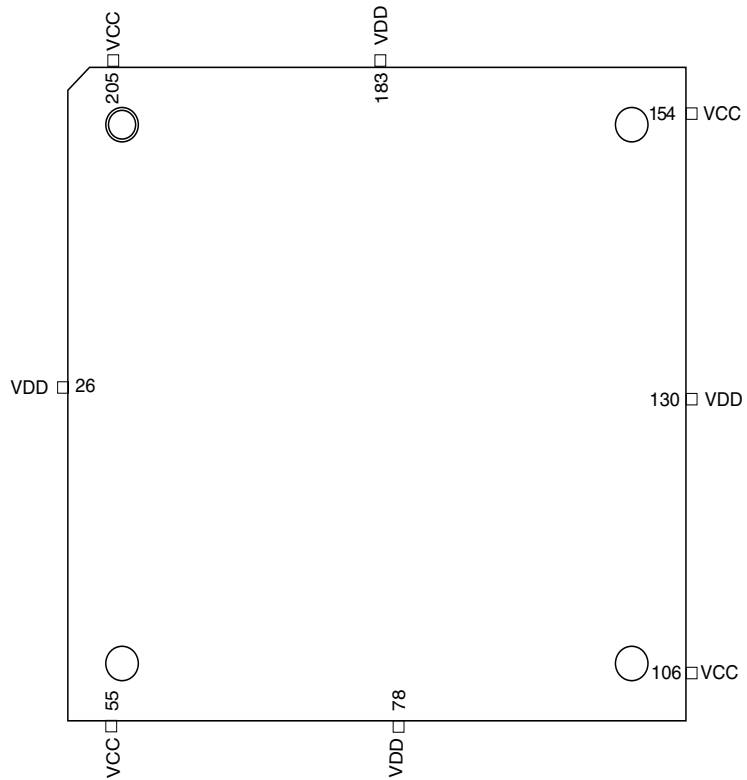


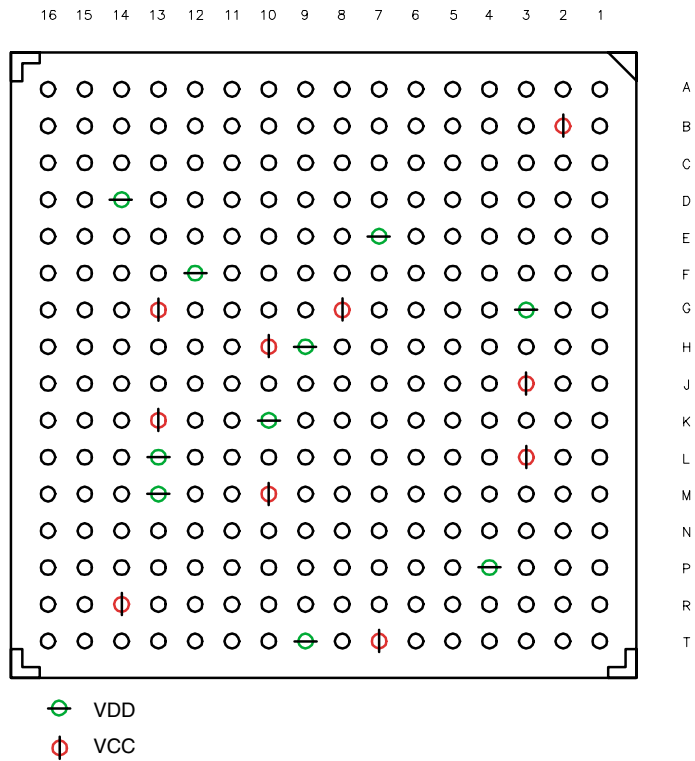
Figure 3. AT94KAX-TQ144 Split Power Supply Diagram



**Figure 4. AT94KAX-PQ208 Split Power Supply Diagram**



**Figure 5. AT94SAX-BG256 Split Power Supply Diagram**





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