



### 2.3 DC Voltage, Current Monitors and Continuity Test.

While connecting an OSEM, verify dc voltages at test points as indicated in below tables. Mark each as Pass or Fail.

**Table 3 DC Power Source Voltage with OSEM Connected.**

Connector J2	Predicted Voltage (v)	Measured Voltage (v)	Pass	Fail
9 (10) to 22	+17±0.3		<input type="checkbox"/>	<input type="checkbox"/>
11 (12) to 24	-17±0.3		<input type="checkbox"/>	<input type="checkbox"/>

**Table 4 DC Power Regulator Voltage with OSEM Connected.**

Connector J4	Predicted Voltage (v)	Measured Voltage (v)	Pass	Fail
17 to 37	+7±0.2		<input type="checkbox"/>	<input type="checkbox"/>
36 to 37	-7±0.2		<input type="checkbox"/>	<input type="checkbox"/>
18 to 37	+5±0.2		<input type="checkbox"/>	<input type="checkbox"/>

Verify coil driver connection path by performing a continuity test on from connector J1(dB25 F) to connector J3(dB25 M) and from connector J3(dB25 M) to connector J4(dB37 F).

**Table 5 Coil Driver Monitor Continuity Test from J3 to J4 connectors.**

Coil Channel	Test Point		Predicted Continuity (Ω)	Measured Continuity (Ω)	Pass	Fail
	J1	J3				
ST 1	10	1	0.5±0.2		<input type="checkbox"/>	<input type="checkbox"/>
FN 1	23	9	0.5±0.2		<input type="checkbox"/>	<input type="checkbox"/>
ST 2	7	3	0.5±0.2		<input type="checkbox"/>	<input type="checkbox"/>
FN 2	20	11	0.5±0.2		<input type="checkbox"/>	<input type="checkbox"/>
ST 3	4	5	0.5±0.2		<input type="checkbox"/>	<input type="checkbox"/>
FN 3	17	13	0.5±0.2		<input type="checkbox"/>	<input type="checkbox"/>
ST 4	1	7	0.5±0.2		<input type="checkbox"/>	<input type="checkbox"/>
FN 4	14	15	0.5±0.2		<input type="checkbox"/>	<input type="checkbox"/>

Test from connector J3(dB25 M) to connector J4(dB37 F) we see a 4.7KΩ resistor in series.

**Table 6 Coil Driver Monitor Continuity Test from J3 to J4 connectors.**

Coil Channel	Test Point		Predicted Continuity (KΩ)	Measured Continuity (KΩ)	Pass	Fail
	J3	J4				
Pos 1	9	13	4.7±0.002		<input type="checkbox"/>	<input type="checkbox"/>
Neg 1	1	32	4.7 ±0.002		<input type="checkbox"/>	<input type="checkbox"/>
Pos 2	11	14	4.7 ±0.002		<input type="checkbox"/>	<input type="checkbox"/>
Neg 2	3	33	4.7 ±0.002		<input type="checkbox"/>	<input type="checkbox"/>
Pos 3	13	15	4.7 ±0.002		<input type="checkbox"/>	<input type="checkbox"/>
Neg 3	5	34	4.7 ±0.002		<input type="checkbox"/>	<input type="checkbox"/>
Pos 4	15	16	4.7 ±0.002		<input type="checkbox"/>	<input type="checkbox"/>
Neg 4	7	35	4.7 ±0.002		<input type="checkbox"/>	<input type="checkbox"/>

Verify the voltage when OSEM is connected is at correct level. Measure the voltage monitors and the current monitors at dB37 connector J4. Complete following tables and verify if PD is getting the correct voltage. Infrared LED is polarized with about 1.45v for a 35mA forward current. The 5.14v is the sum of the voltage drop across R48(3.5v) and R49(1.637v).

