



SP6003 (Application Guide In Chinese) Synchronous Rectifier Driver

Application Guide In Chinese

This guide provides the basic knowledge to adjust SP6003 used in the secondary side of the SMPS.

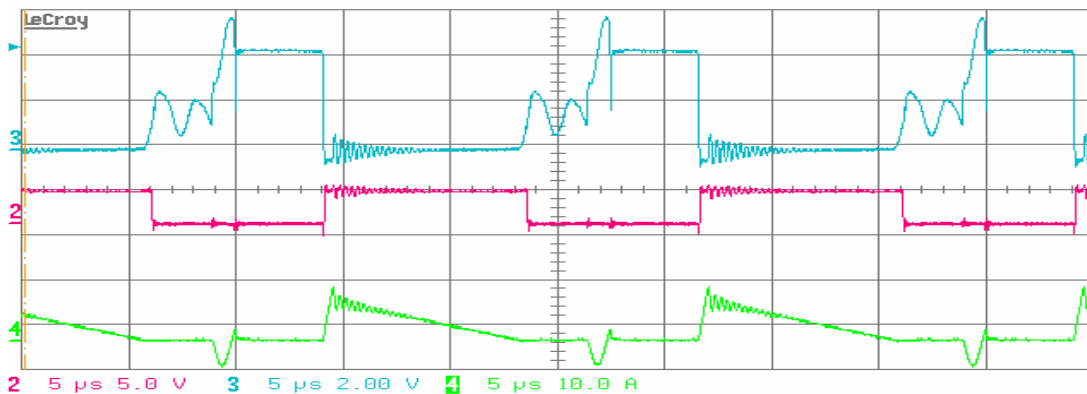
1. Sync Pin (Pin 8)

使用 resistor divider 將 Sync pin 的輸入調整至 5V。若 SMPS 的輸入 AC 電壓為 90-264V，設計 resistor divider 應在 AC90V 下調整後，在 Ssync Pin 對地再加一逆偏 5.5V ZENER DIODE 作為 AC220V 截波，注意 Sync Pin 電壓大於額定值(7V)時將永久損壞 IC。

2. Timing Pin (Pin 1)

此 Pin 設定觸發電流的敏感度。在全載下，Timing Pin 接一可變電阻(0~1M Ω)至 GND 調整其值使 MOSG-C Pin (Pin 6) 產生輸出 (圖一中的紅色曲線)。若如何調整此可變電阻皆無輸出，則改接可變電阻至 vdd，調整其值使 MOSG-C Pin (Pin 6) 產生輸出 (圖一中的紅色曲線)

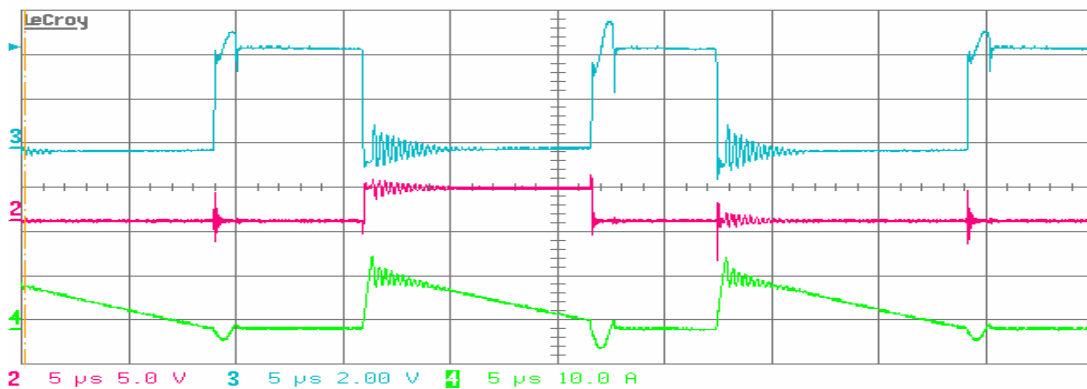
※觀察數個週期，確認每一週期 gate 皆有 turn on 才可。圖一為正確，圖二為錯誤之調整



