

REQUEST FOR PUBLIC COMMENT: RISKS IN THE SEMICONDUCTOR PRODUCT SUPPLY CHAIN

This form is intended to be used to submit comments on challenges currently facing the semiconductor product supply chain. All comments are invited, with this form designed to facilitate submission of information.

Indicate here if this form contains business confidential information, or if all information contained throughout this form is public:

PUBLIC

Those submitting a form containing business confidential information will need to submit a non-confidential version of the same form that does not contain the business confidential information.

A.	Organization Name	NXP Semiconductors N.V.	(U.S Headquarters: 6501 W. William Cannon Dr., Austin, TX 78735)
	Street Address	High Tech Campus 60	
	City	Eindhoven, The Netherlands 5656AG	
	State		
	Zip Code		
	Country		
	Website	www.nxp.com	

From the list below, identify your organization's primary and additional participation in the semiconductor product supply chain. Please mark all applicable rows.		
	Segment	Participation
B.	Integrated Circuit Design	Primary
	Front End Fabrication	Additional
	Back End/Assembly Test/Packaging	Additional
	Electronic Manufacturing Services / Printed Circuit Board Assembly	
	IC Distributor	
	Equipment Supplier	
	Material Supplier	
	Electronic Component Supplier	
	Intermediate or End User of Semiconductor Products	
Other	(specify here)	

Next Step: Sections 2 through 5 of this form are intended to be filled out by organizations that have primary or additional participation in the following segments: Integrated Circuit Design, Front End Fabrication, Back End/Assembly Test/Packaging, Electronic Manufacturing Services / Printed Circuit Board Assembly, IC Distributor, Equipment Supplier, Material Supplier, Electronic Component Supplier, Intermediate or End User of Semiconductor Products.

BURDEN ESTIMATE AND REQUEST FOR COMMENT

Public reporting burden for this collection of information is estimated to average 4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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This response was identified as PUBLIC on the Organization Information tab.

Section 2: Semiconductor Providers - Product Capabilities

Indicate the technology nodes (in nanometers), semiconductor material types, and device types which this organization is capable of providing (design and/or manufacture). A blank response is counted as "No Capability".

A.	Technology Node (nm)		Semiconductor Material Type		Device Type		Organizations participating in the
	6,000 - 10,000		Amorphous Silicon		Analog/Linear Technologies		Design and Manufacture
	3,000 - <6,000		Bulk Silicon	Design and Manufacture	Digital Logic Technologies		Design and Manufacture
	1,500 - <3,000	Design and Manufacture	Silicon on Insulator	Design and Manufacture	Digital Signal Processors		Design and Manufacture
	1,000 - <1,500	Design and Manufacture	Silicon Germanium	Design and Manufacture	Field Programmable Gate Arrays		
	800 - <1,000	Design and Manufacture	Silicon on Sapphire		Structured ASICs		
	500 - <800	Design and Manufacture	Silicon Carbide		Standard Cell ASICs		
	350 - <500	Design and Manufacture	Gallium Arsenide		Custom ASICs		Design and Manufacture
	250 - <350	Design and Manufacture	Gallium Nitride	Design and Manufacture	3D/2.5 ASICs		
	180 - <250	Design and Manufacture	Indium Phosphide		System-on-Chip		Design and Manufacture
	130 - <180	Design and Manufacture	Antimonides		Other Processors		Design and Manufacture
	90 - <130	Design and Manufacture	Organic Technologies		Mixed Signal Technologies		Design and Manufacture
	65 - <90	Design Only	Carbon Based Technologies (e.g. nanotubes)		Nonvolatile Memory		
	45 - <65	Design Only	Superconducting Materials		SRAM		
	32 - <45	Design Only	Other (specify here)		DRAM		
	28 - <32	Design Only			MEMS Technologies		Design and Manufacture
	14 - <28	Design Only			Optical/Photonic Technologies		Manufacture Only
	7 - <14	Design Only			MMIC Technologies		Design and Manufacture
	<7	Design Only			Other RF Technologies		Design and Manufacture
					Other (specify here)		

B.	Point of Contact					
	Name	Title	Phone Number	E-mail	State	Country
	Peter Esser	Head of Government Affairs		peter.esser@nxp.com	Texas	United States

Clarifying Comments (if applicable):

- a) We interpret "Manufacture" in this section to mean Front End manufacturing
b) NXP performs assembly and test for some products at technology nodes designated as "Design Only".
c) NXP does not currently design or manufacture in certain of the Technology Nodes it has designated as "Design Only", but has the capability to initiate designs in these nodes.

