



Test Report: NLDD-700H

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

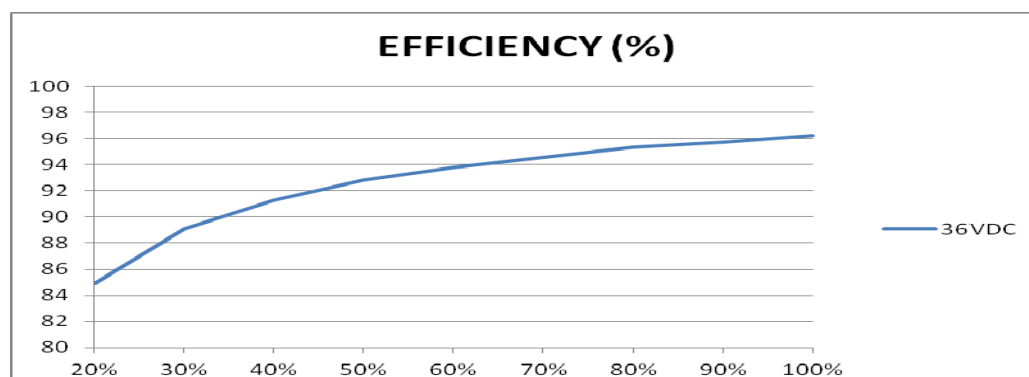
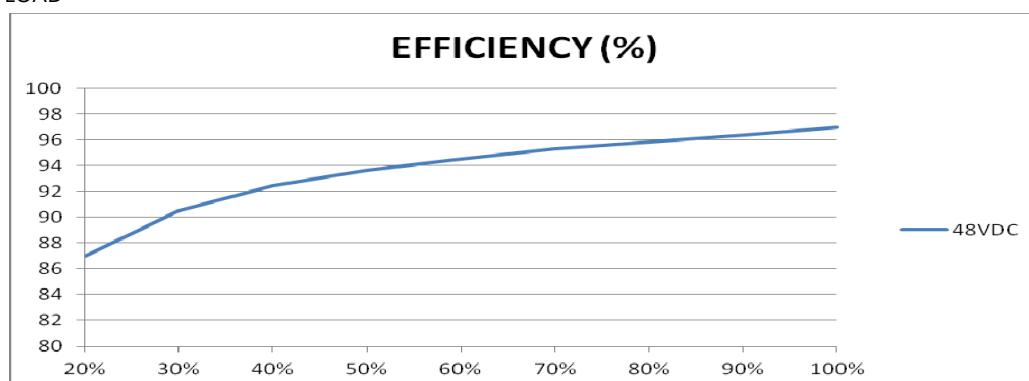
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																							
1	CURRENT ACCURACY	-5%~+5%	I/P: 48VDC O/P: LED max/ LED min Ta:25℃	-2.71%~ 0.142%/48VDC																																							
2	CURRENT RIPPLE	-5%~ +5%	I/P: 48VDC O/P: LED min~ LED max Ta:25℃	3.67%~ 1.73%/48VDC																																							
3	SUGRE CURRENT	< +10%	I/P: 48VDC O/P: LED max/ LED min Ta:25℃	4.29%~ 5.43%/48VDC																																							
4	VOLTAGE RANGE	6~52VDC	I/P: 10- 56VDC O/P:TEST Ta:25℃	6-52VDC																																							
5	DIMMING OPERATION	PWM Dimming Control H(5V) L(0V) 100~1KHz PWM Signal Output Current Max 0 100 75 50 25 10 100 75 50 25 10 Iout(%) Duty Cycle (%) Tol : ±5%(Typ.) Ⓢ Short circuit PWM PIN can realize dimming turn off. Ⓢ During PWM dimming operation, the output current will change to PWM style. I/P 48 VDC O/P DIMMING TEST <table><tr><td>PWM</td><td>0%</td><td>10%</td><td>20%</td><td>30%</td><td>40%</td><td>50%</td><td>60%</td><td>70%</td><td>80%</td><td>90%</td><td>100%</td><td>OPEN</td></tr><tr><td>Output Current (100Hz)</td><td>0</td><td>0.068</td><td>0.136</td><td>0.205</td><td>0.273</td><td>0.342</td><td>0.410</td><td>0.478</td><td>0.547</td><td>0.615</td><td>0.684</td><td>0.687</td></tr><tr><td>%</td><td>0</td><td>9.71</td><td>19.43</td><td>29.29</td><td>39.00</td><td>48.86</td><td>58.57</td><td>68.29</td><td>78.14</td><td>87.86</td><td>97.71</td><td>98.14</td></tr></table> TEST RESULT OK			PWM	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN	Output Current (100Hz)	0	0.068	0.136	0.205	0.273	0.342	0.410	0.478	0.547	0.615	0.684	0.687	%	0	9.71	19.43	29.29	39.00	48.86	58.57	68.29	78.14	87.86	97.71	98.14
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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-0.2VDC= 9.8 VDC HIGH-LINE+3VDC= 59VDC 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)	700mA @48VDC*FULL LOAD 5mA @48VDC*NO LOAD	I/P:48 VDC O/P:FULL LOAD/NO LOAD Ta:25°C	I =645mA/VDC(FULL LOAD) I =1.46mA/VDC(NO LOAD)
3	EFFICIENCY(TYP)	96%	I/P: 36/48VDC O/P:FULL LOAD Ta:25°C	96.96%/48 VDC 96.29%/36 VDC

