

Model Name: Sample 4

Stage: EVT5

Date: 2017/01/20

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## **1. Input & Output Characteristics**

### 1-1. Test condition

- (1) AC Input: 100~277V<sub>AC</sub>; 50/60Hz.
- (2) Output Voltage: 28V<sub>DC</sub>& 36V<sub>DC</sub> & 43V<sub>DC</sub>.
- (3) Output Current: 1.16A, typical.
- (4) Operational temperature: 25degC , 60 degC , -20degC.

### 1-2. Test item

- (1) Power factor
- (2) Input current
- (3) THD
- (4) Efficiency
- (5) Line & load regulation



### 1-3. Test data

#### (1) Ambient: 25degC, $V_{OUT}$ : 28V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	327.96	37.66	27.859	1.1875	33.0826	87.8454	4.5774	0.988	12.624
230V <sub>AC</sub>	50Hz	175.03	38.40	27.859	1.1875	33.0826	86.1525	5.3174	0.9545	18.334
240V <sub>AC</sub>	60Hz	170.93	38.43	27.859	1.1875	33.0826	86.0853	5.3474	0.9371	18.377
277V <sub>AC</sub>	60Hz	154.07	38.44	27.859	1.1875	33.0826	86.0629	5.3574	0.911	21.172

#### (1) Ambient: 25degC, $V_{OUT}$ : 30V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	339.25	40.11	29.75	1.19	35.4025	88.2635	4.7075	0.9887	12.289
230V <sub>AC</sub>	50Hz	185.54	40.65	29.75	1.19	35.4025	87.0910	5.2475	0.9586	17.704
240V <sub>AC</sub>	60Hz	180.86	40.68	29.75	1.19	35.4025	87.0268	5.2775	0.943	17.948
277V <sub>AC</sub>	60Hz	162.13	40.62	29.75	1.19	35.4025	87.1553	5.2175	0.9116	19.463

#### (1) Ambient: 25degC, $V_{OUT}$ : 32V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	361.82	42.91	31.765	1.1912	37.8385	88.1810	5.0715	0.9893	12.026
230V <sub>AC</sub>	50Hz	196.62	43.48	31.765	1.1912	37.8385	87.0250	5.6415	0.9623	17.1
240V <sub>AC</sub>	60Hz	191.41	43.49	31.765	1.1912	37.8385	87.0050	5.6515	0.948	17.346
277V <sub>AC</sub>	60Hz	170.94	43.42	31.765	1.1912	37.8385	87.1453	5.5815	0.9195	18.78

#### (1) Ambient: 25degC, $V_{OUT}$ : 34V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	384.41	45.61	33.796	1.192	40.2848	88.3246	5.3252	0.9898	11.879
230V <sub>AC</sub>	50Hz	207.77	46.10	33.796	1.192	40.2848	87.3858	5.8152	0.9655	16.782
240V <sub>AC</sub>	60Hz	201.85	46.12	33.796	1.192	40.2848	87.3479	5.8352	0.9528	16.57
277V <sub>AC</sub>	60Hz	179.85	46.11	33.796	1.192	40.2848	87.3668	5.8252	0.9261	18.265

#### (1) Ambient: 25degC, $V_{OUT}$ : 36V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	407.04	48.31	35.812	1.1931	42.7273	88.4440	5.5827	0.9902	1.162
230V <sub>AC</sub>	50Hz	218.92	48.71	35.812	1.1931	42.7273	87.7177	5.9827	0.9682	16.241
240V <sub>AC</sub>	60Hz	220.52	48.72	35.812	1.1931	42.7273	87.6997	5.9927	0.9612	16.146
277V <sub>AC</sub>	60Hz	189.77	48.72	35.812	1.1931	42.7273	87.6997	5.9927	0.9272	17.61

#### (1) Ambient: 25degC, $V_{OUT}$ : 43V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	485.40	57.68	42.765	1.194	51.0614	88.5253	6.6186	0.9918	9.658
230V <sub>AC</sub>	50Hz	257.52	57.71	42.765	1.194	51.0614	88.4793	6.6486	0.9752	14.691
240V <sub>AC</sub>	60Hz	248.98	57.73	42.765	1.194	51.0614	88.4487	6.6686	0.9666	14.807
277V <sub>AC</sub>	60Hz	233.84	57.7	42.765	1.194	51.0614	88.4946	6.6386	0.9003	16.15

(2) Ambient: 60degC,  $V_{OUT}$ : 28V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	322.89	38.25	27.843	1.199	33.3838	87.2778	4.8662	0.9880	12.674
230V <sub>AC</sub>	50Hz	177.43	38.96	27.843	1.199	33.3838	85.6873	5.5762	0.9555	18.299
240V <sub>AC</sub>	60Hz	173.24	38.97	27.843	1.199	33.3838	85.6653	5.5862	0.9382	18.583
277V <sub>AC</sub>	60Hz	155.79	38.90	27.843	1.199	33.3838	85.8194	5.5162	0.9044	20.858

(2) Ambient: 60degC,  $V_{OUT}$ : 30V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	344.62	40.85	29.75	1.2	35.7000	87.3929	5.1500	0.9887	12.445
230V <sub>AC</sub>	50Hz	188.16	41.49	29.75	1.2	35.7000	86.0448	5.7900	0.9593	17.861
240V <sub>AC</sub>	60Hz	183.32	41.52	29.75	1.2	35.7000	85.9827	5.8200	0.9442	17.733
277V <sub>AC</sub>	60Hz	164.21	41.54	29.75	1.2	35.7000	85.9413	5.8400	0.9136	19.392

(2) Ambient: 60degC,  $V_{OUT}$ : 32V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	367.57	43.58	31.765	1.204	38.2451	87.7583	5.3349	0.9892	12.233
230V <sub>AC</sub>	50Hz	199.43	44.13	31.765	1.204	38.2451	86.6645	5.8849	0.9629	17.354
240V <sub>AC</sub>	60Hz	193.97	44.17	31.765	1.204	38.2451	86.5861	5.9249	0.9492	17.518
277V <sub>AC</sub>	60Hz	173.17	44.16	31.765	1.204	38.2451	86.6057	5.9149	0.9211	19.113

(2) Ambient: 60degC,  $V_{OUT}$ : 34V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	390.46	46.32	33.796	1.205	40.7242	87.9192	5.5958	0.9897	12.047
230V <sub>AC</sub>	50Hz	212.37	46.78	33.796	1.205	40.7242	87.0547	6.0558	0.9585	16.755
240V <sub>AC</sub>	60Hz	204.57	46.8	33.796	1.205	40.7242	87.0175	6.0758	0.9537	16.895
277V <sub>AC</sub>	60Hz	182.23	46.79	33.796	1.205	40.7242	87.0361	6.0658	0.9274	18.446

(2) Ambient: 60degC,  $V_{OUT}$ : 36V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	412.94	49.07	35.812	1.206	43.1893	88.0156	5.8807	0.9914	10.364
230V <sub>AC</sub>	50Hz	221.99	49.41	35.812	1.206	43.1893	87.4100	6.2207	0.9685	16.129
240V <sub>AC</sub>	60Hz	215.21	49.43	35.812	1.206	43.1893	87.3746	6.2407	0.9575	16.342
277V <sub>AC</sub>	60Hz	192.76	49.48	35.812	1.206	43.1893	87.2863	6.2907	0.9271	17.44

(2) Ambient: 60degC,  $V_{OUT}$ : 43V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	493.04	58.54	42.75	1.207	51.5993	88.1436	6.9407	0.9908	10.200
230V <sub>AC</sub>	50Hz	260.98	58.49	42.75	1.207	51.5993	88.2189	6.8908	0.9752	15.008
240V <sub>AC</sub>	60Hz	252.17	58.50	42.75	1.207	51.5993	88.2038	6.9008	0.9671	15.151
277V <sub>AC</sub>	60Hz	236.22	58.49	42.75	1.207	51.5993	88.2189	6.8908	0.9012	17.682

(3) Ambient: -20degC,  $V_{OUT}$ : 28V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	314.31	37.25	27.89	1.1471	31.9926	85.8862	5.2574	0.9885	12.099
230V <sub>AC</sub>	50Hz	173.25	37.99	27.89	1.1471	31.9926	84.2133	5.9974	0.9541	18.045
240V <sub>AC</sub>	60Hz	169.43	38.03	27.89	1.1471	31.9926	84.1247	6.0374	0.9355	18.12
277V <sub>AC</sub>	60Hz	152.88	38.02	27.89	1.1471	31.9926	84.1468	6.0274	0.8982	21.299

(3) Ambient: -20degC,  $V_{OUT}$ : 30V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	334.55	39.68	29.765	1.1471	34.1434	86.0470	5.5366	0.9892	11.787
230V <sub>AC</sub>	50Hz	183.22	40.35	29.765	1.1471	34.1434	84.6182	6.2066	0.9582	17.241
240V <sub>AC</sub>	60Hz	178.80	40.39	29.765	1.1471	34.1434	84.5344	6.2466	0.9416	17.631
277V <sub>AC</sub>	60Hz	160.57	40.37	29.765	1.1471	34.1434	84.5762	6.2266	0.908	19.776

(3) Ambient: -20degC,  $V_{OUT}$ : 32V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	356.10	42.25	31.796	1.1471	36.4732	86.3271	5.7768	0.9898	11.559
230V <sub>AC</sub>	50Hz	193.83	42.86	31.796	1.1471	36.4732	85.0984	6.3868	0.9620	16.564
240V <sub>AC</sub>	60Hz	188.75	42.89	31.796	1.1471	36.4732	85.0389	6.4168	0.9471	16.710
277V <sub>AC</sub>	60Hz	168.81	42.86	31.796	1.1471	36.4732	85.0984	6.3868	0.9171	18.815

(3) Ambient: -20degC,  $V_{OUT}$ : 34V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	377.79	44.85	33.812	1.1475	38.7993	86.5090	6.0507	0.9904	11.264
230V <sub>AC</sub>	50Hz	204.55	45.38	33.812	1.1475	38.7993	85.4986	6.5807	0.9652	16.16
240V <sub>AC</sub>	60Hz	198.88	45.40	33.812	1.1475	38.7993	85.4609	6.6007	0.9516	16.337
277V <sub>AC</sub>	60Hz	177.26	45.36	33.812	1.1475	38.7993	85.5363	6.5607	0.9243	17.943

(3) Ambient: -20degC,  $V_{OUT}$ : 36V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	399.57	47.45	35.828	1.1475	41.1126	86.6441	6.3374	0.9907	11.041
230V <sub>AC</sub>	50Hz	215.32	47.91	35.828	1.1475	41.1126	85.8122	6.7974	0.9680	15.696
240V <sub>AC</sub>	60Hz	209.00	47.92	35.828	1.1475	41.1126	85.7943	6.8074	0.9558	15.825
277V <sub>AC</sub>	60Hz	185.97	47.88	35.828	1.1475	41.1126	85.8660	6.7674	0.9299	17.294

(3) Ambient: -20degC,  $V_{OUT}$ : 43V<sub>DC</sub>

$V_{IN}$ (V <sub>AC</sub> )	Fre (Hz)	$I_{IN}$ (mA)	$P_{IN}$ (W)	$V_{OUT}$ (V <sub>DC</sub> )	$I_{OUT}$ (A)	$P_{OUT}$ (W)	Eff (%)	$P_{LOSS}$ (W)	PF	THD (%)
120V <sub>AC</sub>	60Hz	475.58	56.45	42.796	1.1484	49.1469	87.0628	7.3031	0.9913	10.315
230V <sub>AC</sub>	50Hz	252.60	56.61	42.796	1.1484	49.1469	86.8167	7.4631	0.9752	14.128
240V <sub>AC</sub>	60Hz	244.30	56.61	42.796	1.1484	49.1469	86.8167	7.4631	0.9660	14.333
277V <sub>AC</sub>	60Hz	227.54	56.58	42.796	1.1484	49.1469	86.8627	7.4331	0.8982	15.561

## 2. Output Current Ripple

### 2-1. Test condition

- (1) AC Input: 100~277V<sub>AC</sub>; 50/60Hz.
- (2) Output Voltage: Light bar
- (3) Output Current: 1.16A, typical; Min. I<sub>OUT</sub> (ripple <30% @ (I<sub>PK-PK</sub>/I<sub>MEAN</sub>)\*100%)
- (4) Operational temperature: 25degC , 60 degC , -20. degC.

