

Test Report: SF150- S12VR

150W Single Output Switching 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

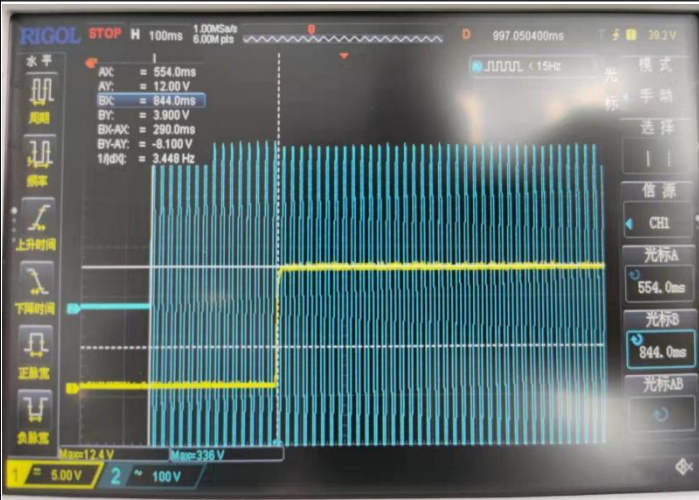
■ RELIABILITY TEST

ENVIRONMENT TEST

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 11-13V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta: 25°C	11.13V ~ 12.8V/230VAC 11.13V ~ 12.8V/115VAC
2	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -1%~ 1 %	I/P: 100VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1: -0.17%
3	LINE REGULATION (Max)	V1:-1%~ 1 %	I/P: 100VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: 0.58%
4	LOAD REGULATION(Max)	V1: -1.0%~1.0%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.58%
5	OVER/UNDERSHOOT TEST	< ± 5 %	I/P: 230VAC O/P:FULL LOAD Ta:25°C	< ± 1.342 %
6	RIPPLE & NOISE(Max)	V1: 120mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 60 mVp-p
7	SET UP TIME(Max)	230VAC/ 1000 ms 115VAC/ 1000 ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 290ms 115VAC/ 706ms
		INPUT=230VAC/50HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage	INPUT=115VAC/60HZ @ FULL LOAD CH1 : Output Voltage CH2 : AC Input Voltage	



8	RISE TIME (Max)	230VAC/ 30 ms 115VAC/ 30 ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 7.6 ms 115VAC/ 9 ms
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INPUT=230VAC/50HZ @ FULL LOAD
CH1 : Output Voltage

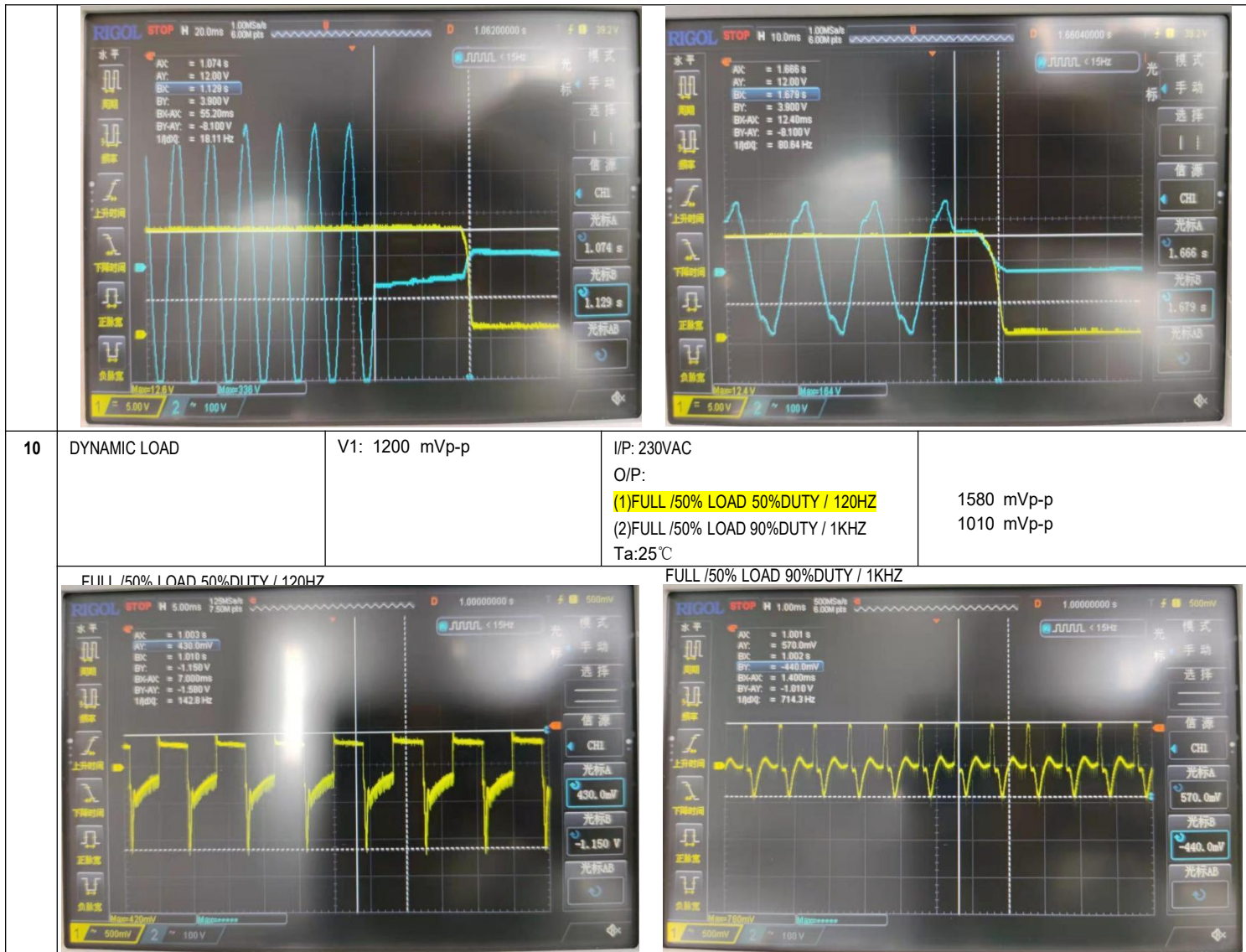
INPUT=115VAC/60HZ @ FULL LOAD
CH1 : Output Voltage



