



Test Report: GST220A36-R7B

220W AC-DC High Reliability Industrial Adaptor

■ 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

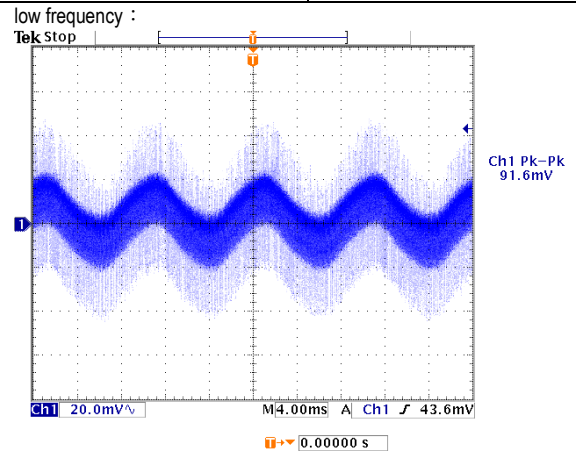
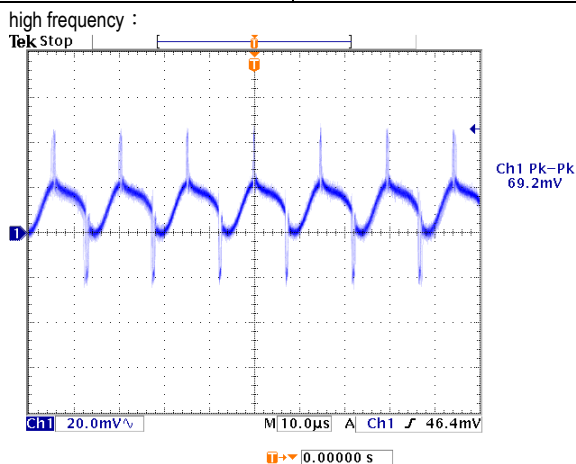
■ RELIABILITY TEST

ENVIRONMENT TEST

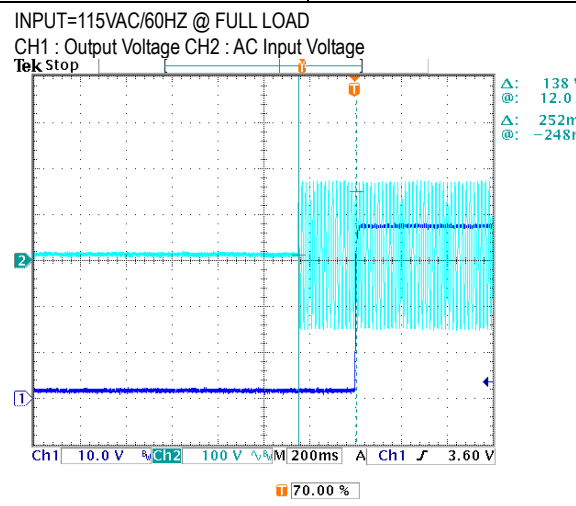
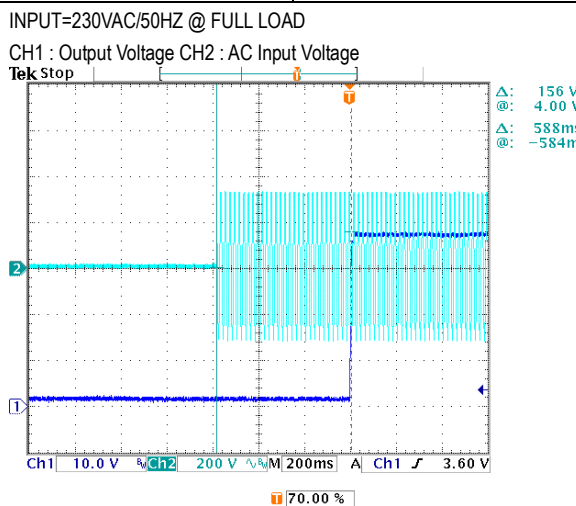
DESIGN VERIFY TEST

