

# Final Product/Process Change Notification Document #:FPCN25572X22 Issue Date: 06 Feb 2024

Title of Change:	· ·	2X - To include the reliability data of 3V Minigates in SC88A for the uard Fab and Assembly related changes for Logic parts.				
Proposed First Ship date:	13 May 2024 or earlie	r if approved by customer				
Contact Information:	Contact your local ons	emi Sales Office or logic.fpcn@onsemi.com				
PCN Samples Contact:	Initial PCN or Final PCN	to be submitted no later than 30 days from the date of first notification, N, for this change. ng will be subject to request date, sample quantity and special customer				
Additional Reliability Data:	Contact your local onsemi Sales Office or <a href="mailto:ChangKit.Mok@onsemi.com">ChangKit.Mok@onsemi.com</a>					
Type of Notification:	90 days prior to imple onsemi will consider the	Process Change Notification (FPCN) sent to customers. FPCNs are issued mentation of the change. his change accepted, unless an inquiry is made in writing within 30 days ce. To do so, contact <a href="mailto:PCN.Support@onsemi.com">PCN.Support@onsemi.com</a>				
Marking of Parts/ Traceability of Change:	Custom source on label will show TW instead of US/JP to indicate new die source from Vanguard. Changed material may be identified by plant code or lot code too.					
Change Category:	Wafer Fab Change, As	ssembly Change, Test Change				
Change Sub-Category(s):	Manufacturing Site Tra	ransfer, Datasheet/Product Doc change				
Sites Affected:						
onsemi Sites		External Foundry/Subcon Sites				
onsemi Leshan, China		Vanguard International Semiconductor, Taiwan				

#### **Description and Purpose:**

With reference to FPCN25572X, this FPCN presents the updated reliability results for 3V Minigates SC88A.

	From	То				
Fab Site	Diodes Maine and Tower	Vanguard				
Wafer Diameter	8 inch and 6 inch	8 inch				
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				

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#### **Datasheet Changes:**

**NL17SGxx Family** 

# NL17SG except for NL17SGU04 - Max Ratings

#### **Existing**

Symbol	Parame	ter	Value	Unit		
Vcc	DC Supply Voltage		-0.5 to +5.5	٧		
VIN	DC Input Voltage		-0.5 to +4.6	٧		
V <sub>OUT</sub>	DC Output Voltage	Output at High or Low State Power-Down Mode (V <sub>CC</sub> = 0 V)	-0.5 to V <sub>CC</sub> +0.5 -0.5 to +4.6	٧		
I <sub>IK</sub>	DC Input Diode Current	V <sub>IN</sub> < GND	-20	mA		
lok	DC Output Diode Current	V <sub>OUT</sub> < GND	-20	mA		
lout	DC Output Source/Sink Current		±20	mA		
Icc	DC Supply Current per Supply Pin		±20	mA		
IGND	DC Ground Current per Ground Pin	C Ground Current per Ground Pin				
T <sub>STG</sub>	Storage Temperature Range		-65 to +150	°C		
TL	Lead Temperature, 1 mm from Case for 10 Se	econds	260	°C		
TJ	Junction Temperature Under Bias		+150	°C		
MSL	Moisture Sensitivity		Level 1			
FR	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in			
V <sub>ESD</sub>	ESD Withstand Voltage	Human Body Model (Note 2) Machine Model (Note 3)	>2000 >100	٧		
LATCHUP	Latchup Performance Above	e V <sub>CC</sub> and Below GND at 125°C (Note 4)	±100	mA		

