

# Beetle 1.1 pads

Positions are the lower left corner of the pad window with respect to the lower left corner of the chip ring.

The pad window of all pads is 95µm x 95µm.

The top right corner of the chip ring is 5500µm,6100µm.

## Front pads

Ref.	Pin name	x[um]	y[um]	Type	Description
1	VddPre	507.18	5837.30	power input	positive preamplifier supply
2	TestInput	45.18	5797.06	input	input of testchannel
3	VddPre	199.18	5756.82	power input	positive preamplifier supply
4	VddPre	353.18	5716.58	power input	positive preamplifier supply
5	VddPre	507.18	5676.34	power input	positive preamplifier supply
6	AnalogIn<0>	45.18	5635.10	input	input of channel 0
7	AnalogIn<1>	199.18	5594.86	input	input of channel 1
8	AnalogIn<2>	353.18	5554.62	input	input of channel 2
9	AnalogIn<3>	507.18	5514.38	input	input of channel 3
10	AnalogIn<4>	45.18	5474.14	input	input of channel 4
11	AnalogIn<5>	199.18	5433.90	input	input of channel 5
12	AnalogIn<6>	353.18	5393.66	input	input of channel 6
13	AnalogIn<7>	507.18	5353.42	input	input of channel 7
14	AnalogIn<8>	45.18	5313.18	input	input of channel 8
15	AnalogIn<9>	199.18	5272.94	input	input of channel 9
16	AnalogIn<10>	353.18	5232.70	input	input of channel 10
17	AnalogIn<11>	507.18	5192.46	input	input of channel 11
18	AnalogIn<12>	45.18	5152.22	input	input of channel 12
19	AnalogIn<13>	199.18	5111.98	input	input of channel 13
20	AnalogIn<14>	353.18	5071.74	input	input of channel 14
21	AnalogIn<15>	507.18	5031.50	input	input of channel 15
22	AnalogIn<16>	45.18	4991.26	input	input of channel 16
23	AnalogIn<17>	199.18	4951.02	input	input of channel 17
24	AnalogIn<18>	353.18	4910.78	input	input of channel 18
25	AnalogIn<19>	507.18	4870.54	input	input of channel 19
26	AnalogIn<20>	45.18	4830.30	input	input of channel 20
27	AnalogIn<21>	199.18	4790.06	input	input of channel 21
28	AnalogIn<22>	353.18	4749.82	input	input of channel 22
29	AnalogIn<23>	507.18	4709.58	input	input of channel 23
30	AnalogIn<24>	45.18	4669.34	input	input of channel 24
31	AnalogIn<25>	199.18	4629.10	input	input of channel 25
32	AnalogIn<26>	353.18	4588.86	input	input of channel 26
33	AnalogIn<27>	507.18	4548.62	input	input of channel 27
34	AnalogIn<28>	45.18	4508.38	input	input of channel 28
35	AnalogIn<29>	199.18	4468.14	input	input of channel 29
36	AnalogIn<30>	353.18	4427.90	input	input of channel 30
37	AnalogIn<31>	507.18	4387.66	input	input of channel 31
38	AnalogIn<32>	45.18	4347.42	input	input of channel 32
39	AnalogIn<33>	199.18	4307.18	input	input of channel 33
40	AnalogIn<34>	353.18	4266.94	input	input of channel 34
41	AnalogIn<35>	507.18	4226.70	input	input of channel 35
42	AnalogIn<36>	45.18	4186.46	input	input of channel 36
43	AnalogIn<37>	199.18	4146.22	input	input of channel 37
44	AnalogIn<38>	353.18	4105.98	input	input of channel 38