Freq(3)	μ Hz	57.0744 kHz
maximum(3)	V	5.89 V
maximum(2)	V	4.38 V
maximum(4)	A	11.9 A

圖一

AUTO



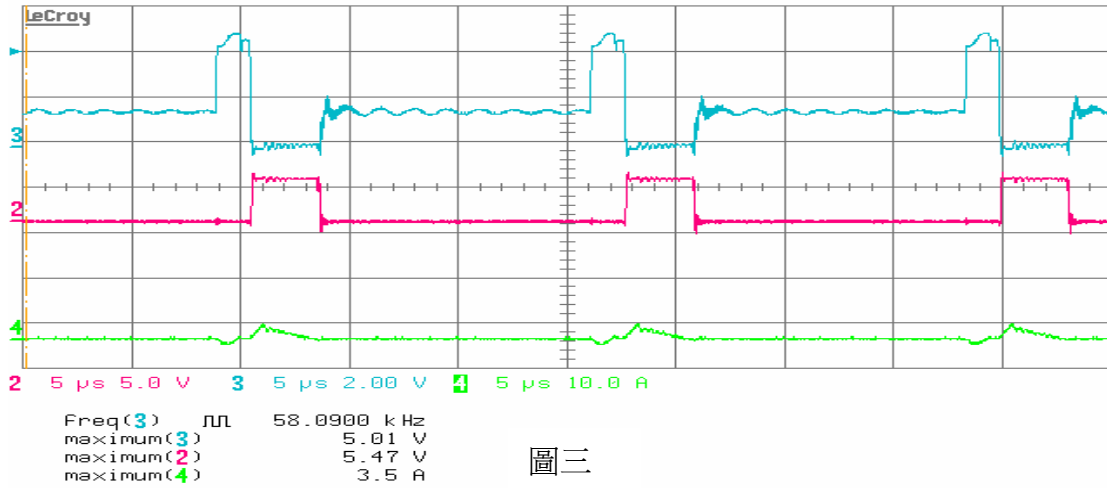
Freq(3)	μ Hz	56.8857 kHz
maximum(3)	V	5.70 V
maximum(2)	V	5.16 V
maximum(4)	A	16.7 A

