

Problem: Electrical Failure

SigmaTron Part number: L27-3253

P/N Description: IC, SM, ANALOG DEMUX/MUX

Report date: Feb/13/2026

PROBLEM

On January 28, 2026, during the first production shift, a rejection of 131 units of assembly B27-812766-001 (Shop order 665467) was identified due to ICT (In-Circuit Test) failures. Technical analysis confirmed that component L27-3253 (PO 81515800/L1, DC 2540), located at positions U6, U7, and U8, presents an open circuit condition. The failure was validated through manual multimeter measurements by the Electrical Test Engineering team.

Background and Recurrence: This failure is identified as a recurring issue, with a previous event recorded on November 27, 2024 (per the production report SO 665185). In that instance, 55 units of assembly B27-812766-002 were rejected. Component L27-3253 (from PO 815196/2, DigiKey Supplier) also exhibited an open circuit condition at reference designators U5, U6, U7, and U8 (DC 2533, Lot # 5559180ML5)

Problem: Electrical failure

SigmaTron component P/N: L27-3253

Supplier component P/N: SN74HC4851PWR

P/N Description: IC, SM, ANALOG DEMUX/MUX, 1~8, 2~6V, 20MA, 3NSEC, 1 ENABLE

Supplier/vendor: DigiKey

Manufacturer name: Texas Instrument

	DMR 9254	DMR 9267	DMR 9271
Qty Rejected raw material:	245 pcs (IC's)	1,715 pcs	4,000 pcs
Qty of rejected assembled ICs:	255 pcs	281 pcs	Not used
PCBAs:	55 pcs	131 pcs	Not used
Purchase Order:	TJ815196	TJ815158	TJ815362
Date Code:	2533	2540	2540
LOT#	5559180ML5	5683146ML5	5683140ML5
Suspect batch	TI 58K	TI 5AK	5 AK

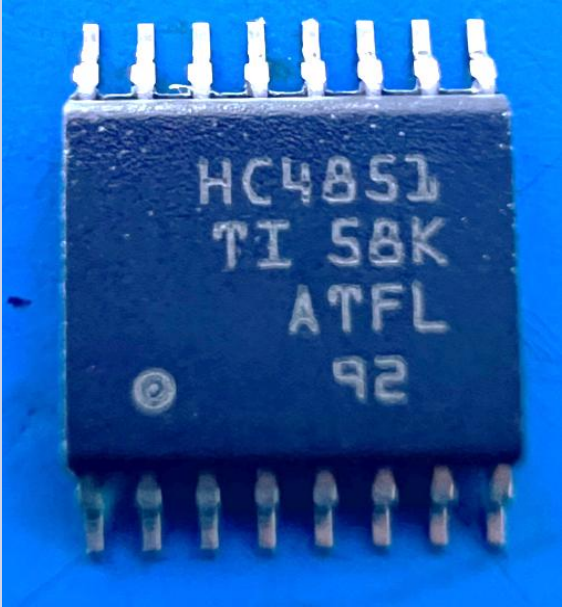
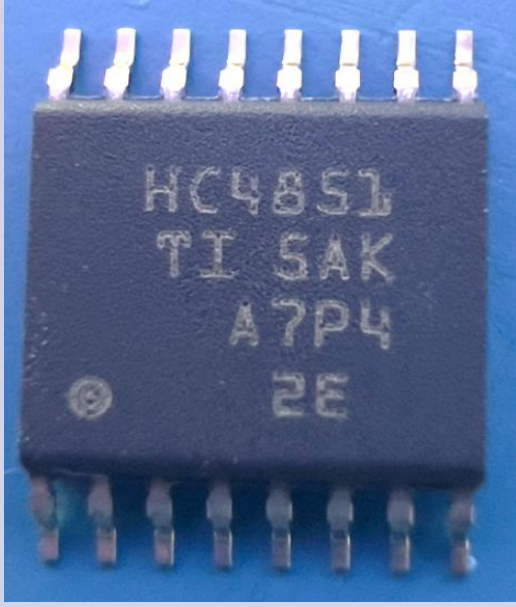
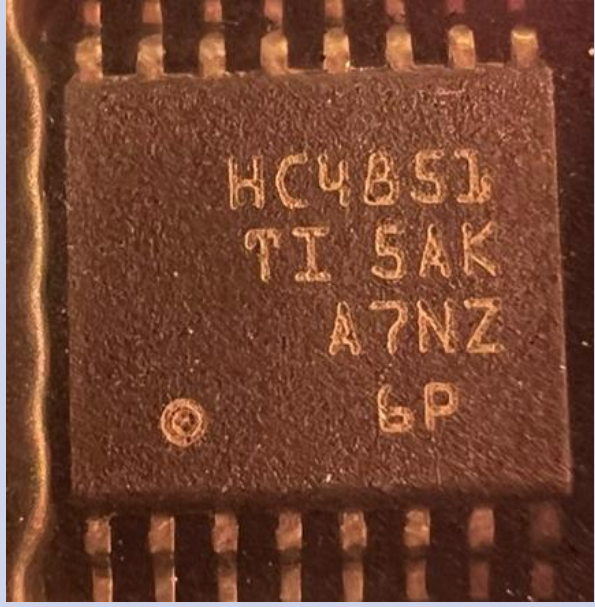
Acceptable



