



Demo Note for the A8583 Evaluation Board

**$4.7V_{IN} - 40V_{IN}$, $8.0V_{OUT}$, $3.5A$, $1.3MHz$
Asynchronous Buck Regulator**

GENERAL SPECIFICATIONS

Specification	Min	Nom	Max	Units
Absolute Maximum Input Voltage	-0.3	-	40	Volts
Operating Input Voltage Range	4.7	12	36	Volts
V _{IN} START Threshold, V _{IN} rising	-	4.2	4.6	Volts
V _{IN} STOP Threshold, V _{IN} falling	-	3.8	4.2	Volts
Output Voltage (FB: 4.42K/40.2K, ±1%)	7.773	8.076	8.387	Volts
Steady-State Output Current	-	3.5	-	A
Pulse-by-pulse Current Limit	4.75	-	6.25	A
Enable/Synchronization Input	-0.3	-	5.5	Volts

OPERATING INSTRUCTIONS

Input Power Connection:

Connect a 12V power supply from V_{IN} to GND that is capable of at least 4.5A. **Once operational, V_{IN} can fall as low as 3.8V_{TYP} (4.2V_{MAX}) before the A8583 is reset.**

Enable Input Connection:

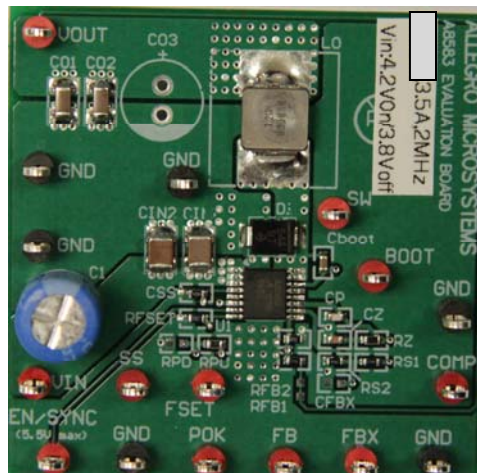
Connect an Enable signal from EN/SYNC to GND. If the EN/SYNC input voltage is higher than 1.8V the A8583 will be enabled. If the EN/SYNC input voltage is lower than 0.8V the A8583 will be disabled. Also, EN/SYNC may be used to simultaneously enable the A8583 and synchronize the PWM switching frequency by applying a square wave above 1.5MHz.

Note: Continuously applying more than 5.5V to the EN/SYNC pin may damage the A8583.

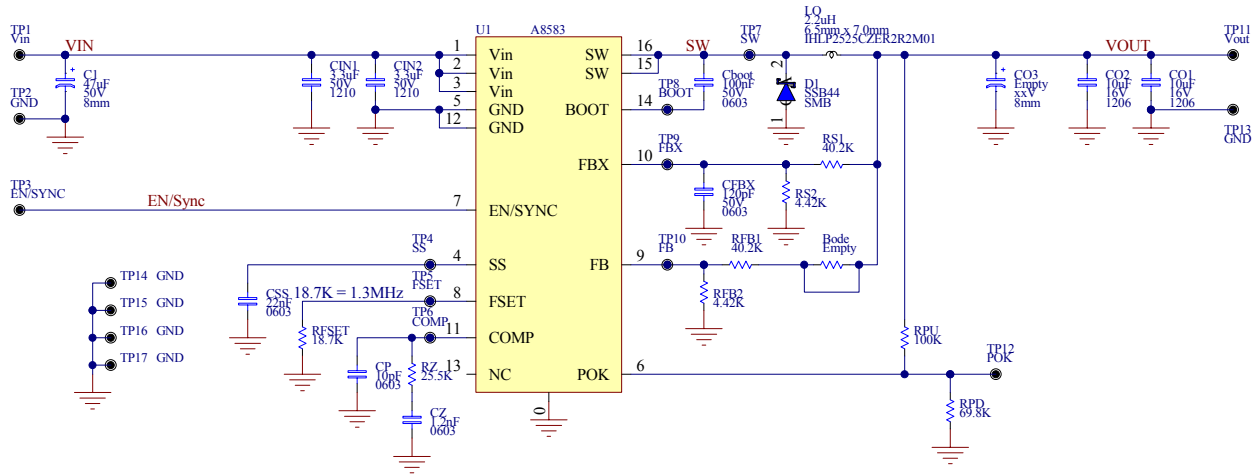
Output Load Connections:

Connect a load from V_{OUT} to GND. The steady-state load current can be as high as 3.5A. Pulse-by-pulse current limit and/or thermal shutdown will occur if the load is greater than 4.75A.

DEMO BOARD PICTURE



DEMO BOARD SCHEMATIC

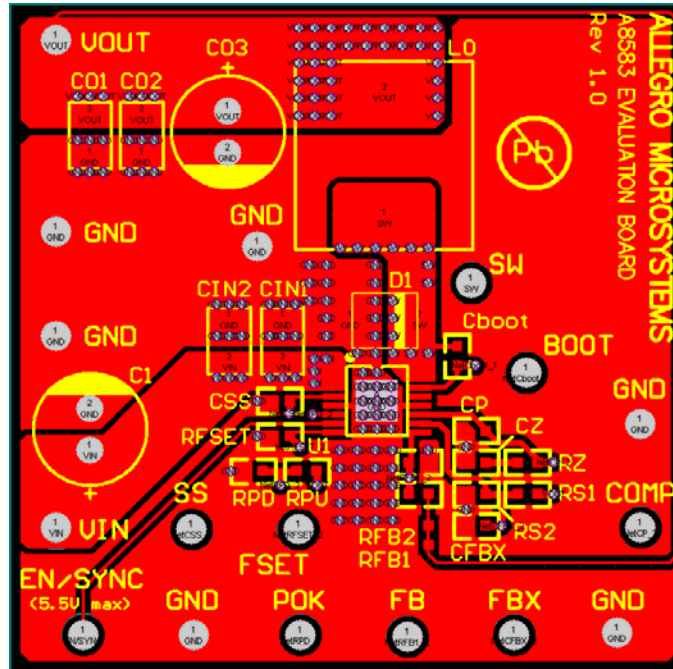


Note: C1 is an optional, bulk, electrolytic capacitor for general supply filtering

