



Test Report: ICL-16R

16A DIN Rail AC Inrush Current Limiter

■ 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

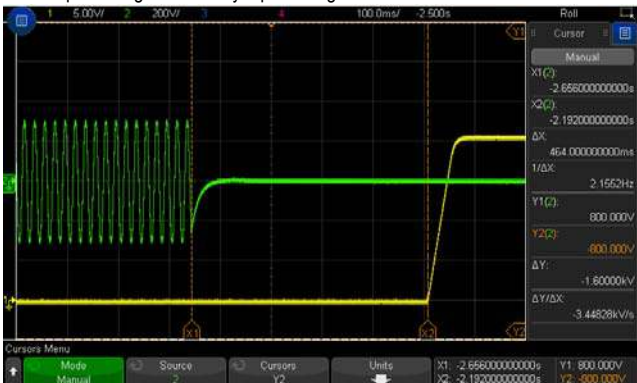
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

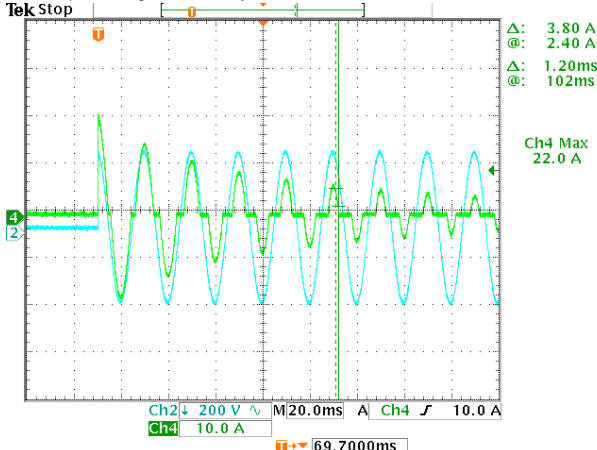
DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INTERNAL RELAY LIMITING TIME (TON POWER ON)	230VAC/300±50ms	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/272ms
INPUT=230VAC/50HZ @ FULL LOAD CH1 : INput Voltage CH2 :relay 				
2	INTERNAL RELAY RELEASE TIME	230VAC/500±50ms	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 464ms
INPUT=230VAC/50HZ @ FULL LOAD CH2 :input Voltage CH1 :relay Input voltage 				

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~264VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	160V~264V
			I/P: LOW-LINE-3V=177 V HIGH-LINE+15%=300 V O/P: FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST:OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 90 VAC ~264 VAC O/P: FULL~MIN LOAD Ta: 25°C	TEST:OK

3	INRUSH CURRENT (Typ.)	230V/ 23A	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I =22A/ 230VAC
INPUT=230VAC/50HZ @ FULL LOAD CH2 :input Voltage CH4 : relay Current  Δ: 3.80 A @: 2.40 A Δ: 1.20ms @: 102ms Ch4 Max 22.0 A Ch2 200 V ~ M 20.0ms A Ch4 10.0 A 69.7000ms				
4	NO LOAD CONSUMPTION	<1 W	I/P : 264VAC O/P : NO LOAD Ta : 25°C	0.77W

COMPONENT STRESS TEST

1	Input Capacitor Voltage	C5 Rated: 220 μ / 35V	I/P:High-Line +3V =267V O/P: (1)Full Load input on/off (2) Min load input on /Off Ta:25°C	(1)26.1V (2)26.1V
2	Input Capacitor Voltage	C6 Rated: 100 μ / 50 V	I/P:High-Line +3V =267V O/P: (1)Full Load input on/off (2) Min load input on /Off Ta:25°C	(1)28.1V (2)28.1V
3	RELAY	RY1 Rated: 36V	I/P:High-Line +3V =267V O/P: (1)Full Load input on/off (2) Min load input on /Off Ta:25°C	(1)26.3V (2)26.5V

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INTERNAL PROTECTION	Protection type : Thermal fuse protects overload and fire	I/P: 230VAC O/P:FULL LOAD	TEST:OK

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 ☐ CLASS A	I/P:230VAC/50HZ O/P:FULL LOAD Ta:25°C	☒ PASS ☐ FAIL
2	CONDUCTION	☒ EN55032 ☐ EN55011 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab

3	RADIATION	☒ EN55032 ☐ EN55011 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab
4	E.S.D	EN61000-4-2 Level 3 AIR: 8KV / Contact: 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	☒ CRITERIA A ☐ CRITERIA B
5	E.F.T	EN61000-4-4 Level 3	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	☒ CRITERIA A ☐ CRITERIA B
6	SURGE	IEC61000-4-5 Level 4 L-N : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	☒ CRITERIA A ☐ CRITERIA B
7	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 : ICL-16R 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 22.6 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta= 71.0 °C <table><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=22.6 °C</th><th>HIGH AMBIENT Ta=71.0 °C</th></tr><tr><td>1</td><td>ZNR1</td><td>54.6°C</td><td>100.5°C</td></tr><tr><td>2</td><td>C1</td><td>54.5°C</td><td>101.7°C</td></tr><tr><td>3</td><td>RY1</td><td>66.1°C</td><td>112.5°C</td></tr><tr><td>4</td><td>R8</td><td>57.9°C</td><td>97.0°C</td></tr><tr><td>5</td><td>FS1</td><td>58.6°C</td><td>104.0°C</td></tr><tr><td>6</td><td>C5</td><td>57.2°C</td><td>98.0°C</td></tr><tr><td>7</td><td>BD1</td><td>61.4°C</td><td>106.7°C</td></tr><tr><td>8</td><td>TB1</td><td>58.0°C</td><td>102.6°C</td></tr><tr><td>9</td><td>PCB(N)</td><td>63.6°C</td><td>110.5°C</td></tr><tr><td>10</td><td>PCB(L)</td><td>64.9°C</td><td>111.4°C</td></tr></table>			NO	Position	ROOM AMBIENT Ta=22.6 °C	HIGH AMBIENT Ta=71.0 °C	1	ZNR1	54.6°C	100.5°C	2	C1	54.5°C	101.7°C	3	RY1	66.1°C	112.5°C	4	R8	57.9°C	97.0°C	5	FS1	58.6°C	104.0°C	6	C5	57.2°C	98.0°C	7	BD1	61.4°C	106.7°C	8	TB1	58.0°C	102.6°C	9	PCB(N)	63.6°C	110.5°C	10	PCB(L)	64.9°C	111.4°C
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -35 °C	TEST : OK																																												
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 70 °C /95 %R.H NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 70 °C HUMIDITY= 95 %R.H	TEST : OK																																												
4	TEMPERATURE COEFFICIENT	± 0.03 %/°C (0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.0008%/°C (0~50°C)																																												

5	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 : 10 CYCLE 5. Input/Output condition : STATIC	TEST : OK												
6	THERMAL SHOCK TEST	1. Thermal shock Temperature : -35°C~ +75°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:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle:230V/ FULL LOAD Burn In Test	TEST : OK												
7	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 3G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C 2 Din Rail <table><tr><td></td><td>Displacement</td><td>Acceleration</td></tr><tr><td>2 (+3/-0) Hz up to 15Hz</td><td>± 2.5mm</td><td>-----</td></tr><tr><td>15Hz up to 50Hz</td><td>-----</td><td>2.3g</td></tr><tr><td>Sweep rate</td><td colspan="2">Max 1 Octave/minute</td></tr></table>		Displacement	Acceleration	2 (+3/-0) Hz up to 15Hz	± 2.5mm	-----	15Hz up to 50Hz	-----	2.3g	Sweep rate	Max 1 Octave/minute		TEST : OK
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2 (+3/-0) Hz up to 15Hz	± 2.5mm	-----													
15Hz up to 50Hz	-----	2.3g													
Sweep rate	Max 1 Octave/minute														
8	CAPACITOR LIFE CYCLE	SUPPOSE C5 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= 70 °C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 70 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 70 °C LIFE TIME	(1) 186108HRS (2) 13454HRS (3) 33128HRS (4) 53446HRS												
9	MTBF	Conducted by Parts Stress Analysis Prediction 2433.76K hrs min. MIL-HDBK-217F (25°C)													

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	LIUTT		WANGDZ

2018.4.30 GP-A50-F010