Embedded Artists'

LPC4357 OEM Board DS rev A DS

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

Document status: Preliminary

LPC4357 OEM Board Feature Highlights

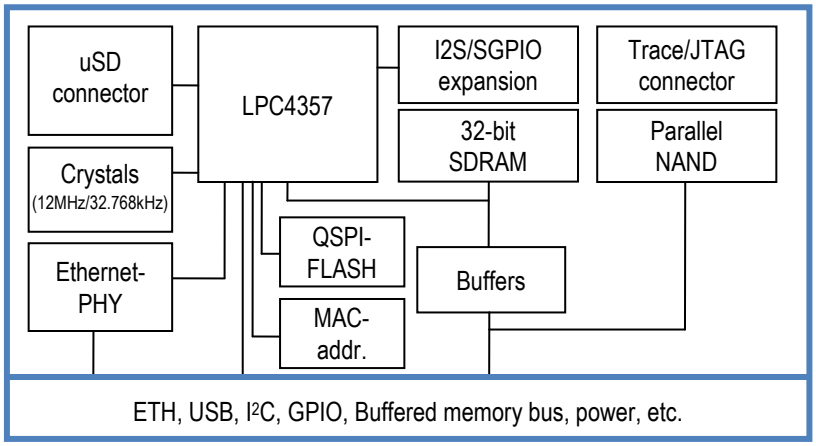
The LPC4357 OEM Board provides a quick and easy solution for implementing a high-performance ARM dual-core Cortex-M4/M0 based design around the LPC4357 from NXP.

- Build around NXP's ARM dual-core Cortex-M4/M0 LPC4357 microcontroller with 1Mbyte FLASH and 136Kbyte SRAM
- 32MByte external SDRAM, via 32-bit databus
- 128 Mbyte NAND FLASH
- 16 Mbit QSPI flash
- 100/10Mbps Ethernet interface based on SMSC LAN8720
- 12.000 MHz and 32.768 kHz crystals for LPC4357
- Buffered 32-bit data bus
- uSD memory card interface connector
- +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 LPC4357 OEM Board



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

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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 +5V tolerant pins on LPC4357	-0.5V to VDD+0.5V -0.5V to +6.0V (see LPC4357 DS for details)
Storage temperature	-40°C to 100°C

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

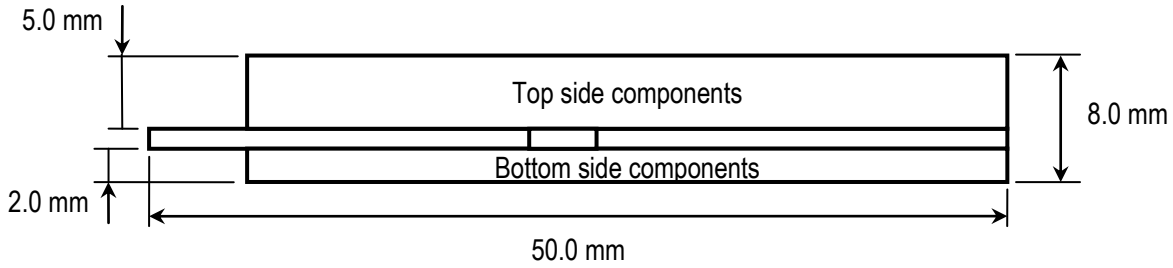
Technical Data

Parameter	Min	Typical	Max
Supply voltage (VDD to GND) Ripple with frequency contents < 100kHz Ripple with frequency contents ≥ 100kHz	3.10V	3.30V	3.50V 50mV 10mV
Supply current - idle, 32kHz RTC active - low-power mode - executing from internal flash (120MHz) - executing from external sdram (120MHz) - Ethernet+usb active		 TBD[2] TBD[2] TBD[2] TBD[2] TBD[2]	Max observed
VBAT current		TBD[2]	
Operating temperature[1]		TBD[2]	
Relative Humidity (RH) 0°C < T_A ≤ 50°C, non-condensing 50°C < T_A ≤ 60°C, non-condensing 60°C < T_A ≤ 70°C, non-condensing	 5% 5% 5%		 80% 50% 35%

[1] Extended temperature range can be supplied on request. Subject to minimum order volume.
[2] Will be defined after a characterization process.