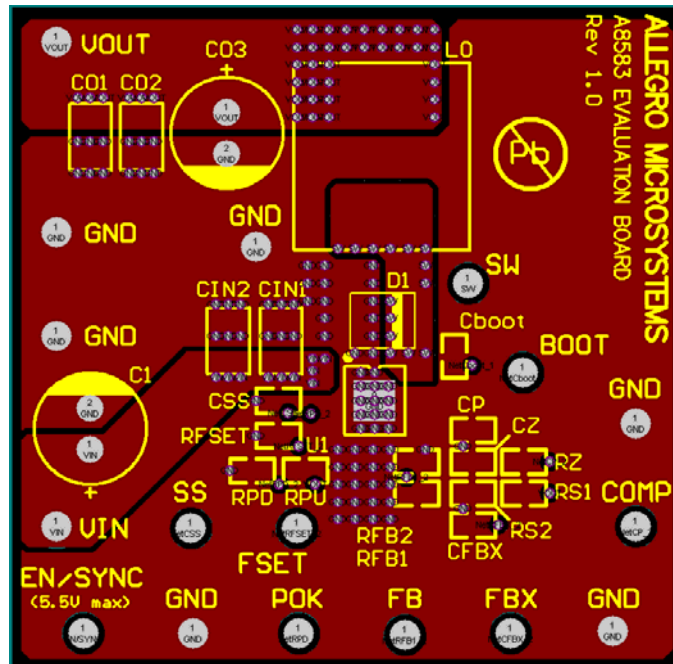
DEMO BOARD BILL-OF-MATERIALS

REFERENCE DESIGNATORS	DESCRIPTION	FOOTPRINT	QTY.	MANUFACTURER	MANUFACTURER P/N	SOURCE	PURCHASE P/N
PCB	A8583 EVAL PCB for eTSSOP16, Rev 1.0	N/A	1	Allegro MicroSystems		4pcb.com	
U1	A8583, 3.5A Buck Regulator	eTSSOP-16	1	Allegro MicroSystems	A8583		
RFB1, RS1	Resistor, 40.2Kohms, 1/10W, 1%	0603	2				
RFB2, RS2	Resistor, 4.42Kohms, 1/10W, 1%	0603	2				
RFSET	Resistor, 18.7Kohms, 1/10W, 1%	0603	1				
RZ	Resistor, 25.5Kohms, 1/10W, 1%	0603	1				
RPU	Resistor, 100Kohms, 1/10W, 1%	0603	1				
RPD	Resistor, 69.8Kohms, 1/10W, 1%	0603	1				
C1	Capacitor, Electrolytic, 47uF, 50V, 0.35ohms, 440mArms, -40degC to 125degC	Thru Hole 8mm x 11.5mm	1	Nichicon	UBT1H470MPD	Mouser	647-UBT1H470MPD
CIN1, CIN2	Capacitor, Ceramic, 3.3uF, 50V, 10% or 20%, X5R or X7R, -55degC to 125degC	1210 part, 1210 pads	2	TDK	C3225X7R1H335M or C3225X7R1H335K	Digikey	445-1432-1-ND 445-3936-1-ND
CO1, CO2	Capacitor, Ceramic, 10uF, 16V, 10%, X7R, -55degC to 125degC	1206 part, 1210 pads	2	TDK	C3216X7R1C106K	Digikey	445-4042-1-ND
CBOOT	Capacitor, Ceramic, 0.1uF, 50V, 10%, X7R	0603	1				
CSS	Capacitor, Ceramic, 22nF, 25V, 10%, X7R	0603	1				
CZ	Capacitor, Ceramic, 1.2nF, 50V, 10%, X7R	0603	1				
CP	Capacitor, Ceramic, 10pF, 50V, 10%, X7R	0603	1				
CFBX	Capacitor, Ceramic, 120pF, 50V, 10%, X7R	0603	1				
CO3, CO4, CO5, CIN3, CIN4, CSNUB, LX, RSNUB	Empty	Various	0				
D1	Diode, Schottky, 4A, 40V	SMB	1	Vishay	SSB44-E3/52T	Digikey Mouser	SSB44-E3/52TGICT-ND 625-SSB44-E3
LO	Inductor, SMT, 2.2uH, 20mohms max, 14Asat	6.5mm x 7mm 3mm thick	1	Vishay	IHLP2525CZER2R2M01	Digikey Mouser	541-1008-1-ND 70-IHLP2525CZER2R2M1
VIN, EN/SYNC, SS, FSET, COMP, SW, BOOT, FBX, FB, POK, VOUT	Test Points, Red, 0.063" diameter	0.063"	11	Keystone	5010	Digikey	5010K-ND
GND	Test Points, Black, 0.063" diameter	0.063"	6	Keystone	5011	Digikey	5011K-ND
Rubber Feet	Self stick rubber feet	Clear	4	3M	SJ-5303 (CLEAR)	Digikey	SJ5303-7-ND

DEMO PCB LAYOUT:



Top Layer and Top Silk



Layer 2 and Top Silk

