B.N.Choukimath

This blog is a step in the ladder to get 25% of knowledge by own

Saturday, March 5, 2016

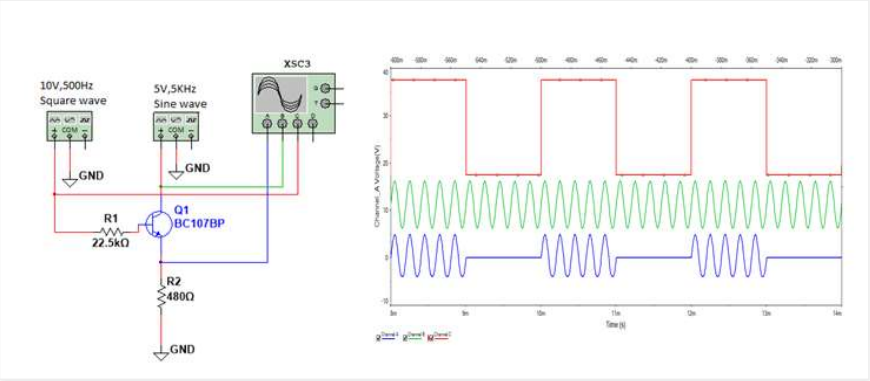
ASK Modulation Simulation in Multisim

What is ASK modulation?

Amplitude shift keying refer to a type of amplitude modulation in which the amplitude of carrier sinusoidal is modified according to binary input data.

Design of ASK modulation

Transistor is need to be operate as a switch hence choose saturation values from data sheet
i.e $V_{CE(sat)}$ = 200mV $V_{BE(on)}$ = 700mV h_{FE} = β = 50, Ic=10mA and assuming that Ic=I_E.



Calculation of RE	Calculation of R_B
Vpeak = Vcc=V_{CE} + $I_E R_E$	V_B=$I_B R_B$ + V_{BE} + $I_E R_E$
5V= 200m + 10m R_E	10= (10m /50) R_B + 700m + 10m X 480
RE= R2=480 Ω	R_B = R_2 = 22.5KΩ

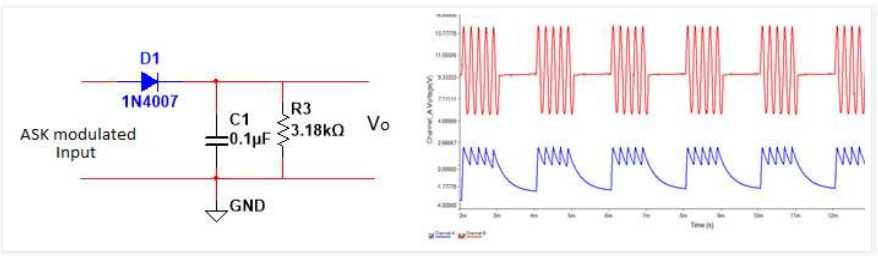
Like Amplitude modulation, an ASK is also linear and sensitive to atmospheric noise, distortions,propagation conditions on different routes in PSTN, etc.

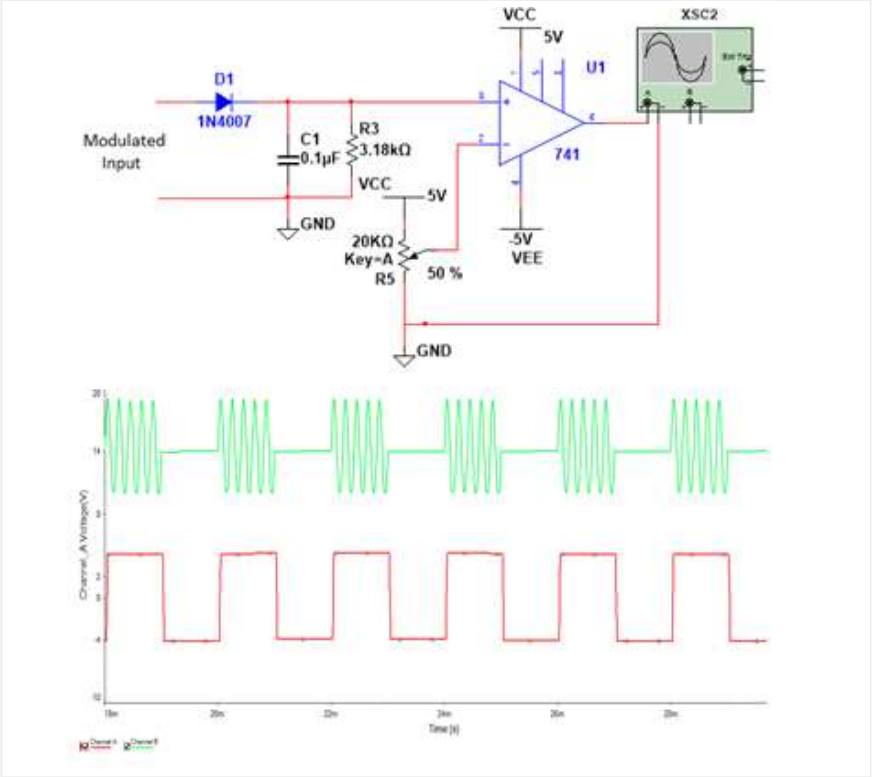
- The ASK technique is also commonly used to transmit digital data over optical fiber. For LED transmitters, binary 1 is represented by a short pulse of light and binary 0 by the absence of light.
- In case of Laser transmitters normally have a fixed "bias" current that causes the device to emit a low light level. This low level represents binary 0, while a higher-amplitude light wave represents binary 1.
- The ASK operates as a switch, using the presence of a carrier wave as a binary one and its absence/-ve to indicate a binary zero. This type of modulation is called **on-off keying** (OOK), and is used at radio frequencies to transmit Morse code

Design of Demodulation

The demodulator circuit works as a low pass filter, it allows low frequency signal source 500Hz and filter out carrier frequency 5KHz.
Hence assume Xc=R and C=0.1uF corner frequency fc=500Hz

$$Xc = R = \frac{1}{(2\pi \times 500 \times 0.1\mu)} = 3.18K\Omega$$





Original message signals is recovered form demodulator by using opamp.

Posted by choukimath at 10:43:00 AM

3 comments:

TECH UPDATE August 4, 2018 at 3:15 AM
multisim software
Reply

TECH UPDATE August 4, 2018 at 3:15 AM
multisim software
Reply

TECH UPDATE August 4, 2018 at 3:16 AM
Download multisim software
Reply

To leave a comment, click the button below to sign in with Blogger.

SIGN IN WITH BLOGGER

Newer Post Home

Subscribe to: Post Comments (Atom)