#### New

Symbol	Parame	Value	Unit	
Voc	DC Supply Voltage		-0.5 to +4.3	٧
VIN	DC Input Voltage		-0.5 to +4.3	٧
V <sub>OUT</sub>	DC Output Voltage	-0.5 to V <sub>CC</sub> + 0.5 -0.5 to +4.3 -0.5 to +4.3	٧	
I <sub>IK</sub>	DC Input Diode Current	V <sub>IN</sub> < GND	-20	mA
lok	DC Output Diode Current	V <sub>OUT</sub> < GND	-20	mA
lout	DC Output Source/Sink Current		±20	mA
CC or IGND	DC Supply Current Per Supply Pin or Grou	±20	mA	
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	°C	
TL	Lead Temperature, 1 mm from Case for 10	260	°C	
TJ	Junction Temperature Under Bias		+150	°C
θјд	Thermal Resistance (Note 2)	SC-88A SOT-953 UDFN6	377 254 154	°C/V
PD	Power Dissipation in Still Air at 85°C	SC-88A SOT-953 UDFN6	332 491 812	mW
MSL	Moisture Sensitivity		Level 1	
FR	Flammability Rating	Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in	
V <sub>ESD</sub>	ESD Withstand Voltage (Note 3)	Human Body Model Charged Device Model	2000 1000	٧
LATCHUP	Latchup Performance (Note 4)		±100	mA