### 2-2. Test data

#### (1) Ambient: 25degC

AC Input	Output Current= 1.16A, typical			Output Current= Min. I <sub>OUT</sub>		
	I <sub>OUT,PK-PK</sub> (mA)	I <sub>OUT,MEAN</sub> (mA)	Ripple(%)	I <sub>OUT,PK-PK</sub> (mA)	I <sub>OUT,MEAN</sub> (mA)	Ripple(%)
120V <sub>AC</sub> /60Hz	14	116	12.07	2.8	10.4	26.92
230V <sub>AC</sub> /50Hz	14	116	12.07	2.8	10.4	26.92
240V <sub>AC</sub> /60Hz	14	116	12.07	2.8	10.4	26.92
277V <sub>AC</sub> /60Hz	16	116	13.79	2.8	10.4	26.92

#### (2) Ambient: 60degC

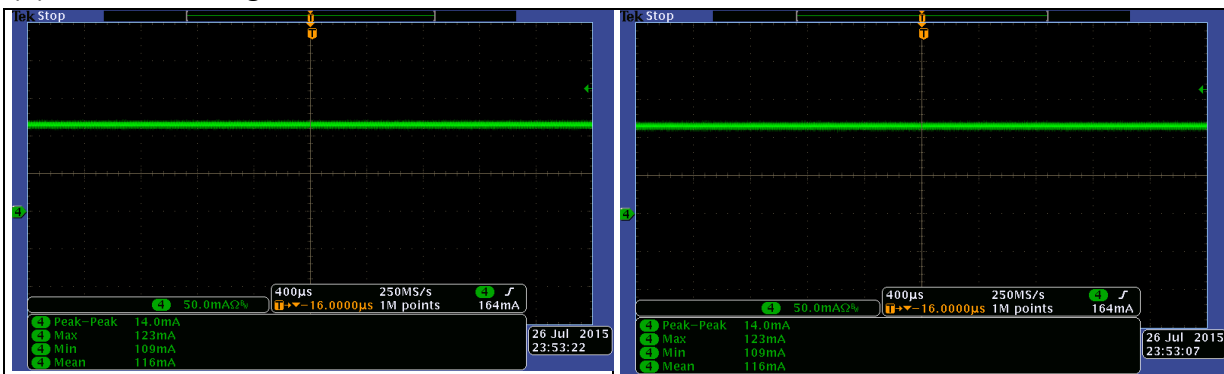
AC Input	Output Current= 1.16A, typical			Output Current= Min. I <sub>OUT</sub>		
	I <sub>OUT,PK-PK</sub> (mA)	I <sub>OUT,MEAN</sub> (mA)	Ripple(%)	I <sub>OUT,PK-PK</sub> (mA)	I <sub>OUT,MEAN</sub> (mA)	Ripple(%)
120V <sub>AC</sub> /60Hz	16	116	13.79	2.8	10.5	26.66
230V <sub>AC</sub> /50Hz	16	116	13.79	2.8	10.5	26.66
240V <sub>AC</sub> /60Hz	14	116	12.07	2.8	10.6	26.42
277V <sub>AC</sub> /60Hz	14	116	12.07	2.8	10.5	26.66

#### (3) Ambient: -20degC

AC Input	Output Current= 1.16A, typical			Output Current= Min. I <sub>OUT</sub>		
	I <sub>OUT,PK-PK</sub> (mA)	I <sub>OUT,MEAN</sub> (mA)	Ripple(%)	I <sub>OUT,PK-PK</sub> (mA)	I <sub>OUT,MEAN</sub> (mA)	Ripple(%)
120V <sub>AC</sub> /60Hz	14	115	12.17	2.4	10.1	23.76
230V <sub>AC</sub> /50Hz	16	115	13.91	2.8	10.1	27.72
240V <sub>AC</sub> /60Hz	14	115	12.17	2.8	10.1	27.72
277V <sub>AC</sub> /60Hz	14	115	12.17	2.4	10.1	23.76

### 2-3. Test waveform

(1) Ambient: 25degC

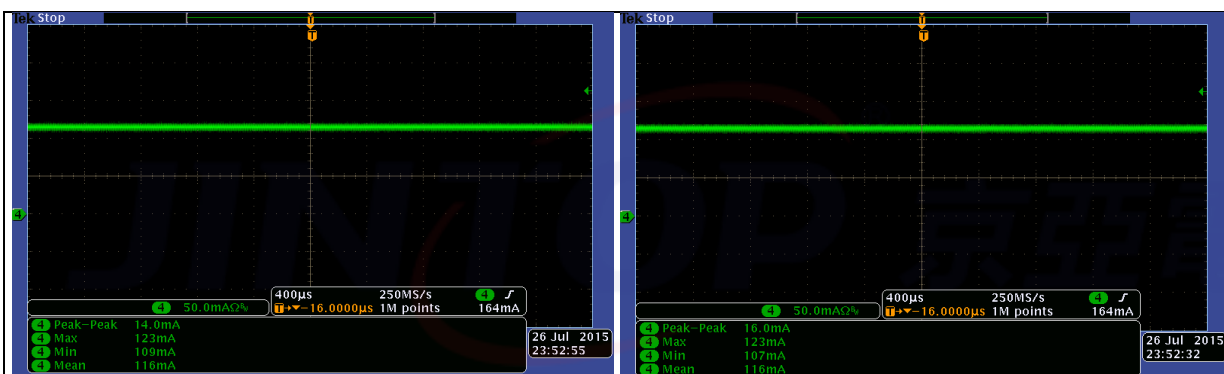


25degC; 120V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

25degC; 230V<sub>AC</sub>/50Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

(4) Output Current

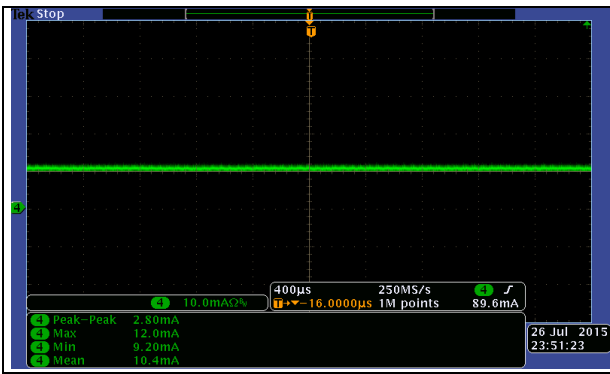


25degC; 240V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

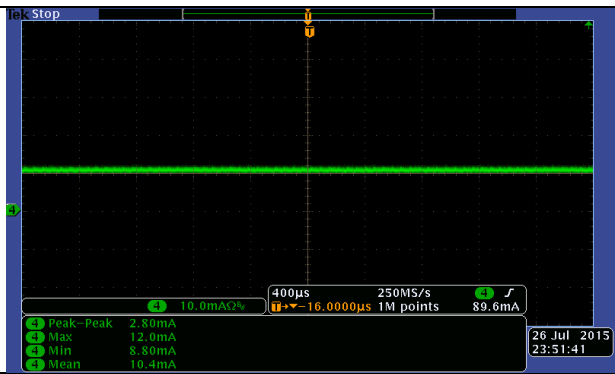
25degC; 277V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

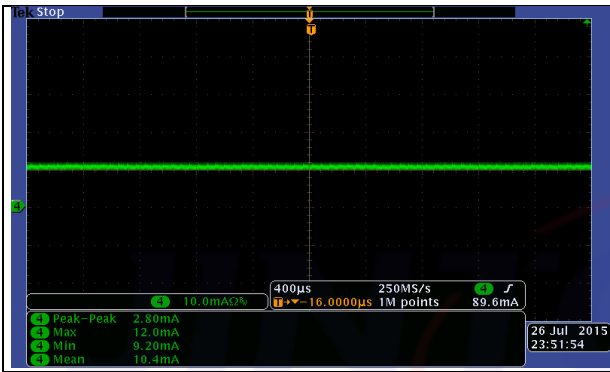
(4) Output Current



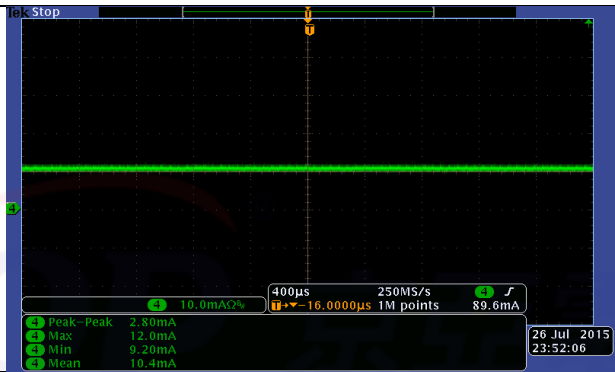
25degC; 120V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current



25degC; 230V<sub>AC</sub>/50Hz; Min. I<sub>OUT</sub>  
 (4) Output Current



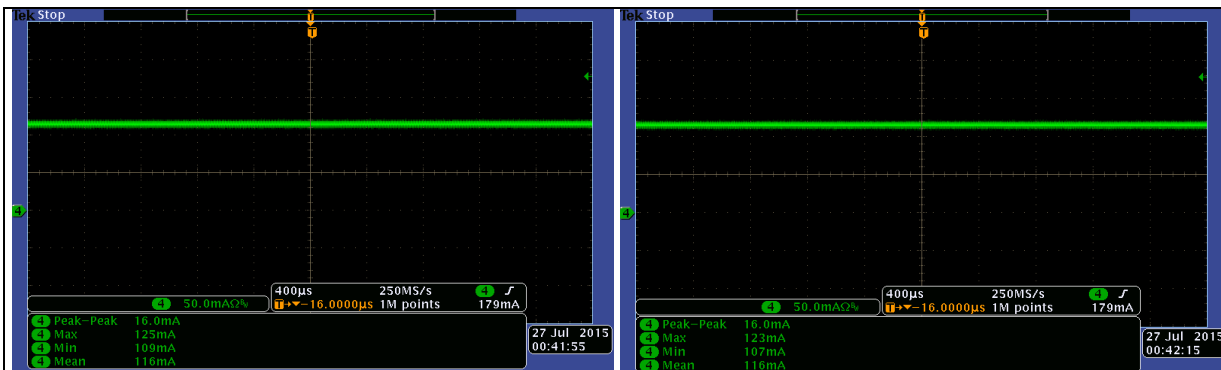
25degC; 240V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current



25degC; 277V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current



(2) Ambient: 60degC

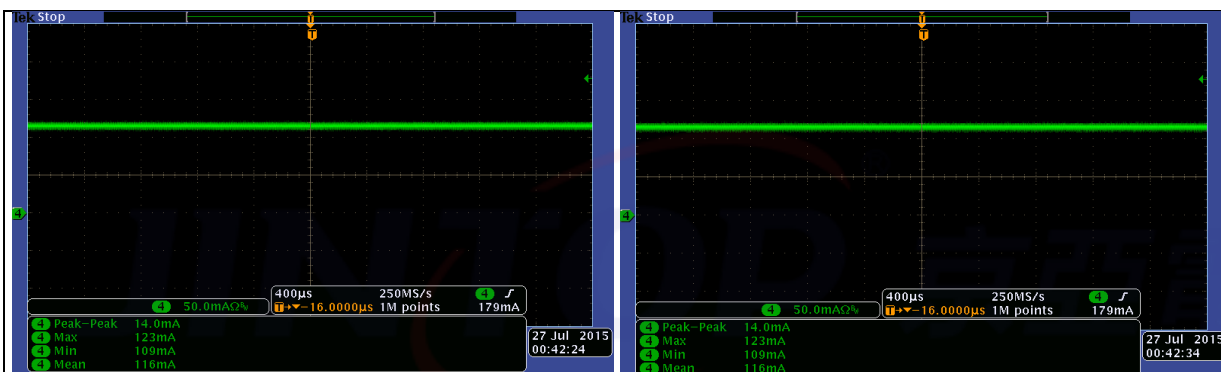


60degC; 120V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

60degC; 230V<sub>AC</sub>/50Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

