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

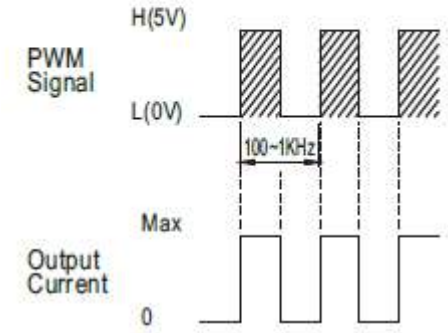
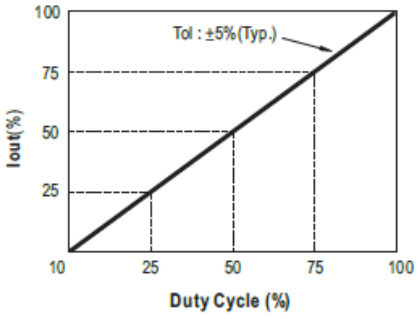
Safety Test
E.M.C. Test

■ 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℃	-2.50%~ 0.833%/48VDC
2	CURRENT RIPPLE	-5%~ +5%	I/P: 48VDC O/P: LED min~ LED max Ta:25℃	1.98%~ 5%/48VDC
3	SUGRE CURRENT	< ±10%	I/P: 48VDC O/P: LED max/ LED min Ta:25℃	7.08%~ 10%/48VDC
4	VOLTAGE RANGE	6~46VDC	I/P: 10- 56VDC O/P:TEST Ta:25℃	6~46VDC
5	DIMMING OPERATION	■ PWM Dimming Control  ◎ 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

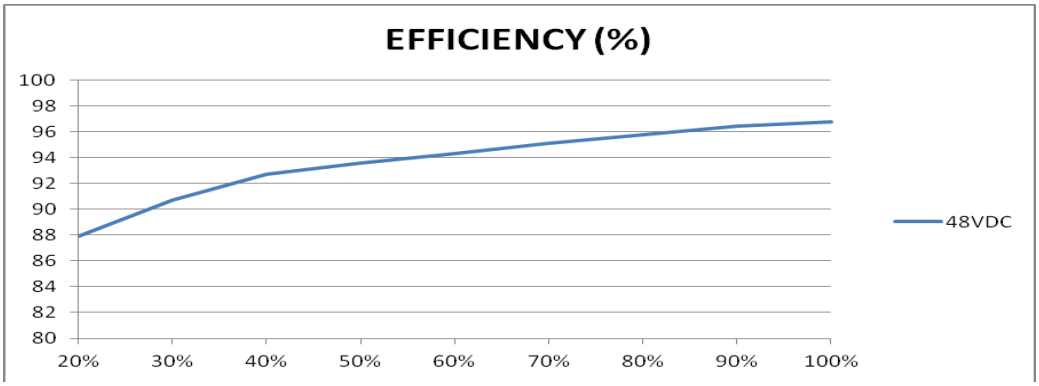
PWM	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	OPEN
Output Current（100Hz）	0	0.104	0.223	0.344	0.457	0.575	0.693	0.811	0.928	1.044	1.181	1.184
%	0	8.67	18.58	28.67	38.08	47.92	57.75	67.58	77.33	87.00	98.42	98.67

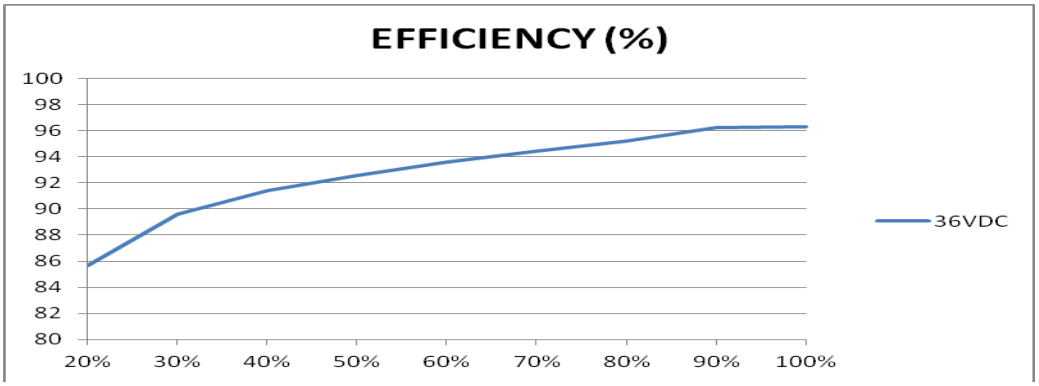
TEST RESULT：OK

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℃	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) OK (2) OK (3) OK
2	INPUT CURRENT(TYP)	1200mA @48VDC*FULL LOAD 5mA @48VDC*NO LOAD	I/P:48 VDC O/P:FULL LOAD/NO LOAD Ta:25℃	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℃	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℃	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℃	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℃	PASS
2	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR：8KV / Contact：4KV	I/P: 56VDC O/P:FULL LOAD Ta:25℃	CRITERIA A
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 0.5KV	I/P: 56VDC O/P:FULL LOAD Ta:25℃	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℃ 2. HIGH AMBIENT BURN-IN： HRS I/P： 56VDC O/P： FULL LOAD Ta= 45 ℃		
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 45 ℃/95 %R.H NO DAMAGE	I/P： 56VDC O/P：FULL LOAD Ta= 50℃ HUMIDITY= 95 %R.H	TEST：OK
4	TEMPERATURE COEFFICIENT	± 0.03%/℃(0~50℃)	I/P： 56VDC O/P：FULL LOAD	± 0.004 %/℃(0~50℃)

NO	Position	ROOM AMBIENT Ta=26.1 ℃	HIGH AMBIENT Ta=45 ℃
1	U1	54.1℃	110.9℃
2	C1	47.0℃	93.3℃
3	D2	48.3℃	96.5℃
4	L1	46.6℃	90.9℃
5	TC	40.4℃	89.3℃

6	STORAGE TEMPERATURE TEST	-40~85℃	1. Thermal shock Temperature： -45℃~ +90℃ 2. Temperature change rate ：25℃ / 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℃	1. Thermal shock Temperature： -45℃~ +50℃ 2. Temperature change rate ：25℃ / 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℃
9	CAPACITOR LIFE CYCLE	SUPPOSE C1 IS THE MOST CRITICAL COMPONENT (1) I/P： 48VDC O/P：FULL LOAD Ta=25 ℃ LIFE TIME (2) I/P： 56VDC O/P：FULL LOAD Ta=45 ℃ LIFE TIME (3) I/P： 56VDC O/P：75% LOAD Ta=45 ℃ LIFE TIME (4) I/P： 56VDC O/P：50% LOAD Ta=45 ℃ LIFE TIME	(1) 395666HRS (2) 27061HRS (3) 27087HRS (4) 31032HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 29984.3K hrs min. Telcordia SR-332 (Bellcore)； 2881.6K hrs min. MIL-HDBK-217F (25℃)	
11	Ongoing Reliability Test	I/P：56VDC O/P：FULL LOAD TA=45℃ Demonstration Mean Time Between Failure : 30,000 hours	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	WUWQ/HUANGMK	WENF	LINKX