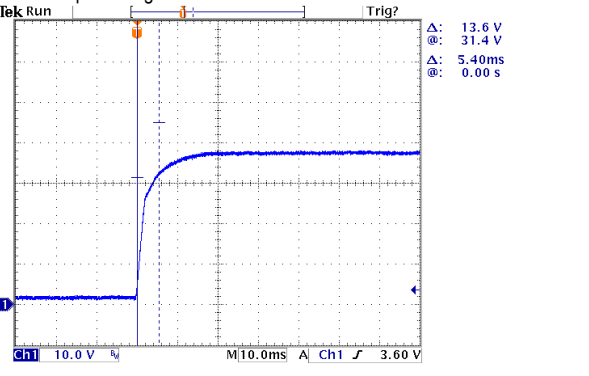
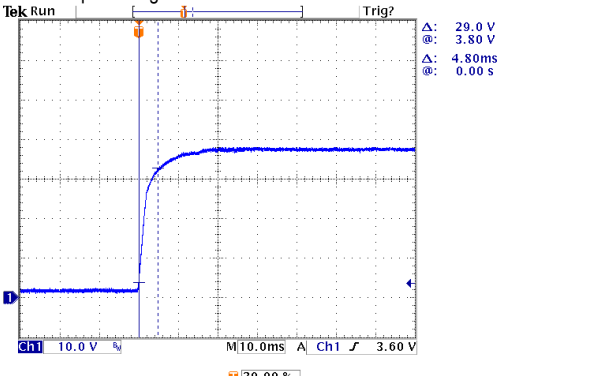
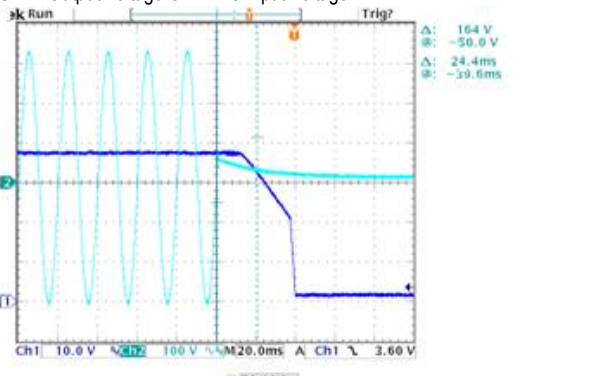
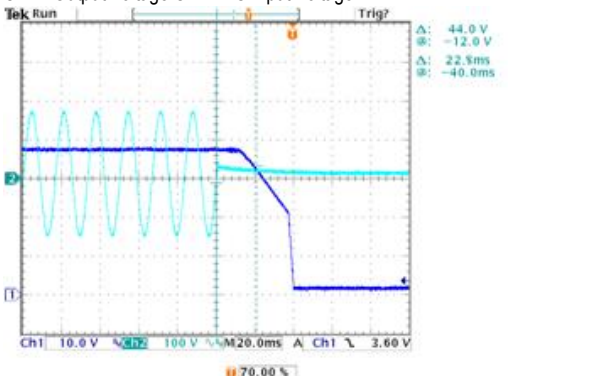
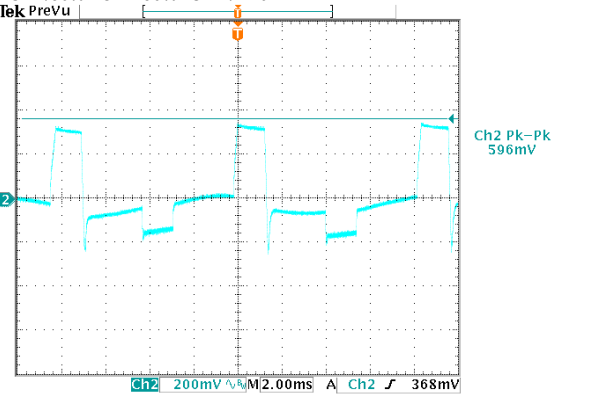
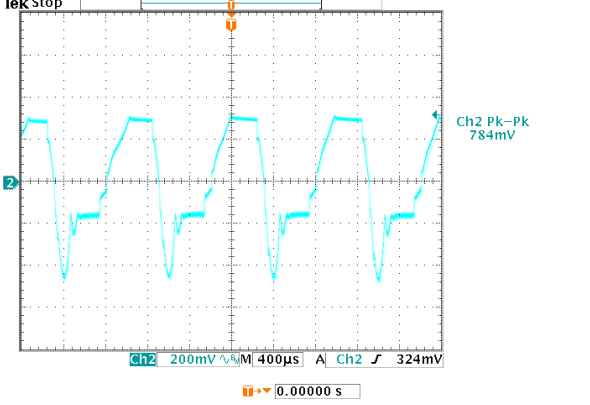
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE(Max) TOLERANCE	V1: -2%~ 2%	I/P: 100VAC /264VAC O/P:FULL/ MIN. LOAD Ta:25°C	V1: -1.002%~ 0.902%
2	LINE REGULATION (Max)	V1: -1%~ 1%	I/P: 100VAC~ 264VAC O/P:FULL LOAD Ta:25°C	V1: -0.01%~ 0.05%
3	LOAD REGULATION(Max)	V1: -2%~ 2%	I/P: 230VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -1.002%~ 0.902%
4	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230VAC O/P:FULL LOAD Ta:25°C	0.557%
5	RIPPLE & NOISE(Max)	V1: 200mVp-p	I/P:230VAC O/P:FULL LOAD Ta:25°C	V1: 91.6mVp-p



