



Test Report: NLDD-1200H

DC-DC Constant Current Step-Down LED driver

■ DESIGN VERIFY TEST

Output Function Test
Input Function Test
Protection Function Test
Control Function Test
Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

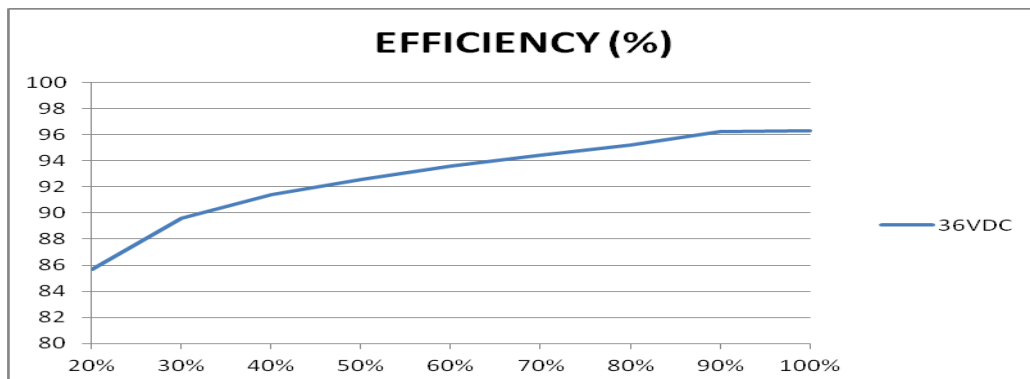
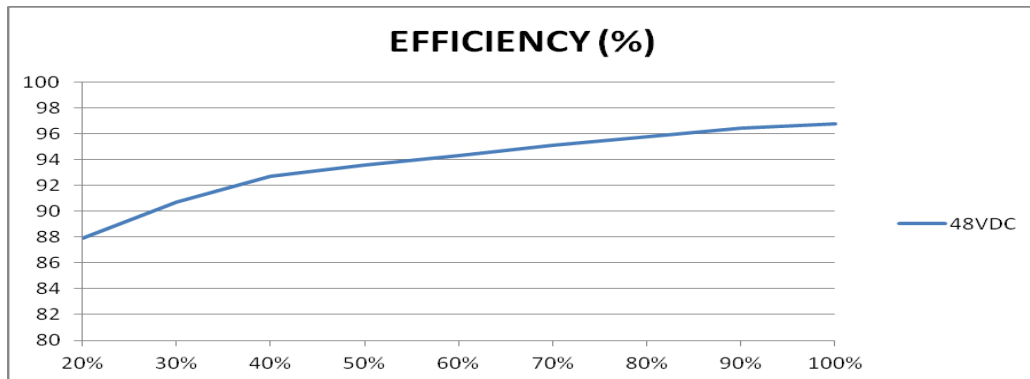
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT ACCURACY	-5%~+5%	I/P: 48VDC O/P: LED max/ LED min Ta:25°C	-2.50%~ 0.833%/48VDC
2	CURRENT RIPPLE	-5%~ +5%	I/P: 48VDC O/P: LED min~ LED max Ta:25°C	1.98%~ 5%/48VDC
3	SUGRE CURRENT	< +10%	I/P: 48VDC O/P: LED max/ LED min Ta:25°C	7.08%~ 10%/48VDC
4	VOLTAGE RANGE	6~46VDC	I/P: 10- 56VDC O/P:TEST Ta:25°C	6~46VDC