9	HOLD UP TIME (Typ.)	230VAC/ 50 ms 115VAC/ 16 ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 55.2 ms 115VAC/ 12.4 ms
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INPUT=230VAC/50HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage

INPUT=115VAC/60HZ @ FULL LOAD
CH1 : Output Voltage CH2 : AC Input Voltage



INPUT FUNCTION TEST

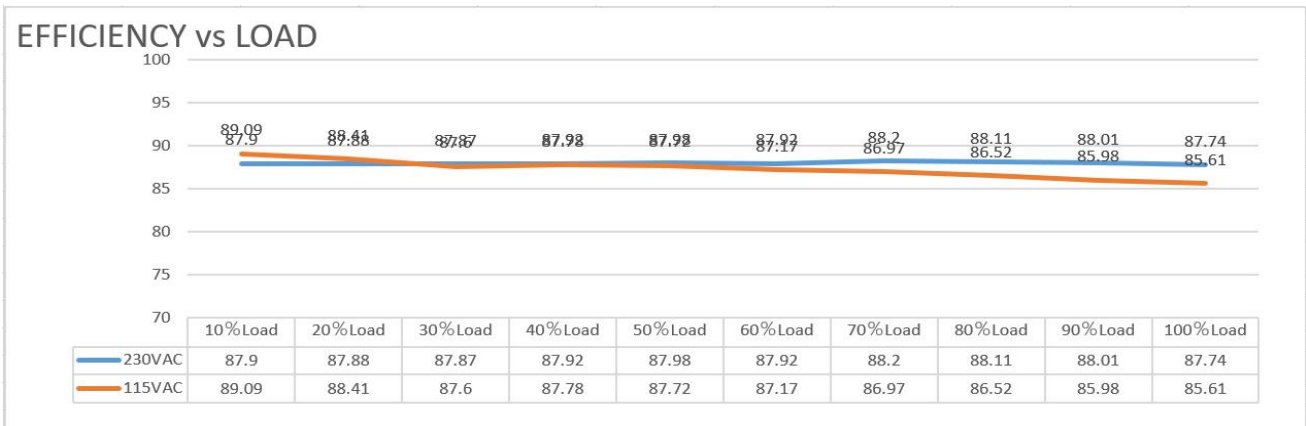
NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~264VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	90VAC~264VAC
			I/P: LOW-LINE-3V=82V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD (PLEASE CHECK DERATING CURVE) ON: 30 Sec OFF: 30 Sec 10MIN (POWER ON/OFF NO DAMAGE)	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P:100 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK
3	INPUT CURRENT (Typ.)	230V/ 1.25 A 115V/ 2.3A	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD	I= 1.274 A/ 230VAC I= 2.069 A/ 115VAC

