

An abstract graphic on the left side of the image, composed of numerous thin, wavy green lines that swirl and overlap to form a complex, organic shape. The lines are a vibrant green color against the dark blue background.

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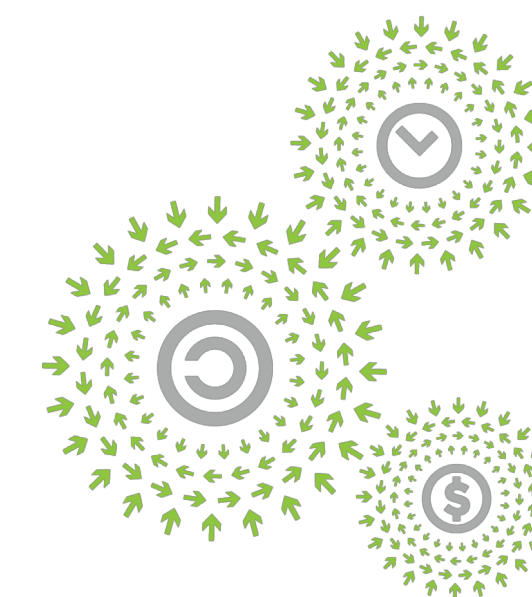
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NETWORKING

Introduction to iQSFP Tester

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Outline



NETWORKING

1. Problem Statements
2. Patent
3. Product Design Concepts
4. Product Information/Mechanical Design Improvements
5. Environmental Tests
6. User Manual
7. Summary

Problem Statements



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- When link failure occurs during deployment or post deployment at DCs, the troubleshoot process is complicated due to different network gears running simultaneously
- Current diagnostic process associated with different physical locations will cause delay dramatically
- There is no efficient portable device to debug the Optical QSFP transceivers in our day to day operation environment
- The existing capital equipment does not support millions of transceiver on-time installations due to lack of proper identification of good/bad optics

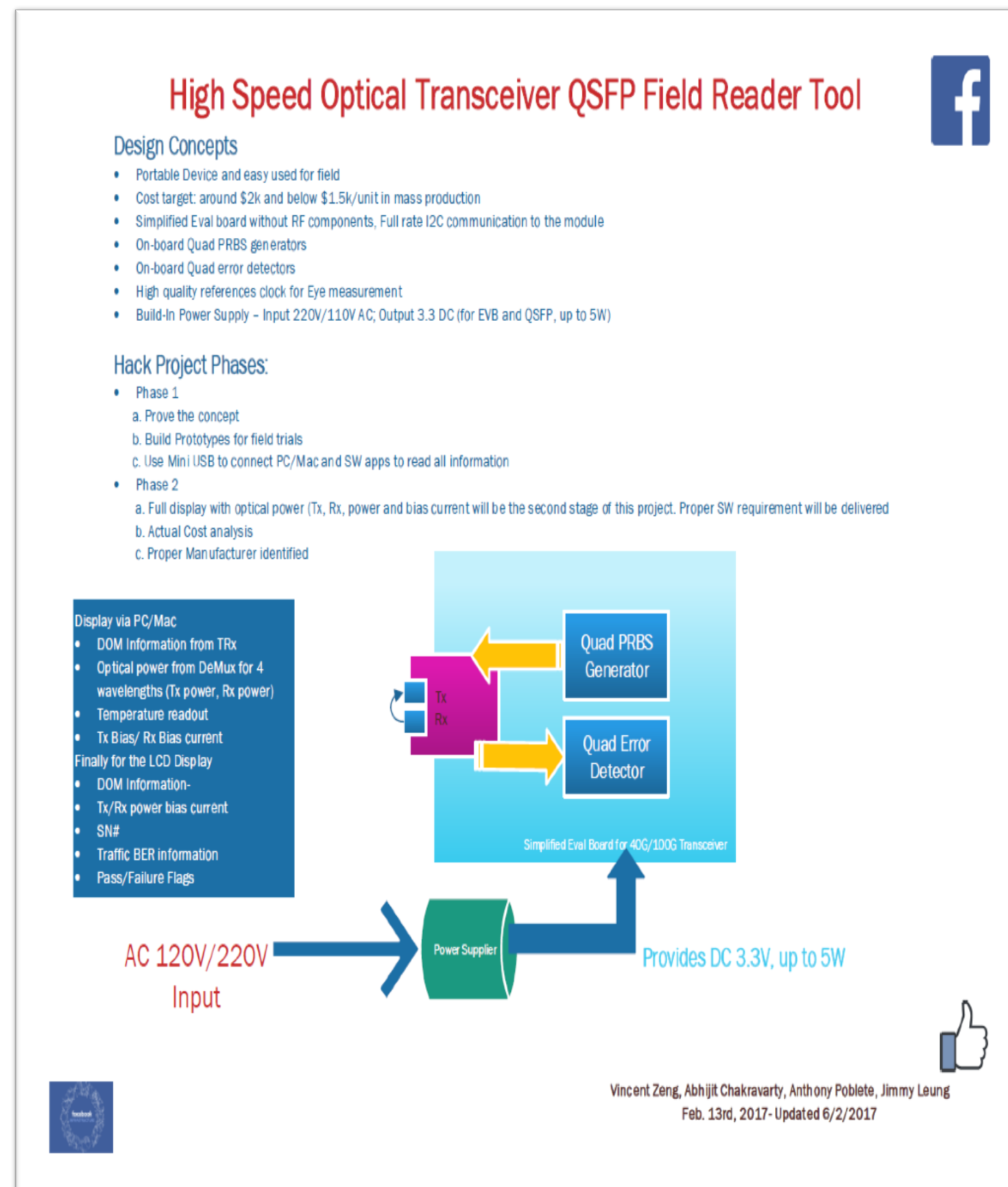
Patent



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Key Features

- **DOM /EEPROM Monitoring**
- **PRBS capability options**
- **Power and Display Options**
- **QSFP cage: prefer an easy way to replace the QSFP cage from the board- daughter card design- after 300times of inserting/mating**
- **GUI: programmable with pass/fail criteria**
- **Quick test time to provide simple pass/failure information- test time within 10seconds per each QSFP**

