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**User Guide for**  
**FEBFAN25800\_MPSLDO1**  
**FEBFAN25800\_MPSLDO2**  
**FEBFAN25801\_MPSLDO1**  
**Evaluation Board**

**500 mA Low- $I_Q$ , Low-Noise,  
LDO Regulator**

**Featured Fairchild Product:**  
**FAN25800, FAN25801**  
**(FAN2580x)**

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This user guide supports the evaluation kit for FAN2580x. 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](http://www.fairchildsemi.com)

## 1. Introduction

FAN2580x is a linear low-dropout (LDO) regulator with high PSRR and low output noise supported with controlled soft-start, thermal shutdown protection, and short-circuit protection. The enable-control pin can shutdown the device and disconnect the output load from the input. During shutdown, the supply current drops below 1  $\mu$ A. The LDO is designed to be stable with space-saving ceramic capacitors as small as 0201 case size.

Board Part Number	LDO Part Number	V <sub>IN</sub> Range	V <sub>OUT</sub>	I <sub>OUT</sub> (Max.)
FEBFAN25800_MPSLDO1	FAN25800AUC33X	2.3 V - 5.5 V	3.30 V	500 mA
FEBFAN25800_MPSLDO2	FAN25800AUC28X	2.3 V - 5.5 V	2.80 V	250 mA
FEBFAN25801_MPSLDO1	FAN25801AUC514X	2.3 V - 5.5 V	5.14 V	250 mA

## 2. Board Configuration

The FAN2580xUCX (WLCSP) evaluation board is shown in Figure 1.

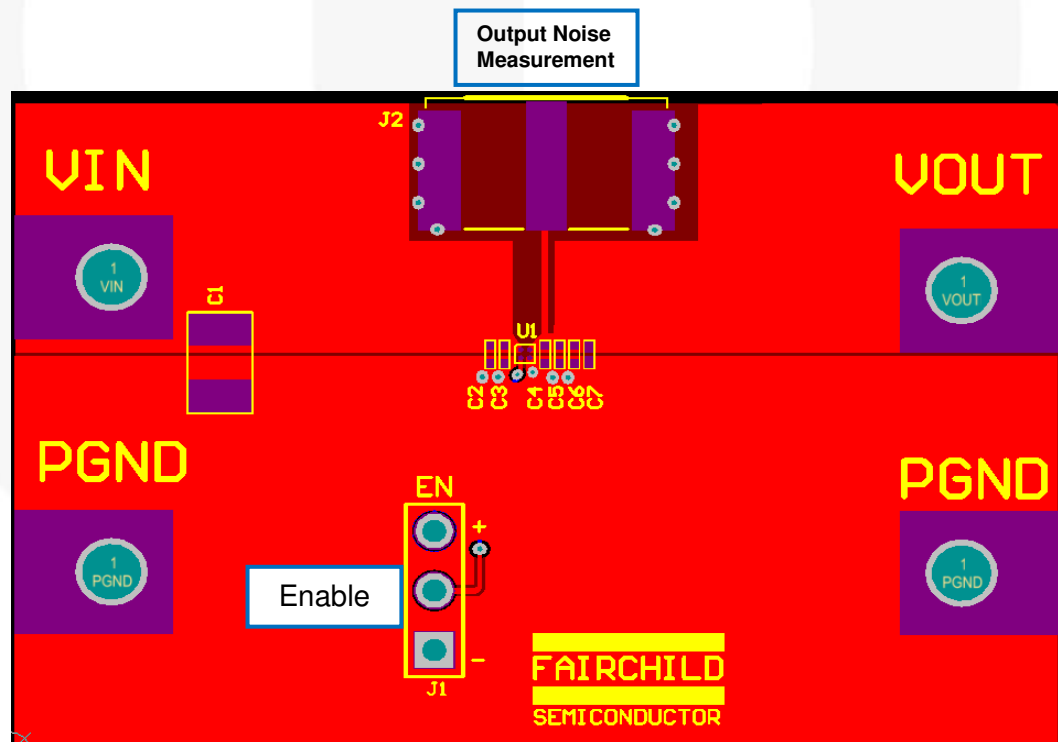
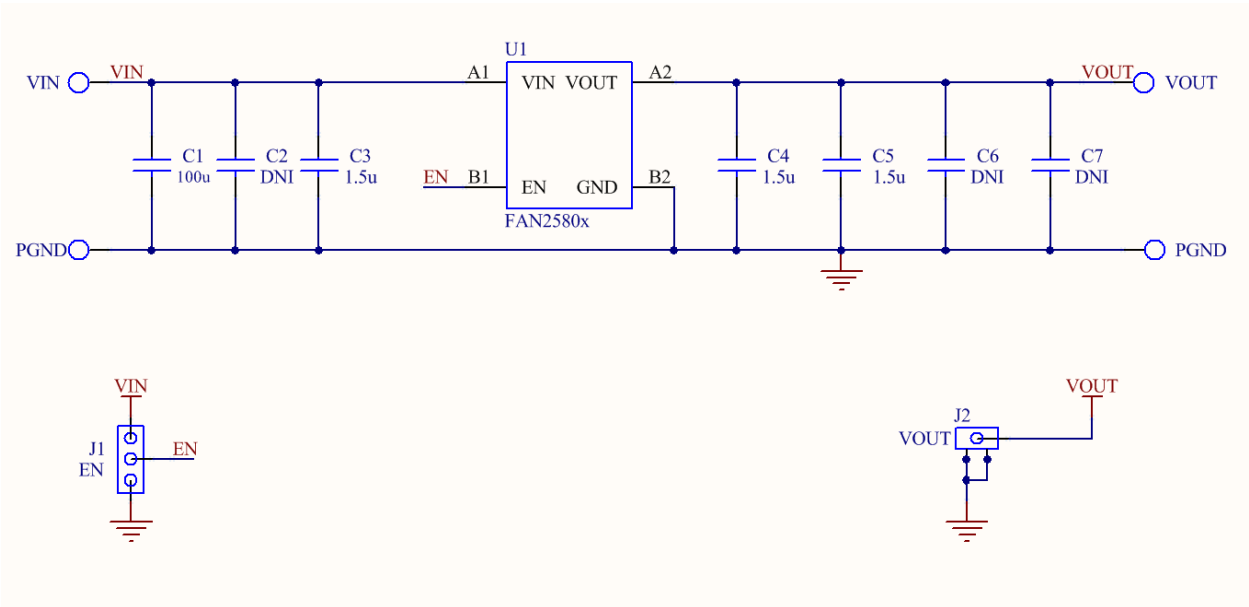