Not acceptable



PROBLEM

	DMR 9254	DMR 9267	DMR 9271
Qty Rejected raw material:	245 pcs (IC's)	1,715 pcs	4,000 pcs
Qty of rejected assembled ICs:	255 pcs	281 pcs	0
Purchase Order:	TJ815196	TJ815158	TJ815362
Date Code:	2533	2540	2540
LOT#	5559180ML5	5683146ML5	5683140ML5
Suspect batch:	TI 58K	TI 5AK	TI 5 AK
Image of IC:			

Response to Request for Internal Corrective Action inv117839830

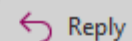
: L27-3253 / IC, SM, ANALOG DEMUX/...



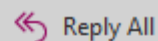
Sarah Whalen <Sarah.Whalen@digikey.com>

To Alexis Sosa

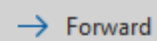
Cc Filemon Sagrero; Gerardo Reyes; Sarah Whalen; Susan Paredes



Reply



Reply All



Forward



Fri 12/12/2025 4:05 PM



FS-QA 01 Rev 08 Customer complaint template.doc

361 KB

Hello,

Thank you for bringing this matter to our attention. After a thorough review, we have determined that the issue with the affected PCBs was due to defective components originating from the manufacturing process.

As this is a manufacturing defect and not related to our internal processes, we are unable to complete your request for an internal Corrective Action Report (CAR). Please be assured that we take quality concerns seriously and will continue to work closely with our manufacturing partners to prevent recurrence.

If you have any further questions or need additional clarification, please feel free to reach out.

Thank you for your understanding and cooperation.

inv117839830 - see ano's

Please do not hesitate to contact us if you have any questions or concerns.

DigiKey

Patty Rentfrow

Customer Resolution

P.800.344.4539 x 11988

digikey.com

Calle Cuauhtemoc 9460-4-A, Fracc, Azteca. Tijuana, B.C., Mexico CP 22590 Main 011-52 (664) 626-8680 Fax 011-52 (664) 626-8676

Discrepant Material Report

DMR No. 9254 - Stockroom Reject

Part Number	Description	Rev	Rejected By	Date Rejected
L27-3253	IC, SM, ANALOG DEMUX/MUX, 1~8,	0	ZBC	11/28/2025

Origin	Disposition	RMA Number	Total Rejected
Stock	Not Selected		500

Item	Rejected	Description of Discrepancy
1	500	Electrical failure in ICT test

Inspector Remarks

Electrical failure during ICT test, received on PO 815196/2 from Digi Key Supplier, we have assembled 255 pcs. in ASSY B27-812766-002-REVN Qty 64 S/O 665185 Purge # 612 DC 2533 Lot # 5559180ML5.

Signoff Notes

- [Buyer](#)
- [Engineer](#)
- [Program Manager](#)

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Labels with batch code **TI 5BK** (DMR 9254)



← SigmaTron receiving label

Calle Cuauhtemoc 9460-4-A, Fracc, Azteca. Tijuana, B.C., Mexico CP 22590 Main 011-52 (664) 626-8680 Fax 011-52 (664) 626-8676

Discrepant Material Report

DMR No. 9267 - Stockroom Reject

Part Number	Description	Rev	Rejected By	Date Rejected
L27-3253	IC, SM, ANALOG DEMUX/MUX, 1-8,	0	ZBC	1/29/2026

Origin	Disposition	RMA Number	Total Rejected
Stock	Not Selected		1996

Item	Rejected	Description of Discrepancy
1	1996	Electrical failure during ICT test,

Inspector Remarks

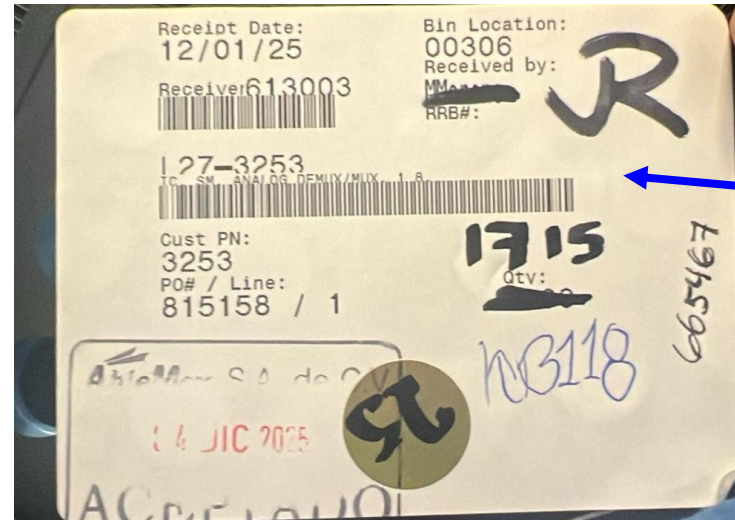
Electrical failure during ICT test, received on PO 815158/1 from Texas Instruments Supplier, Were assembled 281 pcs. ASSY B27-812766-001-REVN S/O 665467 DC 2540 Lot # 5683146ML5. DMN 26-003

