



Test Report: DDR-480D-48

480W DIN Rail Type 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

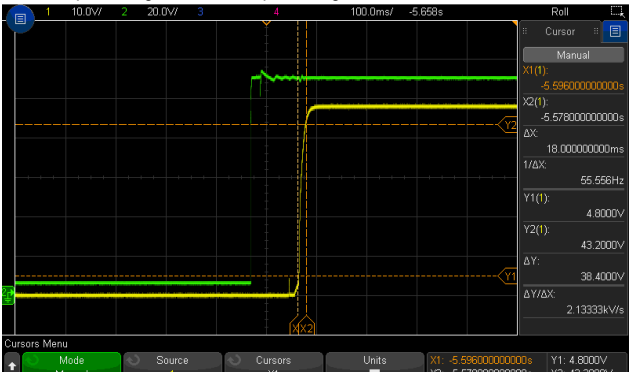
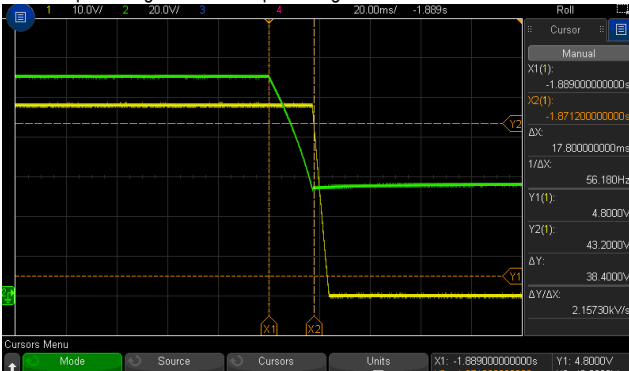

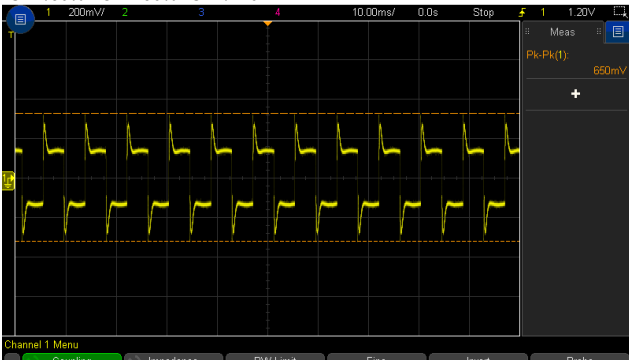
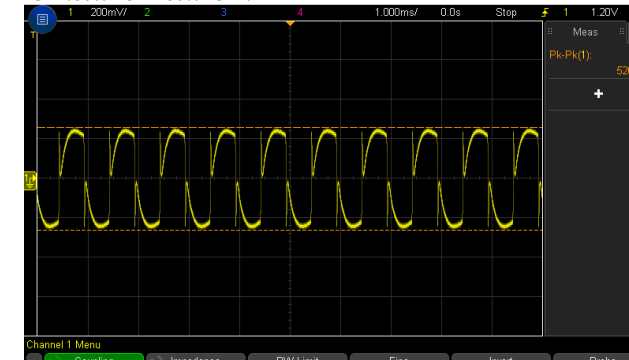
■ RELIABILITY TEST

ENVIRONMENT TEST

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE ADJUST RANGE	CH1: 48V~ 56V	I/P:NORMAL VOLTAGE O/P:MIN LOAD Ta:25°C	CH1:46.04V~57.83V
2	OUTPUT VOLTAGE TOLERANCE(Max)	V1:-1%~1 %	I/P:67.2VDC /154VDC O/P:FULL/ MIN. LOAD Ta:25°C	V1: -0.11%~0.10%
3	LINE REGULATION(Max)	V1: -0.5%~ 0.5%	I/P:67.2VDC /154VDC O/P:FULL LOAD Ta:25°C	V1:-0.01%~0.01%
4	LOAD REGULATION(Max)	V1:-1%~1 %	I/P: 110VDC O/P:FULL ~MIN LOAD Ta:25°C	V1:-0.11%~0.10%
5	OVER/UNDERSHOOT TEST	<±5%	I/P:110VDC O/P:FULL LOAD Ta:25°C	TEST:1.3%
6	PEAK LOAD	720W/5s	I/P: 110 VDC O/P:601.2W Ta:25°C	TEST:OK
7	RIPPLE & NOISE (Max)	V1: 150mVp-p	I/P:110VDC O/P:FULL LOAD Ta:25°C	V1:42mVp-p
		<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>high frequency :</p> </div> <div style="text-align: center;"> <p>low frequency :</p> </div> </div>		
8	SET UP TIME(Max)	110VDC/500ms	I/P:110 VDC O/P:FULL LOAD Ta:25°C	104ms
		<p>INPUT=110VDC @ FULL LOAD</p> <p>CH1 : Output Voltage CH2 : DC Input Voltage</p>		