Section 3: Semiconductor Providers - Integrated Circuit Production

For any integrated circuits you produce--whether fabricated at your own facilities or elsewhere--identify the primary integrated circuit type, product type, relevant technology nodes (in nanometers), and actuals or estimates of annual sales for the years 2019, 2020, and 2021 based on anticipated end use.

For any integrated circuits you produce--whether fabricated at your own facilities or elsewhere--identify the primary integrated circuit type, product type, relevant technology nodes (in nanometers), and actuals or estimates of annual sales for the years 2019, 2020, and 2021 based on anticipated end use.

Integrated Circuit Type						Integrated Circuit Production				
	Primary IC Type	Product Type	Primary Technology Node (nm)	Smallest Technology Node (nm)	Largest Technology Node (nm)			2019	2020	2021 (Projected)
Total	Mixed Signal Technologies					Total	\$ (millions)	\$8.877	\$8.612	\$11.024
							Units			
							Capacity (Units)			
Aerospace	System-on-Chip					Aerospace	% of Total \$	included in Industrial	included in Industrial	included in Industrial
Automotive	Mixed Signal Technologies					Automotive	% of Total \$	47%	44%	49%
Healthcare/Medical	Custom ASICs					Healthcare/Medical	% of Total \$	included in Industrial	included in Industrial	included in Industrial
Industrial	Mixed Signal Technologies					Industrial	% of Total \$	18%	21%	22%
IT/Computers - Personal and Consumer Products	Mixed Signal Technologies					IT/Computers - Personal and Consumer Products	% of Total \$	included in Industrial	included in Industrial	included in Industrial
IT/Computers - Servers	System-on-Chip					IT/Computers - Servers	% of Total \$	included in Industrial	included in Industrial	included in Industrial
Mobile Devices	Custom ASICs					Mobile Devices	% of Total \$	13%	15%	13%
Network Infrastructure	MMIC Technologies					Network Infrastructure	% of Total \$	21%	20%	16%
Other						Other	% of Total \$			
(specify here)										
Clarifying Comments (if applicable):		a) NXP is a broad-based Semiconductor supplier engaged in the design, manufacture and sale of a large variety of semiconductor products across multiple end use market segments. b) Consistent with its reporting practices, NXP includes revenue from i) Aerospace, ii) Healthcare/Medical, iii) IT/Computers - Personal and iv) Consumer Products and IT/Computers - Servers in the Industrial end use segment. c) 2021 projected revenue is based on NXP financial results reported publicly on 1 November 2021 including midpoint revenue guidance for the Fourth Quarter 2021. d) 2021 contribution per end use segment is based on NXP financial results for the First through Third quarters 2021.								

This response was identified as PUBLIC on the Organization Information tab.

Section 4a: Semiconductor Providers - Products

For the semiconductor products that your organization sells, identify those with the largest order backlog. Then for each product, identify the product attributes, sales in the past month, and location of fabrication and package/assembly. The total should account for all semiconductor products that your organization sells, not only the sum of those listed with the largest order backlogs.

This information will carry over into subsequent questions.

	Product					Most Recent Monthly Sales		Production				
	Product Name	Integrated Circuit Type	Material	Node (nm)	Product Description	\$ (millions)	Units	Fabricated By	Fab Location	Packaged/Assembled By	Packaging/Assembly Location	Distributed By
	Total (all semiconductor products, including those not listed below)											
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
Clarifying Comments (if applicable):												

This response was identified as PUBLIC on the Organization Information tab.

Section 4b: Semiconductor Providers - Customers

For the top semiconductor products identified in Section 4a, list each product's top three current customers and the estimated percentage of that product's sales accounted for by each customer.

[illegible]

Clarifying Comments (if applicable):	
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Section 4c: Semiconductor Providers - Product Lead Times

For each phase of the production process, identify whether your organization carries out the step internally or externally. For the top semiconductor products identified in Section 4a, estimate each product's (a) 2019 lead time and (b) current lead time (in days), both overall and for each phase of the production

[illegible]

	Product Name (auto-generated from 4a)	Total Lead Time		Design phase		Acquisition of manufacturing inputs		Front End Manufacturing Process		Back End manufacturing process (ATP)		Electronic Manufacturing Services / Printed Circuit Board Assembly		Time in Outbound Transit/Shipping		Other		Explanation of Delays/Bottlenecks
		Internal/External ---->																
		2019	Current	2019	Current	2019	Current	2019	Current	2019	Current	2019	Current	2019	Current	2019	Current	
	Total (all semiconductor products)																	
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
Clarifying Comments (if applicable):																		

