

-31°C	510.4
-30°C	481
-29°C	453.5

-30°C

EPI-Hi Bias Supplies

Functional Test Procedure

Document Number: 701005

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: -30°C

Input Voltage	Output Voltage	Output Ripple	Input Current	Load Resistor
11.4	24.985	/	8.94	25K
12	24.986	/	8.9	25K
13	24.988	/	8.82	25K
11.4	24.965	30	9.41	23.9K
12	24.966	30	9.34	23.9K
13	24.967	30	9.25	23.9K
11.4	24.94	/	9.92	20K
12	24.942	/	9.82	20K
13	24.944	/	9.7	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	0.05	0.05	0.04	0.003	0.001	0.003	0.06	0.014	0.03	0.001
MIN	11.4	1	53.40	6.25	53.49	7.37	53.37	7.19	53.36	7.75	53.33	7.58
MIN	11.4	2	107.13	31.71	107.3	31.86	107.16	31.43	107.11	15.61	107.08	31.53
MIN	11.4	3	160.77	49.29	161.04	49.52	160.87	48.89	160.74	22.84	160.72	48.99
MIN	11.4	4	214.36	66.87	214.77	67.15	214.56	66.39	214.35	30.46	214.35	66.47
MIN	11.4	5	267.63	84.31	268.22	84.75	268.04	83.81	267.53	38.64	267.51	83.83
MIN	12	0	0.035	0.003	0.033	0.002	0.033	0.001	0.083	0.017	0.09	0.003
MIN	12	1	53.47	6.26	53.48	7.35	53.57	7.2	53.36	7.77	53.32	7.56
MIN	12	2	107.13	31.63	107.30	31.86	107.16	31.43	107.11	15.61	107.08	31.58
MIN	12	3	160.76	49.22	161.03	49.51	160.86	48.9	160.74	22.84	160.72	49.06
MIN	12	4	214.35	66.79	214.72	67.17	214.55	66.38	214.34	30.45	214.34	66.52

Failed

MIN	12	5	267.14	84.31	268.24	84.79	268.05	83.87	267.53	28.0	267.52	83.86
MIN	13	0	0.034	0.002	0.035	0.003	0.026	0.007	0.062	0.014	0.03	0.007
MIN	13	1	53.42	6.32	53.48	7.35	53.38	7.21	53.37	7.27	53.34	7.58
MIN	13	2	107.15	31.64	107.30	31.86	107.18	31.45	107.13	15.61	107.11	31.53
MIN	13	3	160.78	49.23	161.04	49.48	160.9	48.89	160.79	22.83	160.78	48.99
MIN	13	4	214.31	66.82	214.72	67.13	214.59	66.38	214.39	30.45	214.4	66.46
MIN	13	5	267.68	84.28	268.25	84.75	268.11	83.79	267.60	37.99	267.6	83.82

Failed

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	30									
MIN	11.4	1	45	45								
MIN	11.4	2										
MIN	11.4	3										
MIN	11.4	4										
MIN	11.4	5										
MIN	12	0										
MIN	12	1										
MIN	12	2										
MIN	12	3										
MIN	12	4										
MIN	12	5										
MIN	13	0	30									
MIN	13	1	45	60	45	60	45	60	45	60	45	60
MIN	13	2										
MIN	13	3										
MIN	13	4										
MIN	13	5									45	

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	0.007	0.001	0.007	0.001	0.006	0.003	0.01	0.0019	0.0065	0.001
Mom	11.4	1	53.21	6.27	53.27	7.31	53.16	7.19	53.1	3.72	53.1	7.56
Mom	11.4	2	106.67	31.5	106.83	31.73	106.69	31.3	106.6	7.41	106.6	31.3
Mom	11.4	3	160.07	49.05	160.32	49.31	160.1	48.76	160.0	11.22	160.0	48.84
Mom	11.4	4	213.4	66.59	213.76	66.95	213.6	66.2	213.3	14.96	213.3	66.27
Mom	11.4	5	266.42	84.06	266.98	84.53	266.8	83.6	266.3	18.6	266.3	83.61
Mom	12	0	0.0055	0.0009	0.0053	0.0009	0.0061	0.0002	0.007	0.0019	0.0063	0.0008
Mom	12	1	53.2	6.21	53.26	7.32	53.16	7.17	53.1	3.71	53.09	7.55
Mom	12	2	106.6	31.53	106.8	31.74	106.7	31.29	106.6	7.47	106.6	31.4
Mom	12	3	160.0	49.1	160.33	49.35	160.19	48.75	160.0	11.22	160.6	48.8
Mom	12	4	213.4	66.6	213.7	66.97	213.6	66.2	213.4	14.9	213.38	66.3
Mom	12	5	266.4	84.1	267	84.55	266.85	83.6	266.3	18.68	266.3	83.6
Mom	13	0	0.0056	0.0009	0.005	0.001	0.0063	0.001	0.007	0.001	0.006	0.0009
Mom	13	1	53.2	6.2	53.2	7.34	53.14	7.18	53.14	3.71	53.1	7.55
Mom	13	2	106.68	31.5	106.8	31.7	106.7	31.3	106.65	7.47	106.6	31.37
Mom	13	3	160.0	49.07	160.3	49.3	160.19	48.75	160.0	11.2	160.0	48.8
Mom	13	4	213.4	66.63	213.7	66.9	213.6	66.2	213.4	14.95	213.4	66.29
Mom	13	5	266.4	84.1	267.0	84.5	266.8	83.6	266.3	18.6	266.3	83.59

