Project Number: Design Qualification Test Report	Tracking Code: 2708651_Report_Rev_2
Requested by: Andrew Woodson	Date: 5/11/2021
Part #: GPSO-0715-01-01	Tech: Scott Rollefstad
Part description: GPSO	Qty to test: 20
Test Start: 02/22/2021	Test Completed: 02/22/2021

DESIGN QUALIFICATION TEST REPORT

GPSO-0715-01-01

REVISION HISTORY

DATA	REV.NUM.	DESCRIPTION	ENG
3/11/2021	**2**	**Initial Issue**	**PC**

CERTIFICATION

All instruments and measuring equipment were calibrated to National Institute for Standards and Technology (NIST) traceable standards according to IS0 10012-l and ANSI/NCSL 2540-1, as applicable.

SCOPE

To perform the following tests: Design Qualification test. Please see test plan.

APPLICABLE DOCUMENTS

Standards: EIA Publication 364

TEST SAMPLES AND PREPARATION

1) All materials were manufactured in accordance with the applicable product specification.
2) All test samples were identified and encoded to maintain traceability throughout the test sequences.
3) Either an automated cleaning procedure or an ultrasonic cleaning procedure may be used.
4) The automated procedure is used with aqueous compatible soldering materials.
5) Any additional preparation will be noted in the individual test sequences.
6) Solder Information: Not Applicable

FLOWCHARTS

Pull Out Force

Note: Pull out force will be tested using three separate PCB options, the differences being the diameter of the non plated through holes for the GPSO samples.

Group 1
GPSO-B-0715-01-01
PCB BOARD
4 Assemblies
3.30mm Diameter PCB

Step	Description
1.	Pull Out Force *Note: Tesing was performed using a .062 thick PCB with 3.30mm diameter holes.*

Group 2
GPSO-B-0715-01-01
PCB BOARD
4 Assemblies
3.25mm Diameter PCB

Step	Description
1.	Pull Out Force *Note: Tesing was performed using a .062 thick PCB with 3.25mm diameter holes.*

Group 3
GPSO-B-0715-01-01
PCB BOARD
4 Assemblies
3.35mm Diameter PCB

Step	Description
1.	Pull Out Force *Note: Tesing was performed using a .062 thick PCB with 3.35mm diameter holes.* *Target over 50lbs*

Group 4
GPSO-T-0715-01-01
PCB BOARD
4 Assemblies
4.50mm Diameter PCB

Step	Description
1.	Pull Out Force *Note: Tesing was performed using a .062 thick PCB with 3.30mm diameter holes.*

Group 5
GPSO-T-0715-01-01
PCB BOARD
4 Assemblies
4.42mm Diameter PCB

Step	Description
1.	Pull Out Force *Note: Tesing was performed using a .062 thick PCB with 3.25mm diameter holes.*

Group 6
GPSO-T-0715-01-01
PCB BOARD
4 Assemblies
4.58mm Diameter PCB

Step	Description
1.	Pull Out Force *Note: Tesing was performed using a .062 thick PCB with 3.35mm diameter holes.* *Target over 50lbs*

Torque

Note: Torque will be tested using three separate PCB options, the differences being the diameter of the holes for the GPSO assemblies. Apply torque to the standoff until the standoff spins freely in the PCB NPTH. Record max torque.

Group 1
GPSO-B-0715-01-01
PCB BOARD
4 Assemblies
3.30mm Diameter PCB

Step	Description
1.	Torque Force *Note: Tesing was performed using a .062 thick PCB with 3.30mm diameter holes.*

Group 2
GPSO-B-0715-01-01
PCB BOARD
4 Assemblies
3.25mm Diameter PCB

Step	Description
1.	Torque Force *Note: Tesing was performed using a .062 thick PCB with 3.25mm diameter holes.*

Group 3
GPSO-B-0715-01-01
PCB BOARD
4 Assemblies
3.35mm Diameter PCB

Step	Description
1.	Torque Force *Note: Tesing was performed using a .062 thick PCB with 3.35mm diameter holes.*

Group 4
GPSO-B-0715-01-01
PCB BOARD
4 Assemblies
4.50mm Diameter PCB

Step	Description
1.	Torque Force *Note: Tesing was performed using a .062 thick PCB with 3.30mm diameter holes.*

Group 5
GPSO-B-0715-01-01
PCB BOARD
4 Assemblies
4.42mm Diameter PCB

Step	Description
1.	Torque Force *Note: Tesing was performed using a .062 thick PCB with 3.25mm diameter holes.*

Group 6
GPSO-B-0715-01-01
PCB BOARD
4 Assemblies
4.58mm Diameter PCB

Step	Description
1.	Torque Force *Note: Tesing was performed using a .062 thick PCB with 3.35mm diameter holes.*

ATTRIBUTE DEFINITIONS

The following is a brief, simplified description of attributes.

