

1. General Description

ADD1022 is a PRIME (Powerline-Related Intelligent Metering Evolution) compliant ASIC specifically designed for PLC Base Nodes implementation. Systems using this ASIC support both mono-phase and multi-phase PLC injection. Mono-phase injection is achieved by means of a single ADD1022 ASIC, whereas several ADD1022 can be combined to achieve multi-phase injection based on ADD's MIMO technology.

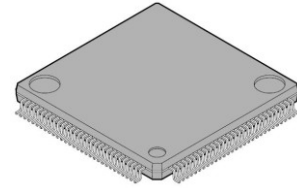
The combination of multi-phase injection and ADD's MIMO technology increases PRIME Base Nodes' performance, resulting in outstanding robustness and network coverage.

ADD1022 has been conceived to be easily managed by an external microcontroller by means of an SPI interface. The external microcontroller implements Base Node upper layers (as specified in PRIME) while ADD1022 carries out PHY layer functionalities.

Line Coupling front end design is extremely simplified, bringing off a very low cost B.O.M.

Features:

- Power Line Carrier Modem for 50 and 60Hz mains
- 97-carriers OFDM PRIME compliant
- Baudrate: 21400 to 128600 bps
- Differential BPSK, QPSK, 8-PSK PRIME compliant modulations
- Viterbi decoding and CRC PRIME compliant
- 32Kbytes On-Chip SRAM
- Up to 256Kbytes external SRAM
- AES encryption PRIME compliant
- Automatic Gain Control and signal amplitude tracking
- Embedded On-chip DMA's
- Power Supply 3.3v
- Pb-Free and RoHS compliant
- Ambient Temperature Range: -40°C to +85°C



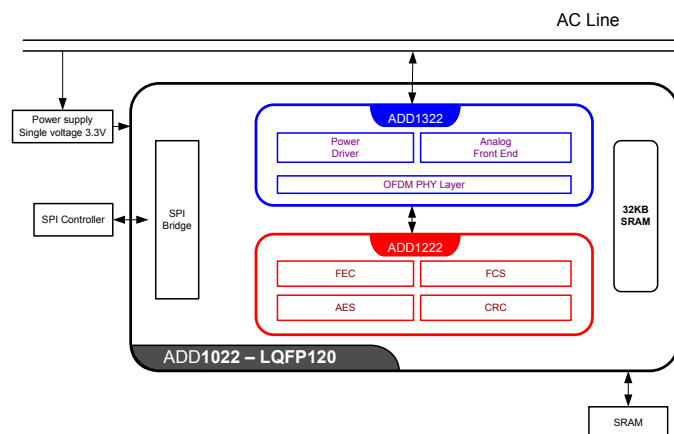
120-pin plastic LQFP
(14 x 14mm)



MARKING DIAGRAM

ADD	=ADD Logo
ADD1022AQF120	=Specific Device Code
00000	=Country of Origin
YYWW	=Year/week code
TTT	=Control Code
LL	=Lead Free Code

