

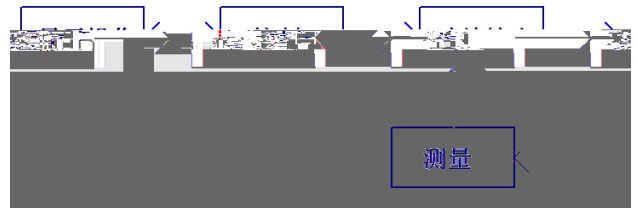
# DDS

Cortex-M3

STM32F107  
DDS

DDS AD9953

0.



1

50Hz

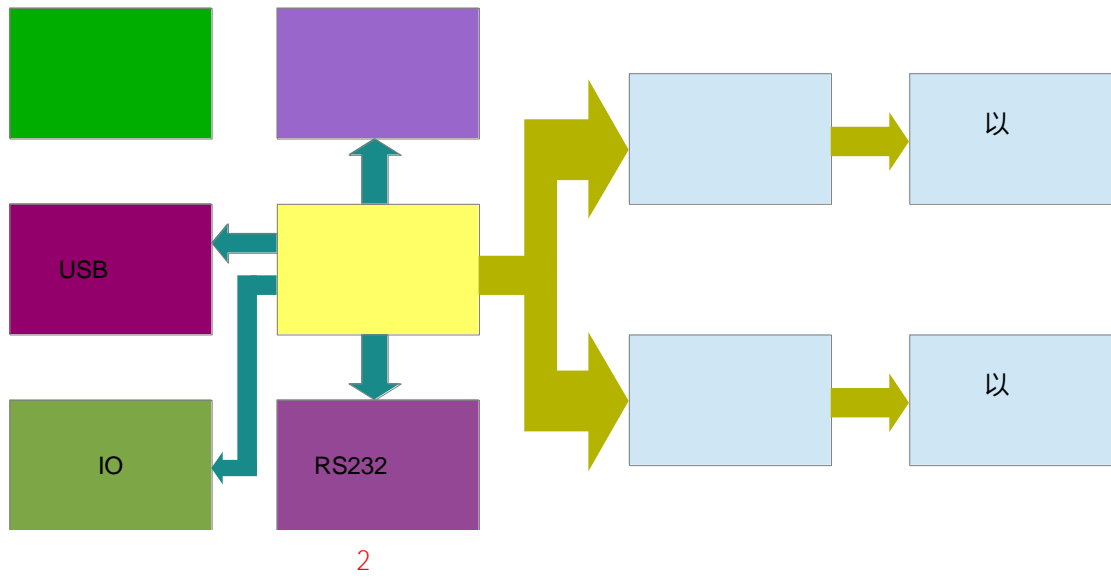
1kV

100A

0.2

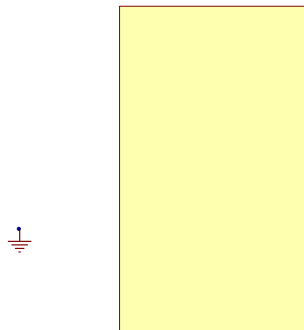
1

2



1.

1) DDS AD9953



### 3 DDS

2) DDS

AD9953 32

$$f_o = (FTW)(f_s)/2^{32} \quad 0 \leq FTW < 2^{31}$$

$$f_o = f_s (1 - (FTW/2^{32}))$$

$$2^{31} \leq FTW < 2^{32} - 1$$

$$f_o = f_s - (FTW) f_s / 2^{32}$$

AD9953  $f_s$

$$f_{o\min} = f_s / 2^{32}$$

0.01Hz

$$f_{o\min} = f_s / 2^{32} = 0.01\text{Hz}$$

$$f_s = 42949672.96\text{Hz} = 42.9\text{MHz}$$

DDS

42.9MHz 10MHz  
PLL 1 10MHz

$$f_{o\min} = 10000000 \text{ Hz} / 2^{32} = 0.0023\text{Hz}$$

AD9953

$$0 \leq FTW < 2^{31} \quad 10\text{MHz}$$

AD9953

$$0.0023\text{Hz} \leq f_o < 5\text{MHz}$$

5~400Hz

10MHz

PLL

AD9953 DA DDS  
D/A AD9953 3  
DAC\_RSET  
(RSET)  
 $I_{DAOUT} = 39.19 / R_{SET}$  DDS  
AD9953 D/A PCB  
AD9953 AD9953  
AD9953  
DAC\_RSET DDS  
D/A DDS I/O UPDATE  
CPU DDS I/O UPDATE CPU  
DAC\_RSET AD9953 3 U4  
DAC\_RSET SYNC\_IN  
DAC\_RSET SYNC\_CLK  
D/A SYNC\_IN  
CPU D/A SYNC\_CLK  
DAC\_RSET  
AD9953

## 2. DDS

D/A 3 16  
AD5663 DAC\_RSET  
AD5663  
D/A DDS  
DDS DDS AD5563  
VREF 1) DDS ROM  
AD9953 DDS  
DAC\_RSET VREF  
1.2V AD5663 D/A  
ADR3412 DDS  $f_c$   
AD5663  
AD9953 14  $f_o$   
16 D/A  
 $1/2^{14}/2^{16}=9.3 \cdot 10^{-7}\%$   $nf_c f_o$  Sin(x)/x  
2)  
5) DDS ROM  
3) D/A