Signoff Notes

- [Buyer](#)
- [Engineer](#)
- [Program Manager](#)

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Labels with batch code **TI 5AK** (DMR 9267)



← SigmaTron receiving label

DISCREPANT MATERIAL REPORT

Tijuana

Inspection Reject

Approved Manufacturers

Item Number L27-3253	Description IC, SM, ANALOG DEMUX/MUX, 1~8,	Rev 0	DMR NO. 9271
Supplier ARROW	PO Number 81536200 / Line 2	Date Received 2/9/2026	Buyer/Planner Susan Paredes
Rejected Qty 4000	Value @ Std 1,208.00	Inspected By ZBC	Date Inspected 2/12/2026
Receiver 615571	Origin Incoming <input type="button" value="v"/>	Disposition None	

Date Code/Comment:

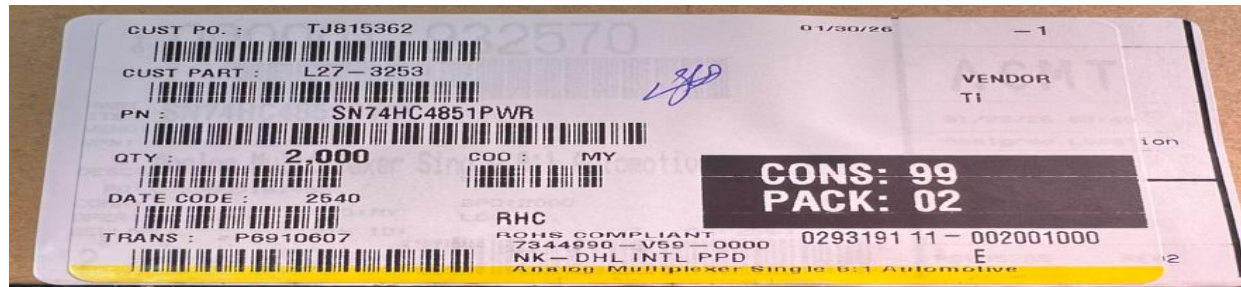
EDIT	ITEM NO	QTY REJ	DESCRIPTION OF DISCREPANCIES
<input type="button" value="1"/>	1	4000	Suspicious per Electrical failure in ICT test
	<input type="text"/>	<input type="text"/>	<input type="text"/> <input type="button" value="add"/>

REMARKS:

Suspicious per Electrical failure in ICT test AML SN74HC4851PWR DC 2540
Lot # 5683140ML5

NOTIFY:

Buyer	Engineer	Program Manager
<input type="checkbox"/> Susan Paredes Signoff Pending	<input type="checkbox"/> Juan Morales Signoff Pending	<input type="checkbox"/> Aida Hinojosa Signoff Pending
Notes: -- None --	Notes: -- None --	Notes: -- None --



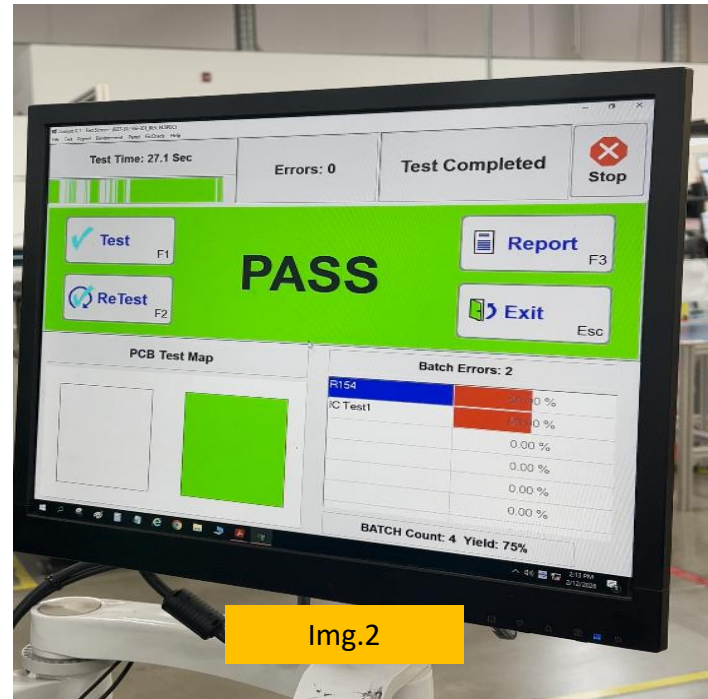
FAILURE ANALYSIS

To confirm that the anomaly is associated with the raw material corresponding to SigmaTron part number **L27-3253 (SN74HC4851PWR)**, a comparative validation was performed using the same PCBA under controlled conditions:

1. Initially, the board was tested with integrated circuits marked **"TI 3BK"** (lot 3951531ML3). The unit successfully passed the ICT test, meeting all established electrical parameters (see *Img.2*).
2. Subsequently, the same previously validated unit had the integrated circuits replaced with components from the suspect lots. After repeating the ICT test, the unit failed electrically, reproducing the rejection condition observed during production (see *Img.3*).



Img.1



Img.2



Img.3

This exercise confirmed that the failure is directly related to the electrical behavior of the ICs from the analyzed lots and is not associated with the PCBA or the assembly process.

ICT TEST FAILURE RESULTS

Description of the applied ICT test

During production validation, the boards were evaluated using ICT (In-Circuit Test) to verify the electrical integrity of the components mounted on the PCBA. According to the test system documentation, the reports show the following information (Fig. 4).

Board identification within the panel.

The *PCB field* indicates the position of the board within the manufacturing panel. In the analyzed reports, the failure corresponds to PCB 1 of a two-piece panel.

Identification of the executed test.

The *Title field* corresponds to the name of the test applied to the integrated circuit, in this case IC Test1, a test intended to verify the electrical integrity of the component.

Measurement references.

The **From Pin** and **To Pin** fields indicate the test points used for the measurement. In this test, the ICs are evaluated against:

GND (Ground)

VCC_3V3

It is important to clarify that **no direct power is applied to the IC**; instead, the internal electrical response of the component is measured using the ICT test method.

Acceptable measurement limits.

The **Low Limit** and **High Limit** parameters define the allowed range for considering the component acceptable.

Normally, the expected measurement is around **0.6–0.7 V**, a value corresponding to the behavior of the device's internal diodes.

Number of detected failures

The Val field indicates the number of measurements found out of specification during the test.

In the analyzed case:

14 out-of-range readings were detected with respect to GND.

20 out-of-range readings were detected with respect to VCC_3V3.

This indicates multiple nodes with an incorrect electrical condition.

Identification of affected nodes

The last field of the report shows the specific failing nodes, indicating:

- Test point number
- PCB node name

Example:

EHR1_HAL2 – Pin 67

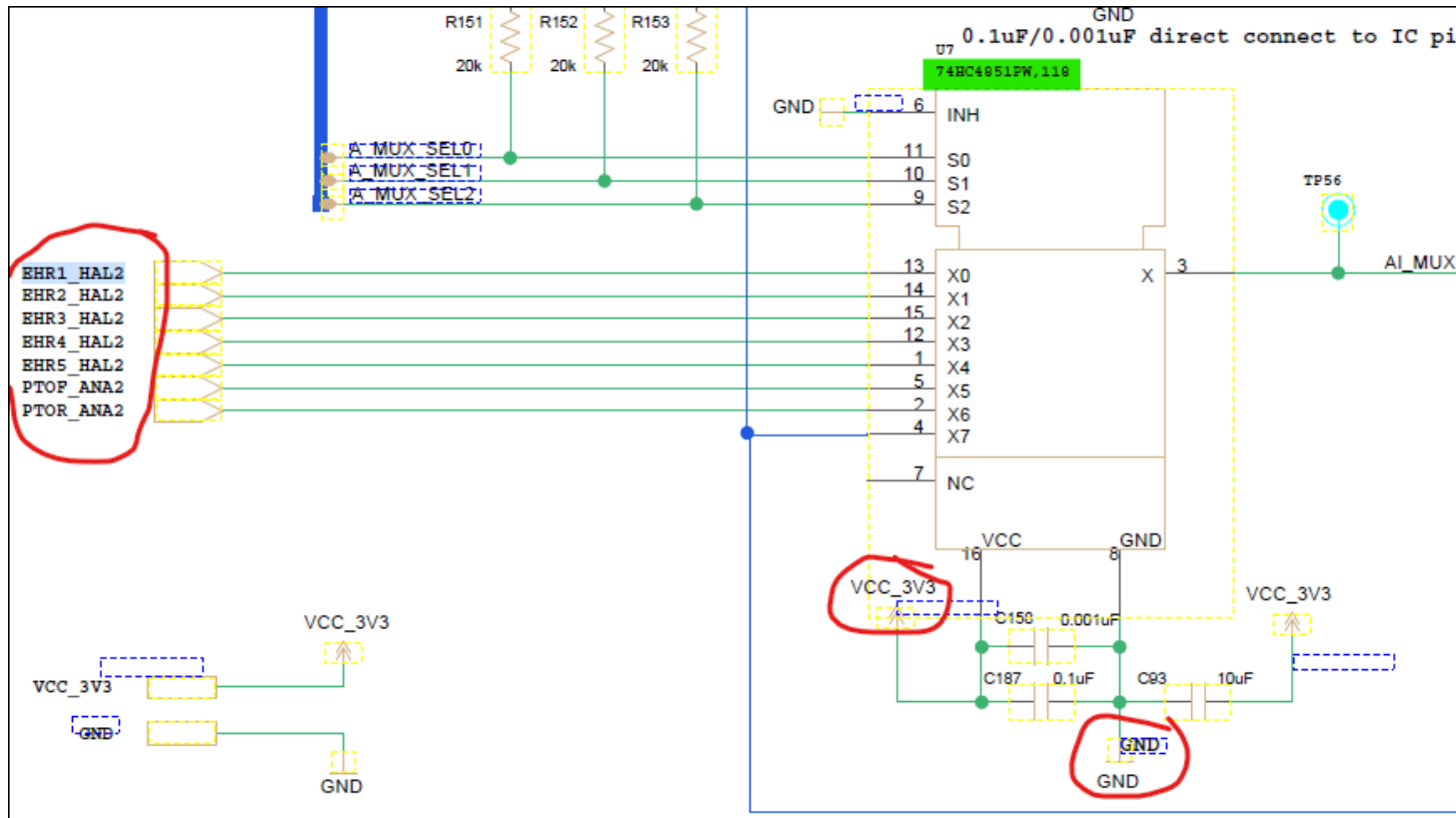
```
PCB      1 (right 1, down 1)
title: IC Test1      from pin: 155
      to pin: 237 low lim:  0.400
      high lim:  0.900 val:    34
      *
GND(155) to: HW_Vers_0(59)
EHR1_HAL2(67) EHR2_HAL2(69)
EHR3_HAL2(71) PTOF_HAL2(89)
PTOR_HAL2(93) TH1_HAL1(104)
TH1_HAL2(105) TH2_HAL1(106)
TH2_HAL2(107) U8-2(157) V0R5V(159)
EHR4_HAL2(204) EHR5_HAL2(210)
VCC_3V3(237) to: AI_MUX1(56)
HW_Vers_0(59) HW_Vers_1(60)
AI_MUX2(61) U6-4(62) AI_MUX3(63)
EHR1_HAL2(67) EHR2_HAL2(69)
EHR3_HAL2(71) PTOF_HAL2(89)
PTOR_HAL2(93) TH1_HAL1(104)
TH1_HAL2(105) TH2_HAL1(106)
TH2_HAL2(107) U8-2(157) V0R5V(159)
EHR4_HAL2(204) EHR5_HAL2(210)
MON_PCB_TEMP(229)
```

Img.4 Result of rejected PCBA on ICT

ICT TEST FAILURE RESULTS

According to the electrical schematic, these nodes are connected to **IC U7 (74HC4851PW)**, confirming that the failure is directly related to the integrated circuit under analysis.

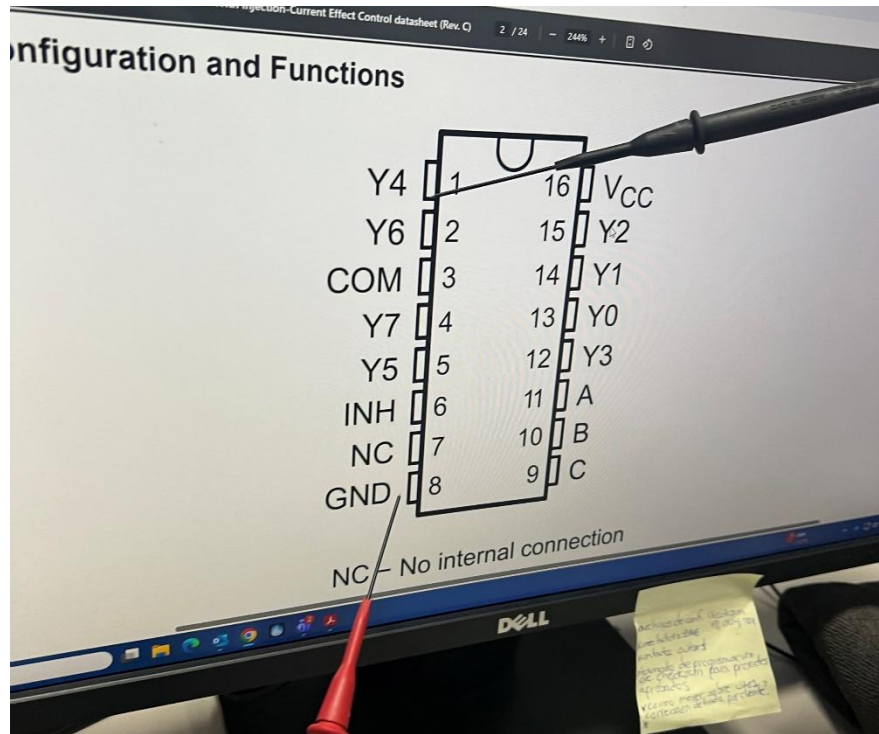
In the following image, it can be observed that EHR1_HAL2 (as well as the other failing “EHRX_HAL2” nodes detected during ICT) are connected to U7, which is one of the ICs in question (74HC4851PW).



