SMART ENERGY METER USING TI-CC3200

- **Requirements before making the project**

  - **Evaluation board from TI along with the USB cable**

Software requirements

- Latest CCS or Energia.
- I Prefer Code composer studio Version 6.0.1
- Software : cc3200sdk_1.0.0 _ downloadable.
- Software : uniflash 3.2
- >> Testing Datafor the terminal :
  - Recommended Teraterm,
  - Hyperterminal, termite can be tried.

- TI – RTOS for simplelink as addon in CCS
- SimpleLink Wifi as addons in CCS

SimpleLink™

Wi-Fi Network Processor

CC3100
Internet-on-a-chip™ solution
Integrated Wi-Fi, internet and
security protocols
Attaches to MCUs

Home automation, Smart energy,
connected appliances, M2M
communication, Health & fitness

CC3200

Wireless MCU
Same features as C3100 +
customer programmable Cortex
M4 MCU

ability to run the wifi
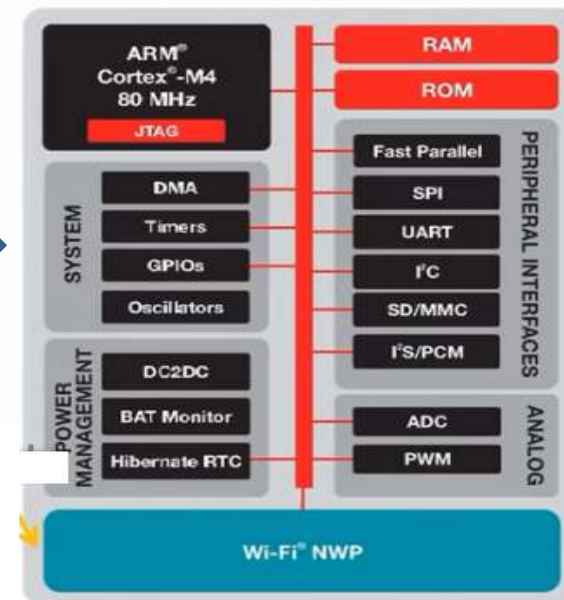unit on 2 AA batteries
for over an year

ARCHITECTURE SUPPORTS HIGH SPPED, 4 ADC (WE CAN USE ONE OF THEM TO TRACK TEMPERATURE OF THE ATMOSPHERE)

CC3200 Internet on a chip + MCU
Wireless MCU
80MHz ARM® Cortex™-M4 integrated
+ Wi-Fi network processor

ARM® Cortex®-M4 80 MHz — JTAG

RAM
ROM

SYSTEM:
DMA
Timers
GPIOs
Oscillators

PERIPHERAL INTERFACES:
Fast Parallel
SPI
UART
I²C
SD/MMC
I²S/PCM

POWER MANAGEMENT:
DC2DC
BAT Monitor
Hibernate RTC

ANALOG:
ADC
PWM

Wi-Fi® NWP

CC3200 Wireless MCU

Temperatures: -40 °C to 85 °C

ARM ® Cortex™ M4 +
Wi-Fi Network Processor

+ Crypto Engine

Radio
- 2.4 GHz
- Wi-Fi 802.11 b/g/n
- STA, AP, Wi-Fi Direct
- WPA2 Personal
- WPA2 Enterprise
- WPS2
- 802.1x
- EAP

Memory
- Embedded ROM
- Up to 256KB RAM

Protocol
- IPv4 TCP/IP Stack
- SSL 3.0
- TLS 1.2

Data Protection
- DES
- DES3
- AES256
- MD5
- SHA2
- RSA
- ECC

Interfaces
- Parulel Camera I/F
- McASP (I2S)