6	SET UP TIME(Max)	230VAC/2000ms 115VAC/2000ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 588ms 115VAC/ 252ms
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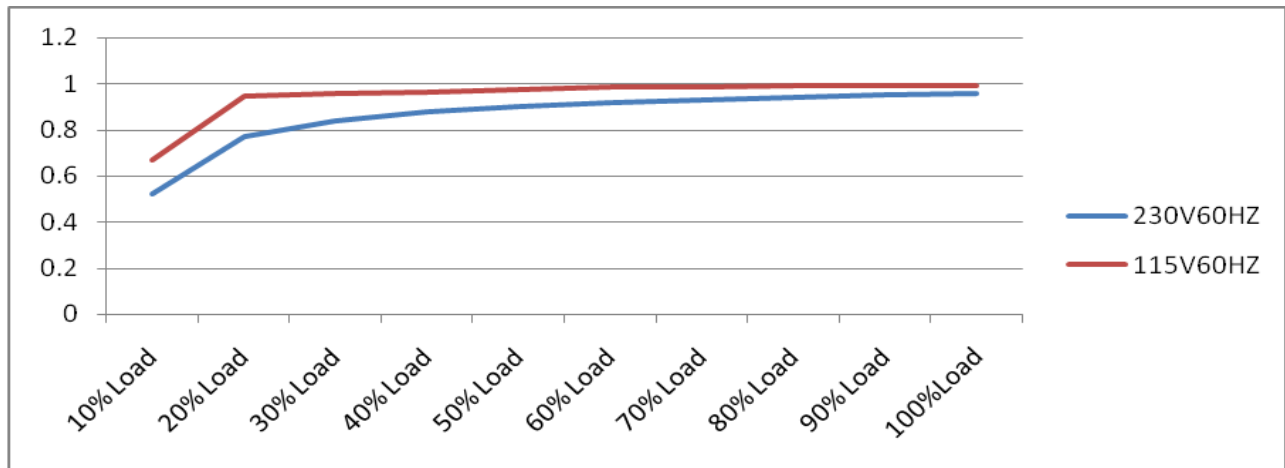


7	RISE TIME (Max) 230VAC/50ms 115VAC/50ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 5.4ms 115VAC/ 4.8ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage</p> 		<p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1 : Output Voltage</p> 	
8	HOLD UP TIME (Typ.) 230VAC/20ms 115VAC/20ms	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 24.4ms 115VAC/ 22.8ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage CH2 : AC Input Voltage</p> 		<p>INPUT=115VAC/60HZ @ FULL LOAD</p> <p>CH1 : Output Voltage CH2 : AC Input Voltage</p> 	
9	DYNAMIC LOAD V1: 1200mVp-p	I/P: 230VAC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C	596mVp-p 784mVp-p
<p>FULL /50% LOAD 50%DUTY / 120HZ</p> 		<p>FULL /50% LOAD 50%DUTY / 1KHZ</p> 	

