

+55°C

EPI-Hi Bias Supplies

Functional Test Procedure

Document Number: 701005

1K 100pF

1.0 Scope: This document is used to for functional tests of EPI-Hi Bias supplies board.

2.0 Applicable Documents:

- 2.1 Schematic: 701002_B.SCH
- 2.2 Layout 701002_A4.PCB
- 2.3 ICD EPI-Hi_Bias_Supply_Req_B_9-17-13.PDF

3.0 +25V Output Test: Complete setup per Figure 1. Make measurements per following table. Record results in the following table:

Record Unit Temperature: +55°C

Input Voltage	Output Voltage	Output Ripple	Input Current	Load Resistor
11.4	25.04	<20	10.89	25K 30K
12	25.05	<20	10.84	25K
13	25.053	<20	11.82	25K
11.4	25.024	<20	11.4	23.9K
12	25.027	<20	11.3	23.9K
13	25.031	<20	11.22	23.9K
11.4	25.001	<20	11.95	20K
12	25.003	<20	11.82	20K
13	25.008	<20	11.67	20K

MIN
NOM
MAX

4.0 Bias Supplies tests: Complete setup per Figure 1. Make measurements per the following table. Record results in the following table. Unit temperature _____. See Figure 1 for MIN, NOM, and MAX Load resistor values. Set DAC1, through DAC5 outputs all the save value as indicated in the following Table. Measure and record output voltage. Also measure and record output ripple in the following table.
Table 2: Output Voltage Measurements

Load	Input Volts	CTRL OUT (DAC1)	V2a Out Volts	V1a Out Volts	V2b Out Volts	V1b Out Volts	V2c Out Volts	V1c Out Volts	V2d Out Volts	V1d Out Volts	V2e Out Volts	V1e Out Volts
MIN	11.4	0	0.064	0.001	0.018	0.001	0.043	0.002	0.547	0.11	0.548	0.109
MIN	11.4	1	53.47	2.336	53.53	3.56	53.4	3.35	53.4	7.8	53.35	3.71
MIN	11.4	2	107.36	32.86	107.5	33.06	107.4	32.6	107.3	15.67	107.28	32.7
MIN	11.4	3	161.2	50.57	161.46	50.81	161.33	50.22	161.1	22.4	161.1	50.3
MIN	11.4	4	214.99	68.27	215.3	68.59	215.2	67.8	214.9	30.6	214.97	67.92
MIN	11.4	5	268.5	85.89	269	86.3	268.9	85.38	268.4	38	268.4	85.38
MIN	12	0	0.069	0.0023	0.023	0.001	0.046	0.0023	0.457	0.093	0.457	0.092
MIN	12	1	53.47	2.336	53.53	3.57	53.4	3.357	53.4	7.8	53.35	3.7
MIN	12	2	107.3	32.87	107.5	33.08	107.39	32.66	107.3	15.7	107.29	32.7
MIN	12	3	161.2	50.56	161.47	50.83	161.33	50.23	161.19	22.9	161.1	50.3
MIN	12	4	215	68.27	215.3	68.59	215.2	67.8	215.0	30.6	214.99	67.92

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MIN	12	5	268.5	85.9	269.1	86.33	268.89	85.37	268.4	38.2	268.4	85.38
MIN	13	0	0.078	0.0023	0.03	0.001	0.046	0.0024	6.375	0.075	0.028	0.002
MIN	13	1	53.47	2.3	53.53	3.57	53.4	3.35	53.4	7.8	53.35	3.71
MIN	13	2	107.3	32.87	107.53	33.08	107.4	32.6	107.3	15.6	107.29	32.74
MIN	13	3	161.22	50.56	161.78	50.84	161.3	50.12	161.2	22.9	161.1	50.3
MIN	13	4	215	68.27	215.38	68.6	215.3	67.8	215.0	30.6	215.0	67.9
MIN	13	5	268.5	85.9	269.1	86.3	269	85.38	268.45	38.2	268.4	85.4

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Table 3, Output ripple measurements

