Final Product/Process Change Notification

Document #:FPCN25572XK
Issue Date:20 Mar 2026

Title of Change:	Update of **FPCN25572X** - 405x Analog Switch; Vanguard FAB Transfer and associated Assembly changes
Proposed First Ship date:	01 Jul 2026 or earlier if approved by customer
Contact Information:	Contact your local onsemi Sales Office
PCN Samples Contact:	Contact your local onsemi Sales Office. Sample requests are to be submitted no later than 30 days from the date of first notification, Initial PCN or Final PCN, for this change. Samples delivery timing will be subject to request date, sample quantity and special customer packing/label requirements.
Additional Reliability Data:	Contact your local onsemi Sales Office
Type of Notification:	This is a Final Product/Process Change Notification (FPCN) sent to customers. FPCNs are issued 90 days prior to implementation of the change. onsemi will consider this change accepted, unless an inquiry is made in writing within 30 days of delivery of this notice. To do so, contact
Marking of Parts/ Traceability of Change:	Affected material can be traced by date code
Change Category:	Wafer Fab Change, Assembly Change, Test Change
Change Sub-Category(s):	Material Change, Manufacturing Site Transfer

Sites Affected:

onsemi Sites	**External Foundry/Subcon Sites**
onsemi Carmona, Philippines	Vanguard International Semiconductor, Taiwan

Description and Purpose:

This is to notify customers of FAB manufacturing transfer from Tower to Vanguard Fab, and Assembly material changes in the current Carmona Assembly site. The Vanguard site will use 200mm wafers. This will impact SOIC-16 and TSSOP-16 Analog Switches.

This product will no longer run assembly at ATEC and be assembled entirely at the Carmona assembly site. Carmona assembly site will convert from 0.8mil Copper to 1.0 PCC bond wire for all affected products. Mold compound will change for TSSOP-16 products from ATEC; Lead frame will only be a change for products currently assembled at ATEC. SOIC-16W products will have no change to mold compound or lead frame.

Change	Before	After
Fab Site	Tower	Vanguard
Wafer Diameter	150mm	200mm
Assembly Site	onsemi Carmona, Philippines, ATEC	onsemi Carmona, Philippines
Mold Compound	onsemi Carmona, Philippines & ATEC: SOIC16 & TSSOP16 = G600	SOIC14 = G600 (no change) TSSOP16 = G700LS
Lead Frame	**SOIC 16:** onsemi = LF SOIC16 1.016 X 1.067 H502 AG SN ATEC = LF 16Lds NB 1.08x1.08vmm Pad, Spot Ag **TSSOP 16:** onsemi = LF TSSOP 16 1.016 x 1.067mm ATEC = LF TSSOP 16L JEDEC 4.4MM PPF	**SOIC 16:** LF SOIC16 1.016 X 1.067 H502 AG SN **TSSOP 16:** LF TSSOP 16 1.016 x 1.067mm
Bond Wire	0.8mil Cu	1.0 mil PCC
TEST Site	onsemi Carmona, Philippines, ATEC	onsemi Carmona, Philippines

There is no product marking change as a result of this change.

Reliability Data Summary:

QV DEVICE NAME : MC74HC4051ADR2G-Q
RMS : O105329
PACKAGE : SOIC 16

Test	Specification	Condition	Interval	Result
High Temperature Operating Life	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hrs	80/80
High Temperature Storage Life	JESD22-A103	Ta= 150°C	1008 hrs	80/80
Preconditioning	J-STD-020 JESD-A113	MSL 1 @ 260°C, Pre TC, uHAST, HAST for surface mount pkgs only	-	Pass
Temperature Cycling	JESD22-A104	Ta= -55°C to +150°C	1000 cyc	80/80
Highly Accelerated Stress Test	JESD22-A110	130°C, 85% RH, 18.8psig, bias	192 hrs	80/80
Unbiased Highly Accelerated Stress Test	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hrs	80/80
ELFR	JESD74A	125°C, bias	48 hrs	800/800

QV DEVICE NAME : MC74HC4051ADTR2G-Q
RMS : O105328
PACKAGE : TSSOP 16

Test	Specification	Condition	Interval	Result
High Temperature Operating Life	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hrs	80/80
High Temperature Storage Life	JESD22-A103	Ta= 150°C	1008 hrs	80/80
Preconditioning	J-STD-020 JESD-A113	MSL 1 @ 260°C, Pre TC, uHAST, HAST for surface mount pkgs only	-	Pass
Temperature Cycling	JESD22-A104	Ta= -55°C to +150°C	1000 cyc	80/80
Highly Accelerated Stress Test	JESD22-A110	130°C, 85% RH, 18.8psig, bias	192 hrs	80/80
Unbiased Highly Accelerated Stress Test	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hrs	80/80
ELFR	JESD74A	125°C, bias	48 hrs	800/800

QV DEVICE NAME : MC74HC4051ADWR2G
RMS : O105327
PACKAGE : SOIC 16W

Test	Specification	Condition	Interval	Result
High Temperature Operating Life	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hrs	80/80
High Temperature Storage Life	JESD22-A103	Ta= 150°C	1008 hrs	80/80
Preconditioning	J-STD-020 JESD-A113	MSL 1 @ 260°C, Pre TC, uHAST, HAST for surface mount pkgs only	-	Pass
Temperature Cycling	JESD22-A104	Ta= -55°C to +150°C	1000 cyc	80/80
Highly Accelerated Stress Test	JESD22-A110	130°C, 85% RH, 18.8psig, bias	192 hrs	80/80
Unbiased Highly Accelerated Stress Test	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hrs	80/80
ELFR	JESD74A	125°C, bias	48 hrs	800/800

Electrical Characteristics Summary:

Electrical characteristics are not impacted.

List of Affected Parts:

Note: *Only the standard (off the shelf) part numbers are listed in the parts list. Any custom parts affected by this PCN are shown in the customer specific PCN addendum in the PCN email notification, or on the* ***PCN Customized Portal****.*

Current Part Number	New Part Number	Qualification Vehicle
MC74VHC4053DTR2G	#NONE	MC74HC4051ADTR2G-Q
MC74VHC4053DR2G	#NONE	MC74HC4051ADR2G-Q
MC74VHC4052DTR2G	#NONE	MC74HC4051ADTR2G-Q
MC74VHC4052DR2G	#NONE	MC74HC4051ADR2G-Q
MC74VHC4051DTR2G	#NONE	MC74HC4051ADTR2G-Q
MC74VHC4051DR2G	#NONE	MC74HC4051ADR2G-Q
MC74HCT4053ADR2G	#NONE	MC74HC4051ADR2G-Q
MC74HCT4052ADR2G	#NONE	MC74HC4051ADR2G-Q
MC74HCT4051ADR2G	#NONE	MC74HC4051ADR2G-Q
MC74HC4053ADWR2G	#NONE	MC74HC4051ADWR2G-Q
MC74HC4053ADTR2G	#NONE	MC74HC4051ADTR2G-Q
MC74HC4053ADR2G	#NONE	MC74HC4051ADR2G-Q
MC74HC4052ADWR2G	#NONE	MC74HC4051ADWR2G-Q
MC74HC4052ADTR2G	#NONE	MC74HC4051ADTR2G-Q
MC74HC4052ADR2G	#NONE	MC74HC4051ADR2G-Q
MC74HC4051ADWR2G	#NONE	MC74HC4051ADWR2G-Q
MC74HC4051ADTR2G	#NONE	MC74HC4051ADTR2G-Q
MC74HC4051ADR2G	#NONE	MC74HC4051ADR2G-Q
M74HCT4053ADTR2G	MC74HCT4053ADTR2G	MC74HC4051ADTR2G-Q
M74HCT4052ADTR2G	MC74HCT4052ADTR2G	MC74HC4051ADTR2G-Q
M74HCT4051ADTR2G	MC74HCT4051ADTR2G	MC74HC4051ADTR2G-Q

Final Product/Process Change Notification

Document #: FPCN25572X
Issue Date: 30 Jun 2023

Title of Change:	Qualification of Vanguard Fab and Some Assembly Related Changes for Logic parts
Proposed First Ship date:	See attached file for proposed first ship date for each product
Contact Information:	Contact your local onsemi Sales Office or
PCN Samples Contact:	Contact your local onsemi Sales Office or Sample requests are to be submitted no later than 30 days from the date of first notification, for this change. Samples delivery timing will be subject to request date, sample quantity and special customer packing/label requirements. See attached file for anticipated availability date.
Type of Notification:	This is a Final Product/Process Change Notification (FPCN) sent to customers. FPCNs are issued 90 days prior to implementation of the change. The change will be implemented at 'Proposed Changed Material First Ship Date' for each part number in the attached file, in compliance to J-STD-46 or ZVEI, or earlier upon customer approval, or per our signed agreements. onsemi will consider this change accepted on that date, unless an inquiry is made in writing within 30 days of delivery of this notice. To do so, contact
Marking of Parts/ Traceability of Change:	As material from different FABs cannot be combined in to (1) reel, product from Vanguard will show "Diffused In: TW" on the label of the reel and box. Please see sample MPN on page 2 at the following link http://www.onsemi.com/pub_link/Collateral/LABELRM-D.PDF to see the location of the Diffused In notation.
Change Category:	Wafer Fab Change, Test Change, Assembly Change
Change Sub-Category(s):	Manufacturing Site Transfer, Datasheet/Product Doc Change

Sites Affected:

onsemi Sites	**External Foundry/Subcon Sites**
onsemi Carmona, Philippines onsemi Leshan Phoenix Semiconductor, China onsemi Seremban, Malaysia onsemi Tarlac, Philippines onsemi Cebu, Philippines	Amkor Technology, Korea Amkor Technology, Philippines ATEC – Automated Technology, Philippines ATX Kun Shan, China ATX Chung Li, China ATX Shanghai, China Greatek Electronics, Taiwan Hana Jiaxing, China Hana Microelectronics, Thailand JCET Jiangyin, China Stars Microelectronics, Thailand UTAC Thai Ltd., Thailand UTL2 Bangsamak, Thailand Vanguard International Semiconductor, Taiwan

Description and Purpose:

The purpose of this notification is to notify customers of the qualification of Vanguard as a wafer supplier for most of the logic product portfolio. Please see the attached file for details on the disposition, sample schedule, and last order dates by part number. We have included the entire logic portfolio for your reference, including part numbers which are not changing, as well as those that have already been included on previous FPCNs.

The bulk of these products are currently processed at Tower Semiconductor, Ltd. (Tower) in Fab 1. Tower has communicated that all onsemi TS35/TS60/TS50 products in Fab 1 are to become obsolete in 2024, so an alternate source is required for customer support.

This FPCN will become effective for each part number on the 'Proposed Change Material First Ship Date' listed in the attached file. Deliveries will start immediately after receiving FPCN approval or Orders Authority (OA). We have no ability to support customer orders beyond the listed First Ship Date. If a customer does not wish to receive product from the new source, they should take action to cancel or push out all future orders. Customer should work with their local sales contacts to cancel or push orders as needed.

In addition, some products that are manufactured in TowerJazz Panasonic Semiconductor Co., Ltd. (TPSCo) in Japan and Diodes, Inc. South Portland, Maine are also being transferred to Vanguard as well to consolidate our product portfolio and ensure strong future support.

	From	To
Fab Site	Tower Semiconductor, TPSCo, and Diodes Maine	Vanguard International Semiconductor (VIS)
Wafer size	150 mm and 200 mm	200 mm
Packaging	Refer to attached file and information below by Product Family/Qual Vehicle	Refer to attached file and information below by Product Family/Qual Vehicle
Part Number Changes	Refer to attached file	Refer to attached file
Product Marking	No change	
Datasheet	Current Revision	New Revision
Absolute Max Rating	6.5V or 7V	6.5V
Electrical Characteristics	Refer to attached file and information below by Product Family	Refer to attached file and information below by Product Family

5V MiniGate Logic

NOTE: Some part numbers covered under FPCN24802X, FPCN24889X, FPCN24889XA, refer to attached file and those PCNs for detailed information

QV DEVICE NAME: NL27WZ14DFT2G, MC74VHC1G14DFT1G
PACKAGE: SC88/A

- **Assembly changes:**

	From	To
Assembly Site	Hana, onsemi Cebu and onsemi Leshan Phoenix Semiconductor	onsemi Seremban and onsemi Leshan Phoenix Semiconductor
Wire	Au, Au, Cu	Cu
Leadframe	PPF, C194, A42 Stamped	A42 Stamped
Mold Compound	G600 HF, CK5000A, GR640HV	GR640HV
Die Attach	2200D, 84-1LMIS4R, N/A – Eutectic	N/A – Eutectic
Plating	Preplated, 100% Sn, 100% Sn	100% Sn

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS L85492, L82712 and S85493.

QV DEVICE NAME: NL27WZ14DFT2G, MC74VHC1G14DFT1G
PACKAGE: SC88/A

- **Assembly changes:**

	From	To
Assembly Site	Hana, onsemi Cebu and onsemi Leshan Phoenix Semiconductor	onsemi Seremban and onsemi Leshan Phoenix Semiconductor
Wire	Au, Au, Cu	Cu
Leadframe	PPF, C194, A42 Stamped	A42 Stamped
Mold Compound	G600 HF, CK5000A, GR640HV	GR640HV
Die Attach	2200D, 84-1LMIS4R, N/A – Eutectic	N/A – Eutectic
Plating	Preplated, 100% Sn, 100% Sn	100% Sn

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS L85492, L82712 and S85493.

QV DEVICE NAME: NL27WZ14DBVT1G, MC74VHC1G14DBVT1G
PACKAGE: SC74/A

- **Assembly changes:**

	From	To
Assembly Site	onsemi Seremban, Hana	onsemi Leshan Phoenix Semiconductor
Lead Frame	COPPER ALLOY CDA 194 with Ag SPOT Plated , PPF	Alloy 42 with OVERALL Cu Plated
Bond Wire	Au, Au	Cu
Mold Compound	SUMITOMO EME-G600FB, EMEG600	Hysol GR640
Die Attach	NON-COND EPOXY, ABLESTICK 2200D	Eutectic
Package Type	TSOP5, TSOP6, SOT23	SC74A, SC74, SC74A
Plating	100% Sn, 100% Sn, PPF	100% Sn

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS S82713, L85044 and S82725.

QV DEVICE NAME: MC74VHC1G08P5T5G
PACKAGE: SOT953

- **Assembly changes:**

	From	To
Assembly Site	onsemi Leshan Phoenix Semiconductor	
Wire Type	Au or Cu	Cu
Mold Compound	Showa Denko GE200F or Hysol GR640 HV	Hysol GR640 HV

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS S87090.

QV DEVICE NAME: NL17SZ08XV5T2GH
PACKAGE: SOT553

- **Assembly changes:**

	From	To
Assembly Site	onsemi Leshan Phoenix Semiconductor	
Bond Wire	Au or Cu	Cu
Mold Compound	Showa Denko GE200F	Hysol GR640 HV

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS S87092.

QV DEVICE NAME: NL17SZ08MU1TCG and NL27WZ17MU1TCG
PACKAGE: UDFN6

- **UDFN6 1.45x1.0 Assembly changes:**

	From	To	
Assembly Site	onsemi Seremban, Tarlac, Stars	onsemi Seremban	onsemi Tarlac
Mold Compound	G760, EME-G770HM , EME-G760 ,EME G700LTD	Sumitomo EME-G770HM	SUMITOMO EME-G760
Wire Type	Au or PCC	PCC	PCC
Lead Frame	PPF, LF UDFN 6L 1.45X1 PPF	LF PPF Plated (C7025)	LF PPF PLATED (C7025)
Die Attach	8006NS, HR-5104 Non Cond	8006NS	8006NS

- **UDFN6 1.2x1.0 Assembly changes:**

	From	To	
Assembly Site	onsemi Seremban, ATX Shanghai, AMKOR, UTAC, Tarlac	onsemi Seremban	onsemi Tarlac
Mold Compound	EME-G770HM, G631H, G700Y, G700HCD, EME-G760	Sumitomo EME-G770HM	SUMITOMO EME-G760
Wire Type	Au or PCC	PCC	PCC
Lead Frame	PPF, Rough PPF, LF sMLF 6L COL C7025, FRAME FR 6L UDFN 1.2X1.0M	LF PPF PLATED (C7025)	LF PPF PLATED (C7025)
Die Attach	8006NS, ATB-F125E, NEX-130CTX-N5	8006NS	8006NS

- **UDFN6 1.0x1.0 Assembly changes:**

	From	To	
Assembly Site	onsemi Seremban, Tarlac	onsemi Seremban	onsemi Tarlac
Mold Compound	G760, EME-G770HM, EME-G760	Sumitomo EME-G770HM	SUMITOMO EME-G760
Wire Type	Au or PCC	PCC	PCC
Lead Frame	PPF	LF PPF PLATED (C7025)	LF PPF PLATED (C7025)

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS S87093, S87094, S87313 and S87316.