(4) Output Current

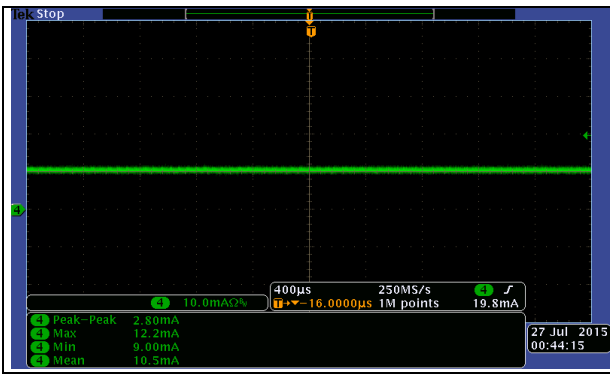


60degC; 240V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

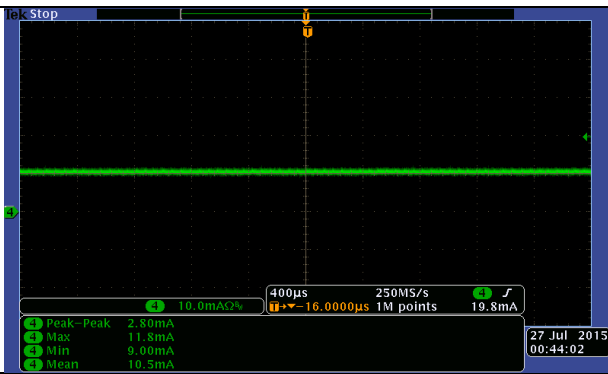
60degC; 277V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

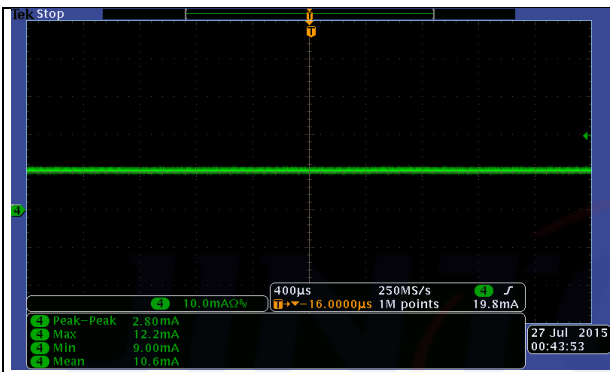
(4) Output Current



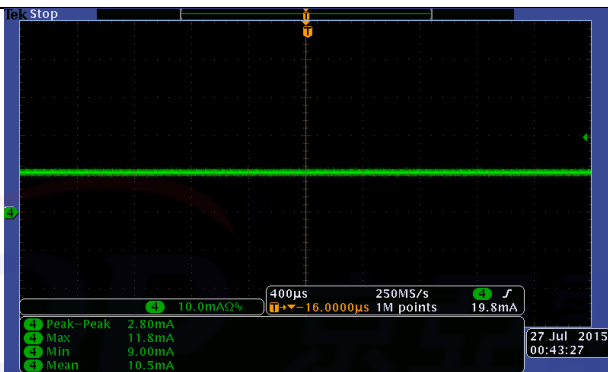
60degC; 120V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current



60degC; 230V<sub>AC</sub>/50Hz; Min. I<sub>OUT</sub>  
 (4) Output Current

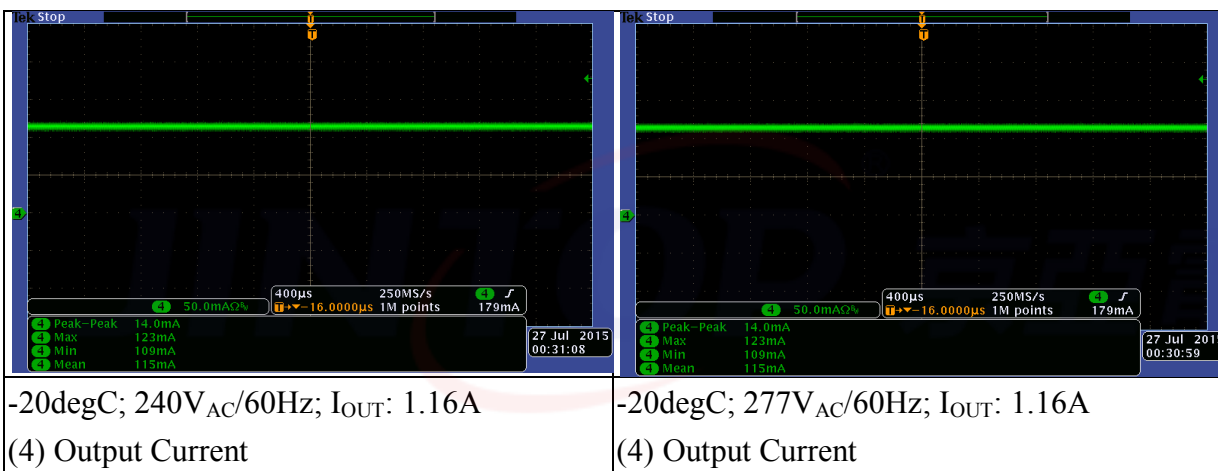
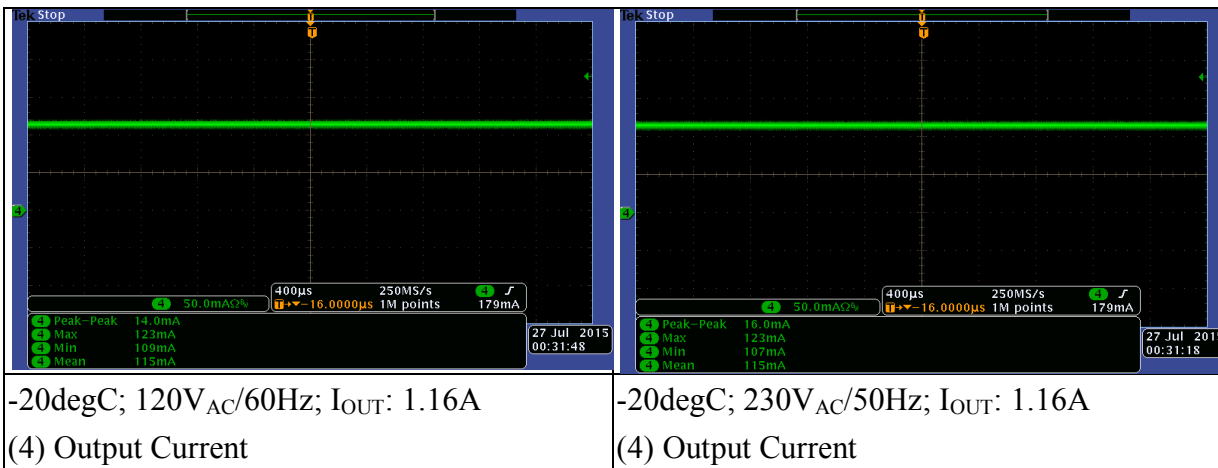


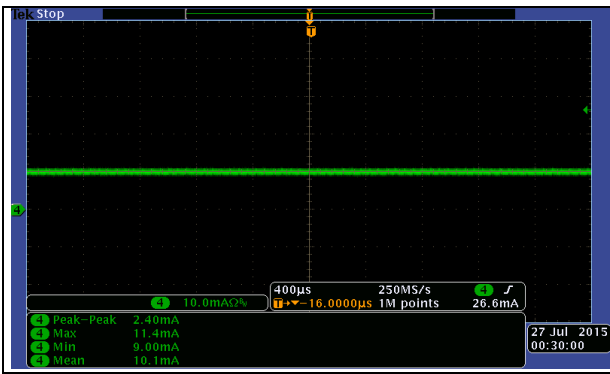
60degC; 240V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current



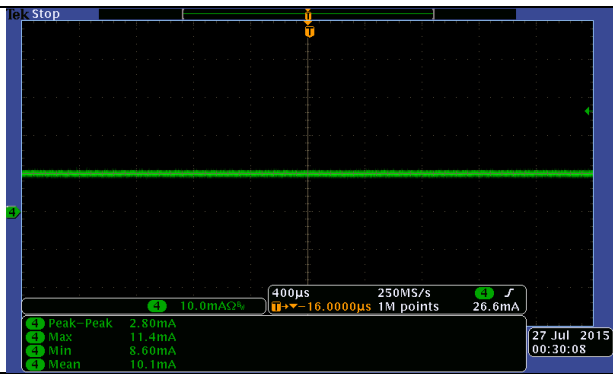
60degC; 277V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current

(3) Ambient: -20degC

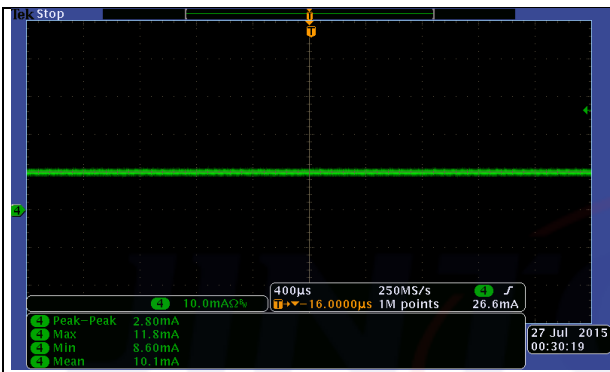




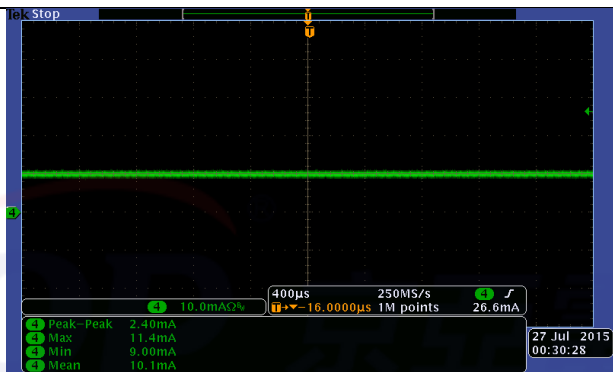
-20degC; 120V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
(4) Output Current



-20degC; 230V<sub>AC</sub>/50Hz; Min. I<sub>OUT</sub>  
(4) Output Current



-20degC; 240V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
(4) Output Current



-20degC; 277V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
(4) Output Current

### **3. Start-up Time**

#### 3-1. Test condition

- (1) AC Input: 100~277V<sub>AC</sub>; 50/60Hz.
- (2) Output Voltage: Light bar
- (3) Output Current: 1.16A, typical
- (4) Operational temperature: 25degC , 60 degC , -20. degC.

#### 3-2. Test data

##### (1) Ambient: 25degC

AC Input	Output Current= 1.16A, typical	
	Start-up time(mS)	over/under shoot(%)
120V <sub>AC</sub> /60Hz	260	7.018
230V <sub>AC</sub> /50Hz	240	8.772
240V <sub>AC</sub> /60Hz	236	7.018
277V <sub>AC</sub> /60Hz	256	8.772

##### (2) Ambient: 60degC

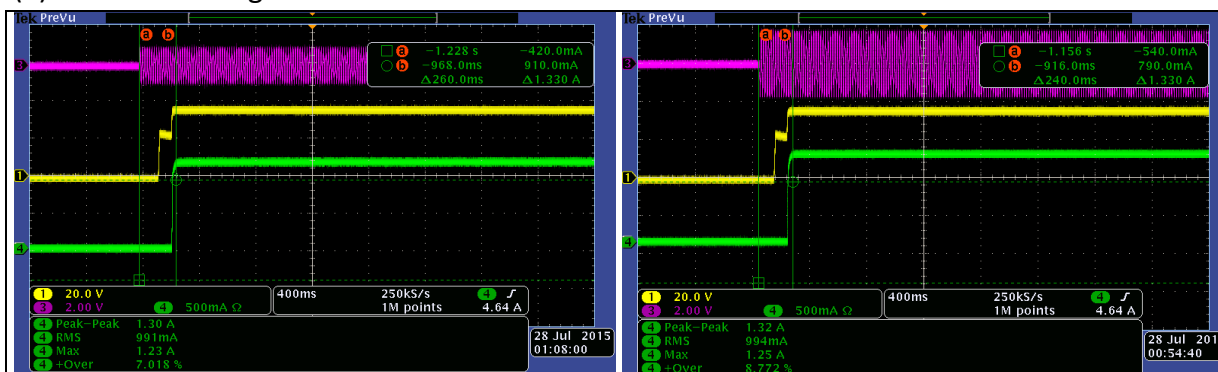
AC Input	Output Current= 1.16A, typical	
	Start-up time(mS)	over/under shoot(%)
120V <sub>AC</sub> /60Hz	252	6.780
230V <sub>AC</sub> /50Hz	240	6.780
240V <sub>AC</sub> /60Hz	240	6.780
277V <sub>AC</sub> /60Hz	236	6.780

