NEC

Preliminary User's Manual

AB-065PI-64GK, AB-065PI-80GC, AB-065PI-100GF

Application Boards AB-065PI

Hardware

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Preface

Readers

This manual is intended for users who want to understand the functions of the AB-065PI Application Boards.

Purpose

This manual presents the hardware manual of the AB-065PI Application Boards.

Organization

This system specification describes the following sections:

- Hardware overview
- Hardware installation
- Measurement/debug possibility
- Electrical characteristics of the development board
- Electrical target specification of prototype chip

Legend

Symbols and notation are used as follows:

Weight in data notation	:	Left is high-order column, right is low order column
Active low notation	:	n (small letter n before or after signal name)
Memory map address:	:	High order at high stage and low order at low stage
Note	:	Explanation of (Note) in the text
Caution	:	Item deserving extra attention
Remark	:	Supplementary explanation to the text
Numeric notation	:	Binary . . . xxxx or xxx_b Decimal . . . $xxxx_d$ Hexadecimal . . . xxxxH or 0x xxxx

Prefixes representing powers of 2 (address space, memory capacity)

K (kilo): $2^{10} = 1024$

M (mega): $2^{20} = 1024^2 = 1.048.576$

G (giga): $2^{30} = 1024^3 = 1.073.741.824$

Data Type:

Word ... 32 bits

Halfword ... 16 bits

Byte ... 8 bits

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Chapter 1 Introduction

The Application Board AB-065PI is the common solution for the user's target hardware for quick functional tests and experimental applications of the NEC real chip microcontrollers and its development tools (emulators). It connects the device or tool with the clock signal, reset circuit, power supply and interface connectors.
The pin assignment for these connections and the additional user's circuits are free definable by the user, due to the own specification and type of the used microcontroller.
The connection to the real device or tool is realized with the NQPACK-type socket. Depending of the pin number and the footprint three different configurations of the AB-065PI are available:

- AB-065PI-64GK (equipped with NQPACK064SB)
- AB-065PI-80GC (equipped with NQPACK080SB)
- AB-065PI-100GF (equipped with NQPACK100RB)

To the delivery area belongs also the corresponding HQPACK-type socket for the real chip and the YQPACK-type socket for the emulation probe.

1.1 Features:

- prepared power supply connections
- adapted to the typical 0.65 mm pitch devices
- real chip or emulator sockets available
- reset circuit with power-up reset and reset button
- oscillator socket on board
- 8 x multi-SOT-footprint for user's applications
- individual pins prepared for pull-up and pull-down resistors
- DIL-SMD-area for user's applications
- assembled typical interface connectors
- board size: 270 mm x 140 mm

[MEMO]

Chapter 2 General Remarks

2.1 Terminology

Table 2-1: Terminology

Term	Description
Real device	Microcontroller IC, one-chip microcomputer with integrated periphery
Emulator	Development tool consisting of hardware and software for functional reproduction of the real device
Target hardware	hardware connected to the real chip or to emulator, electrical environment of the microcontroller