QV DEVICE NAME: MC74VHC3G14MU3TCG
PACKAGE: uDFN8

- **uDFN8 1.45*1.0 Assembly changes:**

	From		To	
Assembly Site	onsemi Seremban	onsemi Tarlac	onsemi Seremban	onsemi Tarlac
Lead Frame	PPF	PPF	LF PPF PLATED (C7025)	LF PPF PLATED (C7025)

- **uQFN8 1.6*1.6 Assembly changes:**

	From	To	
Assembly Site	onsemi Seremban, ATX Shanghai, AMKOR, Tarlac	onsemi Seremban	onsemi Tarlac
Mold Compound	G760, G631H, G700Y, EME-G770HM, EME-G760	Sumitomo EME-G770HM	SUMITOMO EME-G760
Wire Type	Au or PCC	PCC	PCC
Lead Frame	PPF, Rough PPF, Rough PPF	LF PPF PLATED (C7025)	LF PPF PLATED (C7025)
Die Attach	8006NS, ATB-F125E, NEX-130CTX-N5		

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS 87960 and 87889.

QV DEVICE NAME: NC7SZ14L6X, NC7WZ14FHX
PACKAGE: MicroPak and MicroPak 2

- **MicroPak Assembly Changes:**

	From	To
Assembly Site	Stars, Hana, UTAC	Stars
Wire	PCC, Au, Au	PCC
Lead frame	PPF, PPF, PPF	PPF
Mold Compound	EME G700LTD, CEL9220HF13H, G770HCD	EME G700LTD
Die Attach	HR-5104, 8006NS, 8006NS	HR-5104

- **MicroPak2 Assembly Changes:**

	From	To
Assembly Site	Stars, Hana, UTAC	Stars
Wire	PCC, Au, Au	PCC
Lead frame	PPF, PPF, PPF	PPF
Mold Compound	EME G700LTD, CEL9220HF13H, G770HCD	EME G700LTD
Die Attach	HR-5104, 8006NS, 8006NS	HR-5104

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS 87728 and 87726.

QV DEVICE NAME: NC7WZ132K8X
PACKAGE: US8

- **US8 Assembly Changes:**

	From	To
Assembly Site	Stars, onsemi Seremban, Hana	Stars
Wire	PCC, PCC, Au, Au	PCC
Lead frame	PPF, PPF, CuAg, CuAg	PPF
Mold Compound	EME G600, EME-G600FB, EME-G600 HF	EME G600
Die Attach	HR-5104, 8006NS, 8900NC, ABLESTIK 84-1	HR-5104

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet
- **Reliability Summary:** Refer to embedded excel RMS 87355.

QV DEVICE NAME: NC7WZ132L8X
PACKAGE: MicroPak 8L

- **MicroPak 8L Assembly Changes:**

	From	To
Assembly Site	Stars, Hana	Stars
Wire	PCC, Au	PCC
Lead frame	PPF, PPF	PPF
Mold Compound	EME G700LTD, CEL9220HF13H	EME G700LTD
Die Attach	HR-5104, 8006NS	HR-5104

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS 91332.

3V MiniGate Logic

QV DEVICE NAME: NC7SV157P6X
PACKAGE: SC88

- **SC88 Assembly changes:**

	From	To
Assembly Site	Hana, onsemi Cebu	onsemi Leshan Phoenix Semiconductor
Wire	Au, Au	Cu
Leadframe	PPF, C194	A42 Stamped
Mold Compound	G600 HF, CK5000A	GR640HV
Die Attach	2200D, 84-1LMIS4R	N/A – Eutectic
Plating	Preplated, 100% Sn	100% Sn

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS 91004.

QV DEVICE NAME: NC7SP14P5X
PACKAGE: SC88A

- **SC88A Assembly changes:**

	From	To
Assembly Site	Hana, onsemi Cebu, onsemi Leshan Phoenix Semiconductor	onsemi Leshan Phoenix Semiconductor
Wire	Au, Au, Au	Cu
Leadframe	PPF, C194, A42 stamped	A42 Stamped
Mold Compound	G600 HF, CK5000A, GR640HV	GR640HV
Die Attach	2200D, 84-1LMIS4R, N/A – Eutectic	N/A – Eutectic
Plating	Preplated, 100% Sn	100% Sn

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS 88008.

3V MiniGate Logic

QV DEVICE NAME: NL17SG14P5T5G
PACKAGE: SOT953

- **Assembly changes:**

	From	To
Assembly Site	onsemi Leshan Phoenix Semiconductor	
Bond Wire	Au	Cu
Mold Compound	Showa Denko GE200F or Hysol GR640 HV	Hysol GR640 HV

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS 88110.

QV DEVICE NAME: NL17SV16XV5T2G
PACKAGE: SOT553

- **Assembly changes:**

	From	To
Assembly Site	onsemi Leshan Phoenix Semiconductor	
Bond Wire	Au	Cu
Mold Compound	Showa Denko GE200F	Hysol GR640 HV

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS 88114.

3V MiniGate Logic

QV DEVICE NAME: NC7SPU04L6X, NC7SV08FHX
PACKAGE: MicroPak and MicroPak 2

- **MicroPak Assembly Changes:**

	From	To
Assembly Site	Stars, Hana, UTAC	Stars
Wire	PCC, Au, Au	PCC
Lead frame	PPF, PPF, PPF	PPF
Mold Compound	EME G700LTD, CEL9220HF13H, G770HCD	EME G700LTD
Die Attach	HR-5104, 8006NS, 8006NS	HR-5104

- **MicroPak2 Assembly Changes:**

	From	To
Assembly Site	Stars, Hana, UTAC	Stars
Wire	PCC, Au, Au	PCC
Lead frame	PPF, PPF, PPF	PPF
Mold Compound	EME G700LTD, CEL9220HF13H, G770HCD	EME G700LTD
Die Attach	HR-5104, 8006NS, 8006NS	HR-5104

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS 88230 and 90908.

HC, LCX, LVX, VHC, FACT and LV Logic, Bus Switch, 5V Analog Switch

QV DEVICE NAME: NLV74HC595ADTR2G, MC74LVX4051DTR2G, NLVHC4851ADTR2G, MC74LCX14DTR2G, NLV74HC244ADTR2G, MC74HC244ADTR2G
PACKAGE: TSSOP-14, TSSOP-16, TSSOP-20, TSSOP-48

- **TSSOP-14 Assembly changes:**

	From	To	
Assembly Site	onsemi Carmona, ATEC	onsemi Carmona	ATEC
Mold Compound	G600, G700LS	G700LS	G600
Wire Type	0.8 mil Au, 0.8 mil Cu	1 mil PCC	1 mil PCC
Lead Frame	PPF	PPF	Cu with Ag spot

- **TSSOP-16 Assembly changes:**

	From	To	
Assembly Site	onsemi Carmona, ATEC	onsemi Carmona	ATEC
Mold Compound	G600, G700LS	G700LS	G600
Wire Type	0.8 mil Au, 0.8 mil Cu	1 mil PCC	1 mil PCC
Lead Frame	PPF	PPF	Cu with Ag spot

- **TSSOP-20 Assembly changes:**

	From	To	
Assembly Site	onsemi Carmona, ATEC	onsemi Carmona	ATEC
Mold Compound	G700LS, CEL800JF	G700LS	G700LS
Epoxy	QMI519, CRM-1076WB	CRM-1076WB	CRM-1076WB
Wire Type	0.8 mil Au, 0.8 mil Cu	1 mil PCC	1 mil PCC

- **TSSOP-48 Assembly Changes:**
  Not defined yet, FPCN will be updated when data is available

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.

- **Reliability Summary:** Refer to embedded excel RMS O88463, O89920, O89358, 88467, 89368, 89374, 89375, 88468, 89399, 89395, 89401 and TBD (TSSOP48)

HC, LCX, LVX, VHC, FACT and LV Logic, Bus Switch, 5V Analog Switch

QV DEVICE NAME: MC74LCX14DR2G, NLV74HC595ADR2G, MC74HC595ADR2G, MC74LVX4051DR2G, NLV74HC4851ADR2G, MC74HC4851ADR2G, NLV74HC244ADWR2G, MC74HC244ADWR2G
PACKAGE: SOIC-14, SOIC-16, and SOICW-20

- **For SOIC-14 package assembly changes:**

	From	To		
Assembly Site	onsemi Carmona, Hana Micro., ATX Kunshan, ASE Chungli	onsemi Carmona	Hana Micro.	ATX Kunshan
LeadFrame	Cu with Ag spot	Cu with Ag spot	PPF	Cu with Ag spot
Bond Wire	0.8 mil Au, 0.8 mil Cu	1 mil PCC	1 mil PCC	1 mil PCC
Die Attach	CRM-1076WB, EN4900GC	CRM-1076WB	CRM-1076WB	EN4900GC
Mold Compound	G600, CEL9240HF10AK	G600	G600	CEL9240HF10AK

- **For SOIC-16 package assembly changes:**

	From	To		
Assembly Site	onsemi Carmona, ATEC, ATX Kunshan, ASE Chungli	onsemi Carmona	ATEC	ATX Kunshan
Bond Wire	0.8 mil Au, 0.8 mil Cu	1 mil PCC	1 mil PCC	1 mil PCC
Die Attach	CRM-1076WB, EN4900GC	CRM-1076WB	CRM-1076WB	EN4900GC
Mold Compound	G600, CEL9240HF10AK	G600	G600	CEL9240HF10AK

- **For SOICW-20 package assembly changes:**

	From	To	
Assembly Site	onsemi Carmona, ATEC, Greatek, ASE Chungli	onsemi Carmona	Greatek
Bond Wire	0.8 mil Au, 0.8 mil Cu	1 mil PCC	1 mil PCC
Die Attach	CRM-1076WB	CRM-1076WB	EN4900GC
Mold Compound	G600	G600	G600F

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS 89379, 89388, 89394, 89362, 89365, 89367, 89369, 89370, 89372, 88465, 89376, 89377, 89396 and 89402.

HC, LCX, LVX, VHC, FACT and LV Logic, Bus Switch, 5V Analog Switch

QV DEVICE NAME: 74LCX14BQX, NLV74HC595AMN1TWG, MC74LVX4051MNTWG, NLV68SZ126MN2TWG, 74LCX244BQX
PACKAGE: QFN-14, QFN-16, and QFN-20

- **For QFN-14 package assembly changes:**

	From	To
Assembly Site	Hana Micro.	onsemi Tarlac
Die Attach	ABLETHERM 8600	CRM-1076WB
Bond Wire	1 mil Au	1 mil PCC
Mold Compound	CEL9220HF13H	G770HMD

- **For QFN-16 (2.5 mm x 3.5 mm x 0.5 mm) package assembly changes:**

	From	To	
Assembly Site	Hana Micro., Stars Micro.	onsemi Tarlac	onsemi Seremban
LeadFrame	PPF	Cu with Ag spot, PPF	Cu with Ag spot
Die Attach	HR-5104, ABLETHERM 8600	CRM-1076WB	WBC 8006NS
Bond Wire	0.8 mil Au, 1 mil Au	0.8 mil PCC, 1 mil PCC	0.8 mil PCC
Mold Compound	G700LTD, CEL9220HF13H	G770HMD	G770HMD

- **For QFN-16 (3 mm x 3 mm x 0.5 mm) package assembly changes:**

	From	To
Assembly Site	Stars Micro.	onsemi Tarlac
LeadFrame	PPF	Cu with Ag Spot
Die Attach	8200TI	CRM-1076WB
Bond Wire	1 mil Au	1 mil PCC
Mold Compound	G700LTD	G770HMD

- **For QFN-20 package assembly changes:**

	From	To
Assembly Site	Hana Micro., Stars Micro.	onsemi Tarlac
Die Attach	HR-5104, ABLETHERM 8600	CRM-1076WB
Bond Wire	0.8 mil Au, 1 mil Au	1 mil PCC
Mold Compound	CEL9220HF13H, G700LTD	G770HMD

- **Electrical Characteristics:** Refer to tables at the end of this document for changes to datasheet.
- **Reliability Summary:** Refer to embedded excel RMS 89447, 89269, 89405, 89440, 89427, 89442 and 89448

HC, LCX, LVX, VHC, FACT and LV Logic, Bus Switch, 5V Analog Switch

Additional QVs for some remaining products TBD, FPCN to be updated when information is available.

3V Translator, Autosense Translator, Bus Interface, 12V Analog Switch, FST Logic

QV DEVICE NAME: TBD
Qual vehicles and change information for these product families is still being developed. FPCN will be updated when information is available. Estimated dates for sample availability and qualification are available in the file attached.

5 V MiniGate Logic Datasheet Changes

There are no expected datasheet changes to the 5 V Minigate logic devices.

3 V MiniGate Logic Datasheet Changes

NL17SGxx Family

Absolute Maximum Ratings and Recommended Operating Conditions

Existing Datasheet

MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V_{CC}	DC Supply Voltage		−0.5 to +5.5	V
V_{IN}	DC Input Voltage		−0.5 to +4.6	V
V_{OUT}	DC Output Voltage	Output at High or Low State Power−Down Mode (V_{CC} = 0 V)	−0.5 to V_{CC} +0.5 −0.5 to +4.6	V

RECOMMENDED OPERATING CONDITIONS

Symbol	Characteristics		Min	Max	Unit
V_{CC}	Positive DC Supply Voltage		0.9	3.6	V
V_{IN}	Digital Input Voltage		0.0	3.6	V
V_{OUT}	Output Voltage	Output at High or Low State Power−Down Mode (V_{CC} = 0 V)	0.0 0.0	V_{CC} 3.6	V
T_A	Operating Temperature Range		−55	+125	°C
Δt / ΔV	Input Transition Rise or Fall Rate	V_{CC} = 3.3 V ± 0.3 V	0	10	ns/V

New

MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V_{CC}	DC Supply Voltage		−0.5 to +4.3	V
V_{IN}	DC Input Voltage		−0.5 to +4.3	V
V_{OUT}	DC Output Voltage	Active−Mode (High or Low State) Tri−State Mode (Note 1) Power−Down Mode (V_{CC} = 0 V)	−0.5 to V_{CC} + 0.5 −0.5 to +4.3 −0.5 to +4.3	V

Table 1. RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter		Min	Max	Unit
V_{CC}	Positive DC Supply Voltage		0.9	3.6	V
V_{IN}	Digital Input Voltage		0	3.6	V
V_{OUT}	Output Voltage	Active Mode (High or Low State) Tri−State Mode (Note 1) Power Down Mode (V_{CC} = 0 V)	0 0 0	V_{CC} 3.6 3.6	V
T_A	Operating Free−Air Temperature		−55	+125	°C
t_r, t_f	Input Transition Rise or Fall Rate	V_{CC} = 3.3 V ± 0.3 V	0	10	nS/V

DC Input Characteristics for NL17SGxx except for NL17SG14, NL17SG17 and NL17SGU04

Existing Datasheet

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V_{CC} (V)	T_A = 25°C Min	T_A = 25°C Max	T_A = −55°C to +125°C Min	T_A = −55°C to +125°C Max	Unit
V_{IH}	High−Level Input Voltage		0.9	V_{CC}		V_{CC}		V
			1.1 to 1.3	0.7xV_{CC}		0.7xV_{CC}		
			1.4 to 1.6	0.65xV_{CC}		0.65xV_{CC}		
			1.65 to 1.95	0.65xV_{CC}		0.65xV_{CC}		
			2.3 to 2.7	1.7		1.7		
			3.0 to 3.6	2.0		2.0		
V_{IL}	Low−Level Input Voltage		0.9		GND		GND	V
			1.1 to 1.3		0.3xV_{CC}		0.3xV_{CC}	
			1.4 to 1.6		0.35xV_{CC}		0.35xV_{CC}	
			1.65 to 1.95		0.35xV_{CC}		0.35xV_{CC}	
			2.3 to 2.7		0.7		0.7	
			3.0 to 3.6		0.8		0.8	

