NEW HORIZON
COLLEGE OF ENGINEERING

AUTONOMOUS COLLEGE Permanently Affiliated to VTU, Approved by AICTE & UGC
Accredited by NAAC with 'A' Grade

"ANTI THEFT ALARM FOR VEHICLES"

MINI PROJECT REPORT

Submitted by :

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NEW HORIZON COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE

Certified that the mini project work entitled "ANTI-THEFT ALARM FOR VEHICLES" carried out by **Anjali.R (1NH18EC008)** bonafide student of Electronics and Communication Department , New Horizon College of Engineering, Bangalore.

The mini project report has been approved as it satisfies the academic requirements in respect of mini project work prescribed for the said degree.

Project Guide — HOD ECE

Dharmambal V — Dr. Sanjeev Sharma

Senior Assistant Professor

External Viva

Name of Examiner — Signature with Date

1.

2.

ACKNOWLEDGEMENT

The satisfaction that accompany the successful completion of any task would be, but impossible without the mention of the people who made it possible, whose constant guidance and encouragement helped us succeed.

We thank **Dr. Mohan Manghnani**, Chairman of **New Horizon Educational Institution**, for providing necessary infrastructure and creating good environment.

We also record here the constant encouragement and facilities extended to us by **Dr.Manjunatha**, Principal, NHCE and **Dr. Sanjeev Sharma**, head of the department of Electronics and Communication Engineering. We extend sincere gratitude to them.

We sincerely acknowledge the encouragement, timely help and guidance to us by our beloved guide **Guide Name** to complete the project within stipulated time successfully.

Finally, a note of thanks to the teaching and non-teaching staff of electronics and communication department for their co-operation extended to us, who helped us directly or indirectly in this successful completion of mini project.

Anjali.R (1NH18EC008)

TABLE OF CONTENTS

ABSTRACT

Now a day we can see that so many of them are complaining on vehicle thief. It has been hectic for both vehicle owner, and police men to search the vehicle thief. Recently, vehicle tracking system is getting vast popularity because of the rising number of stolen vehicles.

Vehicle theft is happening on parking and sometimes driving in unsecured place protection of vehicles with an intelligent reliable, effective and economical system is very important. Rate of vehicle theft is very high all throughout the world and situation are even worse in developing countries.

We can see many anti theft alarm for vehicles in different ways. Like

1. Anti theft alarm for vehicles using door sensor.

2. Anti theft alarm for vehicles using roof sensor.

The project that we have chosen is pretty safe as it is connected to ignition engine itself , If he/she has to take away our cars, as soon as he/she starts the ignition key the car starts to produce sound using a buzzer .So to overcome from this problem, we have an idea called

"ANTI-THEFT ALARM FOR VEHICLES". Specially designed for cars.

This is very inexpensive and easy to install in the vehicles as well. This circuit requires only few components to do, with a low cost.

This project will be very productive as well

INTRODUCTION

Vehicles security is of at most importance in today's world. As unemployment is increasing day by day, even the literate people are involved in theft and robbery. In today's world vehicles form an important asset to us, without which our life would be incomplete. But when it comes to security of our vehicles, we are very helpless. It's is of a great concern, especially in metropolitan cities, where these incidents occur each and every day. So, the security of our vehicles is foremost requirement.

The system which has been designed now by us ensures the security of our vehicle. This provides security for cars that generates a loud continuous alarm if any unauthorized person tries to theft. As soon as the unauthorized person tries to start the vehicle, the vehicles alarm gets activated leaving no option for him other than to run from the spot. The alarm can be reset and turned off by the owner only. Thus with this system, theft of the vehicles can be prevented to a greater extent, which is very important asset to us and thus leading to safe society.