**Table 7 Voltage Monitor at J4 with OSEM connected.**

Channel	V_mon Pin at J4	Predicted Voltage (V)	Measured Voltage (V <sub>mea</sub> -V)	Predicted Voltage at PD (V)	Voltage Calculated at PD (V) V <sub>mea</sub> -5.14v	Pass	Fail
A	5 to 24	6.59±0.01		1.45±0.01		<input type="checkbox"/>	<input type="checkbox"/>
B	6 to 25	6.59±0.01		1.45±0.01		<input type="checkbox"/>	<input type="checkbox"/>
C	7 to 26	6.59±0.01		1.45±0.01		<input type="checkbox"/>	<input type="checkbox"/>
D	8 to 27	6.59±0.01		1.45±0.01		<input type="checkbox"/>	<input type="checkbox"/>

**Table 8 Current Monitor at J4 with OSEM connected.**

Channel	I_mon Pin at J4	Predicted Voltage (V)	Measured Voltage (V <sub>mea</sub> -V)	Predicted Current (mA)	Current Calculated (mA) V <sub>mea</sub> /28.3ohms	Pass	Fail
A	1 to 20	1±0.002		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>
B	2 to 21	1±0.002		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>
C	3 to 22	1±0.002		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>
D	4 to 23	1±0.002		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>

Flag position is verifying when incident light is 50% block or not block. Measure the voltages on J4(dB37 F) connector as indicated in below table.

**Table 9 Local Diagnostics Monitor at J4 with OSEM connected.**

Channel	Local Diag. Pin at J4	Predicted Voltage Full Light (V)	Measured Voltage Full Light (V)	Predicted Voltage Half Light (V)	Measured Voltage Half Light (V)	Pass	Fail
A	9 to 28	17.9±0.5		8.9±0.5		<input type="checkbox"/>	<input type="checkbox"/>
B	10 to 29	17.9±0.5		8.9±0.5		<input type="checkbox"/>	<input type="checkbox"/>
C	11 to 30	17.9±0.5		8.9±0.5		<input type="checkbox"/>	<input type="checkbox"/>
D	12 to 31	17.9±0.5		8.9±0.5		<input type="checkbox"/>	<input type="checkbox"/>

The next test is to verify the voltages at differential driver outputs located at J2(dB25 M) connector, follow the pins described below and complete the table.

**Table 10 DC Voltage from Differential Amplifier at J2 with OSEM Connected.**

Channel	Diff. Out Pin at J2	Predicted Voltage Full Light (V)	Measured Voltage Full Light (V)	Predicted Voltage Half Light (V)	Measured Voltage Half Light (V)	Pass	Fail
A	1 to 14	17.9±0.5		8.9±0.5		<input type="checkbox"/>	<input type="checkbox"/>
B	2 to 15	17.9±0.5		8.9±0.5		<input type="checkbox"/>	<input type="checkbox"/>
C	3 to 16	17.9±0.5		8.9±0.5		<input type="checkbox"/>	<input type="checkbox"/>
D	4 to 17	17.9±0.5		8.9±0.5		<input type="checkbox"/>	<input type="checkbox"/>

Next, measure the led current source, 35mA, at J2. Table 11 shows the measurement voltage at Imon. Table 12 shows the measurement at the LED pins on J1, for this test we connect a 12.2ohms resistor in parallel to the pins, see Table 12 for details. Another way of getting the current source measure is by removing the chassis lid and use the test points from the 100Ω resistor and measure its voltage, TP27 and TP28.

**Table 11 Current Monitor at J2 with OSEM Connected.**

Channel	Imon Pin at J2	Predicted Voltage (V)	Measured Voltage (V)	Predicted Current (mA)	Current Calculated (mA) V/28.3ohms	Pass	Fail
A	5 to 18	1±0.002		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>
B	6 to 19	1±0.002		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>
C	7 to 20	1±0.002		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>
D	8 to 21	1±0.002		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>

**Table 12 LED Current Measurement with OSEM connected.**

Channel	LED Pin at J1	Predicted Voltage (V)	Measured Voltage (V)	Predicted Current (mA)	Current Calculated (mA) V/12.2ohms	Pass	Fail
A	24 to 11	0.427±0.01		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>
B	21 to 8	0.427±0.01		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>
C	18 to 5	0.427±0.01		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>
D	15 to 2	0.427±0.01		35±0.3		<input type="checkbox"/>	<input type="checkbox"/>

**Table 13 DC Voltage at Current Source measured differentially with OSEM connected.**

Test Point	Voltage (v)	Measured Voltage Value				Pass	Fail
		CH A(v)	CH B(v)	CH C(v)	CH D(v)		
TP27-TP28 (100Ω)	+3.5±0.03					<input type="checkbox"/>	<input type="checkbox"/>

### 3 AC Transfer Function and Noise Section

3.1 By performing a transfer function measurement using a SR-785 driving with a 121K resistor into test point T26 or into J2 at the differential outputs, another option is to measure the transfer function on J4 at the local diagnostic pins; verify all channels as indicated in Table 14.

