Test Report: ICL-16R

16A DIN Rail AC Inrush Current Limter

■ DESIGN VERIFY TEST

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

■ SAFETY & E.M.C. TEST

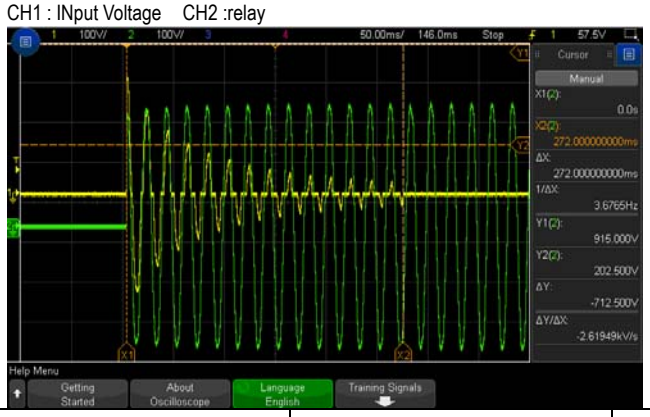
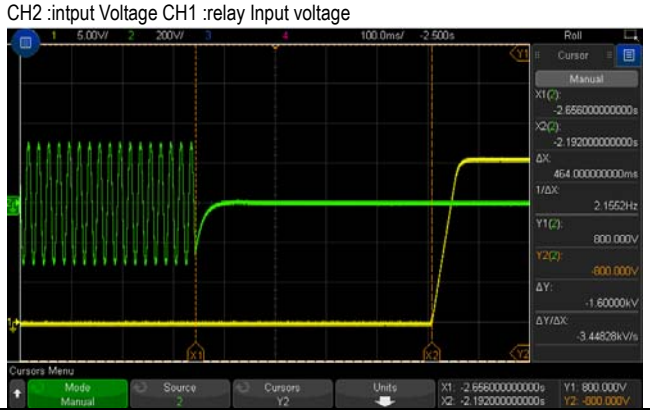
Safety Test
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

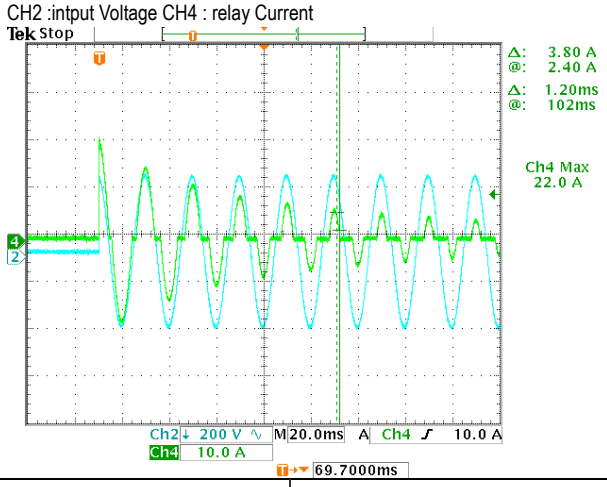
■ DESIGN VERIFY TEST

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℃	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℃	230VAC/ 464ms
	INPUT=230VAC/50HZ @ FULL LOAD CH2 :intput 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℃	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℃	TEST:OK

3	INRUSH CURRENT (Typ.)	230V/ 23A	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	I =22A/ 230VAC
	INPUT=230VAC/50HZ @ FULL LOAD CH2 :intput Voltage CH4 : relay Current 			
4	NO LOAD CONSUMPTION	<1 W	I/P：264VAC O/P：NO LOAD Ta：25℃	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℃	(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℃	(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℃	(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℃	☑PASS □FAIL
2	CONDUCTION	☑EN55032 □EN55011 CLASS B	I/P： 230 VAC (50HZ) O/P：FULL/50% LOAD Ta：25℃	PASS Test by certified Lab

3	RADIATION	☑EN55032 □EN55011 CLASS B	I/P： 230 VAC (50HZ) O/P：FULL LOAD Ta：25℃	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℃	☑CRITERIA A □CRITERIA B
5	E.F.T	EN61000-4-4 Level 3	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	☑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℃	☑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 ℃ 2. HIGH AMBIENT BURN-IN：2 HRS I/P： 230VAC O/P： FULL LOAD Ta= 71.0 ℃		
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 264VAC/100VAC O/P： 100 % LOAD Ta= -35 ℃	TEST：OK
3	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 70 ℃ / 95 %R.H NO DAMAGE	I/P： 272 VAC O/P：FULL LOAD Ta= 70 ℃ HUMIDITY= 95 %R.H	TEST：OK
4	TEMPERATURE COEFFICIENT	± 0.03 %/℃ (0~50℃)	I/P： 230 VAC O/P：FULL LOAD	± 0.0008%/℃ (0~50℃)

NO	Position	ROOM AMBIENT Ta=22.6 ℃	HIGH AMBIENT Ta=71.0 ℃
1	ZNR1	54.6℃	100.5℃
2	C1	54.5℃	101.7℃
3	RY1	66.1℃	112.5℃
4	R8	57.9℃	97.0℃
5	FS1	58.6℃	104.0℃
6	C5	57.2℃	98.0℃
7	BD1	61.4℃	106.7℃
8	TB1	58.0℃	102.6℃
9	PCB(N)	63.6℃	110.5℃
10	PCB(L)	64.9℃	111.4℃

<table>
<tr><td>5</td><td>STORAGE TEMPERATURE TEST</td><td>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</td><td>TEST：OK</td></tr>
<tr><td>6</td><td>THERMAL SHOCK TEST</td><td>1. Thermal shock Temperature： -35℃~ +75℃
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:230V/ FULL LOAD AC ON 3sec/AC OFF 1sec TEST
1cycle:230V/ FULL LOAD Burn In Test</td><td>TEST：OK</td></tr>
<tr><td>7</td><td>VIBRATION TEST</td><td>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℃
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></td><td>TEST：OK</td></tr>
<tr><td>8</td><td>CAPACITOR
LIFE CYCLE</td><td>SUPPOSE C5 IS THE MOST CRITICAL COMPONENT
(1) I/P： 230VAC O/P：FULL LOAD Ta= 25 ℃ LIFE TIME
(2) I/P： 230VAC O/P：FULL LOAD Ta= 70 ℃ LIFE TIME
(3) I/P： 230VAC O/P：75% LOAD Ta= 70 ℃ LIFE TIME
(4) I/P： 230VAC O/P：50% LOAD Ta= 70 ℃ LIFE TIME</td><td>(1) 186108HRS
(2) 13454HRS
(3) 33128HRS
(4) 53446HRS</td></tr>
<tr><td>9</td><td>MTBF</td><td colspan="2">Conducted by Parts Stress Analysis Prediction
2433.76K hrs min. MIL-HDBK-217F (25℃)</td></tr>
</table>

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	LIUTT		WANGDZ

2018.4.30 GP-A50-F010