New

Table 2. DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V_{CC} (V)	T_A = 25°C Min	T_A = 25°C Typ	T_A = 25°C Max	T_A = −55°C to +125°C Min	T_A = −55°C to +125°C Max	Unit
V_{IH}	High−Level Input Voltage		0.9	–	V_{CC}	–	–	–	V
			1.1 to 1.3	0.7 × V_{CC}	–	–	0.7 × V_{CC}	–	
			1.4 to 1.6	0.65 × V_{CC}	–	–	0.65 × V_{CC}	–	
			1.65 to 1.95	0.65 × V_{CC}	–	–	0.65 × V_{CC}	–	
			2.3 to 2.7	1.7	–	–	1.7	–	
			3.0 to 3.6	2.0	–	–	2.0	–	
V_{IL}	Low−Level Input Voltage		0.9	–	GND	–	–	–	V
			1.1 to 1.3	–	–	0.3 × V_{CC}	–	0.3 × V_{CC}	
			1.4 to 1.6	–	–	0.35 × V_{CC}	–	0.35 × V_{CC}	
			1.65 to 1.95	–	–	0.35 × V_{CC}	–	0.35 × V_{CC}	
			2.3 to 2.7	–	–	0.7	–	0.7	
			3.0 to 3.6	–	–	0.8	–	0.8	

3 V MiniGate Logic Datasheet Changes

DC Input Characteristics for NL17SGxx except for NL17SG14 and NL17SG17

Existing Datasheet

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	Typ	Max	−55°C ≤ T_A ≤ 125°C Min	Max	Unit
V_{T+}	Positive−Going Input Threshold Voltage		0.9	0.64	0.7	0.86	0.62	0.87	V
			1.1	0.73	0.81	0.95	0.71	1	
			1.4	0.86	0.94	1.16	0.84	1.2	
			1.65	0.95	1.06	1.25	0.94	1.3	
			2.3	1.22	1.36	1.6	1.18	1.65	
			3.0	1.51	1.8	2.05	1.38	2.1	
V_{T-}	Negative−Going Input Threshold Voltage		0.9	0.09	0.23	0.30	0.08	0.33	V
			1.1	0.15	0.33	0.39	0.12	0.43	
			1.4	0.3	0.47	0.54	0.25	0.55	
			1.65	0.35	0.6	0.65	0.3	0.65	
			2.3	0.55	0.85	0.88	0.5	0.88	
			3.0	0.95	1.13	1.16	0.9	1.16	
V_H	Hysteresis Voltage		0.9	0.15	0.5	0.75	0.2	0.8	V
			1.1	0.15	0.5	0.75	0.2	0.8	
			1.4	0.15	0.5	0.75	0.2	0.8	
			1.65	0.15	0.5	0.75	0.2	0.8	
			2.3	0.15	0.5	0.75	0.2	0.8	
			3.0	0.25	0.65	0.85	0.3	0.9	

New

Table 3. DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V_{CC} (V)	T_A = 25°C Min	Typ	Max	T_A = −55°C to +125°C Min	Max	Unit
V_{T+}	Positive Going Input Threshold Voltage		0.9	–	0.7	–	–	–	V
			1.1	–	0.81	0.95	–	0.95	
			1.4	–	0.94	1.16	–	1.16	
			1.65	–	1.06	1.3	–	1.3	
			2.3	–	1.36	1.73	–	1.73	
			3.0	–	1.8	2.24	–	2.24	
V_{T-}	Negative Going Input Threshold Voltage		0.9	–	0.23	–	–	–	V
			1.1	0.15	0.33	–	0.15	–	
			1.4	0.3	0.47	–	0.3	–	
			1.65	0.35	0.6	–	0.35	–	
			2.3	0.55	0.85	–	0.55	–	
			3.0	0.95	1.13	–	0.95	–	
V_H	Hysteresis Voltage		0.9	–	0.27	–	–	–	V
			1.1	0.2	0.35	0.8	0.2	0.8	
			1.4	0.25	0.41	0.86	0.25	0.86	
			1.65	0.30	0.46	0.9	0.30	0.9	
			2.3	0.40	0.56	1.05	0.40	1.05	
			3.0	0.49	0.59	1.1	0.49	1.1	

DC Input Characteristics for NL17SGU04-Q - **TBD**

DC Output Characteristics for NL17SGxx

Existing Datasheet

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition		V_{CC} (V)	T_A = 25°C Min	Typ	Max	−55°C ≤ T_A ≤ 125°C Min	Max	Unit
V_{OH}	High−Level Output Voltage	V_{IN} = V_{IH} or V_{IL}	I_{OH} = −20 μA	0.9	0.75			0.75		V
			I_{OH} = −0.3 mA	1.1 to 1.3	0.75 x V_{CC}			0.75 x V_{CC}		
			I_{OH} = −1.7 mA	1.4 to 1.6	0.75 x V_{CC}			0.75 x V_{CC}		
			I_{OH} = −3.0 mA	1.65 to 1.95	V_{CC} − 0.45			V_{CC} − 0.45		
			I_{OH} = −4.0 mA	2.3 to 2.7	2.0			2.0		
			I_{OH} = −8.0 mA	3.0 to 3.6	2.48			2.48		
V_{OL}	Low−Level Output Voltage	V_{IN} = V_{IH} or V_{IL}	I_{OL} = 20 μA	0.9			0.1		0.1	V
			I_{OL} = 0.3 mA	1.1 to 1.3			0.25 x V_{CC}		0.25 x V_{CC}	
			I_{OL} = 1.7 mA	1.4 to 1.6			0.25xV cc		0.25 x V_{CC}	
			I_{OL} = 3.0 mA	1.65 to 1.95			0.45		0.45	
			I_{OL} = 4.0 mA	2.3 to 2.7			0.4		0.4	
			I_{OL} = 8.0 mA	3.0 to 3.6			0.4		0.4	

New

Table 3. DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V_{CC} (V)	T_A = 25°C Min	Typ	Max	T_A = −55°C to +125°C Min	Max	Unit
V_{OH}	High−Level Output Voltage	V_{IN} = V_{IH} or V_{IL}							V
		I_{OH} = −20 μA	0.9	–	0.75	–	–	–	
		I_{OH} = −0.3 mA	1.1 o 1.3	0.75 x V_{CC}	–	–	0.75 x V_{CC}	–	
		I_{OH} = −1.7 mA	1.4 to 1.6	0.75 x V_{CC}	–	–	0.75 x V_{CC}	–	
		I_{OH} = −3.0 mA	1.65 to 1.95	V_{CC} − 0.45	–	–	V_{CC} − 0.45	–	
		I_{OH} = −4.0 mA	2.3 to 2.7	2.0	–	–	2.0	–	
		I_{OH} = −8.0 mA	3.0 to 3.6	2.48	–	–	2.48	–	
V_{OL}	Low−Level Output Voltage	V_{IN} = V_{IH} or V_{IL}							V
		I_{OL} = 20 μA	0.9	–	0.1	–	–	–	
		I_{OL} = 0.3 mA	1.1 o 1.3	–	–	0.25 x V_{CC}	–	0.25 x V_{CC}	
		I_{OL} = 1.7 mA	1.4 to 1.6	–	–	0.25 x V_{CC}	–	0.25 x V_{CC}	
		I_{OL} = 3.0 mA	1.65 to 1.95	–	–	0.45	–	0.45	
		I_{OL} = 4.0 mA	2.3 to 2.7	–	–	0.4	–	0.4	
		I_{OL} = 8.0 mA	2.7 to 3.6	–	–	0.4	–	0.4	

AC Characteristics for NL17SGxx except for NL17SG125 and NL17SG126

3 V MiniGate Logic Datasheet Changes

Existing Datasheet

AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3.0$ ns)

Symbol	Parameter	Test Condition	V_{CC} (V)	T_A = 25 °C Min	T_A = 25 °C Typ	T_A = 25 °C Max	T_A = −55°C to +125°C Min	T_A = −55°C to +125°C Max	Unit
t_{PLH}, t_{PHL}	Propagation Delay, A or Y	C_L = 10 pF, R_L = 1 MΩ	0.9	–	27.3	–	–	–	ns
			1.1 to 1.3	–	13.0	22.6	1.0	35.9	
			1.4 to 1.6	–	7.5	10.5	1.0	11.3	
			1.65 to 1.95	–	6.0	7.8	1.0	8.2	
			2.3 to 2.7	–	4.3	5.4	1.0	5.8	
			3.0 to 3.6	–	3.5	4.4	1.0	4.6	
		C_L = 15 pF, R_L = 1 MΩ	0.9	–	29.5	–	–	–	ns
			1.1 to 1.3	–	14.3	25.1	1.0	41.6	
			1.4 to 1.6	–	8.0	11.5	1.0	12.6	
			1.65 to 1.95	–	6.3	8.4	1.0	8.7	
			2.3 to 2.7	–	4.6	5.7	1.0	6.1	
			3.0 to 3.6	–	3.7	4.6	1.0	5.0	
		C_L = 30 pF, R_L = 1 MΩ	0.9	–	40.5	–	–	–	ns
			1.1 to 1.3	–	19.6	35.7	1.0	58.1	
			1.4 to 1.6	–	10.7	15.8	1.0	17.6	
			1.65 to 1.95	–	7.8	10.7	1.0	11.7	
			2.3 to 2.7	–	5.4	6.9	1.0	8.1	
			3.0 to 3.6	–	4.3	5.2	1.0	6.1	

New

Table 4. AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Condition	V_{CC} (V)	T_A = 25°C Min	T_A = 25°C Typ	T_A = 25°C Max	T_A = −55°C to +125°C Min	T_A = −55°C to +125°C Max	Unit
t_{PLH}, t_{PHL}	Propagation Delay, A to Y (Figures 2 and 3)	C_L = 10 pF, R_L = 1 MΩ	0.9	–	TBD	–	–	–	ns
			1.1 to 1.3	–	TBD	TBD	–	TBD	
			1.4 to 1.6	–	TBD	10.5	–	11.3	
			1.65 to 1.95	–	TBD	7.8	–	8.2	
			2.3 to 2.7	–	TBD	5.4	–	5.8	
			3.0 to 3.6	–	TBD	4.4	–	4.6	
		C_L = 15 pF, R_L = 1 MΩ	0.9	–	TBD	–	–	–	ns
			1.1 to 1.3	–	TBD	TBD	–	TBD	
			1.4 to 1.6	–	TBD	11.5	–	12.6	
			1.65 to 1.95	–	TBD	8.4	–	8.7	
			2.3 to 2.7	–	TBD	5.7	–	6.1	
			3.0 to 3.6	–	TBD	4.6	–	5.0	
		C_L = 30 pF, R_L = 1 MΩ	0.9	–	TBD	–	–	–	ns
			1.1 to 1.3	–	TBD	TBD	–	TBD	
			1.4 to 1.6	–	TBD	15.8	–	17.6	
			1.65 to 1.95	–	TBD	10.7	–	11.7	
			2.3 to 2.7	–	TBD	6.9	–	8.1	
			3.0 to 3.6	–	TBD	5.2	–	6.1	

AC Characteristics for NL17SG125 and NL17SG126

Existing Datasheet

AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3.0$ ns)

Symbol	Parameter	Test Condition	V_{CC} (V)	T_A = 25 °C Min	T_A = 25 °C Typ	T_A = 25 °C Max	T_A = −55°C to +125°C Min	T_A = −55°C to +125°C Max	Unit
t_{PHZ}, t_{PLZ}	Output Disable Time, OE to Y	C_L = 10 pF; R_L = 100 kΩ	0.9	-	100.4	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	9.1	14.4	-	22.4	
		R_L = 5 kΩ	1.4 to 1.6	-	7.1	9.1	-	10.4	
		R_L = 5 kΩ	1.65 to 1.95	-	6.5	8.3	-	9	
		R_L = 5 kΩ	2.3 to 2.7	-	5.8	7.3	-	8.8	
		R_L = 5 kΩ	3.0 to 3.6	-	5.4	6.9	-	7.6	
		C_L = 15 pF; R_L = 100 kΩ	0.9	-	122.2	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	9.8	15.3	-	25.1	
		R_L = 5 kΩ	1.4 to 1.6	-	7.8	9.8	-	11.3	
		R_L = 5 kΩ	1.65 to 1.95	-	7.2	9.2	-	10.6	
		R_L = 5 kΩ	2.3 to 2.7	-	7	8.2	-	10.3	
		R_L = 5 kΩ	3.0 to 3.6	-	6.6	7.7	-	9.5	
		C_L = 30 pF; R_L = 100 kΩ	0.9	-	217.1	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	13.2	19.6	-	31.9	
		R_L = 5 kΩ	1.4 to 1.6	-	12.2	13.5	-	14.9	
		R_L = 5 kΩ	1.65 to 1.95	-	11.4	12.7	-	13.9	
		R_L = 5 kΩ	2.3 to 2.7	-	11.3	12.2	-	13.5	
		R_L = 5 kΩ	3.0 to 3.6	-	10.2	11.5	-	12.9	

New

AC ELECTRICAL CHARACTERISTICS (Input $t_r = t_f = 3.0$ ns)

Symbol	Parameter	Test Condition	V_{CC} (V)	T_A = 25 °C Min	T_A = 25 °C Typ	T_A = 25 °C Max	T_A = −55°C to +125°C Min	T_A = −55°C to +125°C Max	Unit
t_{PHZ}, t_{PLZ}	Output Disable Time, OE to Y	C_L = 10 pF; R_L = 100 kΩ	0.9	-	TBD	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	TBD	TBD	-	TBD	
		R_L = 5 kΩ	1.4 to 1.6	-	TBD	9.1	-	10.4	
		R_L = 5 kΩ	1.65 to 1.95	-	TBD	8.3	-	9	
		R_L = 5 kΩ	2.3 to 2.7	-	TBD	7.3	-	8.8	
		R_L = 5 kΩ	3.0 to 3.6	-	TBD	6.9	-	-	
		C_L = 15 pF; R_L = 100 kΩ	0.9	-	TBD	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	TBD	TBD	-	TBD	
		R_L = 5 kΩ	1.4 to 1.6	-	TBD	9.8	-	11.3	
		R_L = 5 kΩ	1.65 to 1.95	-	TBD	9.2	-	10.6	
		R_L = 5 kΩ	2.3 to 2.7	-	TBD	8.2	-	10.3	
		R_L = 5 kΩ	3.0 to 3.6	-	TBD	7.7	-	-	
		C_L = 30 pF; R_L = 100 kΩ	0.9	-	TBD	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	TBD	TBD	-	TBD	
		R_L = 5 kΩ	1.4 to 1.6	-	TBD	13.5	-	14.9	
		R_L = 5 kΩ	1.65 to 1.95	-	TBD	12.7	-	13.9	
		R_L = 5 kΩ	2.3 to 2.7	-	TBD	12.2	-	13.5	
		R_L = 5 kΩ	3.0 to 3.6	-	TBD	11.5	-	12.9	