##### (3) Ambient: -20degC

AC Input	Output Current= 1.16A, typical	
	Start-up time(mS)	over/under shoot(%)
120V <sub>AC</sub> /60Hz	256	6.807
230V <sub>AC</sub> /50Hz	244	6.807
240V <sub>AC</sub> /60Hz	236	6.807
277V <sub>AC</sub> /60Hz	236	8.772

### 3-3. Test waveform

#### (1) Ambient: 25degC

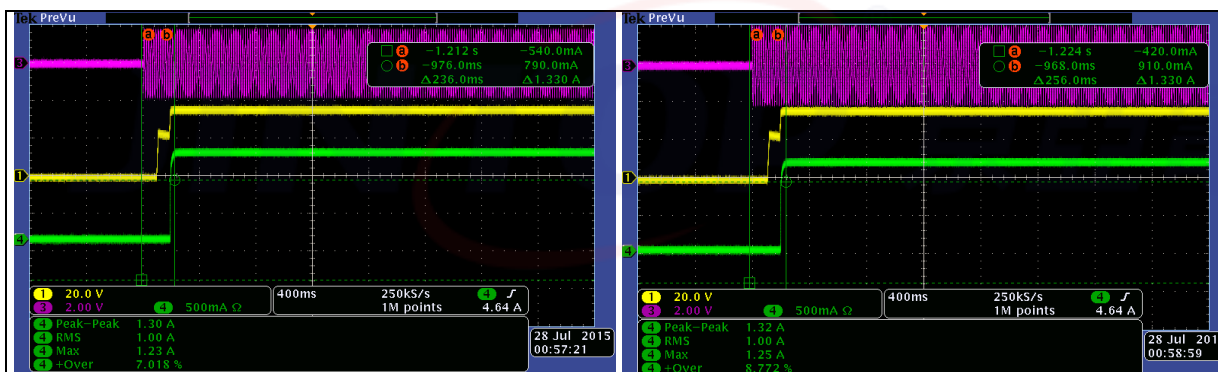


25degC; 120V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

- (1) Output Voltage
- (4) Output Current
- (3) Input Voltage

25degC; 230V<sub>AC</sub>/50Hz; I<sub>OUT</sub>: 1.16A

- (1) Output Voltage
- (4) Output Current
- (3) Input Voltage



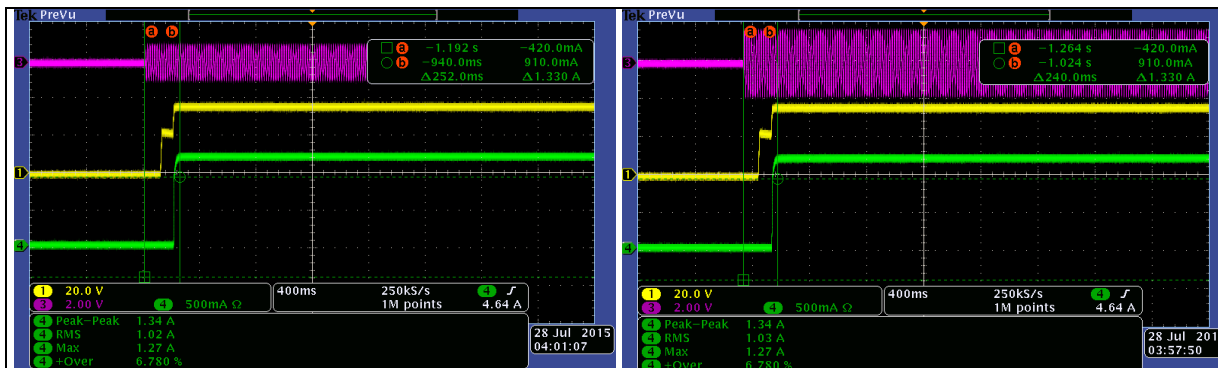
25degC; 240V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

- (1) Output Voltage
- (4) Output Current
- (3) Input Voltage

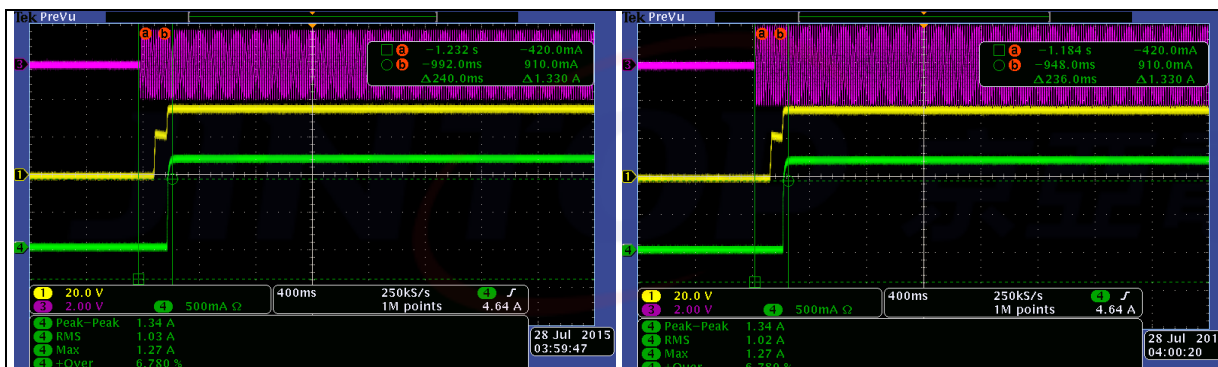
25degC; 277V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

- (1) Output Voltage
- (4) Output Current
- (3) Input Voltage

(2) Ambient: 60degC

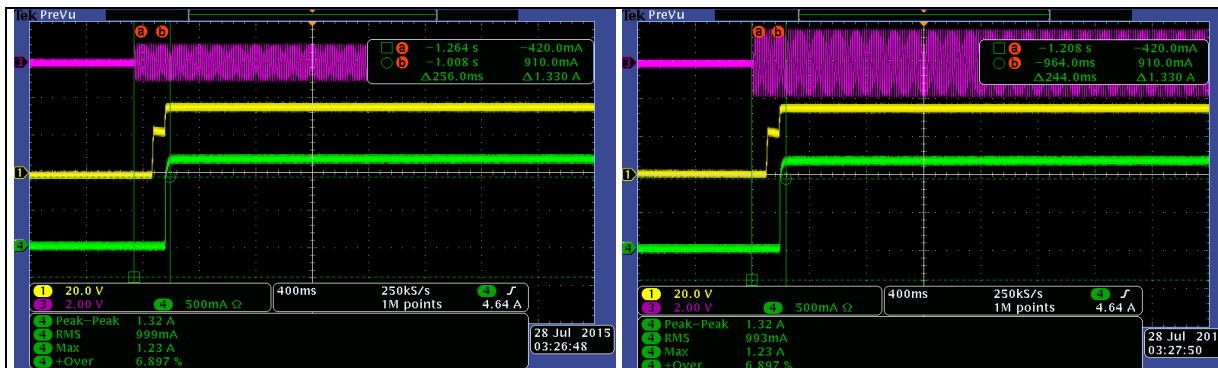


60degC; 120V <sub>AC</sub> /60Hz; I <sub>OUT</sub> : 1.16A (1) Output Voltage (4) Output Current (3) Input Voltage	60degC; 230V <sub>AC</sub> /50Hz; I <sub>OUT</sub> : 1.16A (1) Output Voltage (4) Output Current (3) Input Voltage
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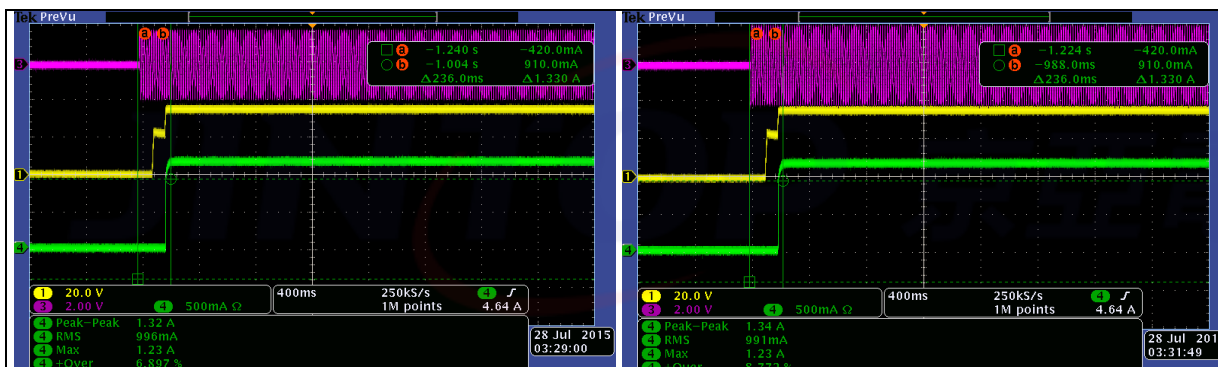


60degC; 240V <sub>AC</sub> /60Hz; I <sub>OUT</sub> : 1.16A (1) Output Voltage (4) Output Current (3) Input Voltage	60degC; 277V <sub>AC</sub> /60Hz; I <sub>OUT</sub> : 1.16A (1) Output Voltage (4) Output Current (3) Input Voltage
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(3) Ambient: -20degC



<p>-20degC; 120V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A</p> <p>(1) Output Voltage (4) Output Current (3) Input Voltage</p>	<p>-20degC; 230V<sub>AC</sub>/50Hz; I<sub>OUT</sub>: 1.16A</p> <p>(1) Output Voltage (4) Output Current (3) Input Voltage</p>
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<p>-20degC; 240V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A</p> <p>(1) Output Voltage (4) Output Current (3) Input Voltage</p>	<p>-20degC; 277V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A</p> <p>(1) Output Voltage (4) Output Current (3) Input Voltage</p>
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#### 4. Input Inrush Current

##### 4-1. Test condition

- (1) AC Input: 100~277V<sub>AC</sub>; 50/60Hz.
- (2) Output Voltage: Light bar
- (3) Output Current: 1.16A, typical; Min. I<sub>OUT</sub>
- (4) Operational temperature: 25degC , 60 degC , -20. degC.
- (5) AC power source phase setting 90deg.

##### 4-2. Test data

###### (1) Ambient: 25degC

AC Input	Output Current= 1.16A, typical			Output Current= Min. I <sub>OUT</sub>		
	I <sub>OUT,MAX.</sub> (A)	I <sub>OUT,RMS</sub> (A)	Time(mS)	I <sub>OUT,MAX.</sub> (A)	I <sub>OUT,RMS</sub> (A)	Time(mS)
120V <sub>AC</sub> /60Hz	27.6	3.84	0.70	23.0	3.13	0.79
230V <sub>AC</sub> /50Hz	44.4	6.90	0.75	38.8	5.59	0.80
240V <sub>AC</sub> /60Hz	46.4	7.08	0.73	36.4	5.12	0.79
277V <sub>AC</sub> /60Hz	46.4	7.44	0.76	31.6	4.30	0.80

###### (2) Ambient: 60degC

AC Input	Output Current= 1.16A, typical			Output Current= Min. I <sub>OUT</sub>		
	I <sub>OUT,MAX.</sub> (A)	I <sub>OUT,RMS</sub> (A)	Time(mS)	I <sub>OUT,MAX.</sub> (A)	I <sub>OUT,RMS</sub> (A)	Time(mS)
120V <sub>AC</sub> /60Hz	29.2	4.14	0.78	23.6	3.12	0.74
230V <sub>AC</sub> /50Hz	46.0	6.93	0.70	35.6	5.03	0.71
240V <sub>AC</sub> /60Hz	46.4	7.07	0.73	35.2	4.88	0.71
277V <sub>AC</sub> /60Hz	47.2	7.55	0.82	30.0	4.08	0.80

###### (3) Ambient: -20degC

AC Input	Output Current= 1.16A, typical			Output Current= Min. I <sub>OUT</sub>		
	I <sub>OUT,MAX.</sub> (A)	I <sub>OUT,RMS</sub> (A)	Time(mS)	I <sub>OUT,MAX.</sub> (A)	I <sub>OUT,RMS</sub> (A)	Time(mS)
120V <sub>AC</sub> /60Hz	24.8	3.38	0.76	24.8	3.32	0.82
230V <sub>AC</sub> /50Hz	44.8	6.90	0.75	38.8	5.46	0.71
240V <sub>AC</sub> /60Hz	46.4	7.08	0.75	40.4	6.25	0.71
277V <sub>AC</sub> /60Hz	47.6	7.49	0.79	37.2	5.08	0.71

