

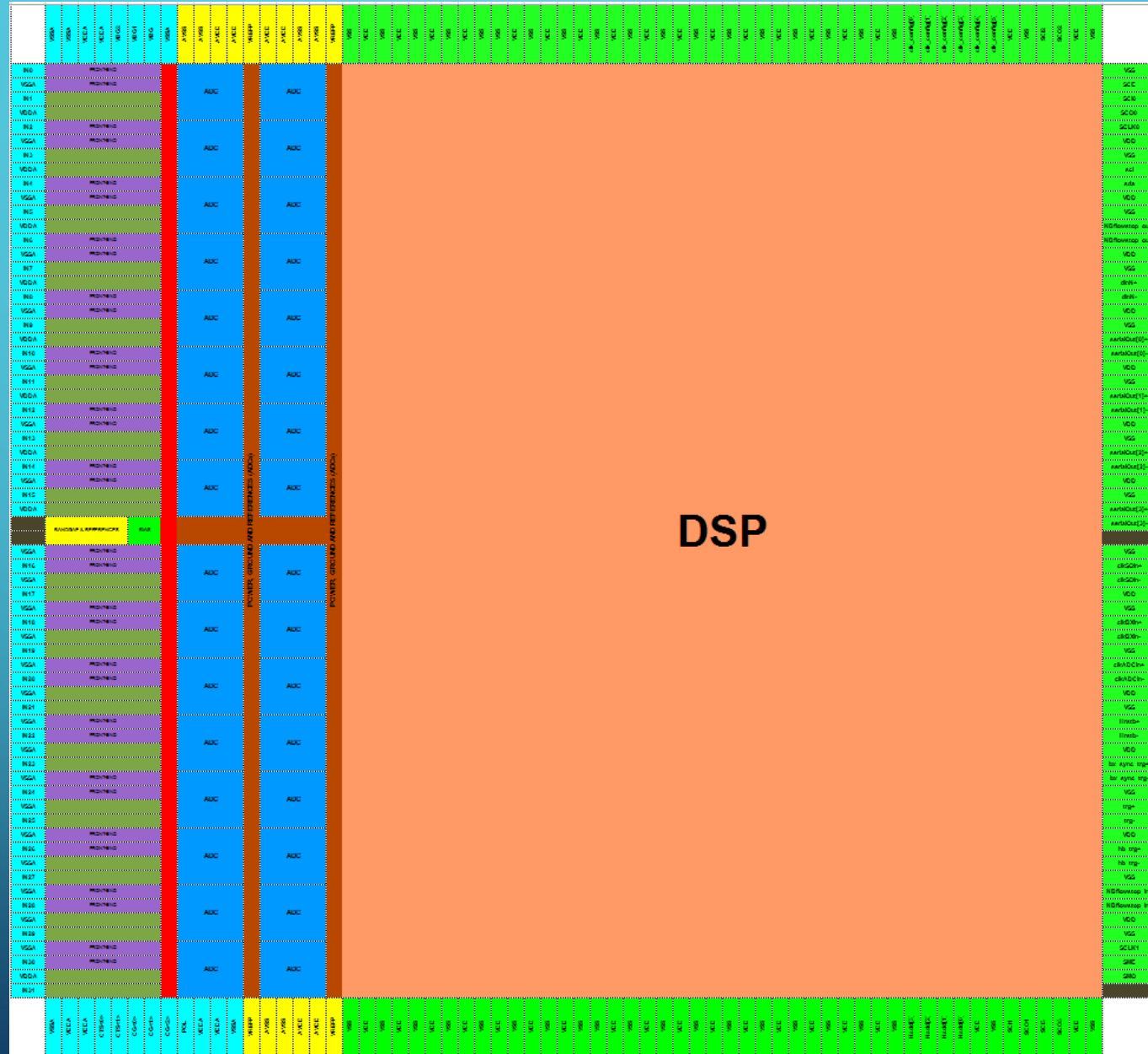
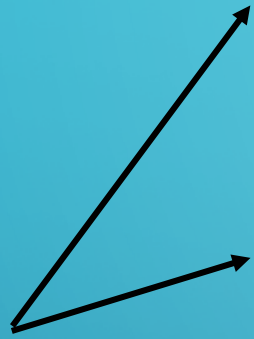