CIRCUIT DIAGRAM

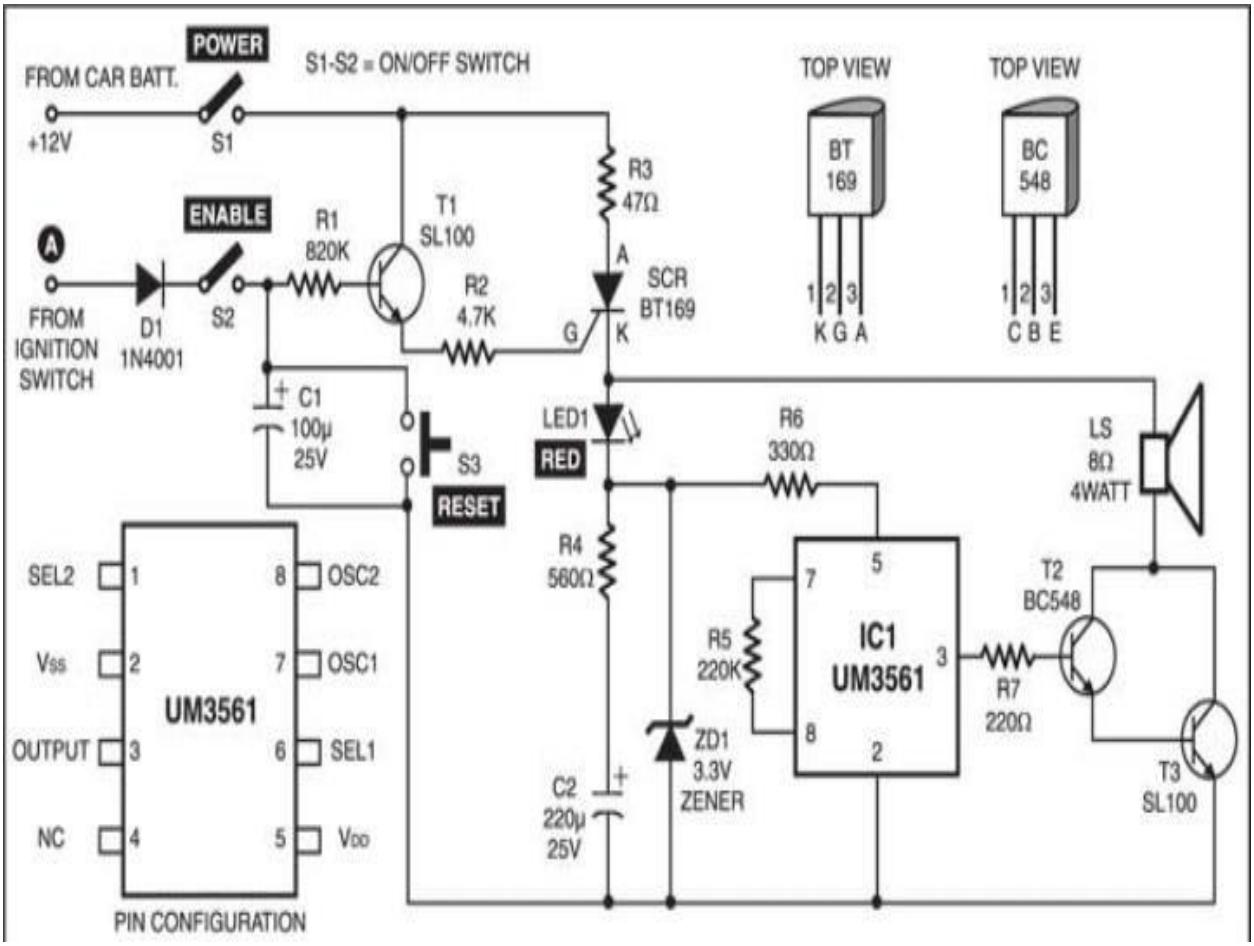


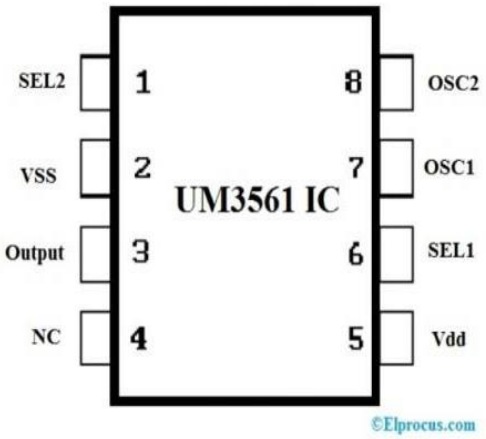
Fig No. 2.1

LIST OF COMPONENTS

COMPONENTS	NAME
1. IC	UM3561
2. TRANSISTOR	SCR BT169
3. TRANSISTOR	BC 548
4. TRANSISTOR	SL100
5. DIODE	DIODE(1N4001)
6. DIODE	ZENER DIODE 3.3V
7. CAPACITOR	(100uf , 200uf)
8. RESISTORS	820 ohm, 4.7k, 47(1watt), 560, 220k, 330,220
9. LED	RED LED
10. SWITCH	ON/OFF SWITCH
11. PUSH BUTTON	RESET BUTTON
12. LOUD SPEAKER	8ohm, 4WATT LS
13. PCB	PRINTED CIRCUIT BOARD

1. ICUM3561–

The integrated circuit UM3561 is an outstanding ROM IC. The main function of this very chip is to produce various siren tones like Ambulance, Police, Machine gun and Fire brigade siren sound. This IC consists of an oscillator as well as tone selection pins, and it is also low cost IC that is mainly designed for many applications. The construction of this circuit can be done with a few basic electronics and electrical components.



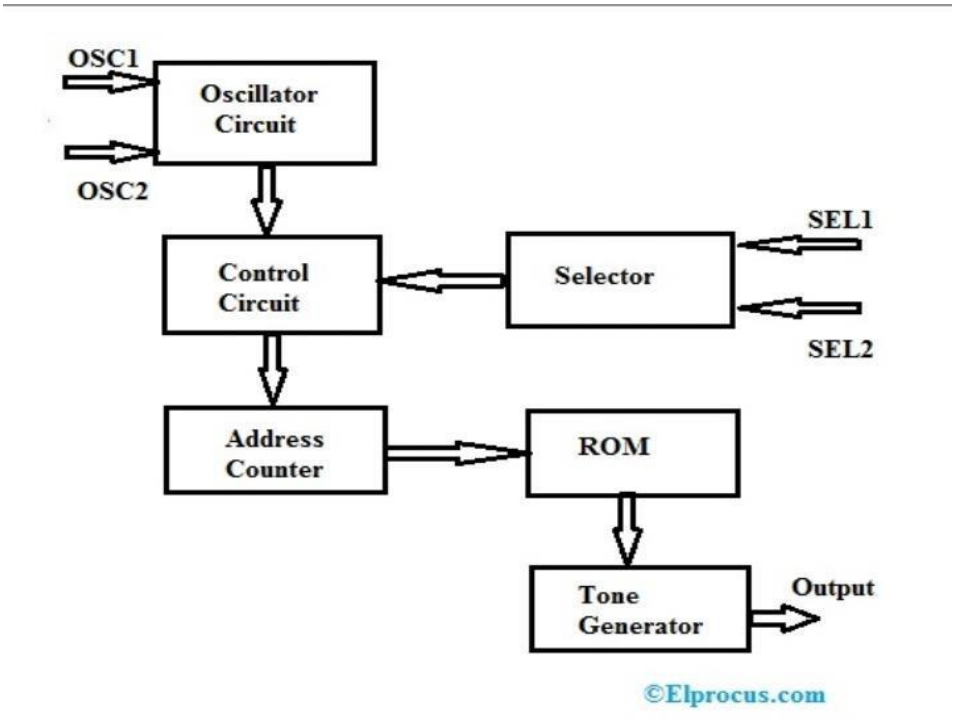
UM3561 IC Pin Configuration

Fig No. 3.1

1. Pin 1(SEL2): selection of sound effect
2. Pin 2(vss): negative power supply
3. Pin 3(o/p): continuous tone output
4. Pin 4(NC):inner testing pin
5. Pin 5(vdd): positive power supply
6. Pin 6(SEL1): selection of sound effect pin 1
7. Pin 7(OSC1): exterior oscillator terminal 1 , Pin 8(OSC2): exterior oscillator terminal

BLOCK DIAGRAM OF ICUM356

The block diagram of IC UM3561 is shown below. This IC includes an oscillator circuit. Oscillations frequency can be controlled with resistors which is connected externally to first oscillator and second oscillator. Thus, the oscillation which is produced will be moved to control circuit. The circuit can be worked depending on the selection of tone through pin 6 and pin 1.



