



SP6002 (Application Guide In Chinese)

Synchronous Rectifier Driver

Application Guide In Chinese

This guide provides the basic knowledge to adjust SP6002 used in the secondary side of the SMPS.

1. Sync Pin (Pin 8)

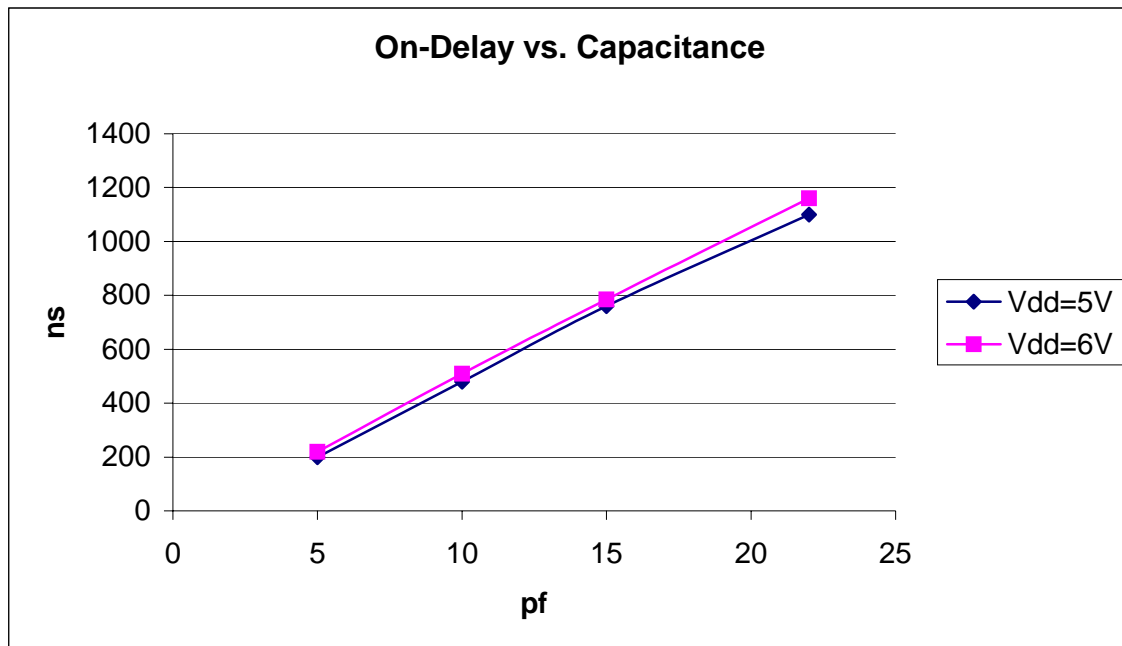
調整 sync high threshold 電位，利用外部分壓電阻器調整 sync threshold high voltage $> 3.9V@AC$ input =90V，若切換成 AC input =264V，內建 ZENER DIODE，將自動將箝位在 7.5V，避免將 IC 損壞。

2. Timing Pin (Pin 1)

此 pin 設定觸發電流的敏感度，當調整至適當的電阻值時，SP6002 即會被觸發而在 pin 4 (MOSG-F) 及 pin 6 (MOSG-F)產生訊號。當 pull up 至+5V(VDD)，電阻值一般為 8Kohm 至 20Kohm 間。