Pull Out Force:

Record maximum force observed when removing standoff from PCB via push/pull testing.

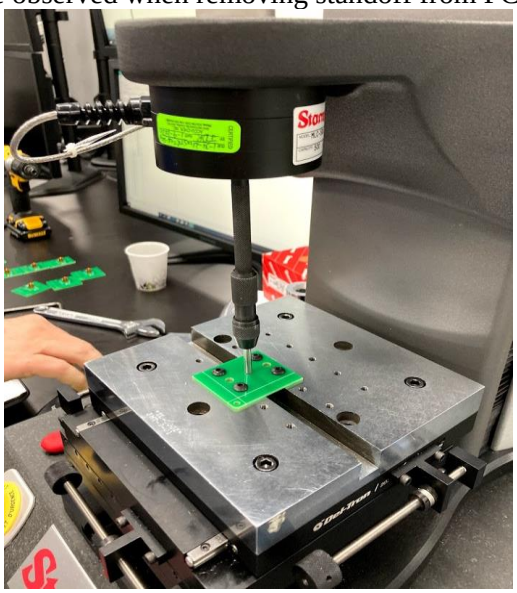

Fig. 1

Torque Force:

Record maximum torque observed when removing standoff from PCB via torque testing. Torque to be applied until standoff spins freely in non-plated thru hole.

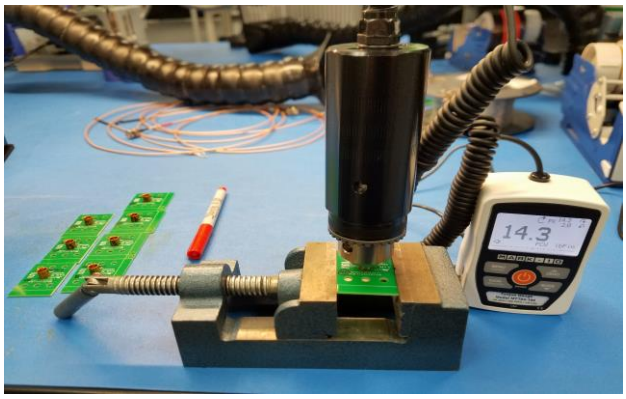

Fig. 2

RESULTS

GPSO-B-0715-01-01

Pull Out force

- **3.30 mm Diameter PCB**
  - **Min----------62.03 lbs**
  - **Max ----------63.89 lbs**
- **3.25 mm Diameter PCB**
  - **Min----------68.57 lbs**
  - **Max ----------71.62 lbs**
- **3.35 mm Diameter PCB**
  - **Min----------45.95 lbs**
  - **Max ----------54.25 lbs**

Torque Force

- **3.30 mm Diameter PCB**
  - **Min----------15.80 in lbs**
  - **Max ----------28.60 in lbs**
- **3.25 mm Diameter PCB**
  - **Min----------16.90 in lbs**
  - **Max ----------17.40 in lbs**
- **3.35 mm Diameter PCB**
  - **Min----------12.30 in lbs**
  - **Max ----------14.70 in lbs**

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Pull Out force

- **4.50 mm Diameter PCB**
  - **Min----------91.29 lbs**
  - **Max ---------- 103.15 lbs**
- **4.42 mm Diameter PCB**
  - **Min----------82.27 lbs**
  - **Max ---------- 105.42 lbs**
- **4.58 mm Diameter PCB**
  - **Min----------49.41 lbs**
  - **Max ----------64.41 lbs**

Torque Force

- **4.50 mm Diameter PCB**
  - **Min----------24.60 in lbs**
  - **Max ----------30.20 in lbs**
- **4.42 mm Diameter PCB**
  - **Min----------25.80 in lbs**
  - **Max ----------28.60 in lbs**
- **4.58 mm Diameter PCB**
  - **Min----------17.40 in lbs**
  - **Max ----------21.20 in lbs**

EQUIPMENT AND CALIBRATION SCHEDULES

Equipment #: TCT-04
Description: Dillon Quantrol TC21 25-1000 mm/min series test stand
Manufacturer: Dillon Quantrol
Model: TC2 I series test stand
Serial #: 04-1041-04
Accuracy: Speed Accuracy: +/- 5% of indicated speed; Speed Accuracy: +/- 5% of indicated speed; … Last Cal: 05/29/2020, Next Cal: 05/29/2021