

Comparison studies on TI Line driver IC G4 Vs Non-G4

Line Driver TI IC Comparison

- Problem Statement : High Icc failure
- Product specs. Icc current limit to 55mA max.
- Icc failure observed for the line driver with suffix G4, drawing as high as 104mA. Double the specification set.
- TI Line Driver IC pinouts impedance reading also differs between G4 and Non-G4 option

No	Test	Results	Remark
1	line driver change	Pass	Observed different marking on top of the IC
2	PCB change	Pass	Observed different marking on top of the IC
3	encoder level functional test	Pass	No issue with encoder
4	impedance test	Fail	G4 IC has different readings vs no suffix
5	capacitor check	Fail	on-board value differs from off board value. off board value check passed.

IC AM26C31Q Pinouts	Good unit (Mohm)	Fail unit (Mohm)
1	3.2	2.6
2	2.8	5.6
3	2.8	5.6
4	3.2	2.6
5	2.8	5.6
6	2.8	5.6
7	3.2	2.6
8	Gnd	Gnd
9	0	0
10	2.8	5.6
11	2.8	5.6
12	0	0
13	2.8	5.6
14	2.8	5.6
15	3.2	2.6
16	2.7	2.37

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Test data log (Screened shot)

PASS

Test Results:

Icc mA	0.008	9.646	31.416	54.884				
	<STATE 1>	<STATE 2>	<STATE 3>	<STATE 4>	<DUTY A>	<DUTY B>	<PHASE>	<CYCLE>
min	0.90	-2.55	-3.70	0.90	-1.65	-5.10	-N/A-	-2.15
max	3.20	-0.25	-1.40	3.20	2.95	-1.65	-N/A-	3.60
ave	1.79	-1.45	-2.30	1.95	0.34	-3.74	-0.27	-N/A-
dPos =	16.12	TIR =	4.06	DUTYSprd =	2.61			
Gt1 =	200.00	Gt2 =	400.00	Gdpl =	2.82			
CUCount =	500.00							
S/N =	27	PASS						

FAIL

Test Results:

Icc mA	4.430***	23.901***	60.424***	89.786***				
	<STATE 1>	<STATE 2>	<STATE 3>	<STATE 4>	<DUTY A>	<DUTY B>	<PHASE>	<CYCLE>
min	-3.99	2.06	-3.69	-2.54	-2.78	0.67	-N/A-	-3.26
max	-1.39	7.82	0.91	2.06	5.28	5.28	-N/A-	3.65
ave	-2.35	4.64	-1.81	-0.48	2.29	2.83	-2.09	-N/A-
dPos =	5.19	TIR =	1.31	DUTYSprd =	5.07			
Gt1 =	200.00	Gt2 =	300.00	Gdpl =	-0.81			
CUCount =	500.00							
S/N =	27	FAIL						

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Failure Analysis (Root Cause)

- Findings: Different IC (suffix - G4) was mounted to the PCB (SMT Part from BH)



(Good part) AM26C31Q lead finish - CU NIPDAU & CU SN

(NG part) AM26C31QG4 lead finish - CU NIPDAU

* Different in material affect the resistance value, hence the current consumption is affected.

END