3. ON Delay (Pin2)

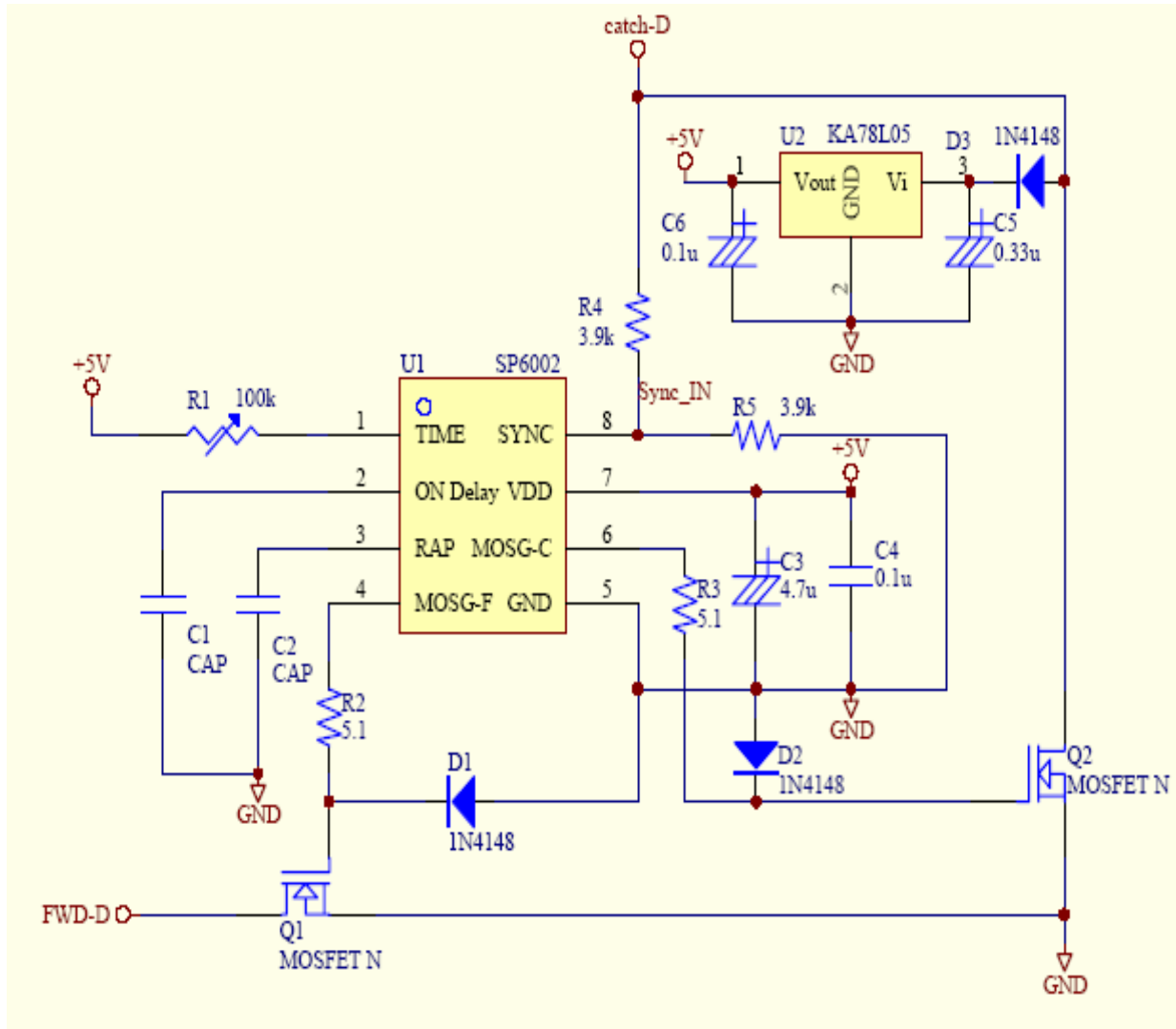
此 pin 是要調整 catch-MOSFET gate turn off 時，forward-MOSFET gate 所要延長的時間，此值的調整在 DCM 時更加重要，若調整適當，會將 MOSFET 的 body diode 導通時間降低，有利於系統的效率提升。





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4. Application Circuit



Note : C4 必須靠近 Pin 7

5. Sync Pin 使用 function generator 輸入

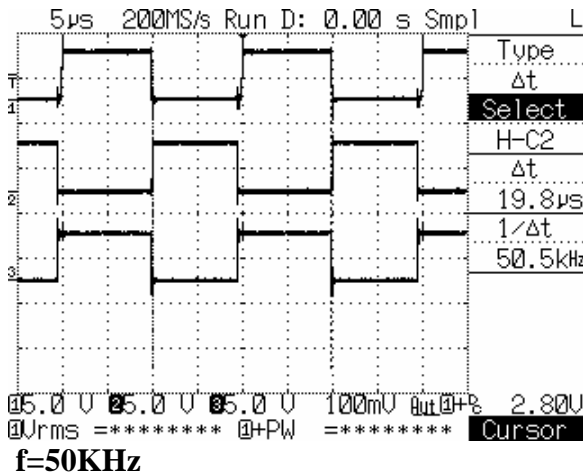
- (1) 移除 R4，將 function generator 的方波由此 pin 輸入，sync threshold high 超過 3.9V 且 sync threshold low 低於 0.9V。
- (2) 由 78L05 output(C6+ point)輸入 +5V DC 至 pin 7。
- (3) 將 MOSFET 之 drain 腳個別連接一個 100ohm 電阻，然後接至 VDD(+5V)。
- (4) 此時的 waveform 如下：



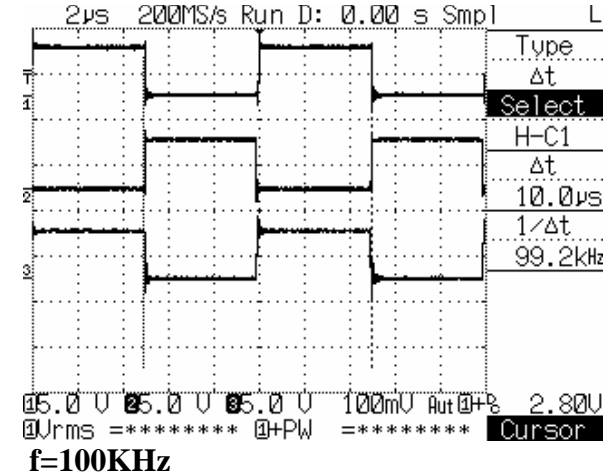
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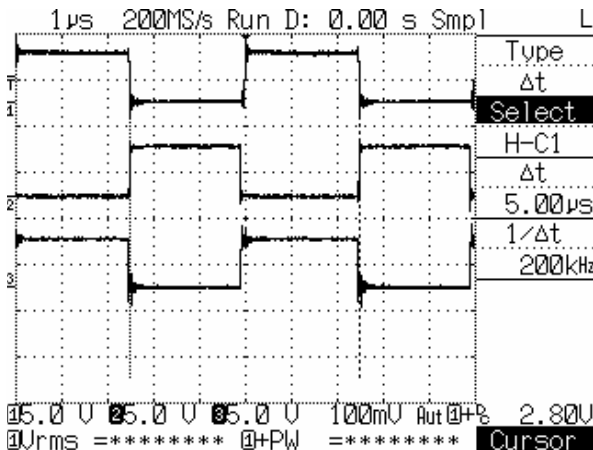
CH1:SYNC input CH2:MOSG-C CH3:MOSG-F