SAMPA PACKAGE

VALÉRIE CHAMBERT, IPNO, SAMPA TESTS MEETING, MAY 6TH 2015

SAMPA PINOUT: 256 PINS

32 inputs



DSP

Differential pairs outputs



POSSIBLE COMPANIES

- IMEC (euopractice Belgium), subcontracting with ASE company
- LSI TEC (Brasil)
- NOVAPAC (Grenoble France)

STATUS OF THE DISCUSSIONS

- IMEC: BGA 0,65 pitch 11x11mm²
- LSI TEC: BGA 17x17mm², nothing more at the moment
- NOVAPAC (Grenoble France): BGA 0,65 pitch 15x15mm²

IMEC DISCUSSIONS

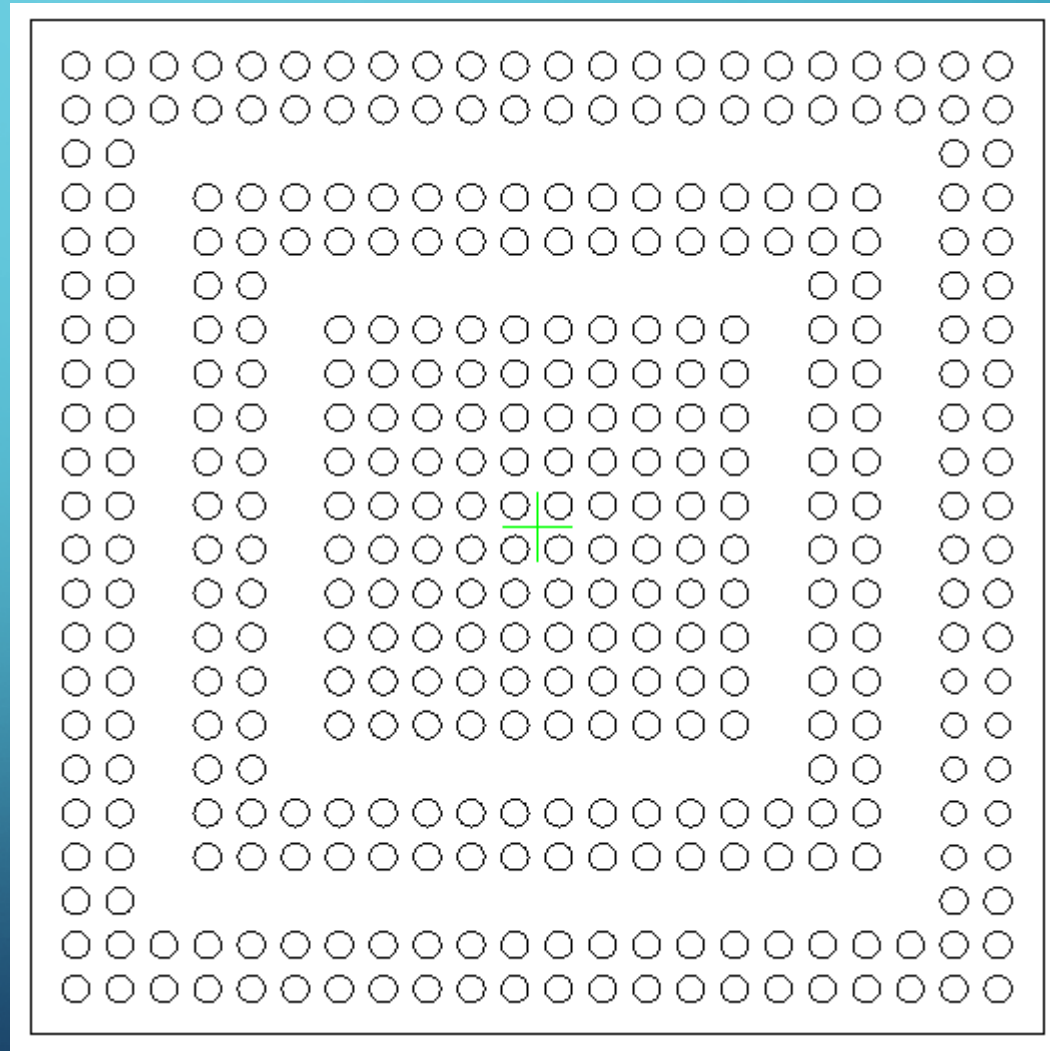
- December 2014, now.
- TFBGA256 11x11mm 0.65mm pitch 4L substrate package
- package outline drawing (POD)
- bonding diagram (BD)
- initial substrate design
- They wait for comments from us