**Front pads** (continue)

Ref.	Pin name	x[um]	y[um]	Type	Description
45	AnalogIn<39>	507.18	4065.74	input	input of channel 39
46	AnalogIn<40>	45.18	4025.50	input	input of channel 40
47	AnalogIn<41>	199.18	3985.26	input	input of channel 41
48	AnalogIn<42>	353.18	3945.02	input	input of channel 42
49	AnalogIn<43>	507.18	3904.78	input	input of channel 43
50	AnalogIn<44>	45.18	3864.54	input	input of channel 44
51	AnalogIn<45>	199.18	3824.30	input	input of channel 45
52	AnalogIn<46>	353.18	3784.06	input	input of channel 46
53	AnalogIn<47>	507.18	3743.82	input	input of channel 47
54	AnalogIn<48>	45.18	3703.58	input	input of channel 48
55	AnalogIn<49>	199.18	3663.34	input	input of channel 49
56	AnalogIn<50>	353.18	3623.10	input	input of channel 50
57	AnalogIn<51>	507.18	3582.86	input	input of channel 51
58	AnalogIn<52>	45.18	3542.62	input	input of channel 52
59	AnalogIn<53>	199.18	3502.38	input	input of channel 53
60	AnalogIn<54>	353.18	3462.14	input	input of channel 54
61	AnalogIn<55>	507.18	3421.90	input	input of channel 55
62	AnalogIn<56>	45.18	3381.66	input	input of channel 56
63	AnalogIn<57>	199.18	3341.42	input	input of channel 57
64	AnalogIn<58>	353.18	3301.18	input	input of channel 58
65	AnalogIn<59>	507.18	3260.94	input	input of channel 59
66	AnalogIn<60>	45.18	3220.70	input	input of channel 60
67	AnalogIn<61>	199.18	3180.46	input	input of channel 61
68	AnalogIn<62>	353.18	3140.22	input	input of channel 62
69	AnalogIn<63>	507.18	3099.98	input	input of channel 63
70	AnalogIn<64>	45.18	3059.74	input	input of channel 64
71	AnalogIn<65>	199.18	3019.50	input	input of channel 65
72	AnalogIn<66>	353.18	2979.26	input	input of channel 66
73	AnalogIn<67>	507.18	2939.02	input	input of channel 67
74	AnalogIn<68>	45.18	2898.78	input	input of channel 68
75	AnalogIn<69>	199.18	2858.54	input	input of channel 69
76	AnalogIn<70>	353.18	2818.30	input	input of channel 70
77	AnalogIn<71>	507.18	2778.06	input	input of channel 71
78	AnalogIn<72>	45.18	2737.82	input	input of channel 72
79	AnalogIn<73>	199.18	2697.58	input	input of channel 73
80	AnalogIn<74>	353.18	2657.34	input	input of channel 74
81	AnalogIn<75>	507.18	2617.10	input	input of channel 75
82	AnalogIn<76>	45.18	2576.86	input	input of channel 76
83	AnalogIn<77>	199.18	2536.62	input	input of channel 77
84	AnalogIn<78>	353.18	2496.38	input	input of channel 78
85	AnalogIn<79>	507.18	2456.14	input	input of channel 79
86	AnalogIn<80>	45.18	2415.90	input	input of channel 80
87	AnalogIn<81>	199.18	2375.66	input	input of channel 81
88	AnalogIn<82>	353.18	2335.42	input	input of channel 82
89	AnalogIn<83>	507.18	2295.18	input	input of channel 83
90	AnalogIn<84>	45.18	2254.94	input	input of channel 84
91	AnalogIn<85>	199.18	2214.70	input	input of channel 85
92	AnalogIn<86>	353.18	2174.46	input	input of channel 86
93	AnalogIn<87>	507.18	2134.22	input	input of channel 87
94	AnalogIn<88>	45.18	2093.98	input	input of channel 88
95	AnalogIn<89>	199.18	2053.74	input	input of channel 89
96	AnalogIn<90>	353.18	2013.50	input	input of channel 90
97	AnalogIn<91>	507.18	1973.26	input	input of channel 91
98	AnalogIn<92>	45.18	1933.02	input	input of channel 92

