

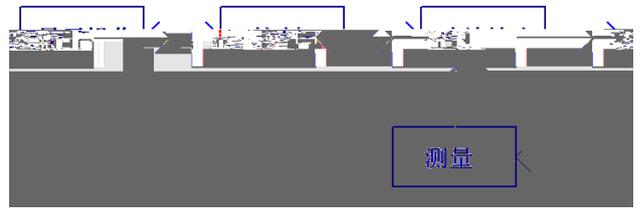
DDS

Cortex-M3

STM32F107
DDS

DDS AD9953

0.



1

50Hz

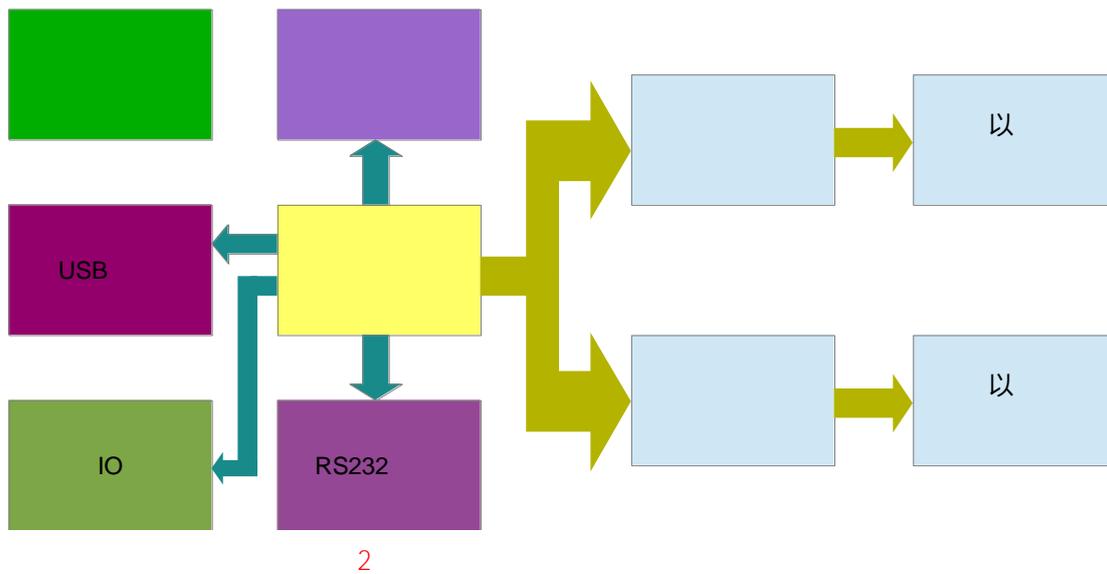
1kV

100A

0.2

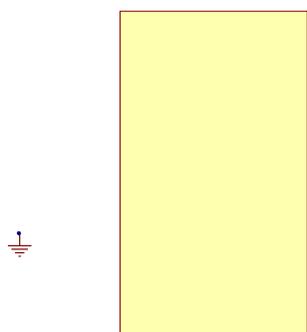
1

2



1.

1) DDS AD9953



3 DDS

2) DDS

AD9953 32

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

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

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

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

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

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

AD9953

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

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 D/A
1.2V AD5663
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

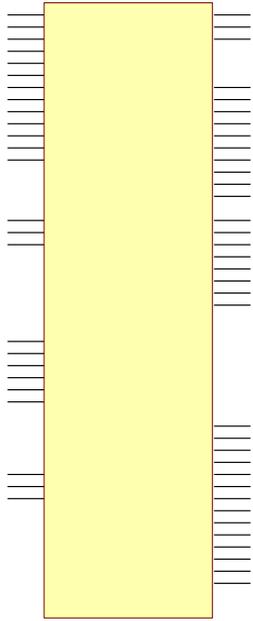
f_o f_c

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.