9	RISE TIME (Max)	110VDC/ 60ms	I/P: 110VDC O/P:FULL LOAD Ta:25°C	18ms
<p>INPUT=110VDC @ FULL LOAD CH1 : Output Voltage CH2 : DC Input Voltage</p> 				
10	HOLD UP TIME (TYP)	110VDC/ 16ms 110VDC/ 24ms@70%LOAD	I/P: 110VDC O/P:FULL LOAD/70%LOAD Ta:25°C	110VDC/17.8ms@FULL LOAD 110VDC/25.8ms@70%LOAD
<p>INPUT=110VDC @ FULL LOAD CH1 : Output Voltage CH2 : DC Input Voltage</p>  <p>INPUT=110VDC @ 70% LOAD CH1 : Output Voltage CH2 : DC Input Voltage</p> 				
11	DYNAMIC LOAD	V1:480mVp-p	I/P: 110VDC O/P: (1)FULL /50% LOAD 50%DUTY/120HZ (2)FULL /50% LOAD 50%DUTY/ 1KHZ Ta:25°C	650mVp-p/120HZ 520mVp-p/1KHZ
<p>FULL /50% LOAD 50%DUTY/120HZ</p>  <p>FULL /50% LOAD 50%DUTY/ 1KHZ</p> 				
12	TRANSIENT RECOVERY TIME	V1:1200mVp-p	I/P: 110VDC O/P:40% LOAD CHANGE 50%DUTY/120HZ	530mVp-p

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																												
1	INPUT VOLTAGE RANGE	67.2VDC~154VDC 66VDC~67.2VD \geq 100ms	I/P:TESTING O/P:FULL LOAD Ta:25°C	(1) 63.7V~154V (2) TEST : OK																																												
			I/P: LOW-LINE-0.2=67V HIGH-LINE+3V=157V 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/5 A	I/P: 110VDC O/P:FULL LOAD Ta:25°C	I=4. 66A/110VDC																																												
3	EFFICIENCY(TYP)	93%	I/P:110VDC O/P:FULL LOAD Ta:25°C	93. 44%																																												
<p>EFFICIENCY vs LOAD</p> <table border="1"> <caption>Efficiency vs Load Data</caption> <thead> <tr> <th>LOAD (%)</th> <th>110VDC (%)</th> <th>154VDC (%)</th> <th>86.4VDC (%)</th> </tr> </thead> <tbody> <tr><td>10%</td><td>85</td><td>80</td><td>86</td></tr> <tr><td>20%</td><td>90</td><td>86</td><td>91</td></tr> <tr><td>30%</td><td>92</td><td>89</td><td>92</td></tr> <tr><td>40%</td><td>93</td><td>90</td><td>93</td></tr> <tr><td>50%</td><td>93</td><td>91</td><td>93</td></tr> <tr><td>60%</td><td>93</td><td>92</td><td>93</td></tr> <tr><td>70%</td><td>93</td><td>92</td><td>93</td></tr> <tr><td>80%</td><td>93</td><td>92</td><td>93</td></tr> <tr><td>90%</td><td>93</td><td>92</td><td>93</td></tr> <tr><td>100%</td><td>93</td><td>92</td><td>93</td></tr> </tbody> </table>					LOAD (%)	110VDC (%)	154VDC (%)	86.4VDC (%)	10%	85	80	86	20%	90	86	91	30%	92	89	92	40%	93	90	93	50%	93	91	93	60%	93	92	93	70%	93	92	93	80%	93	92	93	90%	93	92	93	100%	93	92	93
LOAD (%)	110VDC (%)	154VDC (%)	86.4VDC (%)																																													
10%	85	80	86																																													
20%	90	86	91																																													
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40%	93	90	93																																													
50%	93	91	93																																													
60%	93	92	93																																													
70%	93	92	93																																													
80%	93	92	93																																													
90%	93	92	93																																													
100%	93	92	93																																													
4	INRUSH CURRENT(TYP)	110VDC/30 A COLD START	I/P: 110VDC O/P:FULL LOAD Ta:25°C	19.8A																																												
<p>INPUT=110VDC @ FULL LOAD CH4 : Input current</p>																																																
5	INTERRUPTION OF VOLTAGE SUPPLY	COMPLY WITH S2 LEVEL (10ms)	I/P: 110VDC O/P:FULL LOAD Ta:25°C	17.4ms																																												

