



Test Report: RSD-500D-12

500W Enclosed Type Reliable Railway DC-DC Converter

■ 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

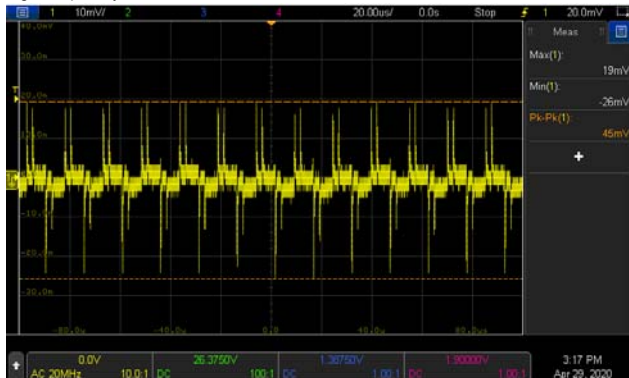
ENVIRONMENT TEST

DESIGN VERIFY TEST

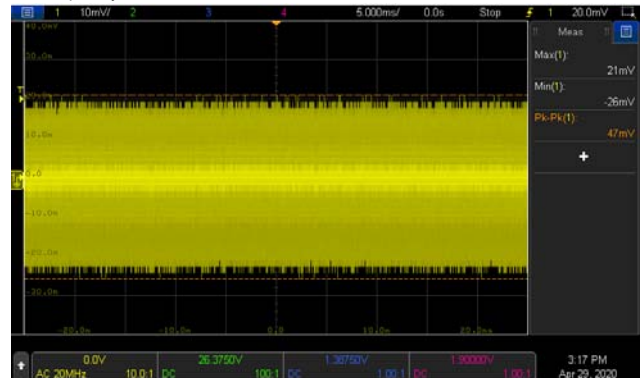
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 12V~ 14V	I/P: 110VDC O/P : MIN LOAD Ta : 25°C	10.64V~14.43V
2	OUTPUT VOLTAGE TOLERANCE (Max)	V1:-1%~+1 %	I/P: 67.2 VDC / 154 VDC O/P:FULL/ MIN. LOAD Ta:25°C	V1: -0.20%~ 0.24 %
3	LINE REGULATION (Max)	V1:-0.5%~+0.5 %	I/P: 67.2 VDC / 154 VDC O/P:FULL LOAD Ta:25°C	V1: -0.02%~ 0.01 %
4	LOAD REGULATION (Max)	V1:-1%~ +1 %	I/P: 110VDC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.20%~ 0.24 %
5	OVER/UNDERSHOOT TEST	< ±5%	I/P: 110VDC O/P:FULL LOAD Ta:25°C	TEST:1.01 %
6	RIPPLE & NOISE (Max)	V1:100mVp-p	I/P: 110VDC O/P:FULL LOAD Ta:25°C	V1: 47mVp-p

high frequency :



low frequency :







7	SET UP TIME (Max)	110VDC/ 500ms	I/P: 110VDC O/P:FULL LOAD Ta:25°C	51.56 ms
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INPUT= 110VDC @ FULL LOAD

