

The Art of Embedded Systems Development – made Easy™

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LPC1788-32 OEM Board Feature Highlights

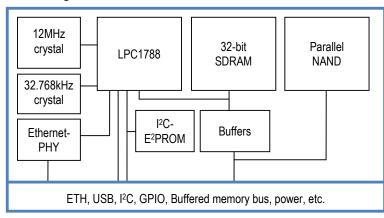
The LPC1788-32 OEM Board provides a quick and easy solution for implementing a high-performance ARM Cortex-M3 based design around the LPC1788 from NXP.

- Build around NXP's ARM Cortex-M3 LPC1788 microcontroller with 512Kbyte internal FLASH and 96Kbyte internal SRAM
- 32MByte external SDRAM, via 32-bit databus
- 128 Mbyte NAND FLASH
- 100/10Mbps Ethernet interface based on SMSC LAN8720
- 12.000 MHz and 32.768 kHz crystals for LPC1788
- 32Kbyte I2C E2PROM for storing non-volatile parameters
- Buffered 32-bit data bus
- +3.3V powering
- 200 pos expansion connector (as defined in popular SO-DIMM industry standard), 0.6mm pitch
- Compact design with dimensions: 68 x 55 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, see picture to right
- Volume discount available
- Customization service available for optimized high-volume design

Block Diagram of LPC1788-32 OEM Board





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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 LPC1788	-0.5V to +6.0V (see LPC1788 DS for details)
Storage temperature	-40°C to 100°C

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

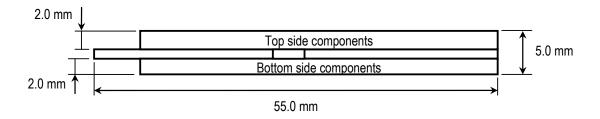
Technical Data

Parameter	Min	Typical	Max
Supply voltage (VDD to GND)	3.10V	3.30V	3.50V
Ripple with frequency contents < 100kHz			50mV
Ripple with frequency contents ≥ 100kHz			10mV
Supply current			Max observed
- idle, 32kHz RTC active		TBD ^[2]	
- low-power mode		TBD ^[2]	
- executing from internal flash (100MHz)		TBD ^[2]	
- executing from external sdram (100MHz)		TBD ^[2]	
- Ethernet+usb active		TBD ^[2]	
VBAT current		TBD ^[2]	
Operating temperature ^[1]		TBD ^[2]	
Relative Humidity (RH)			
$0^{\circ}\text{C} < \text{T}_{A} \le 50^{\circ}\text{C}$, 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 and depth 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.





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^[2] Will be defined after a characterization process.