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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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	LPC4357, vbat
10	O, RTC-ALARM	LPC4357, alarm
11	B, RESET-IN	LPC4357, rst (same as below)
12	B, RESET-OUT	LPC4357, rst (same as above)
13	B, GPIO	LPC4357, PE_14
14	I, DBGEN	LPC4357, dbgen
15	O, TCK/SWDCLK	LPC4357, tck/swdclk
16	A, ADCIN	LPC4357, ADC7
17	I, TRST	LPC4357, trst
18	B, TMS/SWDIO	LPC4357, tms/swdio
19	I, TDI	LPC4357, tdi
20	O, TDO/SWO	LPC4357, tdo/swo
21	P, VDDA	LPC4357, vdda
22	A, ADCIN	LPC4357, ADC6
23	P, VSSA	LPC4357, vssa
24	P, GND	
25	B, GPIO	LPC4357, P7_7
26	B, GPIO	LPC4357, P7_0
27	B, CLKIO	LPC4357, P4_7
28	B, GPIO	LPC4357, P4_5
29	B, GPIO	LPC4357, P4_6
30	B, GPIO	LPC4357, P7_6
31	B, GPIO	LPC4357, P8_7
32	B, GPIO	LPC4357, P8_6
33	B, GPIO	LPC4357, P8_5
34	B, GPIO	LPC4357, P8_4
35	I, ISP_EN	pull low to enable special boot
36	B, CLKIO	LPC4357, PF_4
37	P, VCC	
38	P, GND	
39	P, VCC	
40	P, GND	
41	A, USB1-DP	LPC4357, USB-D1+
42	A, USB0-DP	LPC4357, USB-D0+
43	A, USB1-DM	LPC4357, USB-D1-
44	A, USB0-DM	LPC4357, USB-D0-
45	B, GPIO	LPC4357, P7_2
46	B, GPIO	LPC4357, P7_1
47	B, GPIO	LPC4357, P3_1
48	B, GPIO	LPC4357, P3_2
49	B, GPIO	LPC4357, PF_10
50	B, GPIO	LPC4357, PF_11
51	B, GPIO	LPC4357, P4_1
52	B, GPIO	LPC4357, P4_4
53	B, GPIO	LPC4357, P7_5

