



Vel Tech
Rangarajan Dr. Sagunthala
R&D Institute of Science and Technology
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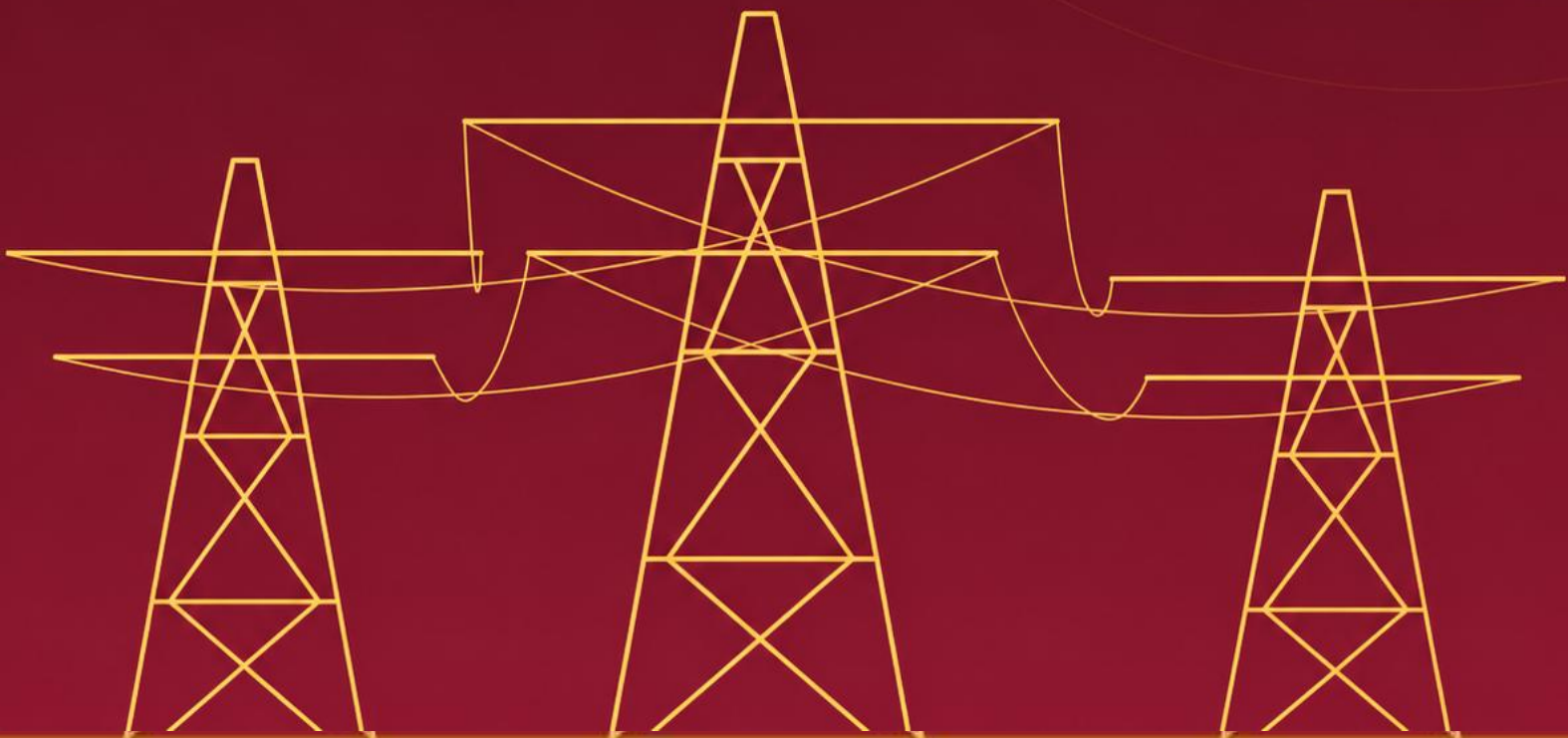
SCHOOL OF ELECTRICAL AND COMMUNICATION

**DEPARTMENT OF
ELECTRICAL AND ELECTRONICS ENGINEERING**

Spark Magazine

(2022 – 23)

ISSUE- 04 (June 2023)



Foreword



Col. Prof. Vel. Dr. R. Rangarajan
Founder President & Chancellor



Dr. Mrs. Sagunthala Rangarajan
Foundress President

We remain committed to building an educational environment that nurtures knowledge, character, innovation, and excellence. Our institution continues to encourage students and faculty to pursue meaningful academic, research, and technological endeavors, supported by modern infrastructure, well-equipped laboratories, and a dedicated faculty. The Department of Electrical and Electronics Engineering reflects this vision through its academic achievements, research initiatives, funded projects, industry collaborations, and the accomplishments of its students and faculty.