Model: SF150-S12VR

Ta: 25°C

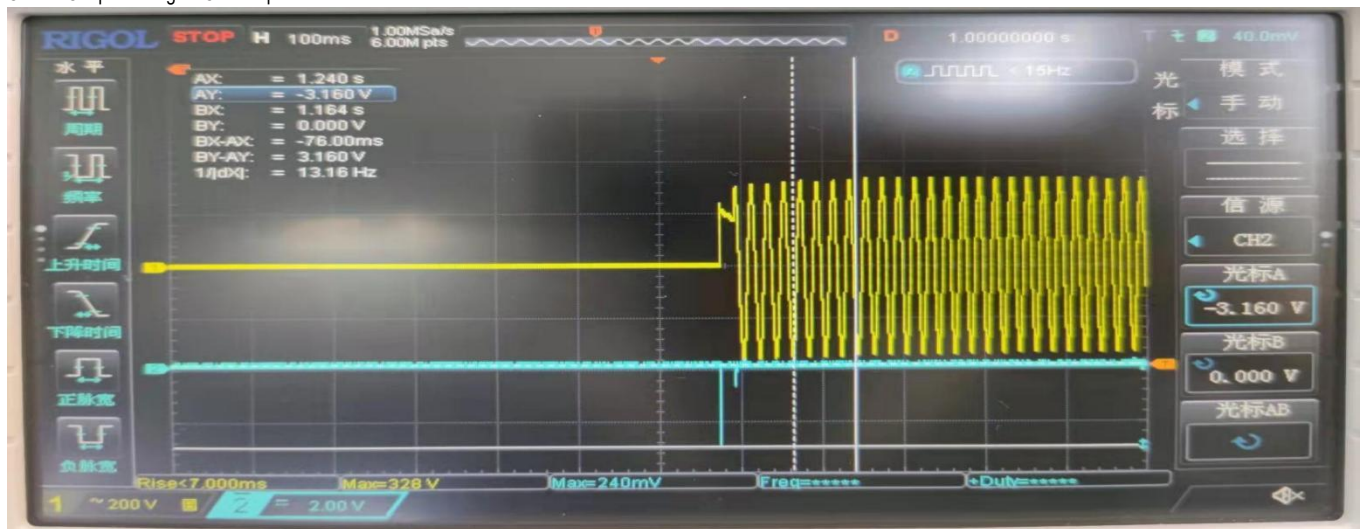
4	LEAKAGE CURRENT	< 0.75 VAC	mA / 240	I/P: 240 VAC O/P: Min LOAD Ta: 25°C	L-FG: 0.95 mA N-FG: 0.95 mA
5	NO LOAD CONSUMPTION	< 0.3W		I/P: 115VAC I/P: 230VAC O/P: NO LOAD Ta: 25°C	< 0.24 W < 0.3 W
6	EFFICIENCY(Typ.)	89 %		I/P:230 VAC O/P:FULL LOAD Ta:25°C	88.65%

EFFICIENCY vs LOAD



8	INRUSH CURRENT(Typ.)	230V/65 A COLD START		I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I= 230VAC/63.2A
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INPUT=230VAC/50HZ @ FULL LOAD
CH2 : AC Input Voltage CH4 : Input current



9	Capacitive load			I/P: 264VAC I/P: 230VAC I/P: 100VAC O/P: FULL LOAD Ta:25°C	3000UF
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PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	103%--130%	I/P: 264VAC I/P: 230VAC I/P: 100VAC O/P: TESTING Ta: 25°C	103%/ 264VAC 106%/ 230VAC 106%/100VAC Hiccup Mode PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	14-19V	I/P: 264VAC I/P: 230VAC I/P: 90VAC O/P: MIN LOAD Ta: 25°C	18.6V/ 264VAC 18.6V/ 230VAC 18.2V/ 90VAC
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup Mode

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q21 Rated : 15A/ 650V	I/P: High-Line +3V =267V AC ON/OFF VDS: O/P: (1) Full Load (2) Output Short (3) Full load continue Ta: 25°C	VDS: (1) 576V (2) (3) 608V
2	Diode Peak Voltage	D30 Rated : 20A/ 100V	I/P: High-Line +3V =267 V AC ON/OFF O/P: (1) Full Load (2) Output Short (3) Full load continue Ta: 25°C	Q100: VDS: (1) 54.4V (2) V (3) 56V
3	Input Capacitor Voltage	C5 Rated: : 47uF / 400V 105 °C	I/P: High-Line +3V =267 V O/P: (1) Full Load input on/off (2) Min load input on /Off (3) Full Load /Min load Change Ta: 25°C	(1) 384 V (2) 380V (3) 372 V
4	Control IC Voltage Test	PWM IC U1 Rated : 28V 9.5V(MIN.)	I/P: High-Line +3V =267 V AC ON/OFF O/P: (1) FULL LOAD (2) Output Short (3) O.L.P (4) O.V.P. (5) NO LOAD VR Min. LOW LINE Ta: 25°C	(1) 12V (2) 12 V (3) 12 V (4) 12 V (5) 12 V