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NOVAPAC PACKAGE PROPOSAL

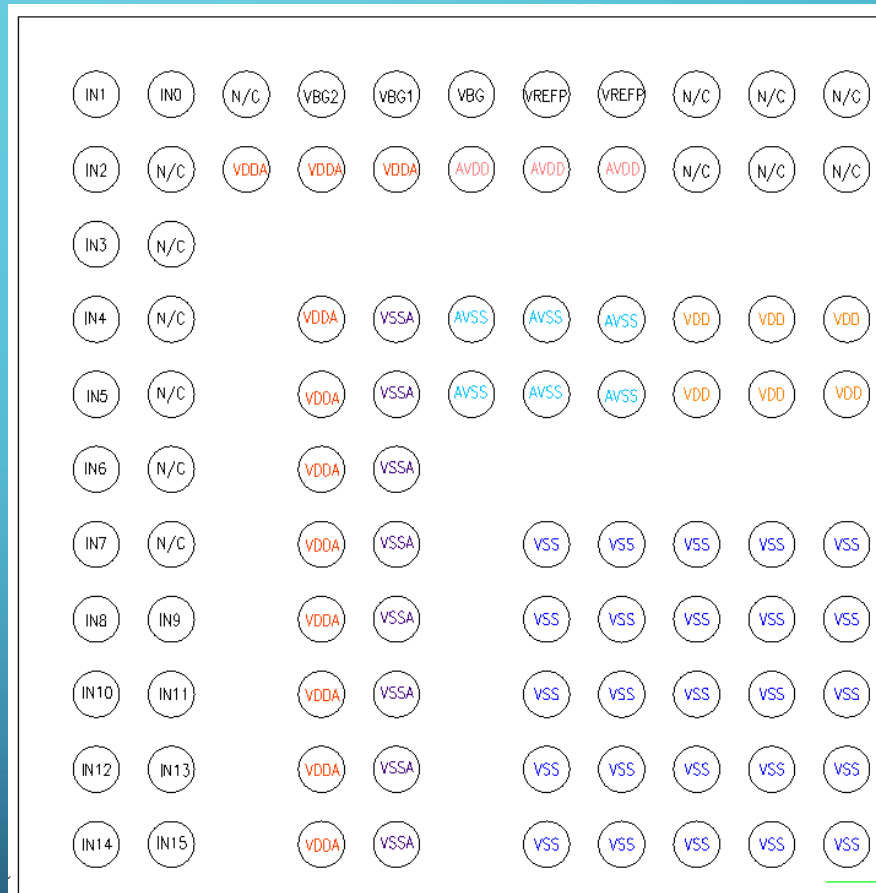
BGA 15X15-372 BALLS
(0.65 MM PITCH, 0.35 MM BALL)

- “Full custom”: pcb design, 4 layers including 2 PS layers
- Flat package : IC pasted at the surface of the PCB



NOVAPAC PRELIMINARY BALL-OUT PROPOSAL : INPUTS WEST SIDE

Meeting at CERN with NOVAPAC people on april 14th



OUR PROPOSAL TO NOVAPAC : INPUTS WEST SIDE

	B	C	D	E	F	G	H
	1	2	3	4	5	6	7
VSSA	IN7	VSSA	IN5	VSSA	IN3	VSSA	IN2
IN8	VSSA	IN6	VSSA	IN4	VSSA	AVSS	AVSS
VSSA	IN9						
IN10	VSSA		vdda	VSSA	AVSS	AVSS	AVSS
VSSA	IN11		vdda	VSSA	AVSS	AVSS	AVSS
IN12	VSSA		vdda	VSSA			
VSSA	IN13		vdda	VSSA			VSS
IN14	VSSA		vdda	VSSA			VSS
VSSA	IN15		vdda	VSSA			VSS
IN16	VSSA		vdda	VSSA			VSS
VSSA	IN17		vdda	VSSA			VSS
IN18	VSSA		vdda	VSSA			VSS
VSSA	IN19		vdda	VSSA			VSS
IN20	VSSA		vdda	VSSA			VSS
VSSA	IN21		vdda	VSSA			VSS
IN22	VSSA		vdda	VSSA			VSS
VSSA	IN23		vdda	VSSA			
IN24	VSSA		vdda	VSSA	VSSA	AVSS	AVSS
VSSA	IN25		vdda	VSSA	VSSA	AVSS	AVSS
IN26	VSSA						
VSSA	IN27	VSSA	IN30	VSSA	VSSA	CTS<0>	CTS<0>
IN28	VSSA	IN29	VSSA	IN31	VSSA	CTS<1>	CTS<1>
	1	2	3	4	5	6	7

