



# Test Report : RQB40W12-110S24

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40W Quarter Brick 14~160Vdc Ultra-wide Input Railway DC-DC Converter

## ■ DESIGN VERIFY TEST

Output Function Test  
Input Function Test  
Protection Function Test

## ■ SAFETY TEST

Safety Test

## ■ RELIABILITY TEST

Environment Test  
Other Test

## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDITC
1	VOLTAGE ACCURACY	-1% ~ +1 %	I/P:110VDC O/P:FULL LOAD Ta:25°C	+0.07%	P
2	RIPPLE & NOISE	150 mVp-p	I/P:110VDC O/P:FULL LOAD Ta:25°C	25 mV	P
3	LINE REGULATION	-0.2% ~ +0.2%	I/P:14VDC~110VDC O/P:FULL LOAD Ta:25°C	-0.00% ~ +0.00%	P
4	LOAD REGULATION	-0.2% ~ +0.2%	I/P:110VDC O/P: 0% LOAD~FULL LOAD Ta:25°C	-0.00% ~ +0.02%	P
5	HOLD UP TIME	S2(>10ms) S3(>20ms) C2(>30ms)	I/P:110VDC O/P:FULL LOAD Ta:25°C	20.8ms 40.2ms 60.8ms	P

### INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDITC
1	INPUT VOLTAGE RANGE	14 VDC ~160 VDC	I/P:TESTING O/P:FULL LOAD Ta:25°C	13.0 VDC ~ 160 VDC	P
2.	EFFICIENCY	88%	I/P:110VDC O/P:FULL LOAD Ta:25°C	88.94%	P
3	DC CURRENT	420 mA / FULL LOAD 15 mA / NO LOAD	I/P:110VDC O/P:NO / FULL LOAD Ta:25°C	408 mA / FULL LOAD 8 mA / NO LOAD	P
4	SETUP TIME	< 40ms	I/P:110VDC O/P:FULL LOAD Ta:25°C	10.2 ms	P

### PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDITC
1	SHORT PROTECTION	CONTINUOUS	I/P:160VDC O/P:FULL LOAD Ta:25°C	HICCUP MODE AUTOMATIC RECOVERY	P
2	OVER LOAD PROTECTION	110~180%	I/P:110VDC O/P:TESTING Ta:25°C	173.4% HICCUP MODE AUTO-RECOVER	P
3	OVER TEMPERATURE	+115°C THEMAL SHUTDOWN	I/P:110VDC O/P:TESTING Ta: TESTING	OK AUTOMATIC RECOVERY	P

## CONTROL FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	REMOTE CONTROL	Power on : >3.0~12Vdc or open circuit Power off : R.C <1.2Vdc or short	I/P:110VDC O/P:FULL LOAD Ta:25°C	Power on : R.C>1.9Vdc or Open Power off : R.C<1.7Vdc or Short	P
2	TRIM	-10%~ +10% (Typ) Trim ~ +Vout Trim DOWN Trim ~ -Vout Trim UP Using 500K ohms VR	I/P:110VDC O/P:FULL LOAD Ta:25°C	Trim DOWN -9.86% Trim UP +10.00%	P

## SAFETY TEST

### SAFETY TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P:3.0K VDC/min	I/P-O/P:3.0K VDC/min Ta:25°C	I/P-O/P: 0.002mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>1000MΩ	I/P-O/P:500 VDC Ta:25°C	I/P-O/P>1000MΩ NO DAMAGE	P

## RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT										
1	TEMPERATURE RISE TEST	1. ROOM AMBIENT BURN-IN : 8HRS I/P:110VDC O/P:FULL LOAD Ta=25°C 2. HIGH AMBIENT BURN-IN : 8HRS I/P:110VDC O/P:FULL LOAD Ta=65°C 3. HIGH AMBIENT BURN-IN : 8HRS I/P:110VDC O/P:50% LOAD Ta=80°C			P										
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CASE</td> <td>65.4°C</td> <td>103.4°C</td> <td>106.3°C</td> </tr> </tbody> </table>			NO	Position	1	2	3	1	CASE	65.4°C	103.4°C	106.3°C	
NO	Position	1	2	3											
1	CASE	65.4°C	103.4°C	106.3°C											
2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 4 HOURS	I/P:110VDC O/P: FULL LOAD Ta= -40°C	TEST : OK	P										

## OTHER

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	MTBF	MIL-HDBK-217F,GB,25°C TOTAL FAILURE RATE : 4.878048 M.T.B.F : 205K HRS			P

TEST RESULT	TESTER	APPROVAL
PASS	ARCHEN HSIAO	PETER CHENG