UM3561 Block Diagram

Fig No. 3.2

SPECIFICATIONS OF IC UM3561

1. DC supply voltage is 3.0v to +5.0v.
2. Input or output voltage (VSS) is 3v to+3v VDD.
3. Ambient operating temperature is -10°c to60°c.
4. The temperature for storage is -55°c to 125°c.
5. VDD (operating voltage) is 3.5v and typical 3v.

2. SCR BT-169:

It is a silicon controlled rectifier which is used for switching and phase control applications. These devices are made to be interfaced directly to microcontrollers, logic Integrated circuits, and other low power gate triggering circuits.

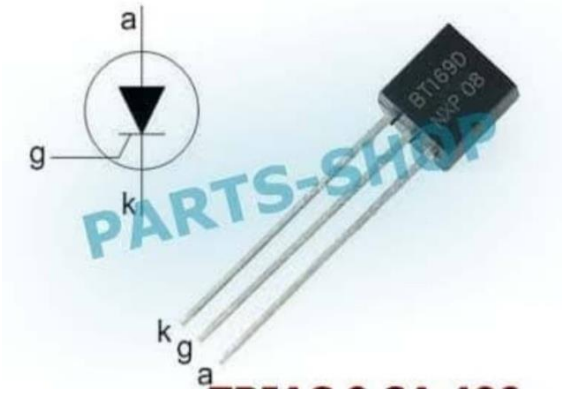


Fig No. 3.3

3. BC 548:

The BC 548 is a general-purpose NPN bipolar junction transistor, that is mostly used in European and American electronic equipments. It is often the first most bipolar junction transistor hobby encounter and is often featured in designing hobby electronic magazines where this is BC548 transistor is required.

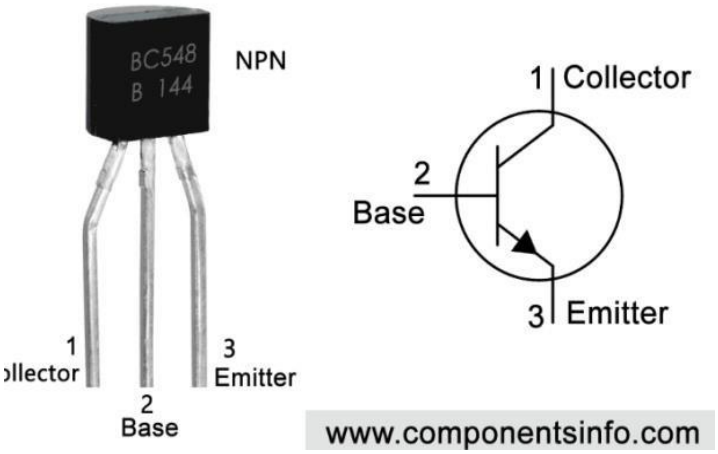


Fig No. 3.4

1. Breakdown voltage, collector-to-emitter with base open-circuit VCEO = 30 V.

2. Rated continuous collector current IC = 100mA.

3. Rated total power dissipation P total = 500mW.

4. Transition frequency (gain-bandwidth product) ft = 150 MHz min

4. SL100

SL100 is a low power transistor. It can be used for the applications like switching circuits, amplifying circuits and manufacturing many logic gates. It is medium power NPN transistor, Collector-Emitter voltage is 50v, collector - Base voltage is 60v ,Emitter Base voltage is of 5v and 0.5A of collector current, DC Current gain is upto 100-300 hfe, output capacitance 20pf, the temperature is from -65°c to 200°c.

Fig No. 3.5

5.DIODE(1N4001):

It is often used for reverse voltage protection, as it is a staple for many power, DC to DC step up and bread board projects. 1N4001 is rated for up to 1A/5 v. This diode allows electric current to flow in one direction from the anode to the cathode and some diodes such as the 1N4001 will break down at 50v or less.

Fig No. 3.6

6. ZENER DIODE:

A Zener diode is one type of diode which allows the current to flow not only from its anode to the cathode, but also allows in the reverse direction, when the voltage across its terminals exceeds the Zener voltage. This is a characteristic of the device.

Fig No. 3.7

7. CAPCITORS (100uF,200uF,25V):

An electrolyte capacitor is a type of capacitor which uses an electrolyte to achieve a larger capacitance than other capacitor. Almost all electrolyte capacitors are polarized which means that the voltage on the positive terminal should always be greater than voltage on negative terminal. These capacitors are great transient/surge-e suppressors.

Fig No 3.8

8. RESISTOR:

The resistors are of passive two terminal electrical components that implements electrical resistance as a circuit element. In many electronic circuits, resistors are used to low the current flow, adjust signals level, to divide voltage, bias active elements, and terminate transmission lines, among other uses.