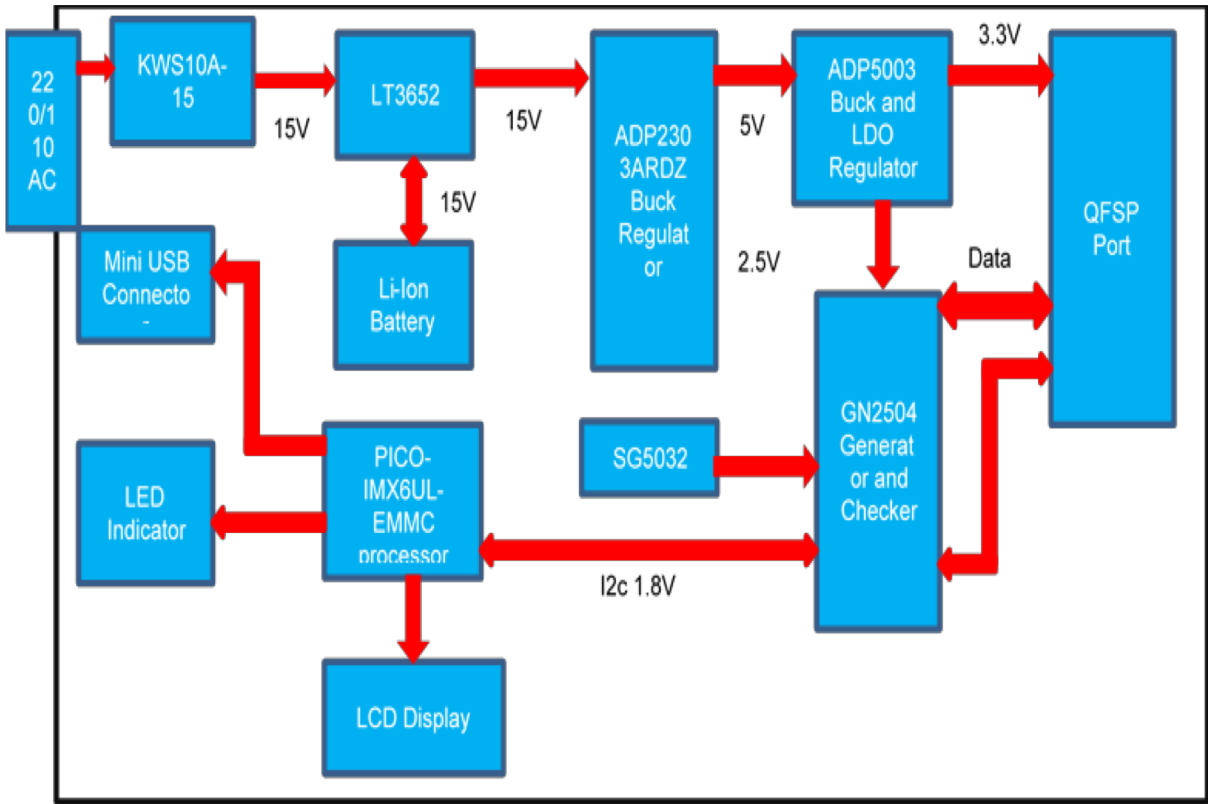


Vincent Z, Abhijit C, Anthony P, Jimmy L

Product Design Review



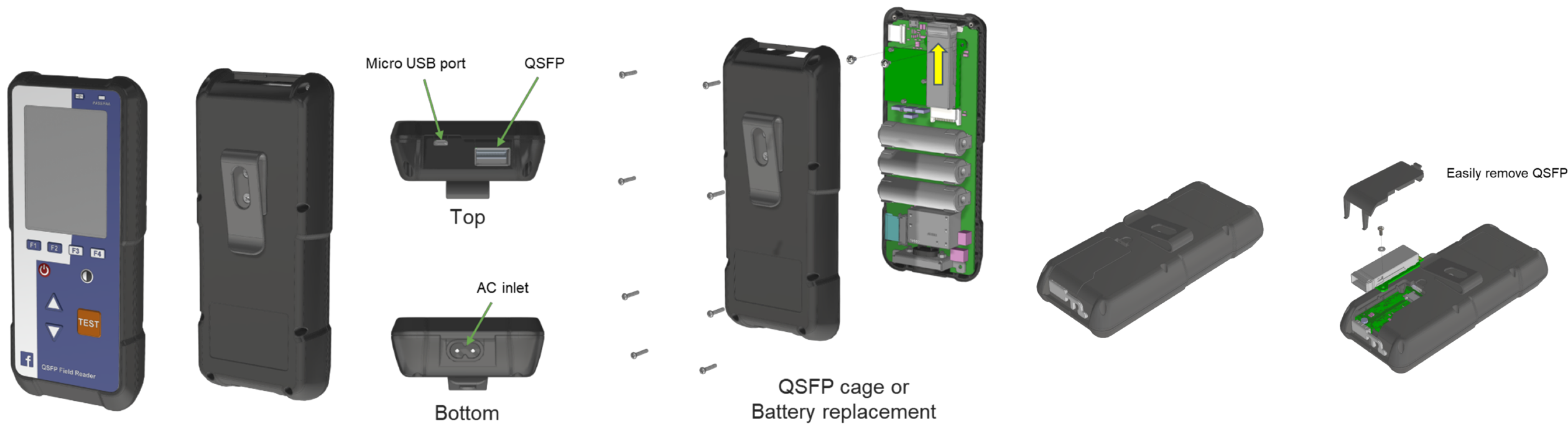
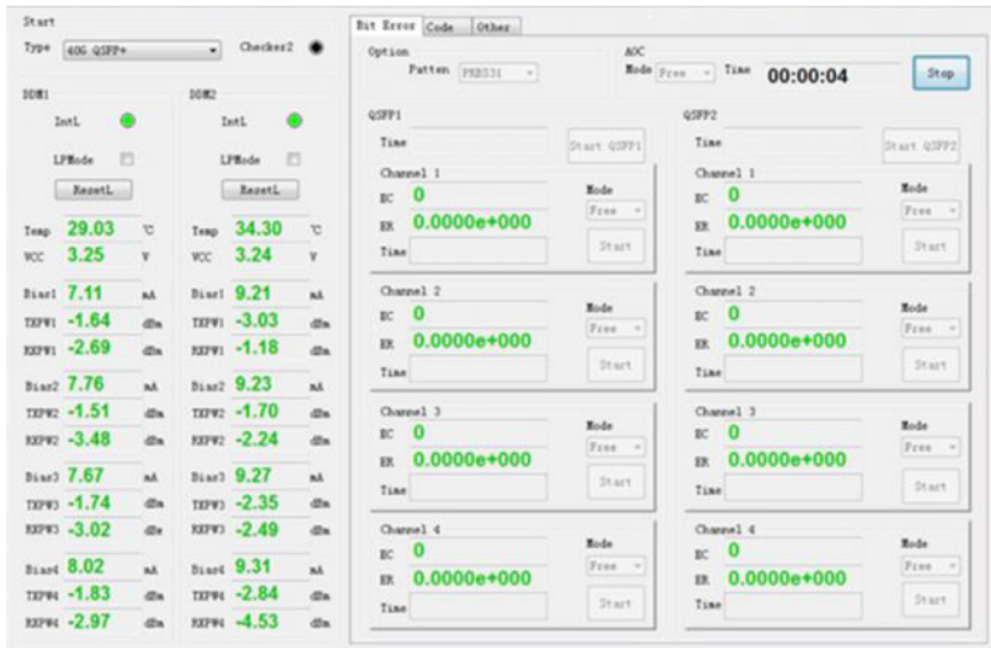
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- **Colorful LED Display**
- **BER/Error Count Option**
- **Rechargeable battery for lasting 3months**
- **Design for easy swap the daughter card**
- **Water resistance package**
- **Change the GUI to reset the pass/failure and resetting counts for the Insertion of QSFP**
- **Friendly reporting structure developed**

5. GUI

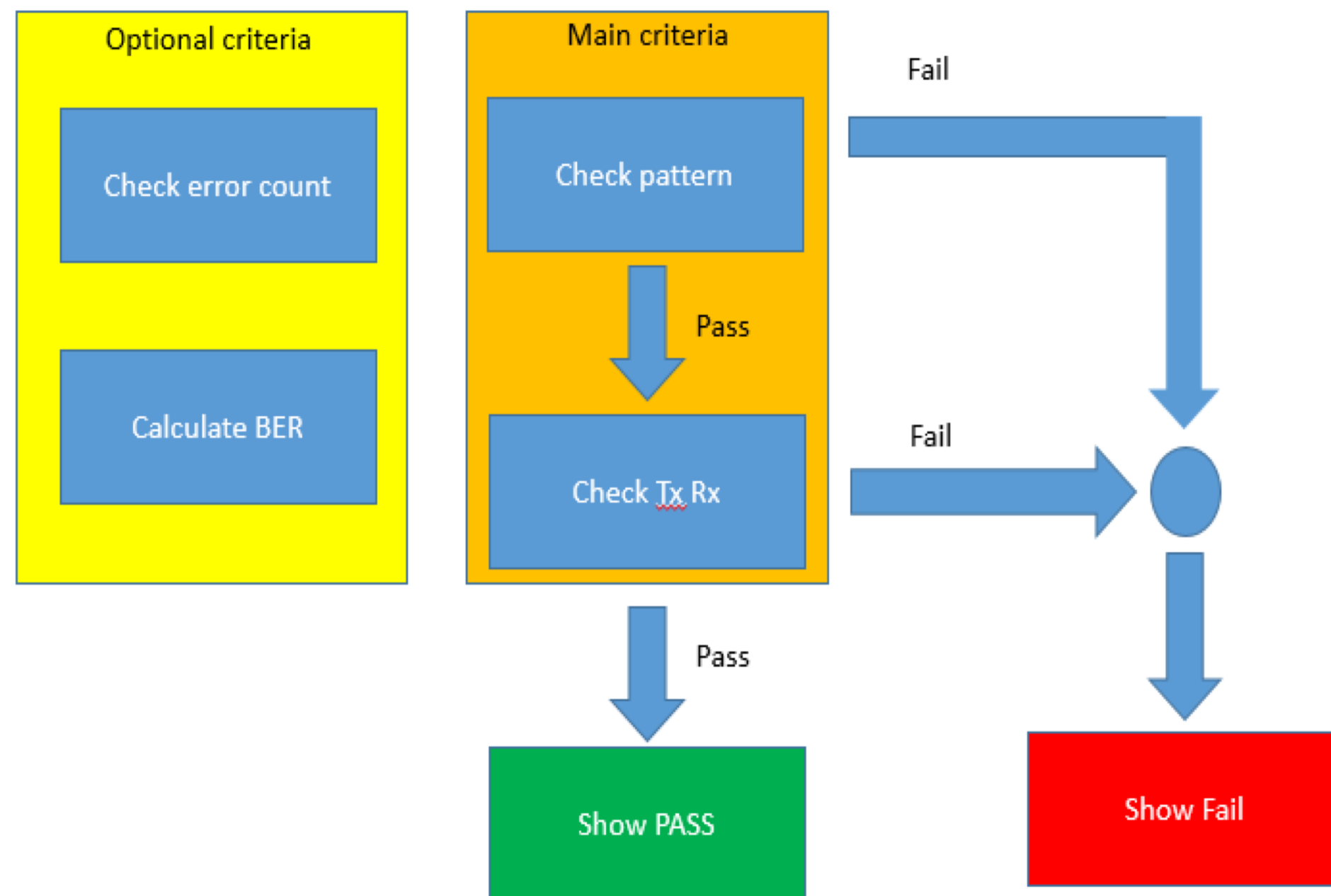
- DDM Information
- Optical Power from Demux
- Wavelengths (Tx power , Rx power)
- Temperature readout
- Tx Bias / Rx Bias Current