Analog
- 4-Ch ADC
- 4 PWM Control

Comms Peripherals
- SD/MMC
- 2x UARTs
- 2x SPI
- I2C

Power & Clocking
- DC2DC
- BAT Monitor
- Hibernate RTC
- Oscillators

System Modules
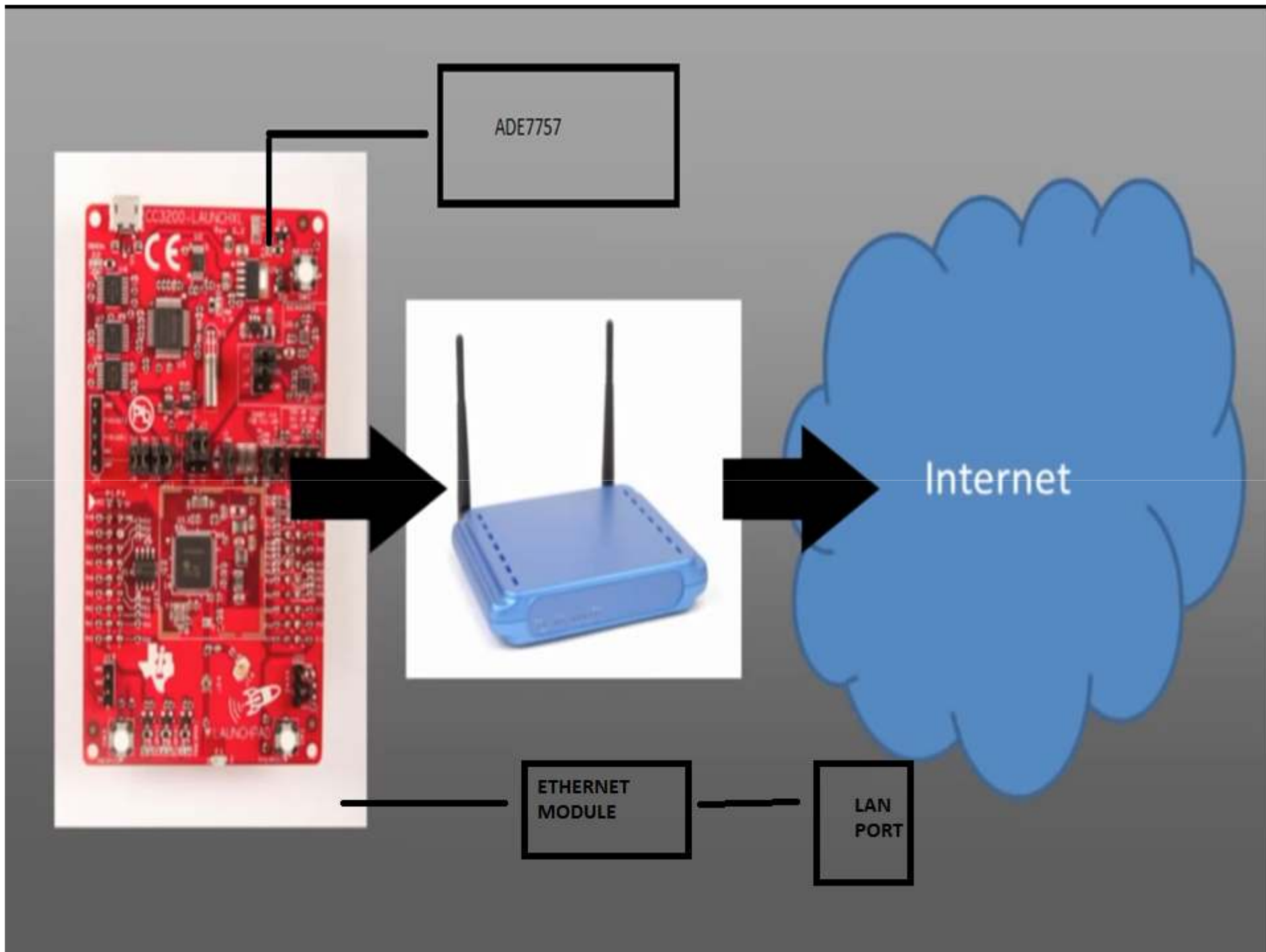- DMA
- Timers
- GPIO
- EPI

Packages
- 64-pin 9x9mm QFN
- 17.5 x 20.5mm Module

- The modules shows No sign of Ethernet Module.

- To be controlled through Lan we need a Ethernet Controller.

- We will have to fix an ethernet IC externally to suffice our requirement to access through LAN

ADE7757

Internet

ETHERNET MODULE

LAN PORT

an ic

ethernet
module

computer

SECURITY

- WPA2 PERSONAL AND ENTERPRISE
- SSL 3.0/ TLS 1.2

- On chip hw encryption
  - Real time encryption
 - Fast TLS connection in 200 msec

Module required

- Cc3200r1m2rgc (256kb, ram) - 1000 nos @ $4.61

Codes and different API's

- Init function to setup the access point.
- Drive the relays through the uln2003 driver or appropriate drivers.
- Drive relays to check parameters in the LCD module on the board. (keeping an lcd module would help us to trouble shoot it in the later stage, lets apis be written for this , not necessary to have it mounted on the finished project)

