

PCN Supporting Data Package

PCN #: 20250304001.1

Title: CD405x Die Revision Change and Datasheet Update

Texas Instruments Contact: Cheri Davis / Bob Pitts

March 2025

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PCN Information:

PCN Number:	20250304001.1		PCN Date:	March 04, 2025	
Title:	CD405x Die Revision Change and Datasheet Update				
Customer Contact:	Change Management team		Dept:	Quality Services	
Proposed 1 st Ship Date:	June 02, 2025		Sample requests accepted until:	May 03, 2025*	
*Sample requests received after May 03, 2025 will not be supported.					
Change Type:					
☐ Assembly Site	☒ Design	☐ Wafer Bump Material			
☐ Assembly Process	☒ Data Sheet	☐ Wafer Bump Process			
☐ Assembly Materials	☐ Part number change	☐ Wafer Fab Site			
☐ Mechanical Specification	☐ Test Site	☐ Wafer Fab Materials			
☐ Packing/Shipping/Labeling	☐ Test Process	☐ Wafer Fab Process			
PCN Details					
Description of Change:					
This notification is to inform of a design change to the CD405x family of devices. This is a design change to improve electrical behavior at 5V and lower operation.					
The product datasheet is updated as seen in the change revision history below:					
 TEXAS INSTRUMENTS CD4051B, CD4052B, CD4053B SCHS047N – AUGUST 1998 – REVISED FEBRUARY 2025					
Changes from Revision M (November 2024) to Revision N (February 2025) Page					
• Updated Section 1 1					
• Removed Figure 5-4 and Figure 5-5..... 11					
• Updated Section 7.1 15					
• Updated Section 7.3 17					
• Updated Figure 8-1 to 5V VDD..... 19					
Product Folder	Current Datasheet Number	New Datasheet Number	Link to full datasheet		
CD405xB	SCHS047M	SCHS047N	http://www.ti.com/product/CD4051B		
Qual details are provided in the Qual Data Section.					
Reason for Change:					
To improve low voltage operation					
Anticipated impact on Form, Fit, Function, Quality or Reliability (positive / negative):					
Improved low voltage operation					
Impact on Environmental Ratings:					
Checked boxes indicate the status of environmental ratings following implementation of this change. If below boxes are checked, there are no changes to the associated environmental ratings.					
RoHS		REACH	Green Status	IEC 62474	
☒ No Change		☒ No Change	☒ No Change	☒ No Change	
Changes to product identification resulting from this PCN:					
Die Rev designator will change as shown in the table and sample label below:					
Current		New			

Wafer Fab/Assembly site maps



About Richardson RFAB Wafer Fab



Key Dates:

Establishment: 2010

Fab Facts:

Wafer Size: 300 mm

Function: IC Manufacturing

- Front-end Process

- Test (Parametric & Multiprobe)

FA Lab

Technologies: LBC7/LBC8LV/LBC8MV/C05/50HPA07HV
and LBC9/HPA9

End Products: Consumer, Automotive & Industrial ICs

Smallest Feature Size: 0.13 μ m

Cleanroom: Class 10/1;
Class 100 (FOUP)

Shift Model 3 Shifts – 12h / 24/7

Texas Instruments Malaysia Sdn Bhd

Standard Data Packet Content

Factory Location

- ☐ Address :
No. 1, Lorong Enggang 33,
Ampang/Ulu Kelang
54200 Kuala Lumpur
- ☐ Geographical location
of Assembly Site
[Street Directory](#)



Package Portfolio/Offering

- ☐ Attach link to package portfolio
TIM [Package portfolio](#)
- ☐ List of package offering
PDIP; SOIC; TVSOP; SSOP; SOP; HTSSOP,
HSSOP, VSON; WSON; VQFN; WQFN

Company Website

- ☐ Attach company website link
TIM [Company profile](#)

Certifications Completed

- ☐ Provide list of Assembly site
Certifications completed
[ISO 9001](#)
[IATF 16949](#)
[ISO 14001](#)
[ISO 45001](#)