Pass/Failure Criteria



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BER: The Math

$$BER = \frac{(\text{number of errored bits})}{(\text{total number of bits})}$$

$$BER = \frac{(\text{error count in measurement period})}{(\text{bit rate} \times \text{measurement period})}$$

In general, BER is the ratio of errored bits to the total number of bits transmitted, received, or processed over a defined amount of time. Mathematically, two formulas are often used to describe BER:

$$BER = (\text{number of errored bits})/(\text{total number of bits})$$

$$BER = (\text{error count in measurement period})/(\text{bit rate} \times \text{measurement period})$$

Evaluation Tests



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Item	Vendor	Model	Type	Carrier	Modem	CH1				CH2				CH3				CH4				Result
						TX Power (dBm)	Rx Power (dBm)	SNR (dB)	BER	TX Power (dBm)	Rx Power (dBm)	SNR (dB)	BER	TX Power (dBm)	Rx Power (dBm)	SNR (dB)	BER	TX Power (dBm)	Rx Power (dBm)	SNR (dB)	BER	
1	SPS	SPS-001	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
2	SPS	SPS-002	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
3	SPS	SPS-003	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
4	SPS	SPS-004	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
5	SPS	SPS-005	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
6	SPS	SPS-006	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
7	SPS	SPS-007	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
8	SPS	SPS-008	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
9	SPS	SPS-009	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
10	SPS	SPS-010	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
11	SPS	SPS-011	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
12	SPS	SPS-012	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
13	SPS	SPS-013	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
14	SPS	SPS-014	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
15	SPS	SPS-015	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
16	SPS	SPS-016	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
17	SPS	SPS-017	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
18	SPS	SPS-018	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
19	SPS	SPS-019	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
20	SPS	SPS-020	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
21	SPS	SPS-021	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
22	SPS	SPS-022	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
23	SPS	SPS-023	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
24	SPS	SPS-024	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
25	SPS	SPS-025	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
26	SPS	SPS-026	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
27	SPS	SPS-027	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
28	SPS	SPS-028	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
29	SPS	SPS-029	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS
30	SPS	SPS-030	4G	HFC	4G	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	17.0	16.8	0.2	0.000	PASS

Spirent N11U (Test time 1 min.)										Result
Link State	total Tx Count (Frames)	total Rx Count (Frames)	FCS Error Frame Count (Frames)	x PRBS Fill Count (bytes)	PRBS Bit Error Ratio					
Link Up	2,109,448,400	2,109,206,157	2,120,826	185,566,633,144	1.59E-06	0	0	0	FAIL	
Link down	0	0	0	0	0	0	0	0	FAIL	
Link down	0	0	0	0	0	0	0	0	FAIL	
Link Up	2,362,787,255	2,362,787,255	0	207,925,278,440	0	0	0	0	PASS	
Link Up	2,390,961,777	2,390,907,248	483,708	210,389,947,630	3.16E-07	0	0	0	FAIL	
Link Up	2,969,013,803	2,969,013,803	0	261,273,214,664	0	0	0	0	PASS	
Link Up	3,324,830,061	3,324,830,061	0	292,585,045,368	0	0	0	0	PASS	
Link Up	2,190,710,005	2,190,710,005	0	192,782,480,440	0	0	0	0	PASS	
Link Up	5,209,977,409	5,209,977,409	0	458,478,011,992	0	0	0	0	PASS	
Link Up	5,212,965,300	5,212,965,300	0	458,740,946,400	0	0	0	0	PASS	
Link Up	2,109,204,683	2,109,204,683	0	185,610,012,104	0	0	0	0	PASS	
Link Up	6,819,381,653	6,819,381,653	0	Non	Non	Non	Non	Non	PASS	
Link Up	2,192,768,908	2,192,768,908	0	192,963,663,904	0	0	0	0	PASS	
Link Up	2,096,643,058	2,096,643,058	0	Non	Non	Non	Non	Non	PASS	
Link Up	2,969,655,275	2,969,655,275	0	261,329,664,200	0	0	0	0	PASS	
Link Up	5,208,178,764	5,208,178,764	0	458,319,731,232	0	0	0	0	PASS	
Link Up	6,601,956,365	6,601,956,365	0	580,972,160,120	0	0	0	0	PASS	
Link Up	6,606,958,760	6,606,958,760	0	581,412,370,880	0	0	0	0	PASS	
Link Up	5,373,892,571	5,373,892,571	0	472,902,546,248	0	0	0	0	PASS	
Link Up	5,210,817,974	5,210,817,974	0	458,551,981,712	0	0	0	0	PASS	
Link Up	5,369,265,623	5,369,265,623	0	472,495,374,824	0	0	0	0	PASS	

Item	Vendor	SW	Type	Connector	Antenna	CH1		CH2		CH3		CH4		QSPF LC (Measure Tx Power (dB) by QSA)				QPM				QSA MPO (Measure Tx Power (dB) by QPM)			
						TX Power (dBm)	Rx Power (dBm)	TX Power (dBm)	Rx Power (dBm)	TX Power (dBm)	Rx Power (dBm)	TX Power (dBm)	Rx Power (dBm)	CH1	CH2	CH3	CH4	CH1	CH2	CH3	CH4	CH1	CH2	CH3	CH4
1	400M952C25AA00	5712-620451	4G	MPO	568	15.170	-0.388	15.170	-0.388	15.170	-0.388	15.170	-0.388	-0.61	-1.08	-1.21	-0.78	-0.61	-1.08	-1.21	-0.78	-0.61	-1.08	-1.21	-0.78
2		5712-620456	4G	MPO	568	15.040	-0.124	15.124	-0.020	15.020	-0.271	15.020	-0.271	-1.85	-0.99	-1.42	-0.81	-1.85	-0.99	-1.42	-0.81	-1.85	-0.99	-1.42	-0.81
3		5712-620571	4G	MPO	568	16.265	-0.297	16.220	-0.102	16.102	-0.102	16.102	-0.102	-1.03	-0.72	-1.97	-1.33	-1.03	-0.72	-1.97	-1.33	-1.03	-0.72	-1.97	-1.33
4		5712-620447	4G	MPO	685	15.144	-0.755	15.346	-1.483	15.346	-1.483	15.346	-1.483	-0.88	-1.56	-1.25	-0.74	-0.88	-1.56	-1.25	-0.74	-0.88	-1.56	-1.25	-0.74
5		5712-620448	4G	MPO	568	16.777	-0.583	16.444	-1.115	16.444	-1.115	16.444	-1.115	-1.18	-0.55	-1.78	-1.87	-1.18	-0.55	-1.78	-1.87	-1.18	-0.55	-1.78	-1.87
6		5712-620446	4G	MPO	568	15.127	-1.557	15.155	-1.510	15.155	-1.510	15.155	-1.510	-1.09	-1.92	-0.48	-1.46	-1.09	-1.92	-0.48	-1.46	-1.09	-1.92	-0.48	-1.46
7		5712-620447	4G	MPO	568	15.752	-1.108	15.582	-1.185	15.582	-1.185	15.582	-1.185	-0.79	-0.74	-1.21	-1.35	-0.79	-0.74	-1.21	-1.35	-0.79	-0.74	-1.21	-1.35
8		PIVAGO 48FB-7850FZ-F21203ag	4G	MPO	685	15.524	-0.897	15.465	-0.883	15.465	-0.883	15.465	-0.883	-0.81	-0.79	-0.82	-1.01	-0.81	-0.79	-0.82	-1.01	-0.81	-0.79	-0.82	-1.01
9	BAUM	4075	100G	LC	1048	1.285	1.297	1.201	1.817	1.817	1.817	1.817	2.28	1.6	1.6	2.9	5.51 dBm								
10		4066	100G	LC	1048	1.859	-0.122	1.236	1.452	1.452	1.452	1.452	2.12	0.26	1.78	0.76	4.70 dBm								
11		4015542037	40G	LC	1049	1.713	-1.495	-1.902	-2.656	-1.122	-1.46	-0.78	-0.11	3.13 dBm											
12		4015542039	40G	LC	1049	1.576	-1.340	-0.887	-1.404	-1.46	-1.12	-0.78	-0.44	4.43 dBm											
13	AVAGO APC7-8860-P01	4015542039	40G	LC	1049	0.821	-0.351	-0.267	-0.568	-0.78	-0.44	0.24	-0.1	4.63 dBm											
14		4015542039	40G	LC	1049	1.085	-0.885	-0.483	-1.194	-0.11	-1.12	-0.44	0.78	4.35 dBm											
15		4015542039	40G	LC	1049	1.227	-0.180	-0.887	-0.366	-0.58	-0.24	0.92	0.24	3.99 dBm											
16		4015701245	100G	LC	1049	1.353	0.500	1.242	1.454	0.88	-0.48	-0.82	-0.14	3.95 dBm											
17	INTEL SPT18P2C002	4015701246	100G	LC	1049	1.139	0.67	0.845	-0.018	2.06	0.02	0.36	0.52	3.94 dBm											
18		4015701248	100G	LC	1049	1.200	0.716	0.961	1.105	2.26	1.24	0.22	1.24	4.35 dBm											
19		4015701249	100G	LC	1049	1.483	0.735	1.137	0.941	0.92	-0.78	-4.52	-1.46	3.42 dBm											
20		4015701249	40G	LC	1049	1.605	1.474	0.969	0.9665	0.58	-0.11	-0.78	-1.12	5.10 dBm											
21		4015701248	100G	LC	1049	1.931	-1.367	-1.683	-0.722	-0.44	-1.52	-4.46	-1.9	3.07 dBm											