**Front pads** (continue)

99	AnalogIn<93>	199.18	1892.78	input	input of channel 93
100	AnalogIn<94>	353.18	1852.54	input	input of channel 94
101	AnalogIn<95>	507.18	1812.30	input	input of channel 95
102	AnalogIn<96>	45.18	1772.06	input	input of channel 96
103	AnalogIn<97>	199.18	1731.82	input	input of channel 97
104	AnalogIn<98>	353.18	1691.58	input	input of channel 98
105	AnalogIn<99>	507.18	1651.34	input	input of channel 99
106	AnalogIn<100>	45.18	1611.10	input	input of channel 100
107	AnalogIn<101>	199.18	1570.86	input	input of channel 101
108	AnalogIn<102>	353.18	1530.62	input	input of channel 102
109	AnalogIn<103>	507.18	1490.38	input	input of channel 103
110	AnalogIn<104>	45.18	1450.14	input	input of channel 104
111	AnalogIn<105>	199.18	1409.90	input	input of channel 105
112	AnalogIn<106>	353.18	1369.66	input	input of channel 106
113	AnalogIn<107>	507.18	1329.42	input	input of channel 107
114	AnalogIn<108>	45.18	1289.18	input	input of channel 108
115	AnalogIn<109>	199.18	1248.94	input	input of channel 109
116	AnalogIn<110>	353.18	1208.70	input	input of channel 110
117	AnalogIn<111>	507.18	1168.46	input	input of channel 111
118	AnalogIn<112>	45.18	1128.22	input	input of channel 112
119	AnalogIn<113>	199.18	1087.98	input	input of channel 113
120	AnalogIn<114>	353.18	1047.74	input	input of channel 114
121	AnalogIn<115>	507.18	1007.50	input	input of channel 115
122	AnalogIn<116>	45.18	967.26	input	input of channel 116
123	AnalogIn<117>	199.18	927.02	input	input of channel 117
124	AnalogIn<118>	353.18	886.78	input	input of channel 118
125	AnalogIn<119>	507.18	846.54	input	input of channel 119
126	AnalogIn<120>	45.18	806.30	input	input of channel 120
127	AnalogIn<121>	199.18	766.06	input	input of channel 121
128	AnalogIn<122>	353.18	725.82	input	input of channel 122
129	AnalogIn<123>	507.18	685.58	input	input of channel 123
130	AnalogIn<124>	45.18	645.34	input	input of channel 124
131	AnalogIn<125>	199.18	605.10	input	input of channel 125
132	AnalogIn<126>	353.18	564.86	input	input of channel 126
133	AnalogIn<127>	507.18	524.62	input	input of channel 127
134	Gnd	45.18	497.10	power input	detector ground
135	Gnd	199.18	456.86	power input	detector ground
136	Gnd	353.18	416.62	power input	detector ground
137	Gnd	507.18	376.38	power input	detector ground

**Bottom pads**

Ref.	Pin name	x[um]	y[um]	Type	Description
138	Gnda	2035.22	37.50	power input	negative analog supply
139	Vdda	2150.22	37.50	power input	positive analog supply
140	VddComp	2265.22	37.50	power input	positive comparator supply
141	GndComp	2380.22	37.50	power input	negative comparator supply
142	notCompClock	2495.22	37.50	LVDS input	comparator clock
143	CompClock	2610.22	37.50	LVDS input	comparator clock
144	notCompOut<15>	2725.22	37.50	LVDS output	comparator output channel 15
145	CompOut<15>	2840.22	37.50	LVDS output	comparator output channel 15
146	notCompOut<14>	2955.22	37.50	LVDS output	comparator output channel 14
147	CompOut<14>	3070.22	37.50	LVDS output	comparator output channel 14

