ON Semiconductor®

Final Product/Process Change Notification

Document #: FPCN23824ZA
Issue Date: 11 Aug 2021

Title of Change:	Gresham Devices as Drop-In Replacements for Current FAB2 Devices - NCV8660B family
Proposed Changed Material First Ship Date:	24 Jun 2022 or earlier if approved by customer
Current Material Last Order Date:	31 Aug 2021 *Orders received after the Current Material Last Order Date expiration are to be considered as orders for new changed material as described in this PCN. Orders for current (unchanged) material after this date will be per mutual agreement and current material inventory availability.*
Current Material Last Delivery Date:	23 Jun 2022, unless otherwise mutually agreed. *The Current Material Last Delivery Date may be subject to change based on build and depletion of the current (unchanged) material inventory*
Product Category:	Active components – Integrated circuits
Contact information:	Contact your local ON Semiconductor Sales Office or PCN.Support@onsemi.com
PCN Samples Contact:	Contact your local ON Semiconductor Sales Office to place sample order or <PCN.samples@onsemi.com>. Sample requests are to be submitted no later than 45 days after publication of this change notification. Samples delivery timing will be subject to request date, sample quantity and special customer packing/label requirements.
Sample Availability Date:	31 Aug 2021
PPAP Availability Date:	14 Sep 2021
Additional Reliability Data:	Contact your local ON Semiconductor Sales Office or Tomas.Vajter@onsemi.com
Type of Notification:	This is a Final Product/Process Change Notification (FPCN) sent to customers. The change will be implemented at 'Proposed Change Material First Ship Date' in compliance to J-STD-46 or ZVEI, or earlier upon customer approval, or per our signed agreements. ON Semiconductor will consider this proposed change and it's conditions acceptable, unless an inquiry is made in writing within 45 days of delivery of this notice. To do so, contact PCN.Support@onsemi.com.

Change Category

Category	Type of Change
Design	Design Change in Active Elements
Process - Wafer Production	Change in process technology (e. g. process changes like lithography, etch, oxide deposition, diffusion, die back surface preparation/backgrind, ...), Move of all or part of wafer fab to a different location/site/subcontractor, New wafer diameter
Data Sheet	Change of datasheet parameters/electrical specification (min./max./typ. values) and/or AC/DC specification
Process - Assembly	Change of mold compound, Change of wire bonding, Change of product marking

Description and Purpose:

Change of design to new wafer technology to support new wafer technology. Change of wafer processing technology from PS5B currently manufactured in Fab2, Oudenaarde, Belgium (150 mm fab) to I3T50 in Gresham, Oregon, USA (200 mm fab). Old PS5B technology replaced by the more advanced I3T50 wafer process. PS5B wafer technology is nearing end of life and cannot support future production needs.
These changes are also related to the Fab2 manufacturing site sale.
In addition, package changes were done to improve delamination performance.

	Before Change Description	After Change Description
OPN	NCV86601BDT50RKG, NCV86602BDT33RKG, NCV86603BDT33RKG	NCV8760CDT501RKG, NCV8760CDT332RKG, NCV8760CDT333RKG
Wafer Fab location	Fab2, Oudenaarde, Belgium	Gresham, Oregon, USA
Wafer Technology	PS5B (1.5um)	I3T50 (0.35um)
Wafer Diameter	150mm	200mm
Bond Wire	2.0 mil	1.5 mil
Mold Compound	GE 8000CH4ES	G700HF

	From	To
Product marking change	NCV86601BDT50RKG - Line1: 6601B5G; NCV86602BDT33RKG - Line1: 6602B3G; NCV86603BDT33RKG - Line1: 6603B3G	NCV8760CDT501RKG - Line1: 7601C5G; NCV8760CDT332RKG - Line1: 7602C3G; NCV8760CDT333RKG - Line1: 7603C3G

Reason / Motivation for Change:	**Benefit of the change:** More modern wafer technology that will supported long term with improved wafer fab capacity. Improved package BOM. Improved parametric performance. **Risk for Late Release:** Possible supply disruptions. **Quality Improvement:** Yes. Lower die defectivity, improved package delamination performance.
Anticipated impact on fit, form, function, reliability, product safety or manufacturability:	The device has been qualified and validated based on the same Product Specification. The device has successfully passed the qualification tests. Potential impacts can be identified, but due to testing performed by ON Semiconductor in relation to the PCN, associated risks are verified and excluded. Datasheet updates as shown in Electrical Characteristic Summary below.