5	DIMMING OPERATION	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <h4 style="background-color: #cccccc; padding: 2px;">PWM Dimming Control</h4> </div> <div style="width: 45%;"> <ul style="list-style-type: none"> ⊙ Short circuit PWM PIN can realize dimming turn off. ⊙ During PWM dimming operation, the output current will change to PWM style. </div> </div>																																								
		<p>I/P : 48 VDC O/P : DIMMING TEST</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>PWM</th> <th>0%</th> <th>10%</th> <th>20%</th> <th>30%</th> <th>40%</th> <th>50%</th> <th>60%</th> <th>70%</th> <th>80%</th> <th>90%</th> <th>100%</th> <th>OPEN</th> </tr> </thead> <tbody> <tr> <td>Output Current (100Hz)</td> <td>0</td> <td>0.104</td> <td>0.223</td> <td>0.344</td> <td>0.457</td> <td>0.575</td> <td>0.693</td> <td>0.811</td> <td>0.928</td> <td>1.044</td> <td>1.181</td> <td>1.184</td> </tr> <tr> <td>%</td> <td>0</td> <td>8.67</td> <td>18.58</td> <td>28.67</td> <td>38.08</td> <td>47.92</td> <td>57.75</td> <td>67.58</td> <td>77.33</td> <td>87.00</td> <td>98.42</td> <td>98.67</td> </tr> </tbody> </table>		PWM	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN	Output Current (100Hz)	0	0.104	0.223	0.344	0.457	0.575	0.693	0.811	0.928	1.044	1.181	1.184	%	0	8.67	18.58	28.67	38.08	47.92	57.75	67.58	77.33	87.00	98.42	98.67
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<p>TEST RESULT : OK</p>																																										

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	10VDC~ 56VDC	I/P:TESTING O/P:FULL LOAD Ta:25°C	9.8~ 59VDC
			I/P: LOW-LINE-0.2= 9.8 V HIGH-LINE+3V= 59V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec . OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST(1) <u>OK</u> (2) <u>OK</u> (3) <u>OK</u>
2	INPUT CURRENT(TYP)	1200mA @48VDC*FULL LOAD 5mA @48VDC*NO LOAD	I/P:48 VDC O/P:FULL LOAD/NO LOAD Ta:25°C	I =1135mA/VDC(FULL LOAD) I =1.48mA/VDC(NO LOAD)
3	EFFICIENCY(TYP)	95%	I/P: 36/48VDC O/P:FULL LOAD Ta:25°C	96.79%/48VDC 96.31%/36VDC

EFFICIENCY vs LOAD



PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER TEMPERATURE PROTECTION	NO DAMAGE	I/P: 48VDC O/P:FULL LOAD	PROTECTION TYPE : Shut down, recovers Automatically after temperature goes down
2	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 10VDC/48VDC/56VDC O/P: FULL LOAD Ta:25°C	NO DAMAGE OK PROTECTION TYPE : Can be continued , recovers automatically after fault condition is removed

CONTROL FUNCTION TEST

1	REMOTE CONTROL	1. Power ON with dimming: DIM ~ -Vin >2.5 ~ 6VDC or open circuit 2. Power OFF : DIM ~ -Vin < 0.8VDC or short	I/P: 10VDC/24VDC/56VDC O/P:FULL LOAD	IP:10VDC 1、 Power OFF: <1.70VDC Power ON: >1.95VDC IP:24VDC 2、 Power OFF: <1.73VDC Power ON: >1.95VDC IP:56VDC 3、 Power OFF: <1.76VDC Power ON: >1.94VDC
2	QUIESCENT INPUT CURRENT IN SHUTDOWN MODE(max.)	2mA at PWM dimming OFF and 24VDC input	I/P: 24 VDC O/P:FULL LOAD	1.23mA

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	U1 Rated MBI6662 2A/ 75V	DC ON/OFF I/P:High-Line +3V =59 VDC VDS: O/P: (1) CV max (2) CV max continue (3) CV min (4)Output Short (5)NO LOAD (6)DIM off I/P:Low-Line -0.2 VDC =9.8 VDC O/P: (1) CV max (2) CV max continue (3) CV min (4)Output Short (5)NO LOAD (6)DIM off Ta:25°C	VDS: 59V (1) 62.0V (2) 61.6V (3) 61.2V (4) 60.8V (5) 61.2V (6) 59.2V VDS: 9.8V (1) 11.84V (2) 11.44V (3) 11.60V (4) 12.00V (5) 10.47V (6) 10.23V

