



# Test Report: DLP-04R

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DAIL Bus Power Supply

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection 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	DC VOLTAGE RANGE	15.3-18.7V	I/P: 230VAC O/P: FULL/ MIN LOAD Ta: 25°C	16.1V-17.9V
2	OVER/UNDERSHOOT TEST	<±5%	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	<5%
3	RIPPLE & NOISE (Max)	50mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	20.4mVp-p
<p>high frequency :</p>		<p>low frequency :</p>		
4	SET UP TIME(Max)	230VAC/250ms 115VAC/250ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/144 ms 115VAC/166 ms
<p>INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH2: AC Input Voltage</p>		<p>INPUT=115VAC/60HZ @ FULLLOAD CH1: Output Voltage CH2: AC Input Voltage</p>		



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5	RISE TIME (Max)	230VAC/ 50ms 115VAC/ 50ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/26.6 ms 115VAC/27.4 ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage 		INPUT=115VAC/60HZ @ FULLLOAD CH1: Output Voltage 	
6	HOLD UP TIME(Typ)	230VAC/ 70ms 115VAC/ 16ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/130 ms 115VAC/32.8 ms
	INPUT=230VAC/50HZ @ FULL LOAD CH1: Output Voltage CH2: AC Input Voltage 		INPUT=115VAC/60HZ @ FULLLOAD CH1: Output Voltage CH2: AC Input Voltage 	

## INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC-264VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	87 V-264V
			I/P: (1)LOW-LINE-3V=87 V HIGH-LINE+15%=300 V O/P: FULL/NO LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2)230VAC ON: 0.5 Sec OFF: 0.5Sec 20MIN (POWER ON/OFF NO DAMAGE)	TEST: OK
2	INPUT FREQUENCYRANGE	47HZ ~63 HZ NO DAMAGE	I/P: 90 VAC ~264 VAC O/P: FULL-NOLOAD Ta: 25°C	TEST: OK



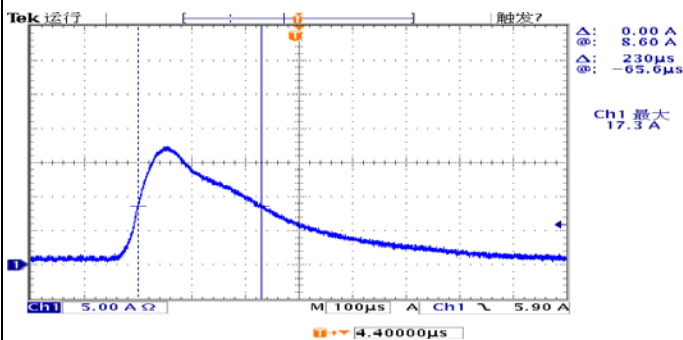
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3	AC CURRENT	0.4A/115VAC 0.2A/230VAC	I/P: 115 VAC I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I=0.089A/ 115VAC I = 0.058A/ 230VAC
4	LEAKAGE CURRENT	< 0.5mA / 240VAC	I/P: 240 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.0026mA N-FG: 0.0025mA
5	NO LOAD CONSUMPTION	< 0.5W	I/P: 115VAC I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.490W/115V 0.452W/230V
6	INRUSH CURRENT(Typ)	230V/20A COLD START	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	I=17.3A/ 230VAC

INPUT=230VAC/50HZ @ FULL LOAD

CH2: Input current CH1: AC Input Voltage



## PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER VOLTAGE PROTECTION	23.6 V-27.0 V	I/P: 90VAC I/P: 230VAC I/P: 264VAC O/P: NO LOAD Ta: 25°C	24.6 V/ 90VAC 24.6 V/ 230VAC 24.6 V/ 264VAC Shut off o/p voltage, clamping by zener diode
2	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 90VAC I/P: 264VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Constant current limiting, recovers automatically after fault condition is removed

## DALI FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	RESULT
1	INSTALLATION TEST		PASS
2	LED DISPLAY	<p><b>Green LED: Normal operation</b></p> <p><b>Yellow LED: Bus Communication</b></p> <p><b>Red LED: Short Circuit</b></p>	PASS

## COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Power Transistor	U1 Rated 1.95 A / 800 V	I/P: High-Line +3V =267V O/P: (1) FULL LOAD Turn on (2) Output Short (3) FULL LOAD continue Ta: 25°C	(1) 562 V (2) 568 V (3) 564 V
2	O/P Diode (MOSFET)	D100 Rated 3 A / 200V	I/P: High-Line +3V =267V O/P: (1) FULL LOAD Turn on (2) Output Short (3) FULL LOAD continue Ta: 25°C	(1) 127 V (2) 127 V (3) 131 V
3	Input Capacitor	C5 Rated 15 μF / 450 V	I/P: High-Line +3V =267 V O/P: (1) FULL LOAD input on/off (2) NO LOAD input on /Off (3) FULL LOAD /NO LOAD Change Ta: 25°C	(1) 448 V (2) 430 V (3) 414 V
4	Control IC	U1 Rated 27V (MAX.)	I/P: High-Line +3V =267 V O/P: ((1) FULL LOAD (2) Output Short (3) Low Line No Load Vo(min) Ta: 25°C	(1) 21.9 V (2) 21.7 V (3) 21.7 V
5	VCC Power Transistor	D2 Rated 1 A / 400V	I/P: High-Line +3V =267V O/P: (1) FULL LOAD Turn on (2) Output Short (3) FULL LOAD continue Ta: 25°C	(1) 263 V (2) 262 V (3) 273 V



SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3 KVAC/min	I/P-O/P: 3.6 KVAC/min Ta: 25°C	I/P-O/P: 0.926 mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100MΩ	I/P-O/P: 500 VDC Ta: 25°C/70%RH	I/P-O/P: >9999 MΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
2	CONDUCTION	EN55015	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
3	RADIATION	EN55015	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR: 8KV Contact: 4KV	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS CRITERIA A
6	SURGE	EN61000-4-5 LIGHT INDUSTRY L-N: 1KV L,N-PE: 2KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS CRITERIA A
7	Test by certified Lab & Test Report Prepare			



RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																																																												
1	TEMPERATURE RISE TEST	MODEL: DLP-04R 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=25.7°C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta=49.6°C																																																																														
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=25.7 °C</th> <th>HIGH AMBIENT Ta=49.6 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>RTH1</td><td>39.0°C</td><td>60.2°C</td></tr> <tr><td>2</td><td>LF1</td><td>47.0°C</td><td>68.5°C</td></tr> <tr><td>3</td><td>BD1</td><td>54.4°C</td><td>75.4°C</td></tr> <tr><td>4</td><td>C1</td><td>41.3°C</td><td>63.0°C</td></tr> <tr><td>5</td><td>ZNR1</td><td>40.4°C</td><td>62.3°C</td></tr> <tr><td>6</td><td>C5</td><td>54.9°C</td><td>76.0°C</td></tr> <tr><td>7</td><td>U1</td><td>77.4°C</td><td>96.6°C</td></tr> <tr><td>8</td><td>D1</td><td>64.1°C</td><td>85.2°C</td></tr> <tr><td>9</td><td>C9</td><td>59.2°C</td><td>80.1°C</td></tr> <tr><td>10</td><td>T1</td><td>62.7°C</td><td>84.0°C</td></tr> <tr><td>11</td><td>D100</td><td>62.3°C</td><td>84.8°C</td></tr> <tr><td>12</td><td>C101</td><td>55.3°C</td><td>78.4°C</td></tr> <tr><td>13</td><td>C102</td><td>54.0°C</td><td>77.0°C</td></tr> <tr><td>14</td><td>U100</td><td>54.2°C</td><td>76.5°C</td></tr> <tr><td>15</td><td>Q100</td><td>51.3°C</td><td>73.4°C</td></tr> <tr><td>16</td><td>D101</td><td>60.7°C</td><td>83.0°C</td></tr> <tr><td>17</td><td>ZD51</td><td>53.4°C</td><td>75.7°C</td></tr> <tr><td>18</td><td>TC</td><td>49.4°C</td><td>71.1°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=25.7 °C	HIGH AMBIENT Ta=49.6 °C	1	RTH1	39.0°C	60.2°C	2	LF1	47.0°C	68.5°C	3	BD1	54.4°C	75.4°C	4	C1	41.3°C	63.0°C	5	ZNR1	40.4°C	62.3°C	6	C5	54.9°C	76.0°C	7	U1	77.4°C	96.6°C	8	D1	64.1°C	85.2°C	9	C9	59.2°C	80.1°C	10	T1	62.7°C	84.0°C	11	D100	62.3°C	84.8°C	12	C101	55.3°C	78.4°C	13	C102	54.0°C	77.0°C	14	U100	54.2°C	76.5°C	15	Q100	51.3°C	73.4°C	16	D101	60.7°C	83.0°C	17	ZD51	53.4°C	75.7°C	18	TC	49.4°C	71.1°C
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 264VAC/90VAC O/P: FULL LOAD Ta= -25°C	TEST: OK																																																																												
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50°C NO DAMAGE	I/P: 264VAC O/P: FULL LOAD Ta=50°C HUMIDITY= 95%R.H	TEST: OK																																																																												
4	STORAGE TEMPERATURE TEST	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: 100 CYCLE 5. Input/Output condition: STATIC		TEST: OK																																																																												
5	THERMAL SHOCK TEST	1. Thermal shock Temperature: -25°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: 230VAC/FULL LOAD AC ON/OFF TEST AC on 3 sec/AC off 1 sec TEST		TEST: OK																																																																												



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# DLP-04R series

6	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency: 10-500Hz (3) Sweep Time: 10min/sweep cycle (4) Acceleration: 2G (5) Test Time: 180min in each axes (X.Y.Z) (6) Ta: 25°C	TEST: OK
7	CAPACITOR LIFE CYCLE	DLP-04R: SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P: 230VAC O/P: FULL LOAD Ta=25 °C LIFE TIME (2) I/P: 230VAC O/P: FULL LOAD Ta=50 °C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta=50 °C LIFE TIME (4) I/P: 230VAC O/P: 50% LOAD Ta=50 °C LIFE TIME	(1) 388483 HRS (2) 72619 HRS (3) 108099 HRS (4) 155299 HRS
8	MTBF	Conducted by Parts Stress Analysis Prediction 604.7K hrs min. MIL-HDBK-217F (25°C)	
9	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 30,000 hours @ Ta 50°C	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	SHENJW/ZHUOKB	SKY	LIUWY