FEDERAL TRADE COMMISSION

I N D E X (PUBLIC RECORD)

WITNESS:	DIRECT	CROSS	REDIRECT	RECROSS
Reczek	4295	4347		

EXHIBITS	FOR ID	IN EVID	WITHDRAWN
CX			
None			
RX			
None			
JX			
None			
DX			
Number 44	4306		
Number 45	4347		

UNITED STATES OF AMERICA

FEDERAL TRADE COMMISSION

In the Matter of:)

Rambus, Inc.) Docket No. 9302

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Thursday, June 5, 2003

9:30 a.m.

TRIAL VOLUME 23

PART 1

PUBLIC RECORD

BEFORE THE HONORABLE STEPHEN J. McGUIRE

Chief Administrative Law Judge

Federal Trade Commission

600 Pennsylvania Avenue, N.W.

Washington, D.C.

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P R O C E E D I N G S

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JUDGE McGUIRE: Good morning, everyone.

ALL COUNSEL: Good morning.

JUDGE McGUIRE: This hearing is now in order.

Any items that we need to take up this morning before we start?

MR. PERRY: No, Your Honor.

MR. ROYALL: No, Your Honor, thank you.

JUDGE McGUIRE: If not, then at this time complaint counsel may call its next witness.

MR. CATT: Your Honor, good morning.

JUDGE McGUIRE: Good morning.

MR. CATT: I'm Malcolm Catt, and I'll be representing complaint counsel today, and complaint counsel calls Dr. Werner Reczek.

JUDGE McGUIRE: Before we get started, let's go off the record.

(Discussion off the record.)

JUDGE McGUIRE: Okay, now we are on the record, and complaint counsel may proceed.

MR. CATT: Your Honor, we call Dr. Werner Reczek this morning.

JUDGE McGUIRE: All right, sir, would you please be sworn in by the court reporter.

Whereupon--

WERNER RECZEK

a witness, called for examination, having been first duly sworn, was examined and testified as follows:

JUDGE McGUIRE: All right, Mr. Catt.

MR. CATT: Thank you.

DIRECT EXAMINATION

BY MR. CATT:

Q. Dr. Reczek, can you state your full name for the record, please?

A. My name is Werner Reczek, I will spell it, R E C Z E K.

Q. Thank you.

And where do you currently live?

A. I live in Villach, in Austria.

Q. And I take it that English isn't your first language?

A. This is correct, yes.

Q. Okay. Are you nevertheless comfortable testifying in English today?

A. Yes, I'm comfortable with it.

Q. Okay. If you do have any questions or have trouble understanding my questions, please let me know, and I'll try to restate.

A. I will ask, yes.

Q. Thank you.

With whom are you currently employed?

A. So, my current employer is Infineon Technologies Austria AG.

Q. And is that a subsidiary of Infineon Technologies AG?

A. Yes, it is.

Q. And what's your current position at Infineon Technologies Austria?

A. So, my current position is managing director and vice president of the site in Villach, in Austria.

Q. Do you have any university degrees?

A. Yes, I have.

Q. And what are those degrees?

A. I have one degree which is equivalent to a Master's Degree in electrical and biomedical engineering from the Technical University in Graz, in Austria, and I have a Ph.D. degree from the Technical University in Munich in Germany.

Q. Now, I'd like to run through your career at Infineon Austria and I take it prior to that at Siemens. Can you state when you started your work at Siemens? What year was that?

A. So, I started somewhere in 1984, March or April, in Villach, in Austria, and then went directly

to Munich to Siemens HL at that time.

Q. And what was that position?

A. And there I was engaged in the development of process technology for low voltage CMOS applications.

Q. And what was your next position?

A. So, after this, somewhere in the middle of 1985, I joined Research & Development Laboratories in Munich, also from Siemens HL.

Q. And after that?

A. After that, in autumn 1987, I joined again the Memory Products Division group of Siemens HL.

Q. And what did you do there?

A. So, there I started my career in the memory products group with testing of the memory devices.

Q. What type of memory devices?

A. Standard DRAM devices, standard dynamic random access memories.

Q. Can you give me a little more detail on what that work actually involved?

A. So, there I have to implement new test programs, write new test programs, running throughputs, doing all the testing of the memory device.

Q. What did you do after that?

A. So, after this position, I got increased responsibility within the Memory Products Division

group, and then also had to do some design work, and at the end of this phase, I got responsible for the whole four-megabit DRAM program and also for the one-megabit DRAM.

Q. Can you give me a little more detail on what that means, be responsible for the whole program?

A. So, I was in charge for the development of, for example, shrinks of the four-megabit. I was responsible for the introduction into production, also for the ramp-up, and also have to take care of customer complaints, if there have been any.

Q. What did you do after that?

A. So, after that, in 1996, I was appointed to be director of production planning for the memory products division for the production part.

Q. And what were your responsibilities in that position?

A. So, in that position, I was responsible for the production planning of the production of worldwide memory product production sites, and I had to run all the production planning, volume planning and also cost planning.

Q. Can you give me a little more detail on what that sort of planning involves?

A. Planning, for example, for the volume and for

the different product mix, what kind of DRAM, which density, which shrink, which type of DRAM, and in terms of costs, we had to define the elements, for example, personnel costs, material costs and capital costs.

Q. During the time that you were in that position -- well, let me ask this: How long did you stay in that position for?

A. So, in that position I stayed from summer of 1996 until September of 2001.

Q. And where did you go from there?

A. So, in October 2001, I was then sent from Munich to Villach, and I was appointed to be the head of the site in Villach with my current position to be managing director and vice president of the site in Villach.

Q. And during the time that you were director of production planning, what DRAM products was Infineon actually manufacturing worldwide?

A. So, it was -- in terms of densities, it was four-megabit, it was 16-megabit, it was 64-megabit, it was 128-megabit and 256-megabit DRAMs with a couple of shrinks, which means, for example, quarter micron technology and all the technologies which followed the quarter micron and smaller dimensions, and also different types of DRAMs, for example, EDO devices, for

example, SDRAM devices and double data rate devices.

Q. You were mentioning different micron sizes. Can you give me a better understanding of what that means?

A. So, for example, if we are talking about a quarter micron technology, this means the smallest dimension, the smallest feature size of this technology is quarter micron, which might be a dimension, which might be a length or a distance of a certain line, for example.

Q. And you mentioned also that term "density" quite a lot. Can you give me a better description of what that means?

A. So, density means that, for example, four-megabit DRAM or 64-megabit DRAM, this is different density of DRAM. It's the number of cells, the number of information that can be stored on one chip.

Q. Okay. Now, you've also used the term "shrink." Can you tell me what a shrink is?

A. So, a shrink is, for example, when we go from a quarter micron technology to the next smaller feature size, which could be, for example, 0.2-micron technology, and so the procedure of going from one technology node to the next technology node is called to be a shrink.