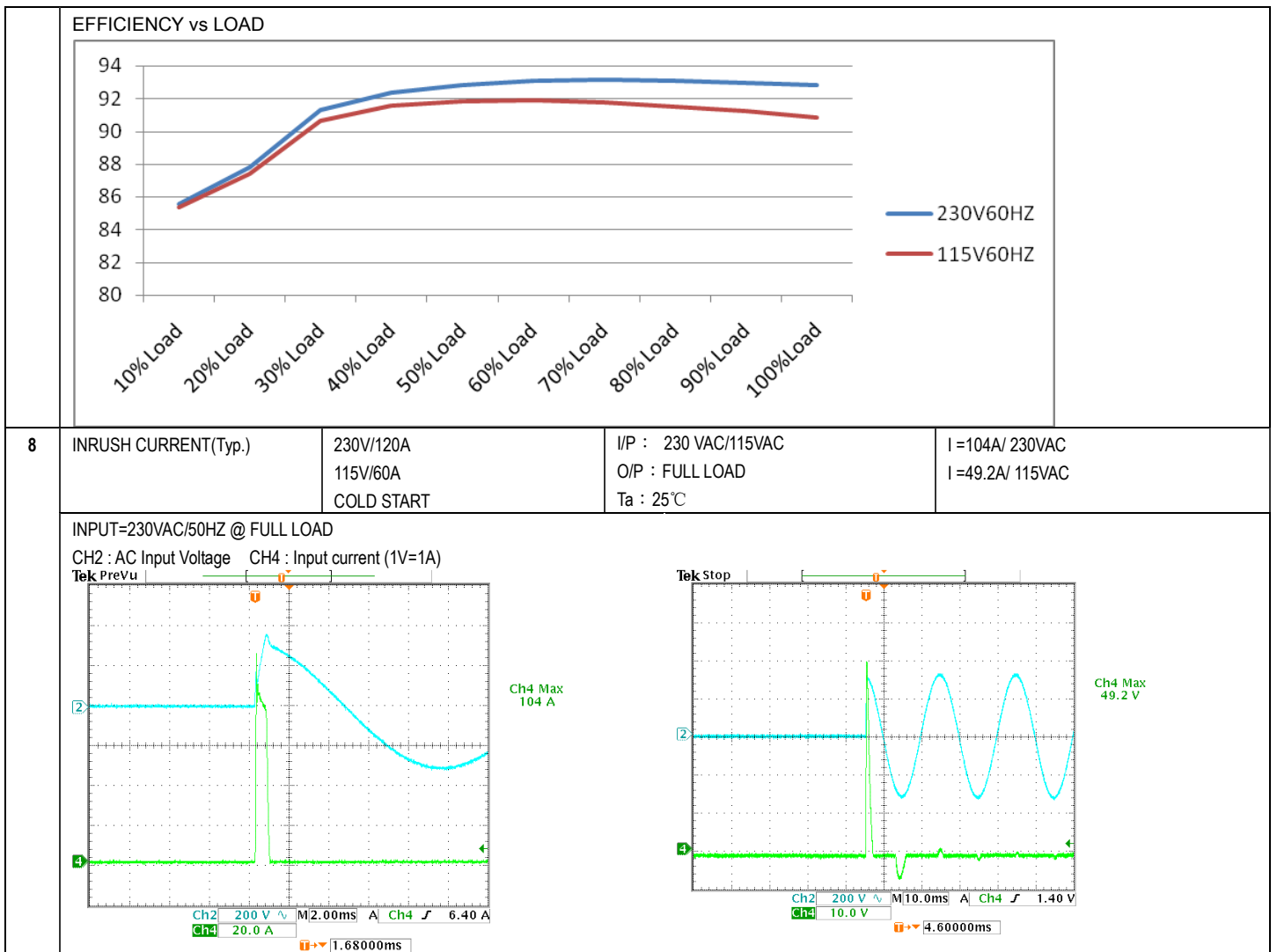
INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	95VAC~264VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	75V~264V
			I/P: LOW-LINE-3V=82 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:100 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK
3	INPUT CURRENT (Typ.)	230V/ 2A 115V/ 4A	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I=1.055A/ 230VAC I=2.105A/ 115VAC
4	LEAKAGE CURRENT	<0.75 mA / 240 VAC	I/P : 240 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.329 mA N-FG : 0.329 mA
5	NO LOAD CONSUMPTION	< 0.15W	I/P : 115VAC I/P : 230VAC O/P : NO LOAD Ta : 25°C	0.124 W 0.132 W
6	POWER FACTOR (Typ.)	0.91/ 230VAC 0.98/115VAC	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	PF=0.953/230VAC PF=0.994/115VAC

P.F vs LOAD



7	EFFICIENCY(Typ.)	92%	I/P:230 VAC O/P:FULL LOAD Ta:25°C	93.85%
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PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~ 135%	I/P: 264VAC I/P: 230VAC I/P: 100VAC O/P: TESTING Ta:25°C	106.7%/ 264VAC 106.5%/ 230VAC 106.7%/115VAC PROTECTION TYPE : Hiccup mode,recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	37.8V~48.6V	I/P: 264VAC I/P: 230VAC I/P: 90VAC O/P: MIN LOAD Ta:25°C	44.2V/ 264VAC 44.2V/ 230VAC 44.2V/ 90VAC PROTECTION TYPE : Shot down o/p voltage,re-power on to recover
3	OVER TEMPERATURE PROTECTION	Protection type :	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD	O.T.P. Active Protection type : Shut down o/p voltage,recovers automatically after temperature goes down
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC I/P: 90VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE PROTECTION TYPE : Hiccup mode,recovers automatically after fault condition is removed

