

EL Driver Demonstration PC Boards, IMP-DBM and IMP-DBS

Introduction

These Demonstration Boards provide a platform for demonstration and experimentation with IMP's EL lamp drivers IMP803, IMP560 and IMP525. The PC board has space for all of the components required for a complete application circuit. In addition, compact size facilitates their use in prototype systems.

For normal operation, the enable pad (EN), the V_{DD} pad and the V_L pad are all connected to the positive supply voltage. If the board is located far from the supply, a $10\mu\text{F}/10\text{V}$ tantalum capacitor from V_L to GND should be used to keep supply impedance low (This cap, or its equivalent, is normally present in a manufactured circuit). Also, better noise immunity may be achieved by utilizing separate wires for the V_L and V_{DD} connections.

The C_{BATT} capacitor is used to bypass the supply pin of the IC. The C_{SW} capacitor (IMP525 only) is utilized to reduce noise on the high impedance R_{SW} pin. C_{SW} should never be greater than 100pF since this can result in instability of the 525's internal oscillator.

The layout was designed to reduce the effects of noise through use of a ground plane and by separation of the high-current components (inductor, diode, and reservoir capacitor) from the high-impedance portion of the circuit (the high-value frequency-setting resistors). Additionally, the lengths of high-current traces were minimized.

If parts are replaced or exchanged by hand-soldering, care should be taken to thoroughly clean the residual flux from the board surface. Otherwise, resultant leakage currents may prevent proper operation of the part. The tight spacing and high impedances of input nodes on the PCB exacerbate this effect. The predominant impact of PCB leakage is a shift in the switch and commutation frequencies away from their designed values due to leakage currents from the R_{SW} and R_{EL} pins.