CH1 : Output Voltage CH2 : DC Input Voltage



8	RISE TIME (Max)	110VDC / 60ms	I/P: 110VDC O/P: FULL LOAD Ta: 25°C	6.2 ms
<p>INPUT=110 VDC @ FULL LOAD CH1 : Output Voltage</p> 				
9	HOLD UP TIME (TYP)	110VDC / 10 ms	I/P: 110VDC O/P: FULL LOAD Ta: 25°C	16.4 ms
<p>INPUT= 110VDC @ FULL LOAD CH1 : Output Voltage CH2 : DC Input Voltage</p> 				
10	TRANSIENT RECOVERY TIME	V1:1200mVp-p	I/P: 110VDC O/P: 40% LOAD CHANGE 50%DUTY/120HZ	434mVp-p
11	DYNAMIC LOAD	V1:1200mVp-p	I/P: 110VDC O/P: (1) FULL / 50% LOAD 50%DUTY / 120HZ (2) FULL / 50% LOAD 50%DUTY / 1KHZ Ta: 25°C	527mVp-p 478mVp-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	67.2VDC~154VDC 57.6 VDC~ 67.2 VDC/1s	I/P:TESTING O/P:FULL LOAD Ta:25°C	(1) 60.2V~ 154V (2) TEST:OK																																												
			I/P: LOW-LINE-0.2= 67 V HIGH-LINE+3V= 157 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 CURRENT(TYP)	110VDC/ 5A	I/P: 110VDC O/P:FULL LOAD Ta:25°C	I = 4.08A																																												
3	EFFICIENCY(TYP)	93%	I/P: 110VDC O/P:FULL LOAD Ta:25°C	93.42 %																																												
<p>EFFICIENCY vs LOAD</p> <table border="1"> <caption>Efficiency vs Load Data</caption> <thead> <tr> <th>LOAD (%)</th> <th>67.2VDC (%)</th> <th>110VDC (%)</th> <th>154VDC (%)</th> </tr> </thead> <tbody> <tr><td>10%</td><td>85</td><td>84</td><td>81</td></tr> <tr><td>20%</td><td>91</td><td>90</td><td>88</td></tr> <tr><td>30%</td><td>93</td><td>92</td><td>90</td></tr> <tr><td>40%</td><td>94</td><td>93</td><td>91</td></tr> <tr><td>50%</td><td>94</td><td>93</td><td>92</td></tr> <tr><td>60%</td><td>94</td><td>93</td><td>93</td></tr> <tr><td>70%</td><td>94</td><td>93</td><td>93</td></tr> <tr><td>80%</td><td>94</td><td>93</td><td>93</td></tr> <tr><td>90%</td><td>93</td><td>93</td><td>93</td></tr> <tr><td>100%</td><td>93</td><td>93</td><td>93</td></tr> </tbody> </table>					LOAD (%)	67.2VDC (%)	110VDC (%)	154VDC (%)	10%	85	84	81	20%	91	90	88	30%	93	92	90	40%	94	93	91	50%	94	93	92	60%	94	93	93	70%	94	93	93	80%	94	93	93	90%	93	93	93	100%	93	93	93
LOAD (%)	67.2VDC (%)	110VDC (%)	154VDC (%)																																													
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70%	94	93	93																																													
80%	94	93	93																																													
90%	93	93	93																																													
100%	93	93	93																																													
4	INRUSH CURRENT(TYP)	30A COLD START	I/P: 110VDC O/P:FULL LOAD Ta:25°C	I=19.5A																																												
<p>INPUT= VDC @ FULL LOAD CH2 : DC Input Voltage CH4 : Input current</p>																																																
5	INTERRUPTION OF VOLTAGE SUPPLY	D-type comply with S2 level (10ms)@ full load	I/P: 110VDC SHORT O/P: TESTING Ta:25°C	15.9 ms/ Full Load																																												

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~ 135%RATED OUTPUT POWER	I/P: 67.2 VDC I/P: 110 VDC I/P: 154 VDC O/P: TESTING Ta: 25°C	121%/ 67.2 VDC 121%/ 110 VDC 121%/ 154 VDC PROTECTION TYPE : Constant current limiting 105%~135% rated output power with auto-recovery .
2	OVER VOLTAGE PROTECTION	CH: 14.4 V~ 17.5 V	I/P: 67.2 VDC I/P: 110 VDC I/P: 154 VDC O/P: MIN LOAD Ta: 25°C	15.75V/ 67.2 VDC 15.75V/ 110 VDC 15.75V/ 154 VDC PROTECTION TYPE : Shut down O/P voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	SPEC: NO DAMAGE	I/P: 154/67.2 VDC O/P: FULL LOAD	O.T.P. Active PROTECTION TYPE : Shut down O/P voltage, re-power on to recover
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 154/67.2 VDC O/P: FULL LOAD Ta: 25°C	NO DAMAGE PROTECTION TYPE : Constant current limiting with auto-recovery recovers automatically after fault condition is removed
5	INPUT REVERSE	POWER OK	I/P: 154/67.2 VDC O/P: FULL LOAD Ta: 25°C	NO DAMAGE
6	INPUT UNDER VOLTAGE PROTECTION	110 VIN (D-TYPE) : POWER ON >=67.2V POWER OFF <=65V	I/P: TESTING O/P: FULL LOAD Ta: 25°C	TEST : POWER ON >= 60.2 V POWER OFF <= 56.99V

