





Part #:	EV26Q64A PIC18F16Q41 Nano Evaluation Kit	  
Description:	<ul style="list-style-type: none"> • MIC5353 LDO regulator controlled by the on-board debugger • 1.8 V to 5.5 V output voltage (limited by USB input voltage) • 500 mA maximum output current 	 Download Datasheet

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January 03, 2022, 07:17:07 pm

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Author

Topic: **FIXED Sencore LC102 Capacitor testing problem low values** (Read 1924 times)

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fastguido

Regular Contributor



Posts: 55

Country:



FIXED Sencore LC102 Capacitor testing problem low values

« on: September 11, 2020, 04:23:43 pm »

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I recently purchased a Sencore LC102 that won't measure any capacitor value below 2uf, just shows Error 7, it's fine at any capacitor value above this. It also won't complete the OPEN test, again shows Error 7. The error comes up right away, doesn't even think about it, (no moving dash across the display like the short test) The SHORT test works properly though, which would rule out any of the common relay problems that these unit have, (I think?) I replaced the test cable with a new one from KK4HXJ just to be sure that wasn't it. I'm thinking that it must be something with the two lower current sources in the capacitor test section? Does anyone know how the circuit works any far as the autoranging or the OPEN test? Of course there is no theory of operation, so I'm not sure how the circuit is supposed to work. Any ideas on what to look for?

« Last Edit: October 10, 2020, 04:10:22 pm by fastguido »

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bob91343

Super Contributor



Posts: 2356

Country:



Re: Sencore LC102 Capacitor testing problem low values

« Reply #1 on: September 11, 2020, 05:48:44 pm »

[Say Thanks](#) [Reply](#) [Quote](#)

I don't know enough to attempt to answer your question. I do know that for the most part I don't trust Sencore products. Perhaps it's their unpleasant advertising that gets me, but I have never liked their stuff.

It would be nice if you knew what method it uses to measure. It can be one of several, and if you know that, you at least have a starting point for solving the problem. It could be a bridge or simply an impedance measurement such as used by Hickok under the guise of measuring capacitance.


Report to moderator  Logged

Johnny10

Frequent Contributor



Posts: 864

Country: 



Re: Sencore LC102 Capacitor testing problem low values

Say Thanks

Reply

Quote

« Reply #2 on: September 11, 2020, 08:52:52 pm »

Lots of information on the Sencore LC102 on the forum.
Manual, Calibration, Pics.

It is a very nice unit, I have had about 6 of them.

They are very sought after.

Open and short test problems usually have to do with relays.
Also problems with the input connector, the fuse is contained within the input assembly.
Sometimes reseating cables is a good first check.

Report to moderator  Logged


Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

Smoky

Frequent Contributor



Posts: 510

Country: 



Re: Sencore LC102 Capacitor testing problem low values

Say Thanks

Reply

Quote

« Reply #3 on: September 11, 2020, 09:02:24 pm »

I'm using a Sencore LC102 as I type this. I'm matching Nichicon UKL electrolytic capacitors in the .33uf to the 1.5uf range with no issues.

The only time I see the "Error 7" is when I attempt to measure ESR on a capacitor below 1uf, which is normal.

I would make sure that your probes pass the "open" and "short" tests and to go ahead and unscrew and clean the BNC adapter/fuse assembly very well.


Report to moderator  Logged

fastguido

Regular Contributor



Posts: 55

Country: 



Re: Sencore LC102 Capacitor testing problem low values

Say Thanks

Reply

Quote

« Reply #4 on: September 11, 2020, 11:32:07 pm »

Quote from: Johnny10 on September 11, 2020, 08:52:52 pm

Lots of information on the Sencore LC102 on the forum.
Manual, Calibration, Pics.

It is a very nice unit, I have had about 6 of them.

They are very sought after.

Open and short test problems usually have to do with relays.
Also problems with the input connector, the fuse is contained within the input assembly.
Sometimes reseating cables is a good first check.

I have already cleaned relays L2, L3, removed and checked out of circuit the reed relay L4. Cleaned and Deoxidized the input BNC assy, replaced the fuse. Cleaned and deoxidized all the PCB cables/connectors. Kinda don't know what to check next, since I don't know the theory of operation. I guy years past had the same problem with the open test and low capacitance test, but he disappeared from the forum, so I don't know what is found or if he ever found a solution.


