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Embedded Artists'
LPC3250 OEM Board v1.5 DS

The Art of Embedded Systems Development – **made Easy™**

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LPC3250 OEM Board Feature Highlights

The LPC3250 OEM Board provides a quick and easy solution for implementing a high-performance ARM ARM926EJ-S based design around the LPC3250 from NXP.

- Build around NXP's ARM926EJ-S LPC3250 microcontroller with 256Kbyte internal SRAM
- 64MByte external DDR SDRAM, via 16-bit databus
- 128 Mbyte NAND FLASH
- 4 MByte SPI-NOR FLASH
- 100/10Mbps Ethernet interface based on DP83848 ETH-PHY
- On-board ISP1301 USB OTG transceiver
- 13.000 MHz and 32.768 kHz crystals for LPC3250
- 32Kbyte I2C E2PROM for storing non-volatile parameters
- Buffered 16-bit data bus with voltage translation to external bus (VCC$_{EXT}$ can be 1.4-3.6V)
- +3.3V powering
- 200 pos expansion connector
  (as defined in popular SO-DIMM industry standard), 0.6mm pitch
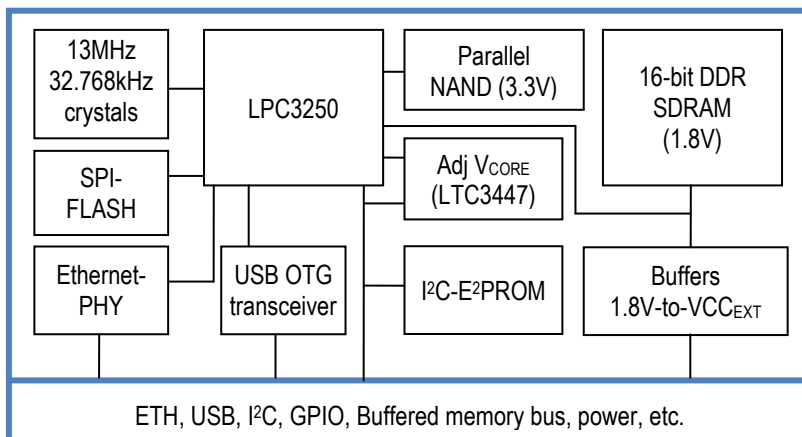- Compact design with dimensions: 68 x 50 mm

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 LPC3250 OEM Board

| 13MHz 32.768kHz crystals | LPC3250 | Parallel NAND (3.3V) | 16-bit DDR SDRAM (1.8V) |

Block diagram boxes: 13MHz 32.768kHz crystals — LPC3250 — Parallel NAND (3.3V) — 16-bit DDR SDRAM (1.8V) — SPI-FLASH — Adj V$_{CORE}$ (LTC3447) — Ethernet-PHY — USB OTG transceiver — I²C-E²PROM — Buffers 1.8V-to-VCC$_{EXT}$ — ETH, USB, I²C, GPIO, Buffered memory bus, power, etc.

NXP Partner

Embedded Artists is a partner of NXP. Together we give engineers an excellent base to work from when creating advanced embedded systems. We have a close co-operation and know everything there is to know about the NXP processors. Take advantage of our unique knowledge! For further information, please contact: support@EmbeddedArtists.com

partner of

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Absolute Maximum Ratings

Parameter	Rating
VDD to GND (Supply voltage)	-0.2V to +4V
Digital/Analog Input/Output Voltage	-0.2V to VDD+0.2V
Storage temperature	-40°C to 100°C

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

Technical Data

| Parameter	Min	Typical	Max
VCC Supply voltage	3.10V	3.30V	3.50V
Ripple with frequency contents < 100kHz			50mV
Ripple with frequency contents ≥ 100kHz			10mV
VCC$_{EXT}$ Supply voltage	1.40V		3.60V
Supply current			Max observed
- idle, 32kHz RTC active		TBD	
- low-power mode (13 MHz)		TBD	
- executing from internal SRAM (266 MHz)		TBD	
- executing from external SDRAM (266MHz)		TBD	
- Ethernet+usb active		TBD	
VBAT current		TBD	
Operating temperature[1]			
- 208 MHz core frequency	0°C		60°C
- 266 MHz core frequency[2]	5°C[3]		40°C[3]
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.