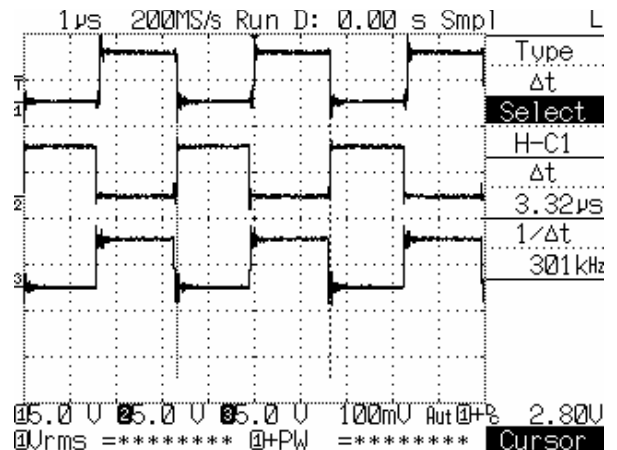
f=50KHz



f=100KHz



f=200KHz



f=300KHz

6. Sync Pin 使用 SMPS 二次側訊號輸入

(1) 調整適當 resistor divider 值, 在 90V AC input 時 sync threshold high 超過 3.9V 且 sync threshold low 低於 0.9V(pin 8)。

Note: 在實際觀察 gate 輸出時, 不可加任何電容於 pin 8 中, 即使是示波器 probe, 所以當 pin 8 電位調整正確時, 即將 probe 移除。

(2) 若 input AC 264V 時, IC 內部有一個 ZENER DIODE 會將 input 箝位至 7.5V。

(3) 調整適當 R1 值, 使得 SP6002 產生觸發訊號。

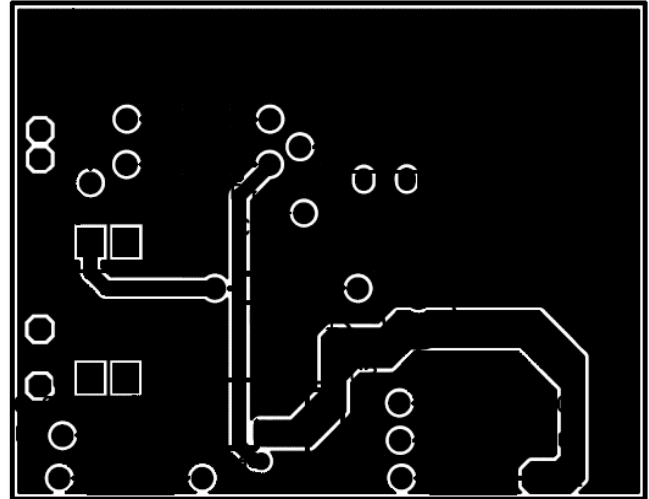
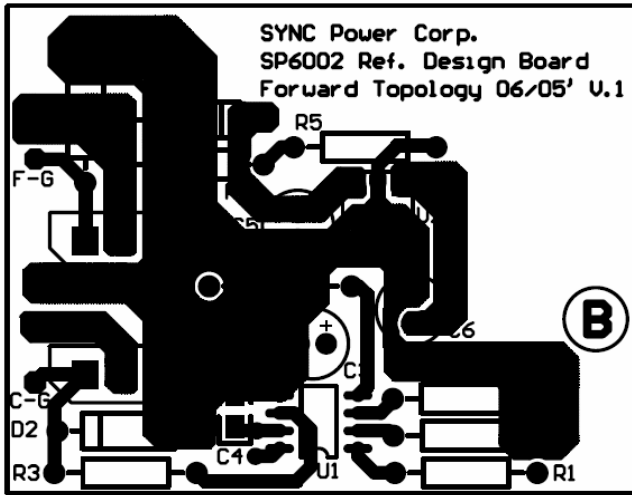
(4) 再調整適當 C2 值, 讓 SMPS 得到最佳效率。

Note: 因為一般 78L05 只可以耐壓至 35V, 若 forward-MOSFET drain 訊號超過此電壓, 建議先移除 78L05, 利用外加 DC source 方式以了解 SP6002 特性。實際應用時可另行加繞線圈以提供穩定電壓。



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7. Demo board Layout



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