3 V MiniGate Logic Datasheet Changes

t_{PZH}, t_{PZL}	Output Enable Time, OE to Y	C_L = 10 pF; R_L = 100 kΩ	0.9	-	11.0	13.3	-	15.8	ns
		R_L = 5 kΩ	1.1 to 1.3	-	8.4	10.9	-	13.0	
		R_L = 5 kΩ	1.4 to 1.6	-	5.3	7.8	-	8.3	
		R_L = 5 kΩ	1.65 to 1.95	-	3.9	5.5	-	5.9	
		R_L = 5 kΩ	2.3 to 2.7	-	2.5	3.5	-	3.8	
		R_L = 5 kΩ	3.0 to 3.6	-	2.1	2.7	-	3	
		C_L = 15 pF; R_L = 100 kΩ	0.9	-	12.0	14.8	-	17.0	ns
		R_L = 5 kΩ	1.1 to 1.3	-	9.0	11.7	-	13.8	
		R_L = 5 kΩ	1.4 to 1.6	-	5.9	8.9	-	11	
		R_L = 5 kΩ	1.65 to 1.95	-	4.4	6.3	-	6.5	
		R_L = 5 kΩ	2.3 to 2.7	-	2.9	3.9	-	4.2	
		R_L = 5 kΩ	3.0 to 3.6	-	2.3	3	-	3.3	
		C_L = 30 pF; R_L = 100 kΩ	0.9	-	13.0	15.2	-	18.3	ns
		R_L = 5 kΩ	1.1 to 1.3	-	10.0	13.1	-	15.2	
		R_L = 5 kΩ	1.4 to 1.6	-	8.3	12.2	-	13.7	
		R_L = 5 kΩ	1.65 to 1.95	-	6.1	8.6	-	9.7	
		R_L = 5 kΩ	2.3 to 2.7	-	3.8	5	-	5.5	
		R_L = 5 kΩ	3.0 to 3.6	-	2.9	3.8	-	4.2	
t_{PHZ}, t_{PLZ}	Output Disable Time, OE to Y	C_L = 10 pF; R_L = 100 kΩ	0.9	-	100.4	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	9.1	14.4	-	22.4	
		R_L = 5 kΩ	1.4 to 1.6	-	7.1	9.1	-	10.4	
		R_L = 5 kΩ	1.65 to 1.95	-	6.5	8.3	-	9	
		R_L = 5 kΩ	2.3 to 2.7	-	5.8	7.3	-	8.8	
		R_L = 5 kΩ	3.0 to 3.6	-	5.4	6.9	-	7.6	
		C_L = 15 pF; R_L = 100 kΩ	0.9	-	122.2	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	9.8	15.3	-	25.1	
		R_L = 5 kΩ	1.4 to 1.6	-	7.8	9.8	-	11.3	
		R_L = 5 kΩ	1.65 to 1.95	-	7.2	9.2	-	10.6	
		R_L = 5 kΩ	2.3 to 2.7	-	7	8.2	-	10.3	
		R_L = 5 kΩ	3.0 to 3.6	-	6.6	7.7	-	9.5	
		C_L = 30 pF; R_L = 100 kΩ	0.9	-	217.1	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	13.2	19.6	-	31.9	
		R_L = 5 kΩ	1.4 to 1.6	-	12.2	13.5	-	14.9	
		R_L = 5 kΩ	1.65 to 1.95	-	11.4	12.7	-	13.9	
		R_L = 5 kΩ	2.3 to 2.7	-	11.3	12.2	-	13.5	
		R_L = 5 kΩ	3.0 to 3.6	-	10.2	11.5	-	12.9	

t_{PZH}, t_{PZL}	Output Enable Time, OE to Y	C_L = 10 pF; R_L = 100 kΩ	0.9	-	TBD	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	TBD	TBD	-	TBD	
		R_L = 5 kΩ	1.4 to 1.6	-	TBD	7.8	-	8.3	
		R_L = 5 kΩ	1.65 to 1.95	-	TBD	5.5	-	5.9	
		R_L = 5 kΩ	2.3 to 2.7	-	TBD	3.5	-	3.8	
		R_L = 5 kΩ	3.0 to 3.6	-	TBD	2.7	-	-	
		C_L = 15 pF; R_L = 100 kΩ	0.9	-	TBD	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	TBD	TBD	-	TBD	
		R_L = 5 kΩ	1.4 to 1.6	-	TBD	8.9	-	11	
		R_L = 5 kΩ	1.65 to 1.95	-	TBD	6.3	-	6.5	
		R_L = 5 kΩ	2.3 to 2.7	-	TBD	3.9	-	4.2	
		R_L = 5 kΩ	3.0 to 3.6	-	TBD	3	-	-	
		C_L = 30 pF; R_L = 100 kΩ	0.9	-	TBD	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	TBD	TBD	-	TBD	
		R_L = 5 kΩ	1.4 to 1.6	-	TBD	12.2	-	13.7	
		R_L = 5 kΩ	1.65 to 1.95	-	TBD	8.6	-	9.7	
		R_L = 5 kΩ	2.3 to 2.7	-	TBD	5	-	5.5	
		R_L = 5 kΩ	3.0 to 3.6	-	TBD	3.8	-	4.2	
t_{PHZ}, t_{PLZ}	Output Disable Time, OE to Y	C_L = 10 pF; R_L = 100 kΩ	0.9	-	TBD	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	TBD	TBD	-	TBD	
		R_L = 5 kΩ	1.4 to 1.6	-	TBD	9.1	-	10.4	
		R_L = 5 kΩ	1.65 to 1.95	-	TBD	8.3	-	9	
		R_L = 5 kΩ	2.3 to 2.7	-	TBD	7.3	-	8.8	
		R_L = 5 kΩ	3.0 to 3.6	-	TBD	6.9	-	-	
		C_L = 15 pF; R_L = 100 kΩ	0.9	-	TBD	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	TBD	TBD	-	TBD	
		R_L = 5 kΩ	1.4 to 1.6	-	TBD	9.8	-	11.3	
		R_L = 5 kΩ	1.65 to 1.95	-	TBD	9.2	-	10.6	
		R_L = 5 kΩ	2.3 to 2.7	-	TBD	8.2	-	10.3	
		R_L = 5 kΩ	3.0 to 3.6	-	TBD	7.7	-	-	
		C_L = 30 pF; R_L = 100 kΩ	0.9	-	TBD	-	-	-	ns
		R_L = 5 kΩ	1.1 to 1.3	-	TBD	TBD	-	TBD	
		R_L = 5 kΩ	1.4 to 1.6	-	TBD	13.5	-	14.9	
		R_L = 5 kΩ	1.65 to 1.95	-	TBD	12.7	-	13.9	
		R_L = 5 kΩ	2.3 to 2.7	-	TBD	12.2	-	13.5	
		R_L = 5 kΩ	3.0 to 3.6	-	TBD	11.5	-	12.9	

NC7SPxx, NC7WPxx, NC7NPxx Family

Absolute Maximum Ratings

Existing Datasheet

Absolute Maximum Ratings (Note 1)

Supply Voltage (V_{CC})	−0.5V to +4.6V
DC Input Voltage (V_{IN})	−0.5V to +4.6V
DC Output Voltage (V_{OUT})	
HIGH or LOW State (Note 2)	−0.5V to V_{CC} +0.5V
V_{CC} = 0V	−0.5V to 4.6V

New

Maximum Ratings

Symbol	Parameter		Value	Unit
V_{CC}	DC Supply Voltage		-0.5 to +4.3	V
V_{IN}	DC Input Voltage		-0.5 to +4.3	V
V_{OUT}	DC Output Voltage	Active-Mode (High or Low State)	-0.5 to V_{CC} + 0.5	V
		Tri-State Mode (Note 1)	-0.5 to +4.3	
		Power-Down Mode (V_{CC} = 0 V)	-0.5 to +4.3	

3 V MiniGate Logic Datasheet Changes

DC Input Characteristics for NC7SPxx, NC7WPxx, NC7NPxx except for NC7SP14, NC7SP17, NC7WP14, NC7NP14, NC7SP57, NC7SP58 and NC7SPU04

Existing Datasheet

DC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	T_A = +25°C Min	T_A = +25°C Max	T_A = −40°C to +85°C Min	T_A = −40°C to +85°C Max	Units	Conditions
V_{IH}	HIGH Level Input Voltage	0.90	0.65 x V_{CC}		0.65 x V_{CC}		V	
		1.10 ≤ V_{CC} ≤ 1.30	0.65 x V_{CC}		0.65 x V_{CC}			
		1.40 ≤ V_{CC} ≤ 1.60	0.65 x V_{CC}		0.65 x V_{CC}			
		1.65 ≤ V_{CC} ≤ 1.95	0.65 x V_{CC}		0.65 x V_{CC}			
		2.30 ≤ V_{CC} ≤ 2.70	1.6		1.6			
		3.00 ≤ V_{CC} ≤ 3.60	2.1		2.1			
V_{IL}	LOW Level Input Voltage	0.90		0.35 x V_{CC}		0.35 x V_{CC}	V	
		1.10 ≤ V_{CC} ≤ 1.30		0.35 x V_{CC}		0.35 x V_{CC}		
		1.40 ≤ V_{CC} ≤ 1.60		0.35 x V_{CC}		0.35 x V_{CC}		
		1.65 ≤ V_{CC} ≤ 1.95		0.35 x V_{CC}		0.35 x V_{CC}		
		2.30 ≤ V_{CC} ≤ 2.70		0.7		0.7		
		3.00 ≤ V_{CC} ≤ 3.60		0.9		0.9		

New

DC Electrical Characteristics

Symbol	Parameter	Conditions	V_{CC} (V)	T_A = 25 °C Min	T_A = 25 °C Typ	T_A = 25 °C Max	T_A = -40°C to +85°C Min	T_A = -40°C to +85°C Max	Unit
V_{IH}	High-Level Input Voltage		0.9	-	0.5	-	-	-	V
			1.1 to 1.3	0.65 x Vcc	-	-	0.65 x Vcc	-	
			1.4 to 1.6	0.65 x Vcc	-	-	0.65 x Vcc	-	
			1.65 to 1.95	0.65 x Vcc	-	-	0.65 x Vcc	-	
			2.3 to 2.7	1.6	-	-	1.6	-	
			3.0 to 3.6	2.1	-	-	2.1	-	
V_{IL}	Low-Level Input Voltage		0.9	-	0.5	-	-	-	V
			1.1 to 1.3	-	-	0.35 x Vcc	-	0.35 x Vcc	
			1.4 to 1.6	-	-	0.35 x Vcc	-	0.35 x Vcc	
			1.65 to 1.95	-	-	0.35 x Vcc	-	0.35 x Vcc	
			2.3 to 2.7	-	-	0.7	-	0.7	
			3.0 to 3.6	-	-	0.9	-	0.9	

DC Input Characteristics for NC7SP14, NC7SP17, NC7WP14, NC7NP14, NC7SP57 and NC7SP58

Existing Datasheet

DC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	Conditions	T_A = +25°C Min.	T_A = +25°C Max.	T_A = −40°C to +85°C Min.	T_A = −40°C to +85°C Max.	Units
V_P	Positive Threshold Voltage	0.90		0.3	0.6	0.3	0.6	V
		1.10		0.4	1.0	0.4	1.0	
		1.40		0.5	1.2	0.5	1.2	
		1.65		0.7	1.5	0.7	1.5	
		2.30		1.0	1.9	1.0	1.9	
		3.00		1.5	2.6	1.5	2.6	
V_N	Negative Threshold Voltage	0.90		0.1	0.6	0.1	0.6	V
		1.10		0.15	0.7	0.15	0.7	
		1.40		0.2	0.8	0.2	0.8	
		1.65		0.25	0.9	0.25	0.9	
		2.30		0.4	1.15	0.4	1.15	
		3.00		0.6	1.5	0.6	1.5	
V_H	Hysteresis Voltage	0.90		0.07	0.5	0.07	0.5	V
		1.10		0.08	0.6	0.08	0.6	
		1.40		0.09	0.8	0.09	0.8	
		1.65		0.10	1.0	0.10	1.0	
		2.30		0.25	1.1	0.25	1.1	
		3.00		0.60	1.8	0.60	1.8	

New

DC Electrical Characteristics

Symbol	Parameter	Conditions	V_{CC} (V)	T_A = 25 °C Min	T_A = 25 °C Typ	T_A = 25 °C Max	T_A = -40°C to +85°C Min	T_A = -40°C to +85°C Max	Unit
V_P	Positive Threshold Voltage		0.9	-	TBD	-	-	-	V
			1.1	-	-	TBD	-	TBD	
			1.4	-	-	1.2	-	1.2	
			1.65	-	-	1.5	-	1.5	
			2.3	-	-	1.9	-	1.9	
			3.0	-	-	2.6	-	2.6	
V_N	Negative Threshold Voltage		0.9	-	TBD	-	-	-	V
			1.1	TBD	-	-	TBD	-	
			1.4	0.2	-	-	0.2	-	
			1.65	0.25	-	-	0.25	-	
			2.3	0.4	-	-	0.4	-	
			3.0	0.6	-	-	0.6	-	
V_H	Hysteresis Voltage		0.9	-	TBD	-	-	-	V
			1.1	TBD	-	TBD	TBD	TBD	
			1.4	0.09	-	0.8	0.09	0.8	
			1.65	0.1	-	1.0	0.1	1.0	
			2.3	0.25	-	1.1	0.25	1.1	
			3.0	0.6	-	1.8	0.6	1.8	

DC Input Characteristics for NC7SPU04 – TBD

DC Output Characteristics for NC7SPxx, NC7WPxx and NC7NPxx

DC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	T_A = +25°C Min	T_A = +25°C Max	T_A = −40°C to +85°C Min	T_A = −40°C to +85°C Max	Units	Conditions
V_{OH}	HIGH Level Output Voltage	0.90	V_{CC} - 0.1		V_{CC} - 0.1		V	
		1.10 ≤ V_{CC} ≤ 1.30	V_{CC} - 0.1		V_{CC} - 0.1			I_{OH} = -20 µA
		1.40 ≤ V_{CC} ≤ 1.60	V_{CC} - 0.1		V_{CC} - 0.1			
		1.65 ≤ V_{CC} ≤ 1.95	V_{CC} - 0.1		V_{CC} - 0.1			
		2.30 ≤ V_{CC} ≤ 2.70	V_{CC} - 0.1		V_{CC} - 0.1			
		3.00 ≤ V_{CC} ≤ 3.60	V_{CC} - 0.1		V_{CC} - 0.1			
		1.10 ≤ V_{CC} ≤ 1.30	0.75 x V_{CC}		0.70 x V_{CC}			I_{OH} = -0.5 mA
		1.40 ≤ V_{CC} ≤ 1.60	1.07		0.99			I_{OH} = -1.0 mA
		1.65 ≤ V_{CC} ≤ 1.95	1.24		1.22			I_{OH} = -1.5 mA
		2.30 ≤ V_{CC} ≤ 2.70	1.95		1.87			I_{OH} = -2.1 mA
		3.00 ≤ V_{CC} ≤ 3.60	2.61		2.55			I_{OH} = -2.6 mA
V_{OL}	LOW Level Output Voltage	0.90		0.1		0.1		
		1.10 ≤ V_{CC} ≤ 1.30		0.1		0.1		I_{OL} = 20 µA
		1.40 ≤ V_{CC} ≤ 1.60		0.1		0.1		
		1.65 ≤ V_{CC} ≤ 1.95		0.1		0.1		
		2.30 ≤ V_{CC} ≤ 2.70		0.1		0.1		
		3.00 ≤ V_{CC} ≤ 3.60		0.1		0.1		
		1.10 ≤ V_{CC} ≤ 1.30		0.30 x V_{CC}		0.30 x V_{CC}		I_{OL} = 0.5 mA
		1.40 ≤ V_{CC} ≤ 1.60		0.31		0.37		I_{OL} = 1.0 mA
		1.65 ≤ V_{CC} ≤ 1.95		0.31		0.35		I_{OL} = 1.5 mA
		2.30 ≤ V_{CC} ≤ 2.70		0.31		0.33		I_{OL} = 2.1 mA
		3.00 ≤ V_{CC} ≤ 3.60		0.31		0.33		I_{OL} = 2.6 mA