### 4-3. Test waveform

#### (1) Ambient: 25degC



25degC; 120V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

(3) Input Voltage

25degC; 230V<sub>AC</sub>/50Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

(3) Input Voltage



25degC; 240V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

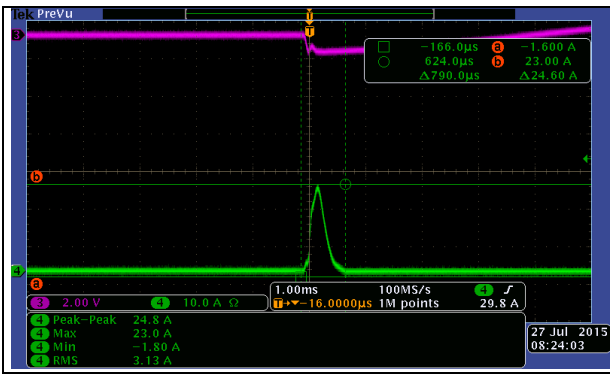
(4) Output Current

(3) Input Voltage

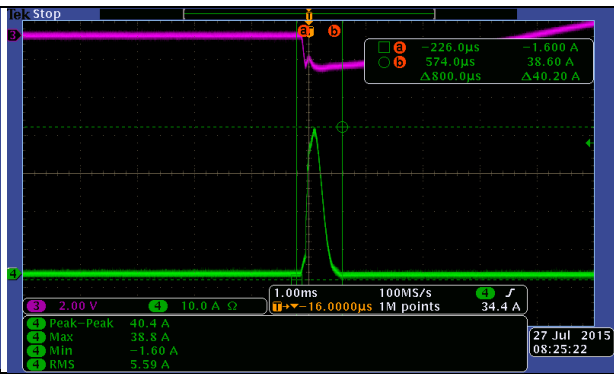
25degC; 277V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

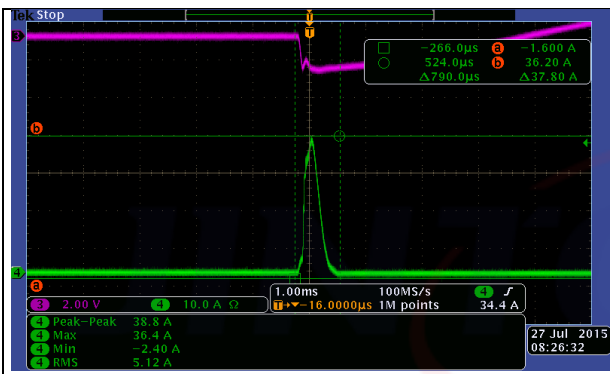
(3) Input Voltage



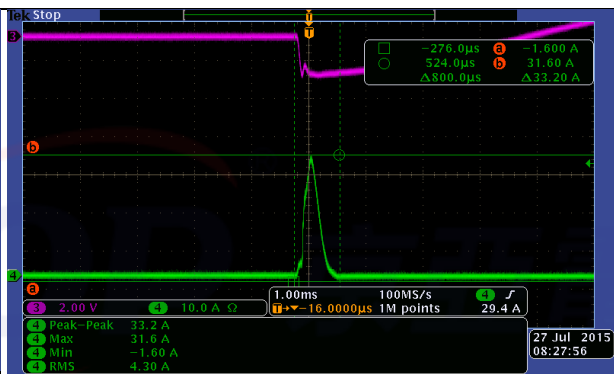
25degC; 120V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage



25degC; 230V<sub>AC</sub>/50Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage



25degC; 240V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage



25degC; 277V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage

(2) Ambient: 60degC



60degC; 120V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

(3) Input Voltage

60degC; 230V<sub>AC</sub>/50Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

(3) Input Voltage



60degC; 240V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

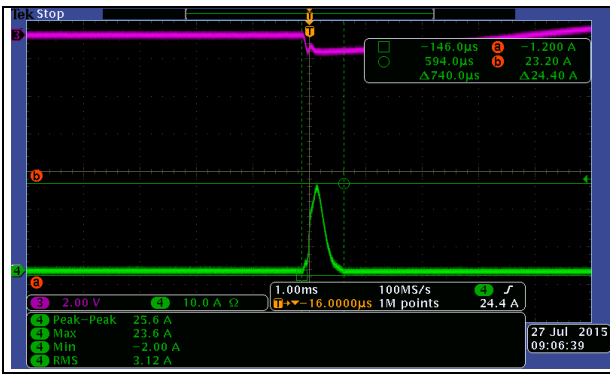
(4) Output Current

(3) Input Voltage

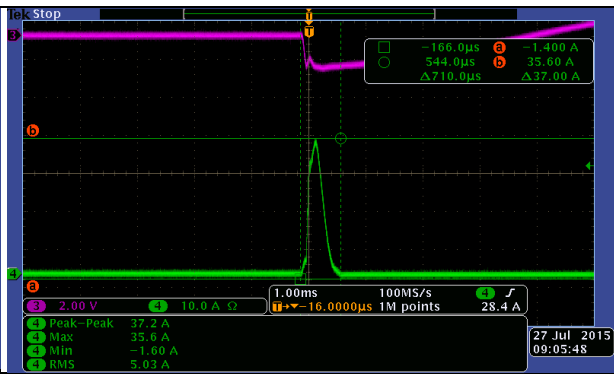
60degC; 277V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

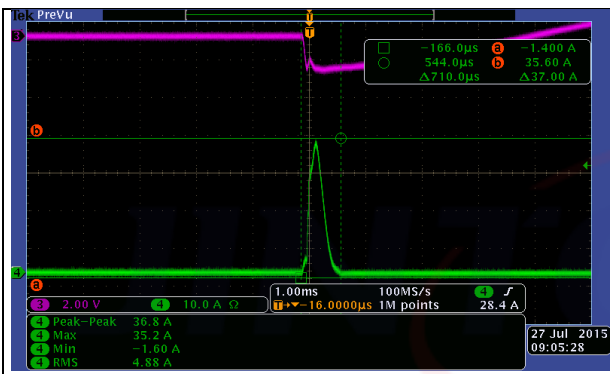
(3) Input Voltage



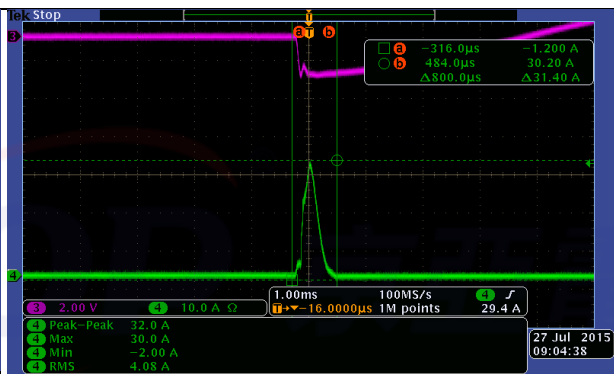
60degC; 120V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage



60degC; 230V<sub>AC</sub>/50Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage



60degC; 240V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage



60degC; 277V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage

(3) Ambient: -20degC



-20degC; 120V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

(3) Input Voltage

-20degC; 230V<sub>AC</sub>/50Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

(3) Input Voltage



-20degC; 240V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

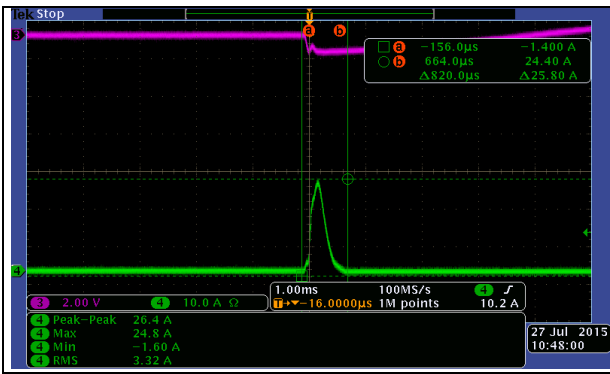
(4) Output Current

(3) Input Voltage

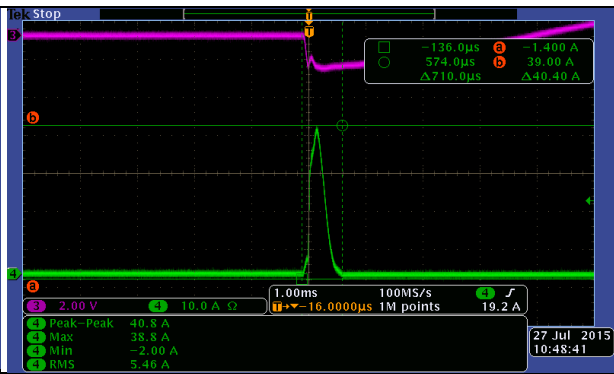
-20degC; 277V<sub>AC</sub>/60Hz; I<sub>OUT</sub>: 1.16A

(4) Output Current

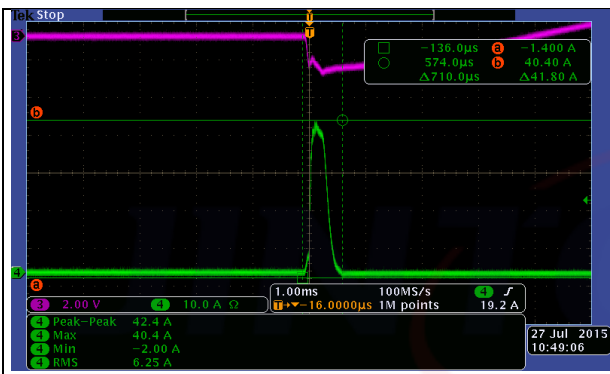
(3) Input Voltage



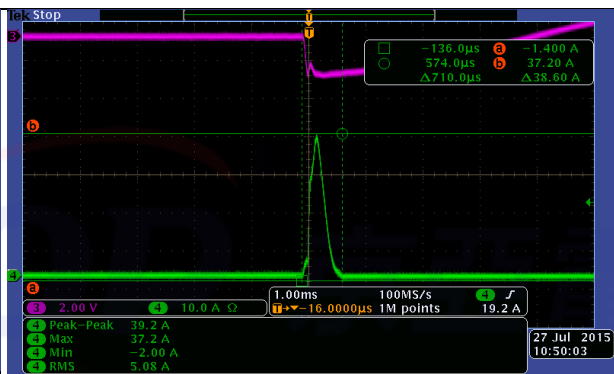
-20degC; 120V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage



-20degC; 230V<sub>AC</sub>/50Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage



-20degC; 240V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage



-20degC; 277V<sub>AC</sub>/60Hz; Min. I<sub>OUT</sub>  
 (4) Output Current  
 (3) Input Voltage

## **5. Protection**

### 5-1. Test condition

- (1) AC Input: 100~277V<sub>AC</sub>; 50/60Hz.
- (2) Output Voltage: Light bar.
- (3) Output Current: 1.16A, typical.
- (4) Operational temperature: 25degC , 60 degC , -20. degC.

### 5-2. Test item

- (a) Output short circuit protection: DC Output load short.
- (b) Output open circuit protection: DC Output Load open.
- (c) Output over voltage protection: DC Output Load higher than 45V<sub>DC</sub>.