Figure 1. Top Layer

### 3. Schematic



**Figure 2. Evaluation Board Schematic**

The input capacitor ( $C_3$ ) is  $1.5 \mu\text{F}$  and the two output capacitors ( $C_4$  and  $C_5$ ) are  $2 \times 1.5 \mu\text{F}$  (option for additional capacitors are available on the PCB.) The FAN2580x can be stable with  $C_3 = C_4 = C_5 = 1 \mu\text{F}$  (0201).  $C_1$  is available to place a  $100 \mu\text{F}$  ceramic capacitor (1210), recommended to reduce noise from the inductance from long wires in a setup.



#### 4. Bill of Materials

REF	QTY	Description	Manufacturer / Part Number
U1	1	IC, FAN2580x, WLCSP-4	Fairchild / FAN25800AUC33X Fairchild / FAN25800AUC28X Fairchild / FAN25801UC514X
C3	1	1.5 $\mu$ f, 6.3 V, 20%, X5R, 0201	Murata / GRM033R60J155M
C4, C5	2	1.5 $\mu$ f, 6.3 V, 20%, X5R, 0201	Murata / GRM033R60J155M
C1	1	100 $\mu$ f, 6.3 V, 20%, X5R, 1210	TDK / C3225X5R0J107M250AC Taiyo Yuden / JMK325ABJ107MM-T
J1	1	3x1 Header Strip, 125C	Digi-Key / SAM1098-03
J2	1	Conn, SMA	Amphenol / 132255 Digi-Key / ACX1424
Turret	4	VIN, VOUT, PGND, PGND	Digi-Key / 1502-2K-ND
Black Banana Connector	2	PGND, PGND	Digi-Key / J152-ND
Red Banana Connector	2	VIN, VOUT	Digi-Key / J151-ND
<b>TOTAL</b>	<b>15</b>		

## 5. Measurements

$V_{IN}$  and  $V_{OUT}$  measurements should be made using the voltage test points (turrets posts). These “sense points” eliminate errors caused by voltage drops through Ammeters and test leads. Figure 3 depicts a typical test configuration.