Fig No. 3.9

1. 820 ohm
2. 4.7 k ohm
3. 47 ohm/1watt
4. 560 ohm
5. 220 k ohm
6. 330 ohm
7. 220 ohm

THE COLOUR CODING OF RESISTORS ARE:

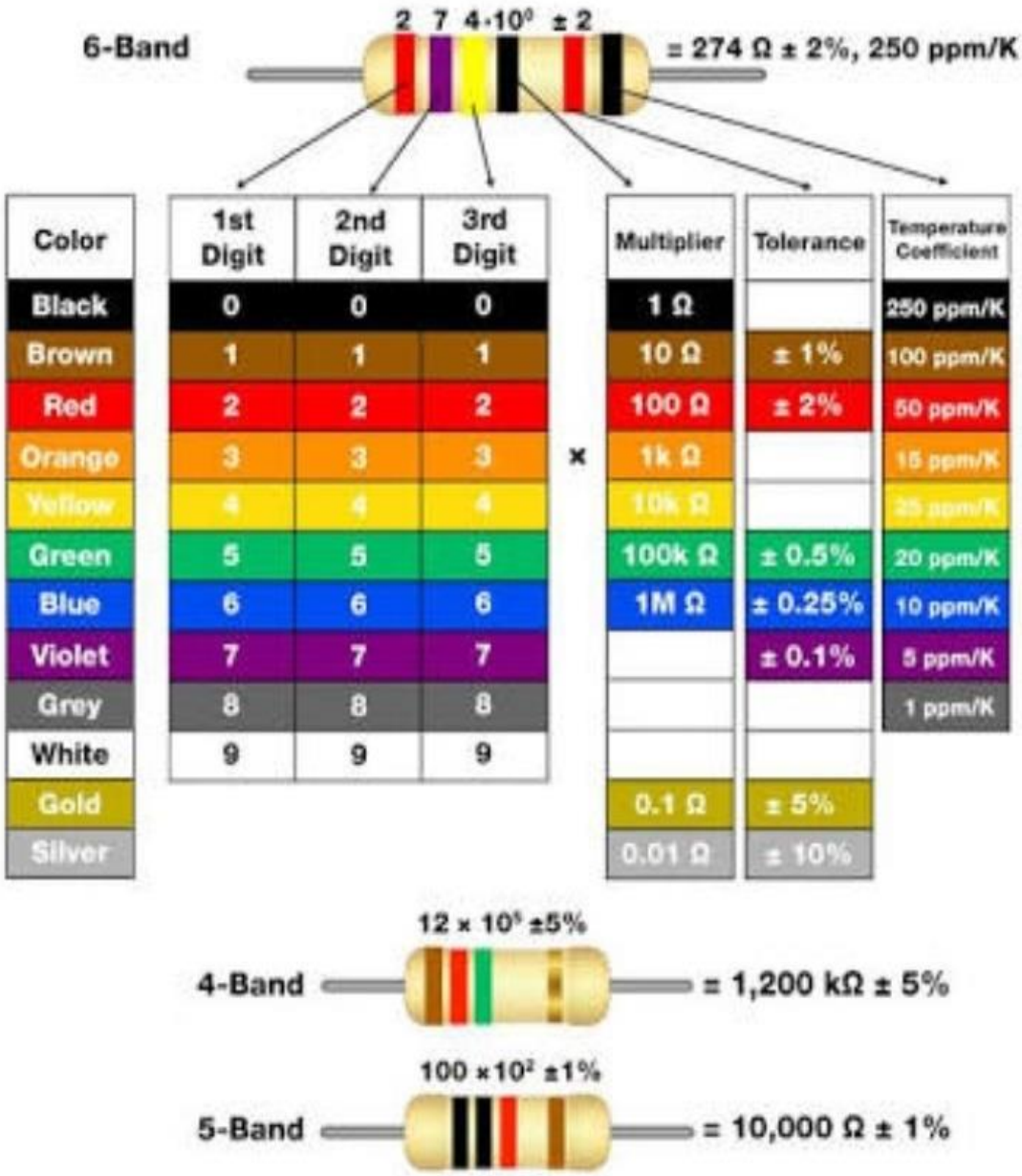


Fig No. 3.1

9 RED LED :

The red light emitting device is used in this circuit to indicate that both circuits are working properly.

Fig No. 3.11

10. SWITCHES(ON/OFF):

Switches are used to ON/OFF the circuits.

Fig No. 3.12

11. PUSH BUTTON:

In most of the personal computers, the Reset button clears the memory and reboots the machine forcibly. Reset buttons are usually found on circuit breakers to reset the circuits. The data corruption mostly found due to this push button so this is not majorly used in PCs.

Fig No. 3.13

12. LOUDSPEAKER:

This loud speaker is used to hear the sound produced from the circuit.

Fig No. 3.14

PRINTED CIRCUIT BOARD:

A PC board mechanically supports and electrically connects electronic components or electrical components using conductive tracks, pads and features etched from one or more sheet layers of copper laminated onto and or between sheet layers of non conductive substrate.

Fig No. 3.15

WORKING OF CIRCUIT

This circuit working is divided into two sections as "SCR based trigger circuit" and “Audio alarm circuit".

1.SCR BASED TRIGGER CIRCUIT:

Main work of this section is to detect any theft attempt by triggering of SCR BT16. Both power and enable switches S1 and S2 should be kept ON but ignition key is switched OFF, there will be no base voltage at transistor T1 as it remains Reverse biased keeping SCR in cutoff region.

