



Test Report: NID65-05

65W DC-DC Non-isolated Regulated 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

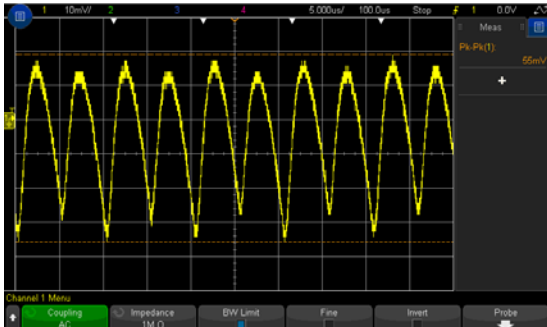
ENVIRONMENT TEST

DESIGN VERIFY TEST

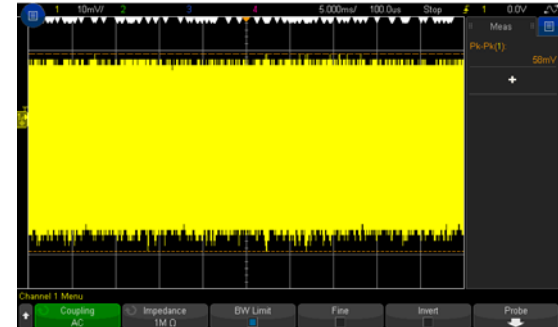
OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OUTPUT VOLTAGE TOLERANCE (Max)	V1: -2%~ 2%	I/P: 10.5 VDC /53VDC O/P:FULL/ MIN. LOAD Ta:25°C	V1: -0.02%~0.02%
2	LINE REGULATION (Max)	V1: -0.5%~ 0.5%	I/P: 10.5 VDC /53VDC O/P:FULL LOAD Ta:25°C	V1:-0.01%~0.01%
3	LOAD REGULATION (Max)	V1: -0.5%~0.5%	I/P: 12VDC/24 VDC/48 VDC O/P:FULL -MIN LOAD Ta:25°C	V1: -0.02%~0.02%
4	OVER/UNDERSHOOT TEST	< ±10%	I/P: 12VDC/24 VDC/48 VDC O/P:FULL LOAD Ta:25°C	TEST:2.4 %
5	RIPPLE & NOISE (Max)	V1: 100mVp-p	I/P: 12VDC/24 VDC/48 VDC O/P:FULL LOAD Ta:25°C	V1:58mVp-p

high frequency :

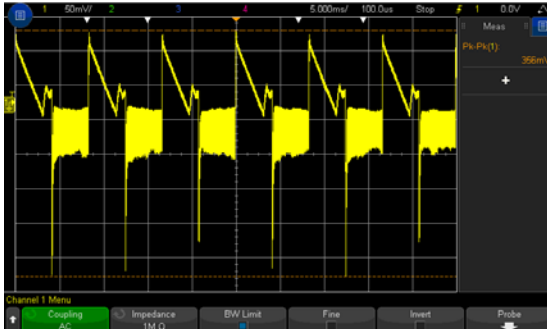


low frequency :

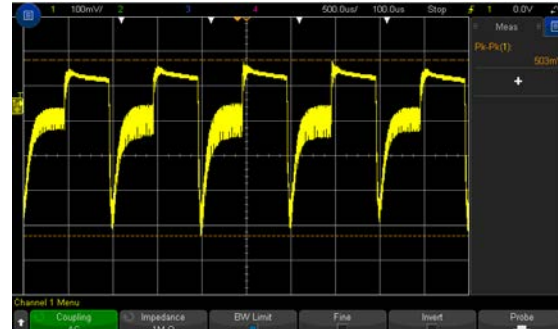


6	DYNAMIC LOAD	V1: 1000mVp-p	I/P: 12VDC/24 VDC/48 VDC O/P: (1)FULL /50% LOAD 50%DUTY / 120HZ (2)FULL /50% LOAD 50%DUTY / 1KHZ Ta:25°C	356mVp-p 503mVp-p
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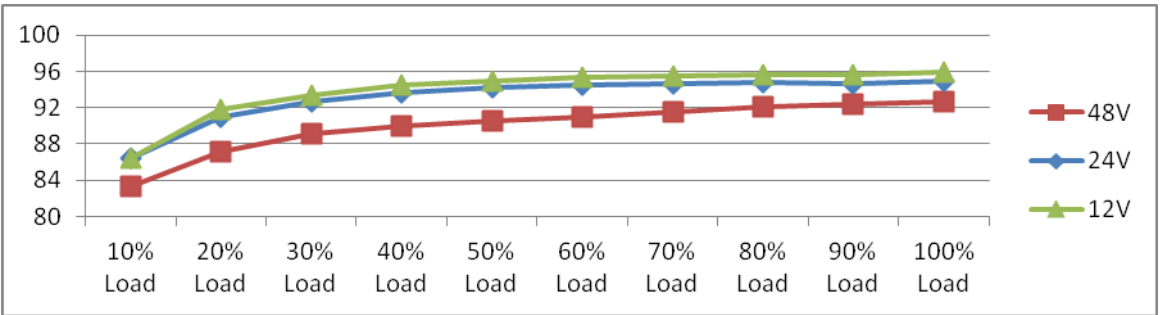
FULL /50% LOAD 50%DUTY / 120HZ