Figure 1

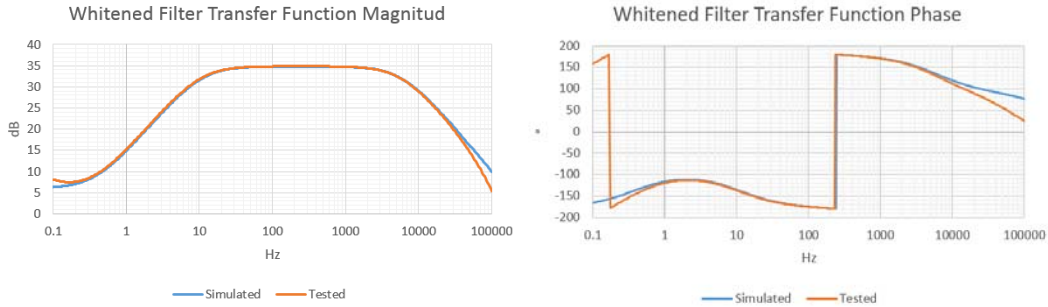


Table 14, Transfer Function.

Frequency (Hz) Input CH-A	Diff Gain Output CH-A dB	Phase (°) CH-A dB	Measured Diff Gain dB CH-A dB	Measured Phase (°) CH-A dB	Pass	Fail
1	15±2	-116±5°			<input type="checkbox"/>	<input type="checkbox"/>
10	31.6±2	-136±5°			<input type="checkbox"/>	<input type="checkbox"/>
1K	34.7±2	+170±5°			<input type="checkbox"/>	<input type="checkbox"/>

Frequency (Hz) Input CH-B	Diff Gain Output CH-B dB	Phase (°) CH-B dB	Measure Diff Gain ±1dB CH-B dB	Measure Phase (°) CH-B dB	Pass	Fail
1	15±2	-116±5°			<input type="checkbox"/>	<input type="checkbox"/>
10	31.6±2	-136±5°			<input type="checkbox"/>	<input type="checkbox"/>
1K	34.7±2	+170±5°			<input type="checkbox"/>	<input type="checkbox"/>

Frequency (Hz) Input CH-C	Diff Gain Output CH-C dB	Phase (°) CH-C dB	Measure Diff Gain ±1dB CH-C dB	Measure Phase (°) CH-C dB	Pass	Fail
1	15±2	-116±5°			<input type="checkbox"/>	<input type="checkbox"/>
10	31.6±2	-136±5°			<input type="checkbox"/>	<input type="checkbox"/>
1K	34.7±2	+170±5°			<input type="checkbox"/>	<input type="checkbox"/>