Q. And what's the purpose of a shrink, aside from going from one to a smaller one?

A. So, the purpose of a shrink is mainly to reduce costs in manufacturing.

Q. And was part of your job then as director of production planning concerned with the cost of producing DRAMs?

A. Yes, this was also one of our daily business, to deal with costs and cost projections, yes.

Q. And you said to do a shrink, the purpose is to save costs. Was there some sort of rule of thumb as to actually doing a shrink, how much it costs to do a shrink?

A. Sure, we would have to go into the different steps which are necessary to produce or to run or to make a shrink.

Q. Okay. And you were talking about the different costs. Can you break down for me the type of costs we're talking about? This is generally, not just for a shrink.

A. So, generally when we are talking about costs, we have to consider personnel costs, we have to consider material costs, and we have to consider capital costs.

Q. Okay.

A. And when we are talking about capital costs, we have to consider how much the capital expenditure is, how much we would have to spend in investments, for example, in order to do the next shrink generation, and then we can maybe calculate this rule of thumb that you need just for the production of the chip, that you need 10 percent of the investment of the original acquisition value, for example, of fab, of a production site.

Q. Okay. Now, you mentioned material costs. What do you mean by material costs?

A. Material costs, for example, are related to direct material, which is one example, the costs for the silicon wafer, which is used in the production process. Another item is all the costs for energy and electricity, all of the costs for the gases which have to be applied to the production, which are necessary to run the equipment.

Q. And I think you also mentioned personnel costs. What do you mean by that?

A. So, personnel costs, for example, are salaries and wages for the people which are engaged in the whole development and production process, and as a rule of thumb, you can, for example, calculate for engineers that they cost $20,000 per month, roughly.

Q. I think you also earlier mentioned the term "ramp-up." Can you tell me what you meant by that?

A. So, ramp-up, my definition is the ramping up of the production, which means once you have a fully functional part, then you have to do all the preparation work in the production facility, in your fab, that they can ramp up to full production.

Q. Now, I'd like to focus now on how Infineon goes about actually implementing a design change to its DRAMs, and is that something you have personal knowledge about?

A. Yes, I do have.

Q. And how did you get that knowledge?

A. For example, I was responsible for -- from between 1987 until 1996, with the four-megabit, I was also a program manager, and in that position, I had to do a lot with -- there I had the responsibility to write design changes and shrinks and also density and time changes for the four-megabit DRAM.

Q. How about in your job as director of production planning?

A. During that phase, when I was responsible for the production planning, I also had to plan all the time lines and the budgets which are necessary to implement the certain densities and shrinks and design

changes, for example.

Q. Are there different categories of the different type of changes that Infineon typically makes to its DRAMs?

A. Yeah, the one category, for example, is a shrink, so that the main focus, the main element is to produce the dimension to smaller sizes in order to reduce the costs, so the main focus there is on technology. When we are talking about new density, increase in density, for example, from 16-megabit to 64-megabit, you have to change the architecture and the floor plan of the die, of the chip, which is a different kind of work that has to be done.

And for example, if you are going to make a change in the type of the DRAM, for example, from EDO DRAM to SDRAM, besides the change in the architecture and the floor plan, you have additionally to do a lot of design work, and this takes really a long time to do this.

Q. So, would you -- in your experience, did Infineon make changes to a shrink at the same time -- do a shrink -- while they were doing a shrink at the same time that they would be making changes to density or to the type of DRAM?

A. No, probably not. So, it's always only to do

one step at a time, because if you mix up two different steps, you might run into severe problems, not finding out what the reason for not functioning in the chip is.

Q. That last little bit, you might not find the problem, is that --

A. So, in the case you take two steps at one time, so this might lead to very big problems, and for example, if something is not working, you don't know whether the technology is not working or the design is not working. So, it's very difficult to figure out what's really going on, what's really going wrong there.

Q. Okay. I think -- well, at the time you were production manager, were you involved in the decision-making process as to what Infineon's future product mix would be?

A. I was involved in the decision-making process, for example, in the way that at least once a year we have our strategic discussions, what kinds of volume, which product mix, at what site we are going to produce, at what costs, quantifying the costs, and this had been done together with the head of the business units, with the people from marketing and sales, and also me, the production planning responsible person.

Q. Okay. And based on your experience at

Infineon, were there typically different steps involved in implementing a design change?

A. Yes.

Q. And again, based on your experience, do those steps generally follow a typical order?

A. So, generally speaking, you always have to follow the same order of steps, the same number of steps.

Q. All right. Okay, now, I think what I'd like to do now is go through those steps, and I believe you've prepared a slide that we're going to use to help us go through those steps, if I can get a copy of that.

May I approach, Your Honor?

JUDGE McGUIRE: Yes.

MR. CATT: Would you like a copy?

MR. PERRY: Is this a DX number?

MR. CATT: Yes, we can give it a DX number.

THE REPORTER: Forty-four.

JUDGE McGUIRE: Forty-four, that's what I was going to say, okay. So noted.

(DX Exhibit Number 44 was marked for identification.)

BY MR. CATT:

Q. All right, well, starting at the beginning, can you look at I think the first three steps there, the

initial design, simulation, layout, and can you describe for me what each of those actually means?

A. Yeah, for the initial design, for example, the work for the different designers have to be broken down to the different elements that have to be designed. So, once you have allocated your design resources to the different topics and tasks in designing the different circuits, you also have to run a simulation, in order -- this is some kind of virtual test whether your design is working properly to your wishes or not.

Q. You said a virtual test?

A. Yes. So, you could do either half the simulation whether a circuit is working properly, but this is not appropriate, so today it's much better to have some kind of software which is simulating the behavior of the circuit you are designing.

Q. Okay. And layout?

A. So, and once you have finished your simulation work, you have to transfer your circuit design to a real physical outline, for example, rectangles, which they are printed after exposure to the silicon.

Q. What was -- what was the word you said before "exposure to the silicon"? I missed that.

A. Draw it on a piece of paper, which then shows at the end of the day work, for example, like a

transistor.

Q. Okay. Now, based on your experience at Infineon, how long did it take typically, a period of time, for Infineon to implement these first three steps we've talked about? And let's start for a shrink, a typical period of time.

A. So, from my experience, the time needed for doing the design work for a shrink is in the range of six months.

Q. And how many engineers would be involved in that process?

A. So, to my experience, the minimum requirement there is five design people plus five layout people.

Q. Okay. And for a change in density, how long would that typically take?

A. So, if you have to do a change in the density, this takes you roughly 12 months, and there are many more head count that is necessary. It's in the range of 50 people, 50 designers plus 50 layout people. So, you can always calculate one designer needs one layout guy.

Q. Okay. And if you are actually changing the type of DRAM?

A. So, when we are changing the type of DRAM, depending on the change which has to be done, this will

be in the range of six to 12 months which is necessary to do the work there.

Q. And how many people, engineers would be involved in that?

A. So -- yeah, this again varies between 20 to 50 people which are necessary to do this, but if you are making a change in the type of the DRAM, it's very likely that you have to go one, two or three steps in addition, because the chip is not working the first time right. So, from my experience, three redesigns are very common with doing so.