FULL /50% LOAD 50%DUTY / 1KHZ



INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																												
1	INPUT VOLTAGE RANGE	10.5VDC-53VDC	I/P:TESTING O/P:FULL LOAD Ta:25°C	9.1V- 56V																																												
			I/P: LOW-LINE-0.2= 10.3V HIGH-LINE+3V= 56V 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)	FULL LOAD: 3200mA NO LOAD: 20mA	I/P: 12VDC/24 VDC/48 VDC O/P:FULL LOAD O/P:NO LOAD Ta:25°C	FULL LOAD NO LOAD I =2825mA/12VDC I =16.8mA/12VDC I =1426mA/24VDC I =18.6mA/24VDC I =736mA/48VDC I =2.6mA/48VDC																																												
3	EFFICIENCY(TYP)	93% /12VDC 93% /24VDC 92%/48VDC	I/P: 12VDC/24 VDC/48 VDC O/P:FULL LOAD Ta:25°C	95.9% /12VDC 94.9% /24VDC 92.6%/48VDC																																												
<p>EFFICIENCY vs LOAD</p>  <table border="1"> <caption>Efficiency vs Load Data</caption> <thead> <tr> <th>Load (%)</th> <th>12V Efficiency (%)</th> <th>24V Efficiency (%)</th> <th>48V Efficiency (%)</th> </tr> </thead> <tbody> <tr><td>10%</td><td>87</td><td>85</td><td>83</td></tr> <tr><td>20%</td><td>92</td><td>90</td><td>87</td></tr> <tr><td>30%</td><td>93</td><td>91</td><td>88</td></tr> <tr><td>40%</td><td>94</td><td>92</td><td>89</td></tr> <tr><td>50%</td><td>94.5</td><td>92.5</td><td>90</td></tr> <tr><td>60%</td><td>95</td><td>93</td><td>90.5</td></tr> <tr><td>70%</td><td>95.5</td><td>93.5</td><td>91</td></tr> <tr><td>80%</td><td>95.8</td><td>93.8</td><td>91.5</td></tr> <tr><td>90%</td><td>96</td><td>94</td><td>92</td></tr> <tr><td>100%</td><td>96.2</td><td>94.2</td><td>92.2</td></tr> </tbody> </table>					Load (%)	12V Efficiency (%)	24V Efficiency (%)	48V Efficiency (%)	10%	87	85	83	20%	92	90	87	30%	93	91	88	40%	94	92	89	50%	94.5	92.5	90	60%	95	93	90.5	70%	95.5	93.5	91	80%	95.8	93.8	91.5	90%	96	94	92	100%	96.2	94.2	92.2
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PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	OVER LOAD PROTECTION	120%-250% RATED OUTPUT POWER	I/P: 53 VDC I/P: 48 VDC I/P: 24VDC I/P: 12VDC I/P: 10.5VDC O/P:TESTING Ta:25°C	145%/53VDC 141%/48VDC 134%/24VDC 128%/12 VDC 127%/10.5VDC PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed
2	OVER VOLTAGE PROTECTION	CH: 6.4 V- 7.5 V	I/P: NO O/P:MIN LOAD Ta:25°C	7.1V PROTECTION TYPE : Shut off o/p voltage, clamp by TVS diode
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P:53 VDC O/P: FULL LOAD Ta:25°C	NO DAMAGE PROTECTION TYPE : Hiccup mode, recovers automatically after fault condition is removed

Control Function Test

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	REMOTE CONTROL	Power on: 1.2VDC < R.C-com < 12VDC Power off: R.C-com < 0.4VDC	I/P: 48 VDC I/P: 24 VDC I/P: 12VDC 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	Q1 Rated : 80 V Q2 Rated : 80 V	I/P: High-Line +3V = 56V DC ON/OFF VDS: O/P: (1) Full Load (2) Output Short (3) Full Load Continue Ta: 25°C	Q1 Q2 VDS: (1) 58.9V (2) 60.1V (3) 58.5V (1) 64.7V (2) 73.2V (3) 64.3V
2	Input Capacitor Voltage	C25 Rated: : 105/100V	I/P: High-Line +3V = 56 V 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	(1) 58.3V (2) 57.5V (3) 58.3V (4) 58.3V
3	Control IC Voltage Test	PWM IC U1 Rated 7.5V-14V	I/P: High-Line +3V = 56V DC ON/OFF O/P: (1) FULL LOAD (2) Output Short (3) O.L.P (4) NO LOAD VR 下限.LOW LINE Ta: 25°C	(1) 8.04V (2) 8.12V (3) 8.04V (4) 7.8V