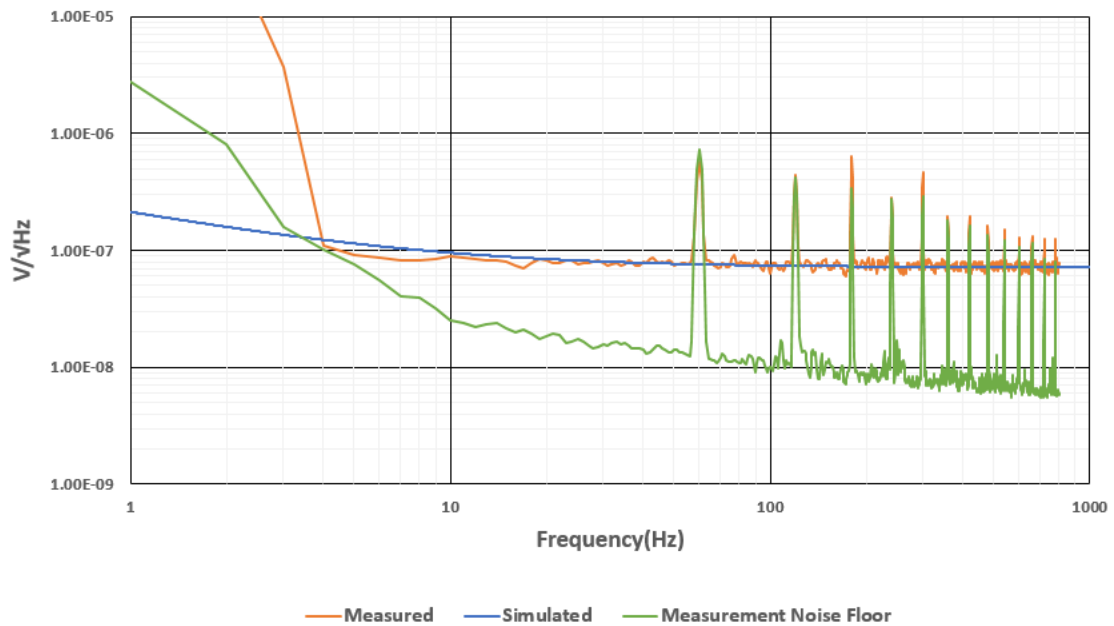
Frequency (Hz) Input CH-D	Diff Gain Output CH-D dB	Phase (°) CH-D dB	Measure Diff Gain ±1dB CH-D dB	Measure Phase (°) CH-D dB	Pass	Fail
1	15±2	-116±5°			<input type="checkbox"/>	<input type="checkbox"/>
10	31.6±2	-136±5°			<input type="checkbox"/>	<input type="checkbox"/>
1K	34.7±2	+170±5°			<input type="checkbox"/>	<input type="checkbox"/>

3.2 Verify LED voltage noise spectra measured differentially at the specified outputs are in conformance with Table 15 data.

**Table 15, LED Voltage Noise Measurement**

Channel	Measure Pin R48(100Ω)	Predicted Noise at 100Hz (nV/√Hz)	Measured Noise at 100Hz (±10nV/√Hz)	Pass	Fail
A	TP27 , TP28	74±2		<input type="checkbox"/>	<input type="checkbox"/>
B	TP27 , TP28	74±2		<input type="checkbox"/>	<input type="checkbox"/>
C	TP27 , TP28	74±2		<input type="checkbox"/>	<input type="checkbox"/>
D	TP27 , TP28	74±2		<input type="checkbox"/>	<input type="checkbox"/>

**LED Voltage Noise from R48(100Ω) D1900217 S1900540**



### 3.3 Verify Photodiode differential driver output noise spectra by measured at the specified outputs describe in table 16.

**Table 16, PD Differential Driver Output Voltage Noise Measurement without OSEM**

Channel	Measure Pin	Predicted Noise at 100Hz ( $\mu\text{V}/\sqrt{\text{Hz}}$ )	Measured Noise at 100Hz ( $\mu\text{V}/\sqrt{\text{Hz}}$ )	Pass	Fail
A	TP2A , TP3A	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>
B	TP2B , TP3B	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>
C	TP2C , TP3C	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>
D	TP2D , TP3D	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>

**Table 17, PD Differential Driver Output Voltage Noise Measurement without OSEM from J2 connector.**

Channel	Diff. Driver Pin at J2	Predicted Noise at 100Hz ( $\mu\text{V}/\sqrt{\text{Hz}}$ )	Measured Noise at 100Hz ( $\mu\text{V}/\sqrt{\text{Hz}}$ )	Pass	Fail
A	1 to 14	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>
B	2 to 15	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>
C	3 to 16	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>
D	4 to 17	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>

**Table 17, PD Differential Driver Output Voltage Noise Measurement without OSEM from J4 connector.**

Channel	Diff. Driver Pin at J4	Predicted Noise at 100Hz ( $\mu\text{V}/\sqrt{\text{Hz}}$ )	Measured Noise at 100Hz ( $\mu\text{V}/\sqrt{\text{Hz}}$ )	Pass	Fail
A	9 to 28	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>
B	10 to 29	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>
C	11 to 30	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>
D	12 to 31	2.9±0.1		<input type="checkbox"/>	<input type="checkbox"/>

**Output Noise Measured Differentially D1900217 S1900540**