Q. Okay. Now, going to the next step, verification, based on your experience at Infineon -- well, let me ask you this: What is verification?

A. Once you have done all your layout work, you have to verify whether the layout will work according to the wishes of the design people, and this is called verification. So, this is some kind of cross-check whether the drawings are corresponding to the circuit plan, to the circuit design.

Q. And based on your experience again at Infineon, how long did it generally take to implement this step for a shrink?

A. So, for a shrink, from my experience, this is in the range of two weeks.

Q. And how many engineers would be required to work on that?

A. So, it's somewhere between two to five people.

Q. What about for a density change?

A. So, when you are doing a density change, it's more likely that it gets more work to do, and therefore it will take roughly four weeks.

Q. And the number of people who are required for that?

A. So, the number of people would be in the same range, two to five people, because too many people cannot work in parallel.

Q. And to do a type change, a change in the type of DRAM?

MR. PERRY: Your Honor, if I could object, I think it's vague to talk about a change in the type of DRAM and ought to be more specific to the type of DRAMs.

JUDGE McGUIRE: Sustained. Could you restate, Mr. Catt?

BY MR. CATT:

Q. For example, can you -- we've been talking about types of DRAM, and I think you mentioned different types. Can you give me an explanation again of the types?

A. So, for example, different types of DRAMs, the switch from an EDO part to a synchronous part or maybe from a synchronous part to a double data rate part, so this would refer to a change in type of the DRAM.

Q. And is there a difference typically between if you were going from -- as far as the time that it takes to do the step if you were going from an EDO to an SDRAM as opposed to going from an SDRAM to a DDR SDRAM?

A. So, it's almost the same if you go from one type to the next type.

Q. All right. Let's talk about going from an SDRAM to a DDR SDRAM. Typically, how long would it take to do the verification step from going from an SDRAM to a DDR SDRAM?

A. So, it's in the range of four weeks.

Q. And from an EDO to an SDRAM?

A. It's roughly the same amount of time.

Q. The same, all right. And the manpower necessary to do that step?

A. It's, again, between two and five people.

Q. Okay, let's go on to the next item on the list, which is mask generation, and can you describe to me what you mean by mask generation?

A. So, mask generation, once you have finished your layout, you have to transfer these data to data

which are capable for running the mask writing equipment. So, this job is done during mask generation. And in addition to your product data, which are on the layout, you also have to add test structures and alignment mods, for example, which are in between the chips which are then on the mask.

And also, for example, if you are talking about more advanced technologies, you also have to run some kind of additional algorithm in order to adjust the data which have then to be printed on the mask.

Q. So, what, in fact, is a mask?

A. So, a mask is more or less a negative which helps you to print the structures on the silicon.

Q. And how many masks are typically required to do a run?

A. So, this depends on the shrink or the technology node which is used, and this is in between 20 to 30 mask levels, number of masks.

Q. All right. So, let's again go through time periods. Does Infineon actually produce its own masks?

A. Infineon has its own mask shop, yes.

Q. And how long does it generally take to obtain a mask for a shrink?

A. So, I wouldn't call it for one mask. For the time frame required for one set of masks is six weeks,

roughly.

Q. And how about for a density change?

A. So, this is almost the same time frame under the assumption that the same number of masks -- masks are required.

Q. How about going from a change from an EDO to an SDRAM type DRAM?

A. So, this is again the same time frame, six weeks.

Q. And from an SDRAM to a DDR SDRAM?

A. It is the same.

Q. Six weeks?

A. Six weeks, yeah.

Q. Thank you.

All right, we're now up to number 6, which is first run wafer fab on your list. Can you describe to me what you mean by a first run wafer fab?

A. Once you have the chip on a piece of paper, you have then to verify this, that this is also working in the real world, working on silicon, and in order to verify this, you have to run the first silicon in the wafer fab.

Q. And based on your experience at Infineon, is preparation typically required before you can do that first run?

A. So, based on my experience, a lot of preparation work has to be done before you can run and start the first silicon, the first wafer.

Q. And what preparation is typically required?

A. So, you have to -- for example, you have to consider that you need a lot of different steps. You have to prepare the equipments in order to -- you have to say to the equipments that you have to do an etching or deposition -- deposition process in the equipment.

Q. Did you -- excuse me, did you say deposition or --

A. Yeah, deposit the layout.

Q. Oh, okay.

A. Sorry for this. And you have to expose the resist in the photography equipment, for example, and these steps have to be defined really well once. And in addition to this, you have to be aware that there are up to thousand different equipments and up to thousand different steps necessary to define the whole flow through the production facility. So, this has to be set up and prepared.

Q. And so for a shrink, how long did that preparation typically take?

A. So, to prepare all the run sets, from my experience, it's roughly three months which are

necessary to do all the preparation work.

Q. And how many engineers would be required to do that preparation?

A. So, from my experience, it's five people which have to do all the preparation work there.

Q. Would the time period be different for a density or a type change?

A. So, based on the assumption that there is no additional development work to be done for the technology or for the manufacturing process, this will be the same time period, yes.

Q. Well, when you say additional development work, what do you mean by that?

A. For example, if you implement a very new manufacturing method, so this takes some time in order to develop this.

Q. Okay. And would the manpower be the same level as well for a shrink for a density or a type change?

A. So, the manpower for the pure preparation work in order to set up all of the logistics and run sets would be the same, in the range of three months.

Q. Three months -- I was asking the number of people --

A. It's five people, sorry, it's five people.

Q. Five people, all right.

So, when this preparation was complete, would you then go on and actually do the first run?

A. Yes.

Q. And based on your experience at Infineon, how long would it typically take to do a first run for a shrink?

A. So, the time for the wafer fab is roughly six weeks for a shrink.

Q. And how many engineers would be involved in that process?

A. So, for doing the first run, you need some people which take care of the first run, and this would be five people.

Q. And going back to time periods, would the time period be any different for doing a run for a density change or a type change?

A. So, it would be the same time frame, also six weeks.

Q. And would the manpower be any different?

A. So, the manpower would be the same, five people requested for this.

Q. Okay. And I think then the next step on your list here is testing first silicon, wafer probing. Can you tell me what that refers to?

A. So, once you have your first silicon coming out

from the wafer fab, you have to make sure that the chips which are on the wafer are working properly or not.

Q. So, do you -- based on your experience at Infineon, is preparation generally needed before you can go ahead and do that testing?

A. Sure, you have to do quite some preparation work. You have to prepare the test programs. You have to prepare also the programs for the redundancy algorithm. You have to prepare also your setup for the laser cutters, and you also have to set up your test programs for the test structures which are also on the wafer.

Q. And how long does this preparation typically take, to do the preparation for the testing of the first silicon for a shrink?

A. So, from my experience, it takes you three months for changing and adjusting the test programs which are required for testing of the first silicon.

