

Using the EL7566 Demo Board

Please refer to the datasheet for the application of features.

This demo board is preset to 1.8V for V_O and operates at

500kHz switching frequency. The measured crossover

frequencies are around 50kHz with the compensation

Technical Brief

July 9, 2003

values.

TB415.1

Introduction



The EL7566 is a high efficiency fullfeatured synchronous 6A step-down regulator. This document lists the completed schematic diagram and BOM, as well as the

layout. With components on one side of the PCB, the complete converter occupies less than 0.72in² of space.

Circuit Diagram

U1 R₀ сс SGND 1 28 C₀ С C₁₂ OPEN C₁₁ 7.68K C_2 8200pF OPEN 270pÉ OPEN 2 VREF COSC 27 ╈ 0.022µF 3 FB STN 26 < STN R₂ R₁ 4 vo STP < STP</pre> 12.7K 10.2K V_{TJ} 5 VTJ EN 24 < EN C₄ TM R₆ 0.022µF 6 ТΜ PG 23 < PG 10K с₈ R₅ £ 7 SEL VDD 22 ╉ 10K L₁ 1uF SEL > V_{OUT} (8 LX **VIN** 21 R₃ OPEN R4 2.7µH OPEN C₅ 9 LX **VIN** 20 150µF < V_{IN} GND> + C₁₀ C9 10 LX **VIN** 19 ΊμF 100µF 11 LX PGND 18 12 LX PGND 17 < GND LX 🥎 13 LX PGND 14 NC NC 15 EL7566CRE



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DESIGNATOR	VALUE	PACKAGE	MANUFACTURER	PHONE #	PART NUMBER
C ₀	8200pF	0603	Any X5R or X7R		
C ₂ , C ₄	0.022µF	0603	Any X5R or X7R		
C ₅ (Note 1)	150µF/4V	D-Size	Panasonic	408-945-5660	EEFUD0G151(X)R
C ₇	270pF 5%	0603	Any		
C ₈	1µF	0603	Any X5R or X7R		
C ₉	1µF	0603	Any X5R or X7R		
C ₁₀ (Note 2)	100µF/6V	D-Size	Panasonic		EEFUD0J101(X)R
R ₀	7.68K/1%	0603	Any		
R ₁	12.7K/1%	0603	Any		
R ₂	10.2K/1%	0603	Any		
R ₅	10K/1%	0603	Any		
R ₆	10K/1%	0603	Any		
L ₁	2.7µH		Coilcraft	847-639-6400	DO3316P-272HC
U1	EL7566DRE	HTSSOP-28	Intersil	888-INTERSIL	EL7566DRE

TABLE 1. DEMO BOARD BILL OF MATERIAL WITH SPCAP ($V_0 = 1.8V$)

NOTES:

1. May be substituted by Sanyo (619-661-6835) POSCAP 4TPE150M.

2. May be substituted by Sanyo POSCAP 6TPE100M or higher value.

The output voltage can be as high as the input voltage minus the PMOS and inductor voltage drops. Use R_1 and R_2 to set the output voltage according to the following formula:

$$V_{O} = V_{FB} \times \left(1 + \frac{R_{1}}{R_{2}}\right)$$

Where V_{FB}=0.8V

When the resisters are changed, please change the compensation capacitor C_0 and resister R_0 . For the convenience, standard values of R_1 and R_2 are listed in Table 2.

 ${\sf R}_5$ and ${\sf R}_6$ can be eliminated if voltage margin feature is not used. Connect TM and SEL pins directly to ground.

1206, 1210, 1812, and D-size can be placed at C_5 and C_{10} positions.

TABLE 2. FEEDBACK RESISTER AND COMPENSATION VALUES (SPCAP)

V _O (V)	C ₀ (pF)	R₀ (k Ω)	R₁ (k Ω)	R₂ (k Ω)
0.8	8200	3.57	0	Open
1	8200	4.42	2.49	10
1.2	8200	5.23	4.99	10
1.5	8200	6.49	10	11.5
1.8	8200	7.68	12.7	10.2
2.5	8200	10.5	21.5	10
3.3	8200	13.7	36	11.5

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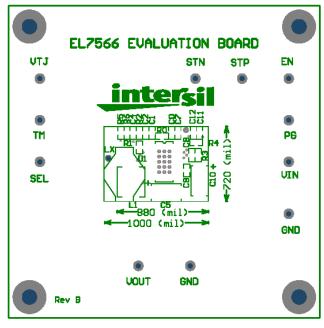
Ceramic capacitors (X5R or X7R types only) can be use for the input and output with equivalent capacitance for C₅ and C₁₀. Different R₀ and C₀ are required. Table 3 lists the compensation values with MLCC capacitors.

TABLE 3. FEEDBACK RESISTER AND COMPENSATION VALUES WITH MLCC CAPACITORS

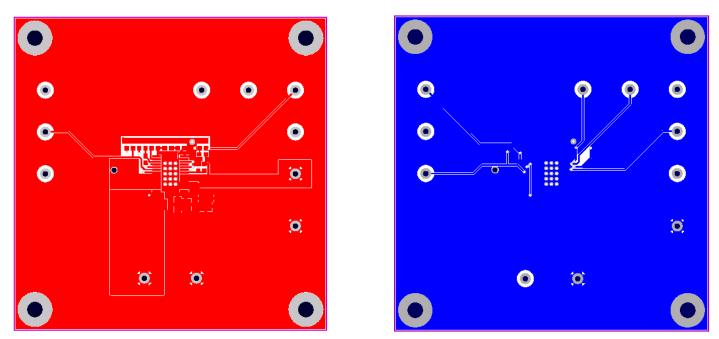
V _O (V)	C ₀ (μF)	R₀ (k Ω)	R₁ (k Ω)	R₂ (k Ω)
0.8	0.012	3.09	0	Open
1	0.012	3.57	2.49	10
1.2	0.012	4.42	4.99	10
1.5	0.012	5.23	10	11.5
1.8	0.012	6.49	12.7	10.2
2.5	0.012	7.68	21.5	10
3.3	0.012	10.5	36	11.5

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Demo Board Layout



TOP SILKSCREEN



TOP LAYER

BOTTOM LAYER

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