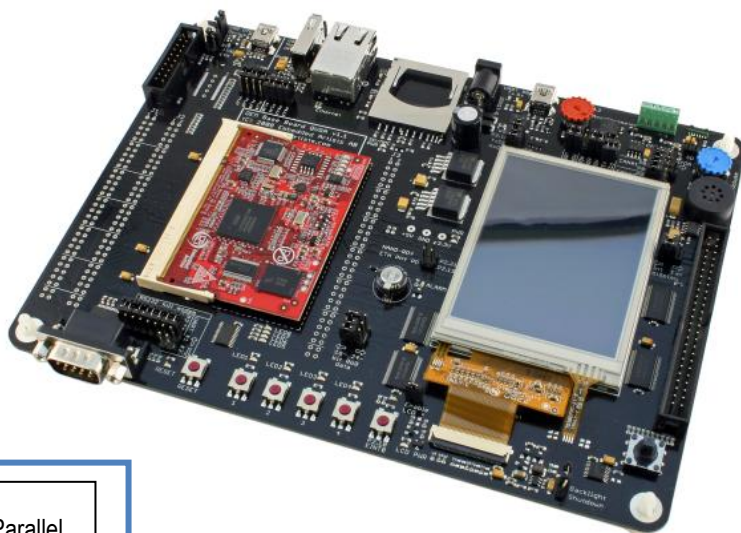## LPC2478-32 OEM Board Feature Highlights

The LPC2478-32 OEM Board provides a quick and easy solution for implementing a high-performance ARM7TDMI based design around the LPC2478 from NXP.

- Build around NXP's ARM7TDMI LPC2478 microcontroller with 512Kbyte internal FLASH and 96Kbyte internal SRAM
- 32MByte external SDRAM, via 32-bit databus
- 128 Mbyte NAND FLASH, via 8-bit databus
- 4 MByte NOR FLASH, via 16-bit databus
- 100/10Mbps Ethernet interface based on DP83848 ETH-PHY
- 12.000 MHz and 32.768 kHz crystals for LPC2478
- 32Kbyte I2C E2PROM for storing non-volatile parameters
- Buffered 32-bit data bus for external expansion
- +3.3V powering
- 200 pos expansion connector
  (as defined in popular SO-DIMM industry standard), 0.6mm pitch
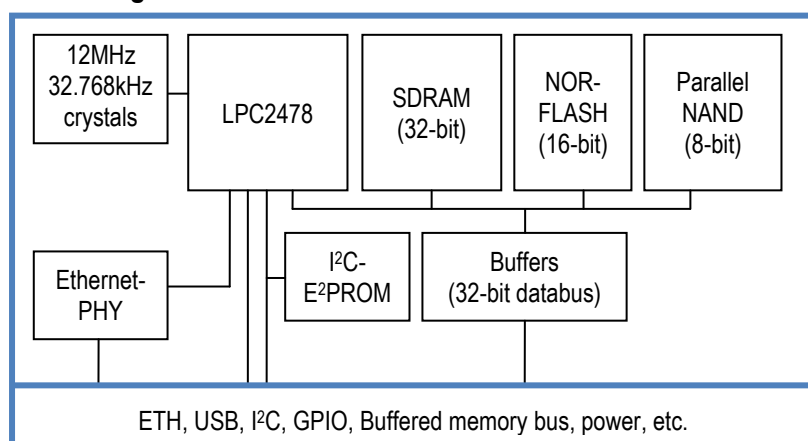- Compact design with dimensions: 68 x 48 mm
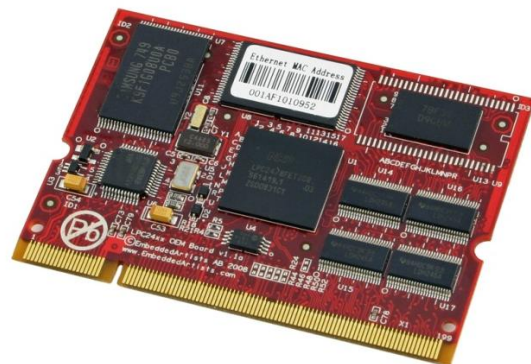
Support Highlights

- Access to Embedded Artists support page containing
  - Schematics
  - User's Manual
  - Sample software applications
  - OEM Board Integration Guide
- Supported by Developer's Kit
- Volume discount available
- Customization service available for optimized high-volume design

Block Diagram of LPC2478-32 OEM Board

12MHz 32.768kHz crystals	LPC2478	SDRAM (32-bit)	NOR-FLASH (16-bit)	Parallel NAND (8-bit)

Ethernet-PHY

I²C-E²PROM

Buffers (32-bit databus)

ETH, USB, I²C, GPIO, Buffered memory bus, power, etc.