# All NL17SG except for NL17SG07/14/17/U04 - DC

# Characteristics

#### **Existing**

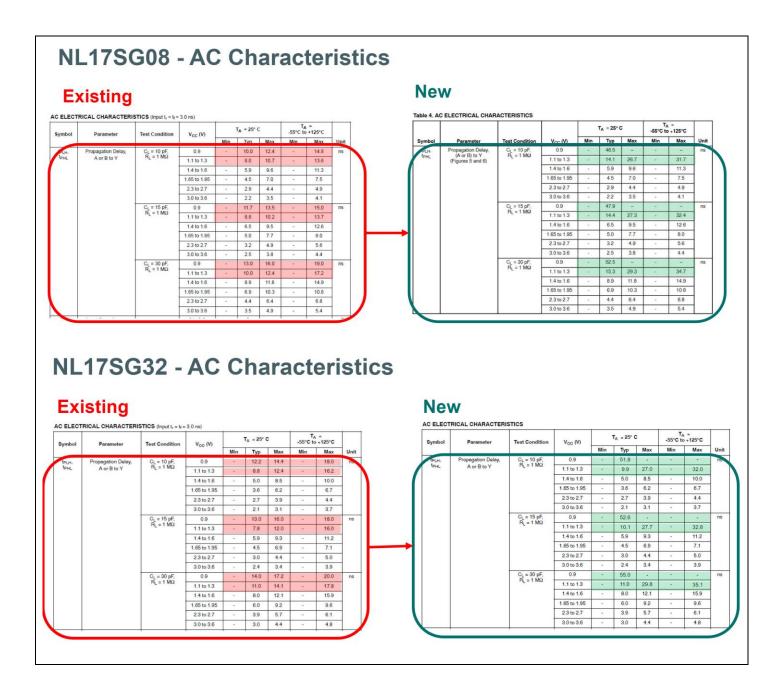
#### New

					T <sub>A</sub> =	25°C		+125°C		Table 3	DC ELECTRICA	L CHARACTERIST	ics		T <sub>A</sub> = 25°C		TA = -55°C	C to +	
mbol	Parameter	C	onditions	V <sub>CC</sub> (V)	Min	Max	Min	Max	Unit	Symbol		- "	W-00		7		Min		
IH	High-Level Input			0.9	Vcc		Voc		V	V	High-Level Input		0.9	-	Voc	2	-		
	Voltage			1.1 to 1.3	0.7xV <sub>CC</sub>		0.7xV <sub>CC</sub>				Voltage		1.1 to 1.3	0.7 x V <sub>CC</sub>	-	-	0.7 x V <sub>CC</sub>		
				1.4 to 1.6	0.65xV <sub>CC</sub>		0.65xV <sub>CC</sub>		1				1.4 to 1.6	0.65 x V <sub>CC</sub>	-	-	0.65 x V <sub>CC</sub>		
				1.65 to 1.95	0.65xV <sub>CC</sub>		0.65xV <sub>CC</sub>		1	/			1.65 to 1.95	0.65 x V <sub>CC</sub>	-	-	0.65 x V <sub>CC</sub>		
				2.3 to 2.7	1.7		1.7		1				2.3 to 2.7	1.7		-	1.7		
				3.0 to 3.6	2.0		2.0		1				3.0 to 3.6	2.0	-	-	2.0	-	
V <sub>IL</sub>	Low-Level Input			0.9		GND		GND	٧	VIL	Low-Level Input Voltage		0.9	-	GND	-	-	-	
	Voltage			1.1 to 1.3		0.3xV <sub>CC</sub>		0.3xV <sub>CC</sub>			7.00		1.1 to 1.3 1.4 to 1.6	-	-	0.3 x V <sub>CC</sub>	-	0.35 x	
				1.4 to 1.6		0.35xV <sub>CC</sub>		0.35xV <sub>CC</sub>	1				1.4 to 1.6 1.65 to 1.95	-	-	0.35 x V <sub>CC</sub> 0.35 x V <sub>CC</sub>	-	0.35	
				1.65 to 1.95		0.35xV <sub>CC</sub>		0.35xV <sub>CC</sub>	1				2.3 to 2.7	-	-	0.30 x V <sub>CC</sub>	-	0.307	
				2.3 to 2.7		0.7		0.7	]				3.0 to 3.6	-	-	0.8	-	0	
				3.0 to 3.6		0.8		0.8		VoH	High-Level Output	$V_{IN} = V_{IH} \text{ or } V_{II}$				-			
V <sub>OH</sub>	High-Level	V <sub>IN</sub> =	I <sub>OH</sub> = -20 μA	0.9	0.75		0.75		v		1000000	Voltage	I <sub>OH</sub> = -20 μA	0.9	2	0.75	-	-	-
On	Output Voltage	V <sub>IH</sub> or V <sub>II</sub>	I <sub>OH</sub> = -0.3 mA	1.1 to 1.3	0.75xV <sub>CC</sub>		0.75xV <sub>CC</sub>				1	I <sub>OH</sub> = -0.3 mA	1.1 to 1.3	0.75 x V <sub>CC</sub>	-	-	0.75 x V <sub>CC</sub>		