**Ordering Code : ADD1022AQF120
Pb-Free**



1.1 Block Diagram

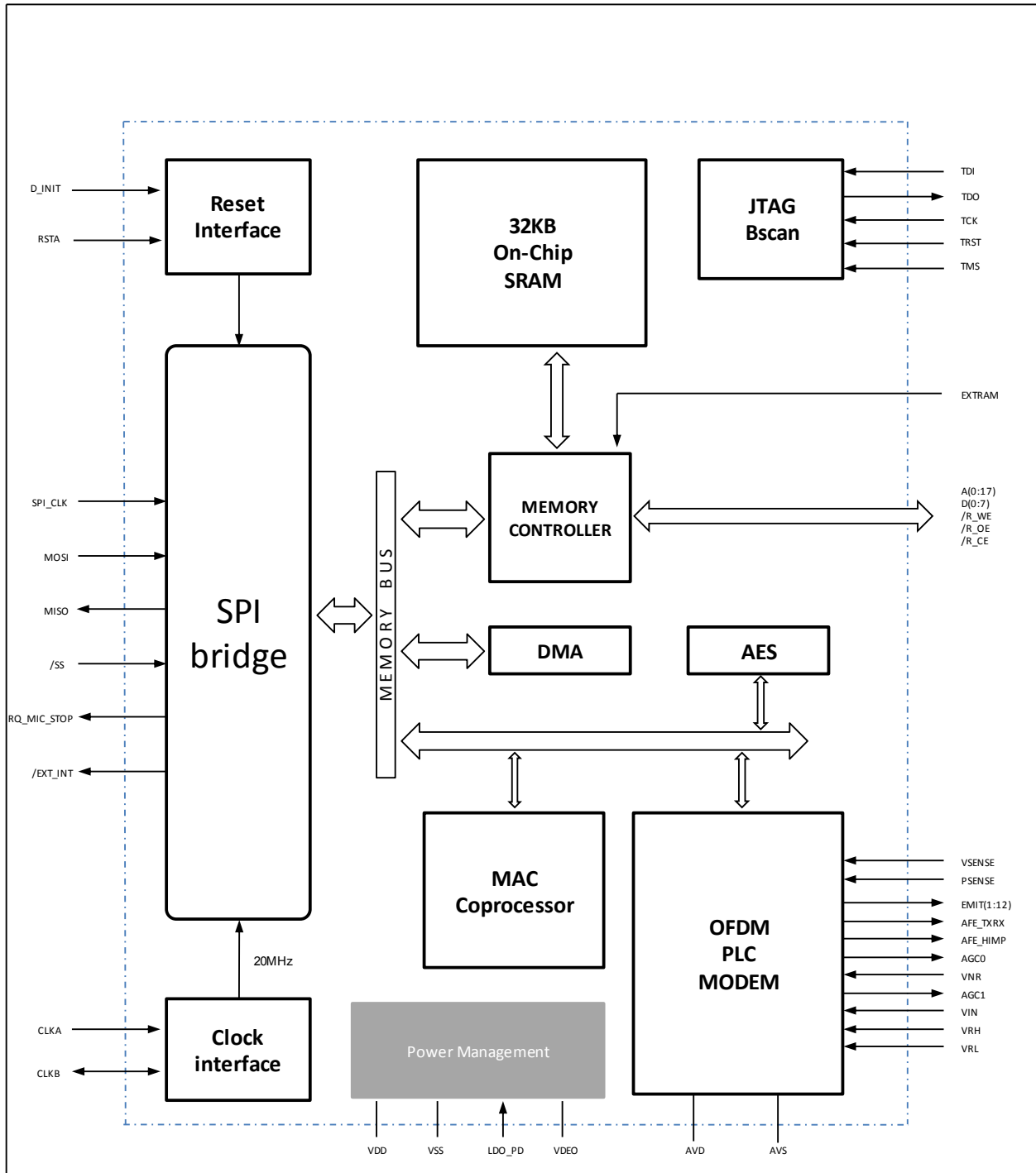


Figure 1. ADD1022 Block Diagram

1.2 Pin Assignment

The following figure illustrates the pinout of the ADD1022 LQFP120 package:

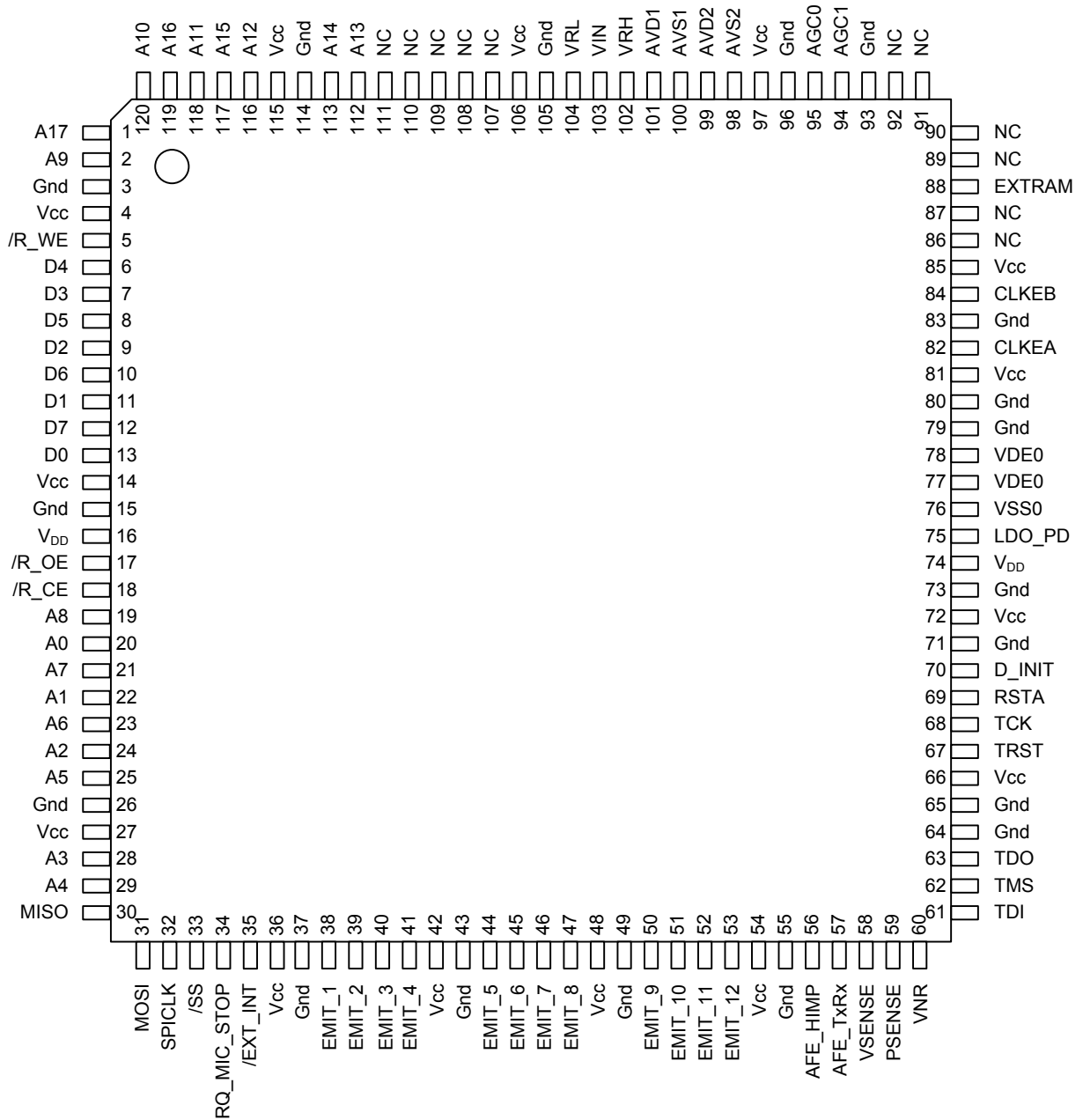


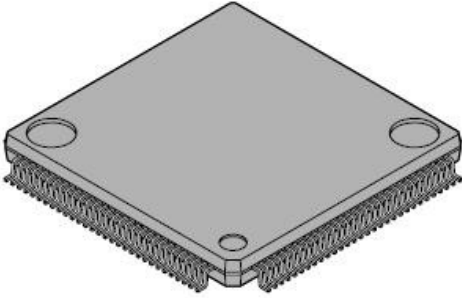
Figure 2. LQFP pin assignment

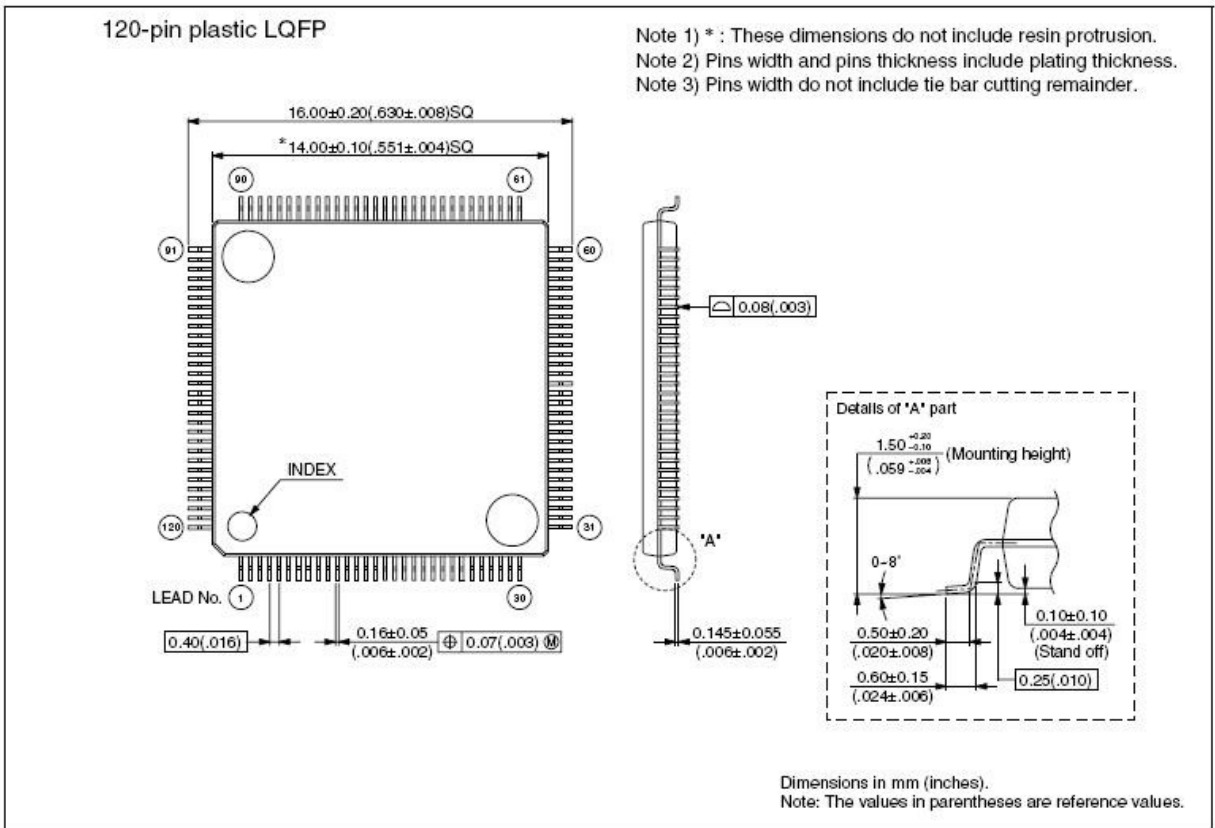
2. Mechanical data

120-pin plastic LQFP (14x14mm) Pb-free, RoHS compliant.

Ambient Temperature Range: -40°C to +85°C.