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q5 Rated : 18A/ 600V	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) 494V (2) 514V (3) 498V
2	P.F.C Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : 15.8 A/ 600 V	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)552V (2) 560V (3) 566V
3	P.F.C DIODE	D2 Rated : 15 A/ 600 V	I/P:High-Line +3V =267 V AC ON/OFF O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (4)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz Ta:25°C	(1) 446V (2) 448V (3) 446V (4) 448V
4	Diode Peak Voltage	Q101 Rated : 30 A/ 100V	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	Q101: VDS: (1) 84V (2) 9.8V (3) 84V
5	Input Capacitor Voltage	C5 Rated: : 220 μ /450 V 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) 436V (2)433V (3)436V
6	Control IC Voltage Test	PWM IC U1 Rated : 32V -0.4 V(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. Ta:25°C	(1) 24.9V (2) 20.1V (3) 20.3V (4) 28.6V

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC/min I/P-FG:2KVAXIC/min	I/P-O/P: 3.6 KVAC/min I/P-FG:2.4KVAXIC/min Ta:25°C	I/P-O/P:6.67mA I/P-FG:3.48mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100M Ω	I/P-O/P: 500 VDC Ta:25°C	I/P-O/P: 9999M Ω NO DAMAGE

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
2	CONDUCTION	EN55022 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab
3	RADIATION	EN55022 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 LIGHT INDUSTRY AIR : 8KV / Contact : 4KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N : 1KV L,N-PE : 2KV	I/P : 230 VAC/50HZ O/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	MODEL : GST220A36-R7B 1. ROOM AMBIENT BURN-IN : 1HRS I/P : 230VAC O/P : FULL LOAD Ta=22 °C 2. HIGH AMBIENT BURN-IN : 1HRS I/P : 230VAC O/P : FULL LOAD Ta= 52.4 °C																																																																						
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 27 °C</th> <th>HIGH AMBIENT Ta= 52.4 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF2</td><td>53.2°C</td><td>78.9°C</td></tr> <tr><td>2</td><td>L2</td><td>56.5°C</td><td>82.5°C</td></tr> <tr><td>3</td><td>C11</td><td>56.9°C</td><td>82.7°C</td></tr> <tr><td>4</td><td>BD1</td><td>56.6°C</td><td>79.8°C</td></tr> <tr><td>5</td><td>D2</td><td>59.6°C</td><td>85.4°C</td></tr> <tr><td>6</td><td>Q2</td><td>58.4°C</td><td>85.0°C</td></tr> <tr><td>7</td><td>L1</td><td>60.2°C</td><td>86.6°C</td></tr> <tr><td>8</td><td>C5</td><td>57.8°C</td><td>84.1°C</td></tr> <tr><td>9</td><td>C81</td><td>58.4°C</td><td>80.5°C</td></tr> <tr><td>10</td><td>C13</td><td>61.4°C</td><td>84.6°C</td></tr> <tr><td>11</td><td>T1</td><td>60.7°C</td><td>88.4°C</td></tr> <tr><td>12</td><td>U4</td><td>58.7°C</td><td>82.4°C</td></tr> <tr><td>13</td><td>Q102</td><td>59.7°C</td><td>89.9°C</td></tr> <tr><td>14</td><td>C109</td><td>55.7°C</td><td>80.1°C</td></tr> <tr><td>15</td><td>U1</td><td>63.0°C</td><td>90.7°C</td></tr> <tr><td>16</td><td>Q5</td><td>59.4°C</td><td>90.4°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 27 °C	HIGH AMBIENT Ta= 52.4 °C	1	LF2	53.2°C	78.9°C	2	L2	56.5°C	82.5°C	3	C11	56.9°C	82.7°C	4	BD1	56.6°C	79.8°C	5	D2	59.6°C	85.4°C	6	Q2	58.4°C	85.0°C	7	L1	60.2°C	86.6°C	8	C5	57.8°C	84.1°C	9	C81	58.4°C	80.5°C	10	C13	61.4°C	84.6°C	11	T1	60.7°C	88.4°C	12	U4	58.7°C	82.4°C	13	Q102	59.7°C	89.9°C	14	C109	55.7°C	80.1°C	15	U1	63.0°C	90.7°C	16	Q5	59.4°C	90.4°C
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 130 % 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= -35 °C	TEST : OK																																																																				
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 50.1 °C HUMIDITY= 95 %R.H	TEST : OK																																																																				
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C (0-50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.003 %/°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	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C	TEST : OK
9	CAPACITOR LIFE CYCLE	SUPPOSE C 109 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) 162961HRS (2) 23556HRS (3) 52689HRS (4) 86715HRS
10	MTBF	MIL-HDBK-217F TOTAL FAILURE RATE : 209.4 KHRS	
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50°C	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	FRANK	GESG	WANGDZ

12.10.30 A50-F031