

Part Failure Analysis (PFA)

1. Part Information

- **Manufacturer:** Texas Instruments
- **Manufacturer Part Number:** CD74HC4067M96
- **EMS Part Number:** PSI305481TEX
- **Suspect Lot Number:** 5231463TW5

2. Quantity Affected

- **Total parts quarantined:** 10,000
- **Parts populated onto PCBAs:** 8,000

3. Historical Usage

EMS Solutions has used the CD74HC4067M96 for over **15 years** on PCBAs produced for Cubascan.

- **Total quantity purchased historically:** >6,500,000 units
- **Prior issues:** None reported
- **First occurrence of failure:** Lot 5231463TW5

This indicates the issue is **isolated to a specific manufacturing lot** rather than a design or application issue.

4. Application Description

The CD74HC4067M96 is used on a PCBA that receives signals from a transmitter PCBA and controls LED outputs.

- Each PCBA contains **20 CD74HC4067M96 devices**
- PCBAs are **fully assembled and function tested** prior to shipment

5. Failure Summary

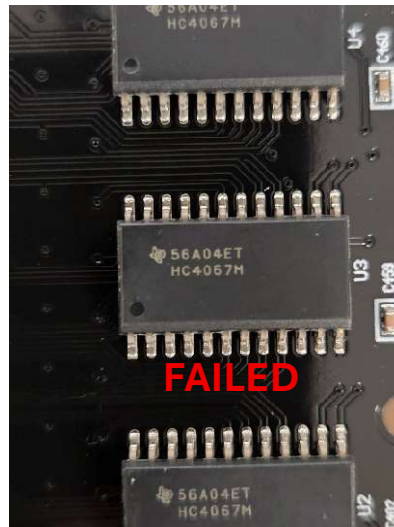
During functional testing, **all PCBAs populated with lot 5231463TW5 failed** the LED output test.

PCBAs populated with other lots **passed testing without issue.**

6. Failure Investigation & Findings

6.1 Visual Inspection

Reference photos show a clear distinction between **passing** and **failing** parts from the suspect lot. A third line is added to the part description on the failed lot.



6.2 Customer Verification Testing (Cubascan)

Cubascan tested **15 PCBAs**, each containing **20 devices** from the suspect lot.

Measured results show that the **on-resistance (R_ON)** of the suspect parts is **significantly lower** than that of known-good parts.

Suspect (Bad) Part – Lot 5231463TW5

- **R_ON range:** ~19.6 Ω to 21.6 Ω
- **Vcom range:** ~0.82 V to 0.89 V

(Consistent across all 16 channels)

Known-Good Part

- **R_ON range:** ~36.6 Ω to 37.7 Ω
- **Vcom range:** ~1.34 V to 1.37 V

(Consistent across all 16 channels)

Conclusion:

The suspect lot exhibits an **abnormally low R_ON**, resulting in reduced Vcom and improper LED drive behavior.

6.3 Functional Rework Confirmation

- The CD74HC4067M96 devices from lot 5231463TW5 were **removed and replaced** on 15 of the failed PCBAs.
- **Result:** All 15 PCBAs passed functional testing after replacement.

This confirms the failure is **directly attributable to the suspected devices**.

6.4 In-House Electrical Testing (Multimeter)

Additional testing was performed on failed PCBAs:

Test Points	Result
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Pin 24 to Pin 12 VCC	does not change
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Pin 10 to Pin 12 VCC	= 4.35 V (expected >3 V)
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Pin 11 to Pin 12 VCC	= 0.4 V (unexpected low)
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Pin 1 to Pin 12	Pass (common leakage)
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Pin 1 to Pin 23	Anomalous reading
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Pin 1 to Pin 4	>310 kΩ difference
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These results further indicate **internal switching anomalies and leakage inconsistencies** within the suspect devices.

7. Impact Assessment

- **Production halted**
- **10,000 devices quarantined**
- **400 PCBAs affected**
- **Rework is required to replace suspect components impacting our customer and our loss of revenue.**
- **End customer impacted (Walmart and Amazon)**

8. Conclusion

The CD74HC4067M96 devices from **lot 5231463TW5** exhibit:

- Abnormally **low on resistance (R_ON)**
- Reduced Vcom levels
- Functional failure in LED output applications

The issue is **lot-specific**, reproducible, and resolved by replacing the suspect devices with known-good parts.

9. Requested Actions

- Root cause analysis from Texas Instruments
- Disposition recommendation for quarantined material
- Corrective and preventive action (CAPA)



TEXAS
INSTRUMENTS



2DC: 2Q:

MSL 1 /260C/UNLIM

SEAL DT

07/17/25

OPT:
ITEM:

LBL: 1A (L)T0:0000⁵⁶

(1P) CD74HC4067M96

(Q) 2000 (D) 2522+5

(31T) LOT: 5231463TW5

(4W) TKY(1T) 6211326ZFK

(P)

(2P) REV: A (V) 0033317

(20L) CS0:RFB (21L) CC0:USA

(22L) AS0:TAI (23L) AC0:TWN

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(1P) CD74HC4067M96

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(31T) LOT: 5231463TW5

(4W) TKY(1T) 6211323ZFK

(P)

(2P) REV: A (V) 0033317

(20L) CS0:RFB (21L) CC0:USA

(22L) AS0:TAI (23L) AC0:TWN

TEXAS
INSTRUMENTS



2DC: 2Q:

MSL 1 /260C/UNLIM

SEAL DT

07/29/25

OPT:
ITEM:

LBL: 7A (L)T0:0000⁵⁶

(1P) CD74HC4067M96

(Q) 2000 (D) 2525+5

(31T) LOT: 5258710TW5

(4W) TKY(1T) 6258419ZFK

(P)

(2P) REV: A (V) 0033317

(20L) CS0:RFB (21L) CC0:USA

(22L) AS0:TAI (23L) AC0:TWN