Sites Affected:

ON Semiconductor Sites	External Foundry/Subcon Sites
ON Semiconductor Gresham, Oregon, USA	None
ON Semiconductor Oudenaarde, Belgium	
ON Semiconductor Seremban, Malaysia	

Marking of Parts/ Traceability of Change:	New OPNs will have new package topside marking: NCV8760CDT501RKG - Line1: 7601C5G; NCV8760CDT332RKG - Line1: 7602C3G; NCV8760CDT333RKG - Line1: 7603C3G

Reliability Data Summary:

QV DEVICE NAME: NCV8760CDT501RKG
RMS: S71317
PACKAGE: DPAK 5LD

Test	Specification	Condition	Interval	Results
HTOL	JESD22-A108	Ta = 125°C, Vcc = 40V	2030 hrs	0/240
HTSL	JESD22-A103	Ta = 150°C	2016 hrs	0/84
TC	JESD22-A104	Ta = -65°C to+150°C	1000 cyc	0/168
PTC	JESD22 A105	Ta = -40°C to+125°C	1000 cyc	0/81
HAST	JESD22-A110	Ta = 110°C, 85% RH, 18.8psig, Vcc = 40V	528 hrs	0/168
uHAST	JESD22-A118	Ta = 130°C, 85% RH, 18.8psig, unbiased	192 hrs	0/168
PC	JESD-A113, J-STD-020	MSL= 1 @ 260°C		

NOTE: AEC-Q100 1-pager attached

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.

AEC-Q100_NCV8760C

Electrical Characteristics Summary:

(Note: changes in test conditions/specifications: in Red – removed/worse, in Green – added/improved.)

Datasheet Maximum Ratings updated as follows

	NCV8660B		NCV8760C		
Rating	**Min**	**Max**	**Min**	**Max**	**Unit**
Input Voltage	-0.3	40	-0.3	40	V
Input Voltage Loadump - Suppressed	-	-	-	45	V
Input Current	-1.0	-	-	-	mA
Output Voltage, DC Output Voltage, Transient t < 10 s	-0.3 -0.3	5.5 16	-0.3 -	7 -	V
Output Current	-1.0	Current Limited	-	-	mA
DT (Reset Delay Time Select) Voltage	-0.3	16	-0.3	7	V
Reset Delay Time Select Current	-1.0	1.0	-	-	mA
Reset Output Voltage, DC Reset Output Voltage, Transient t < 10 s	-0.3 -0.3	5.5 16	-0.3 -	7 -	V
Reset Output Current	-1.0	1.0	-	-	mA
ESD Capability, Human Body Model	-2.0	2.0	-4.0	4.0	kV