[2] Requires VDD$_{core}$ to be 1.35V.

[3] Temperature range planned to be extended after passing Embedded Artists internal qualification process.

Mechanical Dimensions

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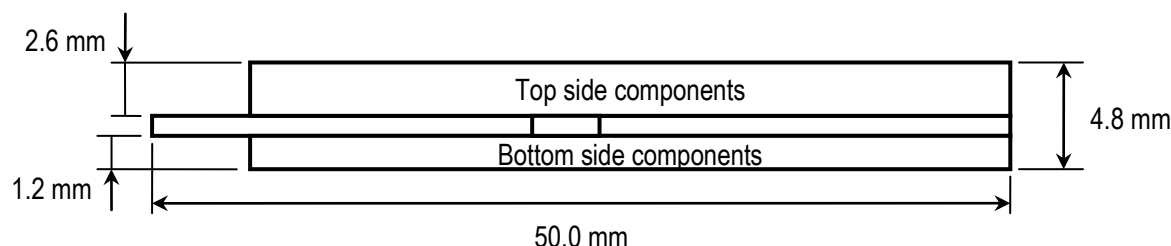
ESD CAUTION

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.

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Pin Information

Note that each LPC3250 pin can have more functions than indicated in table below. See datasheet for details.

SO-DIMM pins	I/O, Application Details	Connected to	SO-DIMM pins	I/O, Application Details	Connected to
1	A, Ethernet TXP	Ethernet-PHY	101	P, GND	
2	A, Ethernet RXP	Ethernet-PHY	102	P, GND	
3	A, Ethernet TXN	Ethernet-PHY	103	B	LPC3250, I2S1TX_CLK
4	A, Ethernet RXN	Ethernet-PHY	104	B	LPC3250, I2S1TX_SDA
5	P, VDD3_3A		105	B	LPC3250, I2S1TX_WS
6	P, GND		106	B, GPIO	LPC3250, P0.0
7	OD, ETH-LED1	Ethernet-PHY	107	B, GPIO	LPC3250, P0.1
8	OD, ETH-LED2	Ethernet-PHY	108	I, GPI	LPC3250, GPI_00
9	P, VBAT-IN	LPC3250, RTC powering	109	B, I2C-SDA	LPC3250, I2C2_SDA
10	O, ONSW	LPC3250,ONSW	110	O, I2C-SCL	LPC3250,I2C2_SCL
11	I, RESET-IN	LPC3250, RESET via buffer	111	I, GPI	LPC3250, GPI_04
12	O, RESET-OUT	LPC3250, RESOUT	112	I, GPI	LPC3250, GPI_06
13	I, ETH-PHY-PD	Ethernet-PHY, power down	113	A	ISP1301, USB_ID
14	I, DBGEN	LPC3250, dbgen	114	I	LPC3250, POWER_ON Vcore
15	I, TCK	LPC3250, jtag-tck	115	O	LPC3250, TST_CLK2
16	O, RTCK	LPC3250, jtag-rtck	116	B, GPIO	LPC3250, P2.7
17	I, TRST	LPC3250, jtag-trst	117	B, GPIO	LPC3250, GPIO_00
18	I, TMS	LPC3250, jtag-tms	118	B, GPIO	LPC3250, GPIO_01
19	I, TDI	LPC3250, jtag-tdi	119	I, GPI	LPC3250, GPI_07
20	O, TDO	LPC3250, jtag-tdo	120	B, GPIO	LPC3250, P2.0
21	P, V3A	LPC3250, vdda	121	B, GPIO	LPC3250, P2.1
22	NC		122	B, GPIO	LPC3250, P2,2
23	P, VSSA	LPC3250, vssa	123	B, GPIO	LPC3250, P2.3