What is needed: Each TI A/T site will provide the above information & store the information on a SharePoint identified by TMG team.
Assembly SDP can be updated by each TI site as needed

PDA (Process Difference Analysis): (All devices)

Process Step	Comments
Form	No impact. The mechanical outline of the product is not changed.
Fit	No change
Function	Improved low voltage behavior

Process Step	RFAB Current Fab LBC9	RFAB New Fab LBC9
Wafer Fab Site	RFAB	RFAB
Wafer Diameter	300mm	Same
Processing Technology	LBC9	Same
Electrically active doping / implantation element	Antimony, Boron, Phosphorus, Arsenic	Same
Gate Oxide Material	SiO2	Same
Dielectric Material	SiO2, BPSG, HDP Oxide, TEOS, Nitride	Same
Wafer substrate material	Ti, TiN, W	Same
Metallization material, front or back side	Ti, TiN, W	Same
Passivation	TiN, Ti, Al / 0.5%Cu, Ti, TiN	Same
Final Wafer Thickness	Oxide, Nitride	Same
Die Coating Material	n/a	n/a
Bump solder ball or attach solder material composition	n/a	n/a

PDA (Process Difference Analysis) – MLA to MLA

(CD4051BPWR, CD4051BQPWRQ1, CD4052BPWR, CD4053BPWR)

Change Type	Current	New
Assembly site	MLA	MLA
Substrate or Lead frame material	Cu (4226052)	Same
Lead frame finish or plating technique	NiPdAu Roughened	Same
BGA solder ball material composition	n/a	n/a
Flip chip ball/bump and/or attach solder material composition	n/a	n/a
Bond wire material / diameter	4218106-1000 (1.0mil PCC)	Same
Mold compound/encapsulation material	(4211471)	Same (4211471)
Die coating material	n/a	n/a
Die attach material	(4147858)	Same
Hermetic Sealing	n/a	n/a
Case outline drawing which alters critical dimensions or loosens tolerances or EPOD design changes	n/a	n/a
Marking appearance or method	Same	Same
Top protective layer or Passivation layer material	Oxide, Nitride	Same
Packing/Shipping	n/a	n/a

PDA (Process Difference Analysis) – MLA to MLA

(CD4051BE, CD4052BE, CD4053BE)

Change Type	Current	New
Assembly site	MLA	MLA
Substrate or Lead frame material	Cu (4223486)	Same
Lead frame finish or plating technique	NiPdAu Roughened	Same
BGA solder ball material composition	n/a	n/a
Flip chip ball/bump and/or attach solder material composition	n/a	n/a
Bond wire material / diameter	4218106 (1.0mil PCC)	Same
Mold compound/encapsulation material	(4211880)	Same
Die coating material	n/a	n/a
Die attach material	(4147858)	Same
Hermetic Sealing	n/a	n/a
Case outline drawing which alters critical dimensions or loosens tolerances or EPOD design changes	n/a	n/a
Marking appearance or method	Same	Same
Top protective layer or Passivation layer material	Oxide, Nitride	Same
Packing/Shipping	n/a	n/a

PDA (Process Difference Analysis) – MLA to MLA

(CD4051BM96, CD4052BM96, CD4053BM96)

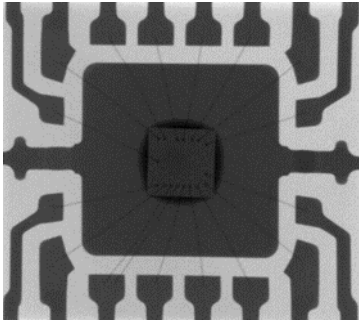
Change Type	ZVEI ID	Current	New
Assembly site	SEM-PA-18	MLA	MLA
Substrate or Lead frame material	SEM-PA-02	Cu (4225923)	Same
Lead frame finish or plating technique	SEM-PA-05	NiPdAu Roughened	Same
BGA solder ball material composition	SEM-PA-06	n/a	n/a
Flip chip ball/bump and/or attach solder material composition	SEM-PA-06	n/a	n/a
Bond wire material / diameter	SEM-PA-08	4218106 (1.0mil PCC)	Same
Mold compound/encapsulation material	SEM-PA-11	(4211880)	Same
Die coating material	SEM-PA-10	n/a	n/a
Die attach material	SEM-PA-07	(4147858)	Same
Hermetic Sealing	SEM-PA-12	n/a	n/a
Case outline drawing which alters critical dimensions or loosens tolerances or EPOD design changes	SEM-PA-01	n/a	n/a
Marking appearance or method	SEM-PA-13	Same	Same
Top protective layer or Passivation layer material	SEM-PW-08	Oxide, Nitride	Same
Packing/Shipping	SEM-PS-04	n/a	n/a