Q. And how many engineers would be involved in that process?

A. So, for this it would be -- from my experience, it's in between five -- it's five people.

Q. How about to prepare to do testing for a density change, how long would that typically take?

A. So, the preparation work for a density change is more work compared to the work to be done on a shrink. So, for a density change, you will need six months from my experience and more than that in order to do all the preparation work.

Q. Why is there more work involved in doing that kind of preparation?

A. So, for example, an increase in density, when you have to go from 16 to 64 megabits, you have to make sure that your testing equipment is capable of doing the additional work, four times as many tests compared to the previous tests, and it's also very likely that you have a change in the architecture which also affects the structure of the test programs.

Q. And how many engineers would be involved in doing the preparation for that -- for testing for density?

A. Increase in the density is in the range of 10 to 20 people.

Q. Going from EDO to SDRAM, how many -- how long would the preparation take to make that move, to prepare for the testing of the first run?

A. So, the preparation work for going from EDO to synchronous was the same range as changing the density, so the time frame, six months plus.

Q. And how many people would be involved in that project?

A. For EDO to SDRAM, a rough estimate -- rough recollection of my memory, in the range of ten people.

Q. And from SDRAM to DDR SDRAM?

A. So, as far as I remember, it was a little bit more than ten people, but almost the same time frame.

Q. The same, six months?

A. Six months plus.

Q. So, when the preparation is completed, then do you then go on and do the testing and wafer probe itself?

A. When you have done all the preparation work, you also need your probe cards. Besides the test program, you also need a means to contact your wafer, and this is done by wafer probe cards, and this also has to be prepared.

Q. And is that prepared at Infineon?

A. No, we usually buy this from outside.

Q. Okay. So, let's talk about the actual doing of the testing now as opposed to preparing for the testing.

How long, based on your experience, did the actual testing and wafer probe typically take for a shrink?

A. So, for a shrink, it's in the range of two weeks.

Q. And how many engineers would be involved in that?

A. So, for doing this work, it's between two and five people.

Q. And for a density change, how long would that testing and wafer probe take for that?

A. So, again, it's more effort. It's four weeks time which is needed for doing the density increase for the first probe.

Q. And the number of people?

A. The number of people is between two and five people.

Q. And going from EDO to SDRAM, how long would that testing and wafer probe take?

A. Yeah, the testing for the first run was in the range of four weeks, and the number of people is in between two and five people.

Q. And from SDRAM to DDR SDRAM?

A. It's almost the same time frame. It's also four weeks and two to five people.

Q. Now, number 8 on your list is assembly. Can you tell me what you mean by assembly?

A. So, once you have your silicon, for example,

divided and diced, you have to provide some protective layer, and this is the assembly process. There the silicon is covered by a mold compound in order to protect the silicon.

Q. And is preparation required before you can go ahead and do assembly?

A. Again, you need a lot of preparation work, which is similar to the preparation work that has to be done in the wafer fab.

Q. Can you give me some more detail on the type of preparation you're talking about?

A. For example, you have to set up all the run sets for the equipments. One example, the die bonder has to be capable to take up the wafer map, which is something like a map, it will indicate where the good and the bad chips are located on the wafer, and we only want to pick the good chips from the wafer which have to be assembled. That's one job we have to do.

Secondly, you have to provide the correct lead frame for the corresponding chip. You also have to make sure that all the other tooling which is necessary and required for the whole assembly process is in place when you are going to run the assembly.

Q. And how long would that take -- typically take, that preparation for a shrink?

A. It depends on the items you have to change. So, for example, the preparation work for getting a new lead frame is at least three months.

Q. And how many engineers would be needed during that process?

A. The process for the preparation work, there will be, for existing packages, five people necessary to do this.

Q. Now, you said existing packages. What do you mean by that?

A. This means that you can take a package which is already qualified and available in production.

Q. As opposed to a nonqualified package?

A. For example, let's go back a couple of years. There, the TSOP package was the standard package, was the main one package. So, if we took one of these packages without changing the dimension and the number of pins of this package, the effort to get the new lead frame was in the range of five people and three months.

But if you are talking today, maybe we see a switch to BGA packages, so in order to have this package in production, you have to do some R&D work before, which might take quite some -- which might take a long time.

Q. Can you give me an idea of what you mean by a

"long time"?

A. Yeah, when I remember back to my work with the four megabits, there was a transition from the SOJ package to a TSOP package, and to get the first TSOP package up and running in production, it took a couple of years.

Q. And how many people were working on that project?

A. At that time, the whole back-end department, the department which was responsible for development of new packages, was engaged in doing this.

Q. The whole department?

A. The whole department, yes.

Q. Can you give me an idea of how many people that would be?

A. I don't know exactly, between 20 and 30 people doing this.

Q. Okay. The preparation for assembly for a density change, a change in density, how long would that typically take?

A. Yeah, based on the assumption that you can take an existing package, it's the same amount of time. It's three months preparation work, and number of people for doing this is five, for the preparation work, for a density change.

Q. And let's say a new package was required.

A. So, if a new package is required, this can take up to couple of years.

Q. Okay. And how about -- would the numbers, the time periods or the people be any different for a change in the type of DRAM than for density?

A. So, again, it's the same basic premise or basic assumption. If you have an existing package, the preparation work and number of people required is the same as doing a shrink. If you have to switch to a new package, so you have to do a lot of development work there.

Q. Okay. Now, once the preparation is finished and you go ahead to do the assembly, how long does it generally take to do the assembly for a shrink?

A. So, time required for this is in the range of two to three weeks for doing this.

Q. And how many personnel would be required?

A. For -- in between two and five people.

Q. And would the time required be any different if you were doing a density change or a type change?

A. So, based on the assumption that you can take an existing package, this will be the same time frame.

Q. Meaning two to three weeks?

A. Two to three weeks, yes.

Q. And if you had to go to a different type of package?

A. If you can use the same -- different type of package?

Q. Yes.

A. This can take -- there are almost no limits. Much, much longer. Maybe twice the time.

Q. All right. And the manpower required, would that be typically the same for a density change or type change as for a shrink?

A. It's very likely that problems are coming up with a new package, and then the number of head count required for doing this is also more or less unlimited.

Q. Okay. The next on your list is test and burn-in. Can you describe what you mean by test and burn-in?

A. Yeah, I would like to refer to burn-in first, simply because the next step -- the next big step after assembly is doing the burn-in of the devices, and you have to set up all your printing systems and printing programs, where you stress the devices with high temperatures and usually also higher voltages.

Q. High voltages?

A. Voltages, yeah.

Q. Okay.

A. For a certain amount of time.

Q. All right. And after the burn-in, what's the testing involve?

A. So, it's -- after the burn-in, you also have to do the testing. Usually you do a testing at high temperatures, and at that time you also are doing the speed sort very likely with the devices, and in addition to this, you also do a testing at low temperatures, for example, room temperature in order to check whether the part is working at all specified temperatures and specified voltages, so it's different timings and timing sets.