5-3. Test data & waveform

(a) Output short circuit protection

(Check Output voltage & current waveform; hiccup mode protection & auto recovery)

(1) Ambient: 25degC

AC Input	Output Voltage: 36V <sub>DC</sub> (for LED load).	Output Current= 1.16A, typical
120V <sub>AC</sub> /60Hz	auto recovery	hiccup mode protection
230V <sub>AC</sub> /50Hz	auto recovery	hiccup mode protection
240V <sub>AC</sub> /60Hz	auto recovery	hiccup mode protection
277V <sub>AC</sub> /50Hz	auto recovery	hiccup mode protection

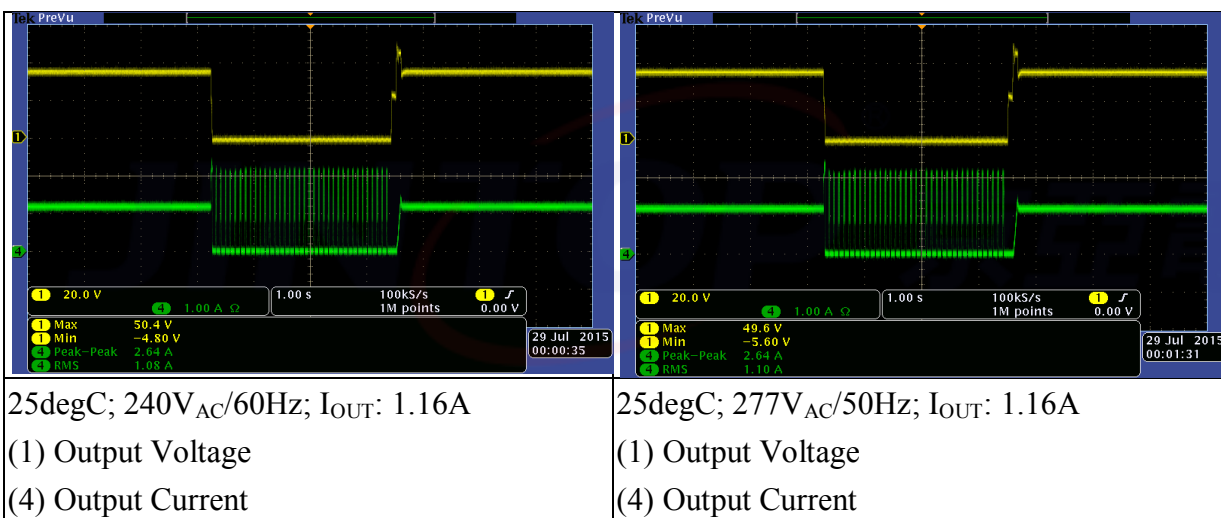
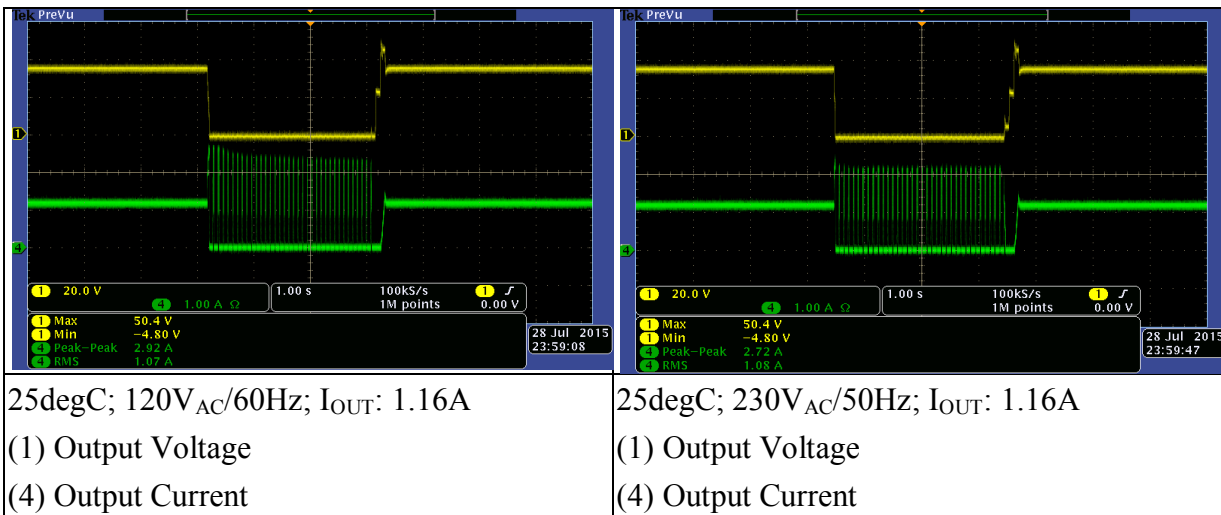
(2) Ambient: 60degC

AC Input	Output Voltage: 36V <sub>DC</sub> (for LED load).	Output Current= 1.16A, typical
120V <sub>AC</sub> /60Hz	auto recovery	hiccup mode protection
230V <sub>AC</sub> /50Hz	auto recovery	hiccup mode protection
240V <sub>AC</sub> /60Hz	auto recovery	hiccup mode protection
277V <sub>AC</sub> /50Hz	auto recovery	hiccup mode protection

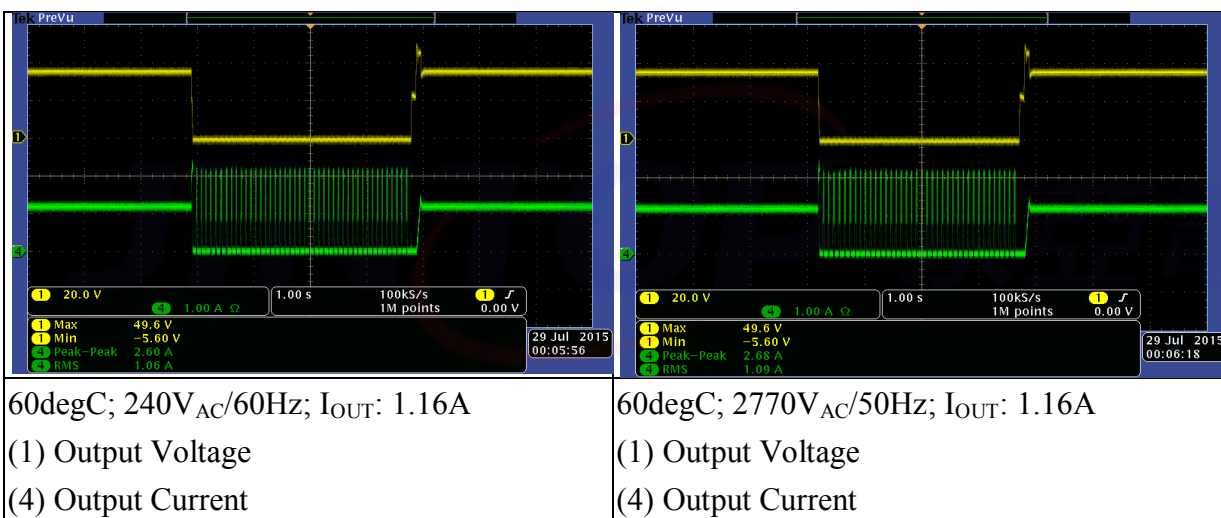
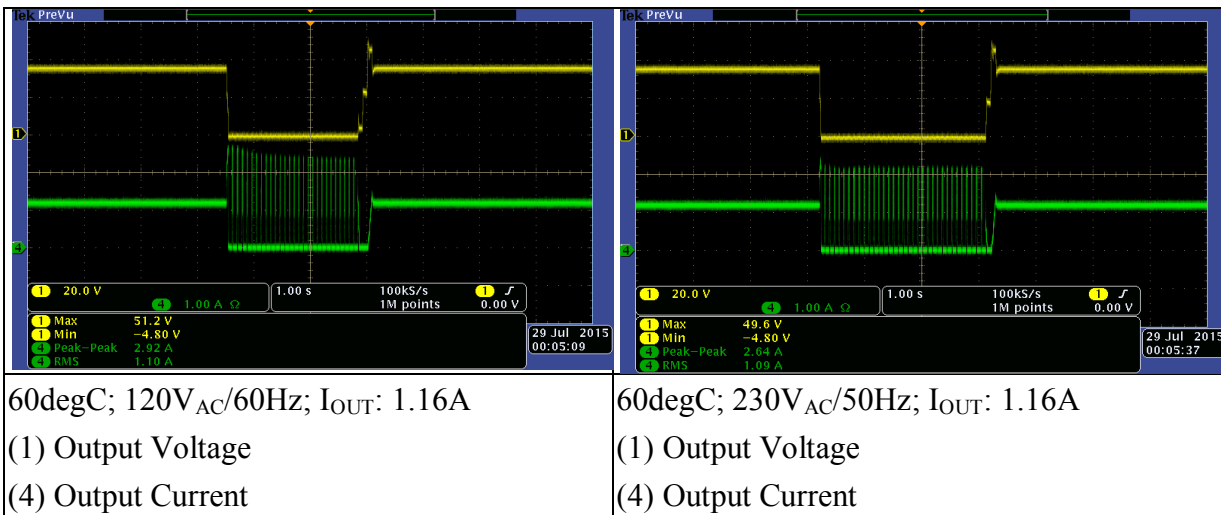
(3) Ambient: -20degC

AC Input	Output Voltage: 36V <sub>DC</sub> (for LED load).	Output Current= 1.16A, typical
120V <sub>AC</sub> /60Hz	auto recovery	hiccup mode protection
230V <sub>AC</sub> /50Hz	auto recovery	hiccup mode protection
240V <sub>AC</sub> /60Hz	auto recovery	hiccup mode protection
277V <sub>AC</sub> /50Hz	auto recovery	hiccup mode protection

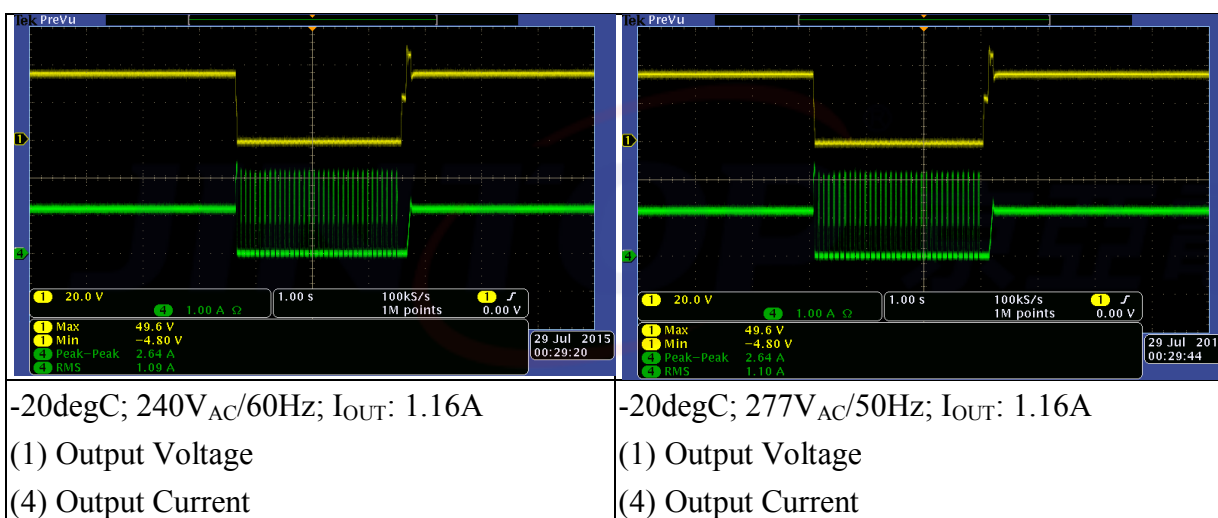
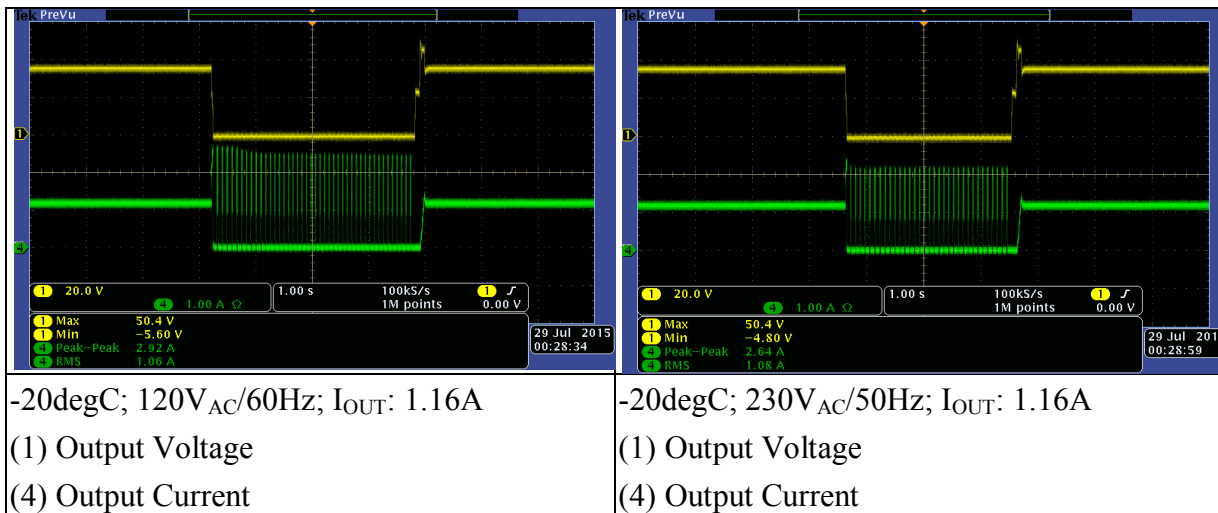
(1) Ambient: 25degC