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q 10/Q12/ Q21/Q23 Rated : 26A/ 400 V	DC ON/OFF I/P: High-Line +3V =157V VDS: O/P: (1) Full Load (2) Output Short (3) Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4) Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5) Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6) Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7) 0%→400% Load. Ta: 25°C	Q10 Q12 VDS: VDS: (1) 219V (1) 217V (2) 231V (2) 233V (3) 253V (3) 255V (4) 247V (4) 247V (5) 247V (5) 247V (6) 247V (6) 255V (7) 370V (7) 360V Q21 Q23 VDS: VDS: (1) 220V (1) 220V (2) 228V (2) 230V (3) 250V (3) 250V (4) 248V (4) 348V (5) 248V (5) 248V (6) 256V (6) 252V (7) 375V (7) 331V
2	Clamp MOSFET (D to S) or (C to E) Peak Voltage	Q8/Q19 Rated : 26A/ 400 V	DC ON/OFF	Q8 Q19 VDS: VDS:



			<p>I/P:High-Line +3V =157V VDS: O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. Ta:25°C</p>	<p>(1) 198V (2) 214V (3) 246V (4) 232V (5) 220V (6) 232V (7) 283V</p>	<p>(1) 198V (2) 214V (3) 240V (4) 226V (5) 220V (6) 230V (7) 384V</p>
3	Diode Peak Voltage	<p>Q100/ Q200 Rated : 100 A/ 120 V Q103/ Q105 Rated : 100 A/ 120 V</p>	<p>DC ON/OFF I/P:High-Line +3V =157 V VOmax: O/P: (1)Full Load (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (5)Dynamic Load Full Load/ Min. Load 90%Duty/5KHz (6)Dynamic Load 100% Load/ Min. Load 50%Duty/120Hz (7)0%→400% Load. (8).NO LOAD VO: O/P: (1)Full Load Ta:25°C</p>	<p>Q100: VOmax: VDS: (1) 55.1V (2) 58.3V (3) 82.0V (4) 73.9V (5) 73.9V (6) 90.0V (7) 86.0V (8) 59.1V VO: (1) 50.5V Q103: VOmax: VDS: (1) 82.5V (2) 94.5V (3) 94.5V (4) 92.9V (5) 92.9V (6) 92.9V (7) 103.4V (8) 101.8V VO: (1) 80.9V</p>	<p>Q200: VOmax: VDS: (1) 50.3V (2) 58.9V (3) 84.0V (4) 72.8V (5) 70.3V (6) 90.4V (7) 71.1V (8) 56.7V VO: (1) 45.2V Q105: VOmax: VDS: (1) 104.9V (2) 99.3V (3) 104.9V (4) 103.3V (5) 104.9V (6) 104.1V (7) 102.5V (8) 104.1V VO: (1) 104.9V</p>
4	Input Capacitor Voltage	<p>C5/C35 Rated: : 270 μ / 160 V</p>	<p>I/P:High-Line +3V =157V O/P: (1)Full Load input on/off (2) Min load input on /Off (3)Full Load /Min load Change (4)Full load continue Ta:25°C</p>	<p>C5 (1) 156V (2) 154V (3) 152V (4) 150V</p>	<p>C35 (1) 156V (2) 154V (3) 152V (4) 150V</p>
5	Control IC Voltage Test	<p>PWM IC U4 Rated 7.5V~ 15 V O/P U100 /U101/U102/U103 Rated -0.3V~ 27 V O/P U201 Rated 0V~ 32 V</p>	<p>DC ON/OFF I/P:High-Line +3V =157 V O/P(1)FULL LOAD (2) Output Short (3)O.L.P (4)O.V.P. (5)NO LOAD VRmin(LOW LINE) Ta:25°C</p>	<p>U4 (1) 13.93V (2) 14.02V (3) 14.02V (4) 14.1V (5) 12.41V U100 (1) 11.11V (2) 11.36V</p>	<p>U201 (1) 11.76V (2) 12.24V (3) 11.6V (4) 15.1V (5) 10.72V U101 (1) 10.15V (2) 10.15V</p>