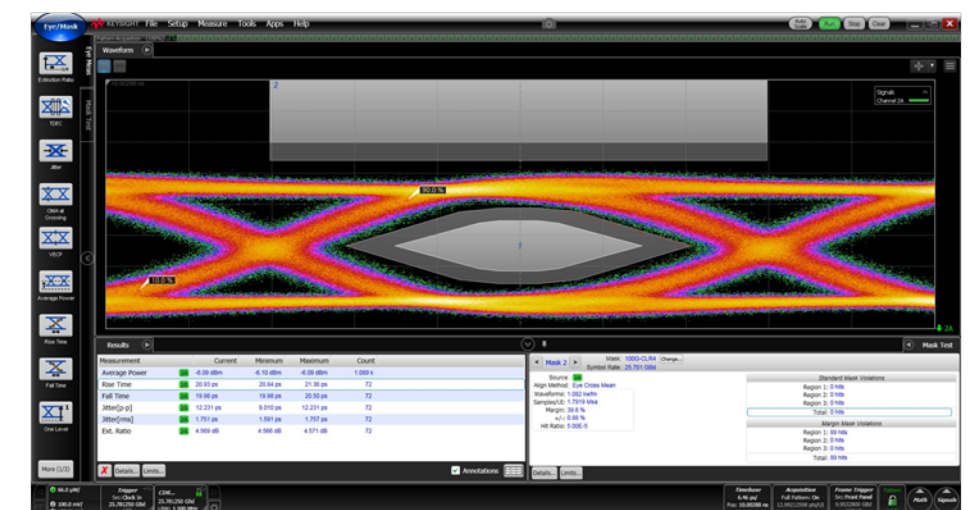
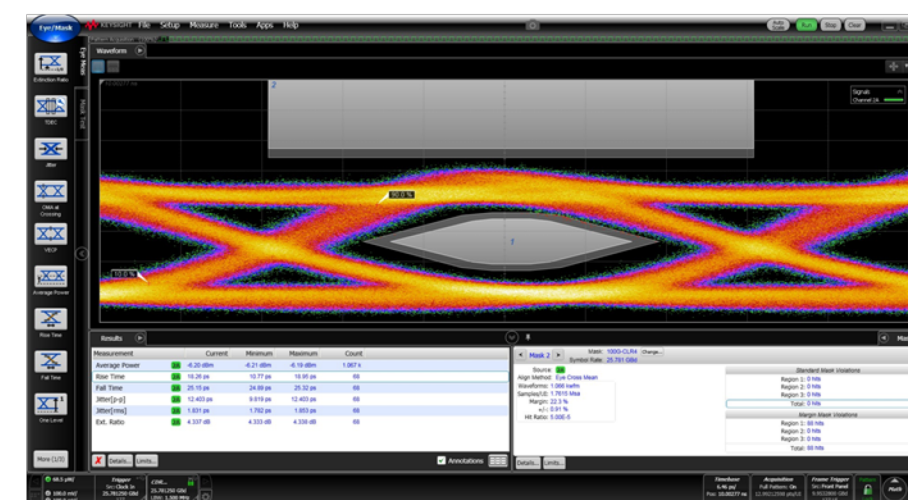
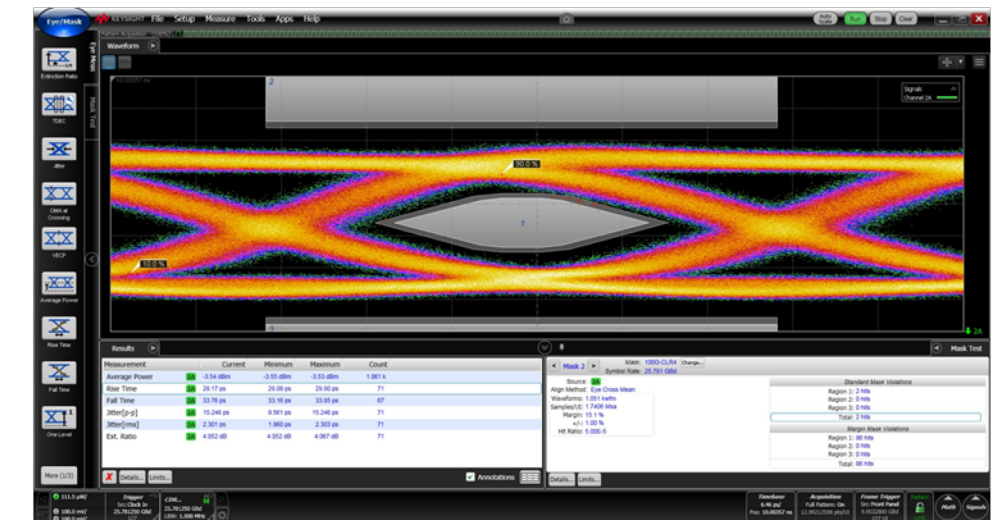
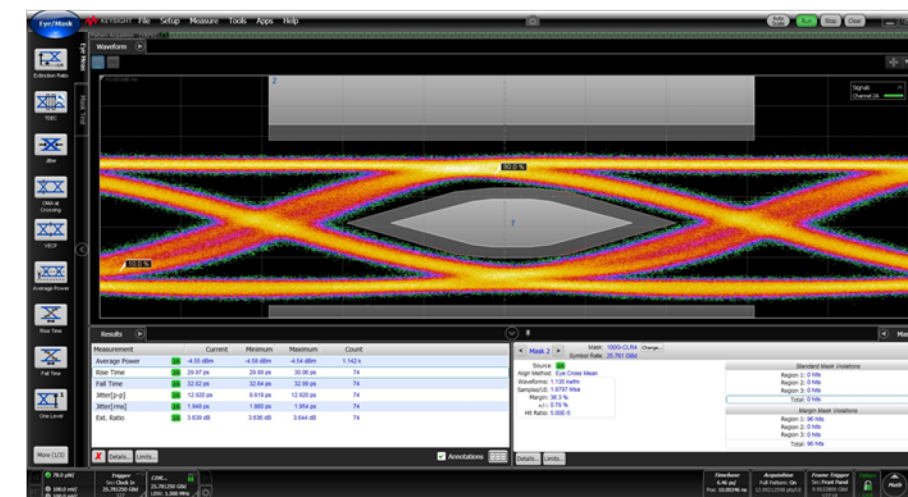
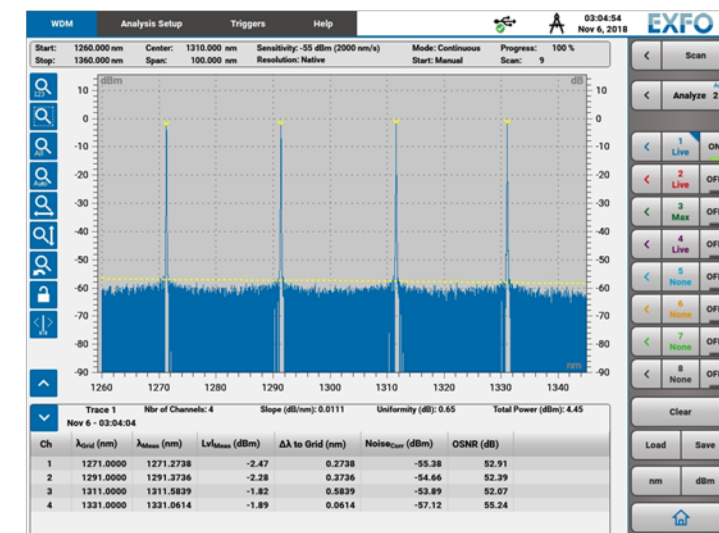
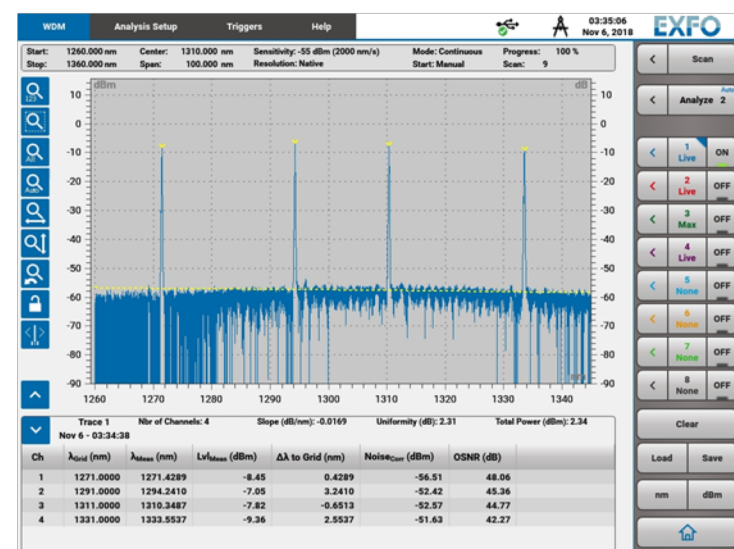
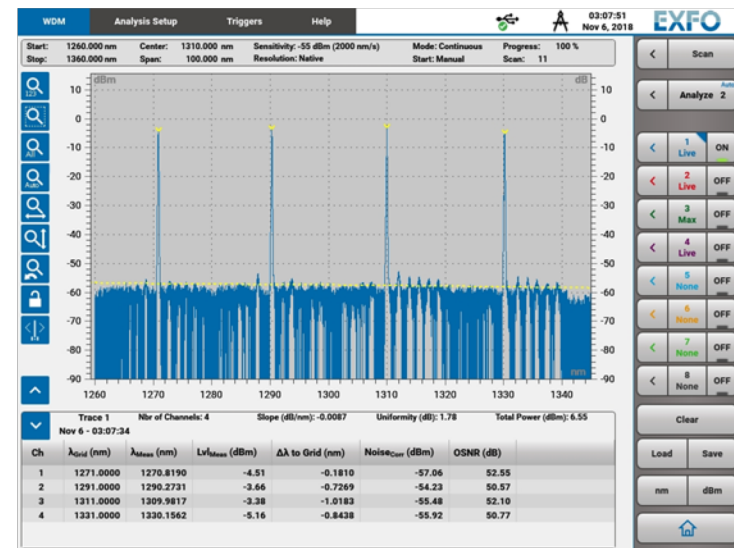
Evaluation Tests