(2) Ambient: 60degC



(3) Ambient: -20degC



(b) Output open circuit protection

(Check Output voltage & current waveform; clamp mode protection & auto recovery)

(1) Ambient: 25degC

AC Input	Output Voltage: 36V <sub>DC</sub> (for LED load).	Output Current= 1.16A, typical
120V <sub>AC</sub> /60Hz	hiccup mode protection	auto recovery
230V <sub>AC</sub> /50Hz	hiccup mode protection	auto recovery
240V <sub>AC</sub> /60Hz	hiccup mode protection	auto recovery
277V <sub>AC</sub> /50Hz	hiccup mode protection	auto recovery

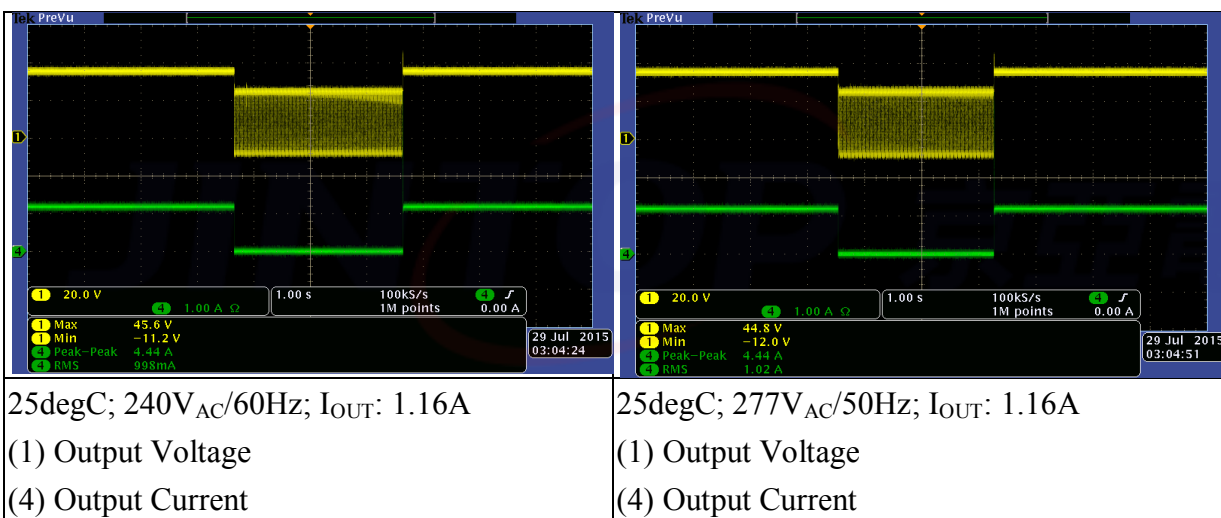
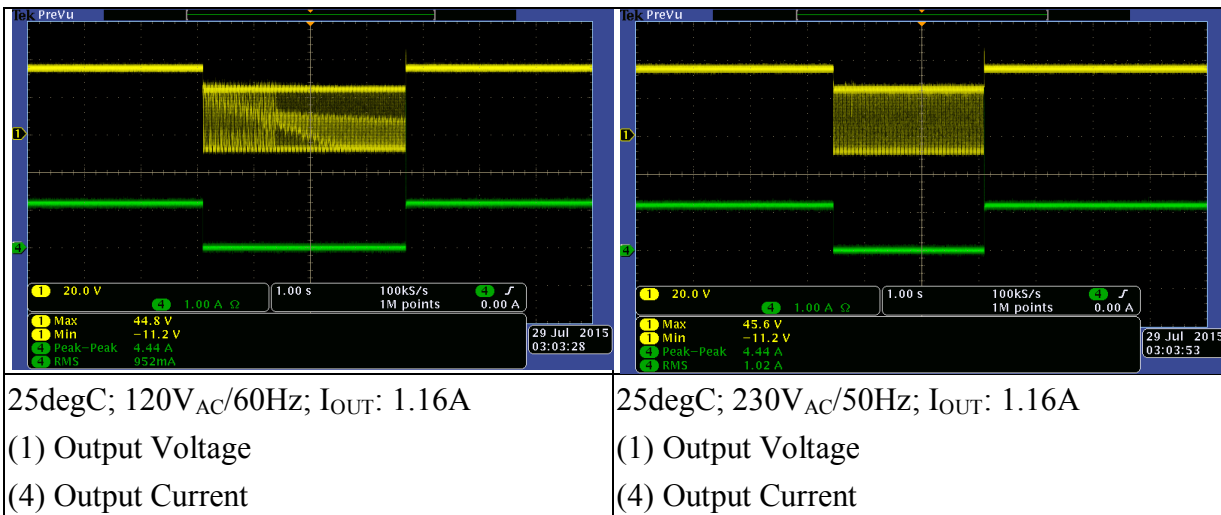
(2) Ambient: 60degC

AC Input	Output Voltage: 36V <sub>DC</sub> (for LED load).	Output Current= 1.16A, typical
120V <sub>AC</sub> /60Hz	hiccup mode protection	auto recovery
230V <sub>AC</sub> /50Hz	hiccup mode protection	auto recovery
240V <sub>AC</sub> /60Hz	hiccup mode protection	auto recovery
277V <sub>AC</sub> /50Hz	hiccup mode protection	auto recovery

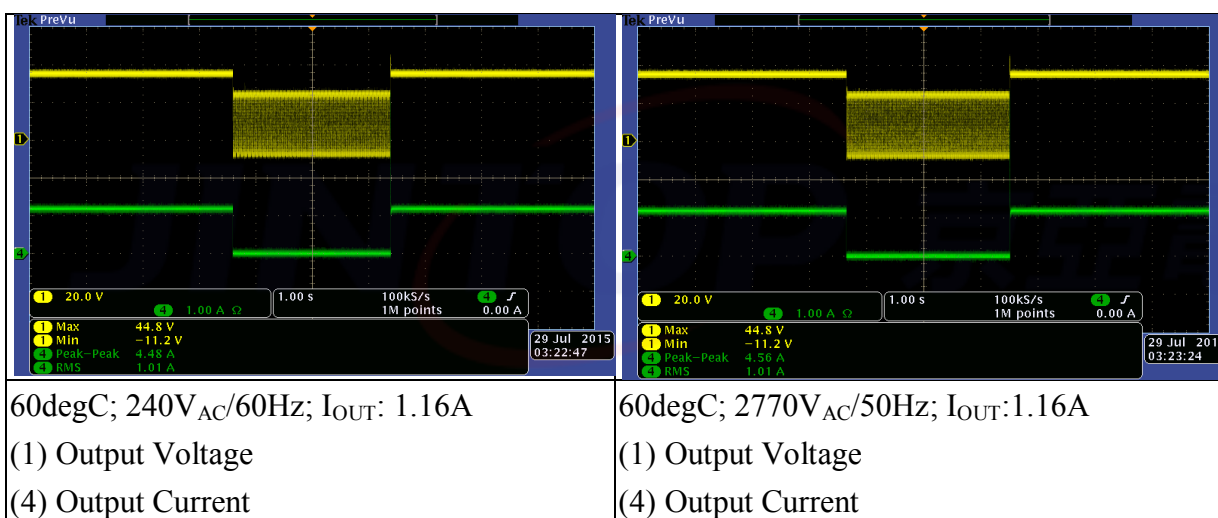
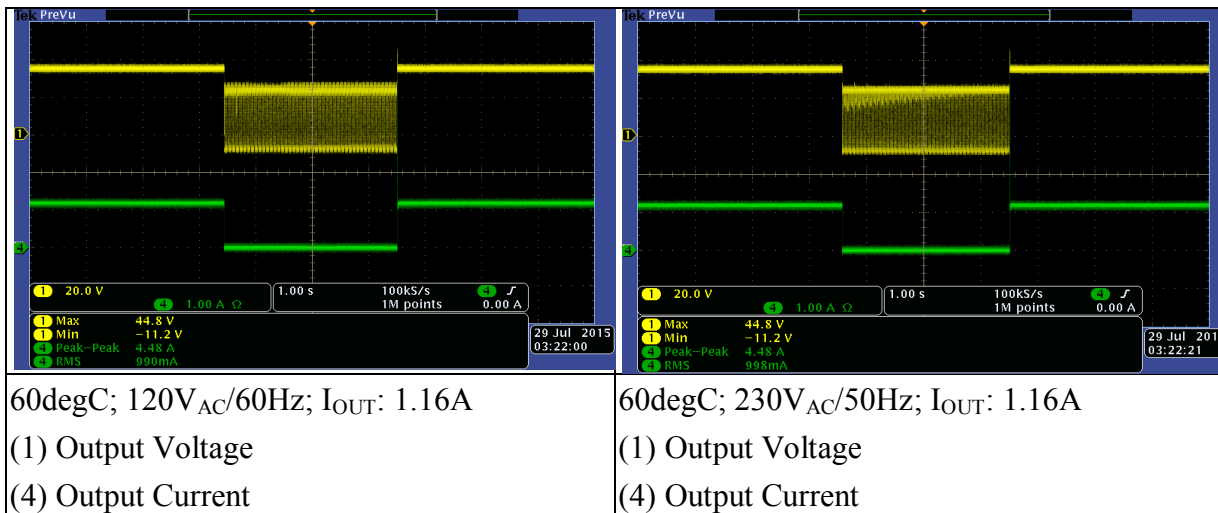
(3) Ambient: -20degC

AC Input	Output Voltage: 36V <sub>DC</sub> (for LED load).	Output Current= 1.16A, typical
120V <sub>AC</sub> /60Hz	hiccup mode protection	auto recovery
230V <sub>AC</sub> /50Hz	hiccup mode protection	auto recovery
240V <sub>AC</sub> /60Hz	hiccup mode protection	auto recovery
277V <sub>AC</sub> /50Hz	hiccup mode protection	auto recovery