LEADERSHIP



Dr. Rangarajan Mahalakshmi Kishore
Chairperson & Managing Trustee

I am delighted to present this vibrant edition of SPARK, the magazine of the Department of Electrical and Electronics Engineering. This magazine reflects the department's academic excellence, student contributions, innovative initiatives, and technical achievements. As technology continues to evolve, I encourage students and faculty to embrace lifelong learning, explore emerging technologies, and apply their knowledge to address real-world challenges. I congratulate the editorial team and the entire EEE department for their dedicated efforts in bringing out this edition and showcasing the department's accomplishments and vision.

Wishing SPARK continued success in inspiring innovation, creativity, and excellence!



LEADERSHIP



Prof. S. Salivahanan
Vice Chancellor

I am delighted to present the latest edition of Spark, the flagship magazine of the EEE Department. This magazine reflects our continuous pursuit of research excellence, creativity, co-curricular activity and technical learning of our students. Kudos to the editorial team, faculty, and brilliant students whose hard work and contributions made this edition possible.



Prof. Dr. E. Kannan
Registrar

I warmly congratulate the EEE Department on launching this vibrant edition of Spark. This platform beautifully captures the dynamic activities, student achievements, and academic excellence of the department. I wish the EEE team continued success in inspiring our community through such creative and meaningful initiatives.



Message from Dean and Head of the Department

Dr. V. Jayasankar

Professor & Dean
School Of Electrical and Communication



Driven by our faculty, students, and staff, the School continues to make remarkable progress in cutting-edge research, academic excellence, and industry collaboration. Spark, the EEE department magazine, beautifully highlights this journey—showcasing our commitment to innovation, hands-on learning, and community impact. I commend the team for their dedication to shaping future-ready professionals and bringing these key milestones to light.

Dr. P.Chandrasekar

Professor & Head
Department of Electrical and Electronics Engineering



It is with great pleasure and pride that I present SPARK, the official magazine of the Department of Electrical and Electronics Engineering. I invite you to explore these pages to discover the remarkable achievements and initiatives within our department. Together, we look forward to a bright future defined by groundbreaking research, transformative education, and impactful contributions to the field.

VISION OF THE DEPARTMENT

To provide intellectual curiosity in the field of Electrical and Electronics engineering that produces skilled interdisciplinary engineers to serve the society.

MISSION OF THE DEPARTMENT

M1: To inculcate knowledge among the students through comprehensive curriculum.

M2: To enrich the academic experience in terms of flexibility, teamwork, design skills, practice and industrial trainings.

M3: To produce competent graduates suitable for a successful career in Industry and Research.

PROGRAMME EDUCATIONAL OBJECTIVE

PEO1: Design and analyse electrical and electronic systems by applying the knowledge of mathematics and engineering.

PEO2: Provide practical solution to multidisciplinary societal problems through innovative ideas.

PEO3: Secure positions and continue as valued, creative and proficient employees in a wide variety of fields and industries for a rewarding career.



Smart Grids: Next -Gen Grid

Most Energy Departments around the world are placing smart devices throughout their networks, right up to customers' homes, offices, and factories. The smart grid collects valuable data to allow both consumers and suppliers a higher degree of control over multiple power sources. It also enables them to predict surges in usage and instantly detect outages. A Smart Grid revolutionizes traditional power delivery by enabling real-time, bidirectional communication between utilities and consumers for optimized energy management. It seamlessly integrates renewable energy sources, such as solar and wind, while dynamically balancing supply and demand to reduce transmission losses.

By allowing end-to-end communication between distribution sites, power plants, and the end user's electrical point-of-presence, smart grids significantly raise efficiency and reduce costs.

Through automated fault detection and self-healing mechanisms, the grid minimizes power outages and enhances overall reliability. Furthermore, it empowers consumers with transparent usage data, encouraging energy efficiency and reducing operational costs across the power network. Soon, it's inevitable that electrical engineers will frequently come across smart grids and or be asked to help develop one.

Charging in sunny hours uses solar energy locally instead of letting it go unused.