Section 4d: Semiconductor Providers - Product Inventories

For the ten semiconductor products identified in Section 4c, list each product's 2010 and current inventory (in days) for finished product, in progress product, and inbound product. Provide an explanation for

	Product No.	Finished Inventory	In-Progress Inventory	Inbound Inventory	
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9
10	10	10	10	10	10
11	11	11	11	11	11
12	12	12	12	12	12
13	13	13	13	13	13
14	14	14	14	14	14
15	15	15	15	15	15
16	16	16	16	16	16
17	17	17	17	17	17
18	18	18	18	18	18
19	19	19	19	19	19
20	20	20	20	20	20
21	21	21	21	21	21
22	22	22	22	22	22
23	23	23	23	23	23
24	24	24	24	24	24
25	25	25	25	25	25
26	26	26	26	26	26
27	27	27	27	27	27
28	28	28	28	28	28
29	29	29	29	29	29
30	30	30	30	30	30
31	31	31	31	31	31
32	32	32	32	32	32
33	33	33	33	33	33
34	34	34	34	34	34
35	35	35	35	35	35
36	36	36	36	36	36
37	37	37	37	37	37
38	38	38	38	38	38
39	39	39	39	39	39
40	40	40	40	40	40
41	41	41	41	41	41
42	42	42	42	42	42
43	43	43	43	43	43
44	44	44	44	44	44
45	45	45	45	45	45
46	46	46	46	46	46
47	47	47	47	47	47
48	48	48	48	48	48
49	49	49	49	49	49
50	50	50	50	50	50
51	51	51	51	51	51
52	52	52	52	52	52
53	53	53	53	53	53
54	54	54	54	54	54
55	55	55	55	55	55
56	56	56	56	56	56
57	57	57	57	57	57
58	58	58	58	58	58
59	59	59	59	59	59
60	60	60	60	60	60
61	61	61	61	61	61
62	62	62	62	62	62
63	63	63	63	63	63
64	64	64	64	64	64
65	65	65	65	65	65
66	66	66	66	66	66
67	67	67	67	67	67
68	68	68	68	68	68
69	69	69	69	69	69
70	70	70	70	70	70
71	71	71	71	71	71
72	72	72	72	72	72
73	73	73	73	73	73
74	74	74	74	74	74
75	75	75	75	75	75
76	76	76	76	76	76
77	77	77	77	77	77
78	78	78	78	78	78
79	79	79	79	79	79
80	80	80	80	80	80
81	81	81	81	81	81
82	82	82	82	82	82
83	83	83	83	83	83
84	84	84	84	84	84
85	85	85	85	85	85
86					

	Product Name (auto-generated from 4a)	Finished Inventory		In-Progress Inventory		Inbound Inventory		Explanation of Inventory Changes
		2019	Current	2019	Current	2019	Current	
	Total (all semiconductor products)	21 days	13 days	77 days	65 days	5 days	7 days	
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

a) "Finished Inventory" represents finished goods Days Inventory Outstanding as of 31 December 2019 and 30 September 2021.
b) NXP understands Inbound Inventory to mean manufacturing raw materials.

This response was identified as PUBLIC on the Organization Information tab.

Section 5: Semiconductor Providers - Disruptions

What are the primary disruptions or bottlenecks that have affected your ability to provide products to customers in the last year?					
	Disruption/Bottleneck	Supplier of Delayed Input	Primary Product Impacted (from Section 4a)	Explanation	
A.	1	Customer demand higher than previously forecast.			
	2	Foundry unable to meet increased demand.			
	3	Front End capacity insufficient to meet increased demand.			
	4	Assembly capacity insufficient to meet increased demand.			
	5	Test capacity insufficient to meet increased demand.			
	6				
	7				
	8				
	9				
	10				
B.	What is your organization's book-to-bill ratio for the past three years?	2019		Explanation of any changes:	
		2020			
		2021			
	If the demand for your products exceeds your capacity, what is the primary method by which your organization allocates the available supply?			Explanation:	
	Does your organization have available capacity?	No	If Yes, what is preventing the filling of that capacity?		
C.	Is your organization considering increasing its capacity?	Yes	If Yes, in what ways, over what timeframe, and what impediments exist to such an increase?		
	What factors does your organization consider when evaluating whether to increase capacity?				
	Has your organization changed its material and/or equipment purchasing levels or practices in the past three years?	Yes	Explanation:	NXP has executed additional long term supply agreements with its suppliers in order to secure future supply and capacity. NXP increased its purchase obligations from \$372M at the end of 2020 to \$4.4B at the end of 3Q 2021 (as per 10Q).	
	What single change (and to which portion of the supply chain) would most significantly increase your ability to supply semiconductor products in the next six months?	Increased front end manufacturing capacity (both internal and external)			
Clarifying Comments (if applicable):					

This response was identified as PUBLIC on the Organization Information tab.