Load	Input Volts	CTRL OUT (DAC1)	V2a Ripple mV	V1a Ripple mV	V2b Ripple mV	V1b Ripple mV	V2c Ripple mV	V1c Ripple mV	V2d Ripple mV	V1d Ripple mV	V2e Ripple mV	V1e Ripple mV
MIN	11.4	0	0.078	0.0023	0.03	0.001	0.046	0.0024	6.375	0.075	0.028	0.002
MIN	11.4	1	30	25	30	25	30	30	30	30	30	30
MIN	11.4	2	15	10	20	15	30	30	30	30	30	25
MIN	11.4	3	30	20	10	10	10	10	10	10	10	10
MIN	11.4	4	20	10	10	10	10	10	10	10	10	10
MIN	11.4	5			10	10	10	10	10	10	10	10
MIN	12	0										
MIN	12	1	30	20	30	30	30	30	30	30	30	30
MIN	12	2	20	15	25	20	20	20	29	30	25	25
MIN	12	3	20	15	10	10	10	10	10	10	10	10
MIN	12	4	15	15	10	10	10	10	10	10	10	10
MIN	12	5	15	15	10	10	10	10	10	10	10	10
MIN	13	0										
MIN	13	1	30	15	30	30	30	25	30	30	30	30
MIN	13	2	15	15	20	20	15	15	30	30	30	30
MIN	13	3	10	10	10	10	10	10	10	10	10	10
MIN	13	4	10	10	10	10	10	10	10	10	10	10
MIN	13	5	10	10			10	10	10	10	10	10

5.0 Output measurements for Nom Load: Change the load to Nominal values and record data per following tables:

Table 4 Output Voltage Measurements, Nominal Load values

Load	Input Volts	CTRL OUT (DAC 1)	V2a Out Volts	V1a Out Volts	V2b Out Volts	V1b Out Volts	V2c Out Volts	V1c Out Volts	V2d Out Volts	V1d Out Volts	V2e Out Volts	V1e Out Volts
Mom	11.4	0	0.029	0.0004	0.007	0.001	0.015	0.0015	0.188	0.017	0.009	0.0015
Mom	11.4	1	53.24	2.27	53.29	3.5	53.2	3.26	53.19	3.74	53.1	3.6
Mom	11.4	2	106.89	32.66	107	32.86	106.9	32.4	106.86	7.51	106.8	32.5
Mom	11.4	3	160.47	50.32	160.7	50.59	160.6	49.98	160.4	11.2	160.4	50.06
Mom	11.4	4	214.0	67.99	214.3	68.3	214.2	67.5	214.0	15.05	214	67.65
Mom	11.4	5	267.3	85.6	267.7	85.99	267.6	85.05	267.1	18.8	267	85
Mom	12	0	0.022	0.0004	0.0085	0.001	0.016	0.001	0.161	0.014	0.0095	0.001
Mom	12	1	53.2	2.27	53.29	3.5	53.2	3.26	53.19	3.7	53.1	3.65
Mom	12	2	106.88	32.65	107	32.86	106.9	32.4	106.87	7.5	106.8	32.5
Mom	12	3	160.45	50.3	160.7	50.58	160.58	49.99	160.46	11.29	160.4	50.09
Mom	12	4	214	67.99	214.3	68.3	214.3	67.56	214	15.06	214	67.67
Mom	12	5	267.3	85.58	267.7	86.0	267.7	85.07	267.2	18.8	267.1	85.1
Mom	13	0	0.024	0.0004	0.010	0.001	0.016	0.001	0.133	0.01	0.010	0.0007
Mom	13	1	53.24	2.27	53.29	3.51	53.19	3.26	53.2	3.7	53.1	3.6
Mom	13	2	106.89	32.66	107	32.8	106.9	32.4	106.87	7.5	106.8	32.5
Mom	13	3	160.47	50.32	160.7	50.58	160.6	49.99	160.48	11.3	160.4	50.1
Mom	13	4	214	67.99	214.38	68.33	214.3	67.6	214.0	15.0	214.02	67.7
Mom	13	5	267.3	85.6	267.86	86.03	267.8	85.1	267.2	18.8	267.2	85.1

Table 5, Output ripple measurements for nominal load values

Ripple < 20 mV

Load	Input Volts	CTRL OUT (DAC1)	V2a Ripple mV	V1a Ripple mV	V2b Ripple mV	V1b Ripple mV	V2c Ripple mV	V1c Ripple mV	V2d Ripple mV	V1d Ripple mV	V2e Ripple mV	V1e Ripple mV
Mom	11.4	0										
Mom	11.4	1										
Mom	11.4	2										
Mom	11.4	3										
Mom	11.4	4										
Mom	11.4	5										
Mom	12	0										
Mom	12	1										
Mom	12	2										
Mom	12	3										
Mom	12	4										
Mom	12	5										
Mom	13	0										
Mom	13	1										
Mom	13	2										
Mom	13	3										
Mom	13	4										
Mom	13	5										