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Testing when assembly .

- EDVT (Temp.pressure) -
- Shock/Vibration/Temp,
- EMC
- Safety
- Compliance .



Product Spec Review



NETWORKING



Microsoft Word Document

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iQSFP Tester Hardware Specification

Date	Revision	Change by	History
12/11/2015	Rev 1.0	Vincent Zeng	Initial version

Facebook Proprietary and Confidential under NDAPage 1

iQSFP Tester Specification Rev 1.0

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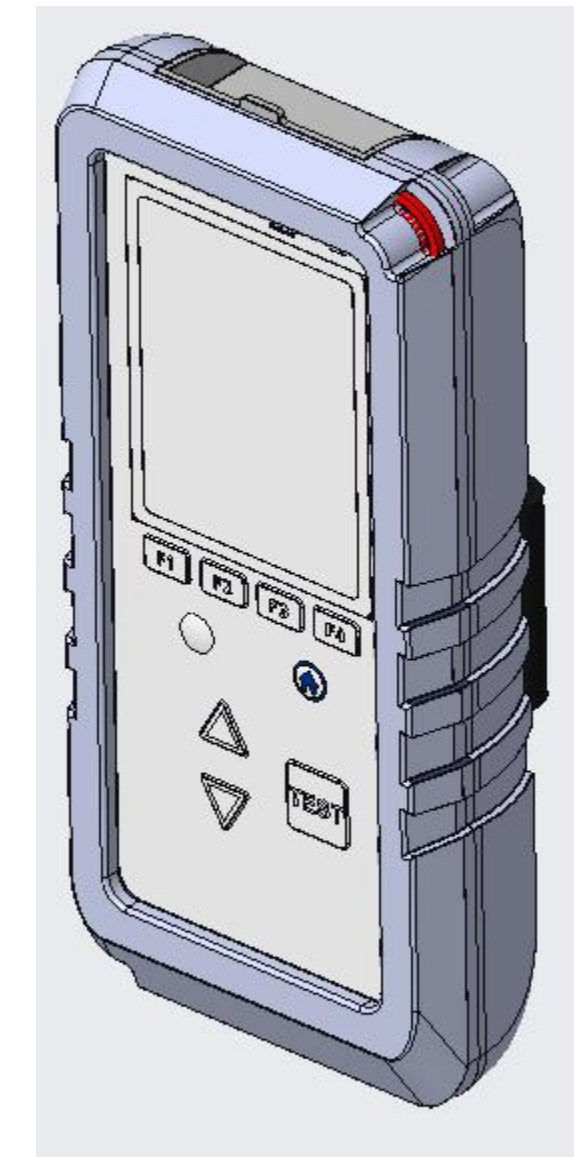
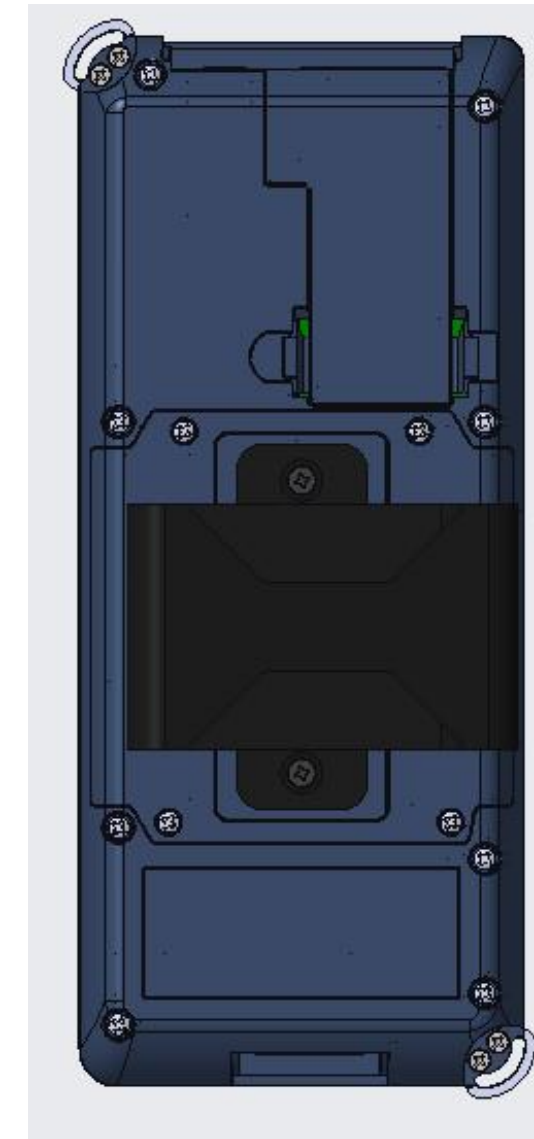
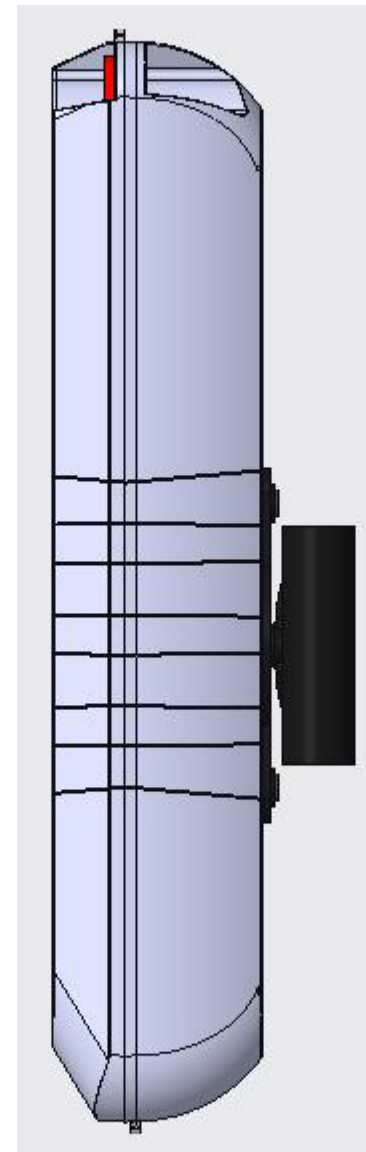
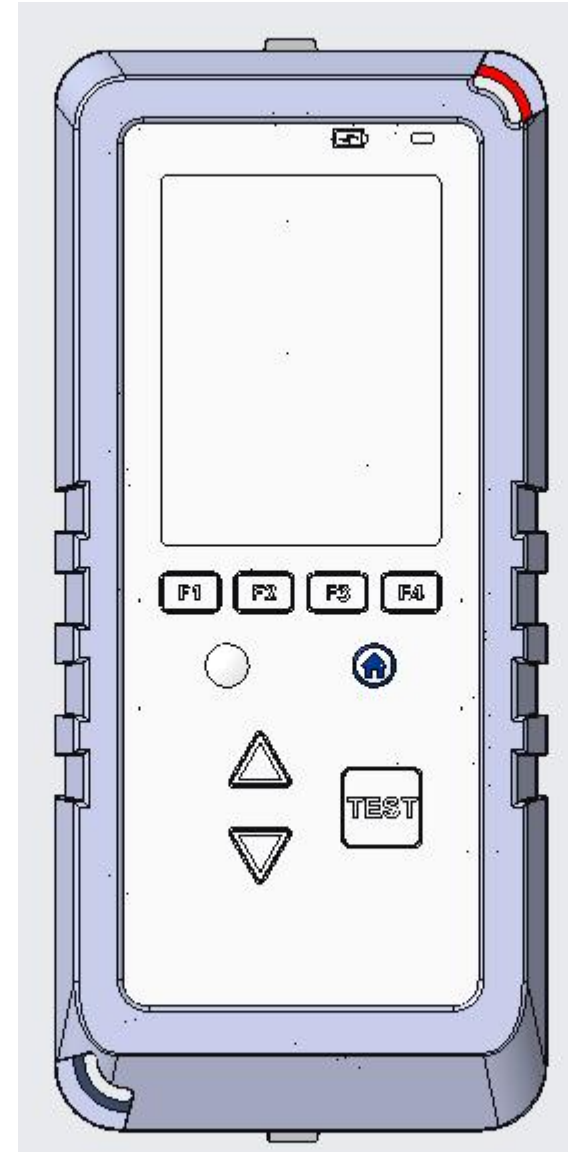
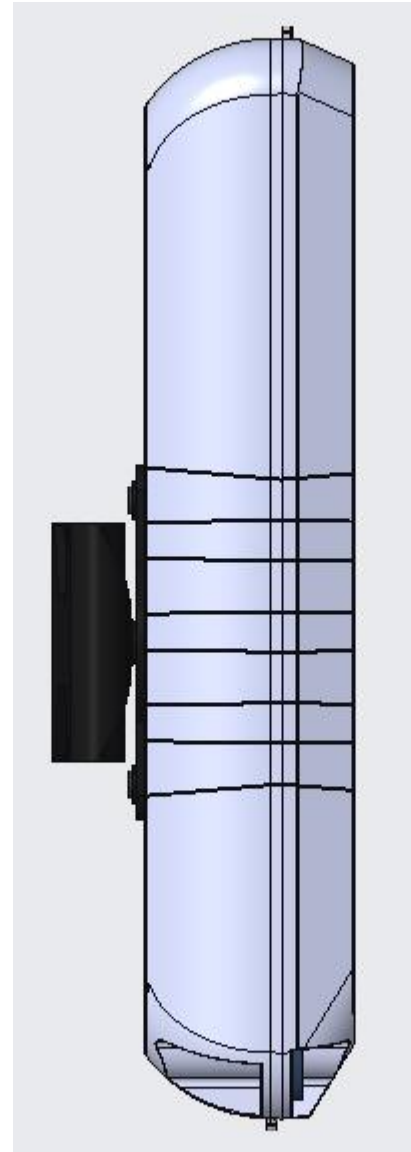
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iQSFP Tester Info