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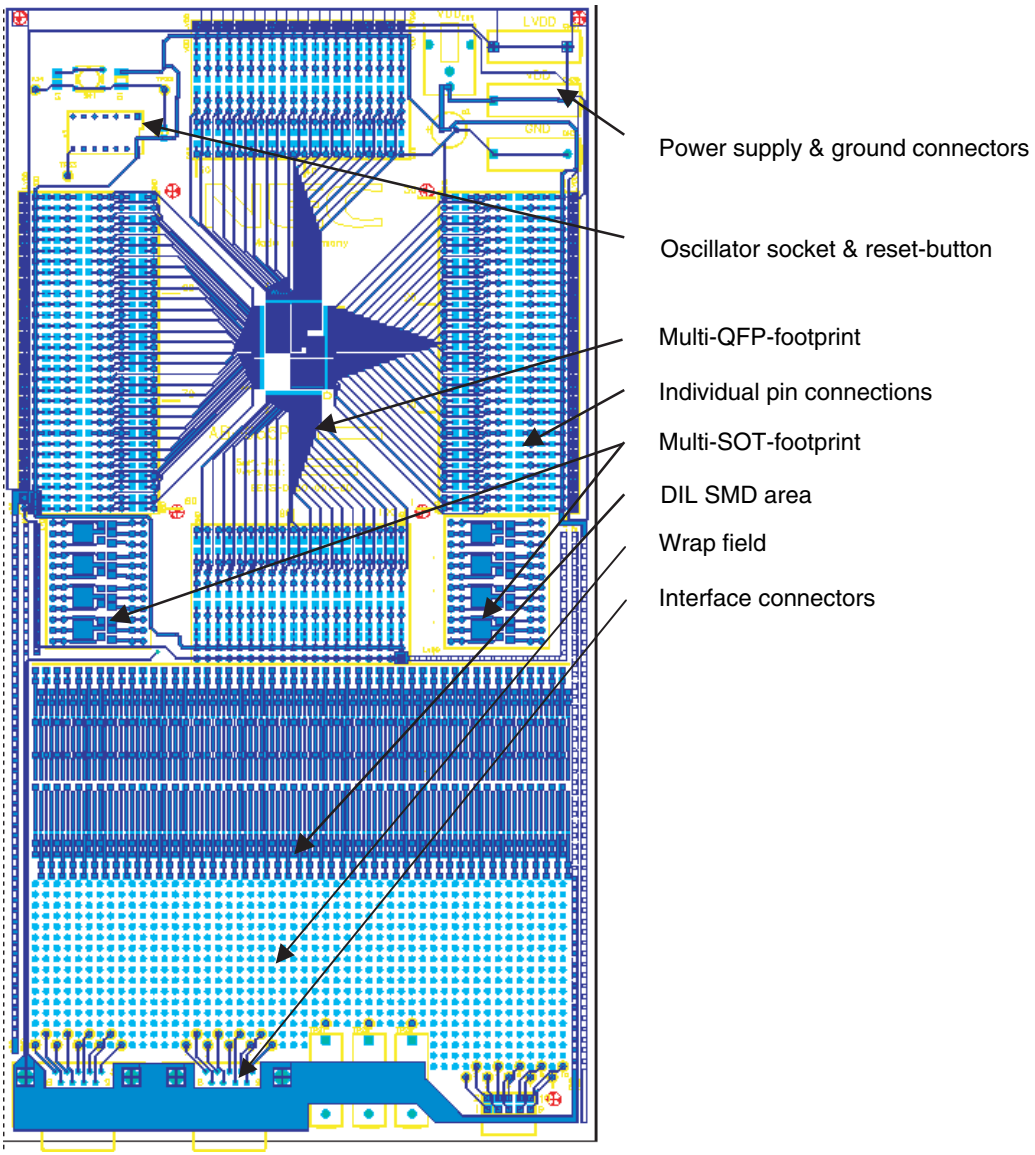
Chapter 3 Outlook of the Application Board

The outlook of the Application Board AB-065PI shows the Figure 3-1.