6.0 Output measurements for Max Load: Change the load to Max values and record data per following tables:

Table 6 Output Voltage Measurements, Max Load values

Load	Input Volts	CTRL OUT (DAC 1)	V2a Out Volts	V1a Out Volts	V2b Out Volts	V1b Out Volts	V2c Out Volts	V1c Out Volts	V2d Out Volts	V1d Out Volts	V2e Out Volts	V1e Out Volts
Max	11.4	0	0.0106	0.0007	0.0036	0.0002	0.0066	0.0008	0.1016	0.0059	0.0043	0.0002
Max	11.4	1	53.02	2.23	53.07	3.54	52.96	3.41	52.96	2.46	52.9	3.6
Max	11.4	2	106.38	32.53	106.53	32.73	106.41	32.79	106.4	4.95	106.3	32.4
Max	11.4	3	159.74	50.2	159.97	50.44	159.85	49.82	159.7	7.42	159.67	49.95
Max	11.4	4	212.95	67.82	213.27	68.13	213.15	67.33	212.99	9.9	212.9	67.48
Max	11.4	5	265.8	85.34	266.18	85.7	266.13	84.75	265.8	12.3	265.5	84.8
Max	12	0	0.0099	0.0002	0.0037	0.0002	0.0063	0.0009	0.0809	0.004	0.0043	0.0002
Max	12	1	53.01	2.25	53.07	3.53	52.96	3.3	52.95	2.46	52.9	3.6
Max	12	2	106.39	32.57	106.54	32.76	106.42	32.33	106.3	4.95	106.3	32.4
Max	12	3	159.74	50.23	159.99	50.48	159.85	49.86	159.7	7.43	159.68	49.96
Max	12	4	212.98	67.85	213.29	68.17	213.19	67.39	213	9.9	212.96	67.5
Max	12	5	265.93	85.4	266.41	85.79	266.3	84.84	265.8	12.36	265.7	84.88
Max	13	0	0.0106	0.0007	0.0005	0.0002	0.0066	0.0002	0.0616	0.003	0.0049	0.0002
Max	13	1	53.01	2.25	53.07	3.51	52.96	3.3	52.96	2.46	52.9	3.6
Max	13	2	106.42	32.54	106.57	32.74	106.45	32.3	106.4	4.95	106.35	32.4
Max	13	3	159.75	50.19	160.01	50.45	159.86	49.83	159.5	7.4	159.7	49.97
Max	13	4	213.07	67.86	213.38	68.16	213.28	67.38	213.1	9.9	213	67.5
Max	13	5	265.99	85.39	266.53	85.81	266.39	84.85	265.5	12.76	265.8	84.9

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Table 7, Output ripple measurements for nominal load values

Load	Input Volts	CTRL OUT (DAC1)	V2a Ripple mV	V1a Ripple mV	V2b Ripple mV	V1b Ripple mV	V2c Ripple mV	V1c Ripple mV	V2d Ripple mV	V1d Ripple mV	V2e Ripple mV	V1e Ripple mV
Max	11.4	0	20	20	20	20	20	20	20	20	20	20
Max	11.4	1	30									
Max	11.4	2	/	/	/	/	/	/				
Max	11.4	3	/	/	/	/	/	/				
Max	11.4	4	/	/	/	/	/	/				
Max	11.4	5	/	/	/	/	/	/				
Max	12	0	20	20	20	20	20	20	20	20	20	20
Max	12	1	/	/	/	/	/	/				
Max	12	2	/	/	/	/	/	/				
Max	12	3	/	/	/	/	/	/				
Max	12	4	/	/	/	/	/	/				
Max	12	5	/	/	/	/	/	/				
Max	13	0	20	20	20	20	20	20	20	20	20	20
Max	13	1	/	/	/	/	/	/				
Max	13	2	/	/	/	/	/	/				
Max	13	3	/	/	/	/	/	/				
Max	13	4	/	/	/	/	/	/				
Max	13	5	/	/	/	/	/	/				

7.0 Input current measurements:

- 7.1 Set All load for all the power supplies to NOM value (6 PS). Set all DAC Values to +5V. Set Input Voltage to +12V. Measure and record input current 50.7. Record input Voltage _____.
- 7.2 Set all load for all the power supplies to MAX values. Set a;; DAC Values for +5V. Set Input Voltage to +12V. Measure and record input current 79.7. Record input Voltage _____.
- 7.3 Set All load for all the power supplies to NOM value (6 PS). Set all DAC Values to +5V. Set Input Voltage to +11.4V. Measure and record input current 52.95. Record input Voltage _____.
- 7.4 Set All load for all the power supplies to MAX value (6 PS). Set all DAC Values to +5V. Set Input Voltage to +11.4V. Measure and record input current 83.2. Record input Voltage _____.
- 7.5 Set All load for all the power supplies to NOM value (6 PS). Set all DAC Values to +5V. Set Input Voltage to +13V. Measure and record input current 48. Record input Voltage _____.
- 7.6 Set All load for all the power supplies to MAX value (6 PS). Set all DAC Values to +5V. Set Input Voltage to +13V. Measure and record input current 74.4. Record input Voltage _____.