				(3) 11.11V (4) 10.87V (5) 10.79V U102 (1) 10.87V (2) 10.87V (3) 10.95V (4) 10.95V (5) 10.79V	(3) 10.23V (4) 10.15V (5) 10.07V U103 (1) 10.23V (2) 10.31V (3) 10.31V (4) 10.23V (5) 10.07V
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SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	EN 60950-1 I/P-O/P:4KVDC/min I/P-FG:2.5 KVDC/min O/P-FG:2.5KVDC/min	I/P-O/P: 4.4KVDC/min I/P-FG: 3 KVDC/min O/P-FG:3KVDC/min Ta:25°C	I/P-O/P: 0.3uA I/P-FG: 0.5uA O/P-FG: 0uA 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: 600 VDC I/P-FG: 600 VDC O/P-FG: 600 VDC Ta:25°C	I/P-O/P: 9999Ω I/P-FG: 9999GΩ O/P-FG: 9999GΩ NO DAMAGE
3	GROUNDING CONTINUITY	EN 60950-1 FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	2mΩ

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RADIATION	EN55032 CLASS B	I/P: 110VDC O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab
2	CONDUCTION	EN55032 CLASS A	I/P:110VDC O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab
3	E.S.D	EN61000-4-2 <input type="checkbox"/> MEDICAL AIR: 15KV / Contact: 8KV <input type="checkbox"/> LIGHT INDUSTRY AIR: 8KV / Contact: 4KV <input checked="" type="checkbox"/> INDUSTRY AIR: 8KV / Contact: 6KV	I/P: 110VDC O/P:FULL LOAD Ta:25°C	<input checked="" type="checkbox"/> CRITERIA A <input type="checkbox"/> CRITERIA B
4	E.F.T	EN61000-4-4 <input type="checkbox"/> LIGHT INDUSTRY INPUT: 0.5KV <input type="checkbox"/> MEDICAL <input checked="" type="checkbox"/> INDUSTRY INPUT: 2KV	I/P:110VDC O/P:FULL LOAD Ta:25°C	<input checked="" type="checkbox"/> CRITERIA A <input type="checkbox"/> CRITERIA B
5	SURGE	IEC61000-4-5 <input checked="" type="checkbox"/> INDUSTRY L-N :1KV L,N-PE:2KV	I/P: 110VDC O/P:FULL LOAD Ta:25°C	<input checked="" type="checkbox"/> CRITERIA A <input type="checkbox"/> CRITERIA B
6	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 : RSD-500D-12 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 110 VDC O/P : FULL LOAD Ta= 25 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 110 VDC O/P : FULL LOAD Ta= 55 °C																																																																																																																																																																										
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 25 °C</th> <th>HIGH AMBIENT Ta= 55 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>55.9°C</td><td>86.1°C</td></tr> <tr><td>2</td><td>LF2</td><td>58.6°C</td><td>83.3°C</td></tr> <tr><td>3</td><td>C17</td><td>57.2°C</td><td>84.3°C</td></tr> <tr><td>4</td><td>Q1</td><td>56.9°C</td><td>84.7°C</td></tr> <tr><td>5</td><td>C5</td><td>58.8°C</td><td>85.9°C</td></tr> <tr><td>6</td><td>T3</td><td>60.8°C</td><td>88.3°C</td></tr> <tr><td>7</td><td>T5</td><td>64.5°C</td><td>90.9°C</td></tr> <tr><td>8</td><td>U4</td><td>65.8°C</td><td>92.7°C</td></tr> <tr><td>9</td><td>Q8</td><td>61.7°C</td><td>88.4°C</td></tr> <tr><td>10</td><td>ZNR1</td><td>50.6°C</td><td>78.3°C</td></tr> <tr><td>11</td><td>D2</td><td>58.2°C</td><td>84.3°C</td></tr> <tr><td>12</td><td>Q35</td><td>58.0°C</td><td>85.1°C</td></tr> <tr><td>13</td><td>U1</td><td>60.4°C</td><td>87.4°C</td></tr> <tr><td>14</td><td>C35</td><td>59.9°C</td><td>87.0°C</td></tr> <tr><td>15</td><td>Q23</td><td>63.2°C</td><td>90.2°C</td></tr> <tr><td>16</td><td>T4</td><td>61.1°C</td><td>88.5°C</td></tr> <tr><td>17</td><td>T6</td><td>64.7°C</td><td>91.5°C</td></tr> <tr><td>18</td><td>T2</td><td>69.6°C</td><td>97.2°C</td></tr> <tr><td>19</td><td>TSW1</td><td>69.3°C</td><td>95.2°C</td></tr> <tr><td>20</td><td>T1</td><td>71.3°C</td><td>96.2°C</td></tr> <tr><td>21</td><td>Q100</td><td>71.8°C</td><td>102.1°C</td></tr> <tr><td>22</td><td>Q103</td><td>72.6°C</td><td>101.8°C</td></tr> <tr><td>23</td><td>L100</td><td>76.8°C</td><td>104.5°C</td></tr> <tr><td>24</td><td>C114</td><td>74.0°C</td><td>101.2°C</td></tr> <tr><td>25</td><td>C115</td><td>75.5°C</td><td>102.2°C</td></tr> <tr><td>26</td><td>LF100</td><td>70.9°C</td><td>98.5°C</td></tr> <tr><td>27</td><td>Q200</td><td>72.6°C</td><td>102.0°C</td></tr> <tr><td>28</td><td>Q105</td><td>76.3°C</td><td>105.0°C</td></tr> <tr><td>29</td><td>R202</td><td>67.4°C</td><td>94.9°C</td></tr> <tr><td>30</td><td>L101</td><td>75.1°C</td><td>103.9°C</td></tr> <tr><td>31</td><td>C103</td><td>73.4°C</td><td>101.7°C</td></tr> <tr><td>32</td><td>D213</td><td>66.3°C</td><td>93.7°C</td></tr> <tr><td>33</td><td>U101</td><td>70.0°C</td><td>96.4°C</td></tr> <tr><td>34</td><td>D107</td><td>94.9°C</td><td>95.1°C</td></tr> <tr><td>35</td><td>D106</td><td>66.3°C</td><td>93.2°C</td></tr> <tr><td>36</td><td>Q204</td><td>72.1°C</td><td>98.4°C</td></tr> <tr><td>37</td><td>Q37</td><td>59.2°C</td><td>85.9°C</td></tr> <tr><td>38</td><td>U3</td><td>58.5°C</td><td>85.3°C</td></tr> <tr><td>39</td><td>D17</td><td>60.0°C</td><td>87.6°C</td></tr> <tr><td>40</td><td>Q17</td><td>71.9°C</td><td>100.3°C</td></tr> <tr><td>41</td><td>U5</td><td>65.3°C</td><td>92.7°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 25 °C	HIGH AMBIENT Ta= 55 °C	1	LF1	55.9°C	86.1°C	2	LF2	58.6°C	83.3°C	3	C17	57.2°C	84.3°C	4	Q1	56.9°C	84.7°C	5	C5	58.8°C	85.9°C	6	T3	60.8°C	88.3°C	7	T5	64.5°C	90.9°C	8	U4	65.8°C	92.7°C	9	Q8	61.7°C	88.4°C	10	ZNR1	50.6°C	78.3°C	11	D2	58.2°C	84.3°C	12	Q35	58.0°C	85.1°C	13	U1	60.4°C	87.4°C	14	C35	59.9°C	87.0°C	15	Q23	63.2°C	90.2°C	16	T4	61.1°C	88.5°C	17	T6	64.7°C	91.5°C	18	T2	69.6°C	97.2°C	19	TSW1	69.3°C	95.2°C	20	T1	71.3°C	96.2°C	21	Q100	71.8°C	102.1°C	22	Q103	72.6°C	101.8°C	23	L100	76.8°C	104.5°C	24	C114	74.0°C	101.2°C	25	C115	75.5°C	102.2°C	26	LF100	70.9°C	98.5°C	27	Q200	72.6°C	102.0°C	28	Q105	76.3°C	105.0°C	29	R202	67.4°C	94.9°C	30	L101	75.1°C	103.9°C	31	C103	73.4°C	101.7°C	32	D213	66.3°C	93.7°C	33	U101	70.0°C	96.4°C	34	D107	94.9°C	95.1°C	35	D106	66.3°C	93.2°C	36	Q204	72.1°C	98.4°C	37	Q37	59.2°C	85.9°C	38	U3	58.5°C	85.3°C	39	D17	60.0°C	87.6°C	40	Q17	71.9°C	100.3°C	41	U5	65.3°C	92.7°C
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9	Q8	61.7°C	88.4°C																																																																																																																																																																									