Img.5 Electrical schematic of the IC.

FAILURE ANALYSIS

To confirm that the issue originates from the raw material, the ICs were inspected at the component level. Diode mode measurements were performed on outputs Y0 through Y7, as well as A, B, C, and GND.



The Electrical Test Engineer observed an internal electrical variation in the integrated circuits of DMRs 9254, 9267, and 9271 from lots #5559180ML5, 5683146ML5, and 5683140ML5. After comparing these against the compliant lot (#5683146ML5 / PO #81515800), it was concluded that an anomaly exists in the mentioned lots despite sharing the same part number. The results are as follows:

Measurement Template – IC SN74HC4851PWR (Measurement in Diode Mode)

Lot: ___TI 3BK_____

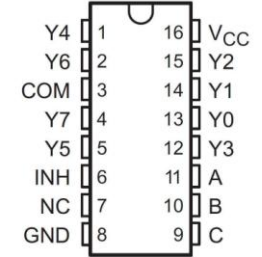
Date: ___17/Feb/2026_____

Equipment: ___Multimetro # 229_____

Test technician name: ___Juan Muro_____

ACCEPTABLE LOT

4 Pin Configuration and Functions



NC – No internal connection

Figure 4-1. SN74HC4851 PW Package, 16-Pin TSSOP (Top View)

Measurement referenced to GND (Pin 8) (Red probe)

Pieza #	Y4 (1)	Y6 (2)	COM (3)	Y7 (4)	Y5 (5)	INH (6)	C (9)	B (10)	A (11)	Y3 (12)	Y0 (13)	Y1 (14)	Y2 (15)
1	0.7246	0.7246	0.6798	0.7241	0.7241	0.7691	0.7691	0.7689	0.7689	0.7237	0.7236	0.7238	0.7237
2	0.7266	0.7268	0.6829	0.6770	0.7268	0.7715	0.7716	0.7716	0.7714	0.7265	0.7265	0.7264	0.7262
3	0.7264	0.7264	0.6822	0.6983	0.7263	0.7711	0.7707	0.7708	0.7712	0.7259	0.7258	0.7258	0.7255

Measurement referenced to VCC (Pin 16) (Black probe)

Pieza #	Y4 (1)	Y6 (2)	COM (3)	Y7 (4)	Y5 (5)	INH (6)	C (9)	B (10)	A (11)	Y3 (12)	Y0 (13)	Y1 (14)	Y2 (15)
1	0.7046	0.7043	0.6641	0.7043	0.7041	0.7358	0.7360	0.7360	0.7359	0.7040	0.7042	0.7037	0.7037
2	0.6816	0.6816	0.6652	0.7055	0.7053	0.7372	0.7273	0.7373	0.7372	0.7054	0.7053	0.7050	0.7049
3	0.7054	0.6817	0.6653	0.7055	0.7056	0.6959	0.7371	0.7371	0.7370	0.7057	0.7052	0.7052	0.7053

Measurement Template – IC SN74HC4851PWR (Measurement in Diode Mode)

Lot: ____T15AK_(DMR 9267)_____

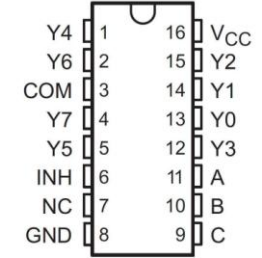
Date: __11/FEB/26_____

Equipment: _Multimetro # 229_____

Test technician name: ____Juan Muro_____

SUSPECT LOT

4 Pin Configuration and Functions



NC – No internal connection

Figure 4-1. SN74HC4851 PW Package, 16-Pin TSSOP (Top View)

Measurement referenced to GND (Pin 8) (Red probe)