Ordering Code: **ADD1022AQF120**

<p>120-pin plastic LQFP</p>  <p>(FPT-120P-M24)</p>	Lead pitch	0.40 mm
	Package width × package length	14.0 mm × 14.0 mm
	Lead shape	Gullwing
	Sealing method	Plastic mold
	Mounting height	1.70 mm MAX
	Code (Reference)	P-LFQFP120-14×14-0.40

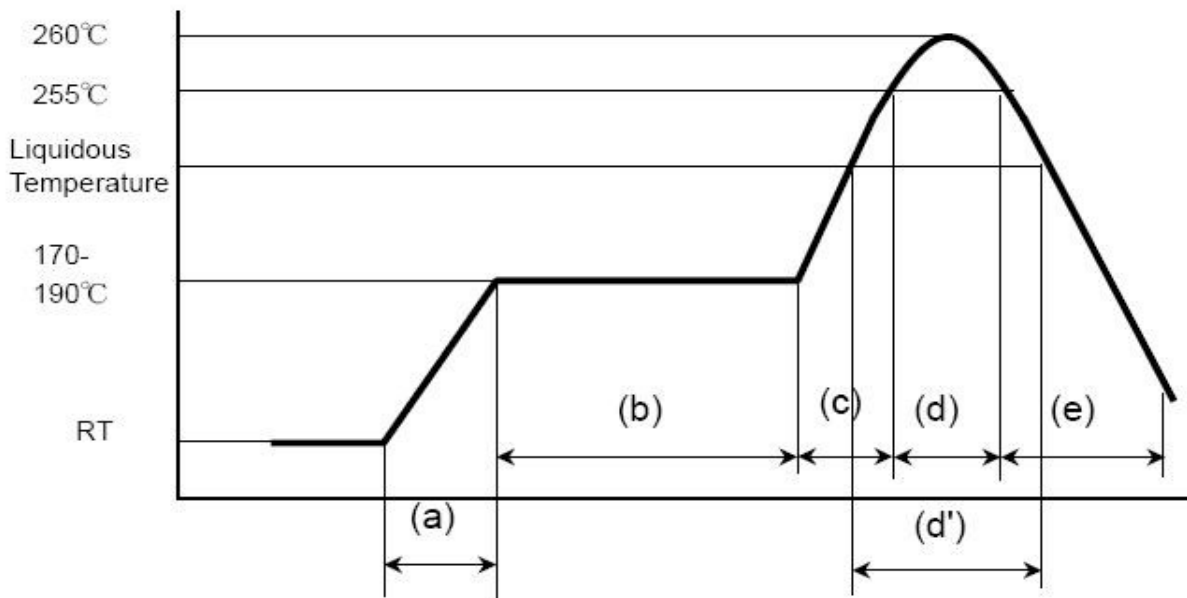


2.1 Recommended mounting conditions

2.1.1 Conditions of Standard Reflow

Items	Contents	
Method	IR(Infrared Reflow) / Convection	
Times	2	
Floor life	Before unpacking	Please use within 2 years after production
	From unpacking to second reflow	Within 8 days
	In case over period of floor life	Baking with 125°C +/- 3°C for 24hrs +2hrs/-0hrs is required. Then please use within 8 days. (please remember baking is up to 2 times)
Floor life condition	Between 5°C and 30°C and also below 70%RH required. (it is preferred lower humidity in the required temp range.)	

Temperature Profile



H rank: 260°C Max

(a) Average ramp-up rate: 1°C/s to 4°C/s

(b) Preheat & Soak: 170°C to 190°C, 60s to 180s

(c) Average ramp-un rate: 1°C/s to 4°C/s

(d) Peak temperature: 260°C Max, Up to 255°C within 10s

**(d') Liquidous temperature: Up to 230°C within 40s or
Up to 225°C within 60s or
Up to 220°C within 80s**

(e) Cooling: Natural cooling or forced cooling

****Temperature on the top of the package is measured***

2.1.2 Manual Soldering

Items	Contents	
Floor life	Before unpacking	Please use within 2 years after production
	From unpacking to Manual Soldering	Within 2 years after production (No control required for moisture adsorption because it is partial heating)
Floor life condition	Between 5°C and 30°C and also below 70%RH required. (It is preferred lower humidity in the required temp range.)	
Solder Condition	Temperature of soldering iron: Max 400°C, Time: Within 5 seconds/pin *Be careful for touching package body with iron	