Report to moderator  Logged

fastguido

Regular Contributor



Posts: 55

Country: 



Re: Sencore LC102 Capacitor testing problem low values

Say Thanks

Reply

Quote

« Reply #5 on: September 11, 2020, 11:35:41 pm »

Quote from: Smoky on September 11, 2020, 09:02:24 pm

I'm using a Sencore LC102 as I type this. I'm matching Nichicon UKL electrolytic capacitors in the .33uf to the 1.5uf range with no issues.

The only time I see the "Error 7" is when I attempt to measure ESR on a capacitor below 1uf, which is normal.

I would make sure that your probes pass the "open" and "short" tests and to go ahead and unscrew and clean the BNC adapter/fuse assembly very well.

Passes the short test just fine, just won't pass the open test, I guess I will clean the BNC adapter/fuse assembly again for the third time, but I don't think that is the problem. Thanks for the input.

Report to moderator Logged

coromonadalix

Super Contributor



Posts: 3495

Country:



Re: Sencore LC102 Capacitor testing problem low values

« Reply #6 on: September 12, 2020, 12:45:24 am »

Say Thanks Reply Quote

the error 7 could be caused by bad test probes and some relays who can be stuck in it, theres one who can give some trouble.

you have to do an open and close test to see if your test probes are okay, the original cable has a special impedance you can buy an compatible cable on Ebay as i did and it worked perfectly

Sadly i dont own an lc102 anymore sold it 1 month ago

On ko4bb website, you have schematics, user manual and calibration and test sheets, i had uploaded the joined images schematics in the Zipped file

« Last Edit: September 12, 2020, 04:40:01 pm by coromonadalix »

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Quarlo Klobrigney

Frequent Contributor



Posts: 873

Country:

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Re: Sencore LC102 Capacitor testing problem low values

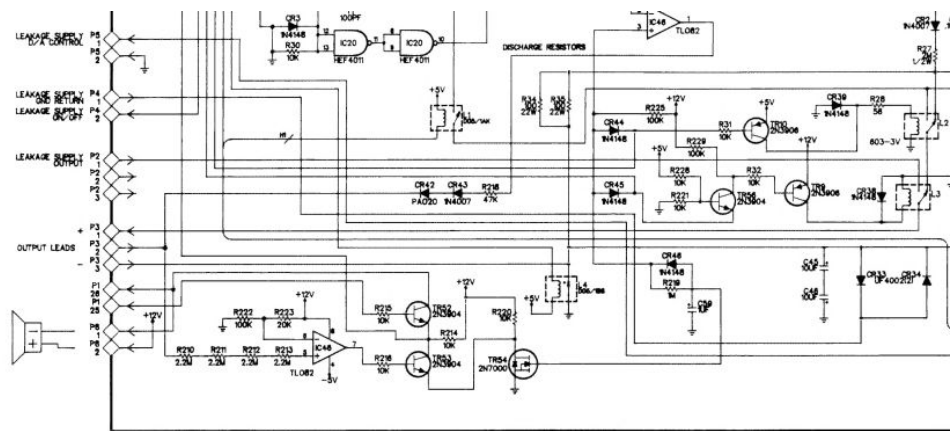
« Reply #7 on: September 12, 2020, 01:31:39 am »

Say Thanks Reply Quote

If the output leads at P3, P3 mean the input circuit, then check all these diodes below. It's not the easiest schematic to follow as it is broken up so badly.

All you have to do is print the original out in a pdf software suite and use the split pages function if it was originally a full size schematic.

If it wasn't, then it's a poor scan to start.



Diodes.jpg (59.86 kB, 864x408 - viewed 64 times.)

« Last Edit: September 12, 2020, 01:34:09 am by Quarlo Klobrigney »

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Voltage does not flow, nor does it go.
"I do 7 things at a time, I do them very well, and then I move on."