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Pin Information

SO-	I/O Amulication Dataile	Commented to
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	LPC1788, vbat
10	O, RTC-ALARM	LPC1788, rtc-alarm
11	I, RESET-IN	LPC1788, rst-in
12	O, RESET-OUT	LPC1788, rst-out
13	NC	
14	B, GPIO	LPC1788, P5.0
15	O, TCK/SWDCLK	LPC1788, tck/swdclk
16	B, GPIO	LPC1788, P5.4
17	I, TRST	LPC1788, trst
18	B, TMS/SWDIO	LPC1788, tms/swdio
19	I, TDI	LPC1788, tdi
20	O, TDO/SWO	LPC1788, tdo/swo
21	P, V3A	LPC1788, v3a
22	P, VREF	LPC1788, vref
23	P, VSSA	LPC1788, vssa
24	P, GND	
25	B, GPIO	LPC1788, P2.0
26	B, GPIO	LPC1788, P2.1
27	B, GPIO	LPC1788, P2.2
28	B, GPIO	LPC1788, P2.3
29	B, GPIO	LPC1788, P2.4
30	B, GPIO	LPC1788, P2.5
31	B, GPIO	LPC1788, P2.6
32	B, GPIO	LPC1788, P2.7
33	B, GPIO	LPC1788, P2.8
34	B, GPIO	LPC1788, P2.9
35	B, GPIO	LPC1788, P2.10
36	B, GPIO	LPC1788, P2.11
37	P, VCC	
38	P, GND	
39	P, VCC	
40	P, GND	
41	A, USB1-DP	LPC1788, USB-D+1
42	A, USB2-DP	LPC1788, USB-D+2
43	A, USB1-DM	LPC1788, USB-D-1
44	A, USB2-DM	LPC1788, USB-D-2
45	B, GPIO	LPC1788, P2.12
46	B, GPIO	LPC1788, P2.13
47	B, GPIO	LPC1788, P0.0
48	B, GPIO	LPC1788, P0.1
49	B, GPIO	LPC1788, P0.2
50	B, GPIO	LPC1788, P0.3
51	B, GPIO	LPC1788, P0.4
52	B, GPIO	LPC1788, P0.5
53	B, GPIO	LPC1788, 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	B, GPIO	LPC1788, P5.4
108	B, GPIO	LPC1788, P5.3
109	B, GPIO	LPC1788, P5.2
110	NC	21 0 17 00, 1 0.2
111	B, GPIO	LPC1788, P1.16
	NC	Li 01700,1 1.10
112		LPC1788, P4.31 via buffer
113	O, Buffered CS1 (internal NAND)	
114	B, GPIO	LPC1788, P4.30
115	B, GPIO	LPC1788, P1.16
116	B, GPIO	LPC1788, P2.14
117	B, GPIO	LPC1788, P2.15
118	B, GPIO	LPC1788, P2.19
119	B, GPIO	LPC1788, P2.21
120	B, GPIO	LPC1788, P2.22
121	B, GPIO	LPC1788, P2.23
122	B, GPIO	LPC1788, P2.25
123	B, GPIO	LPC1788, P2.26
124	B, GPIO	LPC1788, P2.27
125	NC	
126	NC	
127	NC	
128	NC	
129	P, GND	
130	P, GND	
131	O, Buffered Address bus 15	LPC1788, P4.15 via buffer
132	O, Buffered CS2	LPC1788, P2.14 via buffer
133	O, Buffered Address bus 14	LPC1788, P4.14 via buffer
134	O, Buffered CS0	LPC1788, P4.30 via buffer
135	O. Buffered Address bus 13	LPC1788, P4.13 via buffer
136	O, Buffered BLS3	LPC1788, P4.29 via buffer
137	O, Buffered Address bus 12	LPC1788, P4.12 via buffer
		LPC1788, P4.28 via buffer
138	O, Buffered BLS2	·
139	O, Buffered Address bus 11	LPC1788, P4.11 via buffer
140	O, Buffered BLS1	LPC1788, P4.27 via buffer
141	O, Buffered Address bus 10	LPC1788, P4.10 via buffer
142	O, Buffered BLS0	LPC1788, P4.26 via buffer
143	O, Buffered Address bus 9	LPC1788, P4.9 via buffer
144	O, Buffered WE	LPC1788, P4.25 via buffer
145	O, Buffered Address bus 8	LPC1788, P4.8 via buffer
146	O, Buffered OE	LPC1788, P4.24 via buffer
147	O, Buffer Address bus 7	LPC1788, P4.7 via buffer
148	O, Buffer Address bus 23	LPC1788, P4.23 via buffer
149	O, Buffer Address bus 6	LPC1788, P4.6 via buffer
150	O, Buffer Address bus 22	LPC1788, P4.22 via buffer
151	O, Buffer Address bus 5	LPC1788, P4.5 via buffer
152	O, Buffer Address bus 21	LPC1788, P4.21 via buffer
153	O, Buffer Address bus 4	LPC1788, P4.4 via buffer



Embedded Artists AB Davidshallsgatan 16 SE-211 45 Malmö Sweden Phone/Fax: +46 (0)40-611 00 93 E-mail: info@embeddedartists.com http://www.embeddedartists.com

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54	B, GPIO	LPC1788, P0.7
55	B, GPIO	LPC1788, P0.8
56	B, GPIO	LPC1788, P0.9
57	B, GPIO	LPC1788, P0.10
58	B, GPIO	LPC1788, P0.11
59	B, GPIO	LPC1788, P0.12
	•	
60	B, GPIO	LPC1788, P0.13 LPC1788, P0.14
61	B, GPIO	·
62	B, GPIO	LPC1788, P0.15
63	B, GPIO	LPC1788, P0.16
64	B, GPIO	LPC1788, P0.17
65	B, GPIO	LPC1788, P0.18
66	B, GPIO	LPC1788, P0.19
67	B, GPIO	LPC1788, P0.20
68	B, GPIO	LPC1788, P0.21
69	B, GPIO	LPC1788, P0.22
70	B, GPIO	LPC1788, P0.23
71	B, GPIO	LPC1788, P0.24
72	B, GPIO	LPC1788, P0.25
73	B, GPIO	LPC1788, P0.26
74	B, I2C-SDA	LPC1788, P0.27
75	B, I2C-SCL	LPC1788, P0.28
76	P, GND	
77	P, GND	
78	B, GPIO	LPC1788, P1.2
79	B, GPIO	LPC1788, P1.3
80	B, GPIO	LPC1788, P1.5
81	B, GPIO	LPC1788, P1.6
82	B, GPIO	LPC1788, P1.7
83	B, GPIO	LPC1788, P1.11
84	B, GPIO	LPC1788, P1.12
85	B, GPIO	LPC1788, P1.13
86	B, GPIO	LPC1788, P1.18
87	B, GPIO	LPC1788, P1.19
88	B, GPIO	LPC1788, P1.20
89	B, GPIO	LPC1788, P1.21
90	B, GPIO	LPC1788, P1.22
91	B, GPIO	LPC1788, P1.23
92	B, GPIO	LPC1788, P1.24
93	B, GPIO	LPC1788, P1.25
94	B, GPIO	LPC1788, P1.26
95	B, GPIO	LPC1788, P1.27
96	B, GPIO	LPC1788, P1.28
97	B, GPIO	LPC1788, P1.29
98	B, GPIO	LPC1788, P1.30
99	B, GPIO	LPC1788, P1.31
100	OD, NandFlashRdy	Internal NAND flash
1/0 100		