		1,10	I <sub>OH</sub> = -1.7 mA	1.4 to 1.6	0.75xV <sub>CC</sub>		0.75xV <sub>CC</sub>			11		I <sub>OH</sub> = -1.7 mA		0.75 x V <sub>CC</sub>	1.5	.5	0.75 x V <sub>CC</sub>		
			I <sub>OH</sub> = -3.0 mA				V <sub>CC</sub> -0.4					I <sub>OH</sub> = -3.0 mA			-	-	V <sub>CC</sub> - 0.45		
			lon in the	1.65 to 1.95	Vcc-0.45		5					I <sub>OH</sub> = -4.0 mA		2.0		-	2.0		
			I <sub>OH</sub> = -4.0 mA	2.3 to 2.7	2.0		2.0			V C	Low-Level Output	I <sub>OH</sub> = -8.0 mA	3.0 to 3.6	2.48	-	(4)	2.48	-	
			I <sub>OH</sub> = -8.0 mA	3.0 to 3.6	2.48		2.48			VOL	Voltage	$I_{OL} = 20 \mu A$	0.9	-	0.1				
VOL	Low-Level	V <sub>IN</sub> =	I <sub>OL</sub> = 20 μA	0.9		0.1		0.1	٧			I <sub>OL</sub> = 0.3 mA			-	0.25 x V <sub>CC</sub>		0.25	
	Output Voltage	V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> = 0.3 mA	1.1 to 1.3		0.25xV <sub>CC</sub>		0.25xV <sub>CC</sub>				I <sub>OL</sub> = 1.7 mA		-	-	0.25 x V <sub>CC</sub>	-	0.25	
			I <sub>OL</sub> = 1.7 mA	1.4 to 1.6		0.25xV <sub>CC</sub>		0.25xV <sub>CC</sub>				I <sub>OL</sub> = 3.0 mA		-	1 - 1	0.45	-	0.	
			I <sub>OL</sub> = 3.0 mA	1.65 to 1.95		0.45		0.45				I <sub>OL</sub> = 4.0 mA	23 to 2.7	-	-	0.4	-	0	
			I <sub>OL</sub> = 4.0 mA	2.3 to 2.7		0.4		0.4	1			I <sub>OL</sub> = 8.0 mA	2.7 to 3.6	= 1	-	0.4		0	
			I <sub>OL</sub> = 8.0 mA	3.0 to 3.6		0.4		0.4	1	Inc	Input Leakage Current	V <sub>IN</sub> = 0 V to 3.6 V	0.9 to 3.6	-	-	±0.1	-	±	
I <sub>IN</sub>	Input Leakage Current	0 ≤	$V_{IN} \le 3.6 \text{ V}$	0 to 3.6		±0.1		± 1.0	μА	lore	Power Off	V <sub>IN</sub> = 0 V to 3.6 V; V <sub>OUT</sub> = 0 V to 3.6 V	0	-	-	1.0	-	10	
lcc	Quiescent Supply Current	V <sub>IN</sub> :	V <sub>CC</sub> or GND	3.6		0.5		10.0	μА	Voc		V <sub>IN</sub> = V <sub>CC</sub> or GND	0.9 to 3.6	-	-	1.0	-	10	