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RADIATION	EN55015 CLASS A	I/P: 56VDC O/P:FULL LOAD Ta:25°C	PASS
2	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR : 8KV / Contact : 4KV	I/P: 56VDC O/P:FULL LOAD Ta:25°C	CRITERIA A
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 0.5KV	I/P: 56VDC O/P:FULL LOAD Ta:25°C	CRITERIA A
4	Test by certified Lab & Test Report Prepare Any contradictions of the test results, please refer to the latest EMC test report			

RELIABILITY TEST
ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																								
1	TEMPERATURE RISE TEST	MODEL : NLDD-1200HW 1. ROOM AMBIENT BURN-IN : 2HRS I/P : 48VDC O/P : FULL LOAD Ta= 26.1°C 2. HIGH AMBIENT BURN-IN : HRS I/P : 56VDC O/P : FULL LOAD Ta= 45 °C																										
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=26.1 °C</th> <th>HIGH AMBIENT Ta=45 °C</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>U1</td> <td>54.1°C</td> <td>110.9°C</td> </tr> <tr> <td>2</td> <td>C1</td> <td>47.0°C</td> <td>93.3°C</td> </tr> <tr> <td>3</td> <td>D2</td> <td>48.3°C</td> <td>96.5°C</td> </tr> <tr> <td>4</td> <td>L1</td> <td>46.6°C</td> <td>90.9°C</td> </tr> <tr> <td>5</td> <td>TC</td> <td>40.4°C</td> <td>89.3°C</td> </tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=26.1 °C	HIGH AMBIENT Ta=45 °C	1	U1	54.1°C	110.9°C	2	C1	47.0°C	93.3°C	3	D2	48.3°C	96.5°C	4	L1	46.6°C	90.9°C	5	TC	40.4°C	89.3°C
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 10VDC / 56VDC O/P : FULL LOAD Ta= -45 °C	TEST : OK																								
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 45 °C/95 %R.H NO DAMAGE	I/P : 56VDC O/P : FULL LOAD Ta= 50°C HUMIDITY= 95 %R.H	TEST : OK																								
4	TEMPERATURE COEFFICIENT	+ 0.03%/°C(0~50°C)	I/P : 56VDC O/P : FULL LOAD	+ 0.004 %/°C(0~50°C)																								

6	STORAGE TEMPERATURE TEST	-40~85°C	<ol style="list-style-type: none"> 1. Thermal shock Temperature : -45°C~ +90°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : STATIC
7	THERMAL SHOCK TEST	-40~45°C	<ol style="list-style-type: none"> 1. Thermal shock Temperature : -45°C~ +50°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 16 CYCLE 5. Input/Output condition : 15cycle: 56VDC / FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle: 56VDC / FULL LOAD Burn In Test
8	VIBRATION TEST	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes	<ol style="list-style-type: none"> 1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 3G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C
9	CAPACITOR LIFE CYCLE	<p>SUPPOSE C1 IS THE MOST CRITICAL COMPONENT</p> <p>(1) I/P : 48VDC O/P : FULL LOAD Ta=25 °C LIFE TIME (1) 395666HRS</p> <p>(2) I/P : 56VDC O/P : FULL LOAD Ta=45 °C LIFE TIME (2) 27061HRS</p> <p>(3) I/P : 56VDC O/P : 75% LOAD Ta=45 °C LIFE TIME (3) 27087HRS</p> <p>(4) I/P : 56VDC O/P : 50% LOAD Ta=45 °C LIFE TIME (4) 31032HRS</p>	
10	MTBF	<p>Conducted by Parts Stress Analysis Prediction</p> <p>29984.3K hrs min. Telcordia SR-332 (Bellcore); 2881.6K hrs min. MIL-HDBK-217F (25°C)</p>	
11	Ongoing Reliability Test	<p>I/P : 56VDC O/P : FULL LOAD TA=45°C</p> <p>Demonstration Mean Time Between Failure : 30,000 hours</p>	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQ/HUANGMK	WENF	LINKX