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iQSFP Packaging

Packaging Instruction

Packing Instruction

: QSFP Field Reader

The diagram illustrates the packing process for the QSFP Field Reader. It shows the following components and steps:

- Top View of Foam Bottom:** A rectangular foam base with a central cutout for the device. It includes a **Loopback [x1]** and a **Hand Strap & AC Cord [x1]**. The **QSFP Field Reader [x1]** is placed in the center.
- Foam Top [x1] P/N : TBA:** A matching foam lid that is placed over the foam bottom.
- PE Bag [x1] P/N : TBA:** A protective polyethylene bag into which the foam assembly is placed.
- Foam Bottom [x1] P/N : TBA:** The bottom foam piece, which is placed inside the PE bag.
- Pizza Box [x1] P/N : TBA:** A cardboard pizza box into which the PE bag is placed.

Arrows indicate the assembly sequence: Top View of Foam Bottom → Foam Top → PE Bag → Foam Bottom → Pizza Box.

Rev.	Description	Rev By	App.	Date
00	Initial Release	David P.	Winnat C.	21/01/2018

Pizza Box

Technical drawing of a pizza box showing the net layout, dimensions, and material specifications.

Material: Single Wall B-Flute, 200 PSI, Kraft Corrugate.

Dimensions: All dimensions are in mm. Tolerance should be ± 3 mm. Inner dimension: 176W x 279L x 103H mm.

Labels: TBA MM/YY

Notes:

- Material : Single Wall B-Flute ,200 PSI ,Kraft Corrugate.
- All Dimension are in mm. Tolerance Should be ± 3 mm.
- Inner Dimension : 176Wx279Lx103H mm.

Foam Top

Rev.	Description	Rev By	App	Date
00	Initial Release	Direk P.	Wimal C.	2 Nov 19

Notes:
 1. Material :
 Anti-Static Polyethylene
 1.7 P.C.F. ,Pink
 2. All Dimensions Are In mm.
 3. Tolerance Should Be +/-2 mm.

Source	Facebook	Part Number	TBA	CELESTICA (THAILAND) LIMITED
Drawn P.	Direk P.			
OSFP Field Reader.dwg				
Title			Foam Top	

Foam Bottom

Technical drawing of a rectangular foam bottom with a central cutout and a raised section. The drawing includes a top view, a side view, and a perspective view. Dimensions are provided in millimeters.

Top View Dimensions:

- Overall Width: 173 mm
- Overall Depth: 100 mm
- Inner Cutout Width: 100 mm
- Inner Cutout Depth: 75 mm
- Left Flange Width: 30 mm
- Right Flange Width: 70 mm
- Front Flange Width: 43 mm
- Back Flange Width: 23 mm
- Front Flange Height: 20 mm
- Back Flange Height: 30 mm
- Side Flange Height: 30 mm

Side View Dimensions:

- Overall Height: 276 mm
- Top Surface Height: 20 mm
- Inner Cutout Height: 176 mm
- Bottom Surface Height: 10 mm

Notes:

- Material : Anti-Static Polyethylene
1.7 P.C.F., Pink
- All Dimensions Are In mm.
- Tolerance Should Be ± 2 mm.