METERING IC

- On-Chip Oscillator as Clock Source

- High Accuracy, Supposes 50 Hz/60 Hz IEC 521/IEC 61036

- Less than 0.1% Error over a Dynamic Range of 500 to 1

- The ADE7757 Supplies Average Real Power on theFrequency Outputs F1 and F2

- Proprietary ADCs and DSP Provide High Accuracy over Large Variations in Environmental Conditions and Time
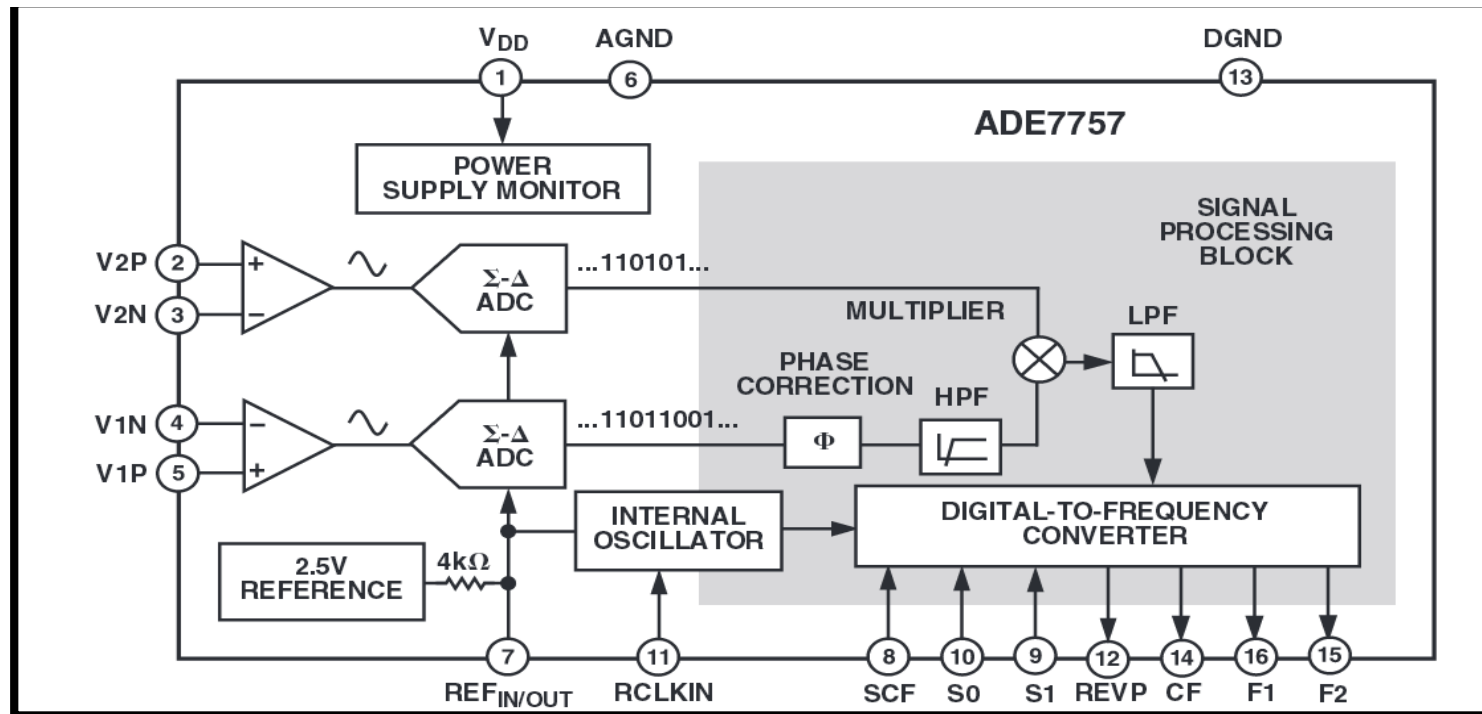
- ADC used is a Sigma Delta
- On-Chip Power Supply Monitoring
- On-Chip Creep Protection (No Load Threshold)
- On-Chip Reference 2.5 V (20 ppm/C Typical) with External Overdrive Capability
- Single 5 V Supply, Low Power (20 mW Typical)
- Low Cost CMOS Process
- AC Input Only

