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User Guide for
FEBFAN6208_CP433v1
Evaluation Board

**FAN6208 Secondary-Side
Synchronous Rectifier**

**Featured Fairchild Product:
FAN6208**

*Direct questions or comments
about this Evaluation Board to:
“Worldwide Direct Support”*

Fairchild Semiconductor.com

Table of Contents

1. Introduction.....	3
2. General Specification.....	3
3. Function Check Report.....	3
3.1. Normal Test.....	4
3.2. DC Output Turn-On Test.....	5
3.3. DC Output Turn-off Test.....	5
3.4. Dynamic Load Test.....	6
3.5. Efficiency.....	7
3.6. Short Output Test.....	7
3.7. Surge Test.....	8
3.8. ESD Test.....	8
4. Photograph.....	8
5. Schematic.....	9
6. PCB Layout.....	10
7. Bill of Materials.....	11
8. Revision History.....	12



1. Introduction

This user guide supports the FAN6208 Secondary-Side Synchronous Rectifier evaluation board. It should be used in conjunction with the product datasheet as well as Fairchild's application notes and technical support team. Please visit Fairchild's website at www.fairchildsemi.com.

2. General Specification

Specification	Min.	Max.	Units
Input			
Voltage	90	264	V _{AC}
Frequency	47	63	Hz
Output			
Output Voltage 1	24		V
Output Current 1	8		A
Output Cable (18AWG)			m
Total Output Power			
Full-load Output Power	192		W
Peak Output Power			W

3. Function Check Report

Test Model	FEBFAN6208_CP433v1-001
Test Date	2010-10-01
Test Temperature	Ambient
Test Equipment	AC source: 6220 AC POWER SOURCE Electronic Load: Chroma 63030 Power Meter: WT210 Oscilloscope: LeCroy LT434 Test Power : FAN6982 + FAN7621 + FSBH0270 24V/8A test board
Test Items	<ol style="list-style-type: none"> 1. Normal test 2. DC output turn-on test 3. DC output turn-off test 4. Dynamic load test 5. Efficiency 6. Short output test 7. Surge test 8. ESD test

3.1. Normal Test

3.1.1. Test Condition

Set output at different loading. Measure the GATE and DET.

3.1.2. Measured Waveforms

Ch1: GATE1; Ch2: DET1; Ch3: GATE2; Ch4: DET2



Figure 1. At 25% Loading



Figure 2. At 50% Loading



Figure 3. At 75% Loading



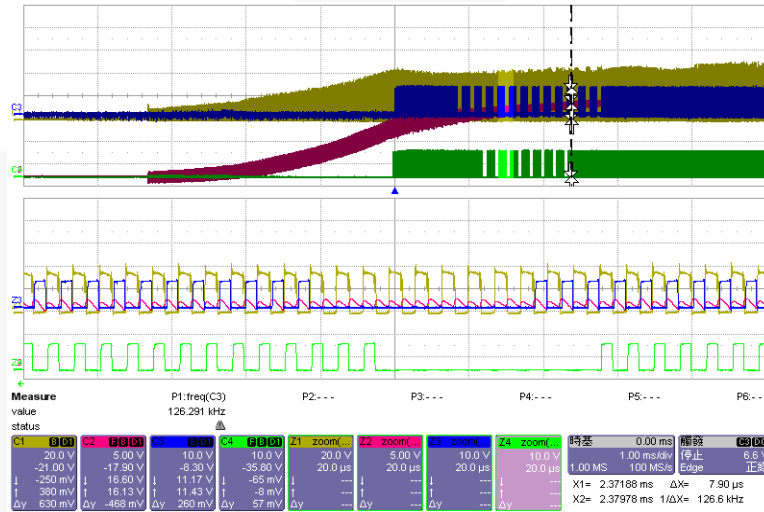
Figure 4. At 100% Loading

3.2. DC Output Turn-On Test

3.2.1. Test Condition

Set output at maximum loading. Measure the GATE and verify DET has no overlap and no voltage spike appears.