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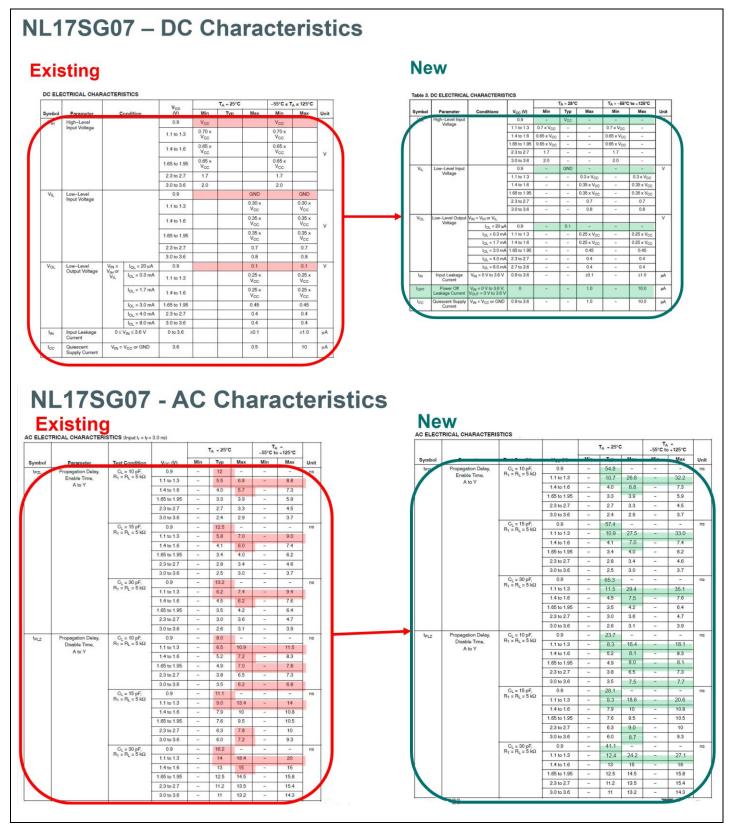
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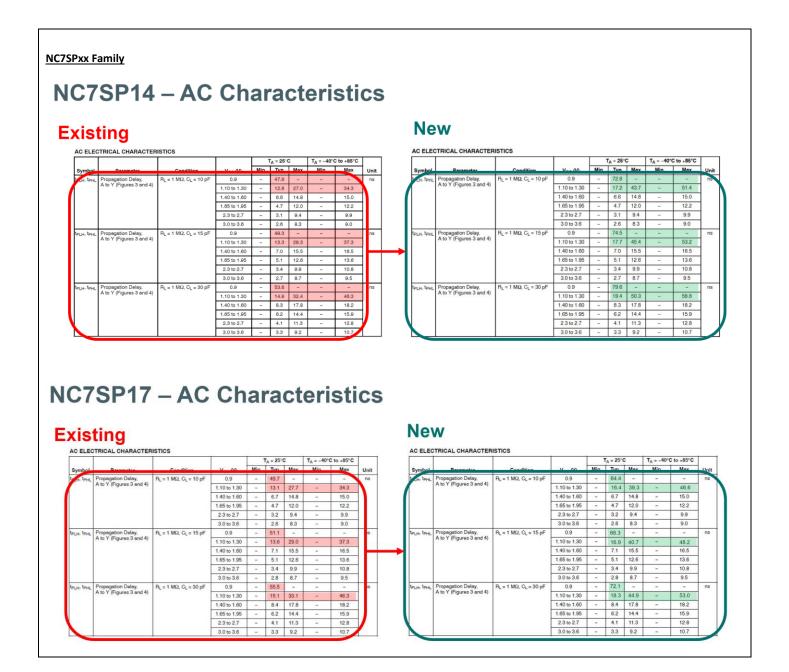
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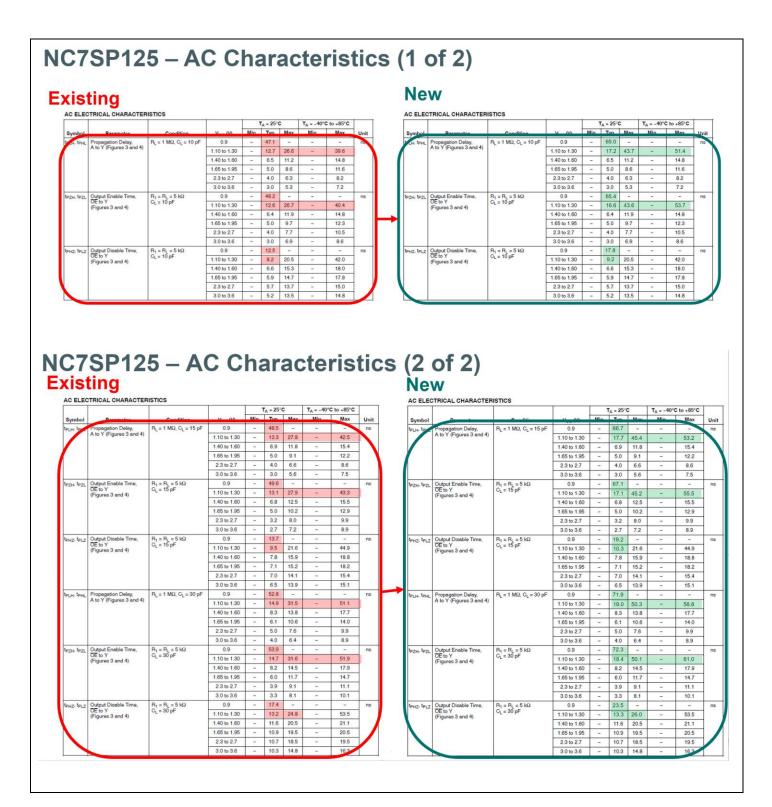