Figure 3-1: Outlook of the Application Board AB-065PI



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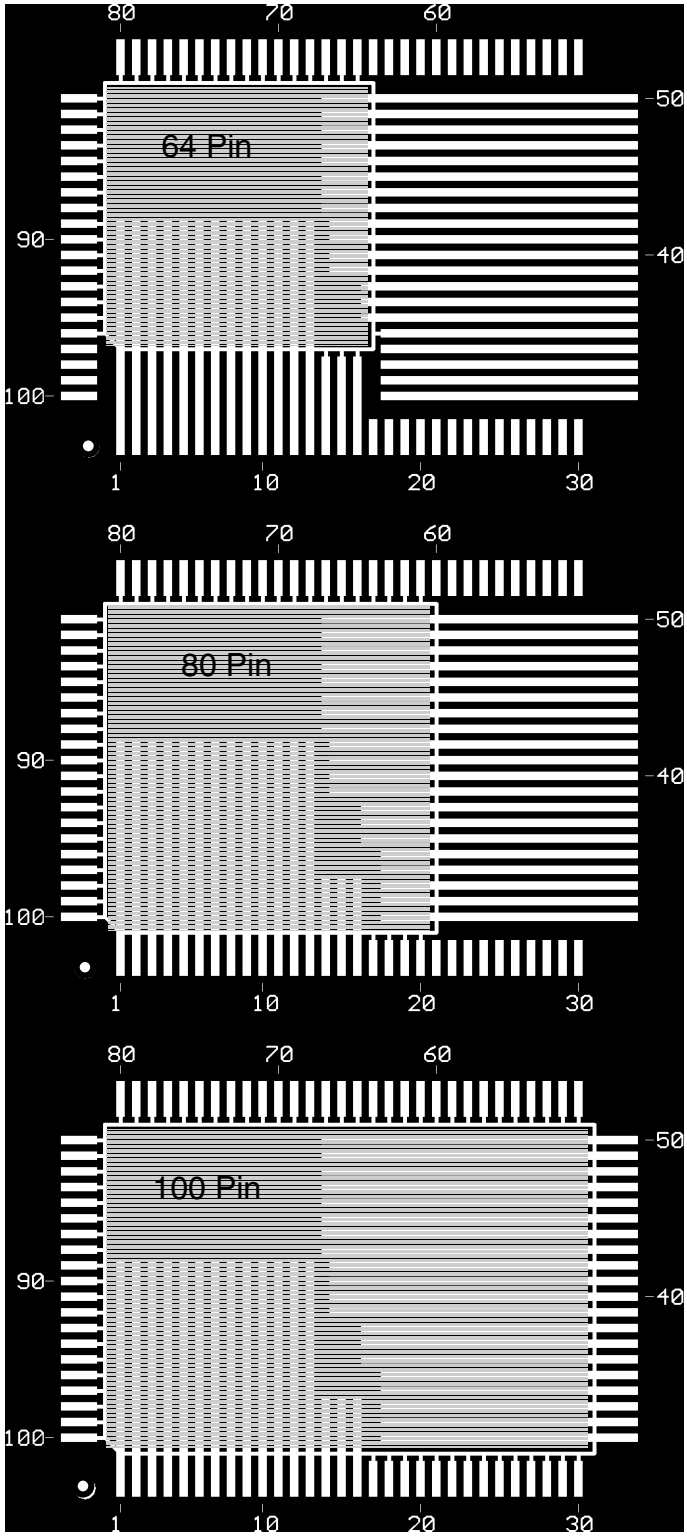
Chapter 4 Multi-QFP-Footprint

The Figure 4-1 shows the connector footprints corresponding to the configuration of the AB-065PI.

Figure 4-1: Types of the NQPACK connectors assembled on the AB-065PI Application Board



Note: Pin 1 marked with ❍.

The allocation of the device pins on the AB-065PI depends of the board configuration:

Table 4-1: Pin assignment on the multi-QFP-footprint (1/2)

Board pins	Socket pins		
	100GF	80GC	64GK
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10
11	11	11	11
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	-
18	18	18	-
19	19	19	17
20	20	20	-
21	21	-	-
22	22	-	-
23	23	-	-
24	24	-	-
25	25	-	-
26	26	-	-
27	27	-	-
28	28	-	-
29	29	-	-
30	30	-	-
31	31	21	-
32	32	22	-
33	33	23	-
34	34	24	-
35	35	25	-
36	36	26	18
37	37	27	19
38	38	28	20
39	39	29	21
40	40	30	22

Board pins	Socket pins		
	100GF	80GC	64GK
41	41	31	23
42	42	32	24
43	43	33	25
44	44	34	26
45	45	35	27
46	46	36	28
47	47	37	29
48	48	38	30
49	49	39	31
50	50	40	32
51	51	-	-
52	52	-	-
53	53	-	-
54	54	-	-
55	55	-	-
56	56	-	-
57	57	-	-
58	58	-	-
59	59	-	-
60	60	-	-
61	61	41	-
62	62	42	-
63	63	43	-
64	64	44	-
65	65	45	33
66	66	46	34
67	67	47	35
68	68	48	36
69	69	49	37
70	70	50	38
71	71	51	39
72	72	52	40
73	73	53	41
74	74	54	42
75	75	55	43
76	76	56	44
77	77	57	45
78	78	58	46
79	79	59	47
80	80	60	48