24	P, GND		124	B, GPIO	LPC3250, P2.4
25	O, GPO	LPC3250, GPO_10	125	B, GPIO	LPC3250, P2.5
26	O, GPO	LPC3250, GPO_12	126	B, GPIO	LPC3250, P2.6
27	O, GPO	LPC3250, GPO_13	127	O, GPO	LPC3250,GPO_07
28	O, GPO	LPC3250, GPO_15	128	O, GPO	LPC3250,GPO_21
29	O, GPO	LPC3250, GPO_16	129	P, GND	
30	O, GPO	LPC3250, GPO_18	130	P, GND	
31	B, GPIO	LPC3250, P0.2	131	O, Buffered Address bus 15	LPC3250, A15 via buffer
32	B, GPIO	LPC3250, P0.3	132	O, Buffered CS3	LPC3250, CS3 via buffer
33	B, GPIO	LPC3250, P0.4	133	O, Buffered Address bus 14	LPC3250, A14 via buffer
34	B, GPIO	LPC3250, P0.5	134	O, Buffered CS2	LPC3250, CS2 via buffer
35	I, GPI	LPC3250, GPI_01	135	O, Buffered Address bus 13	LPC3250, A13 via buffer
36	I, GPI	LPC3250, U7_HCTS	136	O, Buffered CS1	LPC3250, CS1 via buffer
37	P, VCC		137	O, Buffered Address bus 12	LPC3250, A12 via buffer
38	P, GND		138	O, Buffered CS0	LPC3250, CS0 via buffer
39	P, VCC		139	O, Buffered Address bus 11	LPC3250, A11 via buffer
40	P, GND		140	O, Buffered BLS1	LPC3250, BLS1 via buffer
41	NC		141	O, Buffered Address bus 10	LPC3250, A10 via buffer
42	A, USB2-DP	LPC3250, USB-D+	142	O, Buffered BLS0	LPC3250, BLS0 via buffer
43	NC		143	O, Buffered Address bus 9	LPC3250, A9 via buffer
44	A, USB2-DM	LPC3250, USB-D-	144	O, Buffered WE	LPC3250, WE via buffer
45	O	LPC3250, GPO_06	145	O, Buffered Address bus 8	LPC3250, A8 via buffer
46	O	LPC3250, PWMOUT2	146	O, Buffered OE	LPC3250, OE via buffer
47	O	LPC3250, U6_IRTX	147	O, Buffer Address bus 7	LPC3250, A7 via buffer
48	I, GPI	LPC3250, U6_IRRX	148	O, Buffer Address bus 23	LPC3250, A23 via buffer
49	O	LPC3250, U5_TX	149	O, Buffer Address bus 6	LPC3250, A6 via buffer
50	I, GPI	LPC3250, U5_RX	150	O, Buffer Address bus 22	LPC3250, A22 via buffer
51	O, GPO	LPC3250, GPO_02	151	O, Buffer Address bus 5	LPC3250, A5 via buffer