Pieza #	Y4 (1)	Y6 (2)	COM (3)	Y7 (4)	Y5 (5)	INH (6)	C (9)	B (10)	A (11)	Y3 (12)	Y0 (13)	Y1 (14)	Y2 (15)
1	0.5289	0.5001	0.5046	0.5289	0.5296	0.7205	0.7206	0.7206	0.7205	0.5287	0.5291	0.5294	0.5296
2	0.5301	0.5304	0.5056	0.531	0.5308	0.7209	0.7211	0.7211	0.7207	0.5303	0.5309	0.5306	0.5304
3	0.531	0.5308	0.5058	0.5316	0.5314	0.7217	0.7217	0.7216	0.7215	0.5316	0.5309	0.5316	0.5303
4	0.5315	0.5324	0.5075	0.5328	0.5328	0.7197	0.7199	0.7196	0.7194	0.5319	0.5309	0.5318	0.5321
5	0.5346	0.5315	0.5054	0.5307	0.5308	0.7187	0.7188	0.7189	0.7188	0.5309	0.5308	0.5313	0.531

Measurement referenced to VCC (Pin 16) (Black probe)

Pieza #	Y4 (1)	Y6 (2)	COM (3)	Y7 (4)	Y5 (5)	INH (6)	C (9)	B (10)	A (11)	Y3 (12)	Y0 (13)	Y1 (14)	Y2 (15)
1	1.30	1.30	1.29	1.30	1.30	0	0	0	0	1.30	1.30	1.30	1.30
2	1.30	1.30	1.30	1.30	1.30	0	0	0	0	1.27	1.30	1.26	1.26
3	1.30	1.30	1.30	1.30	1.30	0	0	0	0	1.30	1.30	1.31	1.30
4	1.31	1.31	1.30	1.31	1.31	0	0	0	0	1.31	1.31	1.31	1.31
5	1.30	1.30	1.30	1.30	1.30	0	0	0	0	1.30	1.30	1.30	1.30

Measurement Template – IC SN74HC4851PWR (Measurement in Diode Mode)

Lot: _TI 58K_(DMR 9254)

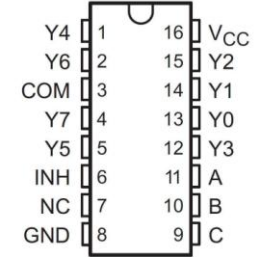
Date: _11/FEB/2026

Equipment: __ Multimetrol # _229

Test technician name: __Juan Muro

SUSPECT LOT

4 Pin Configuration and Functions



NC – No internal connection

Figure 4-1. SN74HC4851 PW Package, 16-Pin TSSOP (Top View)

Measurement referenced to GND (Pin 8) (Red probe)

Pieza #	Y4 (1)	Y6 (2)	COM (3)	Y7 (4)	Y5 (5)	INH (6)	C (9)	B (10)	A (11)	Y3 (12)	Y0 (13)	Y1 (14)	Y2 (15)
1	0.5316	0.5218	0.4863	0.5312	0.5313	0.535	0.7224	0.7225	0.7223	0.5311	0.5313	0.5212	0.5310
2	0.5302	0.5303	0.5054	0.5304	0.309	0.7218	0.7219	0.7218	0.7217	0.5305	0.5302	0.5295	0.5306
3	0.5313	0.5298	0.5052	0.5298	0.5307	0.7212	0.7213	0.7213	0.7210	0.5299	0.5299	0.5296	0.5308
4	0.5253	0.5279	0.5037	0.5288	0.5295	0.7211	0.7214	0.7212	0.7213	0.5292	0.5293	0.5291	0.5288
5	0.5298	0.5302	0.5052	0.5297	0.531	0.7206	0.7207	0.7206	0.7204	0.5298	0.5292	0.5295	0.5299

Measurement referenced to VCC (Pin 16) (Black probe)

Pieza #	Y4 (1)	Y6 (2)	COM (3)	Y7 (4)	Y5 (5)	INH (6)	C (9)	B (10)	A (11)	Y3 (12)	Y0 (13)	Y1 (14)	Y2 (15)
1	1.30	1.26	1.26	1.30	1.30	0	0	0	0	1.30	1.30	1.30	1.26
2	1.30	1.30	1.29	1.30	1.30	0	0	0	0	1.30	1.30	1.30	1.30
3	1.30	1.30	1.29	1.30	1.30	0	0	0	0	1.30	1.30	1.30	1.30
4	1.30	1.30	1.25	1.25	1.30	0	0	0	0	1.30	1.30	1.30	1.30
5	1.30	1.30	1.29	1.30	1.30	0	0	0	0	1.30	1.30	1.30	1.30

Measurement Template – IC SN74HC4851PWR (Measurement in Diode Mode)

Lot: ___TI 5AK_(DMR 9271)_____

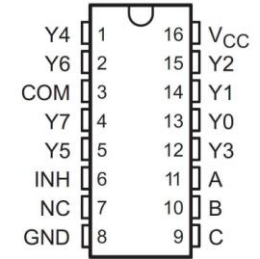
Date: ___17/FEB/2026_____

Equipment: ___229_____

Test technician name: ___Juan Muro_____

SUSPECT LOT

4 Pin Configuration and Functions



NC – No internal connection

Figure 4-1. SN74HC4851 PW Package, 16-Pin TSSOP (Top View)