Table 4-1: Pin assignment on the multi-QFP-footprint (2/2)

Board pins	Socket pins		
	100GF	80GC	64GK
81	81	61	49
82	82	62	50
83	83	63	51
84	84	64	52
85	85	65	53
86	86	66	54
87	87	67	55
88	88	68	56
89	89	69	57
90	90	70	58

Board pins	Socket pins		
	100GF	80GC	64GK
91	91	71	59
92	92	72	60
93	93	73	61
94	94	74	62
95	95	75	63
96	96	76	64
97	97	77	-
98	98	78	-
99	99	79	-
100	100	80	-

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Chapter 5 Individual Pin Connections

This layout offers a high degree of flexibility (Figure 5-1):

(1) Pull-up: either SMD or wired component e.g. resistor, DIL-Switches and -Arrays, LEDs etc.

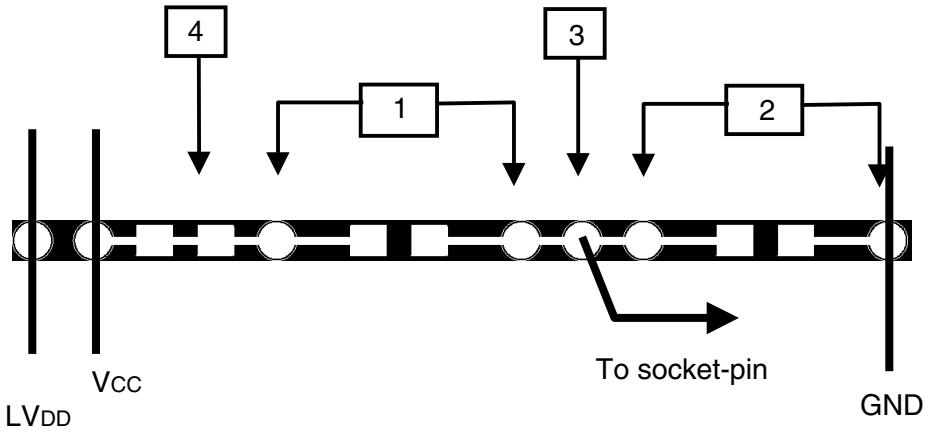
(2) Pull-Down: either SMD or wired component e.g. resistor, DIL-Switches and -Arrays, LED, capacitor

(3) Additional connection for measurement or routing to wire-wrap area

(4) Default V_{CC}-connection – User may cut this and establish LV_{DD}-connection

By combining multiple assembly-options, even more complex options are possible.

Figure 5-1: Individual pin connections



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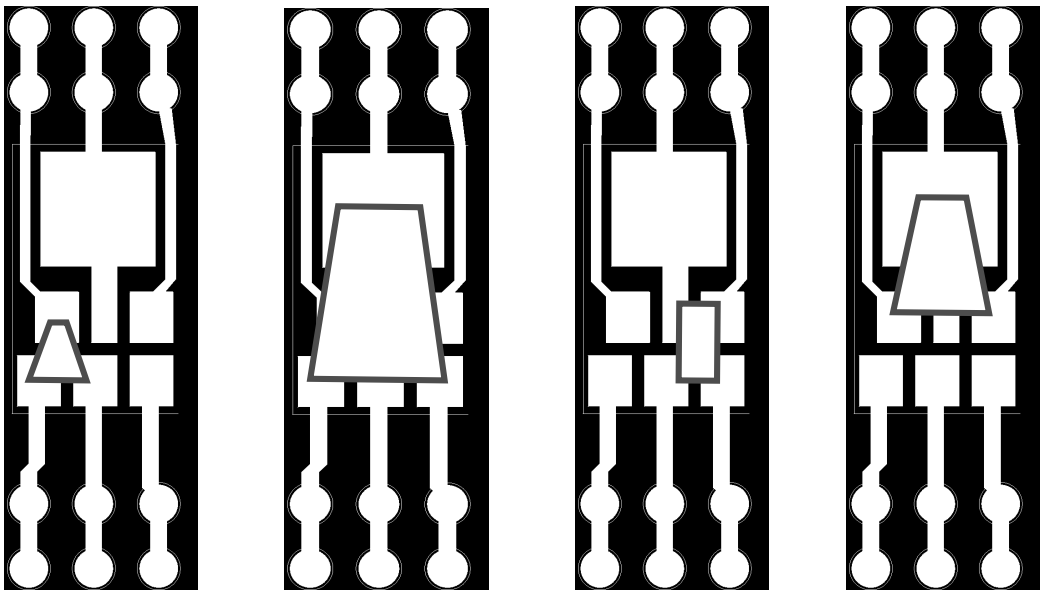
Chapter 6 Multi-SOT-Footprint