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Pin	I/O	Description	Pin	I/O	Description
52	O, GPO	LPC3250, GPO_03	152	O, Buffer Address bus 21	LPC3250, A21 via buffer
53	O, GPO	LPC3250, GPO_08	153	O, Buffer Address bus 4	LPC3250, A4 via buffer
54	O, GPO	LPC3250, GPO_09	154	O, Buffer Address bus 20	LPC3250, A20 via buffer
55	O	LPC3250, PWMOUT1	155	O, Buffer Address bus 3	LPC3250, A3 via buffer
56	O	LPC3250, HICORE	156	O, Buffer Address bus 19	LPC3250, A19 via buffer
57	O	LPC3250, U1_TX	157	O, Buffer Address bus 2	LPC3250, A2 via buffer
58	I, GPI	LPC3250, U1_RX	158	O, Buffer Address bus 18	LPC3250, A18 via buffer
59	I	ISP1301, USB_VBUS_CTRL	159	O, Buffer Address bus 1	LPC3250, A1 via buffer
60	O, GPO	LPC3250, GPO_17	160	O, Buffer Address bus 17	LPC3250, A17 via buffer
61	O, GPO	LPC3250, GPO_20	161	O, Buffer Address bus 0	LPC3250, A0 via buffer
62	O	LPC3250, SPI1_CLK	162	O, Buffer Address bus 16	LPC3250, A16 via buffer
63	O, GPO	LPC3250, GPO_04	163	NC	
64	B	LPC3250, SPI1_DATIN	164	I, ABUF_EN	Connected to GND on board
65	B	LPC3250, SPI1_DATIO	165	P, Buffer-VCC	
66	O, GPO	LPC3250, GPO_05	166	P, GND	
67	O, GPO	LPC3250, GPO_11	167	B, Buffer Data bus 15	LPC3250, D15 via buffer
68	A	LPC3250, TS_XP	168	I, GPI	LPC3250, GPI_08
69	A	LPC3250, TS_YP	169	B, Buffer Data bus 14	LPC3250, D14 via buffer
70	A	LPC3250, AIN1	170	O, GPO	LPC3250, GPO_23
71	A	LPC3250, AIN2	171	B, Buffer Data bus 13	LPC3250, D13 via buffer
72	A	LPC3250, AIN3	172	I, GPI	LPC3250, GPI_09
73	O, GPO	LPC3250, GPO_00	173	B, Buffer Data bus 12	LPC3250, D12 via buffer
74	B, I2C-SDA	LPC3250, I2C1_SDA	174	I, GPI	LPC3250, GPI_19
75	B, I2C-SCL	LPC3250, I2C1_SCL	175	B, Buffer Data bus 11	LPC3250, D11 via buffer
76	P, GND		176	B, GPIO	LPC3250, P2.8
77	P, GND		177	B, Buffer Data bus 10	LPC3250, D10 via buffer
78	B	LPC3250, MCICLK	178	B, GPIO	LPC3250, P2.9
79	B	LPC3250, MCICMD	179	B, Buffer Data bus 9	LPC3250, D9 via buffer
80	O, GPO	LPC3250, GPO_01	180	B, GPIO	LPC3250, P2.10
81	B	LPC3250, MCIDAT0	181	B, Buffer Data bus 8	LPC3250, D8 via buffer
82	B	LPC3250, MCIDAT1	182	B, GPIO	LPC3250, P2.11
83	B	LPC3250, MCIDAT2	183	B, Buffer Data bus 7	LPC3250, D7 via buffer
84	B	LPC3250, MCIDAT3	184	B, GPIO	LPC3250, P2.12
85	B, GPIO	LPC3250, GPIO_05	185	B, Buffer Data bus 6	LPC3250, D6 via buffer
86	O, GPO	LPC3250, GPO_14	186	I, GPI	LPC3250, GPI_28
87	I, GPI	LPC3250, GPI_03	187	B, Buffer Data bus 5	LPC3250, D5 via buffer
88	B, GPI	LPC3250, U7_RX	188	O	LPC3250, U2_TX
89	O	LPC3250, U7_TX	189	B, Buffer Data bus 4	LPC3250, D4 via buffer
90	B, GPIO	LPC3250, P0.6	190	I, GPI	LPC3250, GPI_17
91	B, GPIO	LPC3250, P0.7	191	B, Buffer Data bus 3	LPC3250, D3 via buffer
92	O, GPO	LPC3250, GPO_22	192	I, GPI	LPC3250, GPI_05
93	B	LPC3250, SYSCLKEN	193	B, Buffer Data bus 2	LPC3250, D2 via buffer
94	B	LPC3250, SPI2_DATIO	194	I, GPI	LPC3250, GPI_16
95	B, GPI	LPC3250, SPI2_DATIN	195	B, Buffer Data bus 1	LPC3250, D1 via buffer
96	B, GPIO	LPC3250, GPIO_04	196	I, GPI	LPC3250, GPI_18
97	B	LPC3250, SPI2_CLK	197	B, Buffer Data bus 0	LPC3250, D0 via buffer
98	A	ISP1301, USB_VBUS	198	O	LPC3250, U3_TX
99	I, GPI	LPC3250, GPI_02	199	P, Buffer-VCC	
100	O, GPO	LPC3250, GPO_19 connected to NAND flash WP	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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