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Absolute Maximum Ratings

Parameter	Rating
VDD to GND (Supply voltage)	-0.5V to +3.6V
General for Digital/Analog Input/Output Voltage	-0.5V to VDD+0.5V
+5V tolerant pins on LPC2478	-0.5V to +6.0V (see LPC2478 DS for details)
Storage temperature	-40°C to 100°C

Stress above these limits may cause permanent damage to the board.

Technical Data

Parameter	Min	Typical	Max
Supply voltage	3.10V	3.30V	3.50V
Ripple with frequency contents < 100kHz			50mV
Ripple with frequency contents ≥ 100kHz			10mV
Supply current			
- power down mode (12 MHz)		30 mA	
- executing from internal FLASH (72MHz)		185 mA	
- executing from external SDRAM (72MHz)		315 mA	
VBAT current		TBD	
Operating temperature[1]			
- 66 MHz core frequency	0°C		70°C
- 72 MHz core frequency	10°C		40°C
Relative Humidity (RH)			
0°C < T_A ≤ 50°C, non-condensing	5%		80%
50°C < T_A ≤ 60°C, non-condensing	5%		50%
60°C < T_A ≤ 70°C, non-condensing	5%		35%

[1] Extended temperature range can be supplied on request. Subject to minimum order volume.

Mechanical Dimensions

Board width according to SO-DIMM standard: 67.6 mm. Board height (top and bottom) according to picture below:
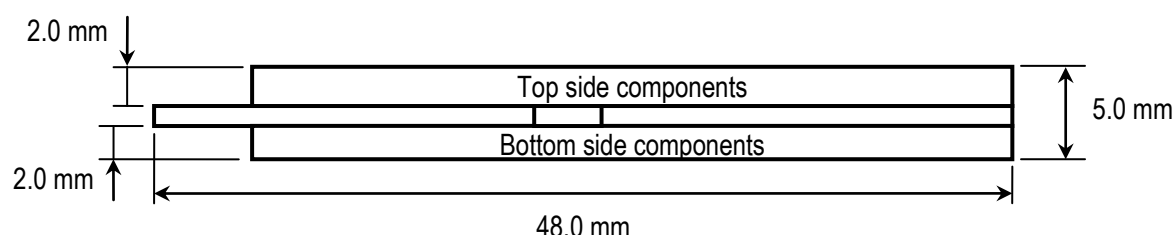
ESD CAUTION

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features ESD protection damages may occur on devices subjected to high energy ESD. Therefore, proper ESD precaution should be taken to avoid performance degradation or loss of functionality.

Rev: 2011-01-12

Pin Information

SO-DIMM pins	I/O, Application Details	Connected to
1	A, Ethernet TXP	Ethernet-PHY
2	A, Ethernet RXP	Ethernet-PHY
3	A, Ethernet TXN	Ethernet-PHY
4	A, Ethernet RXP	Ethernet-PHY
5	P, VDD3_3A	
6	P, GND	
7	OD, ETH-LED1	Ethernet-PHY
8	OD, ETH-LED2	Ethernet-PHY
9	P, VBAT-IN	LPC2478, vbat
10	O, RTC-ALARM	LPC2478, rtc-alarm
11	I, RESET-IN	LPC2478, rst-in
12	O, RESET-OUT	LPC2478, rst-out
13	I	ETH-PHY, power down
14	I	LPC2478, dbgen
15	O, TCK	LPC2478, tck
16	O, RTCK	LPC2478, rtck
17	I, TRST	LPC2478, trst
18	I, TMS	LPC2478, tms
19	I, TDI	LPC2478, tdi
20	O, TDO	LPC2478, tdo
21	P, V3A	LPC2478, v3a
22	P, VREF	LPC2478, vref
23	P, VSSA	LPC2478, vssa
24	P, GND	
25	B, GPIO	LPC2478, P2.0
26	B, GPIO	LPC2478, P2.1
27	B, GPIO	LPC2478, P2.2
28	B, GPIO	LPC2478, P2.3
29	B, GPIO	LPC2478, P2.4
30	B, GPIO	LPC2478, P2.5
31	B, GPIO	LPC2478, P2.6
32	B, GPIO	LPC2478, P2.7
33	B, GPIO	LPC2478, P2.8
34	B, GPIO	LPC2478, P2.9
35	B, GPIO	LPC2478, P2.10
36	B, GPIO	LPC2478, P2.11
37	P, VCC	
38	P, GND	
39	P, VCC	
40	P, GND	
41	A, USBA-DP	LPC2478, P0.29
42	A, USBB-DP	LPC2478, P0.31
43	A, USBA-DM	LPC2478, P0.30
44	A, USBB-DM	LPC2478, USBB-DM
45	B, GPIO	LPC2478, P2.12
46	B, GPIO	LPC2478, P2.13
47	B, GPIO	LPC2478, P0.0
48	B, GPIO	LPC2478, P0.1
49	B, GPIO	LPC2478, P0.2
50	B, GPIO	LPC2478, P0.3
51	B, GPIO	LPC2478, P0.4
52	B, GPIO	LPC2478, P0.5
53	B, GPIO	LPC2478, P0.6