Section 6: Semiconductor Product Consumers

A.	From the list below, identify the market segments that your organization currently serves:		
	Market Segment	Primary/Secondary/Other	Defense/Commercial
	Aerospace		
	Automotive		
	Healthcare/Medical		
	Industrial		
	IT/Computers - Personal and Consumer Products		
	IT/Computers - Servers		
	Mobile Devices		
	Network Infrastructure		
	Other	(specify here)	
Other	(specify here)		
B.	Provide a general description of the types of products your organization sells that rely on semiconductors:		
<div></div>			
Clarifying Comments (if applicable):			

This response was identified as PUBLIC on the Organization Information tab.

Section 7a: Consumers - Inputs

For the semiconductor products that your organization purchases, identify those that present the greatest challenge for your organization to acquire. Then for each product, identify the product attributes and average monthly purchases in 2019 and 2021, as well as average monthly orders in 2021. Then estimate the quantity of each product your organization would purchase in the next six months barring any production constraints, as well as the amount your organization expects to actually be able to purchase. This information will carry over into subsequent questions.

	Product					2019 Average Monthly Purchase		2021 Average Monthly Purchase		2021 Average Monthly Orders		Ideal Monthly Purchase Quantity, Next 6 Months		Expected Monthly Purchase Quantity, Next 6 Months	
	Supplier	Product Description	Semiconductor Type	Material	Node	\$ (millions)	Units	\$ (millions)	Units	\$ (millions)	Units	\$ (millions)	Units	\$ (millions)	Units
	Total (all semiconductor products)														
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
Clarifying Comments (if applicable):															

This response was identified as PUBLIC on the Organization Information tab.

Section 7b: Consumers - Input Lead Times and Inventory

For each of the top semiconductor products identified in Section 7a, estimate each product's lead times (between when your organization places the order and receives the order) and your organization's inventory for (a) 2019 and (b) currently (in days). Provide an explanation of any current delays or bottlenecks.

	Supplier Product (auto-generated from 7a)	Lead Time		Inventory		Explanation of Delays/Bottlenecks and Changes in Inventory Practices
		2019	Current	2019	Current	
	Total (all semiconductor products)					
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
Clarifying Comments (if applicable):						

This response was identified as PUBLIC on the Organization Information tab.

Section 8: Consumers - Supply Chain Disruptions

What are the primary disruptions or bottlenecks that have affected your ability to provide products to customers in the last year?					
	Disruption/Bottleneck	Primary Semiconductor Input Impacted (from Section 7a)	Supplier of Delayed Input	Your Organization's Primary Product Impacted	Explanation
A.	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
B.	Is your organization limiting production due to lack of available semiconductors?		Explanation		
	What percentage of your current production has your organization had to defer, delay, reject, or suspend in the past year?		Explanation		
	Is your organization considering or carrying out new investments to mitigate semiconductor sourcing difficulties?		Explanation		
What semiconductor product types are most in short supply, and by what estimated percentage relative to your demand? What is your view of the root cause?					
	Product	Percent of your demand you are able to fill	Explanation		
C.	1				
	2				
	3				
Has your organization changed its material and/or equipment purchasing levels or practices in the past three years?			Explanation:		
D.	What single change (and to which portion of the supply chain) would most significantly increase your ability to purchase semiconductors in the next six months?				
	What percentage of your orders are fulfilled by distributors versus through direct purchase orders to semiconductor product manufacturers?			Direct Purchase from OEM	
				Distributor	
	For the semiconductor products your organization purchases, how long (in months) are the typical purchase commitments?			How, if at all, do your organization's purchase commitments differ for products in short supply?	
E.	Has your organization faced "de-commits" (defined as a notification from a supplier that expected or committed supply will not be delivered in the agreed-upon time and quantity) in recent months? If this is a significant issue, please explain (e.g., nature of product, supplier, impact)				
Clarifying Comments (if applicable):					

This response was identified as PUBLIC on the Organization Information tab.

