

DESIGN NOTES

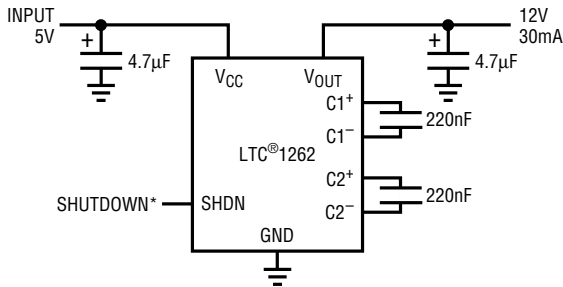
Flash Memory VPP Generator Reference Designs

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.

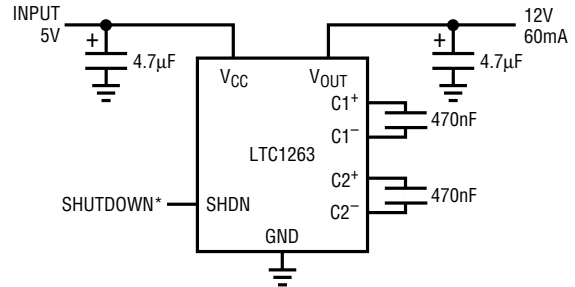
30mA from 5V Input



*0 = PROGRAM, 1 = SHUTDOWN

DN97 • F01

60mA from 5V Input



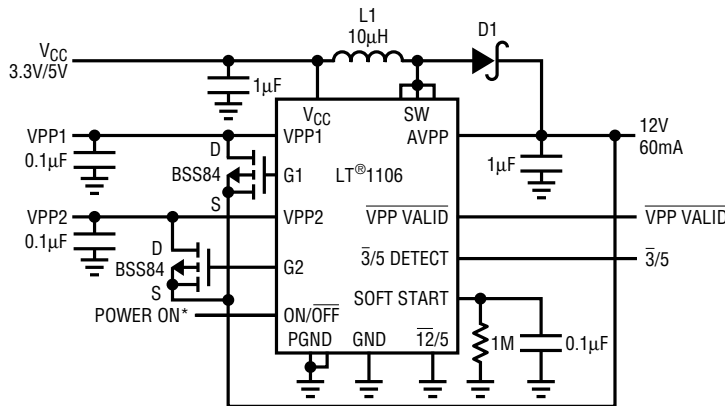
*0 = PROGRAM, 1 = SHUTDOWN

DN97 • F02

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

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60mA from 3.3V/5V Input



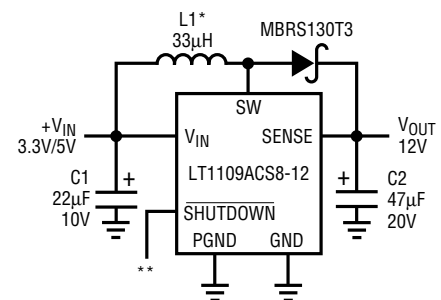
DN97 • F03

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



* COILTRONICS CTX33-2
SUMIDA CD54-330LC

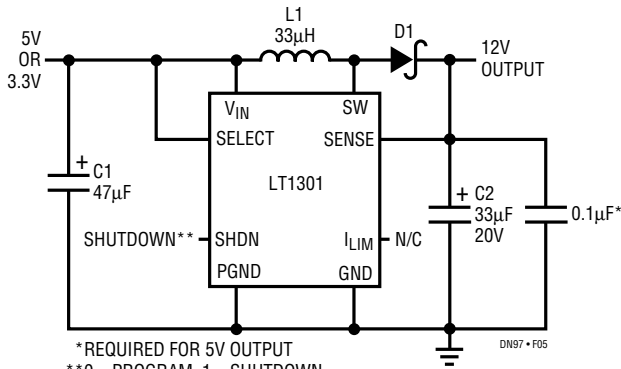
** 1 = PROGRAM
0 = SHUTDOWN

DN97 • F04

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.

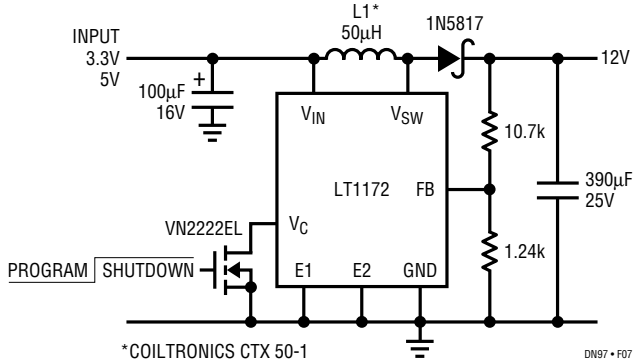
60mA/120mA from 3.3V/5V Input



*REQUIRED FOR 5V OUTPUT
 **0 = PROGRAM, 1 = SHUTDOWN
 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.

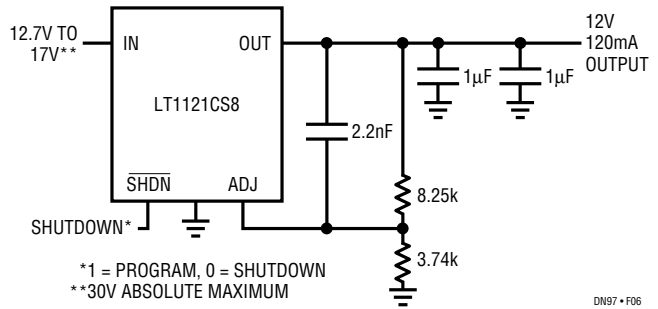
120mA/240mA from 3.3V/5V Input



*COILTRONICS CTX 50-1

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

120mA from 12.7V to 17V Input

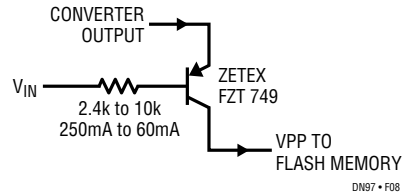


*1 = PROGRAM, 0 = SHUTDOWN
 **30V ABSOLUTE MAXIMUM

DN97 • F06

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

Output Disconnect



DN97 • F08

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