DC Electrical Characteristics

Symbol	Parameter	Conditions	V_{CC} (V)	T_A = 25 °C Min	T_A = 25 °C Typ	T_A = 25 °C Max	T_A = -40°C to +85°C Min	T_A = -40°C to +85°C Max	Unit
V_{OH}	High-Level Output Voltage	V_{IN} = V_{IH} or V_{IL}							V
		I_{OH} = -20 µA	0.9	-	Vcc – 0.1	-	-	-	
			1.1 to 1.3	Vcc – 0.1	-	-	Vcc – 0.1	-	
			1.4 to 1.6	Vcc – 0.1	-	-	Vcc – 0.1	-	
			1.65 to 1.95	Vcc – 0.1	-	-	Vcc – 0.1	-	
			2.3 to 2.7	Vcc – 0.1	-	-	Vcc – 0.1	-	
			3.0 to 3.6	Vcc – 0.1	-	-	Vcc – 0.1	-	
		I_{OH} = -0.5 mA	1.1 o 1.3	0.75 x Vcc	-	-	0.70 x Vcc	-	
		I_{OH} = -1 mA	1.4 to 1.6	1.07	-	-	0.99	-	
		I_{OH} = -1.5 mA	1.65 to 1.95	1.24	-	-	1.22	-	
		I_{OH} = -2.1 mA	2.3 to 2.7	1.95	-	-	1.87	-	
		I_{OH} = -2.6 mA	3.0 to 3.6	2.61	-	-	2.55	-	
V_{OL}	Low-Level Output Voltage	V_{IN} = V_{IH} or V_{IL}							V
		I_{OL} = 20 µA	0.9	-	0.1	-	-	-	
			1.1 to 1.3	-	-	0.1	-	0.1	
			1.4 to 1.6	-	-	0.1	-	0.1	
			1.65 to 1.95	-	-	0.1	-	0.1	
			2.3 to 2.7	-	-	0.1	-	0.1	
			3.0 to 3.6	-	-	0.1	-	0.1	
		I_{OL} = 0.5 mA	1.1 o 1.3	-	-	0.3 x Vcc	-	0.3 x Vcc	
		I_{OL} = 1 mA	1.4 to 1.6	-	-	0.31	-	0.37	
		I_{OL} = 1.5 mA	1.65 to 1.95	-	-	0.31	-	0.35	
		I_{OL} = 2.1 mA	2.3 to 2.7	-	-	0.31	-	0.33	

AC Characteristics for NC7SPxx, NC7WPxx and NC7NPxx except for NC7SP125, NC7SP126, NC7WP125 and NC7SP74

3 V MiniGate Logic Datasheet Changes

Existing Datasheet

AC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	Conditions	T_A = +25°C Min.	T_A = +25°C Typ.	T_A = +25°C Max.	T_A = −40°C to +85°C Min.	T_A = −40°C to +85°C Max.	Units	Figure Number
t_{PHL}, t_{PLH}	Propagation Delay	0.90	C_L = 10pF, R_L = 1MΩ		66.0				ns	Figure 1 Figure 2
		1.10 ≤ V_{CC} ≤ 1.30		3.5	24.0	34.5	3.0	41.6		
		1.40 ≤ V_{CC} ≤ 1.60		2.5	7.0	14.8	2.0	15.0		
		1.65 ≤ V_{CC} ≤ 1.95		2.0	6.0	12.0	1.5	12.2		
		2.30 ≤ V_{CC} < 2.70		1.5	5.0	9.4	1.0	9.9		
		3.00 ≤ V_{CC} ≤ 3.60		1.0	4.0	8.3	1.0	9.0		
		0.90	C_L = 15pF, R_L = 1MΩ		71.0				ns	Figure 1 Figure 2
		1.10 ≤ V_{CC} ≤ 1.30		4.0	28.0	37.3	3.5	46.3		
		1.40 ≤ V_{CC} ≤ 1.60		3.0	8.0	15.5	2.5	16.5		
		1.65 ≤ V_{CC} ≤ 1.95		2.5	6.0	12.6	2.0	13.6		
		2.30 ≤ V_{CC} < 2.70		2.0	5.0	9.9	1.5	10.8		
		3.00 ≤ V_{CC} ≤ 3.60		1.5	4.0	8.7	1.0	9.5		
		0.90	C_L = 30pF, R_L = 1MΩ		76.0				ns	Figure 1 Figure 2
		1.10 ≤ V_{CC} ≤ 1.30		5.0	31.0	39.3	4.0	49.7		
		1.40 ≤ V_{CC} ≤ 1.60		4.0	9.0	17.8	3.5	18.2		
		1.65 ≤ V_{CC} ≤ 1.95		3.0	7.0	14.4	2.0	15.9		
		2.30 ≤ V_{CC} < 2.70		2.0	6.0	11.3	1.5	12.8		
		3.00 ≤ V_{CC} ≤ 3.60		1.5	5.0	9.2	1.0	10.7		

New

AC Electrical Characteristics

Symbol	Parameter	Test Condition	V_{CC} (V)	T_A = 25 °C Min	T_A = 25 °C Typ	T_A = 25 °C Max	T_A = -40°C to +85°C Min	T_A = -40°C to +85°C Max	Unit
t_{PLH}, t_{PHL}	Propagation Delay, A to Y (Figures 3 and 4)	R_L = 1 MΩ, C_L = 10 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	TBD	
			1.4 to 1.6	-	TBD	14.8	-	15.0	
			1.65 to 1.95	-	TBD	12.0	-	12.2	
			2.3 to 2.7	-	TBD	9.4	-	9.9	
			3.0 to 3.6	-	TBD	8.3	-	9.0	
t_{PLH}, t_{PHL}	Propagation Delay, A to Y (Figures 3 and 4)	R_L = 1 MΩ, C_L = 15 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	TBD	
			1.4 to 1.6	-	TBD	15.5	-	16.5	
			1.65 to 1.95	-	TBD	12.6	-	13.6	
			2.3 to 2.7	-	TBD	9.9	-	10.8	
			3.0 to 3.6	-	TBD	8.7	-	9.5	
t_{PLH}, t_{PHL}	Propagation Delay, A to Y (Figures 3 and 4)	R_L = 1 MΩ, C_L = 30 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	TBD	
			1.4 to 1.6	-	TBD	17.8	-	18.2	
			1.65 to 1.95	-	TBD	14.4	-	15.9	
			2.3 to 2.7	-	TBD	11.3	-	12.8	
			3.0 to 3.6	-	TBD	9.2	-	10.7	

AC Characteristics for NC7SP125, NC7SP126 and NC7WP125

Existing Datasheet

AC Electrical Characteristics

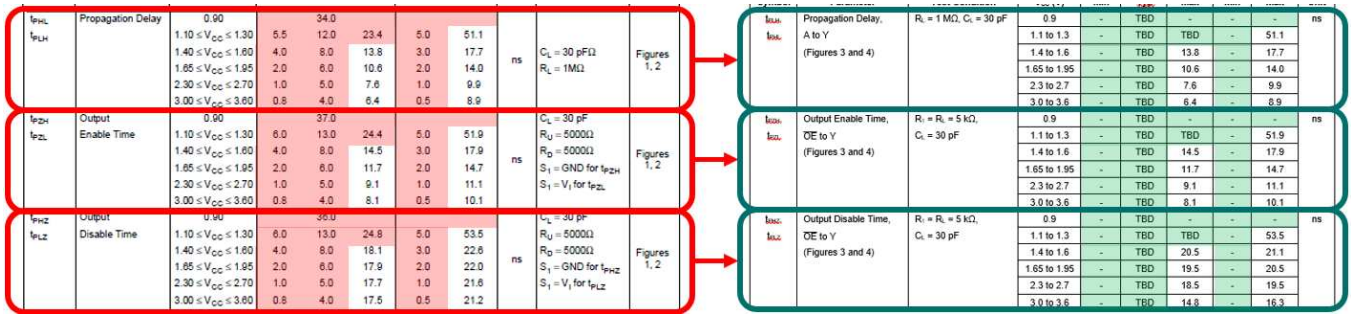
Symbol	Parameter	V_{CC} (V)	T_A = +25°C Min	T_A = +25°C Typ	T_A = +25°C Max	T_A = −40°C to +85°C Min	T_A = −40°C to +85°C Max	Units	Conditions	Figure Number
t_{PHL} t_{PLH}	Propagation Delay	0.90		26.0				ns	C_L = 10 pF R_L = 1 MΩ	
		1.10 ≤ V_{CC} ≤ 1.30	4.0	10.0	19.1	3.5	39.6			
		1.40 ≤ V_{CC} ≤ 1.60	2.0	6.0	11.2	1.5	14.5			
		1.65 ≤ V_{CC} ≤ 1.95	1.5	5.0	8.6	1.0	11.6			
		2.30 ≤ V_{CC} ≤ 2.70	1.0	4.0	6.3	0.8	8.2			
		3.00 ≤ V_{CC} ≤ 3.60	1.0	3.0	5.3	0.5	7.2			
t_{PZH} t_{PZL}	Output Enable Time	0.90		29.0				ns	C_L = 10 pF R_U = 5000Ω R_D = 5000Ω S_1 = GND for t_{PZH} S_1 = V_I for t_{PZL}	
		1.10 ≤ V_{CC} ≤ 1.30	4.0	8.0	17.5	3.5	40.4			
		1.40 ≤ V_{CC} ≤ 1.60	2.0	6.0	11.9	1.5	14.8			
		1.65 ≤ V_{CC} ≤ 1.95	1.5	5.0	9.7	1.0	12.3			
		2.30 ≤ V_{CC} ≤ 2.70	1.0	4.0	7.7	0.8	10.5			
		3.00 ≤ V_{CC} ≤ 3.60	1.0	3.0	6.9	0.5	8.6			
t_{PHZ} t_{PLZ}	Output Disable Time	0.90		28.0				ns	C_L = 10 pF R_U = 5000Ω R_D = 5000Ω S_1 = GND for t_{PHZ} S_1 = V_I for t_{PLZ}	
		1.10 ≤ V_{CC} ≤ 1.30	4.0	8.0	20.5	3.5	42.0			
		1.40 ≤ V_{CC} ≤ 1.60	2.0	6.0	17.6	1.5	18.9			
		1.65 ≤ V_{CC} ≤ 1.95	1.5	5.0	17.4	1.0	18.7			
		2.30 ≤ V_{CC} ≤ 2.70	1.0	4.0	16.4	0.8	17.7			
		3.00 ≤ V_{CC} ≤ 3.60	1.0	3.0	16.2	0.5	17.5			
t_{PHL} t_{PLH}	Propagation Delay	0.90		28.0				ns	C_L = 15 pF R_L = 1 MΩ	Figures 1, 2
		1.10 ≤ V_{CC} ≤ 1.30	5.0	10.0	20.5	4.5	42.5			
		1.40 ≤ V_{CC} ≤ 1.60	3.0	7.0	11.8	2.5	15.4			
		1.65 ≤ V_{CC} ≤ 1.95	2.0	5.0	9.1	2.0	12.2			
		2.30 ≤ V_{CC} ≤ 2.70	1.5	4.0	6.6	1.0	8.6			
		3.00 ≤ V_{CC} ≤ 3.60	1.0	3.0	5.6	0.5	7.5			
t_{PZH} t_{PZL}	Output Enable Time	0.90		31.0				ns	C_L = 15 pF R_U = 5000Ω R_D = 5000Ω S_1 = GND for t_{PZH} S_1 = V_I for t_{PLZ}	Figures 1, 2
		1.10 ≤ V_{CC} ≤ 1.30	5.0	11.0	18.2	4.5	43.3			
		1.40 ≤ V_{CC} ≤ 1.60	3.0	7.0	12.5	2.5	15.5			
		1.65 ≤ V_{CC} ≤ 1.95	2.0	5.0	10.2	2.0	12.9			
		2.30 ≤ V_{CC} ≤ 2.70	1.5	4.0	8.0	1.0	9.9			
		3.00 ≤ V_{CC} ≤ 3.60	1.0	3.0	7.2	0.5	8.9			
t_{PHZ} t_{PLZ}	Output Disable Time	0.90		30.0				ns	C_L = 15 pF R_U = 5000Ω R_D = 5000Ω S_1 = GND for t_{PHZ} S_1 = V_I for t_{PLZ}	Figures 1, 2
		1.10 ≤ V_{CC} ≤ 1.30	5.0	11.0	21.6	4.5	44.9			
		1.40 ≤ V_{CC} ≤ 1.60	3.0	7.0	17.1	2.5	20.0			
		1.65 ≤ V_{CC} ≤ 1.95	2.0	5.0	16.9	2.0	19.9			
		2.30 ≤ V_{CC} ≤ 2.70	1.5	4.0	16.8	1.0	18.1			
		3.00 ≤ V_{CC} ≤ 3.60	1.0	3.0	16.6	0.5	17.8			

New

AC Electrical Characteristics

Symbol	Parameter	Test Condition	V_{CC} (V)	T_A = 25 °C Min	T_A = 25 °C Typ	T_A = 25 °C Max	T_A = -40°C to +85°C Min	T_A = -40°C to +85°C Max	Unit
t_{PLH} t_{PHL}	Propagation Delay, A to Y (Figures 3 and 4)	R_L = 1 MΩ, C_L = 10 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	39.6	
			1.4 to 1.6	-	TBD	11.2	-	14.8	
			1.65 to 1.95	-	TBD	8.6	-	11.6	
			2.3 to 2.7	-	TBD	6.3	-	8.2	
			3.0 to 3.6	-	TBD	5.3	-	7.2	
t_{PZH} t_{PZL}	Output Enable Time, $\overline{OE}$ to Y (Figures 3 and 4)	R_L = R_t = 5 kΩ, C_L = 10 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	40.4	
			1.4 to 1.6	-	TBD	11.9	-	14.8	
			1.65 to 1.95	-	TBD	9.7	-	12.3	
			2.3 to 2.7	-	TBD	7.7	-	10.5	
			3.0 to 3.6	-	TBD	6.9	-	8.6	
t_{PHZ} t_{PLZ}	Output Disable Time, $\overline{OE}$ to Y (Figures 3 and 4)	R_L = R_t = 5 kΩ, C_L = 10 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	42.0	
			1.4 to 1.6	-	TBD	15.3	-	18.0	
			1.65 to 1.95	-	TBD	14.7	-	17.8	
			2.3 to 2.7	-	TBD	13.7	-	15.0	
			3.0 to 3.6	-	TBD	13.5	-	14.8	
t_{PLH} t_{PHL}	Propagation Delay, A to Y (Figures 3 and 4)	R_L = 1 MΩ, C_L = 15 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	42.5	
			1.4 to 1.6	-	TBD	11.8	-	15.4	
			1.65 to 1.95	-	TBD	9.1	-	12.2	
			2.3 to 2.7	-	TBD	6.6	-	8.6	
			3.0 to 3.6	-	TBD	5.6	-	7.5	
t_{PZH} t_{PZL}	Output Enable Time, $\overline{OE}$ to Y (Figures 3 and 4)	R_L = R_t = 5 kΩ, C_L = 15 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	43.3	
			1.4 to 1.6	-	TBD	12.5	-	15.5	
			1.65 to 1.95	-	TBD	10.2	-	12.9	
			2.3 to 2.7	-	TBD	8.0	-	9.9	
			3.0 to 3.6	-	TBD	7.2	-	8.9	
t_{PHZ} t_{PLZ}	Output Disable Time, $\overline{OE}$ to Y (Figures 3 and 4)	R_L = R_t = 5 kΩ, C_L = 15 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	44.9	
			1.4 to 1.6	-	TBD	15.9	-	18.8	
			1.65 to 1.95	-	TBD	15.2	-	18.2	
			2.3 to 2.7	-	TBD	14.1	-	15.4	
			3.0 to 3.6	-	TBD	13.9	-	15.1	