Q. And is preparation required before you can do the burn-in and the testing?

A. Yes, again, you need a lot of preparation work. For burn-in, you have to provide all the programs for the burn-in systems, which are equivalent to test programs. You have to provide all the tooling for the burn-in systems. You have to make sure that you provide the burn-in boards, the appropriate sockets, and you have to make sure that the burn-in systems are up and running.

And for testing, you have to make sure that the test programs are available and in place, and you have to make sure that also the items which are included

with the socket is also available for your test equipment.

Q. So, how long does it typically take based on your experience to do the preparation, test and burn-in for a shrink?

A. So, for a shrink, the preparation work will take three months.

Q. And how many engineers would be required to work on that?

A. So, from my experience, this will be five people.

Q. Would there be any difference in the time period it would take to prepare for a test and burn-in if you were doing a density change or a type change?

A. So, it is very likely that you need more time for doing the preparation work here, so for writing the test programs, you will end up with six months plus for the test programs.

Q. That's for a density --

A. Density increase, yes.

Q. And a type change?

A. And the change of type, it's again the same time frame, six -- did I say six weeks or six months?

Q. Six months you --

A. Six months, yes, six months.

Q. And the number of personnel that would be required to do the work on -- for a density -- preparation for a density or a type change?

A. So, from my experience, this is in the range of 10 to 20 people.

Q. That's for density and type change?

A. The type change, and the type change is very likely to need even more resources, more head count, because they very often have to change additional topics in order to accomplish the test programs.

Q. Okay. So, when you actually go ahead and do the test and burn-in, is there a typical time period it takes to go through that process for a shrink?

A. So, assembly, test and burn-in will be in the range of three to four weeks.

Q. And how many engineers would be required to work on that?

A. For doing the real work there, it's between two and five people.

Q. And for doing a density change, what would the time period be for that?

A. Yeah, based on the assumption that they have an existing package, it's again three to four weeks time required for doing this and two to five people.

Q. And would it be any different for a type

change?

A. Unless you have any additional problems, this would be the same time frame.

Q. Three to --

A. Three to four weeks and two to five people.

Q. Okay. Next on your list is assemble and test modules. Can you describe what you mean by that?

A. So, after finishing with the last step, you have loose parts, you have single memory devices which then now have to be assembled on small printed circuit boards. You know them by, for example, memory expansions which are needed in your PC, in your personal computer. So, this is done in the assembly, the testing of the modules.

Q. Okay. And based on your experience at Infineon, is preparation generally required before you can go ahead and assemble and test the modules?

A. So, you have to make sure that your PCBs, your printed circuit boards, are available and in place, so usually you buy those from outside. And you also have to make sure that all of the setup for the pick and place machines is available, and you have to make sure that also your test programs for the module tests are available.

Q. And for a shrink, typically how long would that

take?

A. So, for a shrink, this will take in the range of two weeks for doing this.

Q. Would the time period be any different for a density or a type change?

A. So, when you are doing a density or type change, this is more effort to do, and therefore you need roughly four weeks.

Q. And would this be being done by Infineon personnel or would it be being done by an outside company?

A. So, this depends on the product. So, for some types, we have the capabilities in-house, and for some types, we have to buy it out-house.

Q. Can you give me an example of the type you can do in-house?

A. So, standard memory modules, standard DIM modules, for example, can be assembled in Richmond, Virginia, because at this location we also have back-end capabilities, back-end volumes for loose part assembly, loose part testing and also for memory module assembly and module testing.

Q. And so can you tell me then in that instance when you're doing it in-house how many engineers would be involved in that process for a shrink?

A. So, for doing this, two to five people are needed to do the assembly and testing of the modules.

Q. And would that be -- that's for a shrink?

A. This is for a shrink, yes.

Q. How about for a density change?

A. So, when you are doing a density change, the number of people and time frame required is almost the same, so it's two to five people, and for density, the time would be a little bit more. It's four weeks.

Q. Okay. And if you were changing the type, for instance, when you were introducing SDRAM or when you were testing SDRAM, how many people would be required?

A. So, for doing a type change, it's two to five people, and the time frame for doing this, it's four weeks.

Q. Okay. Okay, so after you've done the preparation and you go ahead and do the assembly and the testing of the modules, how long does the assembly and testing of the modules take typically for a shrink?

A. So, for a shrink, it's two weeks.

Q. Okay. And how many people?

A. It's two to five people.

Q. I want to make sure we are clear or you were clear on my questions before. I was asking you before about preparing to actually go ahead and do the

assembly and testing. Were you understanding me to be talking about that?

A. I'm sorry, there might be a mismatch.

Q. Sorry, I thought that might be the case, yeah.

For the figures I was talking about before, I was asking how long it takes to actually get ready to do the assembly, not to actually do the assembly itself.

A. Well, the preparation work for doing the assembly --

Q. The preparation work then, yes, sorry.

A. -- the preparation work is roughly three months.

Q. That's for a shrink?

A. For a shrink, yes.

Q. And is that different for a density change?

A. For a density change, based on the assumption you use existing packages, it's the same time required.

Q. Okay. And for a change in type, for example, introducing an SDRAM?

A. That's the same, the same time, three months preparation.

Q. And the numbers you gave me before for the different -- for doing the three types were two to five engineers. Would that number then be different,

talking about preparation?

A. No, preparation, this is okay.

Q. It's the same, it would be two to five?

A. Yeah.

Q. All right. So, now, let's get back on course to actually doing the assembly and testing itself.

A shrink, how long would it typically take to actually do the assembly and testing of a module?

A. For a shrink, the assembly and testing is two weeks.

Q. Okay. And manpower required?

A. It's two to five people.

Q. And for a density change?

A. For doing a density change, the time required for assembly and testing, it's four weeks.

Q. And how many people?

A. It's two to five people.

Q. And for a type change, for instance, going to an SDRAM?

A. For change in type, the time required for assembly and testing of modules is four weeks.

Q. And the manpower required?

A. The manpower is two to five people.

Q. Okay. Next on your list is internal qualification. Can you tell me what you mean by that?

A. So, once you have a functional part -- parts coming out from the wafer fab, after this you have to run a lot of different tests and qualification procedures in order to prove to the customer that every change we have made is working properly. So, it's really a whole bunch of tests and you need quite a number of devices in order to run this qualification. You have quite a lot of tests, destroy the parts, see the limits where the part is breaking, and you also have other parts which are not destructive.

Q. And let me ask you now about -- try to be clear on this now, about the preparation to get ready to do that internal qualification. Based on your experience at Infineon, is preparation actually generally required before you can go ahead and do that internal qualification?

A. Sure, you need quite a lot of internal preparation work. You have to set up all of the qualification equipments in order to do all the tests. You have to define the number of required tests. You have to do all the logistics work. And -- yes, you have to make sure that you have the parts which are necessary to be tested.

Q. And is there a time that it would typically take to do all that preparation for internal

qualification for a shrink?

A. The time required for preparation for doing a shrink is in the range of three months.

Q. And manpower required to do that preparation?

A. So, preparation work there is five people.

Q. And in preparing to -- for the internal qualification for a density change, how long would that typically take?

A. So, preparation work for a density change will be in the same ballpark. It's also three months preparation for five people.