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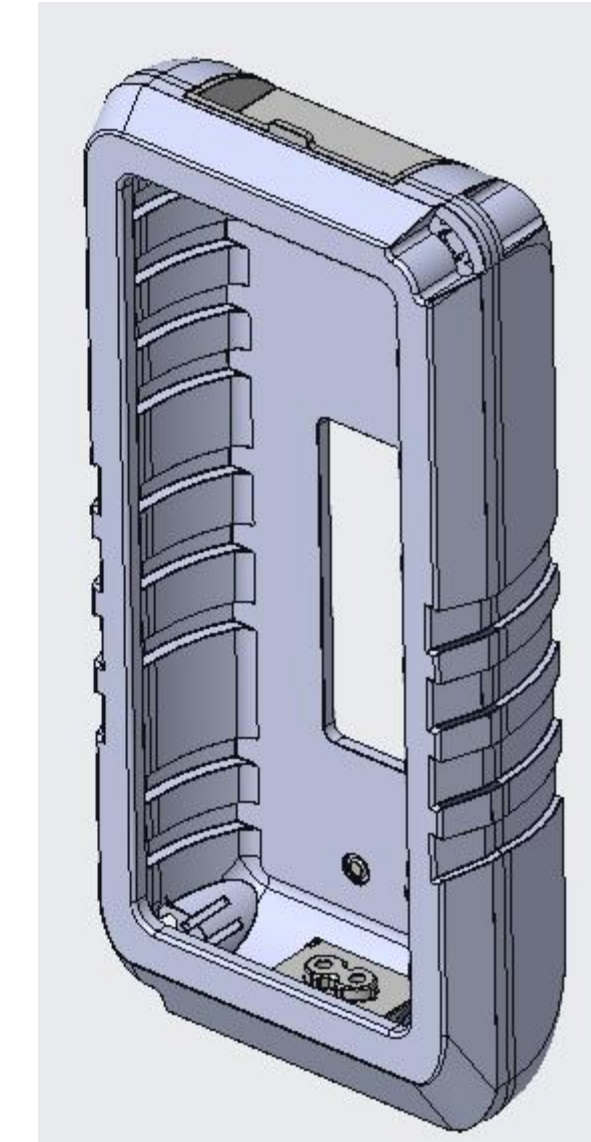
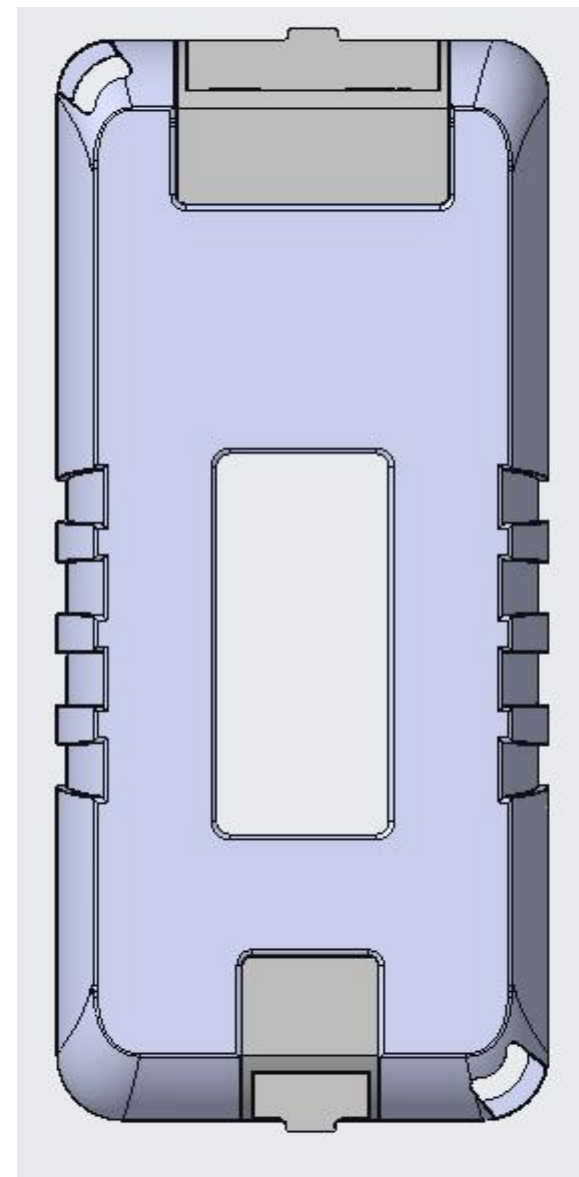
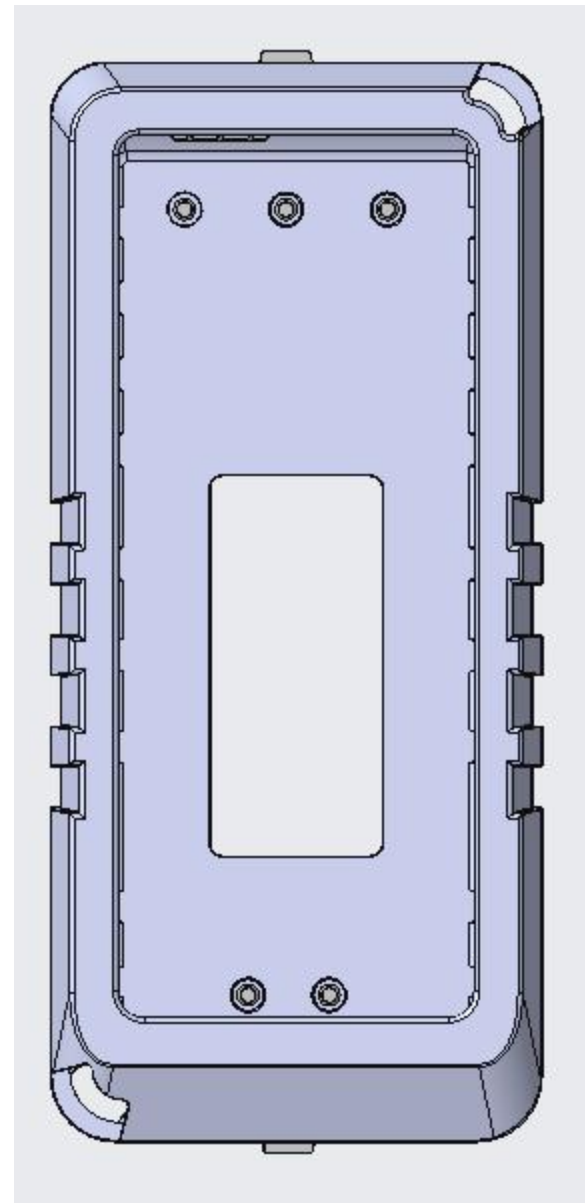


The iQSFP Tester has been tested to the following standard and pass.

Testing Standard	Test Description
IEC 60068-2-1 2007 IEC 60068-2-2 2007 IEC 60068 2-14 2009	Storage Temperature Testing
IEC 60068-2-30 2005	Non-Operating Humidity Testing
IEC 60068-2-6 2007	Mechanical Vibration Testing
IEC 60068-2-64 2008	Transportation Vibration Testing
IEC 60068-2-31 2008	Rough Handling Shock – Drop and Free Fall
IEC 60529 2013	Water Resistance Testing and Dust Ingress Testing (IP52)
IEC 60068-2-33	Thermal Shock Testing
IEC 60068-2-27	Mechanical Shock Testing

NETWORKING

iQSFP Tester Rubber Boot



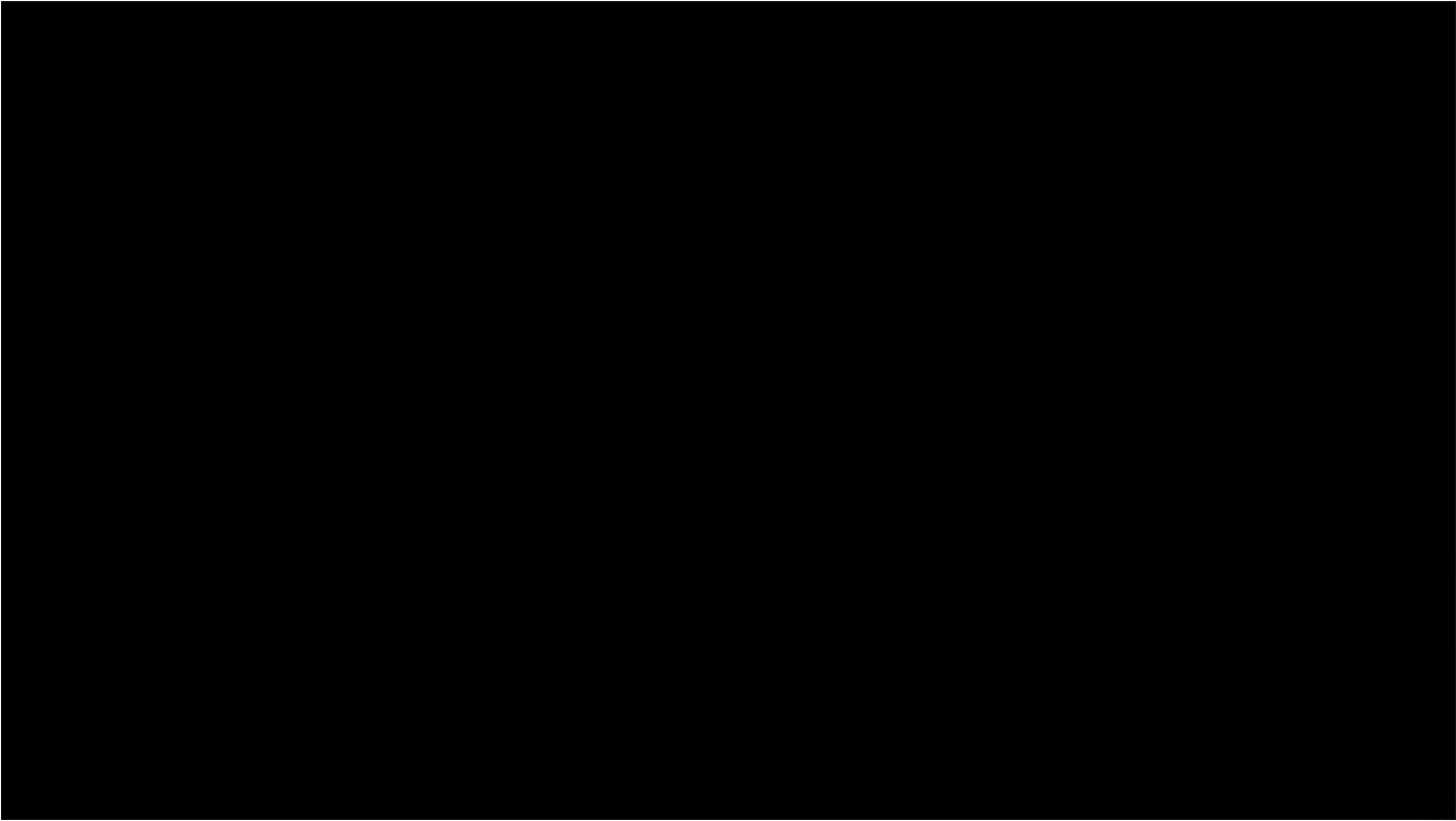
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Tested to meet IP52 water and dust Ingression test