10	ZNR1	50.6°C	78.3°C																																																																																																																																																																									
11	D2	58.2°C	84.3°C																																																																																																																																																																									
12	Q35	58.0°C	85.1°C																																																																																																																																																																									
13	U1	60.4°C	87.4°C																																																																																																																																																																									
14	C35	59.9°C	87.0°C																																																																																																																																																																									
15	Q23	63.2°C	90.2°C																																																																																																																																																																									
16	T4	61.1°C	88.5°C																																																																																																																																																																									
17	T6	64.7°C	91.5°C																																																																																																																																																																									
18	T2	69.6°C	97.2°C																																																																																																																																																																									
19	TSW1	69.3°C	95.2°C																																																																																																																																																																									
20	T1	71.3°C	96.2°C																																																																																																																																																																									
21	Q100	71.8°C	102.1°C																																																																																																																																																																									
22	Q103	72.6°C	101.8°C																																																																																																																																																																									
23	L100	76.8°C	104.5°C																																																																																																																																																																									
24	C114	74.0°C	101.2°C																																																																																																																																																																									
25	C115	75.5°C	102.2°C																																																																																																																																																																									
26	LF100	70.9°C	98.5°C																																																																																																																																																																									
27	Q200	72.6°C	102.0°C																																																																																																																																																																									
28	Q105	76.3°C	105.0°C																																																																																																																																																																									
29	R202	67.4°C	94.9°C																																																																																																																																																																									
30	L101	75.1°C	103.9°C																																																																																																																																																																									
31	C103	73.4°C	101.7°C																																																																																																																																																																									
32	D213	66.3°C	93.7°C																																																																																																																																																																									
33	U101	70.0°C	96.4°C																																																																																																																																																																									
34	D107	94.9°C	95.1°C																																																																																																																																																																									
35	D106	66.3°C	93.2°C																																																																																																																																																																									
36	Q204	72.1°C	98.4°C																																																																																																																																																																									
37	Q37	59.2°C	85.9°C																																																																																																																																																																									
38	U3	58.5°C	85.3°C																																																																																																																																																																									
39	D17	60.0°C	87.6°C																																																																																																																																																																									
40	Q17	71.9°C	100.3°C																																																																																																																																																																									
41	U5	65.3°C	92.7°C																																																																																																																																																																									