PDA (Process Difference Analysis) – MLA to MLA

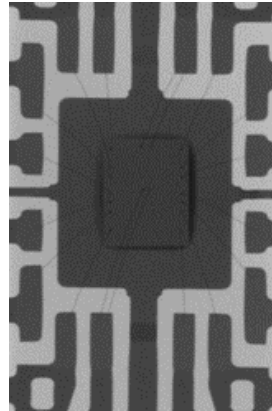
(CD4051BNSR, CD4052BNSR, CD4053BNSR)

Change Type	ZVEI ID	Current	New
Assembly site	SEM-PA-18	MLA	MLA
Substrate or Lead frame material	SEM-PA-02	Cu (4041365)	Same
Lead frame finish or plating technique	SEM-PA-05	NiPdAu Non-roughened	Same
BGA solder ball material composition	SEM-PA-06	n/a	n/a
Flip chip ball/bump and/or attach solder material composition	SEM-PA-06	n/a	n/a
Bond wire material / diameter	SEM-PA-08	4218106 (1.0mil PCC)	Same
Mold compound/encapsulation material	SEM-PA-11	(4211880)	Same
Die coating material	SEM-PA-10	n/a	n/a
Die attach material	SEM-PA-07	(4147858)	Same
Hermetic Sealing	SEM-PA-12	n/a	n/a
Case outline drawing which alters critical dimensions or loosens tolerances or EPOD design changes	SEM-PA-01	n/a	n/a
Marking appearance or method	SEM-PA-13	Same	Same
Top protective layer or Passivation layer material	SEM-PW-08	Oxide, Nitride	Same
Packing/Shipping	SEM-PS-04	n/a	n/a

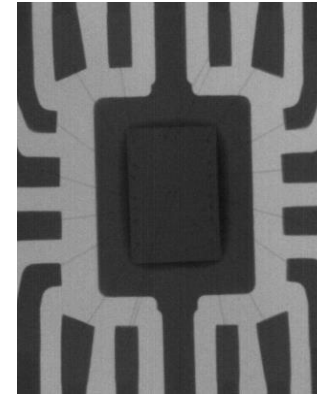
X-ray Data



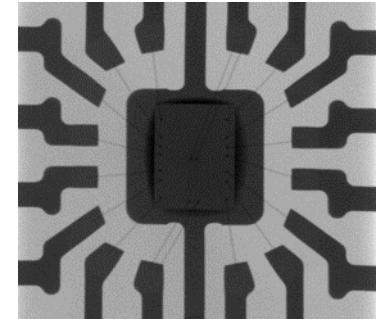
16-PW package



16-D package



16-N package



16-NS

Assembly Characterization Data (CD4051BPWR, CD4051BQPWRQ1, CD4052BPWR, CD4053BPWR)

PCN#	
Purpose	Assembly related characterization data
Package type/pin count	PW/16
Sample Size	76
Results	All parameters meet specs
Notes	

Assembly Parameter	USL	LSL	Ave	Stdev	CPK
Ball Shear		4.0	27.1	2.39	3.22
Wire Pull		3.0	11.84	0.96	>4.0

Assembly Characterization Data (CD4051BE, CD4052BE, CD4053BE)

PCN#	
Purpose	Assembly related characterization data
Package type/pin count	N/16
Sample Size	76
Results	All parameters meet specs
Notes	