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/24 VDC /56 VDC O/P:FULL LOAD	IP:10DC 1、 Power OFF: <1.66VDC Power ON: >1.99VDC IP:24DC 2、 Power OFF: <1.68VDC Power ON: >1.99 VDC IP:59DC 3、 Power OFF: <1.75VDC Power ON: >1.98VDC
2	QUIESCENT INPUT CURRENT IN SHUTDOWN MODE(max.)	2mA at PWM dimming OFF and 24VDC input	I/P: 24 VDC O/P:FULL LOAD	1.24mA

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 +3 VDC =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) 60.9V (2) 60.5V (3) 60.5V (4) 60.5V (5) 60.1V (6) 59.3V VDS: 9.8V (1) 11.60V (2) 10.09V (3) 10.73V (4) 10.65V (5) 9.290V (6) 10.09V

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-1050HW 1. ROOM AMBIENT BURN-IN : 2HRS I/P : 48VDC O/P : FULL LOAD Ta= 28.4℃ 2. HIGH AMBIENT BURN-IN : HRS I/P : 56VDC O/P : FULL LOAD Ta= 51.7 ℃ <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=28.4 ℃</th><th>HIGH AMBIENT Ta=51.7 ℃</th></tr><tr><td>1</td><td>U1</td><td>47.3℃</td><td>80.9℃</td></tr><tr><td>2</td><td>C1</td><td>42.4℃</td><td>69.9℃</td></tr><tr><td>3</td><td>D2</td><td>45.7℃</td><td>73.0℃</td></tr><tr><td>4</td><td>L1</td><td>46.1℃</td><td>74.2℃</td></tr><tr><td>5</td><td>TC</td><td>39.2℃</td><td>69.5℃</td></tr></table>			NO	Position	ROOM AMBIENT Ta=28.4 ℃	HIGH AMBIENT Ta=51.7 ℃	1	U1	47.3℃	80.9℃	2	C1	42.4℃	69.9℃	3	D2	45.7℃	73.0℃	4	L1	46.1℃	74.2℃	5	TC	39.2℃	69.5℃
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5	TC	39.2℃	69.5℃																									
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 10VDC / 56VDC O/P : FULL LOAD Ta= -45 ℃	TEST : OK																								
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 ℃/95 %R.H NO DAMAGE	I/P : 56VDC O/P : FULL LOAD Ta= 55℃ HUMIDITY= 95 %R.H	TEST : OK																								
4	TEMPERATURE COEFFICIENT	± 0.03%/℃(0~50℃)	I/P : 56VDC O/P : FULL LOAD	± 0.001 %/℃(0~50℃)																								

6	STORAGE TEMPERATURE TEST	-40~85°C	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	-40~50°C	1. Thermal shock Temperature : -45°C~ +55°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	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	SUPPOSE C1 IS THE MOST CRITICAL COMPONENT (1) I/P : 48VDC O/P : FULL LOAD Ta=25 °C LIFE TIME (2) I/P : 56VDC O/P : FULL LOAD Ta=50 °C LIFE TIME (3) I/P : 56VDC O/P : 75% LOAD Ta=50 °C LIFE TIME (4) I/P : 56VDC O/P : 50% LOAD Ta=50 °C LIFE TIME	(1) 729024HRS (2) 131582HRS (3) 70911HRS (4) 59044HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 1000K hrs min. MIL-HDBK-217F (25°C)	
11	Ongoing Reliability Test	I/P : 56VDC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 30,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQ/HUANGMK	WENF	LINKX