Johnny10

Frequent Contributor



Posts: 864

Country:



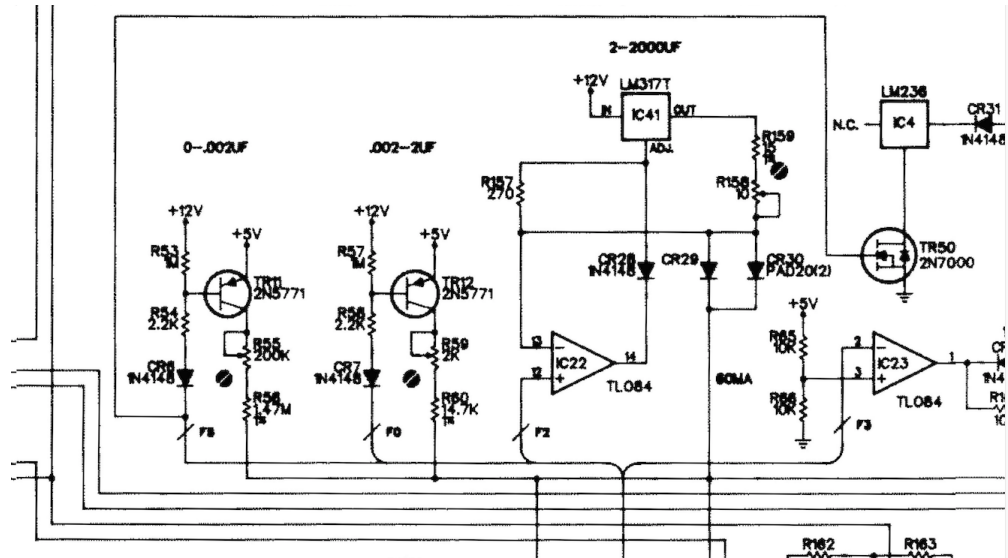
Re: Sencore LC102 Capacitor testing problem low values

« Reply #8 on: September 12, 2020, 01:52:31 am »

Say Thanks Reply Quote

There is specific circuitry for 0- .002uF Capacitance and .002- 2uF It is on the 2000 Board schematic page.

Shown in attachment coromonadalix stated Ko4bb website



Screen Shot 2020-09-11 at 9.47.53 PM.png (379.25 kB, 1332x737 - viewed 81 times.)

« Last Edit: September 12, 2020, 01:59:02 am by Johnny10 »

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Johnny10
Frequent Contributor



Posts: 864
Country:

Re: Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #9 on: September 12, 2020, 02:09:08 am »

coromonadlix

Thanks for uploading the joined schematics.

Back when I first started working on LC102 and your joined schematics were unavailable, I printed out, taped together and laminated those separate pages. Took forever!

Report to moderator Logged

Tektronix TDS7104, DMM4050, HP 3561A, HP 35665, Tek 2465A, HP8903B, DSA602A, Tek 7854, 7834, HP3457A, Tek 575, 576, 577 Curve Tracers, Datron 4000, Datron 4000A, DOS4EVER uTracer, HP5335A, EIP534B 20GHz Frequency Counter, TrueTime Rubidium, Sencore LC102, Tek TG506, TG501, SG503, HP 8568B

Quarlo Klobrigney
Frequent Contributor



Posts: 873
Country:

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Re: Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #10 on: September 12, 2020, 02:21:39 am »

I see those PAD 20's in there CR29 & 30.

They gave me a fit with my various pre-LC101 testers.

In fact they were even circled on the PDF.

I tested them and they read strangely.

I found some replacement\$ at Mouser. TO-39 or was it 72?

« Last Edit: September 12, 2020, 02:24:04 am by Quarlo Klobrigney »

Report to moderator Logged

Voltage does not flow, nor does it go.

"I do 7 things at a time, I do them very well, and then I move on."

fastguido
Regular Contributor



Posts: 55
Country:



Re: Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #11 on: September 12, 2020, 03:34:31 pm »

Quote from: Johnny10 on September 12, 2020, 01:52:31 am

There is specific circuitry for 0- .002uF Capacitance and .002- 2uF
It is on the 2000 Board schematic page.

Shown in attachment coromonadlix stated Ko4bb website

TR11 and TR12 never turn on because the timing isn't right in the 74c374 which controls these two current sources (in both the open test and the < 2uf cap test). I think that the processor isn't telling these to turn on for some reason.

Report to moderator Logged

fastguido
Regular Contributor

Posts: 55
Country:

Re: Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #12 on: September 12, 2020, 03:35:58 pm »

Quote from: Quarlo Klobrigney on September 12, 2020, 02:21:39 am

I see those PAD 20's in there CR29 & 30.
They gave me a fit with my various pre-LC101 testers.
In fact they were even circled on the PDF.
I tested them and they read strangely.
I found some replacement\$ at Mouser. TO-39 or was it 72?

I will check out those diodes, thanks.