This pattern is designed to accept various different SMD-packages for user's own active components: transistors, buffers, one-gate ICs etc.

Following placements are suggested:

Figure 6-1: Assembly samples on the multi-SOT-footprint



SOT-23, SOT323 SOT-223 SOT343, SOT143 SOT-89

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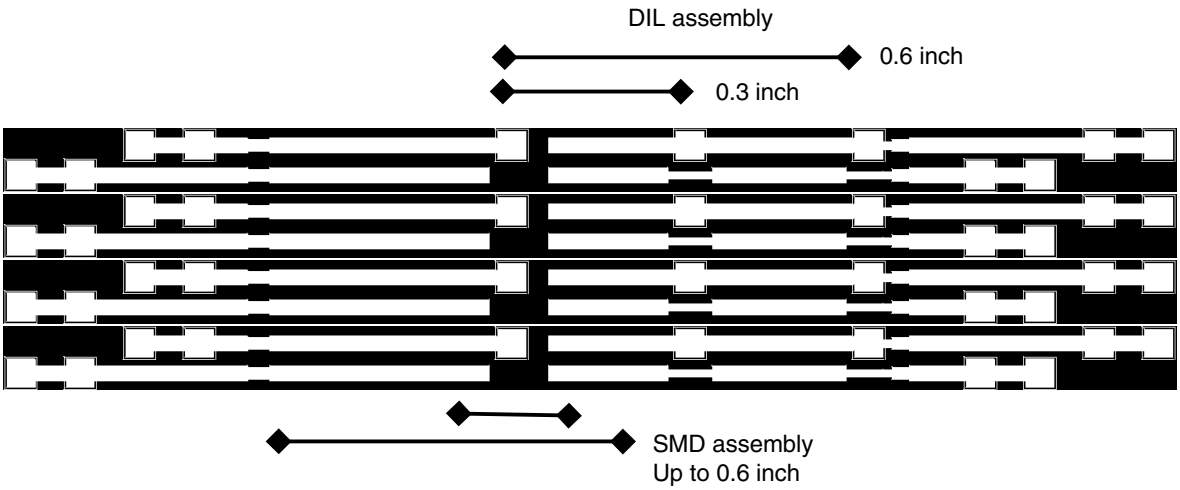
Chapter 7 DIL-SMD-area

This combined area can be used to assemble DIL-IC's in a conventional wired-package with 0.3 inch and 0.6 inch width.
Also SMD-packages with variable width and 2.54 mm and 1.27 mm Pitch can be assembled.