Failed

Table 5, 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
Mom	11.4	0										
Mom	11.4	1	40	40								
Mom	11.4	2										
Mom	11.4	3										
Mom	11.4	4										
Mom	11.4	5									30	18
Mom	12	0										
Mom	12	1										
Mom	12	2										
Mom	12	3										
Mom	12	4							18	17		
Mom	12	5									30	18
Mom	13	0	18	18	18	18	18					
Mom	13	1										
Mom	13	2										
Mom	13	3										
Mom	13	4										
Mom	13	5									30	18

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	0.004	0.0003	0.0036	0.0007	0.0036	0.0007	0.0007	0.0008	0.0037	0.0007
Max	11.4	1	52.98	6.30	53.03	7.35	52.92	7.20	52.9	2.45	52.88	7.54
Max	11.4	2	106.1	31.39	106.3	31.62	106.2	31.2	106.1	4.9	106.1	31.3
Max	11.4	3	159.3	48.93	159.59	49.24	159.4	48.63	159.3	7.39	159.2	48.72
Max	11.4	4	212.3	66.45	212.7	66.8	212.56	66.06	212.4	9.86	212.3	66.13
Max	11.4	5	265.1	83.89	265.6	84.3	265.4	83.85	265	12.31	264.9	83.4
Max	12	0	0.0036	0.0002	0.0031	0.0004	0.0031	0.0006	0.0008	0.0008	0.0035	0.0005
Max	12	1	52.97	6.29	53.03	7.35	52.92	7.19	52.9	2.45	52.87	7.53
Max	12	2	106.19	31.4	106.3	31.63	106.2	31.2	106.1	4.92	106.1	31.29
Max	12	3	159.3	48.94	159.6	49.2	159.4	48.64	159.3	7.4	159.3	48.7
Max	12	4	212.4	66.47	212.76	66.84	212.6	66.05	212.4	9.87	212.4	66.14
Max	12	5	265.1	83.9	265.69	84.38	265.5	83.4	265.0	12.3	264.9	83.4
Max	13	0	0.0031	0.0001	0.0024	0.0006	0.0033	0.0006	0.0038	0.0005	0.0036	0.0006
Max	13	1	52.97	6.29	53.03	7.35	52.9	7.188	52.9	2.45	52.86	7.51
Max	13	2	106.2	31.4	106.36	31.6	106.2	31.2	106.1	4.9	106.1	31.3
Max	13	3	159.3	48.95	159.6	49.24	159.4	48.6	159.3	7.39	159.3	48.7
Max	13	4	212.44	66.49	212.8	66.85	212.6	66.08	212.4	9.86	212.4	66.18
Max	13	5	265.2	83.92	265.75	84.4	265.5	83.4	265.1	12.3	265.0	84.7

Table 7, Output ripple measurements for nominal load values

Failed

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										
Max	11.4	1										
Max	11.4	2										
Max	11.4	3										
Max	11.4	4										
Max	11.4	5	46	15	15	15	15	15	14	13	30	20
Max	12	0										
Max	12	1										
Max	12	2										
Max	12	3										
Max	12	4										
Max	12	5	22	18	15	15	15	15	13	13	30	20
Max	13	0										
Max	13	1										
Max	13	2									20	20
Max	13	3										
Max	13	4										
Max	13	5	20	17	15	14	15	15	14	13	35	20

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 47.8. 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 76.7. 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 49.7. 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 20.5. 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 45.1. 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 71.1. Record input Voltage _____.

MIN +11.4 21.95 mA

MIN +12 21.3 mA

MIN +13 20.62 mA