Measurement referenced to GND (Pin 8) (Red probe)

Pieza #	Y4 (1)	Y6 (2)	COM (3)	Y7 (4)	Y5 (5)	INH (6)	C (9)	B (10)	A (11)	Y3 (12)	Y0 (13)	Y1 (14)	Y2 (15)
1	0.5325	0.4997	0.4880	0.4879	0.4999	0.5393	0.7239	0.7238	0.7234	0.5326	0.5325	0.5327	0.532
2	0.5321	0.5313	0.4863	0.5319	0.4990	0.5360	0.7226	0.7225	0.7222	0.5320	0.5314	0.5313	0.5316
3	0.5230	0.5290	0.5037	0.5230	0.5290	0.7220	0.7222	0.6907	0.7215	0.5287	0.5285	0.5282	0.529
4	0.5260	0.5230	0.5031	0.5820	0.5291	0.7214	0.7216	0.7217	0.7218	0.5286	0.5284	0.574	0.5281
5	0.5001	0.4870	0.4874	0.4932	0.5326	0.7215	0.7215	0.7216	0.7215	0.5324	0.4988	0.5316	0.5319

Measurement referenced to VCC (Pin 16) (Black probe)

Pieza #	Y4 (1)	Y6 (2)	COM (3)	Y7 (4)	Y5 (5)	INH (6)	C (9)	B (10)	A (11)	Y3 (12)	Y0 (13)	Y1 (14)	Y2 (15)
1	1.31	1.31	1.30	1.31	1.31	0	0	0	0	1.31	1.31	1.31	1.31
2	1.31	1.26	1.26	1.26	1.31	0	0	0	0	1.31	1.31	1.31	1.31
3	1.30	1.25	1.29	1.30	1.30	0	0	0	0	1.27	1.27	1.30	1.30
4	1.30	1.3	1.26	1.27	1.27	0	0	0	0	1.30	1.30	1.30	1.25
5	1.28	1.28	1.27	1.28	1.28	0	0	0	0	1.28	1.28	1.28	1.31

Measurement Template – IC SN74HC4851PWR (Measurement in Diode Mode)

Conclusion:

According to the measurement tables obtained, lot 3BK (the good parts) should measure 0.72 for the YX outputs with respect to GND, or 0.7 for the YX outputs with respect to VCC.

Measurement referenced to GND (Pin 8) (Red probe)

Pieza #	Y4 (1)	Y6 (2)	COM (3)	Y7 (4)	Y5 (5)	INH (6)	C (9)	B (10)	A (11)	Y3 (12)	Y0 (13)	Y1 (14)	Y2 (15)
1	0.7246	0.7246	0.6798	0.7241	0.7241	0.7691	0.7691	0.7689	0.7689	0.7237	0.7236	0.7238	0.7237
2	0.7266	0.7268	0.6829	0.6770	0.7268	0.7715	0.7716	0.7716	0.7714	0.7265	0.7265	0.7264	0.7262
3	0.7264	0.7264	0.6822	0.6983	0.7263	0.7711	0.7707	0.7708	0.7712	0.7259	0.7258	0.7258	0.7255

Measurement referenced to VCC (Pin 16) (Black probe)

Pieza #	Y4 (1)	Y6 (2)	COM (3)	Y7 (4)	Y5 (5)	INH (6)	C (9)	B (10)	A (11)	Y3 (12)	Y0 (13)	Y1 (14)	Y2 (15)
1	0.7046	0.7043	0.6641	0.7043	0.7041	0.7358	0.7360	0.7360	0.7359	0.7040	0.7042	0.7037	0.7037
2	0.6816	0.6816	0.6652	0.7055	0.7053	0.7372	0.7273	0.7373	0.7372	0.7054	0.7053	0.7050	0.7049
3	0.7054	0.6817	0.6653	0.7055	0.7056	0.6959	0.7371	0.7371	0.7370	0.7057	0.7052	0.7052	0.7053

The values with respect to GND for the YX outputs are **0.53**, and with respect to VCC they are **1.3**.

This results in an approximate value difference for YX with respect to GND of **26.38%**, and for YX with respect to VCC of **46.15%**.

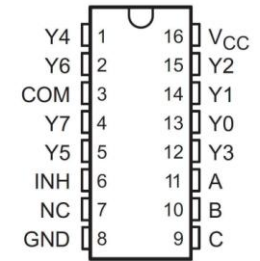
The value rejected by the ICT corresponds to the measurements with respect to VCC, since the standard range is 0.4 to 0.9.

```

title: IC Test1      from pin: 155
to pin: 237 low lim: 0.400
high lim: 0.900 val: 34
    
```

Therefore, it does not pass the ICT tests.

4 Pin Configuration and Functions



NC – No internal connection

Figure 4-1. SN74HC4851 PW Package, 16-Pin TSSOP (Top View)