

DESIGN NOTES

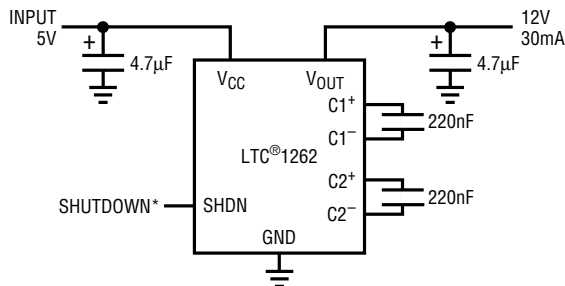
Flash Memory VPP Generator Reference Designs

Design Note 97

Mitchell Lee

The VPP generator circuits shown here cover a range of 30mA to 240mA with 3.3V or 5V inputs as noted. Table 1 summarizes these circuits for quick reference.

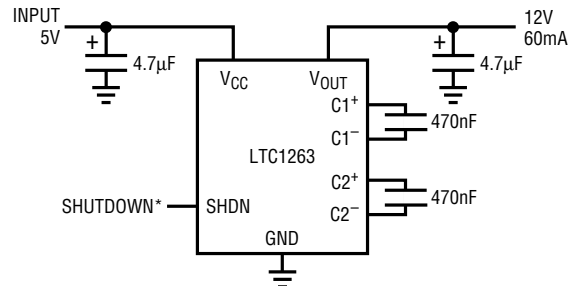
30mA from 5V Input



*0 = PROGRAM, 1 = SHUTDOWN

DN97 • F01

60mA from 5V Input



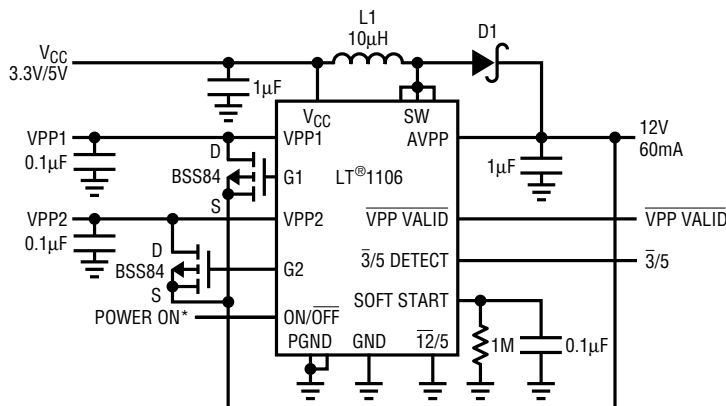
*0 = PROGRAM, 1 = SHUTDOWN

DN97 • F02

Charge pump design uses no inductors. This is a minimum component count, minimum size solution.

Charge pump design uses no inductors. This is a minimum component count, minimum size solution.

60mA from 3.3V/5V Input



DN97 • F03

FOR TYPE I CARDS:

L1: DALE ILS-3825-01

D1: 4 BAT54Cs IN PARALLEL (PHILIPS), 1.1mm MAXIMUM HEIGHT

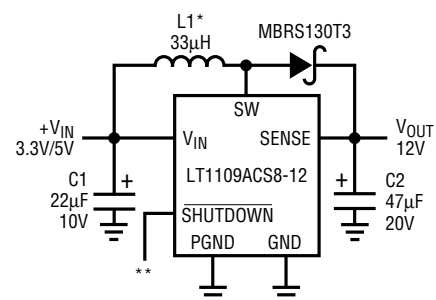
FOR TYPE II CARDS:

L1: MURATA ERIE LQH3C100K04M00

D1: MOTOROLA MBRS0520, 2.1mm MAXIMUM HEIGHT

*1 = PROGRAM, 0 = SHUTDOWN

60mA/120mA from 3.3V/5V Input



DN97 • F04

* COILTRONICS CTX33-2
SUMIDA CD54-330LC

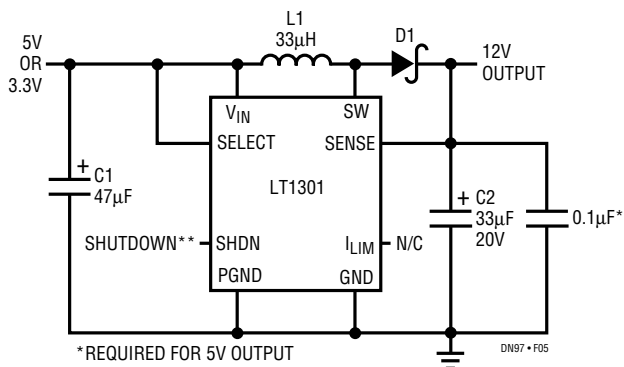
** 1 = PROGRAM
0 = SHUTDOWN

All surface mount, minimum component count solution.

Designed for PCMCIA Type I or Type II in-card use. The LT1106 includes VPP bank switching for up to four memory chips.

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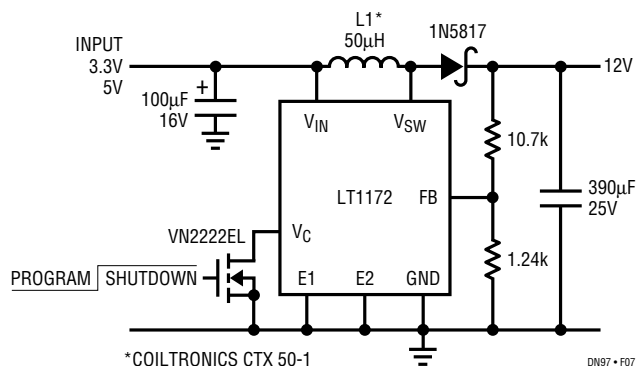
60mA/120mA from 3.3V/5V Input



L1: COILCRAFT D03316-333 OR SUMIDA CD73-330KC
D1: 1N5817 OR MOTOROLA MBR5130LT3
C1: AVX TPSD476M016R0100 OR SANYO OS-CON 165A47M
C2: AVX TPSD336M020R0100 OR SANYO OS-CON 205A33M

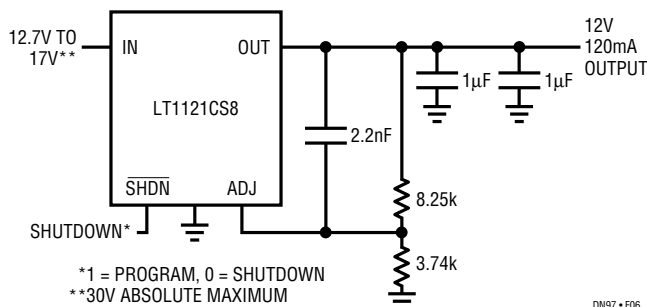
Efficiency is 84% to 88% at full load.

120mA/240mA from 3.3V/5V Input



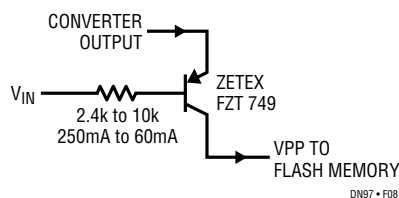
High output current converter programs up to eight memory chips simultaneously.

120mA from 12.7V to 17V Input



This circuit serves as a post regulator for flyback converters or overwindings. Output automatically falls to zero in shutdown.

Output Disconnect



This shutdown circuit allows output to drop to zero when switching converter is disabled.

Table 1. Summary of Flash Memory VPP Generator Solutions

Number of Flash Chips			Regulator	Advantages
V _{IN} = 3.3V	V _{IN} = 5V	V _{IN} = 12.6V To 17V		
—	1	—	LTC1262	No Inductors
—	2	—	LTC1263	No Inductors
2	2	—	LT1106	PCMCIA Type I In-Card Use. Includes VPP Bank Switching for 4 Memory Chips
2	4	—	LT1109A	Low Cost
2	4	—	LT1301	High Efficiency
—	—	4	LT1121	Linear Post Regulator
4	8	—	LT1172	High Current

For literature on our Switching Regulators, call **1-800-4-LINEAR**. For applications help, call (408) 432-1900, Ext. 361