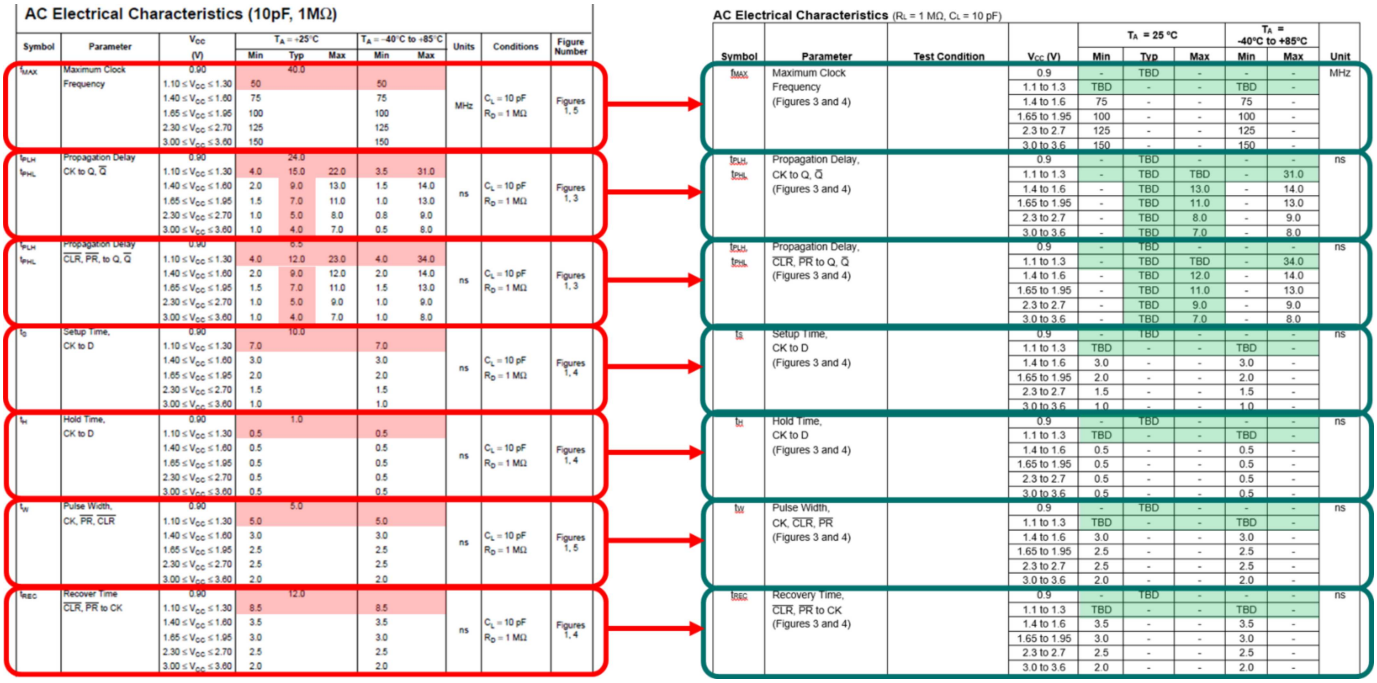
3 V MiniGate Logic Datasheet Changes



t_{PHL} / t_{PLH}	Propagation Delay	0.90		34.0						
		1.10 ≤ V_{CC} ≤ 1.30	5.5	12.0	23.4	5.0	51.1	ns	C_L = 30 pF Ω R_L = 1MΩ	Figures 1, 2
		1.40 ≤ V_{CC} ≤ 1.60	4.0	8.0	13.8	3.0	17.7			
		1.65 ≤ V_{CC} ≤ 1.95	2.0	6.0	10.6	2.0	14.0			
		2.30 ≤ V_{CC} ≤ 2.70	1.0	5.0	7.6	1.0	9.9			
		3.00 ≤ V_{CC} ≤ 3.60	0.8	4.0	6.4	0.5	8.9			
t_{PZH} / t_{PZL}	Output Enable Time	0.90		37.0						
		1.10 ≤ V_{CC} ≤ 1.30	6.0	13.0	24.4	5.0	51.9	ns	C_L = 30 pF R_U = 5000Ω R_D = 5000Ω S_1 = GND for t_{PZH} S_1 = V_I for t_{PZL}	Figures 1, 2
		1.40 ≤ V_{CC} ≤ 1.60	4.0	8.0	14.5	3.0	17.9			
		1.65 ≤ V_{CC} ≤ 1.95	2.0	6.0	11.7	2.0	14.7			
		2.30 ≤ V_{CC} ≤ 2.70	1.0	5.0	9.1	1.0	11.1			
		3.00 ≤ V_{CC} ≤ 3.60	0.8	4.0	8.1	0.5	10.1			
t_{PHZ} / t_{PLZ}	Output Disable Time	0.90		36.0						
		1.10 ≤ V_{CC} ≤ 1.30	6.0	13.0	24.8	5.0	53.5	ns	C_L = 30 pF R_U = 5000Ω R_D = 5000Ω S_1 = GND for t_{PHZ} S_1 = V_I for t_{PLZ}	Figures 1, 2
		1.40 ≤ V_{CC} ≤ 1.60	4.0	8.0	18.1	3.0	22.6			
		1.65 ≤ V_{CC} ≤ 1.95	2.0	6.0	17.9	2.0	22.0			
		2.30 ≤ V_{CC} ≤ 2.70	1.0	5.0	17.7	1.0	21.6			
		3.00 ≤ V_{CC} ≤ 3.60	0.8	4.0	17.5	0.5	21.2			

t_{PLH} / t_{PHL}	Propagation Delay, A to Y (Figures 3 and 4)	R_L = 1 MΩ, C_L = 30 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	51.1	
			1.4 to 1.6	-	TBD	13.8	-	17.7	
			1.65 to 1.95	-	TBD	10.6	-	14.0	
			2.3 to 2.7	-	TBD	7.6	-	9.9	
			3.0 to 3.6	-	TBD	6.4	-	8.9	
t_{PZH} / t_{PZL}	Output Enable Time, $\overline{OE}$ to Y (Figures 3 and 4)	R_L = R_L = 5 kΩ, C_L = 30 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	51.9	
			1.4 to 1.6	-	TBD	14.5	-	17.9	
			1.65 to 1.95	-	TBD	11.7	-	14.7	
			2.3 to 2.7	-	TBD	9.1	-	11.1	
			3.0 to 3.6	-	TBD	8.1	-	10.1	
t_{PHZ} / t_{PLZ}	Output Disable Time, $\overline{OE}$ to Y (Figures 3 and 4)	R_L = R_L = 5 kΩ, C_L = 30 pF	0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	53.5	
			1.4 to 1.6	-	TBD	20.5	-	21.1	
			1.65 to 1.95	-	TBD	19.5	-	20.5	
			2.3 to 2.7	-	TBD	18.5	-	19.5	
			3.0 to 3.6	-	TBD	14.8	-	16.3	

AC Characteristics for NC7SP74



AC Electrical Characteristics (10pF, 1MΩ)

Symbol	Parameter	V_{CC} (V)	T_A = +25°C Min	T_A = +25°C Typ	T_A = +25°C Max	T_A = -40°C to +85°C Min	T_A = -40°C to +85°C Max	Units	Conditions	Figure Number
f_{MAX}	Maximum Clock Frequency	0.90		40.0				MHz	C_L = 10 pF R_D = 1 MΩ	Figures 1, 5
		1.10 ≤ V_{CC} ≤ 1.30	50			50				
		1.40 ≤ V_{CC} ≤ 1.60	75			75				
		1.65 ≤ V_{CC} ≤ 1.95	100			100				
		2.30 ≤ V_{CC} ≤ 2.70	125			125				
		3.00 ≤ V_{CC} ≤ 3.60	150			150				
t_{PLH} / t_{PHL}	Propagation Delay CK to Q, $\overline{Q}$	0.90		24.0				ns	C_L = 10 pF R_D = 1 MΩ	Figures 1, 3
		1.10 ≤ V_{CC} ≤ 1.30	4.0	15.0	22.0	3.5	31.0			
		1.40 ≤ V_{CC} ≤ 1.60	2.0	9.0	13.0	1.5	14.0			
		1.65 ≤ V_{CC} ≤ 1.95	1.5	7.0	11.0	1.0	13.0			
		2.30 ≤ V_{CC} ≤ 2.70	1.0	5.0	8.0	0.8	9.0			
		3.00 ≤ V_{CC} ≤ 3.60	1.0	4.0	7.0	0.5	8.0			
t_{PLH} / t_{PHL}	Propagation Delay $\overline{CLR}$, $\overline{PR}$, to Q, $\overline{Q}$	0.90		6.5				ns	C_L = 10 pF R_D = 1 MΩ	Figures 1, 3
		1.10 ≤ V_{CC} ≤ 1.30	4.0	12.0	23.0	4.0	34.0			
		1.40 ≤ V_{CC} ≤ 1.60	2.0	9.0	12.0	2.0	14.0			
		1.65 ≤ V_{CC} ≤ 1.95	1.5	7.0	11.0	1.5	13.0			
		2.30 ≤ V_{CC} ≤ 2.70	1.0	5.0	9.0	1.0	9.0			
		3.00 ≤ V_{CC} ≤ 3.60	1.0	4.0	7.0	1.0	8.0			
t_S	Setup Time, CK to D	0.90		10.0				ns	C_L = 10 pF R_D = 1 MΩ	Figures 1, 4
		1.10 ≤ V_{CC} ≤ 1.30	7.0			7.0				
		1.40 ≤ V_{CC} ≤ 1.60	3.0			3.0				
		1.65 ≤ V_{CC} ≤ 1.95	2.0			2.0				
		2.30 ≤ V_{CC} ≤ 2.70	1.5			1.5				
		3.00 ≤ V_{CC} ≤ 3.60	1.0			1.0				
t_H	Hold Time, CK to D	0.90		1.0				ns	C_L = 10 pF R_D = 1 MΩ	Figures 1, 4
		1.10 ≤ V_{CC} ≤ 1.30	0.5			0.5				
		1.40 ≤ V_{CC} ≤ 1.60	0.5			0.5				
		1.65 ≤ V_{CC} ≤ 1.95	0.5			0.5				
		2.30 ≤ V_{CC} ≤ 2.70	0.5			0.5				
		3.00 ≤ V_{CC} ≤ 3.60	0.5			0.5				
t_W	Pulse Width, CK, $\overline{PR}$, $\overline{CLR}$	0.90		5.0				ns	C_L = 10 pF R_D = 1 MΩ	Figures 1, 5
		1.10 ≤ V_{CC} ≤ 1.30	5.0			5.0				
		1.40 ≤ V_{CC} ≤ 1.60	3.0			3.0				
		1.65 ≤ V_{CC} ≤ 1.95	2.5			2.5				
		2.30 ≤ V_{CC} ≤ 2.70	2.5			2.5				
		3.00 ≤ V_{CC} ≤ 3.60	2.0			2.0				
t_{REC}	Recover Time $\overline{CLR}$, $\overline{PR}$ to CK	0.90		12.0				ns	C_L = 10 pF R_D = 1 MΩ	Figures 1, 4
		1.10 ≤ V_{CC} ≤ 1.30	8.5			8.5				
		1.40 ≤ V_{CC} ≤ 1.60	3.5			3.5				
		1.65 ≤ V_{CC} ≤ 1.95	3.0			3.0				
		2.30 ≤ V_{CC} ≤ 2.70	2.5			2.5				
		3.00 ≤ V_{CC} ≤ 3.60	2.0			2.0				

AC Electrical Characteristics (R_L = 1 MΩ, C_L = 10 pF)

Symbol	Parameter	Test Condition	V_{CC} (V)	T_A = 25 °C Min	T_A = 25 °C Typ	T_A = 25 °C Max	T_A = -40°C to +85°C Min	T_A = -40°C to +85°C Max	Unit
f_{MAX}	Maximum Clock Frequency (Figures 3 and 4)		0.9	-	TBD	-	-	-	MHz
			1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	75	-	-	75	-	
			1.65 to 1.95	100	-	-	100	-	
			2.3 to 2.7	125	-	-	125	-	
			3.0 to 3.6	150	-	-	150	-	
t_{PLH} / t_{PHL}	Propagation Delay, CK to Q, $\overline{Q}$ (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	31.0	
			1.4 to 1.6	-	TBD	13.0	-	14.0	
			1.65 to 1.95	-	TBD	11.0	-	13.0	
			2.3 to 2.7	-	TBD	8.0	-	9.0	
			3.0 to 3.6	-	TBD	7.0	-	8.0	
t_{PLH} / t_{PHL}	Propagation Delay, $\overline{CLR}$, $\overline{PR}$ to Q, $\overline{Q}$ (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	34.0	
			1.4 to 1.6	-	TBD	12.0	-	14.0	
			1.65 to 1.95	-	TBD	11.0	-	13.0	
			2.3 to 2.7	-	TBD	9.0	-	9.0	
			3.0 to 3.6	-	TBD	7.0	-	8.0	
t_S	Setup Time, CK to D (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	3.0	-	-	3.0	-	
			1.65 to 1.95	2.0	-	-	2.0	-	
			2.3 to 2.7	1.5	-	-	1.5	-	
			3.0 to 3.6	1.0	-	-	1.0	-	
t_H	Hold Time, CK to D (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	0.5	-	-	0.5	-	
			1.65 to 1.95	0.5	-	-	0.5	-	
			2.3 to 2.7	0.5	-	-	0.5	-	
			3.0 to 3.6	0.5	-	-	0.5	-	
t_W	Pulse Width, CK, $\overline{CLR}$, $\overline{PR}$ (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	3.0	-	-	3.0	-	
			1.65 to 1.95	2.5	-	-	2.5	-	
			2.3 to 2.7	2.5	-	-	2.5	-	
			3.0 to 3.6	2.0	-	-	2.0	-	
t_{REC}	Recovery Time, $\overline{CLR}$, $\overline{PR}$ to CK (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	3.5	-	-	3.5	-	
			1.65 to 1.95	3.0	-	-	3.0	-	
			2.3 to 2.7	2.5	-	-	2.5	-	
			3.0 to 3.6	2.0	-	-	2.0	-	

3 V MiniGate Logic Datasheet Changes

AC Electrical Characteristics (15pF, 1MΩ)

Symbol	Parameter	V_{CC} (V)	T_A = +25°C Min	Typ	Max	T_A = −40°C to +85°C Min	Max	Units	Conditions	Figure Number
f_{MAX}	Maximum Clock Frequency	0.90		40.0				MHz	C_L = 15 pF, R_D = 1 MΩ	Figures 1, 5
		1.10 ≤ V_{CC} ≤ 1.30	50			150				
		1.40 ≤ V_{CC} ≤ 1.60	75			200				
		1.65 ≤ V_{CC} ≤ 1.95	100			250				
		2.30 ≤ V_{CC} ≤ 2.70	125			175				
		3.00 ≤ V_{CC} ≤ 3.60	150			200				
t_{PLH} t_{PHL}	Propagation Delay CK to Q, $\overline{Q}$	0.90		27.0				ns	C_L = 15 pF, R_D = 1 MΩ	Figures 1, 3
		1.10 ≤ V_{CC} ≤ 1.30	5.0	16.0	23.0	4.5	34.0			
		1.40 ≤ V_{CC} ≤ 1.60	3.0	10.0	14.0	2.5	16.0			
		1.65 ≤ V_{CC} ≤ 1.95	2.0	7.0	11.0	2.0	13.0			
		2.30 ≤ V_{CC} ≤ 2.70	1.5	5.0	8.0	1.0	9.0			
		3.00 ≤ V_{CC} ≤ 3.60	1.0	4.0	7.0	0.5	8.0			
t_{PLH} t_{PHL}	Propagation Delay $\overline{CLR}$, $\overline{PR}$, to Q, $\overline{Q}$	0.90		27.0				ns	C_L = 15 pF, R_D = 1 MΩ	Figures 1, 3
		1.10 ≤ V_{CC} ≤ 1.30	5.0	15.0	24.0	5.0	37.0			
		1.40 ≤ V_{CC} ≤ 1.60	3.0	10.0	13.0	3.0	16.0			
		1.65 ≤ V_{CC} ≤ 1.95	2.0	7.0	11.0	2.0	13.0			
		2.30 ≤ V_{CC} ≤ 2.70	1.5	5.0	9.0	1.5	9.0			
		3.00 ≤ V_{CC} ≤ 3.60	1.0	4.0	7.0	1.0	8.0			
t_S	Setup Time, CK to D	0.90		10.0				ns	C_L = 15 pF, R_D = 1 MΩ	Figures 1, 4
		1.10 ≤ V_{CC} ≤ 1.30	7.0			7.0				
		1.40 ≤ V_{CC} ≤ 1.60	3.0			3.0				
		1.65 ≤ V_{CC} ≤ 1.95	2.0			2.0				
		2.30 ≤ V_{CC} ≤ 2.70	1.5			1.5				
		3.00 ≤ V_{CC} ≤ 3.60	1.0			1.0				
t_H	Hold Time, CK to D	0.90		1.0				ns	C_L = 15 pF, R_D = 1 MΩ	Figures 1, 4
		1.10 ≤ V_{CC} ≤ 1.30	0.5			0.5				
		1.40 ≤ V_{CC} ≤ 1.60	0.5			0.5				
		1.65 ≤ V_{CC} ≤ 1.95	0.5			0.5				
		2.30 ≤ V_{CC} ≤ 2.70	0.5			0.5				
		3.00 ≤ V_{CC} ≤ 3.60	0.5			0.5				
t_W	Pulse Width, CK, $\overline{PR}$, $\overline{CLR}$	0.90		5.0				ns	C_L = 15 pF, R_D = 1 MΩ	Figures 1, 5
		1.10 ≤ V_{CC} ≤ 1.30	5.0			5.0				
		1.40 ≤ V_{CC} ≤ 1.60	3.0			3.0				
		1.65 ≤ V_{CC} ≤ 1.95	2.5			2.5				
		2.30 ≤ V_{CC} ≤ 2.70	2.5			2.5				
		3.00 ≤ V_{CC} ≤ 3.60	2.0			2.0				
t_{REC}	Recover Time $\overline{CLR}$, $\overline{PR}$ to CK	0.90		12.0				ns	C_L = 15 pF, R_D = 1 MΩ	Figures 1, 4
		1.10 ≤ V_{CC} ≤ 1.30	8.5			8.5				
		1.40 ≤ V_{CC} ≤ 1.60	3.5			3.5				
		1.65 ≤ V_{CC} ≤ 1.95	3.0			3.0				
		2.30 ≤ V_{CC} ≤ 2.70	2.5			2.5				
		3.00 ≤ V_{CC} ≤ 3.60	2.0			2.0				