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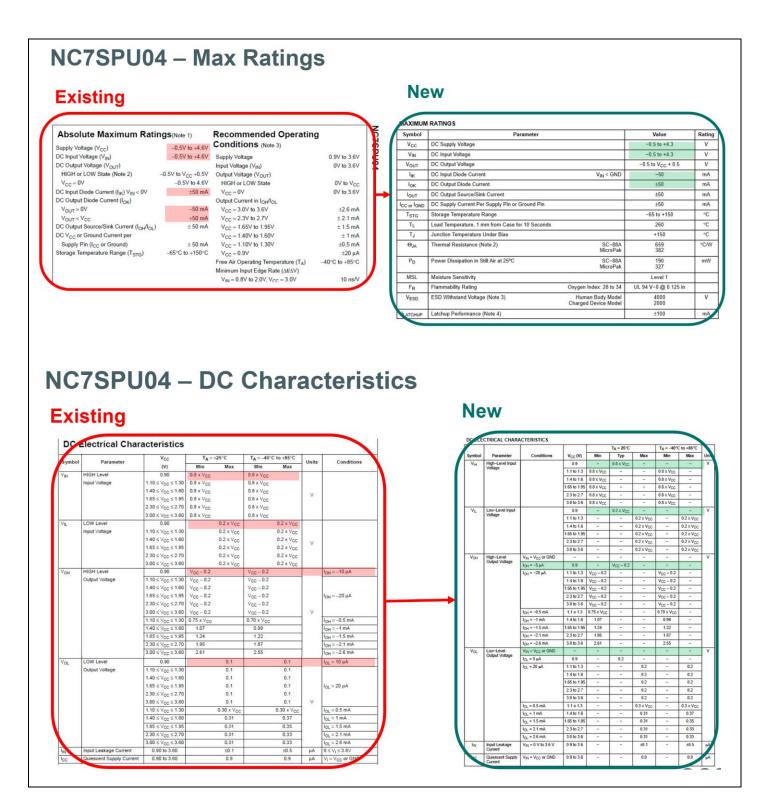
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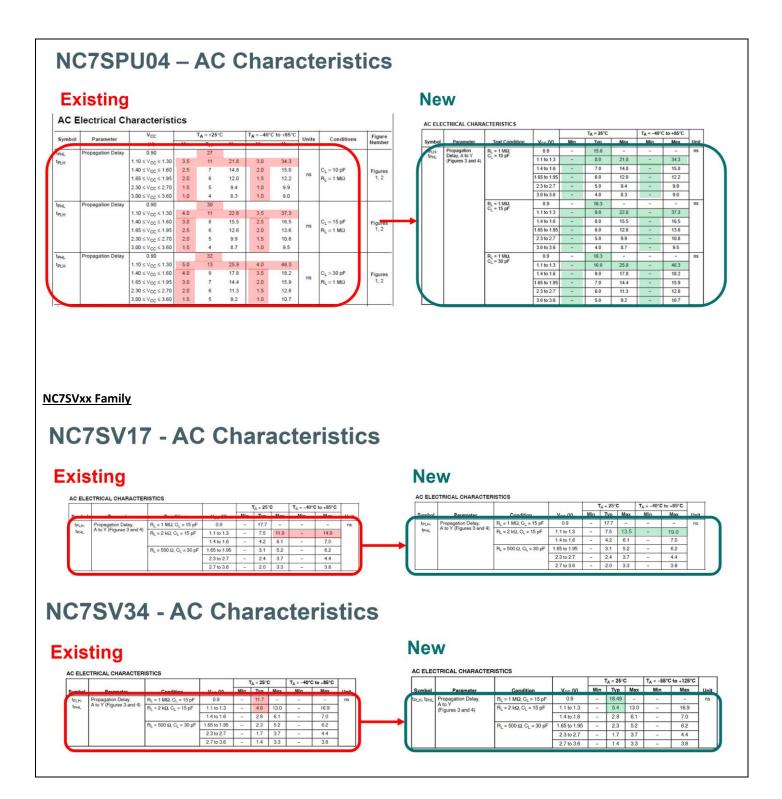
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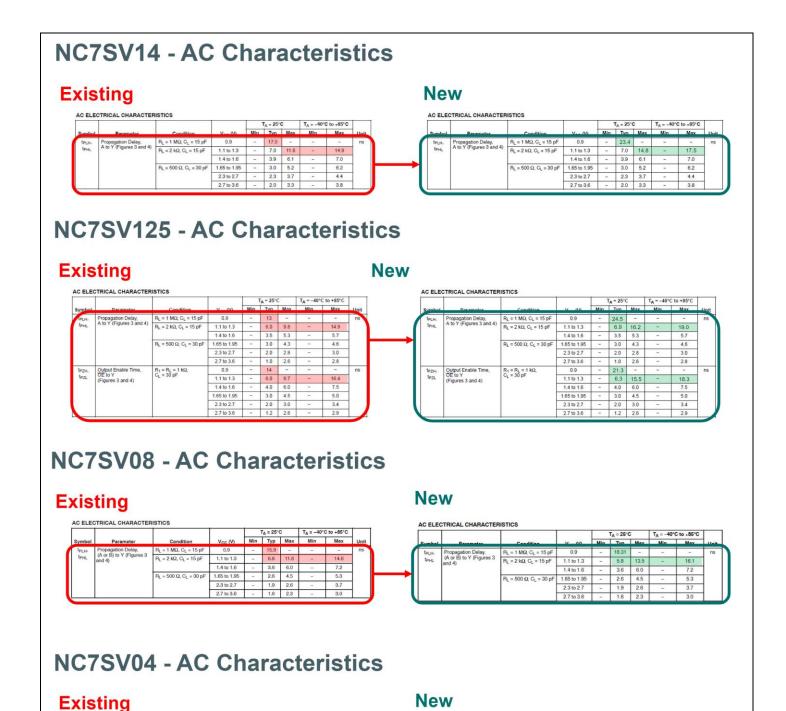
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AC ELECTRICAL CHARACTERISTICS