Q. And would it be any different for a type, a new type?

A. As long as you don't need new test equipment for this, it will be the same effort. It will be three months preparation work with five people.

Q. What happens if you do need new testing equipment?

A. If you need new test equipment, you have to buy this, and usually you have a certain lead time in order to get the equipment. So, and this can vary from short times, like three months lead time, up to -- I don't know exactly, nine months, one year, which I experienced once.

Q. Okay. And once you've actually completed your

preparation to do the internal qualification, how long does it, in fact, take to do the internal qualification for a shrink?

A. So, from my experience, the qualification work is in the range of three months to be done there.

Q. And the number of engineers involved in that?

A. Number of engineers which are necessary there, it's five people.

Q. How about for a density change?

A. So, for a density change, under the assumption that you don't need new packages and the package is already qualified, this again will be the same time frame. It's three months and five people.

Q. Would the time period be any different to do internal qualification for a type -- for a new type?

A. So, if you are going for a new type without changing the package, this will be the same effort, which means three months and five people, but additional steps and reiterations are very likely if you are going to change the type of DRAM.

Q. Can you give me a little more detail on that? Why would that be?

A. In my experience, when we went from fast page mode to EDO devices, it took us a long time to get this part up and running, and we had a lot of work to be

redone during the design phase and also during the qualification time and totally took from my experience two years at least in order to get the new type up and running, and this was valid for EDO devices, this is valid for synchronous devices, and from my understanding and knowledge, also for other devices.

Q. You were talking about two years and we were talking about internal qualification. You said it takes two years just to do the internal qualification?

A. No, not the internal qualification, the whole process to get the parts up and running.

Q. All right.

MR. PERRY: Your Honor, if I could -- I could do this in cross, but the whole process, two years, is that the first 11 steps for that? I can save that for cross, but --

JUDGE McGUIRE: Can you clarify that, Mr. Catt?

BY MR. CATT:

Q. When you were talking about to go through the whole process, can you tell me, looking at your chart here, what steps you were including in that? Were you talking about going from step 1 all the way through to step 11?

A. So, when I -- as under -- from my knowledge, we had to do a couple of redesigns for going from one type

to the next type, and which means you have to go from step 1 to 12, and you have to do some loops in between. You have to redo some steps in between. This takes roughly more than 24 months.

Q. To do each step --

A. Which means -- which means you have to do, for example, one step or couple of steps twice or three times.

Q. Okay. Finally -- not finally, but 12 --

JUDGE McGUIRE: All right, let me interject here just for my clarification now. Does that answer your question, Mr. Perry, because I'm a little unclear myself.

MR. PERRY: It didn't, but I was going to try to --

JUDGE McGUIRE: It's not that I'm just trying to answer your question. I'm trying to answer it for myself. Is the testimony here that it takes an average two years to go through these first steps, or -- I was a little unsure, because you said you have to repeat certain steps, and depending on --

THE WITNESS: Yeah.

JUDGE McGUIRE: Maybe if you could clarify that also, sir, it would certainly help the Court.

MR. CATT: I think, Your Honor, before he does

that, I should say that one thing we are going to do is ask him to actually go -- to try to summarize the full time period, and he is going to go --

JUDGE McGUIRE: Okay, well, if you want to do it then, that's fine with me. I just want to address that point for my edification as well so that I understand his overall testimony. So, I'll go ahead and have you proceed, and then if I still have questions, I'll interject at that time.

MR. CATT: Yes, I understand, and there's lots of different time periods we've been talking about, and at the end I'm going to hopefully get him to clarify that.

JUDGE McGUIRE: Okay, all right.

Can you wait for that, Mr. Perry?

MR. PERRY: Yes, Your Honor, thank you.

BY MR. CATT:

Q. The next step we were starting to talk about was customer qualification. Can you describe to me what you mean by customer qualification?

A. So, once you have done all your internal qualification and you have some papers where you can prove that the change is working, then you can give samples to the customer where he is to make his qualification in his application.

Q. Okay. And how long does it typically take for a customer to do that qualification for a shrink?

A. So, from my experience, this takes three months to do the customer qualification.

Q. Would that be a different time period for a density, a new density?

A. So, for density increase, from my experience, it's three months plus possibly.

Q. And for a change in the type?

A. So, if you change the type, the time required for customer qualification is, again, three months plus. So, three months would mean a minimum time required to do the customer qualification.

Q. Okay. And then finally, you have on the list number 13, ramp to production. I think you have talked about ramp-up before, but can you just tell me what you mean by that as you put it down here in your list?

A. So, once you have a qualified part which is acceptable to customer, then you have to make sure that you can ramp this part also in your production facility, so you have to convert all the toolings and also possibly some kind of equipments that you can run and ramp up to 100 percent of your production volume.

So, this takes somewhere in between four to six quarters, which is one to one and a half years, until

you have fully converted all your production facilities to run the new -- the new part.

Q. And would that be the same for a shrink, a density and a type change?

A. This is more or less the same for the three different types, yes.

Q. Okay. All right, now, why don't we try then to see if we can summarize what we've been through and actually get time periods that make sense. We have a board here. Would it make sense for you to draw it on the board, would that be helpful?

A. This, I can do it, yes.

MR. CATT: Would that be all right, Your Honor?

JUDGE McGUIRE: That's fine.

MR. CATT: Hopefully we have a pen.

MR. PERRY: There's one there.

BY MR. CATT:

Q. If we could start then with a shrink, and if you could go through the process basically taking us through -- 1 through -- you know, step 1 through the end of 13, sort of give us the time periods.

A. Well, let's first talk about doing a shrink, so I will summarize the total time required to do this in three major blocks. So, one block is doing the design work.

Q. And if you could sort -- when you are writing that down, if you could reference the numbers on the list here, I think that would be helpful.

A. So, this is step 1 to 4. Then the next step is doing the silicon, running the silicon, plus assembly, plus the tests, then doing the qualification. And last but not least, doing the ramp-up.

Q. And so can you write the steps downs underneath each of those that --

A. So, for design it's initial design --

Q. You can just write down 1 to 4.

A. Yes, this is 1 to 4.

Q. And then for the next one, you could write the steps that silicon and assembly includes.

A. Steps 1 to 4, so here we have silicon plus assembly and test, so this is step number 5, assembly and test modules, 5 to 10, and for the qualification, that's the step of internal qualification of 11, and step number 12, which is the customer qualification. Then ramp-up is step number 13.

So, when we take a rough calculation out of this for doing the design work from initial design, simulation and layout, including verification, so this is roughly six months plus for a shrink.

For the silicon and assembly and the tests,

it's again in the range of six months. So, for the qualification, we have a time required of six months. And for the ramp-up to full production, to 100 percent production, so this is four to six quarters.

So, if we consider the time from step 1 until step 12, so this is 18 months, from here to there. So, if we are doing --

JUDGE McGUIRE: Okay, so it's 18 months on average from I guess step 1 to step 12. Is that correct?