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	RADIATION	<input checked="" type="checkbox"/> EN55032 <input type="checkbox"/> EN55011 <input type="checkbox"/> CLASS A <input checked="" type="checkbox"/> CLASS B	I/P: 48 VDC O/P: FULL LOAD Ta: 25°C	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL Test by certified Lab
2	CONDUCTION	<input checked="" type="checkbox"/> EN55032 <input type="checkbox"/> EN55011 <input type="checkbox"/> CLASS A <input checked="" type="checkbox"/> CLASS B	I/P: 48 VDC O/P: FULL LOAD Ta: 25°C	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL Test by certified Lab
3	E.F.T	EN61000-4-4 <input type="checkbox"/> LIGHT INDUSTRY INPUT: 0.5KV <input type="checkbox"/> MEDICAL <input checked="" type="checkbox"/> INDUSTRY INPUT: 1KV	I/P: 48 VDC O/P: FULL LOAD Ta: 25°C	<input checked="" type="checkbox"/> CRITERIA A <input type="checkbox"/> CRITERIA B
4	SURGE	IEC61000-4-5 <input type="checkbox"/> MEDICAL <input type="checkbox"/> LIGHT INDUSTRY L-N : 0.5KV L,N-PE: 0.5KV <input checked="" type="checkbox"/> INDUSTRY L-N : 1KV L,N-PE: 1KV	I/P: 48VDC O/P: FULL LOAD Ta: 25°C	<input checked="" type="checkbox"/> CRITERIA A <input type="checkbox"/> CRITERIA B
5	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 : NID65-05 1. ROOM AMBIENT BURN-IN : 1.5 HRS I/P : 48 VDC O/P : FULL LOAD Ta= 24.6 °C 2. HIGH AMBIENT BURN-IN : 1.5 HRS I/P : 48 VDC O/P : FULL LOAD Ta= 55.4 °C																																		
				<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 24.6 °C</th> <th>HIGH AMBIENT Ta= 55.4 °C</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>L1</td> <td>72.5°C</td> <td>99.9°C</td> </tr> <tr> <td>2</td> <td>Q1</td> <td>72.3°C</td> <td>101.4°C</td> </tr> <tr> <td>3</td> <td>Q2</td> <td>70.0°C</td> <td>100.8°C</td> </tr> <tr> <td>4</td> <td>ZD1</td> <td>57.5°C</td> <td>84.3°C</td> </tr> <tr> <td>5</td> <td>C32</td> <td>57.4°C</td> <td>76.8°C</td> </tr> <tr> <td>6</td> <td>C24</td> <td>67.5°C</td> <td>95.4°C</td> </tr> <tr> <td>7</td> <td>U1</td> <td>67.3°C</td> <td>95.3°C</td> </tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 24.6 °C	HIGH AMBIENT Ta= 55.4 °C	1	L1	72.5°C	99.9°C	2	Q1	72.3°C	101.4°C	3	Q2	70.0°C	100.8°C	4	ZD1	57.5°C	84.3°C	5	C32	57.4°C	76.8°C	6	C24	67.5°C	95.4°C	7	U1	67.3°C	95.3°C
NO	Position	ROOM AMBIENT Ta= 24.6 °C	HIGH AMBIENT Ta= 55.4 °C																																	
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4	ZD1	57.5°C	84.3°C																																	
5	C32	57.4°C	76.8°C																																	
6	C24	67.5°C	95.4°C																																	
7	U1	67.3°C	95.3°C																																	
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 48 VDC O/P : 129% LOAD Ta : 25°C	TEST : OK																																
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 20 VDC / 53 VDC 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 55 °C /95 %R.H NO DAMAGE	I/P : 56 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 : 48VDC O/P : FULL LOAD	±0.0030%/°C(0-55°C)																																
6	STORAGE TEMPERATURE TEST	-30-105°C	1. Thermal shock Temperature : -45°C~ +110°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	-30-55°C	1. Thermal shock Temperature : -35°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: 48 VDC / FULL LOAD AC ON 3sec/AC OFF 1sec TEST 1cycle: 48 VDC / FULL LOAD Burn In Test																																	
8	VIBRATION TEST	10 ~ 500Hz, 2G 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 : 3G (5) Test Time : 180min in each axis (X.Y.Z) (6) Ta : 25°C																																	



9	Ongoing Reliability Test	I/P : 48VDC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 30,000 hours
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TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	LIUTT		Wangdz

2018.4.30 GP-A50-F010