**Bottom pads** (continue)

Ref.	Pin name	x[um]	y[um]	Type	Description
148	notCompOut<13>	3185.22	37.50	LVDS output	comparator output channel 13
149	CompOut<13>	3300.22	37.50	LVDS output	comparator output channel 13
150	notCompOut<12>	3415.22	37.50	LVDS output	comparator output channel 12
151	CompOut<12>	3530.22	37.50	LVDS output	comparator output channel 12
152	notCompOut<11>	3645.22	37.50	LVDS output	comparator output channel 11
153	CompOut<11>	3760.22	37.50	LVDS output	comparator output channel 11
154	notCompOut<10>	3875.22	37.50	LVDS output	comparator output channel 10
155	CompOut<10>	3990.22	37.50	LVDS output	comparator output channel 10
156	notCompOut<9>	4105.22	37.50	LVDS output	comparator output channel 9
157	CompOut<9>	4220.22	37.50	LVDS output	comparator output channel 9
158	notCompOut<8>	4335.22	37.50	LVDS output	comparator output channel 8
159	CompOut<8>	4450.22	37.50	LVDS output	comparator output channel 8
160	VddComp	4565.22	37.50	power input	positive comparator supply
161	GndComp	4680.22	37.50	power input	negative comparator supply
162	TrigMon	4795.22	37.50	CMOS output	indicates if pipeline trigger pointer passes column 0
163	WriteMon	4910.22	37.50	CMOS output	indicates if pipeline write pointer passes column 0
164	SDAoutputMode	5025.22	37.50	CMOS input	selects between an analog or digital SDA-line delay stage

**Backside pads**

Ref.	Pin name	x[um]	y[um]	Type	Description
165	notT2A	5370.72	529.72	LVDS in-/output	Token for address/readout daisy-chain
166	T2A	5370.72	644.72	LVDS in-/output	Token for address/readout daisy-chain
167	notT2B	5370.72	759.72	LVDS in-/output	Token for address/readout daisy-chain
168	T2B	5370.72	874.72	LVDS in-/output	Token for address/readout daisy-chain
169	SCL	5370.72	989.72	CMOS input	I <sup>2</sup> C-bus clock port
170	SDA	5370.72	1104.72	CMOS in-/output	I <sup>2</sup> C-bus data port
171	notClock	5370.72	1219.72	LVDS input	system clock
172	Clock	5370.72	1334.72	LVDS input	system clock
173	notTrigger	5370.72	1449.72	LVDS input	trigger
174	Trigger	5370.72	1564.72	LVDS input	trigger
175	notDataValid	5370.72	1679.72	LVDS output	indicates presence of valid data
176	DataValid	5370.72	1794.72	LVDS output	indicates presence of valid data
177	notTestpulse	5370.72	1909.72	LVDS input	test pulse
178	Testpulse	5370.72	2024.72	LVDS input	test pulse
179	notReset	5370.72	2139.72	LVDS input	system reset
180	Reset	5370.72	2254.72	LVDS input	system reset
181	AnalogOut<3>	5370.72	2369.72	output	analog output channel 3
182	notAnalogOut<3>	5370.72	2484.72	output	analog output channel 3
183	AnalogOut<2>	5370.72	2599.72	output	analog output channel 2
184	notAnalogOut<2>	5370.72	2714.72	output	analog output channel 2
185	AnalogOut<1>	5370.72	2829.72	output	analog output channel 1
186	notAnalogOut<1>	5370.72	2944.72	output	analog output channel 1
187	AnalogOut<0>	5370.72	3059.72	output	analog output channel 0
188	notAnalogOut<0>	5370.72	3174.72	output	analog output channel 0
189	notError	5370.72	3289.72	CMOS output	on chip error signal
190	lpipe	5370.72	3404.72	block output	analog probe pad (to be blocked)
191	Vd	5370.72	3519.72	block output	analog probe pad (to be blocked)
192	Vdcl	5370.72	3634.72	block output	analog probe pad (to be blocked)
193	lsf	5370.72	3749.72	block output	analog probe pad (to be blocked)