2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 110 VDC O/P : 118% LOAD Ta : 25°C	TEST : OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 67.2 VDC / 154 VDC O/P : 100 % LOAD Ta= -45 °C	TEST : OK
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 55 °C /95 %R.H NO DAMAGE	I/P : 157 VDC O/P : FULL LOAD Ta= 55 °C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	± 0.03%/°C (0~55°C)	I/P : 110 VDC O/P : FULL LOAD	± 0.0081 %/°C (0~55°C)
6	STORAGE TEMPERATURE TEST	-40~85°C	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	
7	THERMAL SHOCK TEST	-40~55°C	1. Thermal shock Temperature : -45°C~+60°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: 110 VDC / FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle: 110 VDC / FULL LOAD Burn In Test	
8	VIBRATION TEST	10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 6G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C	
9	CAPACITOR LIFE CYCLE	SUPPOSE C115 IS THE MOST CRITICAL COMPONENT (1) I/P : 110VDC O/P : FULL LOAD Ta= 25 °C LIFE TIME (2) I/P : 110VDC O/P : FULL LOAD Ta= 55 °C LIFE TIME (3) I/P : 110VDC O/P : 75% LOAD Ta= 55 °C LIFE TIME (4) I/P : 110VDC O/P : 50% LOAD Ta= 55 °C LIFE TIME		(1) 187973.8 HRS (2) 39791.5 HRS (3) 93165.4 HRS (4) 211552.1 HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 277.9K hrs min. Telcordia SR-332 (Bellcore) ; 99.1K hrs min. MIL-HDBK-217F (25°C)		
11	Ongoing Reliability Test	I/P : 110VDC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 30,000 hours		

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	LIUTT		Wangdz

2018.4.30 GP-A50-F010