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	105%~ 135 %RATED OUTPUT POWER PEAK LOAD:150%LOAD	I/P: 86.4VDC I/P: 110VDC I/P: 154VDC O/P: TESTING PEAK LOAD (5S) Ta:25°C	118.9%/86.4VDC 118.6%/110VDC 118.7%/154VDC PROTECTION TYPE : Normally works within 150% rated output power for more than 5 seconds and then constant current protection 105%~135% rated output power with auto-recovery.
2	OVER VOLTAGE PROTECTION	CH:57.6V~65V	I/P:67.2VDC I/P: 110VDC I/P:154VDC O/P:MIN LOAD Ta:25°C	62.3V/67.2VDC 62.3V/110VDC 62.3V/154VDC PROTECTION TYPE : Shut down O/P voltage, re-power on to recover
3	OVER TEMPERATURE PROTECTION	SPEC: NO DAMAGE	I/P: 154 VDC O/P: FULL LOAD Ta:25°C	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 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
6.	INPUT REVERSE	POWER OK	I/P: 154 VDC O/P: FULL LOAD Ta:25°C	NO DAMAGE
7	INPUT UNDER VOLTAGE PROTECTION	110 VIN (C-TYPE) : POWER ON >=67.2V POWER OFF <=65V	I/P: TESTING O/P: FULL LOAD Ta:25°C	POWER ON >=63.59V POWER OFF <=54.56V

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	REMOTE ON/OFF CONTROL	I/P: 110VDC O/P: FULL LOAD Ta:25°C Test Result :		
		Remote ON-OFF (TB1 PIN2,4)	Power Supply Status	
		Open or 4~10VDC	ON 5.3VDC	
		Short or 0~0.8VDC	OFF 0.82VDC	
2	DC OK CONTACT RATINGS	30VDC/1A RESISTIVE LOAD	I/P: 110VDC O/P: FULL LOAD Ta:25°C	TEST : OK

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT										
1	PWM Transistor (D to S) or (C to E) Peak Voltage	Q 8/Q19 Rated : 26 A/ 400 V Q12/Q17 Rated : 26 A/ 400 V	DC ON/OFF I/P: High-Line +3V =157V VDS: O/P: (1) Full Load (2) Output Short	<table border="0"> <tr> <td>Q8</td> <td>Q19</td> </tr> <tr> <td>VDS:</td> <td>VDS:</td> </tr> <tr> <td>(1) 219V</td> <td>(1) 218V</td> </tr> <tr> <td>(2) 320V</td> <td>(2) 319V</td> </tr> <tr> <td>(3) 244V</td> <td>(3) 241V</td> </tr> </table>	Q8	Q19	VDS:	VDS:	(1) 219V	(1) 218V	(2) 320V	(2) 319V	(3) 244V	(3) 241V
Q8	Q19													
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			<p>(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>(4) 242V (5) 242V (6) 258V (7) 266V</p> <p>Q12 VDS: (1) 223V (2) 261V (3) 239V (4) 235V (5) 237V (6) 247V (7) 267V</p>	<p>(4) 237V (5) 237V (6) 251V (7) 264V</p> <p>Q17 VDS: (1) 225V (2) 227V (3) 237V (4) 234V (5) 235V (6) 253V (7) 269V</p>
2	Clamp MOSFET (D to S) or (C to E) Peak Voltage	Q20/Q4 Rated : 26 A/ 400 V	<p>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</p>	<p>Q20 VDS: (1) 200V (2) 246V (3) 230V (4) 228V (5) 224V (6) 240V (7) 253V</p>	<p>Q4 VDS: (1) 200V (2) 246V (3) 240V (4) 240V (5) 238V (6) 258V (7) 274V</p>
3	Diode PeakVoltage	<p>Q101/Q105 Rated : 10 A/ 400 V Q200/Q203Rated : 10 A/ 400 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>Q101: VOmax: VDS: (1) 290V (2) 268V (3) 337V (4) 333V (5) 333V (6) 337V (7) 317V (8) 190V VO: (1) 223V Q203: VOmax: VDS: (1) 372V (2) 376V (3) 376V (4) 372V (5) 372V (6) 372V (7) 376V (8) 335V VO: (1) 368V</p>	<p>Q200: VOmax: VDS: (1) 231V (2) 263V (3) 285V (4) 320V (5) 293V (6) 316V (7) 173V (8) 144V VO: (1) 155V Q105: VOmax: VDS: (1) 376V (2) 380V (3) 380V (4) 376V (5) 376V (6) 376V (7) 380V (8) 356V VO: (1) 372V</p>