**Backside pads** (continue)

Ref.	Pin name	x[um]	y[um]	Type	Description
194	Icurrbuf	5370.72	3864.72	block output	analog probe pad (to be blocked)
195	Gnnd	5370.72	3979.72	power input	negative digital supply
196	Gnnd	5370.72	4094.72	power input	negative digital supply
197	Gnda	5370.72	4209.72	power input	negative analog supply
198	Gnda	5370.72	4324.72	power input	negative analog supply
199	Gnda	5370.72	4439.72	power input	negative analog supply
200	Vddd	5370.72	4554.72	power input	positive digital supply
201	Vddd	5370.72	4669.72	power input	positive digital supply
202	Vdda	5370.72	4784.72	power input	positive analog supply
203	Vdda	5370.72	4899.72	power input	positive analog supply
204	Vdda	5370.72	5014.72	power input	positive analog supply
205	T1B	5370.72	5129.72	LVDS in-/output	Token for address/readout daisy-chain
206	notT1B	5370.72	5244.72	LVDS in-/output	Token for address/readout daisy-chain
207	T1A	5370.72	5359.72	LVDS in-/output	Token for address/readout daisy-chain
208	notT1A	5370.72	5474.72	LVDS in-/output	Token for address/readout daisy-chain

**Top pads**

Ref.	Pin name	x[um]	y[um]	Type	Description
209	IRef	5025.22	5967.52	input	reference current for current source
210	IOut	4910.22	5967.52	output	analog probe pad
211	I <sup>2</sup> CAddrMode	4795.22	5967.52	CMOS input	selects between 7-bit and 10-bit I <sup>2</sup> C-address
212	PipeampTestOut	4680.22	5967.52	output	analog probe pad
213	FifoFull	4565.22	5967.52	CMOS output	indicates full derandomizing buffer
214	GndComp	4450.22	5967.52	power input	negative comparator supply
215	VddComp	4335.22	5967.52	power input	positive comparator supply
216	CompOut<7>	4220.22	5967.52	LVDS output	comparator output channel 7
217	notCompOut<7>	4105.22	5967.52	LVDS output	comparator output channel 7
218	CompOut<6>	3990.22	5967.52	LVDS output	comparator output channel 6
219	notCompOut<6>	3875.22	5967.52	LVDS output	comparator output channel 6
220	CompOut<5>	3760.22	5967.52	LVDS output	comparator output channel 5
221	notCompOut<5>	3645.22	5967.52	LVDS output	comparator output channel 5
222	CompOut<4>	3530.22	5967.52	LVDS output	comparator output channel 4
223	notCompOut<4>	3415.22	5967.52	LVDS output	comparator output channel 4
224	CompOut<3>	3300.22	5967.52	LVDS output	comparator output channel 3
225	notCompOut<3>	3185.22	5967.52	LVDS output	comparator output channel 3
226	CompOut<2>	3070.22	5967.52	LVDS output	comparator output channel 2
227	notCompOut<2>	2955.22	5967.52	LVDS output	comparator output channel 2
228	CompOut<1>	2840.22	5967.52	LVDS output	comparator output channel 1
229	notCompOut<1>	2725.22	5967.52	LVDS output	comparator output channel 1
230	CompOut<0>	2610.22	5967.52	LVDS output	comparator output channel 0
231	notCompOut<0>	2495.22	5967.52	LVDS output	comparator output channel 0
232	GndComp	2380.22	5967.52	power input	negative comparator supply
233	VddComp	2265.22	5967.52	power input	positive comparator supply
234	Vdda	2150.22	5967.52	power input	positive analog supply
235	Gnda	2035.22	5967.52	power input	negative analog supply
236	TestOutput	1920.22	5967.50	output	frontend output of testchannel
237	Bufbias	1805.22	5967.50	output	analog probe pad
238	Shabias1	1690.22	5967.50	output	analog probe pad
239	Shabias	1575.22	5967.50	output	analog probe pad
240	Prebias1	1460.22	5967.50	output	analog probe pad
241	Prebias	1345.22	5967.50	output	analog probe pad