SO-DIMM pins	I/O, Application Details	Connected to
101	P, GND	
102	P, GND	
103	B, CLKIO	LPC4357, P3_0
104	B, GPIO	LPC4357, PC_12
105	B, GPIO	LPC4357, PC_13
106	B, CLKIO	LPC4357, P6_0
107	B, GPIO	LPC4357, P6_1
108	B, GPIO	LPC4357, P6_2
109	I, WAKEUP	LPC4357, WAKEUP3
110	I, WAKEUP	LPC4357, WAKEUP2
111	I, WAKEUP	LPC4357, WAKEUP1
112	I, WAKEUP	LPC4357, WAKEUP0
113	A, USB_ID	LPC4357, USB0_ID
114	O, SAMPLE	LPC4357, SAMPLE_N
115	B, CLKIO	LPC4357, CLK2
116	B, GPIO	LPC4357, P9_2
117	B, GPIO	LPC4357, P8_1
118	B, GPIO	LPC4357, P8_2
119	B, GPIO	LPC4357, PC_2
120	B, GPIO	LPC4357, PA_1
121	B, GPIO	LPC4357, PA_2
122	B, GPIO	LPC4357, PA_3
123	B, GPIO	LPC4357, P9_0
124	B, GPIO	LPC4357, P9_1
125	B, GPIO	LPC4357, PF_8
126	B, GPIO	LPC4357, PF_9
127	B, GPIO	LPC4357, P4_3
128	B, GPIO	LPC4357, P4_2
129	P, GND	
130	P, GND	
131	O, Buffered Address bus 15	LPC4357, P6_7 via buffer
132	O, Buffered CS2	LPC4357, PD_12 via buffer
133	O, Buffered Address bus 14	LPC4357, P6_8 via buffer
134	O, Buffered CS0	LPC4357, P1_5 via buffer
135	O, Buffered Address bus 13	LPC4357, P2_0 via buffer
136	O, Buffered BLS3	LPC4357, PD_10 via buffer
137	O, Buffered Address bus 12	LPC4357, P2_1 via buffer
138	O, Buffered BLS2	LPC4357, PD_13 via buffer
139	O, Buffered Address bus 11	LPC4357, P2_2 via buffer
140	O, Buffered BLS1	LPC4357, P6_6 via buffer
141	O, Buffered Address bus 10	LPC4357, P2_6 via buffer
142	O, Buffered BLS0	LPC4357, P1_4 via buffer
143	O, Buffered Address bus 9	LPC4357, P2_7 via buffer
144	O, Buffered WE	LPC4357, P1_6 via buffer
145	O, Buffered Address bus 8	LPC4357, P2_8 via buffer
146	O, Buffered OE	LPC4357, P1_3 via buffer
147	O, Buffer Address bus 7	LPC4357, P1_2 via buffer
148	O, Buffer Address bus 23	LPC4357, PA_4 via buffer
149	O, Buffer Address bus 6	LPC4357, P1_1 via buffer
150	O, Buffer Address bus 22	LPC4357, PE_4 via buffer
151	O, Buffer Address bus 5	LPC4357, P1_0 via buffer
152	O, Buffer Address bus 21	LPC4357, PE_3 via buffer
153	O, Buffer Address bus 4	LPC4357, P2_13 via buffer

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54	B, GPIO	LPC4357, P4_8
55	B, GPIO	LPC4357, P7_4
56	B, GPIO	LPC4357, P7_3
57	B, GPIO	LPC4357, P9_3
58	B, GPIO	LPC4357, P2_4
59	O, GPO	inverted LPC4357, P2_3
60	B, GPIO	LPC4357, P9_4
61	B, GPIO	LPC4357, P9_5
62	B, CLKIO	LPC4357, PF_0
63	B, GPIO	LPC4357, PF_1
64	B, GPIO	LPC4357, PF_2
65	B, GPIO	LPC4357, PF_3
66	B, GPIO	LPC4357, P4_0
67	B, GPIO	LPC4357, PE_15
68	A, ADCIN	LPC4357, ADC5
69	A, ADCIN	LPC4357, ADC4
70	A, ADCIN	LPC4357, ADC1
71	A, ADCIN	LPC4357, ADC2
72	A, ADCIN	LPC4357, ADC3
73	A, ADCIN/DACOUT	LPC4357, ADC0/DACOUT
74	B, I2C-SDA	LPC4357, I2C_SDA
75	B, I2C-SCL	LPC4357, I2C_SCL
76	P, GND	
77	P, GND	
78	B, GPIO	LPC4357, PF_5
79	B, GPIO	LPC4357, PC_11
80	B, GPIO	LPC4357, PC_3
81	B, GPIO	LPC4357, PD_14
82	B, GPIO	LPC4357, PF_7
83	B, GPIO	LPC4357, PC_14
84	B, GPIO	LPC4357, P2_5
85	B, CLKIO	LPC4357, P8_8
86	B, GPIO	LPC4357, P9_6
87	B, GPIO	LPC4357, PF_6
88	B, GPIO	LPC4357, P4_10
89	B, GPIO	LPC4357, P4_9
90	B, GPIO	LPC4357, P8_3
91	B, GPIO	LPC4357, PB_6
92	B, GPIO	LPC4357, PB_5
93	B, GPIO	LPC4357, PB_4
94	B, GPIO	LPC4357, PB_3
95	B, GPIO	LPC4357, PB_2
96	B, GPIO	LPC4357, PB_1
97	B, GPIO	LPC4357, PB_0
98	B, GPIO	LPC4357, USB0_VBUS
99	B, GPIO	LPC4357, P8_0
100	OD, NandFlashRdy	Internal NAND flash