SO-DIMM pins	I/O, Application Details	Connected to
101	P, GND	
102	P, GND	
103	NC	
104	NC	
105	NC	
106	NC	
107	NC	
108	NC	
109	NC	
110	NC	
111	NC	
112	NC	
113	NC	
114	NC	
115	NC	
116	B, GPIO	LPC2478, P2.14
117	B, GPIO	LPC2478, P2.15
118	B, GPIO	LPC2478, P2.19
119	B, GPIO	LPC2478, P2.21
120	B, GPIO	LPC2478, P2.22
121	B, GPIO	LPC2478, P2.23
122	B, GPIO	LPC2478, P2.25
123	B, GPIO	LPC2478, P2.26
124	B, GPIO	LPC2478, P2.27
125	NC	
126	NC	
127	B, GPIO	LPC2478, P4.28
128	B, GPIO	LPC2478, P4.29
129	P, GND	
130	P, GND	
131	O, Buffered Address bus 15	LPC2478, P4.15 via buffer
132	O, Buffered DQM1	LPC2478, P2.29 via buffer
133	O, Buffered Address bus 14	LPC2478, P4.14 via buffer
134	O, Buffered DQM0	LPC2478, P2.28 via buffer
135	O, Buffered Address bus 13	LPC2478, P4.13 via buffer
136	O, Buffered BCAS	LPC2478, P2.16 via buffer
137	O, Buffered Address bus 12	LPC2478, P4.12 via buffer
138	O, Buffered BRAS	LPC2478, P2.17 via buffer
139	O, Buffered Address bus 11	LPC2478, P4.11 via buffer
140	O, Buffered BLS1	LPC2478, P4.27 via buffer
141	O, Buffered Address bus 10	LPC2478, P4.10 via buffer
142	O, Buffered BLS0	LPC2478, P4.26 via buffer
143	O, Buffered Address bus 9	LPC2478, P4.9 via buffer
144	O, Buffered WE	LPC2478, P4.25 via buffer
145	O, Buffered Address bus 8	LPC2478, P4.8 via buffer
146	O, Buffered OE	LPC2478, P4.24 via buffer
147	O, Buffer Address bus 7	LPC2478, P4.7 via buffer
148	O, Buffer Address bus 23	LPC2478, P4.23 via buffer
149	O, Buffer Address bus 6	LPC2478, P4.6 via buffer
150	O, Buffer Address bus 22	LPC2478, P4.22 via buffer
151	O, Buffer Address bus 5	LPC2478, P4.5 via buffer
152	O, Buffer Address bus 21	LPC2478, P4.21 via buffer
153	O, Buffer Address bus 4	LPC2478, P4.4 via buffer