Section 9: General Comments

Use this space to provide any general comments that do not reasonably fit in other sections of the form. Please limit your response to the space available; supplemental information can be submitted as a separate attachment on regulations.gov.

A.

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Section A: Definitions	
Term	Definition
Authorizing Official	An executive officer of the organization or business unit or another individual who has the authority to execute this survey on behalf of the organization.
Capability	The ability to perform standardized design and/or manufacturing steps for producing integrated circuit products within an organization's own facilities and its own employees with little or no outsourcing.
Complementary Metal Oxide Semiconductor (CMOS)	A class of semiconductor used in digital logic circuits employed in microcontrollers, microprocessors, memory, and other devices. The technology is also used in analog circuits such as sensors, transceivers, data converters and other systems.
Customer	An entity to which an organization directly delivers the product or service that the facility produces. A customer may be another organization or another facility owned by the same parent organization. The customer may be the end user for the item but often will be an intermediate link in the supply chain, adding additional value before transferring the item to yet another customer.
Design Facility	A facility with personnel who use design software, intellectual property blocks, supporting computer systems, and other information technology to create integrated circuit designs.
Extreme Integration	The incorporation of functional systems (e.g., logic, memory, input/output, etc.) on an integrated circuit (IC) die or in combination with the integration of multiple IC die (such as memory, standard processors, and field programmable gate arrays) to form a single operational component.
Foundry	For the purpose of this survey a foundry is considered to be a facility that manufactures integrated circuit products for outside organizations as a business. Foundries are: 1) businesses dedicated solely to manufacturing integrated circuit products for fabless integrated circuit companies and other businesses; and/or 2) organizations that chiefly design and manufacture their own integrated circuit products, but that also operate a business of manufacturing IC products for other entities for a fee.
Integrated Circuit (IC)	Analog or digital devices that incorporate transistors, diodes, capacitors, resistors, and other circuit elements that are integrated on a single substrate (chip), typically silicon.
Manufacturing	The production of a working integrated circuit product at a fabrication facility.
Manufacturing Facility	A facility that transforms integrated circuit designs into integrated circuit devices using an array of fabrication equipment including photolithography, deposition, etch, wafer dicing, and testing tools. These facilities produce functioning die as an end-product, devices that may be built with electronics-grade silicon or compound semiconductor materials, including gallium arsenide, gallium nitride, indium phosphide, and others.
Non-U.S. Company	For the purpose of this survey, a non-U.S. company is an organization (publicly traded, privately held, for profit, not-for-profit, or non-profit) that is domiciled at a location outside of the United States. Companies that are a business unit of a parent organization with legal domicile located outside of the United States are non-U.S. companies.
Organization	A company, firm, laboratory, or other entity that owns or controls one or more U.S. establishment(s) capable of designing and/or manufacturing integrated circuit products. A company may be an individual proprietorship, partnership, joint venture, or corporation including any subsidiary corporation in which more than 50 percent of the outstanding voting stock is owned by a business trust, cooperative, trustee(s) in bankruptcy, or receiver(s) under decree of any court owning or controlling one or more establishment.
Outsource	To obtain goods and/or services by contract from a supplier (domestic or foreign) outside the organization.
Product/Process Development	Conceptualization and development of a product prior to the production of the product for customers.
Semiconductor	Elemental materials such as silicon and germanium (or compounds like gallium arsenide) that possess levels of electrical conductivity that are less than a conductor but greater than an insulator. The properties of these materials and similar ones can be manipulated to affect conductivity through temperature and/or the use of dopants.
Service	An intangible product (contrasted to a good, which is a tangible product). Services typically cannot be stored or transported, are instantly perishable, or come into existence at the time they are bought and consumed.
Single Source	An organization that is designated as the only accepted source for the supply of parts, components, materials, or services, even though other sources with equivalent technical know-how and production capability may exist.
Sole Source	An organization that is the only source for the supply of parts, components, materials, or services. No alternative U.S. or non-U.S. based suppliers exist other than the current supplier.
Supplier	An entity from which your organization obtains inputs, which may be goods or services. A supplier may be another firm with which you have a contractual relationship, or it may be another facility owned by the same parent organization.
United States	The "United States" or "U.S." includes the 50 states, Puerto Rico, the District of Columbia, Guam, the Trust Territories, and the U.S. Virgin Islands.
Wafer Starts Per Week	The number of semiconductor wafers that can be processed by an integrated circuit production line in a 7-day period.