4	Input Capacitor Voltage	C20/C28 Rated: 180μ/160V	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	C20 (1) 157V (2) 156V (3) 156V (4) 153V	C28 (1) 157V (2) 157V (3) 157V (4) 153V
5	Control IC Voltage Test	PWM IC U1 Rated 7.5V~ 15 V/VCC O/PU100Rated -0.3V~ 32 V	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	U1 /VCC1/VCC2 (1) 13. 76V/13. 52V (2) 14. 1V/13. 76V (3) 14. 1V/13. 60V (4) 14. 0V/13. 28V (5) 11. 59V/11. 51V	U100 (1) 11. 75V (2) 11. 91V (3) 12. 09V (4) 11. 59V (5) 11. 35V

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTANDVOLTAGE	I/P-O/P:4KVDC/min I/P-FG:2.5KVDC/min O/P-FG:0.71KVDC/min	I/P-O/P: 4.4KVDC/min I/P-FG: 3KVDC/min O/P-FG:0.852KVDC/min Ta:25°C	I/P-O/P:0.2uA I/P-FG:0.2uA O/P-FG:0.3uA NO DAMAGE
2	ISOLATIONRESISTANCE	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: 600VDC O/P-FG: 600VDC Ta:25°C	I/P-O/P:9999MΩ I/P-FG:9999MΩ O/P-FG:9999MΩ NO DAMAGE
3	GROUNDINGCONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	3mΩ