When ignition is ON, a +12v DC voltage gets applied to base of T1 through point A, diode D1, switch S2, and resistor R1, as T1 is forward biased now, it turns ON the SCR through its gate terminals and resistor R2, capacitor C1 charges to upper voltage level to provide base voltage level to T1 even after ignition key is turned OFF, pressing Reset switch S3 discharges C1 completely but resets the circuit only after power OFF condition

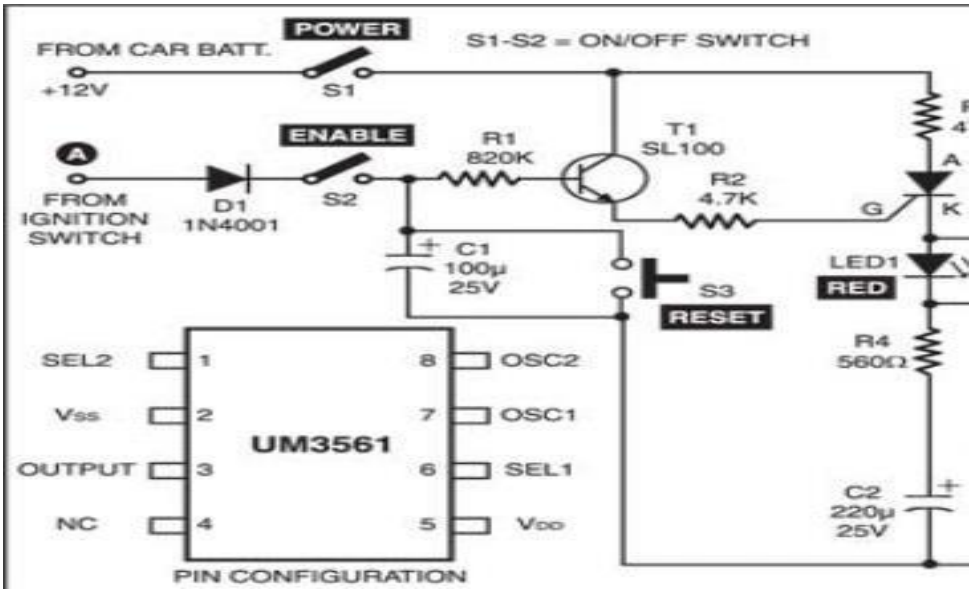


Fig No. 4.1

2. AUDIO ALARM CIRCUIT:

This section is build around IC UM3561 this section is used to generate police siren on triggering of SCR the ICI is a siren sound generator. UM3561 is having inbuilt oscillator. The oscillations are decided by value of resistance connected in between its pin 7 and8. Zener diode limits voltage of IC up to 3.3v and resistor R6 limits current. The output oscillations from pin 3 of IC are amplified by transistors T2 and T3. The loudspeaker connected between collectors of transistors and cathode of SCR converts amplified electrical impulses to alarm sound. As capacitor C2 also charges fully there is continuous alarm sound even after switching OFF the ignition key. Red LED connected between two sections glows to indicate proper functioning of alarm circuit.

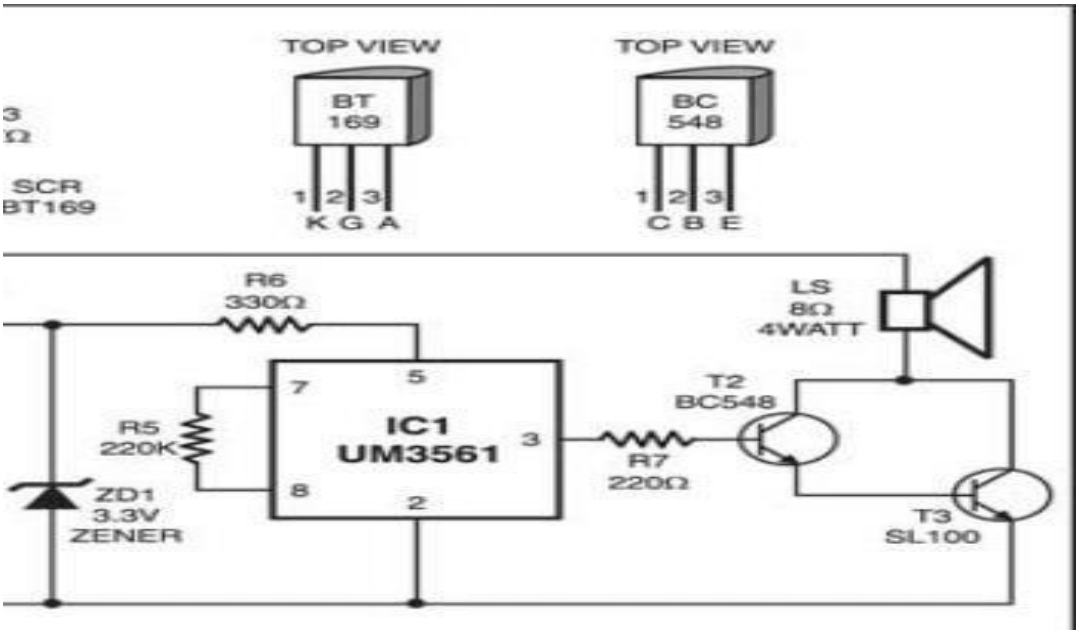


Fig No. 4.2

The circuit can be assembled on PCB. Use a small heat sink for transistor T1. Connect point A to the ignition switch terminal that goes to the ignition coil. The hidden switch S1 is used for power on/off and switch S2 enables the circuit.

HOW TO BUILD COMPLETED PCB

1. First of all read the given manual thoroughly and study the circuits given in figure. Also have a look at PCB and components supplied.
2. Each component has to be soldered in its position on PCB.
3. Identification of resistors is done by color coding. The color band on each resistor corresponds to its exact value.
4. There are different methods in which values are defined on capacitors. But usually values are specified numerically on them.
5. Can you make out the whole working of circuit and are you able to identify each component separately as to where each of them as to be placed? If yes, only then proceed further to actually mounting and soldering the parts.
6. Not ICs but there sockets are to be soldering on PCB. This is to make mounting and dismounting of ICs easy while troubleshooting.
7. Start from left most corner of PCB and solider the components one by one on their current position on PCB.
8. Before soldering any component see that you have placed at correct position and with correct polarity. Due attention to Diodes and electrolytic capacitors as they have polarity dependent.
9. Do the soldering of other components in the same way while keeping in mind that components with long and sensitive leads like capacitors and transistors, Leads are soldering at last.
10. Make sure you apply flux on PCB , before soldering any components because without applying flux soldering the components may damage or burn the component.

TESTING THE KIT

1. Install the circuit somewhere inside the vehicle with all three switches S1, S2, S3, hidden. Connect +12v DC to circuit using Vehicles battery power supply.