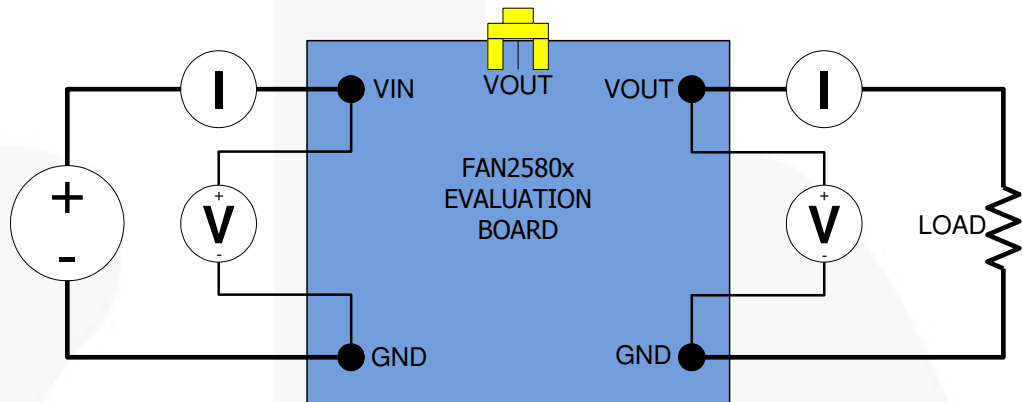


Figure 3. DC Measurement Configuration

An SMA connector is soldered to J2 (see Figure 1), which is then connected to the spectrum analyzer. A DC block can be connected between  $V_{OUT}$  and the spectrum analyzer to measure output noise or PSRR.

Table 1. Signal Table

Signal	Level
ENABLE	LOW = 0 V = DISABLE HIGH > 1.2 V = ENABLE

The enable-control pin (ENABLE) is pulled HIGH or LOW by the associated jumper. It is recommended to drive the ENABLE pin with a separate power supply (DC voltage = 1.8 V), but the pin can also be tied to  $V_{IN}$ .

## 6. Post Regulation

Due to its high PSRR and low output noise, the FAN2580x can be used as a post-DC-DC regulator to reduce the output ripple and output noise at high efficiency for noise-sensitive applications. The following shows post-DC-DC regulation of an LDO with a buck converter. The capacitor on the output of the buck converter can be shared by the LDO as its input capacitor.

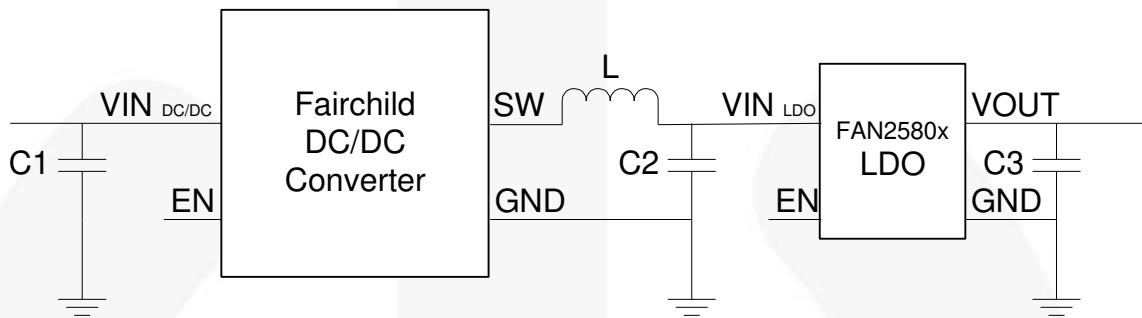


Figure 4. Post DC-DC Regulation





## 7. Revision History

Rev.	Date	Description
1.0.0	February 2014	Initial Release
1.0.3	April 2014	Update to include three board options
1.2	February 2015	Updated Links

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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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