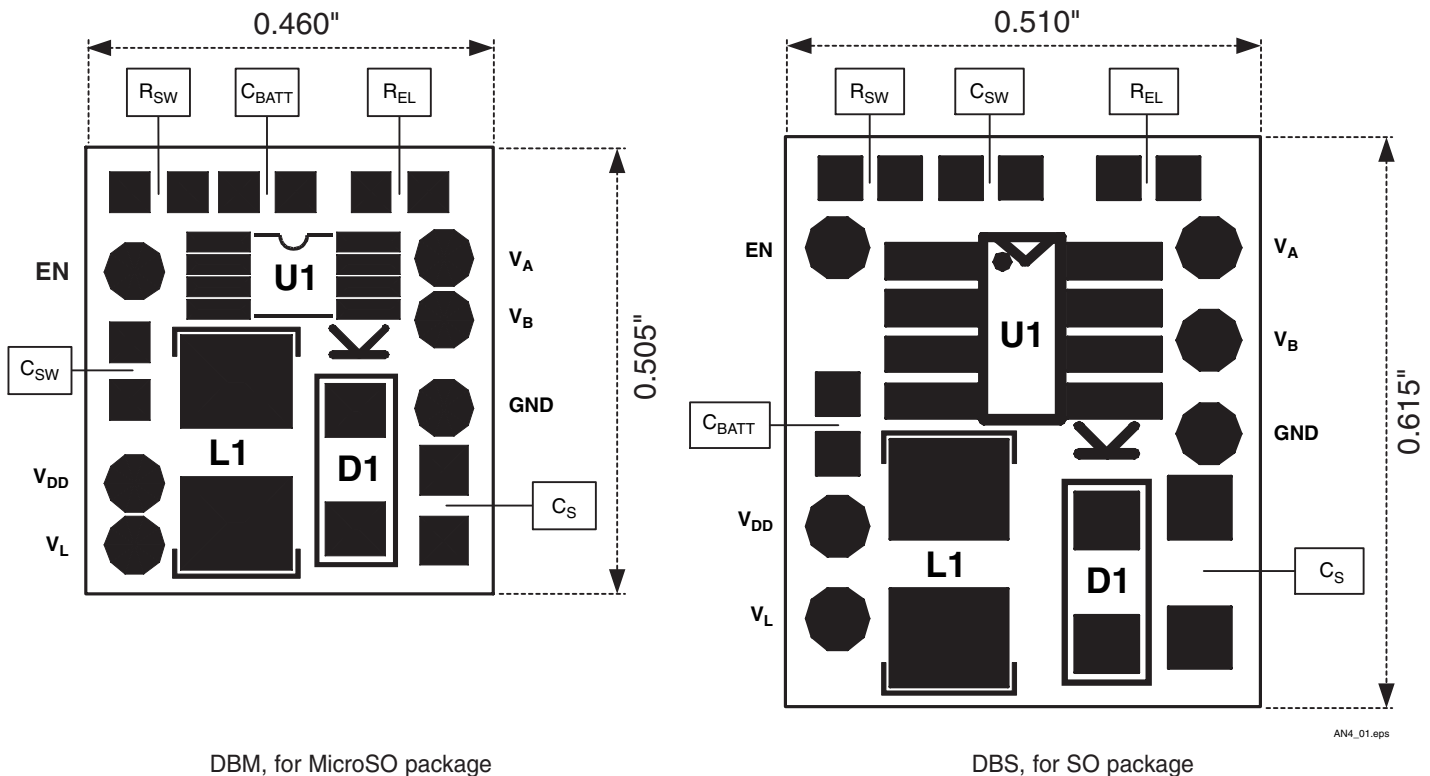


Figure 1. Top View of Printed Circuit Board

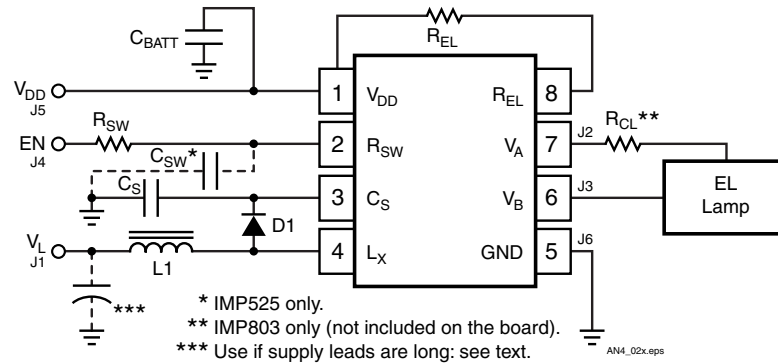


Figure 2. Demonstration Board Schematic.

Table 1. Bill of Materials (use as required)

Component	Package	Manufacturer and Part Number	IMP803	IMP560	IMP525
R _{SW}	0603	Any	750kΩ	750kΩ	1MΩ
R _{EL}	0603	Any	2MΩ	2MΩ	1MΩ
R _{CL}	0603	Any	510Ω	—	—
L1	1812	Murata LQH4N561K04	560μH	560μH	560μH
C _S	0805	NovaCap 0805B683K101NT	68nF/100V	68nF/100V	68nF/100V
D1	SOD80	4148-type	100V	75V	75V
C _{BATT}	0603	Any	100nF	100nF	100nF
C _{SW}	0603	Any	—	—	100pF, max

Table 2. Component Description Table

Component	Function	Comments
R _{SW}	Sets switch frequency	Decreasing R increases frequency.
R _{EL}	Sets commutation frequency	Decreasing R increases frequency.
R _{CL}	Limits output current	Optional <i>external</i> part: protects bridge if V(C _S) > 80V (IMP803 only).
L1	Boost inductor	Delivers energy to C _S .
C _S	Reservoir capacitor	Delivers energy to commutating bridge.
C _{SW}	Noise reduction capacitor	Optional, use if flickering is observed (IMP525 only).
C _{BATT}	Supply bypass capacitor	Optional (use if missing from external circuit)
D1	Catch diode	Fast recovery diode recommended. Observe BV _{REV} .