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC/min I/P-FG :2KVAC/min O/P-FG:0.5KVAC/min	I/P-O/P: 3KVAC/min I/P-FG: 2 KVAC/min O/P-FG:0.5KVAC/min Ta:25°C	I/P-O/P: 0.58mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P:>1999MΩ NO DAMAGE
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	mΩ

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	--
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P: FULL/50% LOAD Ta: 25°C	Test by certified Lab: CLASS B
		TEST MODE: LINE		
		TEST MODE: NEUTRAL		
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ)O/P: FULL LOAD Ta: 25°C	Test by certified Lab

		TEST MODE: HORIZONTAL	Test by certified Lab	
		TEST MODE: VERTICAL	Test by certified Lab	
4	E.S.D	EN61000-4-2 INDUSTRY AIR: 8KV / Contact: 4KV	I/P: 230 VAC/50HZO/P: FULL LOAD Ta: 25°C	CRITERIA A
5	E.F.T	EN61000-4-4 INDUSTRY INPUT: 4KV	I/P: 230 VAC/50HZO/P: FULL LOAD Ta: 25°C	CRITERIA A
6	SURGE	IEC61000-4-5 INDUSTRY L-N : 2KV L,N-PE: 4KV	I/P: 230 VAC/50HZO/P: FULL LOAD Ta: 25°C	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															
	测试项目	位置	1	2	3	4	5	6	7	8	9	10	11	12	13	14
		测试条件	C1	NF	BD	MOV	Q21	CY	U22	D30	C31	D24	R213	变压器线包	变压器磁芯	变压器接地端
	环境 50℃ 100%LO AD	90VAC 100% LOAD	84.3	105.3	84.54	72.4	97	79.3	83.56	99.68	92.56	92.56	99.58	80.31	86.54	73.54
		115VAC 100% LOAD	64.22	88.5	64.15	53.92	87.55	61.73	64.25	82.46	73.04	71.34	86.84	60.52	68.36	54.43
230VAC 100% LOAD		57.99	62.81	55.43	49.98	80.97	59.41	62.18	78	70.29	66.87	73.68	59.73	69.48	53.81	
264VAC 100% LOAD		56.45	57.67	53.74	48.93	80.28	58.95	61.76	77.85	70	66.15	71.91	59.42	70.1	53.58	
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 115% LOAD Ta: 25°C	TEST: OK												
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 264VAC/100VAC O/P: 100 % LOAD Ta= -30°C	TEST: OK												
		I/P: 264VAC O/P: 100 %LOAD Ta= -30°C		I/P: 100VAC O/P: 100 %LOAD Ta= -30°C												

4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40°C NO DAMAGE	I/P: 272 VAC O/P: FULL LOAD Ta=40°C HUMIDITY= 95 %R.H	TEST: OK
5	TEMPERATURE COEFFICIENT	+ 0.03%/°C(0~50°C)	I/P: 230 VAC O/P: FULL LOAD	+0.008%/°C(0~50°C)
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature: -40°C~ +85°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle: 5 CYCLE 5. Input/Output condition: STATIC		OK
7	THERMAL SHOCK TEST	1. Thermal shock Temperature: -30°C~ +70°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: 230VAC/Full Load AC ON/OFF TEST turn on 58sec; turn off 2sec		OK
8	ON OFF TEST	In put: 230VAC,FULL LOAD /3S AND 0VAC FULL LOAD/3S,ALL:10K times。 Required, no damage		OK

9	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency: 10~500Hz (3) Sweep Time: 12min/sweep cycle (4) Acceleration: 5G (5) Test Time: 60min in each axis (X.Y.Z) (6) Ta: 25°C	TEST: OK
10	CAPACITOR LIFE CYCLE	SUPPOSE C32 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=40°C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta=40°C LIFE TIME (4) I/P: 230VAC O/P: 50% LOAD Ta=40°C LIFE TIME	(1) HRS (2) HRS (3) HRS (4) HRS
11	MTBF	MIL-HDBK-217F TOTAL FAILURE RATE: 681.2 KHRS	
12	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50°C	

TEST RESULT	TESTER	APPROVAL

2022/3/23