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T<sub>A</sub> = -40°C to +85°C

6.0

5.2 3.4

TA = 25°C

3.1 5.1

2.4 4.2 1.8 2.7

1.5 2.3

1.4 to 1.6

2.7 to 3.6

AC ELECTRICAL CHARACTERISTICS

 $R_L = 2 k\Omega$ ,  $C_L = 15 pF$ 

1.1 to 1.3

1.4 to 1.6

1.65 to 1.95 2.3 to 2.7 3.1 5.1 2.4 4.2

3.4



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# NC7SV00 - AC Characteristics

#### New **Existing** AC ELECTRICAL CHARACTERISTICS AC ELECTRICAL CHARACTERISTICS T<sub>A</sub> = -40°C to +85°C 7.2 5.3 1.4 to 1.6 3.4 6.0 7.2 1.4 to 1.6 R<sub>L</sub> = 500 Ω, C<sub>L</sub> = 30 pF 2.3 to 2.7 2.7 to 3.6 1.8 2.6 1.5 2.3 2.3 to 2.7 2.7 to 3.6 1.8 2.6 1.5 2.3 3.7

No change for NC7SV32

#### **Reliability Data Summary:**

QV DEVICE NAME: NC7SP14P5X

RMS: S88008 / S88413 PACKAGE: SC88A

Test	Specification	Condition	Interval	Results
High Temperature Operating Life	JESD22-A108	Ta=125°C, 100 % max rated Vcc	1008 hours	0/231
Earlier Life Failure Rate	JESD22-A108	Ta=125°C, 100 % max rated Vcc	48 hours	0/2400
High Temperature Storage Life	JESD22-A103	Ta= 150°C	1008 hours	0/231
Preconditioning	J-STD-020 JESD-A113			0/693
Temperature Cycling	JESD22-A104	Ta= -65°C to +150°C	500 cycles	0/231
Highly Accelerated Stress Test	JESD22-A110	130°C, 85% RH, 18.8psig, bias	96 hours	0/231
Unbiased Highly Accelerated Stress Test	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hours	0/231
Resistance to Solder Heat	JESD22- B106	Ta = 265°C, 10 sec	=	0/30

#### **Electrical Characteristics Summary:**

Electrical characteristics available upon request.

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#### **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**.

Part Number	New Part Number	Qualification Vehicle				
NC7SP125P5X	#NONE	NC7SP14P5X				
NC7SP125P5X-L22735	NC7SP125P5X	NC7SP14P5X				
NC7SP14P5X	#NONE	NC7SP14P5X				
NC7SP17P5X	#NONE	NC7SP14P5X				
NC7SPU04P5X	#NONE	NC7SP14P5X				
NC7SV17P5X	#NONE	NC7SP14P5X				
NL17SG32DFT2G-L22735	NL17SG32DFT2G	NC7SP14P5X				
NL17SG32DFT2G	#NONE	NC7SP14P5X				
NL17SG08DFT2G	#NONE	NC7SP14P5X				
NL17SG07DFT2G	#NONE	NC7SP14P5X				
NL17SG07EDFT2G	NL17SG07DFT2G	NC7SP14P5X NC7SP14P5X				
NC7SV32P5X	#NONE					
NC7SV34P5X	#NONE	NC7SP14P5X				
NC7SV14P5X	#NONE	NC7SP14P5X				
NC7SV125P5X	#NONE	NC7SP14P5X				
NC7SV08P5X-L22735	NC7SV08P5X	NC7SP14P5X				
NC7SV08P5X	#NONE	NC7SP14P5X				
NC7SV04P5X	#NONE	NC7SP14P5X				
NC7SV00P5X	#NONE	NC7SP14P5X				

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