154	O, Buffer Address bus 20	LPC4357, PE_2 via buffer
155	O, Buffer Address bus 3	LPC4357, P2_12 via buffer
156	O, Buffer Address bus 19	LPC4357, PE_1 via buffer
157	O, Buffer Address bus 2	LPC4357, P2_11 via buffer
158	O, Buffer Address bus 18	LPC4357, PE_0 via buffer
159	O, Buffer Address bus 1	LPC4357, P2_10 via buffer
160	O, Buffer Address bus 17	LPC4357, PD_15 via buffer
161	O, Buffer Address bus 0	LPC4357, P2_9 via buffer
162	O, Buffer Address bus 16	LPC4357, PD_16 via buffer
163	O, Buffered CS3	LPC4357, PD_11 via buffer
164	NC	
165	P, Buffer-VCC	
166	P, GND	
167	B, Buffer Data bus 15	LPC4357, P5_3 via buffer
168	B, Buffer Data bus 31	LPC4357, PE_12 via buffer
169	B, Buffer Data bus 14	LPC4357, P5_2 via buffer
170	B, Buffer Data bus 30	LPC4357, PE_11 via buffer
171	B, Buffer Data bus 13	LPC4357, P5_1 via buffer
172	B, Buffer Data bus 29	LPC4357, PE_10 via buffer
173	B, Buffer Data bus 12	LPC4357, P5_0 via buffer
174	B, Buffer Data bus 28	LPC4357, PE_9 via buffer
175	B, Buffer Data bus 11	LPC4357, P5_7 via buffer
176	B, Buffer Data bus 27	LPC4357, PE_8 via buffer
177	B, Buffer Data bus 10	LPC4357, P5_6 via buffer
178	B, Buffer Data bus 26	LPC4357, PE_7 via buffer
179	B, Buffer Data bus 9	LPC4357, P5_5 via buffer
180	B, Buffer Data bus 25	LPC4357, PE_6 via buffer
181	B, Buffer Data bus 8	LPC4357, P5_4 via buffer
182	B, Buffer Data bus 24	LPC4357, PE_5 via buffer
183	B, Buffer Data bus 7	LPC4357, P1_14 via buffer
184	B, Buffer Data bus 23	LPC4357, PD_9 via buffer
185	B, Buffer Data bus 6	LPC4357, P1_13 via buffer
186	B, Buffer Data bus 22	LPC4357, PD_8 via buffer
187	B, Buffer Data bus 5	LPC4357, P1_12 via buffer
188	B, Buffer Data bus 21	LPC4357, PD_7 via buffer
189	B, Buffer Data bus 4	LPC4357, P1_11 via buffer
190	B, Buffer Data bus 20	LPC4357, PD_6 via buffer
191	B, Buffer Data bus 3	LPC4357, P1_10 via buffer
192	B, Buffer Data bus 19	LPC4357, PD_5 via buffer
193	B, Buffer Data bus 2	LPC4357, P1_9 via buffer
194	B, Buffer Data bus 18	LPC4357, PD_4 via buffer
195	B, Buffer Data bus 1	LPC4357, P1_8 via buffer
196	B, Buffer Data bus 17	LPC4357, PD_3 via buffer
197	B, Buffer Data bus 0	LPC4357, P1_7 via buffer
198	B, Buffer Data bus 16	LPC4357, PD_2 via buffer
199	P, Buffer-VCC	
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
CLKIO: Pin dedicated to clock signals

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