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 ■INDUSTRY AIR: 8KV / Contact: 6KV	I/P: 110VDC O/P:FULL LOAD Ta:25°C	■CRITERIA A □CRITERIA B
4	E.F.T	EN61000-4-4 ■INDUSTRY INPUT: 2KV	I/P:110VDC O/P:FULL LOAD Ta:25°C	■CRITERIA A □CRITERIA B
5	SURGE	IEC61000-4-5 ■INDUSTRY L-N :1KV L,N-PE:2KV	I/P: 110VDC O/P:FULL LOAD Ta:25°C	■CRITERIA A □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 : DDR-480D-12 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 110 VDC O/P : FULL LOAD Ta= 27.6 °C 2. HIGH AMBIENT BURN-IN : HRS I/P : 110 VDC O/P : FULL LOAD Ta= 55.7 °C																																																																																																																																																																						
			<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 27.6 °C</th> <th>HIGH AMBIENT Ta=55.7 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>ZNR1</td><td>41.1°C</td><td>72.9°C</td></tr> <tr><td>2</td><td>LF1</td><td>43.2°C</td><td>75.3°C</td></tr> <tr><td>3</td><td>LF2</td><td>47.1°C</td><td>79.4°C</td></tr> <tr><td>4</td><td>Q6</td><td>45.4°C</td><td>77.5°C</td></tr> <tr><td>5</td><td>C29</td><td>40.3°C</td><td>71.1°C</td></tr> <tr><td>6</td><td>LF3</td><td>44.2°C</td><td>75.8°C</td></tr> <tr><td>7</td><td>U1</td><td>46.5°C</td><td>78.2°C</td></tr> <tr><td>8</td><td>T7</td><td>47.0°C</td><td>78.7°C</td></tr> <tr><td>9</td><td>TSW1</td><td>63.6°C</td><td>97.2°C</td></tr> <tr><td>10</td><td>T3</td><td>49.2°C</td><td>81.0°C</td></tr> <tr><td>11</td><td>Q4</td><td>47.5°C</td><td>79.1°C</td></tr> <tr><td>12</td><td>Q204</td><td>69.3°C</td><td>101.4°C</td></tr> <tr><td>13</td><td>T2</td><td>64.3°C</td><td>97.6°C</td></tr> <tr><td>14</td><td>L200</td><td>74.3°C</td><td>107.5°C</td></tr> <tr><td>15</td><td>R217</td><td>66.6°C</td><td>101.9°C</td></tr> <tr><td>16</td><td>Q203</td><td>67.6°C</td><td>102.9°C</td></tr> <tr><td>17</td><td>Q200</td><td>72.3°C</td><td>106.4°C</td></tr> <tr><td>18</td><td>C204</td><td>71.2°C</td><td>104.1°C</td></tr> <tr><td>19</td><td>U100</td><td>58.8°C</td><td>90.9°C</td></tr> <tr><td>20</td><td>R202</td><td>67.6°C</td><td>102.1°C</td></tr> <tr><td>21</td><td>Q13</td><td>64.0°C</td><td>95.9°C</td></tr> <tr><td>22</td><td>ZD202</td><td>66.2°C</td><td>99.0°C</td></tr> <tr><td>23</td><td>R201</td><td>71.9°C</td><td>104.6°C</td></tr> <tr><td>24</td><td>U203</td><td>74.1°C</td><td>106.5°C</td></tr> <tr><td>25</td><td>D210</td><td>68.6°C</td><td>101.7°C</td></tr> <tr><td>26</td><td>U101</td><td>64.5°C</td><td>95.7°C</td></tr> <tr><td>27</td><td>LF4</td><td>44.6°C</td><td>76.6°C</td></tr> <tr><td>28</td><td>TSW3</td><td>62.6°C</td><td>96.2°C</td></tr> <tr><td>29</td><td>T8</td><td>46.9°C</td><td>79.3°C</td></tr> <tr><td>30</td><td>Q101</td><td>67.5°C</td><td>101.9°C</td></tr> <tr><td>31</td><td>T4</td><td>50.1°C</td><td>82.3°C</td></tr> <tr><td>32</td><td>Q20</td><td>48.9°C</td><td>81.7°C</td></tr> <tr><td>33</td><td>Q8</td><td>56.8°C</td><td>89.7°C</td></tr> <tr><td>34</td><td>Q19</td><td>59.4°C</td><td>92.8°C</td></tr> <tr><td>35</td><td>T1</td><td>63.5°C</td><td>97.0°C</td></tr> <tr><td>36</td><td>L101</td><td>75.1°C</td><td>108.6°C</td></tr> <tr><td>37</td><td>Q105</td><td>71.1°C</td><td>105.8°C</td></tr> <tr><td>38</td><td>C110</td><td>62.3°C</td><td>95.7°C</td></tr> <tr><td>39</td><td>U102</td><td>70.1°C</td><td>103.2°C</td></tr> <tr><td>40</td><td>Q102</td><td>66.5°C</td><td>99.5°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 27.6 °C	HIGH AMBIENT Ta=55.7 °C	1	ZNR1	41.1°C	72.9°C	2	LF1	43.2°C	75.3°C	3	LF2	47.1°C	79.4°C	4	Q6	45.4°C	77.5°C	5	C29	40.3°C	71.1°C	6	LF3	44.2°C	75.8°C	7	U1	46.5°C	78.2°C	8	T7	47.0°C	78.7°C	9	TSW1	63.6°C	97.2°C	10	T3	49.2°C	81.0°C	11	Q4	47.5°C	79.1°C	12	Q204	69.3°C	101.4°C	13	T2	64.3°C	97.6°C	14	L200	74.3°C	107.5°C	15	R217	66.6°C	101.9°C	16	Q203	67.6°C	102.9°C	17	Q200	72.3°C	106.4°C	18	C204	71.2°C	104.1°C	19	U100	58.8°C	90.9°C	20	R202	67.6°C	102.1°C	21	Q13	64.0°C	95.9°C	22	ZD202	66.2°C	99.0°C	23	R201	71.9°C	104.6°C	24	U203	74.1°C	106.5°C	25	D210	68.6°C	101.7°C	26	U101	64.5°C	95.7°C	27	LF4	44.6°C	76.6°C	28	TSW3	62.6°C	96.2°C	29	T8	46.9°C	79.3°C	30	Q101	67.5°C	101.9°C	31	T4	50.1°C	82.3°C	32	Q20	48.9°C	81.7°C	33	Q8	56.8°C	89.7°C	34	Q19	59.4°C	92.8°C	35	T1	63.5°C	97.0°C	36	L101	75.1°C	108.6°C	37	Q105	71.1°C	105.8°C	38	C110	62.3°C	95.7°C	39	U102	70.1°C	103.2°C	40	Q102	66.5°C	99.5°C	
NO	Position	ROOM AMBIENT Ta= 27.6 °C	HIGH AMBIENT Ta=55.7 °C																																																																																																																																																																					
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2	LF1	43.2°C	75.3°C																																																																																																																																																																					
3	LF2	47.1°C	79.4°C																																																																																																																																																																					
4	Q6	45.4°C	77.5°C																																																																																																																																																																					
5	C29	40.3°C	71.1°C																																																																																																																																																																					
6	LF3	44.2°C	75.8°C																																																																																																																																																																					
7	U1	46.5°C	78.2°C																																																																																																																																																																					
8	T7	47.0°C	78.7°C																																																																																																																																																																					
9	TSW1	63.6°C	97.2°C																																																																																																																																																																					
10	T3	49.2°C	81.0°C																																																																																																																																																																					