Figure 7-1: DIL-SMD-area



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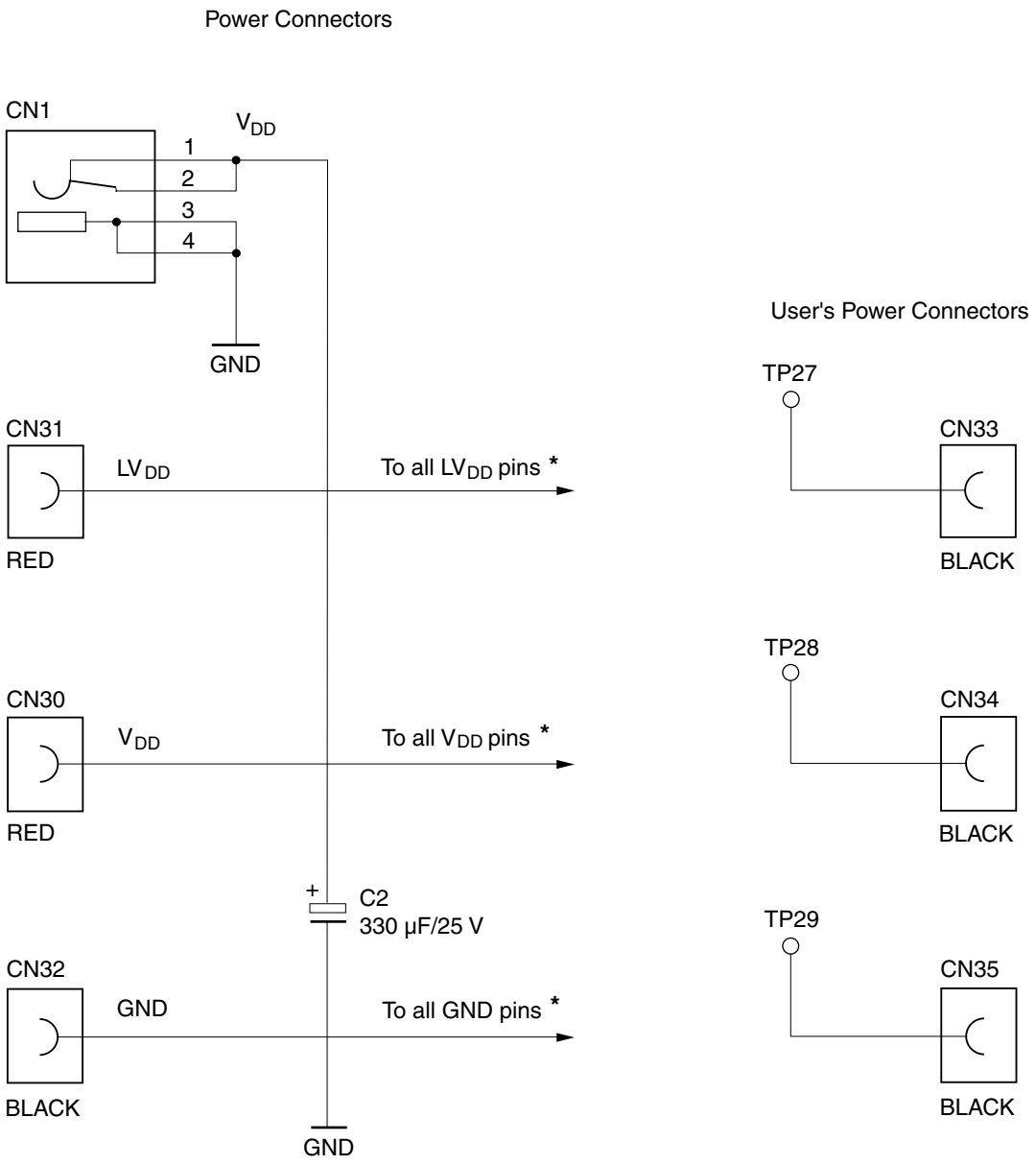
Chapter 8 Circuit Diagrams

The reset circuit and the socket for the quartz oscillator are placed on the Application Board AB-065PI. The other circuits and connections can be specified by the user on the multi-SOT-footprint, individual pin connections, DIL-SMD-area and wrap field.

8.1 Power supply

The power supply can be connected to the AB-065PI board either to the CN1 (standard power supply) or to the CN30 ($+V_{DD}$) and CN32 (GND). The V_{DD} net on the AB-065PI board is always connected to both CN1 and CN30. An additional user's voltage can be connected to the CN31 (LV_{DD}).
The user's power connectors CN33, CN34, CN35 can be specified by the user. They are not connected with any other nets.

Figure 8-1: Power Supply Circuit

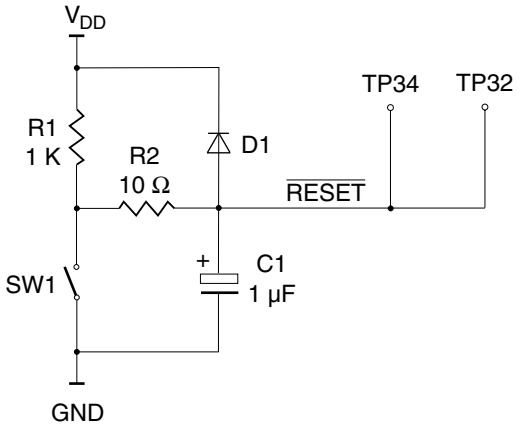


Note: *: see Figure 5-1.

