

Advanced LIGO Engineering Change Request (ECR)

ECR Title: ECR: Mitigation of the RF intermodulation in aLIGO broadband photodetectors

DCC No: E1500240

Date: May 6, 2015

Requester: Koji Arai

Impacted Subsystem(s): ISC

Description of Proposed Change(s): Modify aLIGO ISC Broadband Photodetectors (D1002969-v9).

- Remove U1 (MAR-6SM+) and short the input and output pads of the U1.
- Remove L21
- Replace U2 (GALI-6+) with Minicircuits GALI-52+
- Replace R22 with 1W 220Ohm SMD Resistor like Stackpole Electronics Inc RMCP2010FT220R

Reason for Change(s):

Described in G1500595-v2

Estimated Cost: The components cost less than \$5 for each. The soldering work requires less than 15 minutes for each.

Schedule Impact Estimate: In addition to the above described time to require the retrofitting, removal, reinstallation, realignment of the photodetector requires about an hour detector time. Retuning of the sensing gain and demodulation phase may require an hour to two hours detector time.

Nature of Change (check all that apply):

- Safety
- Correct Hardware
- Correct Documentation

- Improve Hardware
- Improve/Clarify Documentation
- Change Interface
- Change Requirement

Importance:

- Desirable for ease of use, maintenance, safety
- Desirable for improved performance, reliability
- Essential for performance, reliability
- Essential for function
- Essential for safety

Urgency:

- No urgency
- Desirable by date/event: _____
- Essential by date/event: _____
- Immediately (ASAP)

Impacted Hardware (select all that apply):

Repair/Modify. List part & SNs: _____
LIGO-S1200234 ~ S1200273 (40 units).

Scrap & Replace. List part & SNs: _____

Installed units? List IFO, part & SNs: _____

Future units to be built

Impacted Documentation (list all dwgs, design

reports, test reports, specifications, etc.):
D1002969-v9

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Disposition of the proposed change(s):

The disposition of this proposed engineering change request is to be completed by Systems Engineering and indicated in the “Notes and Changes” metadata field in the DCC entry for this ECR. The typical dispositions are as follows:

- **Additional Information Required:** in which case the additional information requested is defined. The ECR requester then re-submits the ECR with the new information using the same DCC number for the ECR but with the next version number.
- **Rejected:** in which case the reason(s) for the rejection are to be given
- **Approved**
- **Approved with Caveat(s):** in which case the caveat(s) are listed
- **TRB:** the ECR is referred to an ad-hoc Technical Review Board for further evaluation and recommendation. It is the System Engineer’s (or designee’s) responsibility to organize the TRB. The System Engineer (or designee) then makes a technical decision based on the TRB’s recommendation. Links to the TRB’s documentation (charge, memos, final report, etc.) are to be added to the “Related Documents” field for this ECR.
- **CCB:** a change request for approval of additional funds or schedule impact is to be submitted to the Configuration Control Board. Links to the CCB’s documentation (CR, etc.) are to be added to the “Related Documents” field for this ECR.

Concurrence by Project Management:

Acknowledgement/acceptance/approval of the disposition is to be indicated by the electronic “signature” feature in the DCC entry for this ECR, by one the following personnel:

- Systems Scientist
- Systems Engineer
- Deputy Systems Engineer