2. Connect point A to the ignition switch terminal that goes to the ignition coil.

3. Initially keep both Power and Enable switches S1, S2 in OFF position. But before leaving the Vehicle turn them ON.

4. With these conditions if someone turns ON the ignition the alarm will be activated to continuously sound police siren.

5. To stop alarm sound in between, momentarily press Reset switch S3 and then turn OFF switch S1. If S1 is triggered without Resetting, the alarm again turns ON after power is resumed.

6. Before you are going to start the vehicle yourself, don't forget to switch OFF S1 , S2.

APPLICATIONS

Many vehicles security systems like central locking, steering lock etc provide security only up to vehicle accessibility level. But once inside a vehicle clearing all obstacles auto filter with key in his hand can easily fly off to his way. This circuit provides security at this level; as soon as any unauthorized person without knowledge of owner tries to start the vehicle a loud alarm gets activated and sounds continuously. Even when the intruder switches OFF the ignition key alarm sound is not stopped. The last option left for that person is to leave vehicle intact and runs away.

GENERAL DESCRIPTION

Glass passivated, sensitive gate thyristor in a plastic envelope, suitable for surface mounting, intended for use in general purpose switching and phase control applications. This device is intended to be interfaced directly to microcontrollers, logic integrated circuits and other low power gate trigger circuits.

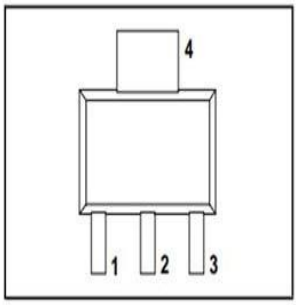
QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	MAX.	MAX.	MAX.	UNIT
	BT169	BW	DW	EW	GW	
V_{DRM}, V_{RRM}	Repetitive peak off-state voltages	200	400	500	600	V
$I_{T(AV)}$	Average on-state current	0.5	0.5	0.5	0.5	A
$I_{T(RMS)}$	RMS on-state current	0.8	0.8	0.8	0.8	A
I_{TSM}	Non-repetitive peak on-state current	8	8	8	8	A

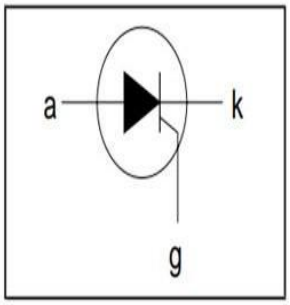
PINNING - SOT223

PIN	DESCRIPTION
1	cathode
2	anode
3	gate
tab	anode

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.				UNIT
				B	D	E	G	
V_{DRM}, V_{RRM}	Repetitive peak off-state voltages		-	200[1]	400[1]	500[1]	600[1]	V
$I_{T(AV)}$	Average on-state current	half sine wave; $T_{sp} \leq 112$ ˚C	-	0.63				A
$I_{T(RMS)}$	RMS on-state current	all conduction angles	-	1				A
I_{TSM}	Non-repetitive peak on-state current	half sine wave; T_j = 25 ˚C prior to surge						
		t = 10 ms	-	8				A
		t = 8.3 ms	-	9				A
I^2t	I^2t for fusing	t = 10 ms	-	0.32				A^2s
dI_T/dt	Repetitive rate of rise of on-state current after triggering	I_{TM} = 2 A; I_G = 10 mA; dI_G/dt = 100 mA/µs	-	50				A/µs
I_{GM}	Peak gate current		-	1				A
V_{GM}	Peak gate voltage		-	5				V
V_{RGM}	Peak reverse gate voltage		-	5				V
P_{GM}	Peak gate power		-	2				W
$P_{G(AV)}$	Average gate power	over any 20 ms period	-	0.1				W
T_{stg}	Storage temperature		-40	150				˚C
T_j	Operating junction temperature		-	125				˚C

Thyristor
logic level

BT169W Series

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j\text{-}sp}$	Thermal resistance junction to solder point		-	-	15	K/W
$R_{th\ j\text{-}a}$	Thermal resistance junction to ambient	pcb mounted, minimum footprint	-	156	-	K/W
		pcb mounted; pad area as in fig:14	-	70	-	K/W

STATIC CHARACTERISTICS

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{GT}	Gate trigger current	V_D = 12 V; I_T = 10 mA; gate open circuit	-	50	200	µA
I_L	Latching current	V_D = 12 V; I_{GT} = 0.5 mA; R_{GK} = 1 kΩ	-	2	6	mA
I_H	Holding current	V_D = 12 V; I_{GT} = 0.5 mA; R_{GK} = 1 kΩ	-	2	5	mA
V_T	On-state voltage	I_T = 2 A	-	1.35	1.5	V
V_{GT}	Gate trigger voltage	V_D = 12 V; I_T = 10 mA; gate open circuit	-	0.5	0.8	V
		$V_D = V_{DRM(max)}$; I_T = 10 mA; T_j = 125 ˚C; gate open circuit	0.2	0.3	-	V
I_D, I_R	Off-state leakage current	$V_D = V_{DRM(max)}$; $V_R = V_{RRM(max)}$; T_j = 125 ˚C; R_{GK} = 1 kΩ	-	0.05	0.1	mA

DYNAMIC CHARACTERISTICS

T_j = 25 ˚C unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
dV_D/dt	Critical rate of rise of off-state voltage	V_{DM} =67% $V_{DRM(max)}$; T_j = 125 ˚C; exponential waveform; R_{GK} = 1k Ω	-	25	-	V/µs
t_{gt}	Gate controlled turn-on time	I_{TM} = 2 A; $V_D = V_{DRM(max)}$; I_G = 10 mA; dI_G/dt = 0.1 A/µs	-	2	-	µs
t_q	Circuit commutated turn-off time	V_D = 67% $V_{DRM(max)}$; T_j = 125 ˚C; I_{TM} = 1.6 A; V_R = 35 V; dI_{TM}/dt = 30 A/µs; dV_D/dt = 2 V/µs; R_{GK} = 1 kΩ	-	100	-	µs

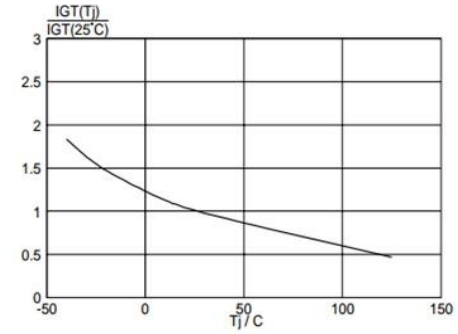


Fig.7. Normalised gate trigger current $I_{GT}(T_j)/ I_{GT}(25˚C)$, versus junction temperature T_j.