THE WITNESS: Right.

JUDGE McGUIRE: Okay.

THE WITNESS: So, if we are doing a density increase, we can have the same application of the different steps. So, design work is in here. For doing the silicon run and all the assembly and the test, it's a little bit longer than compared to the shrink. So, for doing the qualification -- so, I'll write down the figures.

So, design work in this case is in the range of 12 months for steps 1 to 4. For silicon and test, it's again in the same range, six months plus. And for the qualification, it's again six months plus. So, for ramp-up of the production, it's again the same time, four to six quarters for doing this. So, this is 5 to

10, 11 to 12, then 13. So, if we count this from step 1 to step 12, so this time it's up to 24 months, plus/minus a little bit.

So, if we are doing a change in type, the time required for doing the design is something in between, it's six to 12 months, for 1 to 4. For the silicon run and the test, the qualification, plus the ramp-up. This is 5 to 10, 11 to 12, 13. This is six months plus, and this is six months.

So, we have very likely a lot of redesigns, we have to go either through additional design loops, additional testing loops, additional qualification loops, so this time that's up to 24 months, plus in my experience, when we moved from fast page mode to EDO or from synchronous to double data rate or from EDO to synchronous, it was almost more than the 24 months for doing that type change, because we had some iterations -- iteration loops here in between.

JUDGE McGUIRE: Now, do these -- let me inquire. Do these time frames, are they cumulative, you add all these up, or is this the overall for all three of these phases? You know what I'm saying? You said 18 months under shrink, 24 months under type and density. Do all those add up or are they all embraced within an overall period of 24 months?

THE WITNESS: So, for changing the type, it's 24 months plus, and maybe you start a design, think it's going all right, then you go to running the silicon, then you figure out --

JUDGE McGUIRE: That's the design, all right.

THE WITNESS: -- something is wrong, then you go back to the design, start all over again.

JUDGE McGUIRE: So, the whole process on average should take about 24 months, is that correct, which we go back now to the question of opposing counsel. He was unclear what the 24 months actually included.

So, can you step in on this, Mr. Catt?

BY MR. CATT:

Q. For each of these, they are for a separate product. Is that correct?

A. Separate product.

Q. So, you are not doing --

JUDGE McGUIRE: Oh, okay.

BY MR. CATT:

Q. -- a shrink and then a density on top of that?

JUDGE McGUIRE: Okay, I understand.

BY MR. CATT:

Q. And I believe I'm correct. Would you do a shrink and a density on the same -- change on the same

product?

A. No, you wouldn't do this at the same time.

JUDGE McGUIRE: I understand, okay. That answers my question.

BY MR. CATT:

Q. Okay. Now, those figures, we've talked about a lot of months before, and some of the months we talked about before, are they not -- the preparation, for instance, are they included in those numbers you've given there?

A. No, you can start some things in parallel. For example, preparation work for running the first silicon can start somewhere in here when you are doing the design.

JUDGE McGUIRE: I understand.

THE WITNESS: Doing all the maintenance and things like that. So, this can start in here.

JUDGE McGUIRE: So, there is some overlap?

THE WITNESS: Some overlap, yes.

JUDGE McGUIRE: Okay.

MR. CATT: I don't think I have any further questions, Your Honor.

JUDGE McGUIRE: Then Mr. Perry, you had that inquiry earlier. Do you want to just talk to that now or -- in case you're not clear so we can finally get

this resolved?

MR. PERRY: I'm okay with it now, Your Honor.

JUDGE McGUIRE: Okay, I'm fine, too. So, let's proceed.

MR. CATT: Can I propose a short break, Your Honor, before we start cross?

JUDGE McGUIRE: Let's take a break for ten minutes.

(A brief recess was taken.)

JUDGE McGUIRE: Mr. Catt, I understand that you have concluded your examination of the witness?

MR. CATT: Yes, I have concluded my examination. I would just like to ask that the chart that has been drawn up be marked as DX-45.

JUDGE McGUIRE: So noted.

(DX Exhibit Number 45 was marked for identification.)

JUDGE McGUIRE: At this time, then, we will entertain the cross examination. Mr. Perry?

MR. PERRY: Thank you, Your Honor.

CROSS EXAMINATION

BY MR. PERRY:

Q. I'll be brief, just a few questions, Dr. Reczek.

You talked about having overall responsibility

at Siemens for the one-megabit and the four-megabit DRAMs. Do you remember that?

A. Yes, that's right, sir.

Q. And were those synchronous devices?

A. No, those were not -- those were nonsynchronous devices.

Q. And you've never been involved in designing a synchronous DRAM, correct?

A. No, I have never been involved directly in designing synchronous device.

Q. And you had no role in designing Infineon's DDR SDRAM device, correct?

A. I had no role as a designer in designing such devices, but I was involved with the planning.

Q. And your current position in Austria, you've held that since September 2001. Is that correct?

A. This is correct, yes.

Q. And that factory produces products for the automotive industry, correct?

A. Mainly for the automotive industry, that's correct, yes.

Q. Are any DRAMs produced in that factory?

A. There are no DRAMs produced there.

Q. Now, if we could bring up the DX-45, I guess it is, please.

JUDGE McGUIRE: Forty-four?

MR. PERRY: Oh, I thought it was just described as 45.

JUDGE McGUIRE: No, this is 45, the chart.

MR. PERRY: Oh, Your Honor, the piece of paper, all right.

JUDGE McGUIRE: The sheet that he drew.

MR. PERRY: Thank you.

BY MR. PERRY:

Q. Referring now to DX-44, this is entitled Steps to Implement a Design Change. You have that in front of you?

A. No -- oh, this one?

Q. Right.

A. Yeah.

Q. Is it correct that Infineon has to go through each one of these steps whenever it makes a change to a DRAM? Correct?

A. Whenever it makes a design change, yes.

Q. And that process can be simple or it can be complicated depending upon a lot of different factors, right?

A. This is correct, yes.

Q. For example, when Infineon made a transition from a 128-meg SDRAM device to a 256-meg SDRAM device,

that was a major change, correct?

A. As far as I remember, it was the other way around. We first did the 256-meg, and after this we went to the 128-meg.

Q. And that was a major change, correct?

A. To increase the density is a major change, yes.

Q. And certainly when Infineon transitioned from SDRAM to DDR SDRAM, that was a major change, right?

A. This was also major change, yes.

Q. And that transition for Infineon from SDRAM to DDR SDRAM occurred in the year 2000, correct?

A. I don't remember exactly the date of transition.

Q. Well, you do remember that at about the time you moved to your new job in Austria, Infineon was ramping up production on DDR SDRAM. Isn't that right?

A. This is right. I don't -- I just don't remember the exact year of this transition.

Q. And Infineon had to go through three major redesigns for its DDR SDRAM device before it was able to produce a device that showed acceptable customer performance, correct?

A. This is correct, yes.

Q. And that meant that for each of those DDR redesigns, Infineon had to start all over again at the

start of this chart, DX-44, and cover each step, right?