圖二

AUTO



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圖三

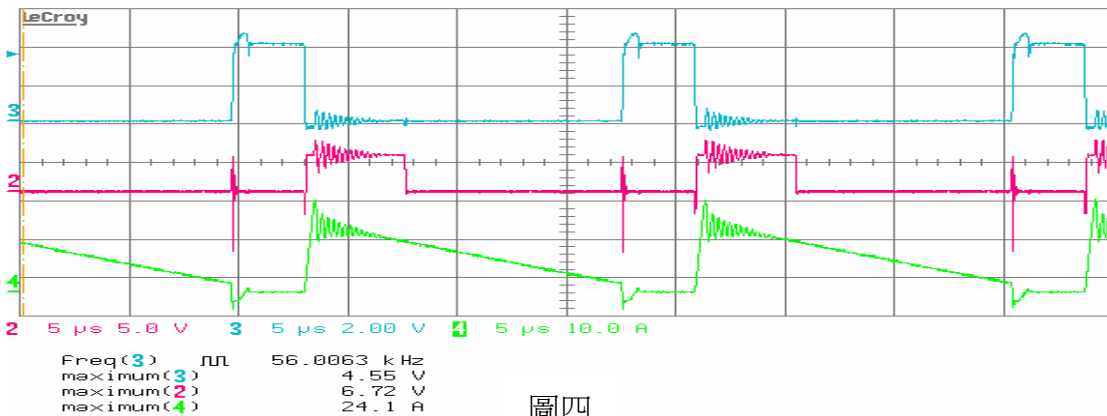
AUTO

調整正確時，當在輕載時，電流 ramp 至 0 時，MOSG-C 會自行 turn off 如圖三所示。

3. Cramp (Pin 4)

全載下若 GATE TURN OFF 過早如圖四所示，可以在 Cramp Pin 對 GND 加一電容以改變其 TURN OFF TIME

A. 電容=0pF



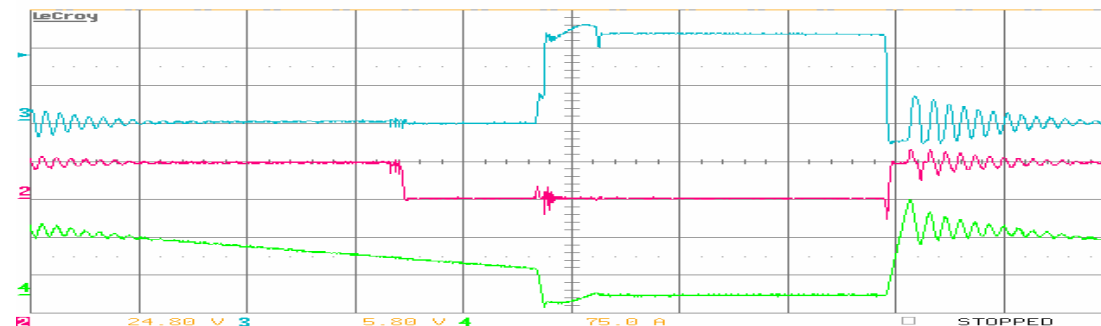
圖四

STOPPED

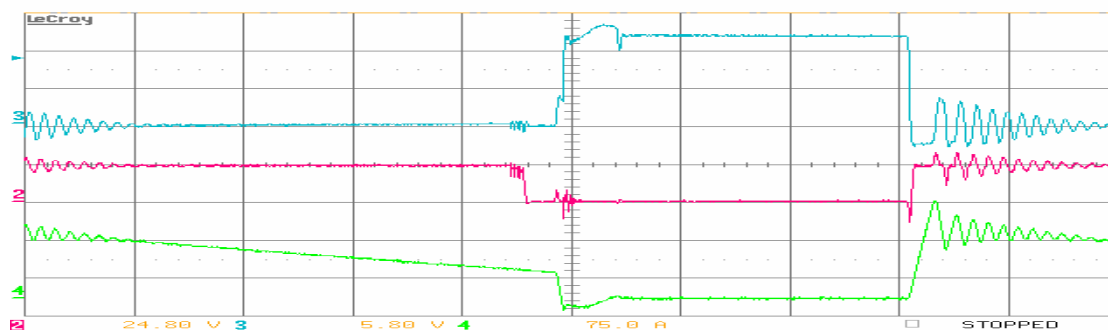


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B. 電容=5pF(圖形放大後)



C. 電容=22pF(圖形放大後)



GATE TURN OFF 要在 Sync Turn On 之前，所需提前時間之最佳值以調到最高效率為準。

4. MOSG-C Pin (Pin 6)

MOSG-C Pin 至 MOSFET 間的電阻需隨選用之 FET 之 C_{iss} 調整，當 C_{iss} 較大時，調高此阻值但須注意 GATE TURN OFF 要在 Sync Turn On 之前。建議使用 $C_{iss} < 1nF$ 。

本文件所使用的圖表針對某一 SMPS 條件，MOSFET 為 ON Semi 的 NTP30N60、Pin 1 接一 $15K\Omega$ 電阻至 Vdd。Channel 2 為 MOSFET Gate 的訊號，Channel 3 為 Sync 的訊號，Channel 4 為 Id 的訊號。

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SYNC Power Corporation

9F-5, No.3-2, Park Street

NanKang District (NKSP), Taipei, Taiwan 115

Phone: 886-2-2655-8178

Fax: 886-2-2655-8468

<http://www.syncpower.com>