8.2 Reset circuit

The low-active $\overline{\text{RESET}}$ signal is available on the TP32 and TP34 (Figure 8-2).

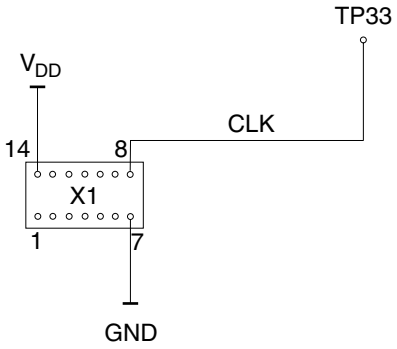
Figure 8-2: Reset circuit



8.3 Quartz oscillator

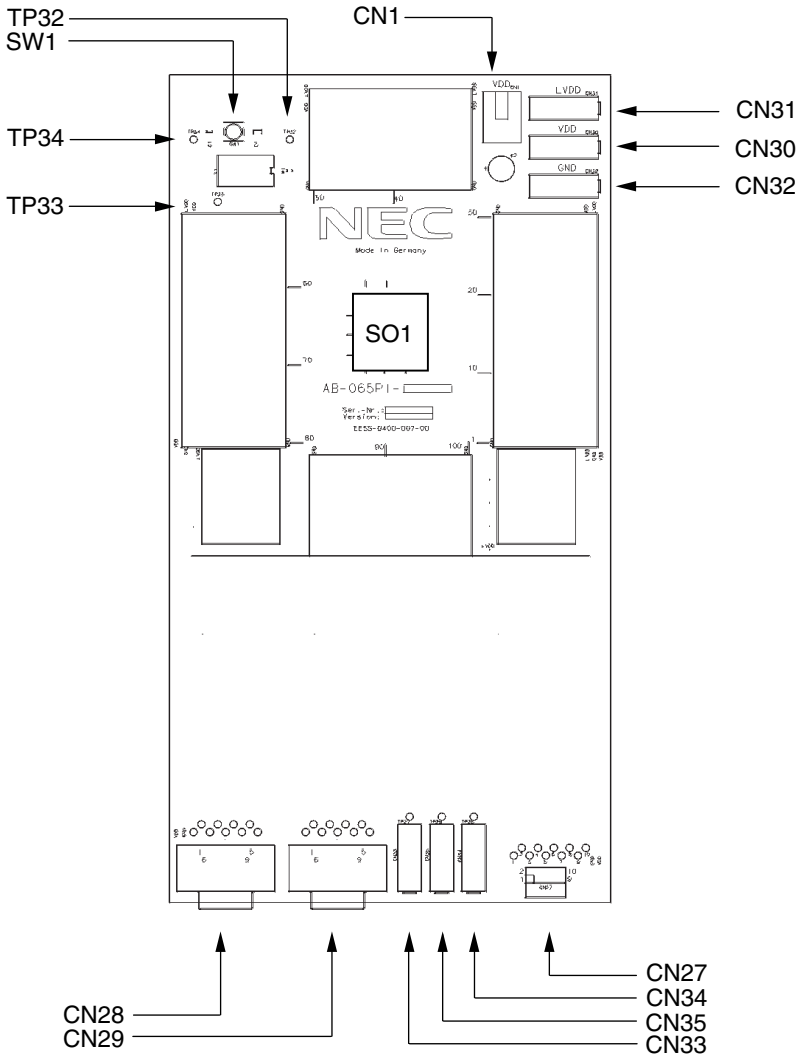
If the quartz oscillator is assembled on the X1 socket, the CLK signal is available on the TP33 (Figure 8-3).

Figure 8-3: Socket for the quartz oscillator



Chapter 9 Placement of the Components

Figure 9-1: Placement of the Components



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