Assembly Parameter	USL	LSL	Ave	Stdev	CPK
Ball Shear		4.0	25.90	1.95	3.75
Wire Pull		3.0	12.80	1.05	>4.0

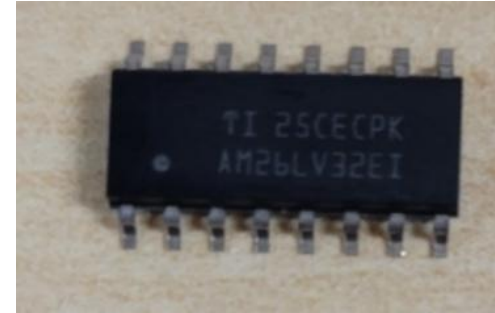
Visual of new device



16-D



16-N



16-NS



16-PW

(Representative Devices)

PACKAGE OUTLINE

SOP



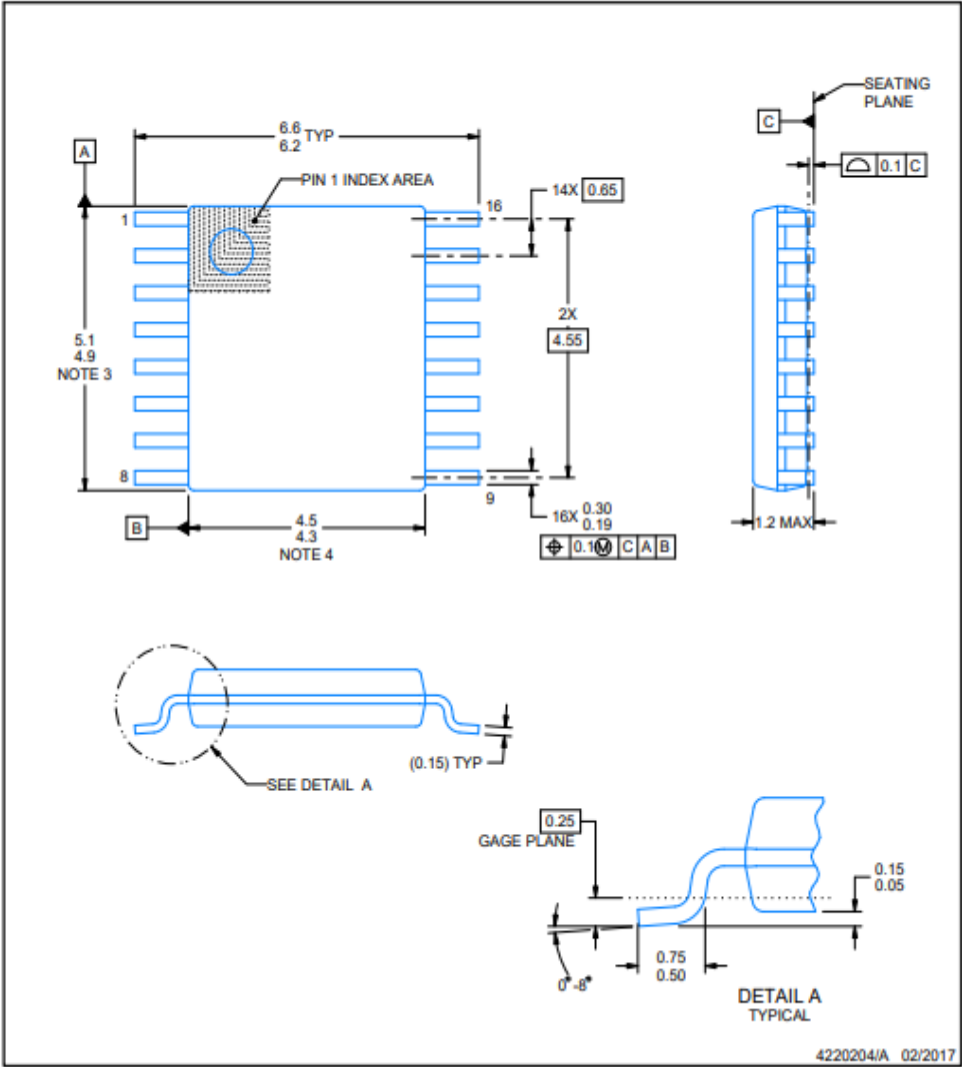
15

Package Dimension – PW16 package, N16 package

PW0016A

TSSOP - 1.2 mm max height

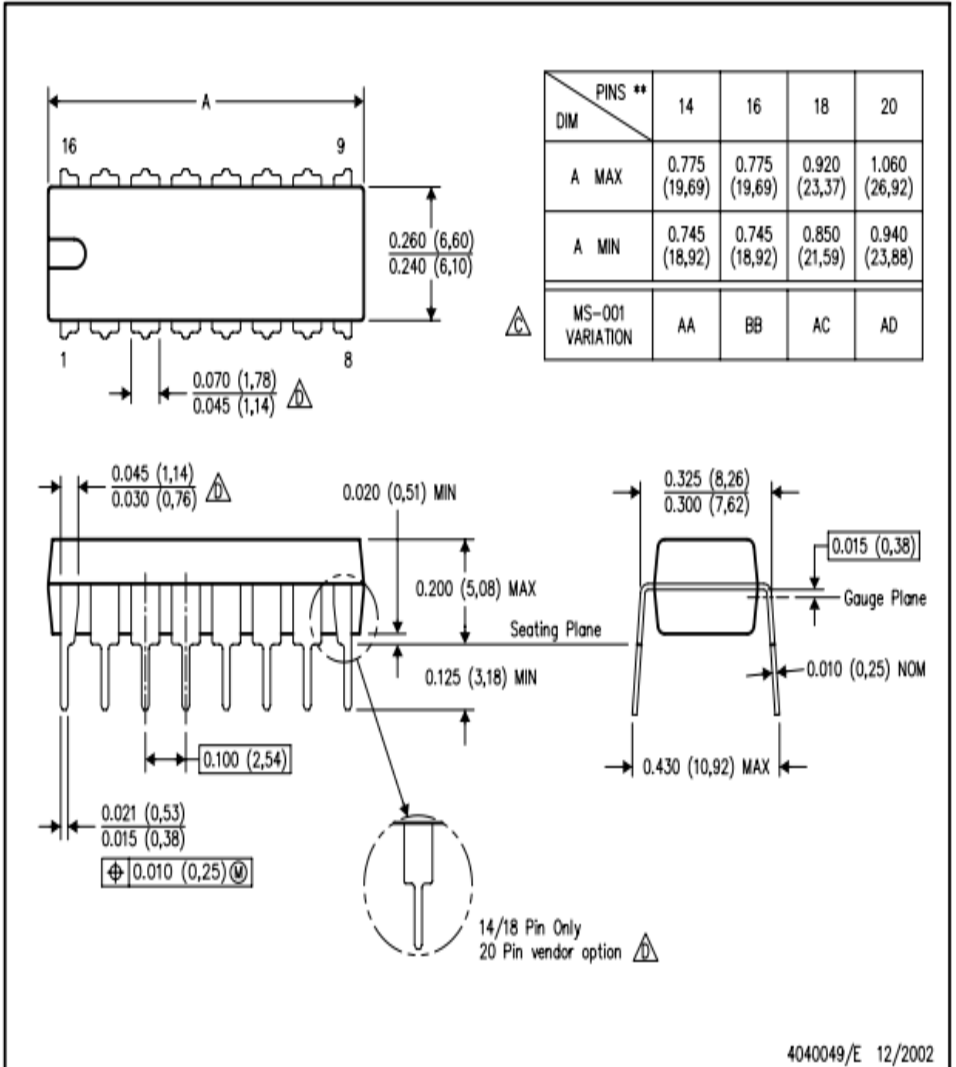
SMALL OUTLINE PACKAGE



N (R-PDIP-T**)

16 PINS SHOWN

PLASTIC DUAL-IN-LINE PACKAGE



Side by side Product Electrical Comparison

(CD4051BPWR, CD4051BQPWRQ1, CD4051BE, CD4051BM96, CD4051BNSR)

PCN#	C2411039
Purpose	Data provided for electrical distribution comparisons
Device(s)	CD4051BPWR, CD4051BQPWRQ1, CD4051BE, CD4051BM96, CD4051BNSR
Sample Size	>9000
Results	All parameters meet updated datasheet specifications
Notes	For test with Cpk<1.67, there is no plan to improve Cpk since this is a mature product. All the limits are datasheet guaranteed. Cpk for one sided limits are either Cp(u) or Cp(l), respectively.