Sample Circuit to read details from the sensing circuit using ADE7757
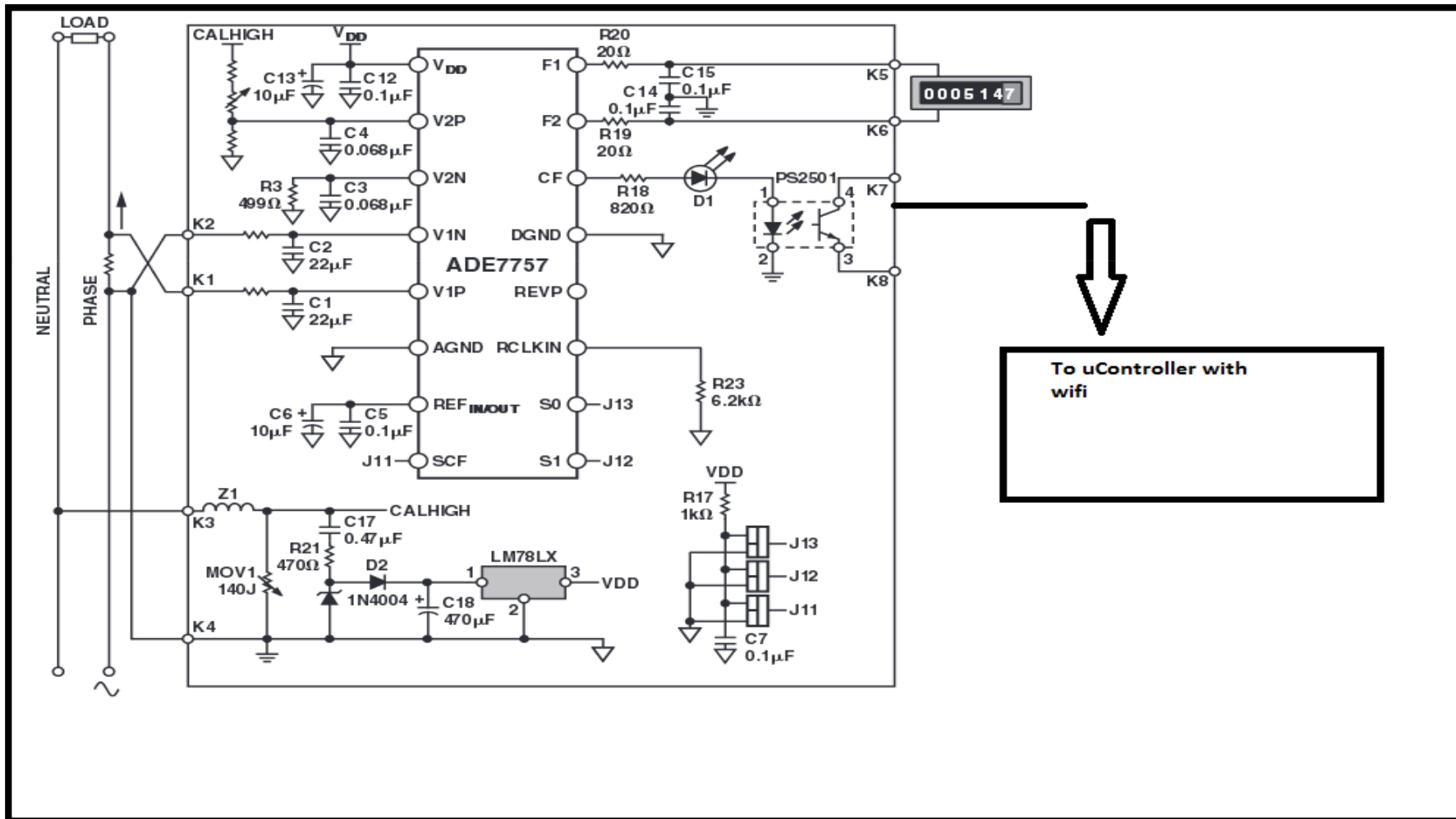
RELAYS
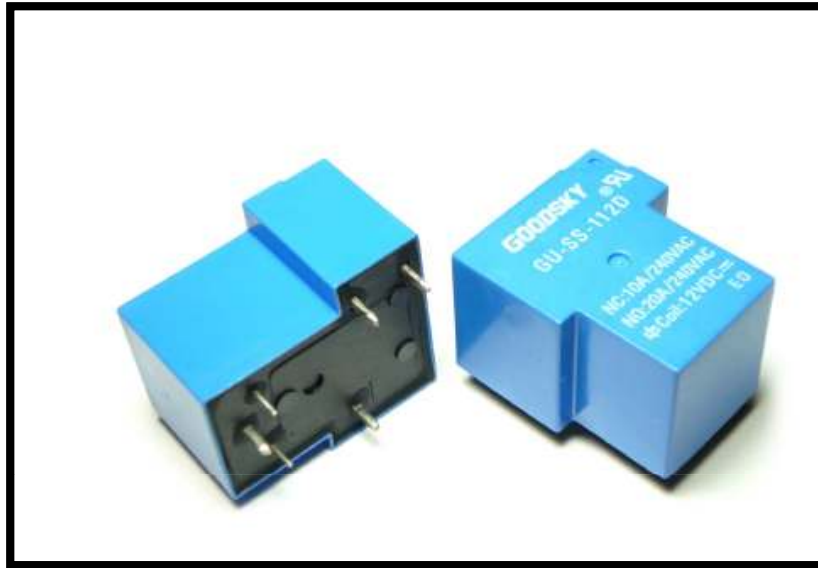
1. Single contact Form (SPST) series Relay offers switching capacity 30A in small size.
2. Dust cover, sealed & unclosed cover types are available.
3. UL Class F insulation available.
4. Halogen Free series available.
5. Comply with RoHS and REACH regulations