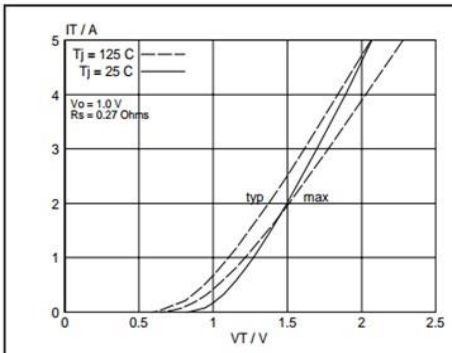


Fig.10. Typical and maximum on-state characteristic.

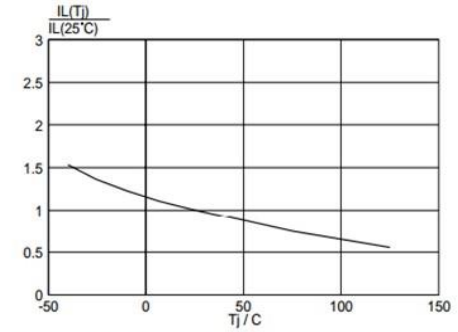


Fig.8. Normalised latching current $I_L(T_j)/ I_L(25˚C)$, versus junction temperature T_j, R_{GK} = 1 kΩ.

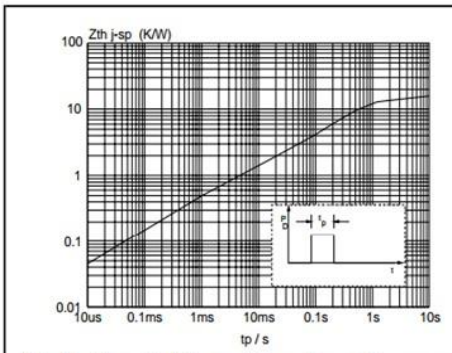


Fig.11. Transient thermal impedance $Z_{th\,j\text{-}sp}$, versus pulse width t_p.

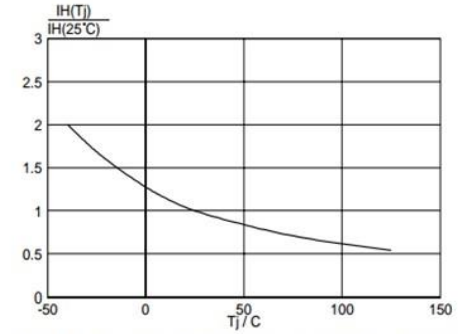


Fig.9. Normalised holding current $I_H(T_j)/ I_H(25˚C)$, versus junction temperature T_j, R_{GK} = 1 kΩ.

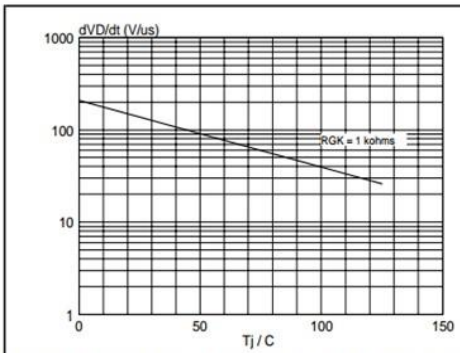


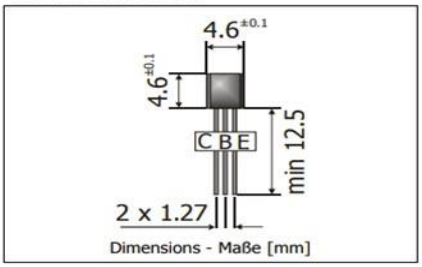
Fig.12. Typical, critical rate of rise of off-state voltage, dV_D/dt versus junction temperature T_j.

Diotec Semiconductor

BC546xBK ... BC549xBK

NPN **General Purpose Si-Epitaxial Planar Transistors**
Si-Epitaxial Planar-Transistoren für universellen Einsatz **NPN**

Version 2009-12-03



Dimensions - Maße [mm]

Power dissipation – Verlustleistung	500 mW
Plastic case Kunststoffgehäuse	TO-92 (10D3)
Weight approx. – Gewicht ca.	0.18 g
Plastic material has UL classification 94V-0 Gehäusematerial UL94V-0 klassifiziert	
Special packaging bulk Sonder-Lieferform Schüttgut	

Maximum ratings (T_A = 25°C) **Grenzwerte (T_A = 25°C)**

			BC546	BC547	BC548/549
Collector-Emitter-voltage	E-B short	V_{CES}	85 V	50 V	30 V
Collector-Emitter-voltage	B open	V_{CEO}	65 V	45 V	30 V
Collector-Base-voltage	E open	V_{CBO}	80 V	50 V	30 V
Emitter-Base-voltage	C open	V_{EB0}	5 V		
Power dissipation – Verlustleistung		P_{tot}	500 mW [1])		
Collector current – Kollektorstrom (dc)		I_C	100 mA		
Peak Collector current – Kollektor-Spitzenstrom		I_{CM}	200 mA		
Peak Base current – Basis-Spitzenstrom		I_{BM}	200 mA		
Peak Emitter current – Emitter-Spitzenstrom		$-I_{EM}$	200 mA		
Junction temperature – Sperrschichttemperatur Storage temperature – Lagerungstemperatur		T_j T_S	-55...+150°C -55...+150°C		