Datasheet Electrical Characteristics updated as follows

	NCV8660B						NCV8760C					
	5.5 V < Vin < 40 V, −40°C ≤ TJ ≤ 150°C unless otherwise specified						VIN = 13.5 V, CIN = 0.1 µF, COUT = 2.2 µF, Min and Max values are valid for temperature range −40°C ≤ TJ ≤ +150°C unless noted otherwise and are guaranteed by test, design or statistical correlation. Typical values are referenced to TJ = 25°C (Note 8)					
Parameter	**Test Conditions**	**Symbol**	**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**	**Symbol**	**Min**	**Typ**	**Max**	**Unit**
Regulator Output												
Output Voltage (Accuracy %)	V_{IN} = 6 V to 16 V, I_{OUT} = 0.1 mA to 150 mA	V_{OUT}	4.9	5	5.1	V	V_{IN} = 5.7 V to 16 V, I_{OUT} = 0 mA to 150 mA	V_{OUT}	4.9	5	5.1	V
5.0 V	V_{IN} = 6 V to 40 V, I_{OUT} = 0.1 mA to 100 mA		4.9	5	5.1		V_{IN} = 5.55 V to 40 V, I_{OUT} = 0 mA to 100 mA		4.9	5	5.1	
	V_{IN} = 5.6 V to 16 V, I_{OUT} = 0 mA to 150 mA, T_J ≤ 125°C		4.9	5	5.1				-	-	-	
3.0 V	V_{IN} = 5.5 V to 16 V, I_{OUT} = 0.1 mA to 150 mA		3.234	3.3	3.366		V_{IN} = 4.5 V to 16 V, I_{OUT} = 0 mA to 150 mA		3.234	3.3	3.366	
	V_{IN} = 5.5 V to 40 V, I_{OUT} = 0.1 mA to 100 mA		3.234	3.3	3.366		V_{IN} = 4.5 V to 40 V, I_{OUT} = 0 mA to 100 mA		3.234	3.3	3.366	
Line Regulation	V_{IN} = 6 V to 28 V, I_{OUT} = 5.0 mA	ΔV_{OUT}	-20	0	20	mV	V_{IN} = 6 V to 28 V, I_{OUT} = 5.0 mA	Reg_{LINE}	-20	0	20	mV
Load Regulation	V_{IN} = 13.2 V, I_{OUT} = 0.1 mA to 150 mA	ΔV_{OUT}	-40	10	40	mV	Iout = 0.1 mA to 150 mA	Reg_{LOAD}	-40	0	40	mV
Dropout Voltage (Note 9) 5	Iout = 100 mA (Note 7)	V_{DR}	-	255	450	mV	I_{OUT} = 100 mA	V_{DO}	-	125	300	mV
	Iout = 150 mA (Note 7)		-	300	600	mV	I_{OUT} = 150 mA		-	200	450	
Quiescent Current												
Quiescent Current, $I_Q = I_{IN} - I_{OUT}$		I_Q				µA	I_{OUT} = 0 mA, T_J = 25°C	I_Q	-	18	21	µA
							I_{OUT} = 0 mA, T_J ≤ 125°C		-	-	23	
	I_{OUT} = 0.1 mA to 150 mA, V_{IN} = 13.2 V, T_J = 25°C		-	25	30		I_{OUT} = 0.1 mA, T_J = 25°C		-	20	24	
	I_{OUT} = 0.1 mA to 150 mA, V_{IN} = 13.2 V, T_J ≤ 85°C		-	-	40		I_{OUT} = 0.1 mA, T_J ≤ 125°C		-	-	26	
PSRR												
Power Supply Ripple Rejection	V_{IN} = 13.2 V, f = 100 Hz, 0.5 Vpp	PSRR	-	60	-	dB	f = 100 Hz, 0.5 Vpp	PSRR	-	70	-	dB
Reset Output RO												
Reset Output Low Voltage	10 kΩ RESET to OUT, V_{OUT} = 4.5 V	V_{RL}	-	0.2	0.4	V	V_{OUT} < V_{RT}, I_{RO} = -1 mA	V_{ROL}	-	0.2	0.4	V
Reset Output High Voltage	10 kΩ RESET to GND	V_{RH}	VOUT - 0.4	VOUT - 0.2	-	V		V_{ROH}	VOUT - 0.4	VOUT - 0.2	-	V
Thermal Shutdown (Note 10)												
Thermal Shutdown Temperature	(Note 6)	T_{SD}	150	175	195	°C		T_{SD}	150	175	195	°C
Thermal Shutdown Hysteresis	(Note 6)	T_{HYS}	-	25	-	°C		T_{SH}	- - -	10	- - -	°C

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
NCV86603BDT33RKG	NCV8760CDT333RKG	NCV8760CDT501RKG
NCV86602BDT33RKG	NCV8760CDT332RKG	NCV8760CDT501RKG
NCV86601BDT50RKG	NCV8760CDT501RKG	NCV8760CDT501RKG