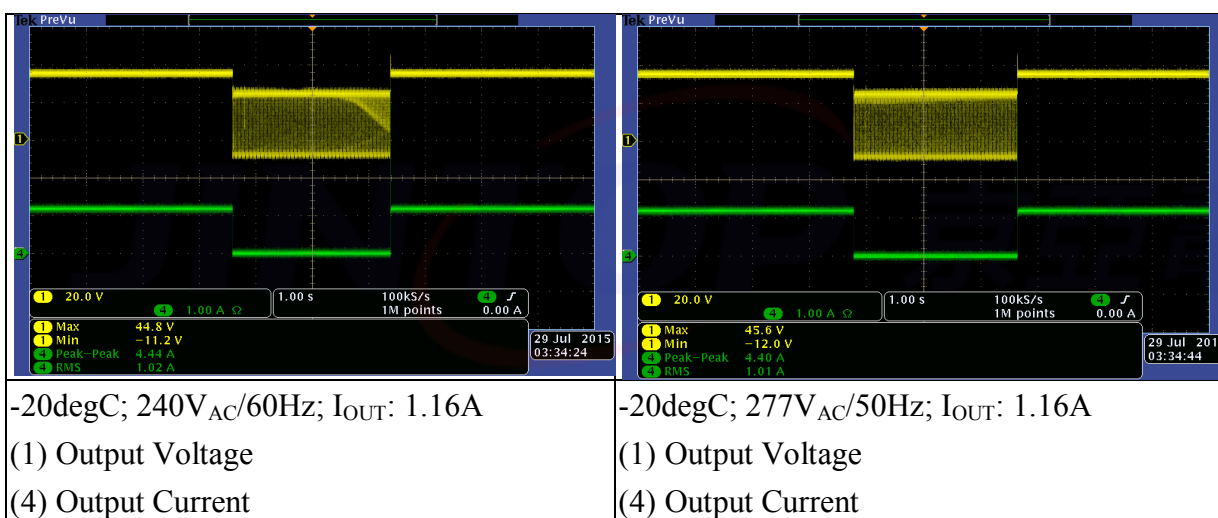
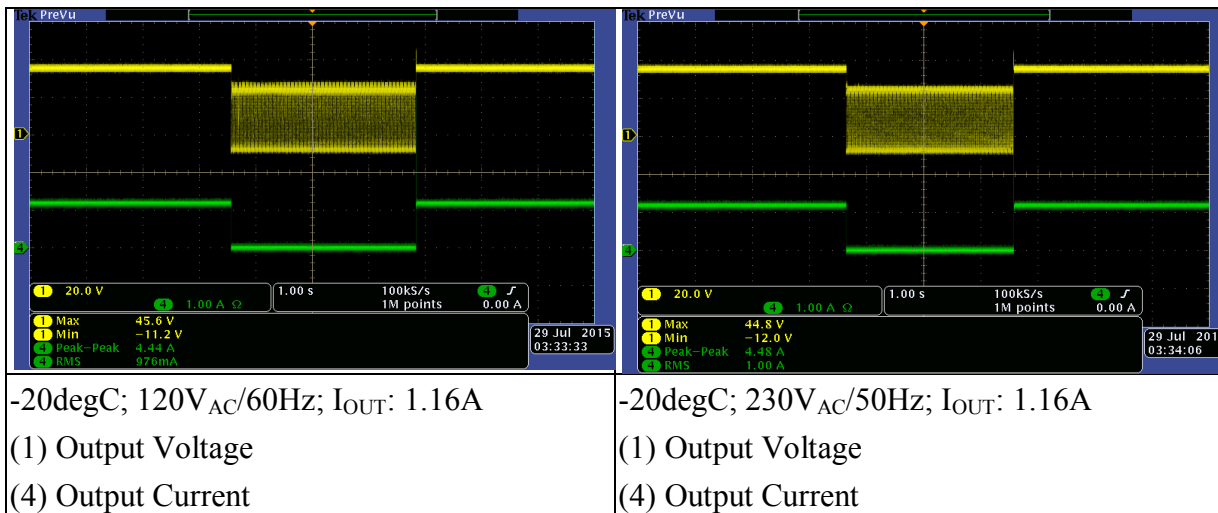
(1) Ambient: 25degC



(2) Ambient: 60degC



(3) Ambient: -20degC





(c) Output over voltage protection

(Check OVP protect point;  $V_{OUT} > 45V_{DC}$ , output power limit protection & auto recovery)

AC Input	Ambient= 25degC	Ambient= 60degC	Ambient= -20degC
	$V_{OUT} (V_{DC})$	$V_{OUT} (V_{DC})$	$V_{OUT} (V_{DC})$
120VAC/60Hz	46.4	46.8	46.8
230VAC/50Hz	46.8	46.8	46.8
240VAC/60Hz	47.0	46.8	47.2
277VAC/50Hz	46.8	46.8	47.0

(1) Ambient: 25degC

AC Input	Output Voltage: $36V_{DC}$	Output Current= 1.16A, typical
120V <sub>AC</sub> /60Hz	auto recovery	auto recovery
230V <sub>AC</sub> /50Hz	auto recovery	auto recovery
240V <sub>AC</sub> /60Hz	auto recovery	auto recovery
277V <sub>AC</sub> /50Hz	auto recovery	auto recovery

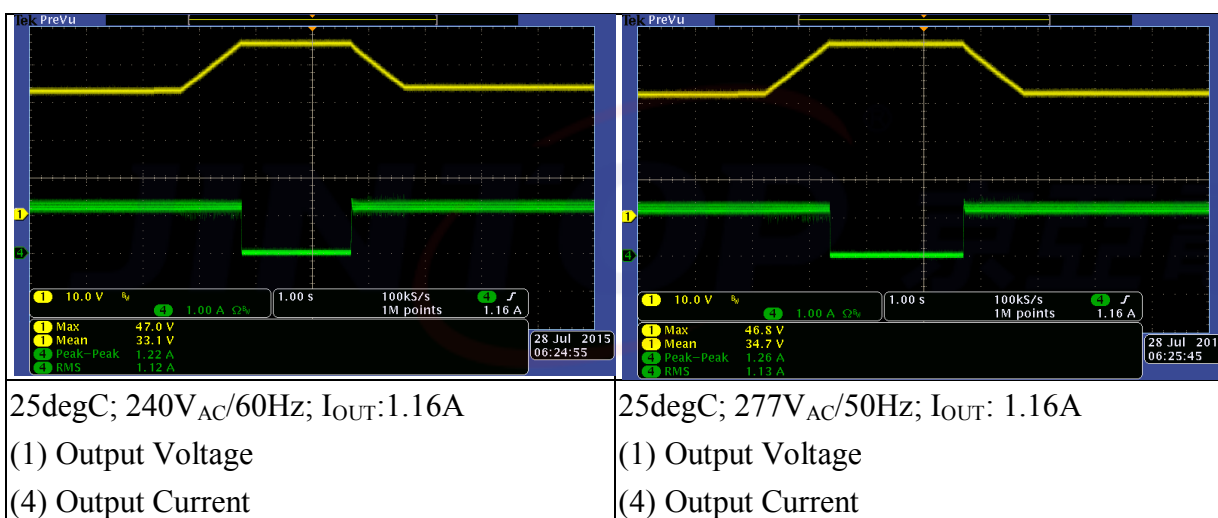
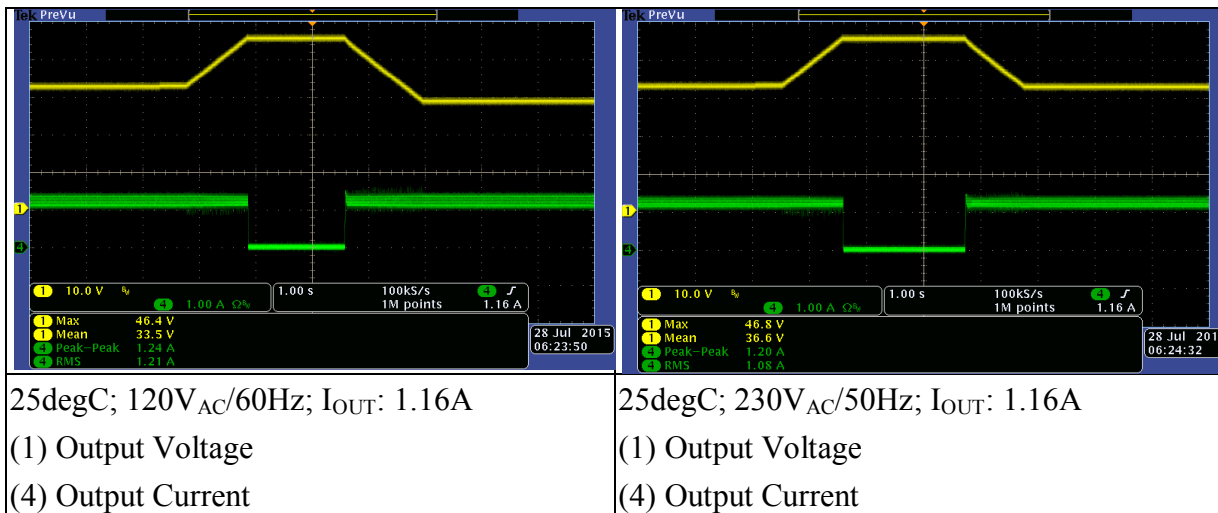
(2) Ambient: 60degC

AC Input	Output Voltage: $36V_{DC}$	Output Current= 1.16A, typical
120V <sub>AC</sub> /60Hz	auto recovery	auto recovery
230V <sub>AC</sub> /50Hz	auto recovery	auto recovery
240V <sub>AC</sub> /60Hz	auto recovery	auto recovery
277V <sub>AC</sub> /50Hz	auto recovery	auto recovery

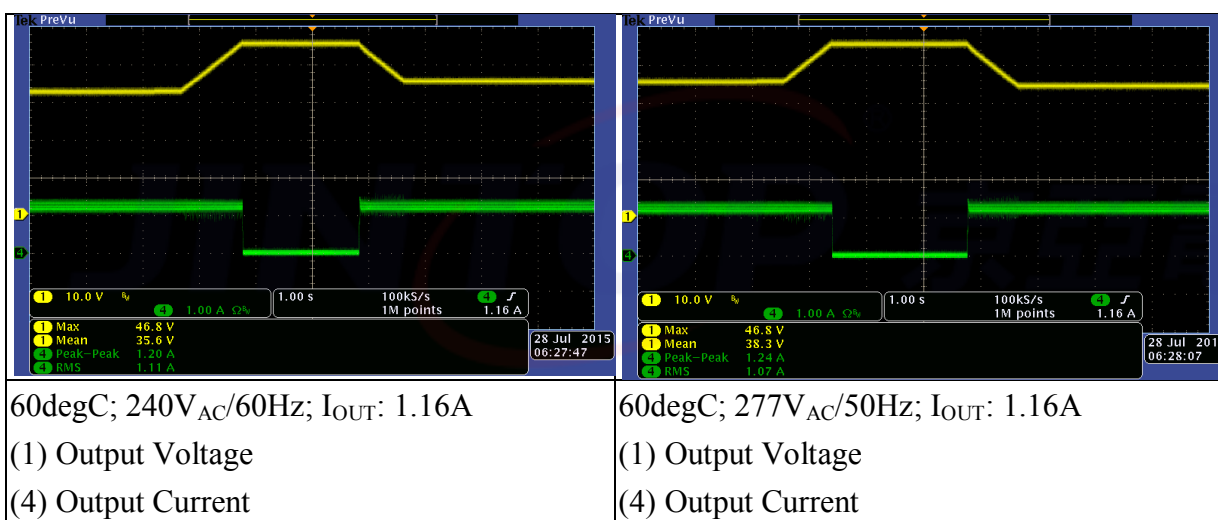
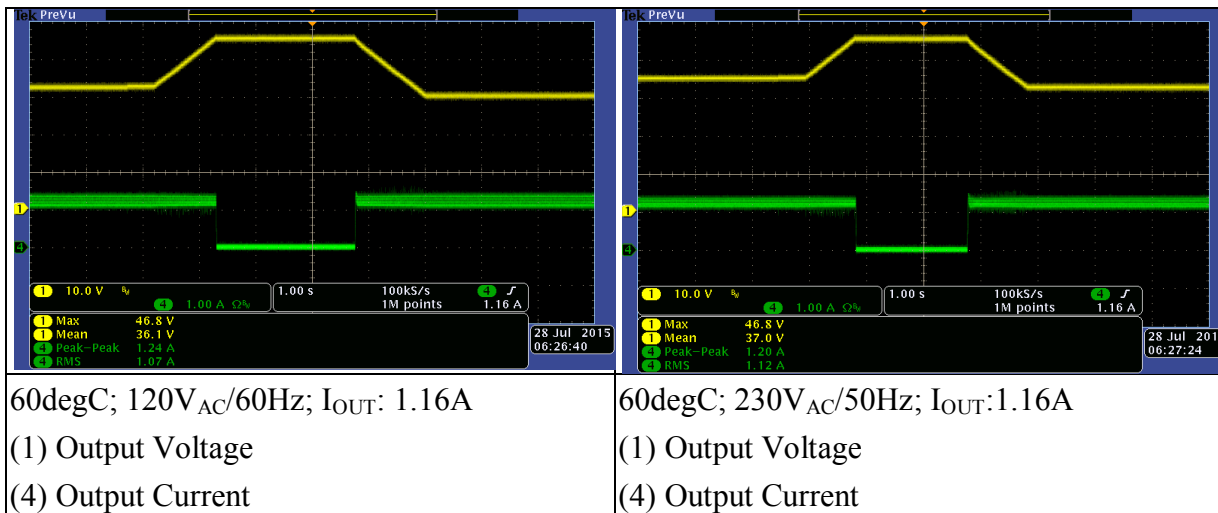
(3) Ambient: -20degC

AC Input	Output Voltage: $36V_{DC}$	Output Current= 1.16A, typical
120V <sub>AC</sub> /60Hz	auto recovery	auto recovery
230V <sub>AC</sub> /50Hz	auto recovery	auto recovery
240V <sub>AC</sub> /60Hz	auto recovery	auto recovery
277V <sub>AC</sub> /50Hz	auto recovery	auto recovery

(1) Ambient: 25degC



(2) Ambient: 60degC



(3) Ambient: -20degC