I/O legend

O: output

I: input

B: Bidirectional

P: Power

A: Analog

	154	O, Buffer Address bus 20	LPC1788, P4.20 via buffer
	155	O, Buffer Address bus 3	LPC1788, P4.3 via buffer
j	156	O, Buffer Address bus 19	LPC1788, P4.19 via buffer
	157	O, Buffer Address bus 2	LPC1788, P4.2 via buffer
	158	O, Buffer Address bus 18	LPC1788, P4.18 via buffer
ĺ	159	O, Buffer Address bus 1	LPC1788, P4.1 via buffer
ĺ	160	O, Buffer Address bus 17	LPC1788, P4.17 via buffer
	161	O, Buffer Address bus 0	LPC1788, P4.0 via buffer
	162	O, Buffer Address bus 16	LPC1788, P4.16 via buffer
	163	O, Buffered CS3	LPC1788, P2.15 via buffer
	164	I, ABUF_EN	Connected to GND on board
	165	P, Buffer-VCC	
	166	P, GND	
	167	B, Buffer Data bus 15	LPC1788, P3.15 via buffer
	168	B, Buffer Data bus 31	LPC1788, P3.31 via buffer
	169	B, Buffer Data bus 14	LPC1788, P3.14 via buffer
	170	B, Buffer Data bus 30	LPC1788, P3.30 via buffer
	171	B, Buffer Data bus 13	LPC1788, P3.13 via buffer
	172	B, Buffer Data bus 29	LPC1788, P3.29 via buffer
	173	B, Buffer Data bus 12	LPC1788, P3.12 via buffer
	174	B, Buffer Data bus 28	LPC1788, P3.28 via buffer
	175	B, Buffer Data bus 11	LPC1788, P3.11 via buffer
	176	B, Buffer Data bus 27	LPC1788, P3.27 via buffer
	177	B, Buffer Data bus 10	LPC1788, P3.10 via buffer
	178	B, Buffer Data bus 26	LPC1788, P3.26 via buffer
	179	B, Buffer Data bus 9	LPC1788, P3.9 via buffer
	180	B, Buffer Data bus 25	LPC1788, P3.25 via buffer
	181	B, Buffer Data bus 8	LPC1788, P3.8 via buffer
	182	B, Buffer Data bus 24	LPC1788, P3.24 via buffer
	183	B, Buffer Data bus 7	LPC1788, P3.7 via buffer
	184	B, Buffer Data bus 23	LPC1788, P3.23 via buffer
	185	B, Buffer Data bus 6	LPC1788, P3.6 via buffer
	186	B, Buffer Data bus 22	LPC1788, P3.22 via buffer
	187	B, Buffer Data bus 5	LPC1788, P3.5 via buffer
	188	B, Buffer Data bus 21	LPC1788, P3.21 via buffer
	189	B, Buffer Data bus 4	LPC1788, P3.4 via buffer
	190	B, Buffer Data bus 20	LPC1788, P3.20 via buffer
	191	B, Buffer Data bus 3	LPC1788, P3.3 via buffer
	192	B, Buffer Data bus 19	LPC1788, P3.19 via buffer
	193	B, Buffer Data bus 2	LPC1788, P3.2 via buffer
	194	B, Buffer Data bus 18	LPC1788, P3.18 via buffer
	195	B, Buffer Data bus 1	LPC1788, P3.1 via buffer
	196	B, Buffer Data bus 17	LPC1788, P3.17 via buffer
	197	B, Buffer Data bus 0	LPC1788, P3.0 via buffer
	198	B, Buffer Data bus 16	LPC1788, P3.16 via buffer
	199	P, Buffer-VCC	
	200	P, GND	

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





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