Report to moderator Logged

coromonadalix
Super Contributor

Posts: 3495
Country:

Re: Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #13 on: September 12, 2020, 04:36:33 pm »

Quote from: Johnny10 on September 12, 2020, 02:09:08 am

coromonadalix
Thanks for uploading the joined schematics.
Back when I first started working on LC102 and your joined schematics were unavailable, I printed out, taped together and laminated those separate pages. Took forever!

I did my best to join them on Ms Paint, not perfect tough, better than nothing lol

Report to moderator Logged

coromonadalix
Super Contributor

Posts: 3495
Country:

Re: Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #14 on: September 13, 2020, 09:19:38 am »

Op you should check every voltages given in the calibration document, you have to do some verifications before changing parts, as i wrote, some lc102 were prone to have a relay going bad on the contacts (the biggest one with a clear shell) and other small relays ... mine was slightly different with metalised / shielded relays straight form sencore.

Report to moderator Logged

fastguido
Regular Contributor

Posts: 55
Country:

Re: Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #15 on: September 13, 2020, 04:02:17 pm »

I started doing the calibration per the document starting with the voltage calibration which was fine, then to the capacitor cal, but couldn't do that because it won't read the 1500pf cap or the open test. On the two large relays, I burnished and deoxidized both.

Report to moderator Logged

fastguido
Regular Contributor

Posts: 55
Country:

Re: Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #16 on: September 16, 2020, 05:14:29 pm »

Quote from: Quarlo Klobrigney on September 12, 2020, 02:21:39 am

I see those PAD 20's in there CR29 & 30.
They gave me a fit with my various pre-LC101 testers.
In fact they were even circled on the PDF.
I tested them and they read strangely.
I found some replacement\$ at Mouser. TO-39 or was it 72?

Great lead! CR-30 is bad, but they appear to be no longer available . Do you remember what you replaced them with? It seems the they are only rated at 50ma, so they put two in parallel for the 60ma current source, The newer JPAD's are only rated at 10ma so that's a no go.


Report to moderator Logged

 **fastguido**

Regular Contributor



Posts: 55

Country:  **Re: Sencore LC102 Capacitor testing problem low values**

Say Thanks

Reply

Quote

« Reply #17 on: September 16, 2020, 05:18:40 pm »

Quote from: coromonadalix on September 12, 2020, 12:45:24 am

On ko4bb website, you have schematics, user manual and calibration and test sheets, i had uploaded the joined images schematics in the Zipped file

Thanks for doing the schematics! I had them printed onto blueprint sized sheets, they came out great. My old eyes can now see the pin #'s.

Report to moderator  Logged **coromonadalix**

Super Contributor



Posts: 3495

Country:  **Re: Sencore LC102 Capacitor testing problem low values**

Say Thanks

Reply

Quote

« Reply #18 on: September 16, 2020, 05:29:27 pm »


the LCR102 i had never developed any problems, it was a good horse

Report to moderator  Logged **Quarlo Klobrigney**

Frequent Contributor



Posts: 873

Country: 

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 **Re: Sencore LC102 Capacitor testing problem low values**

Say Thanks

Reply

Quote

« Reply #19 on: September 16, 2020, 05:30:36 pm »

I will search the archive, the dusty shelves of my mind. I'll let you know later today.

Quote from: fastguido on Today at 02:14:29

Great lead! CR-30 is bad, but they appear to be no longer available . Do you remember what you replaced them with?

Report to moderator  Logged**Voltage does not flow, nor does it go.**

"I do 7 things at a time, I do them very well, and then I move on."

 **fastguido**

Regular Contributor



Posts: 55

Country:  **Re: Sencore LC102 Capacitor testing problem low values**

Say Thanks

Reply

Quote

« Reply #20 on: September 16, 2020, 05:33:05 pm »

Quote from: Quarlo Klobrigney on September 16, 2020, 05:30:36 pm

I will search the archive, the dusty shelves of my mind. I'll let you know later today.

Quote from: fastguido on Today at 02:14:29

Great lead! CR-30 is bad, but they appear to be no longer available . Do you remember what you replaced them with?


Thanks

Report to moderator  Logged **Quarlo Klobrigney**

Frequent Contributor



Posts: 873

Country: 

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 **Re: Sencore LC102 Capacitor testing problem low values**

Say Thanks

Reply

Quote

« Reply #21 on: September 16, 2020, 05:51:27 pm »

It used to be a Fairchild product now it's off to InterFET. Try Mouser with 106-DPAD5. That's what I ordered and used. It all comes back to me now... I called the original device's manufactures and found someone knowledgeable who steered me in the right direction for a prahpaah (Boston) sub.