3.2.2. Measured Waveform



Ch1: DET
Ch2: XN
Ch3: GATE1
Ch4: GATE2

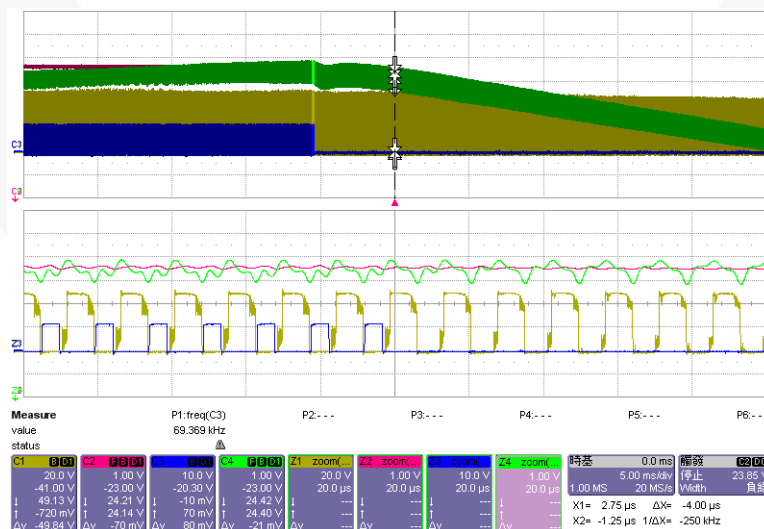
Figure 5. At Maximum Load

3.3. DC Output Turn-Off Test

3.3.1. Test Condition

Set output at maximum loading. Measure the GATE and verify DET has no overlap and no voltage spike appears.

3.3.2. Measured Waveform



Ch1: DET
Ch2: VO
Ch3: GATE1
Ch4: XN

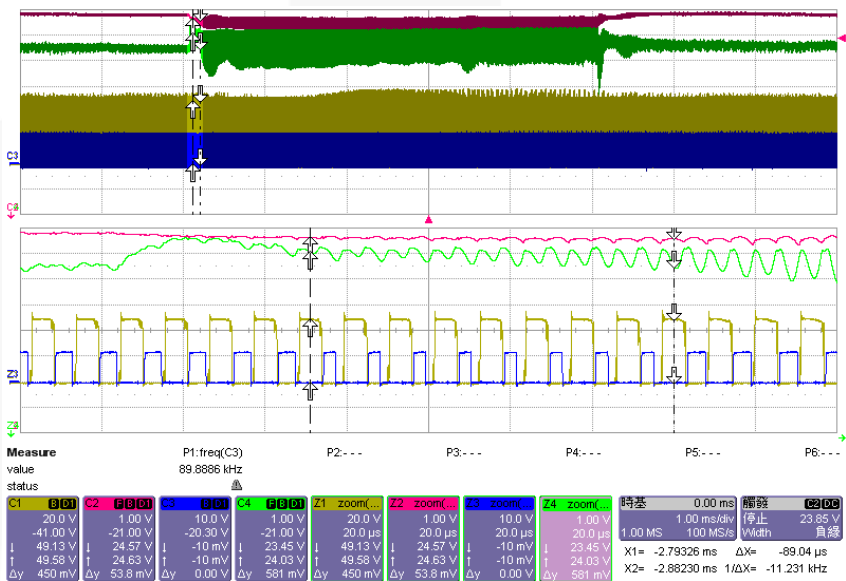
Figure 6. At Maximum Load

3.4. Dynamic Load Test

3.4.1. Test Condition

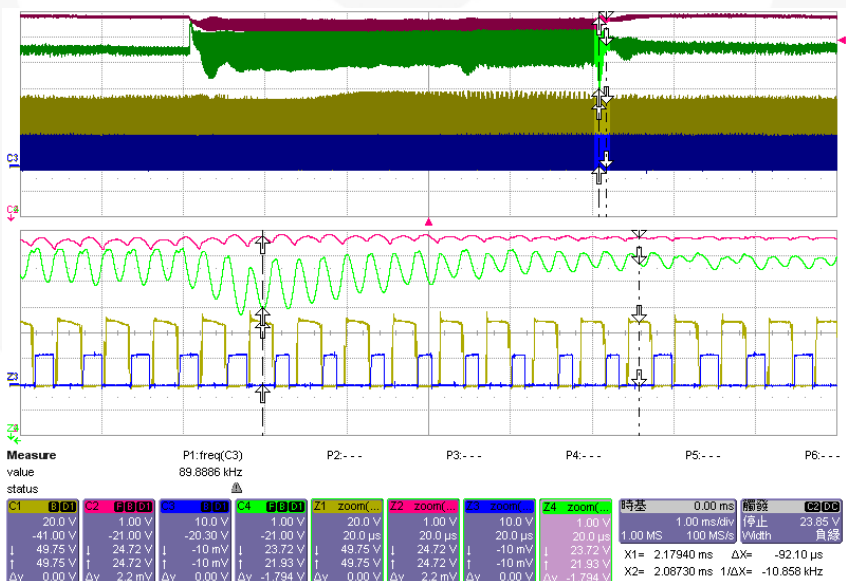
Set output loading 10% to 90%. Measure the GATE and verify DET has no overlap and no voltage spike appears.