A. This is correct, yes.

Q. Now, I've heard the phrase "tapeout." Is there someplace on this chart, DX-44, that corresponds to the tapeout of a device?

A. So, this term was generated in former days because the layout people handed the tape to the mask shop, and this actually was called to be a tapeout. So, this is in between step 4 and 5 as a deadline, for example, in the schedule.

Q. Thank you.

Now, you've mentioned SDRAM and DDR SDRAM. Did Infineon also design at some point in time an RDRAM, a Rambus DRAM device?

A. Yes, Infineon also designed a Rambus device.

Q. And did Infineon successfully accomplish the first 12 steps with respect to the RDRAM device?

A. So, could you please specify what you mean with "successfully"?

Q. Did Infineon complete the first 12 steps that are listed on DX-44 with respect to the RDRAM?

A. As far as I remember, yes.

Q. And --

A. We completed the steps 1 to 12.

Q. And did Infineon choose not to ramp the RDRAM

to production?

A. Could you please specify this question a little bit more?

Q. Was there a decision made by Infineon at some point -- to your personal knowledge, was there a decision made by Infineon at some point not to ramp the RDRAM to production?

A. As far as I remember, in our five-year plan, we had some volume allocated to the Rambus part. I don't know exactly how much this is -- this was.

Q. Did Infineon ramp the RDRAM to production?

A. Infineon had some production volume of the Rambus part, yes.

Q. Now, you became aware at some point that Rambus had asserted that Infineon's SDRAM and DDR SDRAM devices infringed Rambus' patents, correct?

A. I'm sorry, could you repeat the question?

Q. Did you at some point learn that Rambus had claimed that Infineon's SDRAM and DDR SDRAM devices infringed Rambus patents?

A. Well, I'm not aware of this, because I didn't know the claims or the patents of Rambus.

Q. Well, let me ask. Were you involved in the decision by Infineon not to take a license from Rambus for the Rambus patents?

A. I was not in this decision loop.

Q. So, do you have personal knowledge of why Infineon chose not to take the license?

A. I have no personal knowledge about why Infineon did not -- made any decision on taking a license or not.

Q. Were you involved in Infineon's decision that it would not redesign its memory devices to try to avoid the Rambus patents?

A. No, I was not involved.

Q. So, do you have personal knowledge of what the factors were that were considered by Infineon when it made a decision not to try to redesign to avoid the Rambus patents?

A. No, I don't know.

MR. PERRY: I have nothing further, Your Honor.

JUDGE McGUIRE: Thank you, Mr. Perry.

Mr. Catt, redirect?

MR. CATT: No further questions, Your Honor.

JUDGE McGUIRE: Okay, sir, thank you very much for your testimony here today. You're excused from this proceeding.

How does complaint counsel intend to proceed throughout today? Did you --

MR. ROYALL: Your Honor, I -- we didn't know

how long this was going to take today, and we do not have another witness today. We do have a witness in the morning.

JUDGE McGUIRE: Mr. Perry?

MR. PERRY: Well, Your Honor, there is some frustration on our side of the aisle with respect to these dark afternoons. This was always designated as a half day. My only point -- I understand scheduling of witnesses, but my only point is they've had our counter-designations to the depositions that they want to read or show on most of the witnesses for over 30 days, and what we really don't want to see -- and this is a personal matter -- is three weeks from now we sit here for a week and watch transcripts.

JUDGE McGUIRE: Yes. Well, I don't want to see that either, and I appreciate that complaint counsel has issues getting testimony scheduled, but I don't want to see a whole lot of open afternoons, because that doesn't help this process. We all have an obligation and certainly I am charged with seeing that this hearing is expedited, and you know, today you don't have anything, but in the future, I don't want to see any afternoons that are dark, because you have had time to at least introduce the deposition testimony, and I understand there is quite a few items in that

regard that you intend to put on, so I would expect complaint counsel in the future to be prepared to offer that type of testimony in those hours that are otherwise open so we can expedite this proceeding.

MR. ROYALL: We understand that, Your Honor, and we appreciate that, and I can assure -- I'm not personally involved, I don't know if anyone in the courtroom is involved in the work that's going on with the depositions, but I can assure you that we are working our hardest to try to prepare those, to deal with objections and to deal with other issues that have been raised so we can fill any free time with the depositions.

JUDGE McGUIRE: Well, I think the Court has made its impressions known, so I don't anticipate having to comment on this again in the future in this proceeding.

Having said that, can you tell me what's on tap then for Friday?

MR. ROYALL: I believe that Mr. Peisl or Dr. Peisl, I'm not sure which, is testifying tomorrow morning.

JUDGE McGUIRE: And how much time do you anticipate his being on the stand?

MR. ROYALL: Do you know the answer to that?

MR. CATT: I have been slightly involved in that. I do anticipate it's going to go longer than this did this morning. I'm not certain that it is actually going to go all day tomorrow, though. I can -- I'll go back directly to see if I can get more information and see what we can do about getting deposition testimony prepared.

MR. PERRY: And we would anticipate examining Mr. or Dr. Peisl for about the same amount of time that they examine him, so I just don't know how much that will be, because they don't know.

JUDGE McGUIRE: Okay. Well, you know, if we -- as a rule, if we adjourn at 3:30 or 4:00, then, you know, that's -- I'm not going to complain about that, but I don't want to adjourn at 1:30 and still have another three or four hours that we could be hearing some type of testimony, because as we know I think when we first started out in this hearing, it was estimated it would go nine weeks, and now we're -- I've been advised it's going to go it looks like 12 weeks, so at least through the end of July, as I've been advised, and at some point we may be into August. So, obviously we all have an interest in getting this thing resolved.

MR. PERRY: Your Honor, on this side of the aisle, we have said August is a dirty word. We

really --

JUDGE McGUIRE: Okay, well, I'm glad to hear that. I think it should be a dirty word. So, you know, I hope everyone is clear now. And that's going to apply to the other side as well when it comes time, you know, for your case in chief.

So, having cautioned the parties on that, this hearing is adjourned, and we'll convene in the morning at 9:30 a.m.

MR. ROYALL: Thank you, Your Honor.

MR. CATT: Thank you, Your Honor.

MR. PERRY: Thank you.

(Whereupon, at 11:15 a.m., the hearing was adjourned.)

C E R T I F I C A T I O N O F R E P O R T E R

DOCKET NUMBER: 9302

CASE TITLE: RAMBUS, INC.

DATE: JUNE 5, 2003

I HEREBY CERTIFY that the transcript contained herein is a full and accurate transcript of the notes taken by me at the hearing on the above cause before the FEDERAL TRADE COMMISSION to the best of my knowledge and belief.

DATED: 6/5/03

SUSANNE BERGLING, RMR

C E R T I F I C A T I O N O F P R O O F R E A D E R

I HEREBY CERTIFY that I proofread the transcript for accuracy in spelling, hyphenation, punctuation and format.

DIANE QUADE