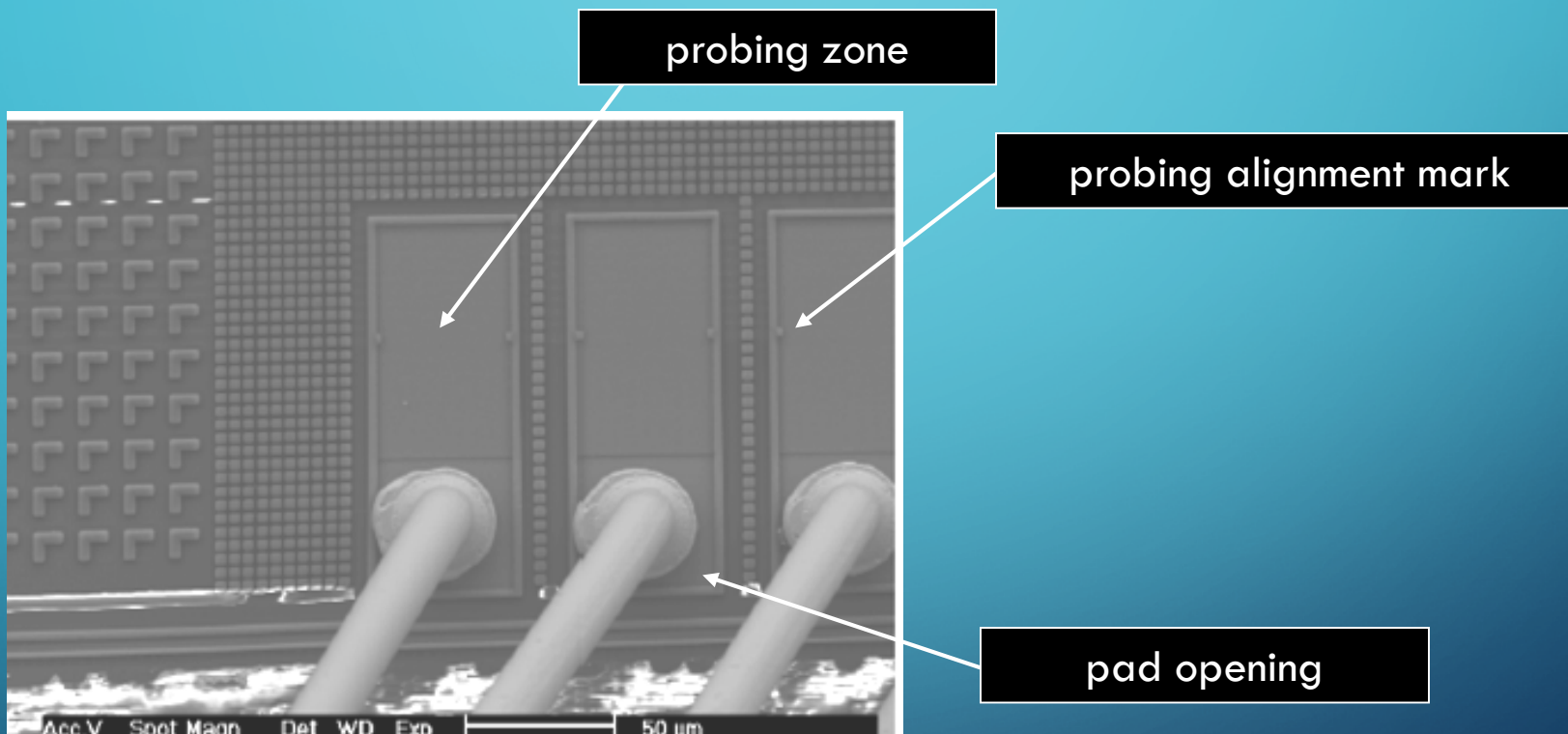
NOVAPAC PRELIMINARY BALL-OUT PROPOSAL : EAST SIDE