- Power Consumption　　:　　0.93 W
- Dielectric Strength
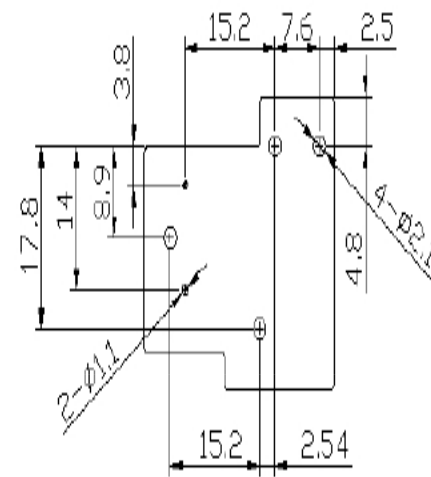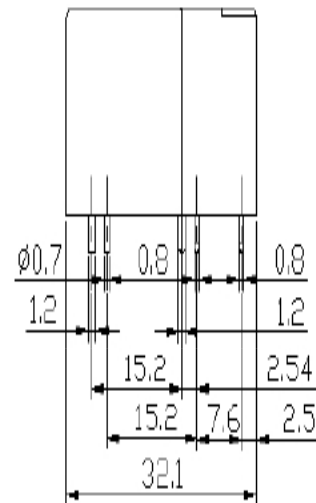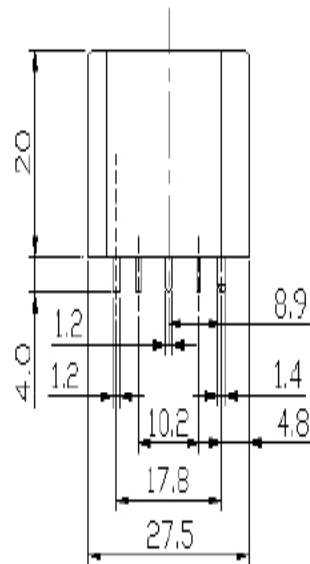 - :

    AC, 1500V (between coil and contact).
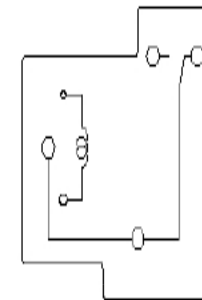   AC, 1500VBetween Contacts

- Life Expectancy:
  - Mechanical　　10 ^ 7 = 10000000 times at No load condition
  - Electrical　10 ^ 5 = 100000 at resistive load

GU-D : 2 Common terminals : 6 PIN

20

4 O

1.2
1.2

8.9

1.4

10.2

4.8

17.8

27.5

Ø0.7

0.8

0.8

1.2

1.2

15.2

2.54

15.2

7.6

2.5

32.1

15.2

7.6

2.5

3.8

17.8

14

8.9

4 - Ø2.1

4.8

2 - Ø1.1

15.2

2.54

P.C.B. Layout

Bottom View

PENDING ITEMS

- PCB BOARD -
- BOXING
- ACCESSING SOFTWARES….
  - ETC….