Characteristics (T_j = 25°C) **Kennwerte (T_j = 25°C)**

		Group A	Group B	Group C
DC current gain – Kollektor-Basis-Stromverhältnis [2])				
V_{CE} = 5 V, I_C = 10 µA	h_{FE}	typ. 90	typ. 150	typ. 270
V_{CE} = 5 V, I_C = 2 mA	h_{FE}	110 ... 220	200 ... 450	420 ... 800
V_{CE} = 5 V, I_C = 100 mA	h_{FE}	typ. 120	typ. 200	typ. 400
h-Parameters at/bei V_{CE} = 5 V, I_C = 2 mA, f = 1 kHz				
Small signal current gain Kleinsignal-Stromverstärkung	h_{fe}	typ. 220	typ. 330	typ. 600
Input impedance – Eingangs-Impedanz	h_{ie}	1.6 ... 4.5 kΩ	3.2 ...8.5 kΩ	6 ... 15 kΩ
Output admittance – Ausgangs-Leitwert	h_{oe}	18 < 30 µS	30 < 60 µS	60 < 110 µS
Reverser voltage transfer ratio Spannungsrückwirkung	h_{re}	typ. $1.5*10^{-4}$	typ. $2*10^{-4}$	typ. $3*10^{-4}$

1 Valid, if leads are kept at ambient temperature at a distance of 2 mm from case
Gültig wenn die Anschlussdrähte in 2 mm Abstand vom Gehäuse auf Umgebungstemperatur gehalten werden

Diotec Semiconductor

BC546xBK ... BC549xBK

Characteristics (T_j = 25°C) **Kennwerte (T_j = 25°C)**

			Min.	Typ.	Max.
Collector-Emitter cutoff current – Kollektor-Emitter-Reststrom					
V_{CE} = 80 V, (B-E short)	BC546	I_{CES}	–	0.2 nA	15 nA
V_{CE} = 50 V, (B-E short)	BC547	I_{CES}	–	0.2 nA	15 nA
V_{CE} = 30 V, (B-E short)	BC548 / BC549	I_{CES}	–	0.2 nA	15 nA
V_{CE} = 80 V, T_j = 125°C, (B-E short)	BC546	I_{CES}	–	–	4 µA
V_{CE} = 50 V, T_j = 125°C, (B-E short)	BC547	I_{CES}	–	–	4 µA
V_{CE} = 30 V, T_j = 125°C, (B-E short)	BC548 / BC549	I_{CES}	–	–	4 µA
Collector-Emitter saturation voltage – Kollektor-EmitterSättigungsspg. [2]					
I_C = 10 mA, I_B = 0.5 mA		V_{CEsat}	–	80 mV	200 mV
I_C = 100 mA, I_B = 5 mA		V_{CEsat}	–	200 mV	600 mV
Base saturation voltage – Basis-Sättigungsspannung [2]					
I_C = 10 mA, I_B = 0.5 mA		V_{BEsat}	–	700 mV	–
I_C = 100 mA, I_B = 5 mA		V_{BEsat}	–	900 mV	–
Base-Emitter-voltage – Basis-Emitter-Spannung [2]					
V_{CE} = 5 V, I_C = 2 mA		V_{BE}	580 mV	660 mV	700 mV
V_{CE} = 5 V, I_C = 10 mA		V_{BE}	–	–	720 mV
Gain-Bandwidth Product – Transitfrequenz					
V_{CE} = 5 V, I_C = 10 mA, f = 100 MHz		f_T	–	300 MHz	–
Collector-Base Capacitance – Kollektor-Basis-Kapazität					
V_{CB} = 10 V, I_E = i_e = 0, f = 1 MHz		C_{CBO}	–	3.5 pF	6 pF
Emitter-Base Capacitance – Emitter-Basis-Kapazität					
V_{EB} = 0.5 V, I_C = i_c = 0, f = 1 MHz		C_{EBO}	–	9 pF	–
Noise figure – Rauschzahl					
V_{CE} = 5 V, I_C = 200 µA, R_G = 2 kΩ	BC546 / BC547	F	–	2 dB	10 dB
f = 1 kHz, Δf = 200 Hz	BC548 / BC549	F	–	1.2 dB	4 dB
Thermal resistance junction to ambient air Wärmewiderstand Sperrschicht – umgebende Luft		R_{thA}	< 200 K/W [1]		
Recommended complementary PNP transistors Empfohlene komplementäre PNP-Transistoren			BC556 ... BC559		
Available current gain groups per type Lieferbare Stromverstärkungsgruppen pro Typ			BC546A BC547A BC548A	BC546B BC547B BC548B BC549B	BC547C BC548C BC549C

CONCLUSION AND FUTURE SCOPE

Thus the most expensive and important asset of all of us will be on our finger tips and fully secure.

This will prove to be a great technique, to prevent the theft of vehicles, especially in metropolitan cities. Where theft cases are being reported almost every day.

1. Planning to install a GPS system into a device, with which location of the vehicle can be instantly located anytime remotely from anywhere.
2. Furthermore, more functionalities to automate the vehicle remotely from anytime anywhere with an app are under process too.
3. We are also planning to increase the security of the vehicle but cutting off the batteries supply to vehicles , does adding security to it.

REFERENCES

1. https://electronicsforu.com/electronics-projects/anti-theft-alarm-for-vehicles

2. "Basic Electronics" section of manual for details of resistorand capacitor identification methods.

3. Daid lame (2012) car alarm system.

4. Ji Shin (2009) car security system.

5. Ruchita.J.Shah, Anuradha P . Gharge(2012) GSM based Car security system.