		RFAB Data	RFAB data (New Product)				
Typical Final Test Data		CD405x					
Section	Parameter	Cpk >1.67	Cpk >1.67	Current D S Min	Current D S Typ	Current D S Max	Units
Resistance	RON Switch Resistance	>1.67	>1.67		125	240	Ω
Leakage	ION On Leakage Current	>1.67	>1.67	-300		300	nA
Leakage	IOFF Off Leakage Current	>1.67	>1.67	-300		300	nA
Logic	IIH High-level enable-input current	>1.67	>1.67	-1	±0.6	1	μA
Logic	IIL Low-level enable-input current	>1.67	>1.67	-1	±0.6	1	μA
Supply	IDD Supply Current	>1.67	>1.67		18	100	μA

Side by side Product Electrical Comparison

(CD4052BPWR, CD4052BE, CD4052BM96, CD4052BNSR)

PCN#	C2411039
Purpose	Data provided for electrical distribution comparisons
Device(s)	CD4052BPWR, CD4052BE, CD4052BM96, CD4052BNSR
Sample Size	>5000
Results	All parameters meet updated datasheet specifications
Notes	For test with Cpk<1.67, there is no plan to improve Cpk since this is a mature product. All the limits are datasheet guaranteed. Cpk for one sided limits are either Cp(u) or Cp(l), respectively.

		RFAB Data	RFAB data (New Product)				
Typical Final Test Data		CD405x					
Section	Parameter	Cpk >1.67	Cpk >1.67	Current D S Min	Current D S Typ	Current D S Max	Units
Resistance	RON Switch Resistance	>1.67	>1.67		125	240	Ω
Leakage	ION On Leakage Current	>1.67	>1.67	-300		300	nA
Leakage	IOFF Off Leakage Current	>1.67	>1.67	-300		300	nA
Logic	IIH High-level enable-input current	>1.67	>1.67	-1	±0.6	1	μA
Logic	IIL Low-level enable-input current	>1.67	>1.67	-1	±0.6	1	μA
Supply	IDD Supply Current	>1.67	>1.67		18	100	μA

Side by side Product Electrical Comparison

(CD4053BPWR, CD4053BE, CD4053BM96, CD4053BNSR)

PCN#	C2411039
Purpose	Data provided for electrical distribution comparisons
Device(s)	CD4053BPWR, CD4053BE, CD4053BM96, CD4053BNSR
Sample Size	>5000
Results	All parameters meet updated datasheet specifications
Notes	For test with Cpk<1.67, there is no plan to improve Cpk since this is a mature product. All the limits are datasheet guaranteed. Cpk for one sided limits are either Cp(u) or Cp(l), respectively.

		RFAB Data	RFAB data (New Product)				
Typical Final Test Data		CD405x					
Section	Parameter	Cpk >1.67	Cpk >1.67	Current D S Min	Current D S Typ	Current D S Max	Units
Resistance	RON Switch Resistance	>1.67	>1.67		125	240	Ω
Leakage	ION On Leakage Current	>1.67	>1.67	-300		300	nA
Leakage	IOFF Off Leakage Current	>1.67	>1.67	-300		300	nA
Logic	IIH High-level enable-input current	>1.67	>1.67	-1	±0.6	1	μA
Logic	IIL Low-level enable-input current	>1.67	>1.67	-1	±0.6	1	μA
Supply	IDD Supply Current	>1.67	>1.67		18	100	μA

Conclusion

- The electrical data comparisons show that the new die revision are performing to required datasheet guarantee.
- For further information of questions, please contact your PCN representative.

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