N  
4)

DDS

DDS

DDS

400Hz

AD9953 10MHz

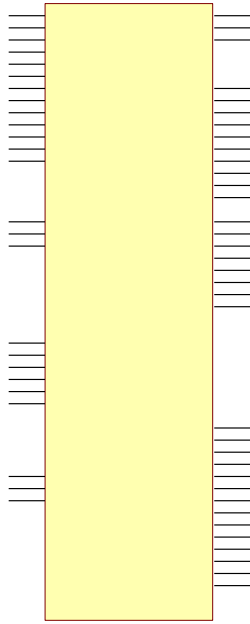
$f_o$   $f_c$

7 100kHz  
0.1dB 130kHz

X6	X7	X8	X9	X10
3.345 nF	56.75 nF	78.762 H	13.553 nF	27.018 nF

### 3.

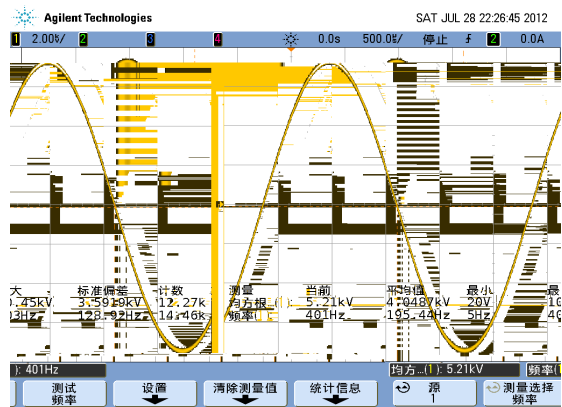
2 CAN USB2.0 OTG  
 10M/100M  
 5 STM32F107  
 STM32F107 U1  
 3.3V  
 ARM Cortex-M3  
 STM32F107 Flash RAM  
 Cortex-M3 ARM U1B  
 X1 JTAG CN1  
 ARM7 Cortex-M3  
 STM32F107 IIC  
 IIC EEPROM AT24C16  
 U2 AT24C16 2K  
 Cortex-M3 32 2.7V~5.5V  
 STM32F107  
 DDS  
 STM32F107 SPI STM32F107  
 SPI DDS SPI  
 STM32F107 STM32  
 SPI STM32F107  
 72MHz  
 256K Flash 64K  
 14 SRAM  
 2 I2C  
 5 UARTS 3 SPI  
 18Mbps I2S  
 16 D/A AD5663  
 STM32F107 SPI  
 STM32F107 SPI AD5663 SPI



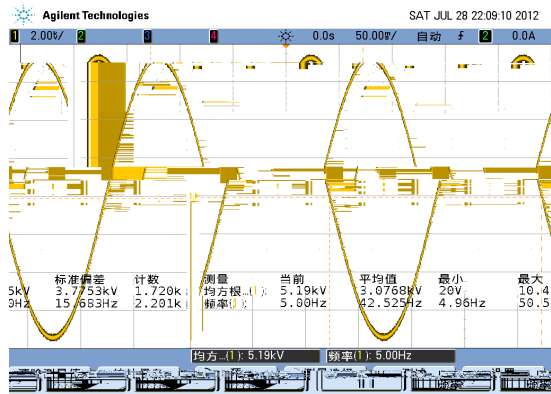
5

4.

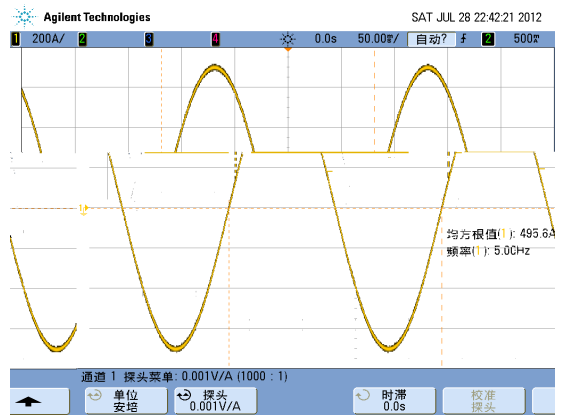
MSO7054  
N2771A                      A621



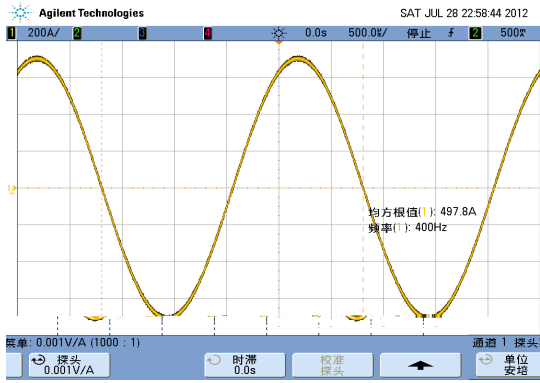
Hz/5kV



5Hz/5kV



5Hz/500A



400Hz/500A

5.

DDS

5-400Hz

- [1] .. DDS  
[D]. ,2007.
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[J]. ,2009(11),  
19-21.
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