AC Electrical Characteristics (R_L = 1 MΩ, C_L = 15 pF)

Symbol	Parameter	Test Condition	V_{CC} (V)	T_A = 25 °C Min	Typ	Max	T_A = −40°C to +85°C Min	Max	Unit
f_{MAX}	Maximum Clock Frequency (Figures 3 and 4)		0.9	-	TBD	-	-	-	MHz
			1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	75	-	-	TBD	-	
			1.65 to 1.95	100	-	-	TBD	-	
			2.3 to 2.7	125	-	-	TBD	-	
			3.0 to 3.6	150	-	-	TBD	-	
t_{PLH} t_{PHL}	Propagation Delay, CK to Q, $\overline{Q}$ (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	34.0	
			1.4 to 1.6	-	TBD	14.0	-	16.0	
			1.65 to 1.95	-	TBD	11.0	-	13.0	
			2.3 to 2.7	-	TBD	8.0	-	9.0	
			3.0 to 3.6	-	TBD	7.0	-	8.0	
t_{PLH} t_{PHL}	Propagation Delay, $\overline{CLR}$, $\overline{PR}$ to Q, $\overline{Q}$ (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	-	TBD	TBD	-	37.0	
			1.4 to 1.6	-	TBD	13.0	-	16.0	
			1.65 to 1.95	-	TBD	11.0	-	13.0	
			2.3 to 2.7	-	TBD	9.0	-	9.0	
			3.0 to 3.6	-	TBD	7.0	-	8.0	
t_S	Setup Time, CK to D (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	3.0	-	-	3.0	-	
			1.65 to 1.95	2.0	-	-	2.0	-	
			2.3 to 2.7	1.5	-	-	1.5	-	
			3.0 to 3.6	1.0	-	-	1.0	-	
t_H	Hold Time, CK to D (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	0.5	-	-	0.5	-	
			1.65 to 1.95	0.5	-	-	0.5	-	
			2.3 to 2.7	0.5	-	-	0.5	-	
			3.0 to 3.6	0.5	-	-	0.5	-	
t_W	Pulse Width, CK, $\overline{CLR}$, $\overline{PR}$ (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	3.0	-	-	3.0	-	
			1.65 to 1.95	2.5	-	-	2.5	-	
			2.3 to 2.7	2.5	-	-	2.5	-	
			3.0 to 3.6	2.0	-	-	2.0	-	
t_{REC}	Recovery Time, $\overline{CLR}$, $\overline{PR}$ to CK (Figures 3 and 4)		0.9	-	TBD	-	-	-	ns
			1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	3.5	-	-	3.5	-	
			1.65 to 1.95	3.0	-	-	3.0	-	
			2.3 to 2.7	2.5	-	-	2.5	-	
			3.0 to 3.6	2.0	-	-	2.0	-	

NC7SVxx, NC7WVxx Family

Absolute Maximum Ratings

Existing Datasheet

Absolute Maximum Ratings (Note 1)

Supply Voltage (V_{CC})	−0.5V to +4.6V
DC Input Voltage (V_{IN})	−0.5V to +4.6V
DC Output Voltage (V_{OUT})	
HIGH or LOW State (Note 2)	−0.5V to V_{CC} +0.5V
V_{CC} = 0V	−0.5V to 4.6V

New

Maximum Ratings

Symbol	Parameter		Value	Unit
V_{CC}	DC Supply Voltage		-0.5 to +4.3	V
V_{IN}	DC Input Voltage		-0.5 to +4.3	V
V_{OUT}	DC Output Voltage	Active-Mode (High or Low State)	-0.5 to V_{CC} + 0.5	V
		Tri-State Mode (Note 1)	-0.5 to +4.3	
		Power-Down Mode (V_{CC} = 0 V)	-0.5 to +4.3	

Thermal Characteristics

Existing Datasheet

θ_{JA}	Thermal Resistance	SC70-6		425	°C/W
		MicroPak™-6		500	
		MicroPak2™-6		560	
P_D	Power Dissipation at +85°C	MicroPak™-6		130	mW
		SC70-6		150	
		MicroPak2™-6		120	

New

θ_{JA}	Thermal Resistance (Note 2)	SC−88	377	°C/W
		MicroPak	154	
P_D	Power Dissipation in Still Air	SC−88	332	mW
		MicroPak	812	

3 V MiniGate Logic Datasheet Changes

DC Input Characteristics for NC7SVxx, NC7WVxx except for NC7SV14, NC7SP57, NC7SV58, NC7WV14, NC7WV17 and NC7SVU04

Existing Datasheet

DC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	T_A = +25°C Min	T_A = +25°C Max	T_A = −40°C to +85°C Min	T_A = −40°C to +85°C Max	Units	Conditions
V_{IH}	HIGH Level Input Voltage	0.90	0.65 x V_{CC}		0.65 x V_{CC}		V	
		1.10 ≤ V_{CC} ≤ 1.30	0.65 x V_{CC}		0.65 x V_{CC}			
		1.40 ≤ V_{CC} ≤ 1.60	0.65 x V_{CC}		0.65 x V_{CC}			
		1.65 ≤ V_{CC} ≤ 1.95	0.65 x V_{CC}		0.65 x V_{CC}			
		2.30 ≤ V_{CC} < 2.70	1.6		1.6			
		2.70 ≤ V_{CC} ≤ 3.60	2.0		2.0			
V_{IL}	LOW Level Input Voltage	0.90		0.35 x V_{CC}		0.35 x V_{CC}	V	
		1.10 ≤ V_{CC} ≤ 1.30		0.35 x V_{CC}		0.35 x V_{CC}		
		1.40 ≤ V_{CC} ≤ 1.60		0.35 x V_{CC}		0.35 x V_{CC}		
		1.65 ≤ V_{CC} ≤ 1.95		0.35 x V_{CC}		0.35 x V_{CC}		
		2.30 ≤ V_{CC} < 2.70		0.7		0.7		
		2.70 ≤ V_{CC} ≤ 3.60		0.8		0.8		

New

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	T_A = 25°C Typ	T_A = 25°C Max	T_A = −40°C to +85°C Min	T_A = −40°C to +85°C Max	Unit
V_{IH}	High−Level Input Voltage		0.9	–	0.5	–	–	–	V
			1.1 to 1.3	0.65 x V_{CC}	–	–	0.65 x V_{CC}	–	
			1.4 to 1.6	0.65 x V_{CC}	–	–	0.65 x V_{CC}	–	
			1.65 to 1.95	0.65 x V_{CC}	–	–	0.65 x V_{CC}	–	
			2.3 to <2.7	1.6	–	–	1.6	–	
			2.7 to 3.6	2.0	–	–	2.0	–	
V_{IL}	Low−Level Input Voltage		0.9	–	0.5	–	–	–	V
			1.1 to 1.3	–	–	0.35 x V_{CC}	–	0.35 x V_{CC}	
			1.4 to 1.6	–	–	0.35 x V_{CC}	–	0.35 x V_{CC}	
			1.65 to 1.95	–	–	0.35 x V_{CC}	–	0.35 x V_{CC}	
			2.3 to <2.7	–	–	0.7	–	0.7	
			2.7 to 3.6	–	–	0.8	–	0.8	

DC Input Characteristics for NC7SV14, NC7SP57, NC7SV58, NC7WV14 and NC7WV17

Existing Datasheet

DC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	T_A = +25°C Min	T_A = +25°C Max	T_A = −40°C to +85°C Min	T_A = −40°C to +85°C Max	Units	Conditions
V_P	Positive Threshold Voltage	0.90	0.3	0.7	0.3	0.7	V	
		1.10	0.4	1.0	0.4	1.0		
		1.40	0.5	1.25	0.5	1.4		
		1.65	0.7	1.5	0.7	1.5		
		2.30	1.0	1.8	1.0	1.8		
		2.70	1.5	2.2	1.5	2.2		
V_N	Negative Threshold Voltage	0.90	0.10	0.6	0.10	0.6	V	
		1.10	0.15	0.7	0.15	0.7		
		1.40	0.20	0.8	0.20	0.8		
		1.65	0.25	0.9	0.25	0.9		
		2.30	0.4	1.15	0.4	1.15		
		2.70	0.6	1.5	0.6	1.5		
V_H	Hysteresis Voltage	0.90	0.07	0.5	0.07	0.5	V	
		1.10	0.08	0.6	0.08	0.6		
		1.40	0.09	0.8	0.09	0.8		
		1.65	0.15	1.0	0.15	1.0		
		2.30	0.25	1.1	0.25	1.1		
		2.70	0.60	1.2	0.60	1.2		

New

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	T_A = 25°C Typ	T_A = 25°C Max	T_A = −40°C to +85°C Min	T_A = −40°C to +85°C Max	Unit
V_P	Positive Threshold Voltage		0.9	–	0.62	–	–	–	V
			1.1	–	–	1.0	–	1.0	
			1.4	–	–	1.25	–	1.25	
			1.65	–	–	1.5	–	1.5	
			2.3	–	–	1.8	–	1.8	
			2.7	–	–	2.2	–	2.2	
V_N	Negative Threshold Voltage		0.9	–	0.34	–	–	–	V
			1.1	0.15	–	–	0.15	–	
			1.4	0.2	–	–	0.2	–	
			1.65	0.25	–	–	0.25	–	
			2.3	0.4	–	–	0.4	–	
			2.7	0.6	–	–	0.6	–	
V_H	Hysteresis Voltage		0.9	–	0.29	–	–	–	V
			1.1	0.08	–	0.6	0.08	0.6	
			1.4	0.09	–	0.8	0.09	0.8	
			1.65	0.15	–	1.0	0.15	1.0	
			2.3	0.25	–	1.1	0.25	1.1	
			2.7	0.6	–	1.2	0.6	1.2	

DC Input Characteristics for NC7SVU04 – TBD

DC Output Characteristics for NC7SVxx and NC7WVxx

Symbol	Parameter	V_{CC} (V)	T_A = +25°C Min	T_A = +25°C Max	T_A = −40°C to +85°C Min	T_A = −40°C to +85°C Max	Units	Conditions
V_{OH}	HIGH Level Output Voltage	0.90	V_{CC} − 0.1		V_{CC} − 0.1		V	
		1.10 ≤ V_{CC} ≤ 1.30	V_{CC} − 0.1		V_{CC} − 0.1			
		1.40 ≤ V_{CC} ≤ 1.60	V_{CC} − 0.2		V_{CC} − 0.2			I_{OH} = −100 µA
		1.65 ≤ V_{CC} ≤ 1.95	V_{CC} − 0.2		V_{CC} − 0.2			
		2.30 ≤ V_{CC} < 2.70	V_{CC} − 0.2		V_{CC} − 0.2			
		2.70 ≤ V_{CC} ≤ 3.60	V_{CC} − 0.2		V_{CC} − 0.2			
		1.10 ≤ V_{CC} ≤ 1.30	0.75 x V_{CC}		0.75 x V_{CC}			I_{OH} = −2 mA
		1.40 ≤ V_{CC} ≤ 1.60	0.75 x V_{CC}		0.75 x V_{CC}		V	I_{OH} = −4 mA
		1.65 ≤ V_{CC} ≤ 1.95	1.25		1.25			I_{OH} = −6 mA
		2.30 ≤ V_{CC} < 2.70	2.0		2.0			
		2.30 ≤ V_{CC} < 2.70	1.8		1.8			I_{OH} = −12 mA
		2.70 ≤ V_{CC} ≤ 3.60	2.2		2.2			
		2.30 ≤ V_{CC} < 2.70	1.7		1.7			I_{OH} = −18 mA
		2.70 ≤ V_{CC} ≤ 3.60	2.4		2.4			
		2.70 ≤ V_{CC} ≤ 3.60	2.2		2.2			I_{OH} = −24 mA
V_{OL}	LOW Level Output Voltage	0.90		0.1		0.1		
		1.10 ≤ V_{CC} ≤ 1.30		0.1		0.1		
		1.40 ≤ V_{CC} ≤ 1.60		0.2		0.2		I_{OL} = 100 µA
		1.65 ≤ V_{CC} ≤ 1.95		0.2		0.2		
		2.30 ≤ V_{CC} < 2.70		0.2		0.2		
		2.70 ≤ V_{CC} ≤ 3.60		0.2		0.2		
		1.10 ≤ V_{CC} ≤ 1.30		0.25 x V_{CC}		0.25 x V_{CC}		I_{OL} = 2 mA
		1.40 ≤ V_{CC} ≤ 1.60		0.25 x V_{CC}		0.25 x V_{CC}	V	I_{OL} = 4 mA
		1.65 ≤ V_{CC} ≤ 1.95		0.3		0.3		I_{OL} = 6 mA
		2.30 ≤ V_{CC} < 2.70		0.4		0.4		I_{OL} = 12 mA
		2.70 ≤ V_{CC} ≤ 3.60		0.4		0.4		
		2.30 ≤ V_{CC} < 2.70		0.6		0.6		I_{OL} = 18 mA
		2.70 ≤ V_{CC} ≤ 3.60		0.4		0.4		
		2.70 ≤ V_{CC} ≤ 3.60		0.55		0.55		I_{OL} = 24 mA

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	T_A = 25°C Typ	T_A = 25°C Max	T_A = −40°C to +85°C Min	T_A = −40°C to +85°C Max	Unit
V_{OH}	High−Level Output Voltage	V_{IN} = V_{IH} or V_{IL}							V
		I_{OH} = −100 µA	0.9	–	V_{CC} − 0.1	–	–	–	
			1.1 to 1.3	V_{CC} − 0.1	–	–	V_{CC} − 0.1	–	
			1.4 to 1.6	V_{CC} − 0.1	–	–	V_{CC} − 0.1	–	
			1.65 to 1.95	V_{CC} − 0.2	–	–	V_{CC} − 0.2	–	
			2.3 to <2.7	V_{CC} − 0.2	–	–	V_{CC} − 0.2	–	
			2.7 to 3.6	V_{CC} − 0.2	–	–	V_{CC} − 0.2	–	
		I_{OH} = −2 mA	1.1 o 1.3	0.75 x V_{CC}	–	–	0.75 x V_{CC}	–	
		I_{OH} = −4 mA	1.4 to 1.6	0.75 x V_{CC}	–	–	0.75 x V_{CC}	–	
		I_{OH} = −6 mA	1.65 to 1.95	1.25	–	–	1.25	–	
			2.3 to <2.7	2.0	–	–	2.0	–	
		I_{OH} = −12 mA	2.3 to <2.7	1.8	–	–	1.8	–	
			2.7 to 3.6	2.2	–	–	2.2	–	
		I_{OH} = −18 mA	2.3 to <2.7	1.7	–	–	1.7	–	
			2.7 to 3.6	2.4	–	–	2.4	–	
		I_{OH} = −24 mA	2.7 to 3.6	2.2	–	–	2.2	–	
V_{OL}	Low−Level Output Voltage	V_{IN} = V_{IH} or V_{IL}							V
		I_{OL} = 100 µA	0.9	–	0.1	–	–	–	
			1.1 to 1.3	–	–	0.1	–	0.1	
			1.4 to 1.6	–	–	0.1	–	0.1	
			1.65 to 1.95	–	–	0.2	–	0.2	
			2.3 to < 2.7	–	–	0.2	–	0.2	
			2.7 to 3.6	–	–	0.2	–	0.2	
		I_{OL} = 2 mA	1.1 o 1.3	–	–	0.25 x V_{CC}	–	0.25 x V_{CC}	
		I_{OL} = 4 mA	1.4 to 1.6	–	–	0.25 x V_{CC}	–	0.25 x V_{CC}	
		I_{OL} = 6 mA	1.65 to 1.95	–	–	0.3	–	0.3	
		I_{OL} = 12 mA	2.3 to <2.7	–	–	0.4	–	0.4	
			2.7 to 3.6	–	–	0.4	–	0.4	
		I_{OL} = 18 mA	2.3 to <2.7	–	–	0.6	–	0.6	
			2.7 to 3.6	–	–	0.4	–	0.4	
		I_{OL} = 24 mA	2.7 to 3.6	–	–	0.55	–	0.55	