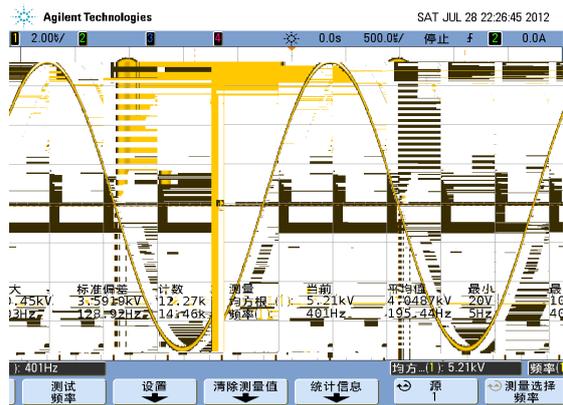
2 CAN USB2.0 OTG
 10M/100M
 5 STM32F107
 STM32F107 U1
 3.3V
 ARM Cortex-M3
 STM32F107 Flash RAM
 Cortex-M3 ARM U1B
 X1 JTAG CN1
 ARM7 Cortex-M3
 STM32F107 IIC
 IIC EEPROM AT24C16
 U2 AT24C16 2K
 2.7V~5.5V
 STM32F107
 DDS
 STM32F107 SPI STM32F107
 SPI DDS SPI
 STM32F107 STM32
 SPI STM32F107
 DDS
 256K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



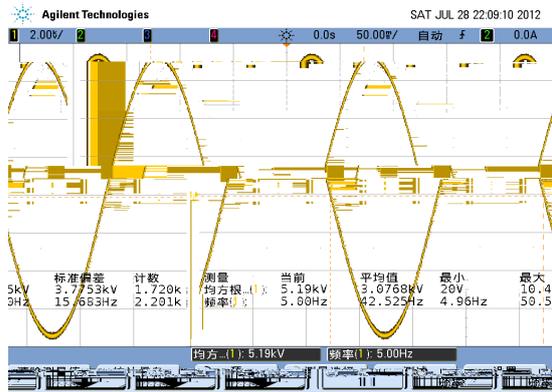
5

4.

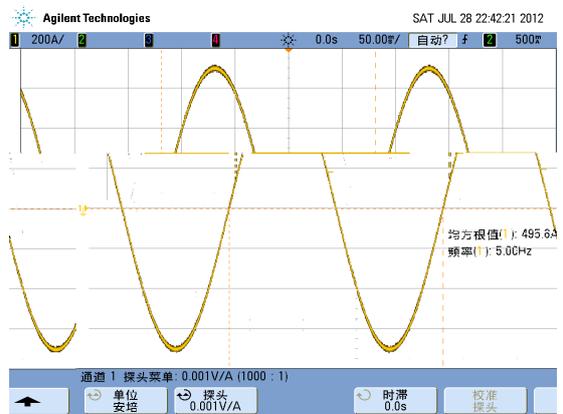
MSO7054
N2771A A621



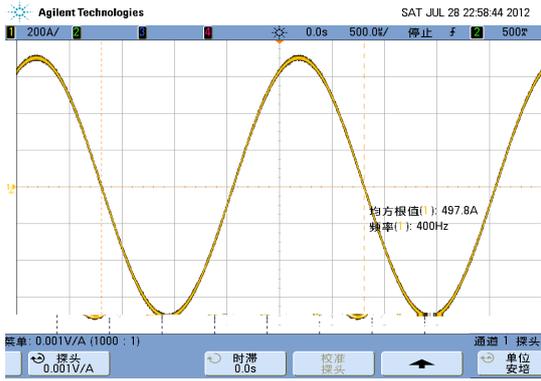
Hz/5kV



5Hz/5kV



5Hz/500A



400Hz/500A

5.

DDS

5-400Hz

- [1] .. DDS
[D]. ,2007.
- [2] , , . AD9850
[J]. ,2009(11),
19-21.
- [3] . AD9850 DDS
[J].
,2008,27(3) :40-43.
- [4] , , . DDS
[J].
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- [5] , , . DDS
[J].
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- [6] , . AD9850
[J].
,2009(16):47-50.