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Haokai Microelectronics (Shanghai) Corporation

Phase Locked Loop IP List

IP Name	Technology	Status	Period jitter (P-P) / (RMS) (ps)	Period jitter (P-P) / (RMS) (%)	PFD input frequency (MHz)	Output frequency (MHz)	Size ($\mu\text{m} \times \mu\text{m}$)	Metal layer	N** range	Power range (mW)
Haokai_PLL_130SMIC_01	SMIC 0.13 μm mixed signal CMOS	Silicon proven on MPW	(16-33)/(2-7)	(2-3.6)/(0.3-0.7)	0.5 to 5	20 to 1400	651 x 431	1P8M	60 to 3000	6 to 13
Haokai_PLL_130SMIC_02	SMIC 0.13 μm mixed signal CMOS	Silicon proven on MPW	(20-34)/(2.5-4.3)	(0.9-0.4)/(0.13-0.4)	5 to 30	20 to 1400	651 x 431	1P8M	10 to 300	6 to 13
Haokai_PLL_130SMIC_03	SMIC 0.13 μm mixed signal CMOS	Silicon proven on MPW	(18-33)/(2.5-5.3)	(1.1-2.6)/(0.15-0.42)	30 to 150	20 to 1400	651 x 431	1P8M	2 to 50	7 to 14
Haokai_PLL_130SMIC_04	SMIC 0.13 μm mixed signal CMOS	Silicon proven on MPW	(17-34)/(2.4-5.8)	(0.9-4)/(0.13-0.37)	50 to 200	25 to 2400	502 x 298	1P8M	2 to 32	7 to 14
Haokai_PLL_130SMIC_05	SMIC 0.13 μm generic CMOS	Silicon proven on MPW	(23-58)/(2.7-7.1)	(0.16-2.3)/(0.02-0.4)	50 to 400	80 to 2000	260 x 235	1P8M	2 to 32	4 to 14
Haokai_PLL_130SMIC_06	SMIC 0.13 μm generic CMOS	Silicon proven on MPW	(16-52)/(2.3-13.3)	(0.42-2.5)/(0.08-0.8)	5 to 350	50 to 800	260 x 235	1P8M	2 to 32	3 to 9
Haokai_PLL_130SMIC_07	SMIC 0.13 μm generic CMOS	Silicon proven on MPW	(13-71)/(1.6-16)	(2.3-5.1)/(0.32-1.14)	0.5 to 5	100 to 2000	356 x 290	1P8M	160 to 4095	6 to 13
Haokai_PLL_130SMIC_08	SMIC 0.13 μm generic CMOS	Silicon proven on MPW	(14-71)/(1.8-16)	(1.8-5.1)/(0.32-1.14)	1.5 to 30	150 to 2000	356 x 290	1P8M	32 to 680	5 to 14
Haokai_PLL_130SMIC_09	SMIC 0.13 μm generic CMOS	Silicon proven on MPW	(14-46)/(1.9-11)	(1.6-5.4)/(0.3-0.97)	5 to 300	150 to 2000	356 x 290	1P8M	4 to 128	5 to 16
Haokai_PLL_130SMIC_10	SMIC 0.13 μm generic CMOS	Silicon proven on MPW	(12-68)/(2.4-20)	(1-4.6)/(0.2-1.29)	1.5 to 4.5	150 to 800	356 x 274	1P8M	160 to 511	8 to 9
Haokai_PLL_130SMIC_11	SMIC 0.13 μm generic CMOS	Silicon proven on MPW	(12-83)/(1.9-24)	(0.9-5)/(0.11-1.42)	1.8 to 50	50 to 800	356 x 274	1P8M	16 to 500	3 to 9
Haokai_PLL_130SMIC_12	SMIC 0.13 μm generic CMOS	Silicon proven on MPW	(19-187)/(2.2-32)	(0.6-2.85)/(0.1-0.84)	8 to 400	20 to 800	356 x 274	1P8M	1 to 64	3 to 11
Haokai_PLL_090SMIC_01	SMIC 90 nm generic CMOS	Silicon proven on MPW	(15-38)/(2-7)	(0.74-4.5)/(0.1-0.48)	0.5 to 5	20 to 1600	289 x 255	1P8M	200 to 3200	3 to 8
Haokai_PLL_090SMIC_02	SMIC 90 nm generic CMOS	Silicon proven on MPW	(16-54)/(2-8)	(0.75-5.1)/(0.12-0.7)	5 to 30	20 to 1600	289 x 255	1P8M	10 to 320	3 to 8
Haokai_PLL_090SMIC_03	SMIC 90 nm generic CMOS	Silicon proven on MPW	(18-37)/(2.6-7)	(0.7-4.7)/(0.12-0.62)	30 to 150	20 to 1600	289 x 255	1P8M	2 to 60	3 to 9
Haokai_PLL_090SMIC_04	SMIC 90 nm generic CMOS	Silicon proven on MPW	(13-37)/(2-5.8)	(1.1-5.1)/(0.17-0.95)	50 to 200	40 to 3000	213 x 212	1P8M	2 to 32	2.5 to 11
Haokai_PLL_130CHRT_01	CHRT 0.13 μm generic CMOS	Silicon proven on MPW	(18-252)/(2.4-38)	(0.5-4.5)/(0.1-1)	10 to 400	25 to 1000	309 x 332	1P6M	2 to 32	2 to 9
Haokai_PLL_130CHRT_02	CHRT 0.13 μm generic CMOS	Silicon proven on MPW	(18-288)/(2.2-70)	(0.7-4.6)/(0.1-0.8)	0.5 to 250	20 to 1000	405 x 314	1P6M	1 to 511	2 to 11
Haokai_PLL_180CHRT_01	CHRT 0.18 μm generic IB CMOS	MPW finished, testing			10 to 150	50 to 1400	400 x 300	1P3M	2 to 32	
Haokai_PLL_180CHRT_02	CHRT 0.18 μm generic IB CMOS	MPW finished, testing			5 to 100	20 to 600	400 x 270	1P3M	2 to 32	
Haokai_PLL_130SMIC_phase	SMIC 0.13 μm generic CMOS	Under development			5 to 350	5 to 800	260 x 525	1P6M	1 to 512	

N** is output frequency to PFD input frequency ratio

All questions concerning the document and/or other questions can be directed to Haokai Corporation as follows:

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