R	S	T	U	V	W	X
17	18	19	20	21	22	
onfig[3]	clk_config[4]	clk_config[5]	SCI2	SCO2	SCE	A
	N/C	N/C	N/C	N/C	SCIO	B
				N/C	SCO0	C
	vdd	vdd		N/C	SCLK0	D
	vdd	vdd		sda	sci	E
	vdd	vdd		NBflowstop_out-	NBflowstop_out+	F
	vdd	vdd		dinN-	dinN+	G
	vdd	vdd		serialOut[0]-	serialOut[0]+	H
	vdd	vdd		serialOut[1]-	serialOut[1]+	J
	vdd	vdd		serialOut[2]-	serialOut[2]+	K
	vdd	vdd		serialOut[3]-	serialOut[3]+	L
	vdd	vdd		clkSOin-	clkSOin+	M
	vdd	vdd		clkBXin-	clkBXin+	N
	vdd	vdd		clkADCin-	clkADCin+	P
	vdd	vdd		Hrstb-	Hrstb-	R
	vdd	vdd		bx_sync_trg-	bx_sync_trg+	T
	vdd	vdd		trg-	trg+	U
	vdd	vdd		hb_trg-	hb_trg+	V
	vdd	vdd		NBflowstop_in-	NBflowstop_in+	W
				N/C	SCLK1	Y
	N/C	N/C	N/C	N/C	SME	AA
	SCI1	SCO1	SCI3	SCO3	SMO	AB
17	18	19	20	21	22	

OUR PRELIMINARY BALL-OUT PROPOSAL : EAST SIDE

P	Q	R	S	T	U	V	W	X
15	16	17	18	19	20	21	22	
VREFP	VREFP	clk_config[3]	clk_config[4]	clk_config[5]	SCO2	SCE	SCIO	A
avdd	avdd	clk_config[0]	clk_config[1]	clk_config[2]	SCI2	N/C	SCO0	B
						sda	SCLK0	C
vdd	vdd	vdd	vdd	vdd		N/C	sci	D
vdd	vdd	vdd	NBflowstop_out-	NBflowstop_out+		vdd	vdd	E
			vdd	vdd		dinN-	dinN+	F
VSS	VSS		vdd	vdd		vdd	vdd	G
VSS	VSS		vdd	vdd		serialOut[0]-	serialOut[0]+	H
VSS	VSS		vdd	vdd		vdd	vdd	J
VSS	VSS		vdd	vdd		serialOut[1]-	serialOut[1]+	K
VSS	VSS		vdd	vdd		vdd	vdd	L
VSS	VSS		vdd	vdd		serialOut[2]-	serialOut[2]+	M
VSS	VSS		vdd	vdd		vdd	vdd	N
VSS	VSS		vdd	vdd		serialOut[3]-	serialOut[3]+	P
VSS	VSS		clkSOin-	clkSOin+		vdd	vdd	R
VSS	VSS		vdd	vdd		clkBXin-	clkBXin+	T
			clkADCin-	clkADCin+		vdd	vdd	U
vdd	vdd	vdd	vdd	vdd		Hrstb-	Hrstb-	V
vdd	vdd	vdd	vdd	vdd		bx_sync_trg-	bx_sync_trg+	W
						trg-	trg+	Y
Hard[0]	SCLK1	SME	SMO		NBflowstop_in-	hb_trg-	vdd	AA
Hard[1]	SCI1	SCO1	SCI3	SCO3	NBflowstop_in+	hb_trg+	N/C	AB
15	16	17	18	19	20	21	22	

NOVAPAC: BOND PAD STRUCTURE



The pad opening related to the IC technology ($44\mu\text{m}$) is a concern for the bonding

CONCLUSIONS

- We must chose a company: technical proposal, level of possible technical discussions, quotations...Contacts with NOVAPAC and IMEC
- Design of the ball-out and of the package PCB
- 40/50 samples for MPW2
- 88 000 packaged circuits for the production
- Tests of the final production
- Option of naked circuits