3.4.2. Measured Waveforms



Ch1: DET
Ch2: VO
Ch3: GATE1
Ch4: XN

Figure 7. Light Load to Heavy Load



Ch1: DET
Ch2: VO
Ch3: GATE1
Ch4: XN

Figure 8. Heavy Load to Light Load

3.5. Efficiency

3.5.1. Test Condition

Output at 25%, 50%, 75%, and 100% load.

3.5.2. Test Result

Output Wattage	25%	50%	75%	100%	Specification
I _o	2A	4A	6A	8A	
P _{IN}	57.43W	110.4W	164.42W	220.6W	
P _{OUT}	48.73W	97.52W	145.91W	194.55W	
EFF	85.76%	88.8%	89.06%	88.43%	

3.6. Short Output Test

3.6.1. Test Condition

Set output short circuit. Measure the GATE and verify DET has no overlap and no voltage spike appears.

3.6.2. Measured Waveform

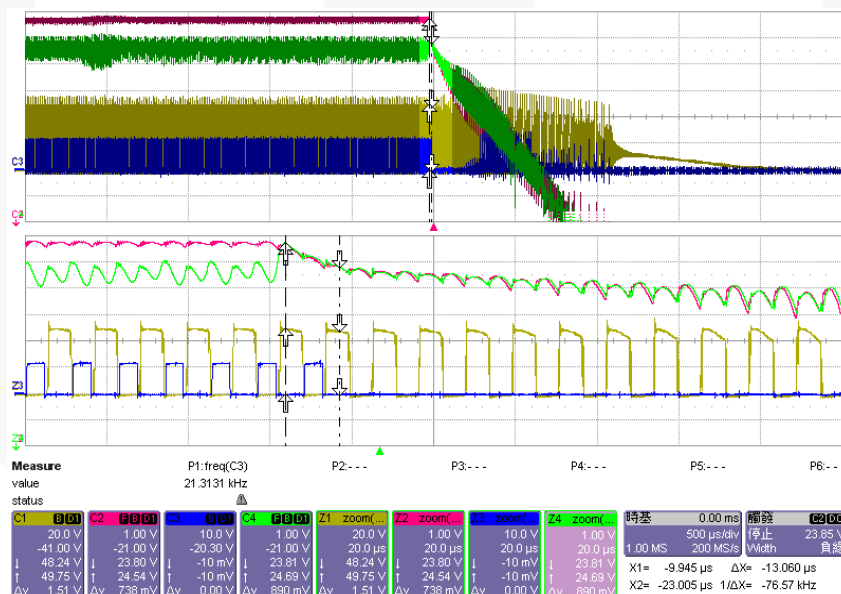


Figure 9. At Maximum Load

3.7. Surge Test

Mode	Polarity	Phase	Voltage	Condition
L-PE	+/-	0°	3KV	PASS
	+/-	90°		PASS
	+/-	180°		PASS
	+/-	270°		PASS
N-PE	+/-	0°	3KV	PASS
	+/-	90°		PASS
	+/-	180°		PASS
	+/-	270°		PASS