User Manual Review



NETWORKING



QSFP Field Reader
USERS MANUAL 
Sep, 2018
Version: P0B



Adobe Acrobat
Document

Summary

- iQSFP Tester is a portable device developed from patented concept to product within 1 year
- iQSFP Tester offers cost effective solution to debug optical networking issue on site immediately
- The product is ready for OCP community



NETWORKING



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Call to Action

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How to get involved in the project.

Timeline for Contribution Availability

Schedule if product is being promoted

Link to Contribution/Marketplace on OCP website

Where to find additional information (URL links)

[Example] Where to buy: <https://www.opencompute.org/products>

[Example] Project Wiki with latest specification : <http://www.opencompute.org/wiki/Server/Mezz>

[Example] Mailing list: <http://lists.opencompute.org/mailman/listinfo/opencompute-mezz-card>

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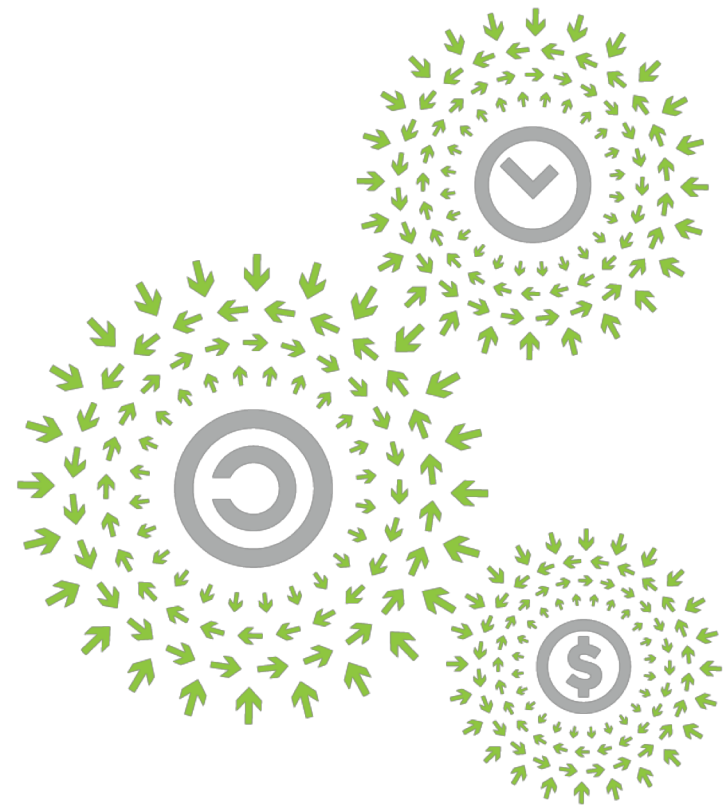
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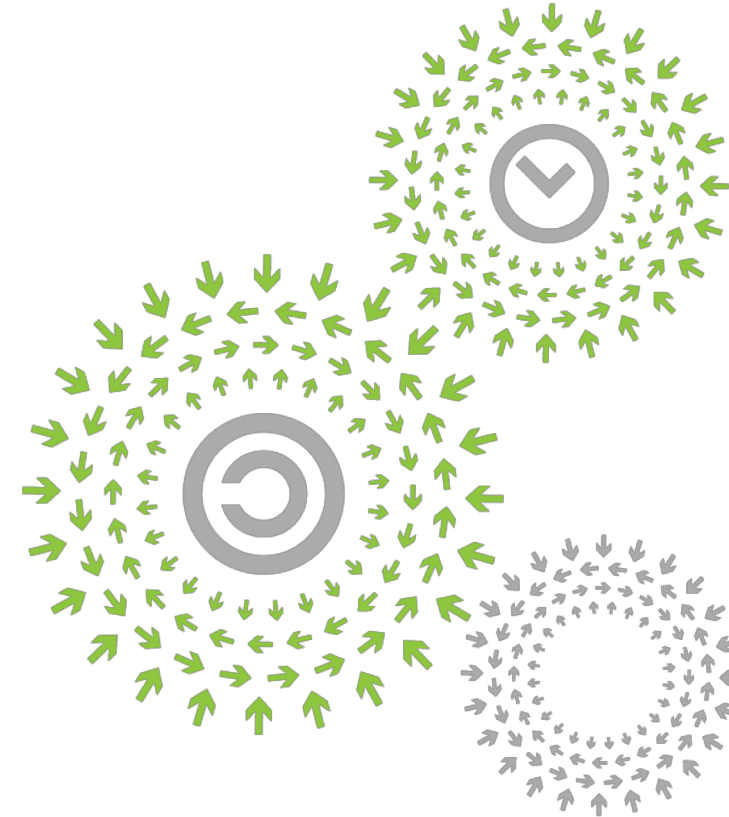
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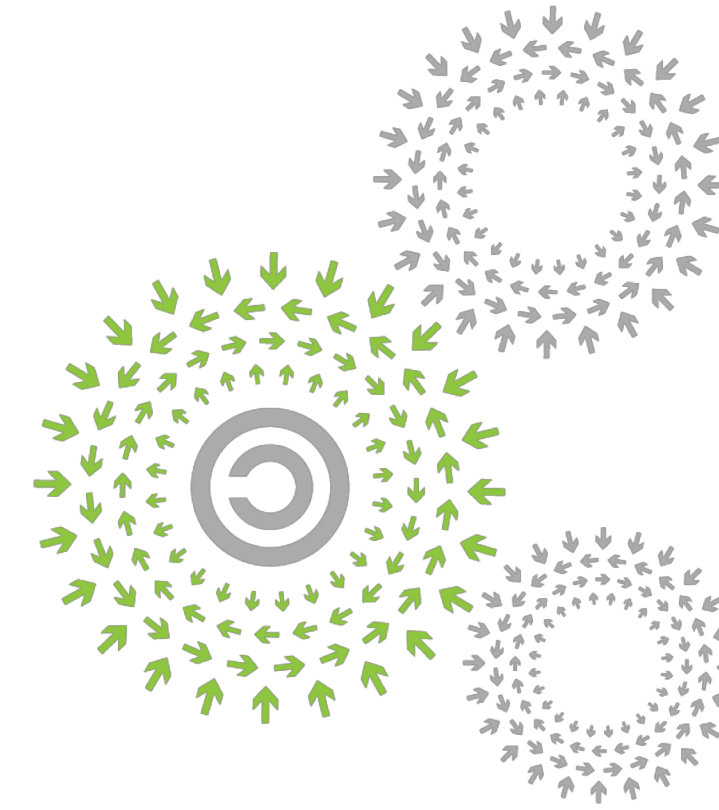
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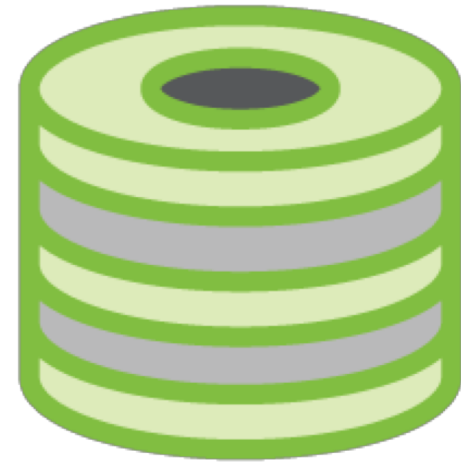
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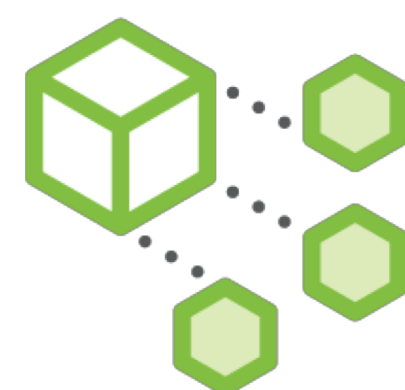


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