She's an expensive little thing that. 🤔

And I thought that it was expensive then!

Product Detail	Customer #	Order Qty.	Price (USD)	Ext. (USD)	Status	Date	Invoice #
Mouser #: 106-DPAD5 Mfr. #: DPAD5 Desc.: Diodes - General Purpose, Power, Switching Diodes - General Purpose, Power, Switching Dual Pico-Amp Diode 50mA -45BVr 0.8Vf		2	\$9.25	\$18.50	2 Shipped	16-Apr-19	

DPAD5.gif (15.63 kB, 864x139 - viewed 54 times.)

« Last Edit: September 16, 2020, 06:01:40 pm by Quarlo Klobrigney »

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Voltage does not flow, nor does it go.

"I do 7 things at a time, I do them very well, and then I move on."

fastguido

Regular Contributor



Posts: 55

Country:



Re: Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #22 on: September 16, 2020, 06:39:05 pm »

Very good, thanks for the time searching for it! So I see that it is a dual package, so you must of replaced both CR29,30 with one of these? \$17.53 each wow!

Report to moderator Logged

Quarlo Klobrigney

Frequent Contributor



Posts: 873

Country:

This Space For Rent



Re: Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #23 on: September 16, 2020, 06:46:06 pm »

Double what I paid 😞!
But the pA leakage rating is better than the PAD20.
I needed 2 to do the job on my LC 53 & 75.

« Last Edit: September 16, 2020, 06:48:38 pm by Quarlo Klobrigney »

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Voltage does not flow, nor does it go.

"I do 7 things at a time, I do them very well, and then I move on."

fastguido

Regular Contributor



Posts: 55

Country:



Re: Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #24 on: October 10, 2020, 04:09:39 pm »

Fixed, replaced both CR29, CR 30 PAD diodes, only one was bad, but replaced both from the same lot #. They are in parallel with each other , so they share current. Did the calibration on the capacitor section and is good to go. I am noticing that measuring in the pico farad range that reading do wander a little bit, compared to my DE-5000, but it has Kevin leads on it.

But a question, On top of the unit there is a sticker that mentions, that there will be poor readings in the low capacitance range unless the unit is grounded. Any ideas on why that would be the case, (maybe something to do with the switch mode power supply in the unit not being shielded?). I noticed that it appears the chassis/case is only grounded through the external power supply ground.

Report to moderator Logged

Quarlo Klobrigney

Frequent Contributor



Posts: 873

Country:

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Re: FIXED Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

« Reply #25 on: October 10, 2020, 04:50:38 pm »

I think you said it works now, am I correct?

As far as the wandering all over, all of mine do that. RG-62 is what they use for coax if I remember. It was bending everywhere all those years, not to mention how good is the shielding on the cable after all this time? Did you do the full external calibration?

As for grounding, yes it is grounded through the power cord and several places in the unit. I don't understand what they're referring to....

« Last Edit: October 10, 2020, 04:53:27 pm by Quarlo Klobrigney »

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Voltage does not flow, nor does it go.

"I do 7 things at a time, I do them very well, and then I move on."

coromonadalix

Re: FIXED Sencore LC102 Capacitor testing problem low values

Say Thanks Reply Quote

Super Contributor



Posts: 3495

Country:



« Reply #26 on: October 11, 2020, 02:13:07 am »

sometimes the grounding on the probes are to get rid of stray capacitances values

My lc-102 was working fine with some non rg-62 cables, until you reach a capacitance value and resistance value, the lc102 in open and short test mode may pass fine, i had to cut 1 inch of lenght of the cable i had because of the added micro clips i had to change.

You have a seller on ebay who sell very good rg-62 cable i bought 2 of them and they worked perfectly

Report to moderator Logged

fastguido

Regular Contributor



Posts: 55

Country:



Re: FIXED Sencore LC102 Capacitor testing problem low values

« Reply #27 on: October 11, 2020, 03:57:03 pm »

Say Thanks Reply Quote

Yes it works, just noticed the wandering measuring low values of capacitance say 1500pf, it seems to wander from the marked value to a lower value then to a higher value, then back down, kinda like its scanning back and forth, never seems to settle. I going to check out the grounds on the external power supply.

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