3.8. ESD Test

Air Discharge (16.5KV)		Contact Discharge (8.8KV)	
PASS	PASS	PASS	PASS

4. Photograph

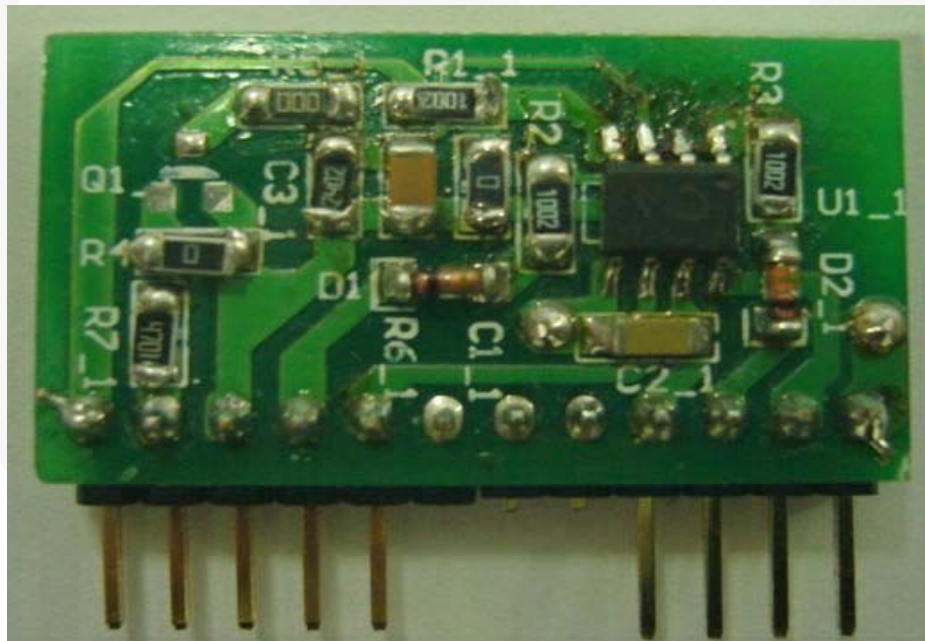


Figure 10. Top View

5. Schematic

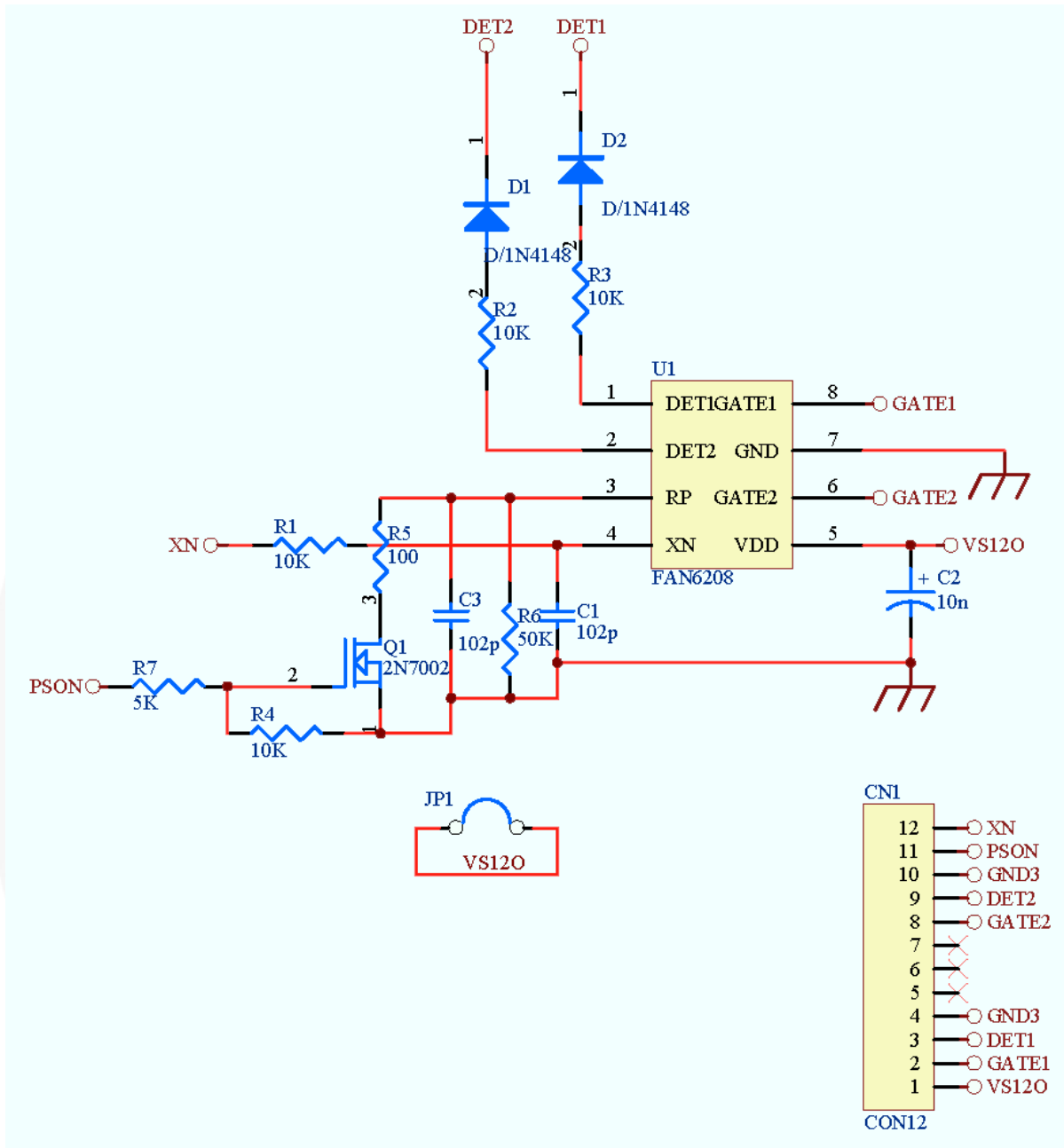


Figure 11. Circuit Schematic

6. PCB Layout

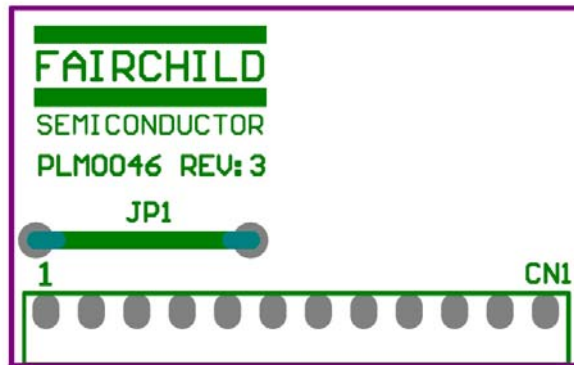


Figure 12. PCB Layout

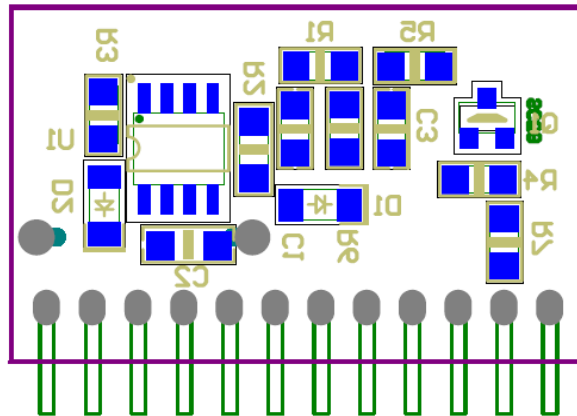


Figure 13. Top Layer

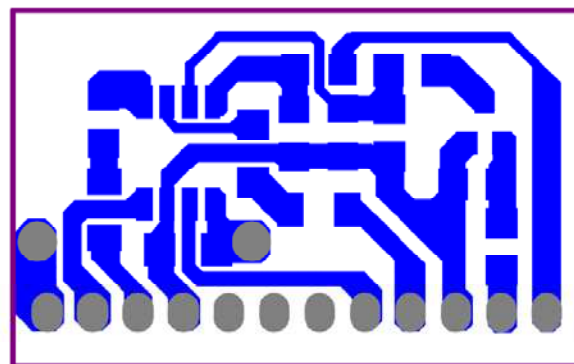


Figure 14. Bottom Layer

7. Bill of Materials

Component	Qty	Part No.	Manufacturer	Reference
JUMPER WIRE 0.6*52mm	1			JP1
SMD Resistor 1206 0Ω±5%	1			R5
SMD Resistor 1206 4.7kΩ±5%	1			R7
SMD Resistor 1206 10kΩ±5%	4			R1,R2,R3,R4
SMD Resistor 1206 20kΩ±1%	1			R6
SMD MLCC 1206 104P 100V ±10%	2			C2,C3
SMD Diode 1A/100V SOD80	2	FDLL4148	Fairchild	D1,D2
SMD MOS 2N7002	1		Fairchild	Q1
PIN HDR 1*12P 2.54mm 90°	2			CN1
SR Controller for LLC Topology	1	FAN6208MY	Fairchild	U1
PCB PLM0046 REV3	1			

8. Revision History

Rev.	Date	Description
1.0.0	November, 2011	Initial release

WARNING AND DISCLAIMER

Replace components on the Evaluation Board only with those parts shown on the parts list (or Bill of Materials) in the Users' Guide. Contact an authorized Fairchild representative with any questions.

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