54	B, GPIO	LPC2478, P0.7		154	O, Buffer Address bus 20	LPC2478, P4.20 via buffer
55	B, GPIO	LPC2478, P0.8		155	O, Buffer Address bus 3	LPC2478, P4.3 via buffer
56	B, GPIO	LPC2478, P0.9		156	O, Buffer Address bus 19	LPC2478, P4.19 via buffer
57	B, GPIO	LPC2478, P0.10		157	O, Buffer Address bus 2	LPC2478, P4.2 via buffer
58	B, GPIO	LPC2478, P0.11		158	O, Buffer Address bus 18	LPC2478, P4.18 via buffer
59	B, GPIO	LPC2478, P0.12		159	O, Buffer Address bus 1	LPC2478, P4.1 via buffer
60	B, GPIO	LPC2478, P0.13		160	O, Buffer Address bus 17	LPC2478, P4.17 via buffer
61	B, GPIO	LPC2478, P0.14		161	O, Buffer Address bus 0	LPC2478, P4.0 via buffer
62	B, GPIO	LPC2478, P0.15		162	O, Buffer Address bus 16	LPC2478, P4.16 via buffer
63	B, GPIO	LPC2478, P0.16		163	I, DBUS_EN	Enable data bus buffers
64	B, GPIO	LPC2478, P0.17		164	I, ABUF_EN	Enable address buffers
65	B, GPIO	LPC2478, P0.18		165	P, Buffer-VCC	
66	B, GPIO	LPC2478, P0.19		166	P, GND	
67	B, GPIO	LPC2478, P0.20		167	B, Buffer Data bus 15	LPC2478, P3.15 via buffer
68	B, GPIO	LPC2478, P0.21		168	B, Buffer Data bus 31	LPC2478, P3.31 via buffer
69	B, GPIO	LPC2478, P0.22		169	B, Buffer Data bus 14	LPC2478, P3.14 via buffer
70	B, GPIO	LPC2478, P0.23		170	B, Buffer Data bus 30	LPC2478, P3.30 via buffer
71	B, GPIO	LPC2478, P0.24		171	B, Buffer Data bus 13	LPC2478, P3.13 via buffer
72	B, GPIO	LPC2478, P0.25		172	B, Buffer Data bus 29	LPC2478, P3.29 via buffer
73	B, GPIO	LPC2478, P0.26		173	B, Buffer Data bus 12	LPC2478, P3.12 via buffer
74	B, I2C-SDA	LPC2478, P0.27		174	B, Buffer Data bus 28	LPC2478, P3.28 via buffer
75	B, I2C-SCL	LPC2478, P0.28		175	B, Buffer Data bus 11	LPC2478, P3.11 via buffer
76	P, GND			176	B, Buffer Data bus 27	LPC2478, P3.27 via buffer
77	P, GND			177	B, Buffer Data bus 10	LPC2478, P3.10 via buffer
78	B, GPIO	LPC2478, P1.2		178	B, Buffer Data bus 26	LPC2478, P3.26 via buffer
79	B, GPIO	LPC2478, P1.3		179	B, Buffer Data bus 9	LPC2478, P3.9 via buffer
80	B, GPIO	LPC2478, P1.5		180	B, Buffer Data bus 25	LPC2478, P3.25 via buffer
81	B, GPIO	LPC2478, P1.6		181	B, Buffer Data bus 8	LPC2478, P3.8 via buffer
82	B, GPIO	LPC2478, P1.7		182	B, Buffer Data bus 24	LPC2478, P3.24 via buffer
83	B, GPIO	LPC2478, P1.11		183	B, Buffer Data bus 7	LPC2478, P3.7 via buffer
84	B, GPIO	LPC2478, P1.12		184	B, Buffer Data bus 23	LPC2478, P3.23 via buffer
85	B, GPIO	LPC2478, P1.13		185	B, Buffer Data bus 6	LPC2478, P3.6 via buffer
86	B, GPIO	LPC2478, P1.18		186	B, Buffer Data bus 22	LPC2478, P3.22 via buffer
87	B, GPIO	LPC2478, P1.19		187	B, Buffer Data bus 5	LPC2478, P3.5 via buffer
88	B, GPIO	LPC2478, P1.20		188	B, Buffer Data bus 21	LPC2478, P3.21 via buffer
89	B, GPIO	LPC2478, P1.21		189	B, Buffer Data bus 4	LPC2478, P3.4 via buffer
90	B, GPIO	LPC2478, P1.22		190	B, Buffer Data bus 20	LPC2478, P3.20 via buffer
91	B, GPIO	LPC2478, P1.23		191	B, Buffer Data bus 3	LPC2478, P3.3 via buffer
92	B, GPIO	LPC2478, P1.24		192	B, Buffer Data bus 19	LPC2478, P3.19 via buffer
93	B, GPIO	LPC2478, P1.25		193	B, Buffer Data bus 2	LPC2478, P3.2 via buffer
94	B, GPIO	LPC2478, P1.26		194	B, Buffer Data bus 18	LPC2478, P3.18 via buffer
95	B, GPIO	LPC2478, P1.27		195	B, Buffer Data bus 1	LPC2478, P3.1 via buffer
96	B, GPIO	LPC2478, P1.28		196	B, Buffer Data bus 17	LPC2478, P3.17 via buffer
97	B, GPIO	LPC2478, P1.29		197	B, Buffer Data bus 0	LPC2478, P3.0 via buffer
98	B, GPIO	LPC2478, P1.30		198	B, Buffer Data bus 16	LPC2478, P3.16 via buffer
99	B, GPIO	LPC2478, P1.31		199	P, Buffer-VCC	
100	OD, NandFlashRdy	Internal NAND flash		200	P, GND	

I/O legend
O: output
I: input
B: Bidirectional
P: Power
A: Analog

OD: Open-drain output
GPIO: General purpose I/O
GPI: General purpose input
GPO: General purpose output

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