11	Q4	47.5°C	79.1°C																																																																																																																																																																					
12	Q204	69.3°C	101.4°C																																																																																																																																																																					
13	T2	64.3°C	97.6°C																																																																																																																																																																					
14	L200	74.3°C	107.5°C																																																																																																																																																																					
15	R217	66.6°C	101.9°C																																																																																																																																																																					
16	Q203	67.6°C	102.9°C																																																																																																																																																																					
17	Q200	72.3°C	106.4°C																																																																																																																																																																					
18	C204	71.2°C	104.1°C																																																																																																																																																																					
19	U100	58.8°C	90.9°C																																																																																																																																																																					
20	R202	67.6°C	102.1°C																																																																																																																																																																					
21	Q13	64.0°C	95.9°C																																																																																																																																																																					
22	ZD202	66.2°C	99.0°C																																																																																																																																																																					
23	R201	71.9°C	104.6°C																																																																																																																																																																					
24	U203	74.1°C	106.5°C																																																																																																																																																																					
25	D210	68.6°C	101.7°C																																																																																																																																																																					
26	U101	64.5°C	95.7°C																																																																																																																																																																					
27	LF4	44.6°C	76.6°C																																																																																																																																																																					
28	TSW3	62.6°C	96.2°C																																																																																																																																																																					
29	T8	46.9°C	79.3°C																																																																																																																																																																					
30	Q101	67.5°C	101.9°C																																																																																																																																																																					
31	T4	50.1°C	82.3°C																																																																																																																																																																					
32	Q20	48.9°C	81.7°C																																																																																																																																																																					
33	Q8	56.8°C	89.7°C																																																																																																																																																																					
34	Q19	59.4°C	92.8°C																																																																																																																																																																					
35	T1	63.5°C	97.0°C																																																																																																																																																																					
36	L101	75.1°C	108.6°C																																																																																																																																																																					
37	Q105	71.1°C	105.8°C																																																																																																																																																																					
38	C110	62.3°C	95.7°C																																																																																																																																																																					
39	U102	70.1°C	103.2°C																																																																																																																																																																					
40	Q102	66.5°C	99.5°C																																																																																																																																																																					



2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 110VDC O/P : 123LOAD Ta : 25°C	TEST : OK
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 67.2VDC /154VDC 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 : 157VDC O/P : FULL LOAD Ta= 55°C HUMIDITY= 95 %R.H	TEST : OK
5	TEMPERATURE COEFFICIENT	± 0.03%/°C (0-55°C)	I/P : 110VDC 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 C204 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) 489631.3HRS (2) 43881.8HRS (3) 118499HRS (4) 232167.2HRS
10	MTBF	Conducted by Parts Stress Analysis Prediction 750.3 K hrs min. Telcordia SR-332 (Bellcore) ; 101.7K 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