3 V MiniGate Logic Datasheet Changes

AC Characteristics for NC7SVxx and NC7WVxx for NC7SV05, NC7WV07, NC7SV125, NC7SV126 and NC7SV74

Existing Datasheet

AC Electrical Characteristics

Symbol	Parameter	V_{CC}	Conditions	T_A=25°C Min.	T_A=25°C Typ.	T_A=-40 to 85°C Min.	T_A=-40 to 85°C Typ.	T_A=-40 to 85°C Min.	Units	Figure
t_{PHL}, t_{PLH}	Propagation Delay	0.90	C_L=15pF, R_L=1MΩ		15.0				ns	Figure 15 Figure 16
		1.10 ≤ V_{CC} ≤ 1.30	C_L=15pF, R_L=2KΩ	4.0	8.0	16.5	3.3	31.0		
		1.40 ≤ V_{CC} ≤ 1.60		2.0	6.0	10.0	2.0	12.0		
		1.65 ≤ V_{CC} ≤ 1.95		2.0	4.0	9.1	1.9	10.0		
		2.30 ≤ V_{CC} ≤ 2.70	C_L=30pF, R_L=500Ω	1.5	3.1	6.2	1.4	6.7		
		2.70 ≤ V_{CC} ≤ 3.60		1.2	2.5	5.4	1.2	6.1		

New

AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	T_A = 25°C Typ	T_A = 25°C Max	T_A = -40°C to +85°C Min	T_A = -40°C to +85°C Max	Unit
t_{PLH}, t_{PHL}	Propagation Delay, (I0 or I1 or I2) to Y (Figures 12 and 13)	R_L = 1 MΩ, C_L = 15 pF	0.9	–	TBD	–	–	–	ns
		R_L = 2 kΩ, C_L = 15 pF	1.10 to 1.30	–	TBD	TBD	–	TBD	
			1.40 to 1.60	–	TBD	10.0	–	12.0	
		R_L = 500 Ω, C_L = 30 pF	1.65 to 1.95	–	TBD	9.1	–	10.0	
			2.3 to 2.7	–	TBD	6.2	–	6.7	
			3.0 to 3.6	–	TBD	5.4	–	6.1	

AC Characteristics for NC7SV05 and NC7WV07

Existing Datasheet

AC Electrical Characteristics

Symbol	Parameter	V_{CC}	Conditions	T_A=25°C Min.	T_A=25°C Typ.	T_A=25°C Max.	T_A=-40 to 85°C Min.	T_A=-40 to 85°C Max.	Units	Figure
t_{PZL}, t_{PLZ}	Propagation Delay	0.90	C_L=15pF, R_L=R_D=1MΩ		13				ns	Figure 4 Figure 5
		1.10 ≤ V_{CC} ≤ 1.30	C_L=15pF, R_L=R_D=2kΩ	2.0	6.0	15.0	1.0	18.6		
		1.40 ≤ V_{CC} ≤ 1.60		1.0	3.2	8.7	1.0	9.7		
		1.65 ≤ V_{CC} ≤ 1.95		1.0	2.0	6.0	1.0	6.8		
		2.30 ≤ V_{CC} ≤ 2.70	C_L=30pF, R_L=R_D=500Ω	0.7	1.2	3.6	0.6	4.7		
		2.70 ≤ V_{CC} ≤ 3.60		0.5	1.0	3.3	0.4	4.0		

New

AC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C Min	T_A = 25°C Typ	T_A = 25°C Max	T_A = -40°C to +85°C Min	T_A = -40°C to +85°C Max	Unit
t_{PLH}, t_{PHL}	Propagation Delay, A to Y (Figures 3 and 4)	R_L = 1 MΩ, C_L = 15 pF	0.9	–	TBD	–	–	–	ns
		R_L = 2 kΩ, C_L = 15 pF	1.1 to 1.3	–	TBD	TBD	–	TBD	
			1.4 to 1.6	–	TBD	8.7	–	9.7	
		R_L = 500 Ω, C_L = 30 pF	1.65 to 1.95	–	TBD	6.0	–	6.8	
			2.3 to 2.7	–	TBD	3.6	–	4.7	
			2.7 to 3.6	–	TBD	3.3	–	4.0	

AC Characteristics for NC7SV74

Existing Datasheet

AC Electrical Characteristics

Symbol	Parameter	V_{CC} (V)	T_A = +25°C Min.	T_A = +25°C Typ.	T_A = +25°C Max.	T_A = -40°C to +85°C Min.	T_A = -40°C to +85°C Max.	Units	Conditions	Figure Number
f_{MAX}	Maximum Clock Frequency	0.90		50					C_L = 15 pF, R_L = 1 MΩ	
		1.10 ≤ V_{CC} ≤ 1.30	150			150		MHz	C_L = 15 pF, R_L = 2 kΩ	Figure 1 Figure 5
		1.40 ≤ V_{CC} ≤ 1.60	200			200			C_L = 30 pF	
		1.65 ≤ V_{CC} ≤ 1.95	200			200			R_L = 500Ω	
		2.30 ≤ V_{CC} ≤ 2.70	200			200				
		2.70 ≤ V_{CC} ≤ 3.60	200			200				
t_{PLH} t_{PHL}	Propagation Delay CK to Q, $\overline{Q}$	0.90		13.0					C_L = 15 pF, R_L = 1 MΩ	
		1.10 ≤ V_{CC} ≤ 1.30	3.0	6.0	9.9	1.0	14.6	ns	C_L = 15 pF, R_L = 2 kΩ	Figure 1 Figure 3
		1.40 ≤ V_{CC} ≤ 1.60	1.0	3.2	6.0	1.0	7.2		C_L = 30 pF	
		1.65 ≤ V_{CC} ≤ 1.95	1.0	1.9	4.5	1.0	5.3		R_L = 500 Ω	
		2.30 ≤ V_{CC} ≤ 2.70	0.8	1.2	3.0	0.7	3.7			
		2.70 ≤ V_{CC} ≤ 3.60	0.7	1.0	2.8	0.6	3.2			
t_{PLH} t_{PHL}	Propagation Delay $\overline{CLR}$, $\overline{PR}$, to Q, $\overline{Q}$	0.90		14.0					C_L = 15 pF, R_L = 1 MΩ	
		1.10 ≤ V_{CC} ≤ 1.30	3.0	6.5	10.5	1.0	15.1	ns	C_L = 15 pF, R_L = 2 kΩ	Figure 1 Figure 3
		1.40 ≤ V_{CC} ≤ 1.60	1.0	3.2	6.0	1.0	7.2		C_L = 30 pF	
		1.65 ≤ V_{CC} ≤ 1.95	1.0	1.9	4.5	1.0	5.3		R_L = 500 Ω	
		2.30 ≤ V_{CC} ≤ 2.70	0.8	1.2	3.0	0.7	3.7			
		2.70 ≤ V_{CC} ≤ 3.60	0.7	1.0	2.8	0.6	3.2			
t_S	Setup Time, CK to D	0.90		6.5			6.5		C_L = 15 pF, R_L = 1 MΩ	
		1.10 ≤ V_{CC} ≤ 1.30	3.5				3.5	ns	C_L = 15 pF, R_L = 2 kΩ	Figure 1 Figure 4
		1.40 ≤ V_{CC} ≤ 1.60	2.0				2.0		C_L = 30 pF	
		1.65 ≤ V_{CC} ≤ 1.95	1.5				1.5		R_L = 500 Ω	
		2.30 ≤ V_{CC} ≤ 2.70	2.0				2.0			
		2.70 ≤ V_{CC} ≤ 3.60	1.5				1.5			
t_H	Hold Time, CK to D	0.90		0.5			0.5		C_L = 15 pF, R_L = 1 MΩ	
		1.10 ≤ V_{CC} ≤ 1.30	0.5				0.5	ns	C_L = 15 pF, R_L = 2 kΩ	Figure 1 Figure 4
		1.40 ≤ V_{CC} ≤ 1.60	0.5				0.5		C_L = 30 pF	
		1.65 ≤ V_{CC} ≤ 1.95	0.5				0.5		R_L = 500 Ω	
		2.30 ≤ V_{CC} ≤ 2.70	0.5				0.5			
		2.70 ≤ V_{CC} ≤ 3.60	0.5				0.5			
t_W	Pulse Width, CK, $\overline{PR}$, $\overline{CLR}$	0.90		7.0			7.0		C_L = 15 pF, R_L = 1 MΩ	
		1.10 ≤ V_{CC} ≤ 1.30	4.0				4.0	ns	C_L = 15 pF, R_L = 2 kΩ	Figure 1 Figure 5
		1.40 ≤ V_{CC} ≤ 1.60	3.0				3.0		C_L = 30 pF	
		1.65 ≤ V_{CC} ≤ 1.95	3.0				3.0		R_L = 500Ω	
		2.30 ≤ V_{CC} ≤ 2.70	3.0				3.0			
		2.70 ≤ V_{CC} ≤ 3.60	3.0				3.0			
t_{REC}	Recover Time $\overline{CLR}$, $\overline{PR}$ to CK	0.90		8.0			8.0		C_L = 15 pF, R_L = 1 MΩ	
		1.10 ≤ V_{CC} ≤ 1.30	4.5				4.5	ns	C_L = 15 pF, R_L = 2 kΩ	Figure 1 Figure 4
		1.40 ≤ V_{CC} ≤ 1.60	3.0				3.0		C_L = 30 pF	
		1.65 ≤ V_{CC} ≤ 1.95	3.0				3.0		R_L = 500Ω	
		2.30 ≤ V_{CC} ≤ 2.70	3.0				3.0			
		2.70 ≤ V_{CC} ≤ 3.60	3.0				3.0			

New

AC Electrical Characteristics

Symbol	Parameter	Test Condition	V_{CC} (V)	T_A = 25 °C Min	T_A = 25 °C Typ	T_A = 25 °C Max	T_A = -40°C to +85°C Min	T_A = -40°C to +85°C Max	Unit
f_{MAX}	Maximum Clock Frequency (Figures 3 and 4)	R_L = 1 MΩ, C_L = 15 pF	0.9	-	TBD	-	-	-	MHz
		R_L = 2 kΩ, C_L = 15 pF	1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	200	-	-	200	-	
		R_L = 500 Ω, C_L = 30 pF	1.65 to 1.95	200	-	-	200	-	
			2.3 to 2.7	200	-	-	200	-	
			3.0 to 3.6	200	-	-	200	-	
t_{PLH}, t_{PHL}	Propagation Delay, CK to Q, $\overline{Q}$ (Figures 3 and 4)	R_L = 1 MΩ, C_L = 15 pF	0.9	-	TBD	-	-	-	ns
		R_L = 2 kΩ, C_L = 15 pF	1.1 to 1.3	-	TBD	TBD	-	14.6	
			1.4 to 1.6	-	TBD	6.0	-	7.2	
		R_L = 500 Ω, C_L = 30 pF	1.65 to 1.95	-	TBD	4.5	-	5.3	
			2.3 to 2.7	-	TBD	3.0	-	3.7	
			3.0 to 3.6	-	TBD	2.8	-	3.2	
t_{PLH}, t_{PHL}	Propagation Delay, $\overline{CLR}$, $\overline{PR}$ to Q, $\overline{Q}$ (Figures 3 and 4)	R_L = 1 MΩ, C_L = 15 pF	0.9	-	TBD	-	-	-	ns
		R_L = 2 kΩ, C_L = 15 pF	1.1 to 1.3	-	TBD	TBD	-	34.0	
			1.4 to 1.6	-	TBD	6.0	-	7.2	
		R_L = 500 Ω, C_L = 30 pF	1.65 to 1.95	-	TBD	4.5	-	5.3	
			2.3 to 2.7	-	TBD	3.0	-	3.7	
			3.0 to 3.6	-	TBD	2.8	-	3.2	
t_S	Setup Time, CK to D (Figures 3 and 4)	R_L = 1 MΩ, C_L = 15 pF	0.9	-	TBD	-	-	-	ns
		R_L = 2 kΩ, C_L = 15 pF	1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	2.0	-	-	2.0	-	
		R_L = 500 Ω, C_L = 30 pF	1.65 to 1.95	1.5	-	-	1.5	-	
			2.3 to 2.7	2.0	-	-	2.0	-	
			3.0 to 3.6	1.5	-	-	1.5	-	
t_H	Hold Time, CK to D (Figures 3 and 4)	R_L = 1 MΩ, C_L = 15 pF	0.9	-	TBD	-	-	-	ns
		R_L = 2 kΩ, C_L = 15 pF	1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	0.5	-	-	0.5	-	
		R_L = 500 Ω, C_L = 30 pF	1.65 to 1.95	0.5	-	-	0.5	-	
			2.3 to 2.7	0.5	-	-	0.5	-	
			3.0 to 3.6	0.5	-	-	0.5	-	
t_W	Pulse Width, CK, $\overline{CLR}$, $\overline{PR}$ (Figures 3 and 4)	R_L = 1 MΩ, C_L = 15 pF	0.9	-	TBD	-	-	-	ns
		R_L = 2 kΩ, C_L = 15 pF	1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	3.0	-	-	3.0	-	
		R_L = 500 Ω, C_L = 30 pF	1.65 to 1.95	3.0	-	-	3.0	-	
			2.3 to 2.7	3.0	-	-	3.0	-	
			3.0 to 3.6	3.0	-	-	3.0	-	
t_{REC}	Recovery Time, $\overline{CLR}$, $\overline{PR}$ to CK (Figures 3 and 4)	R_L = 1 MΩ, C_L = 15 pF	0.9	-	TBD	-	-	-	ns
		R_L = 2 kΩ, C_L = 15 pF	1.1 to 1.3	TBD	-	-	TBD	-	
			1.4 to 1.6	3.0	-	-	3.0	-	
		R_L = 500 Ω, C_L = 30 pF	1.65 to 1.95	3.0	-	-	3.0	-	
			2.3 to 2.7	3.0	-	-	3.0	-	
			3.0 to 3.6	3.0	-	-	3.0	-	

All Other Families
Additional datasheet changes will be published in the PCN updates as soon as available.
Reliability Data Summary: Refer to information below by Product Family/Qual Vehicle. ***To view attachments:*** *1. Download pdf copy of the PCN to your computer* *2. Open the downloaded pdf copy of the PCN* *3. Click on the paper clip icon available on the menu provided in the left/bottom portion of the screen to reveal the Attachment field* *4. Then click on the attached file/s.*
Electrical Characteristics Summary: Electrical characteristics available upon request
List of Affected Parts: *Note: Only the standard (off the shelf) part numbers are listed in the parts list. Any custom parts affected by this PCN are shown in the customer specific PCN addendum in the PCN email notification, or on the PCN Customized Portal.* ***To view attached Parts List:*** *1. Download pdf copy of the PCN to your computer* *2. Open the downloaded pdf copy of the PCN* *3. Click on the paper clip icon available on the menu provided in the left/bottom portion of the screen to reveal the Attachment field* *4. Then click on the attached file/s.*