VTU21247 SAI TEJASWINI

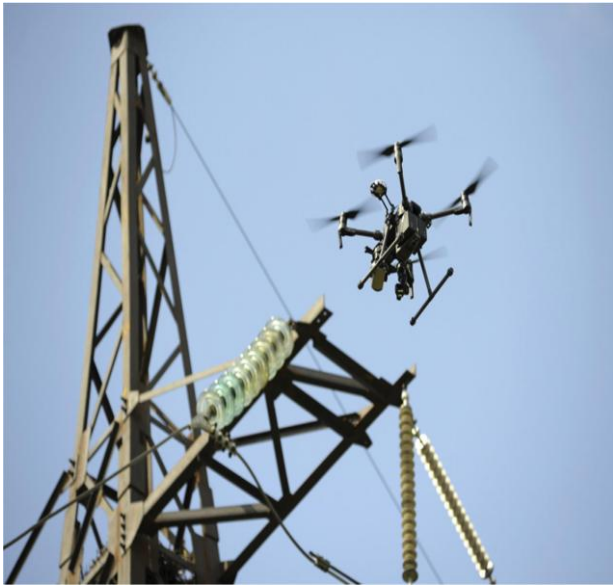
Electric Vehicles: An overview



Electric Vehicles (EVs) represent a monumental paradigm shift in modern transportation, replacing traditional internal combustion engines with clean, high-efficiency electric drive systems. Driven by advanced lithium-ion and solid-state battery technologies, power electronic converters, and high-torque motors like Permanent Magnet Synchronous Motors (PMSM), EVs offer smooth acceleration, near-silent operation, and zero direct tailpipe emissions.

Furthermore, the integration of Vehicle-to-Grid (V2G) technology transforms electric vehicles from simple transportation modes into mobile, distributed energy storage units. During peak demand periods, V2G enables bidirectional power flow, allowing plugged-in EVs to feed stored power back into the grid, stabilizing voltage levels and facilitating the seamless adoption of renewable energy sources like solar and wind. As battery chemistries advance and charging networks expand globally, electric vehicles stand as a cornerstone of sustainable, smart urban mobility and grid modernization.

Drones: New Medium of Transportation



Unmanned Aerial Vehicles (UAVs), commonly known as drones, are rapidly evolving from aerial photography tools into a revolutionary medium of modern transportation.

In the realm of logistics and cargo delivery, transportation drones offer an unprecedented solution to urban traffic congestion and rural accessibility challenges. By bypassing ground infrastructure, medical drones now deliver life-saving supplies, vaccines, and blood samples to remote or disaster-stricken areas within minutes. Simultaneously, retail and logistics giants are deploying autonomous delivery fleets for "last-mile" urban operations, drastically reducing delivery times, fuel consumption, and carbon footprints. As autonomous flight control and battery technologies continue to advance, drones are set to establish an efficient, sustainable, and truly three-dimensional transportation network for the smart cities of tomorrow.

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VTU21247 SAI TEJASWINI

Inspiration in Ethics and Excellence: Mr. Ratan Tata



Mr. Ratan Tata exemplifies how industrial vision and moral integrity can jointly shape a nation's destiny. As a transformer of Indian industry, his leadership expanded global horizons while keeping human values at the core of enterprise

Mr. Tata stewardship, technological progress was never merely about profit margins; it was a tool for societal upliftment, sustainable development, and national progress. For engineering students and young innovators, his life offers a profound lesson: technical capability achieves its highest purpose when guided by ethics. He demonstrated that true success lies in building systems that endure, empowering communities, and maintaining empathy amid rapid modernization. Through his philanthropic legacy and unwavering commitment to social responsibility, Mr. Ratan Tata remains a beacon of principled leadership. His life reminds us that while intellect builds technology, it is character and compassion that illuminate the path to enduring progress.

Charging in sunny hours uses solar energy locally instead of letting it go unused.

My Imagination!

A spark of thought within the silent mind,
Unlocks a world where logic is redefined.
It bridges gaps where heavy circuits end,
And shapes the dreams that future hands will bend.
No boundary limits where its currents flow,
It lights the dark with an unyielding glow.
From abstract ideas to the physical ground,
In pure imagination, tomorrow is found.

VTU 11938 Naga Swetha

Charging in sunny hours uses solar energy
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Droplets.

Tiny spheres of silver, falling from the sky,
Tracing quiet stories as they trickle by.
On the leaves of morning, shining soft and clear,
Whispering of rain that draws the garden near.
Gathering in rivers, small yet full of grace,
Carrying a rhythm to every open space.
Each a little mirror to the sun's warm ray,
Washing all the dust of yesterday away.
Proof that gentle moments hold a quiet power,
Nurturing the earth with every passing shower.

VTU 11938 Naga Swetha

Charging in sunny hours uses solar energy
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Art: Shading Some Real Truth!



VTU17929 PRANAV KUMAR ROWLA

SUDOKU: Mind Challenge

Fill the grid so that every row, every column and every 3x3 box contains the numbers 1 to 9.

1.

	7		3			5		6
5	1		6	7	2	4	3	8
		4	5	9	8	7		
9	2		8	5		3	7	4
		8	4	3	1	6		
		6	9	2	7	1		
2	4		7		9	8	5	1
6	9	7		8	5		4	3
1	8	5	2	4	3	9	6	7

VTU18180 Jashuva

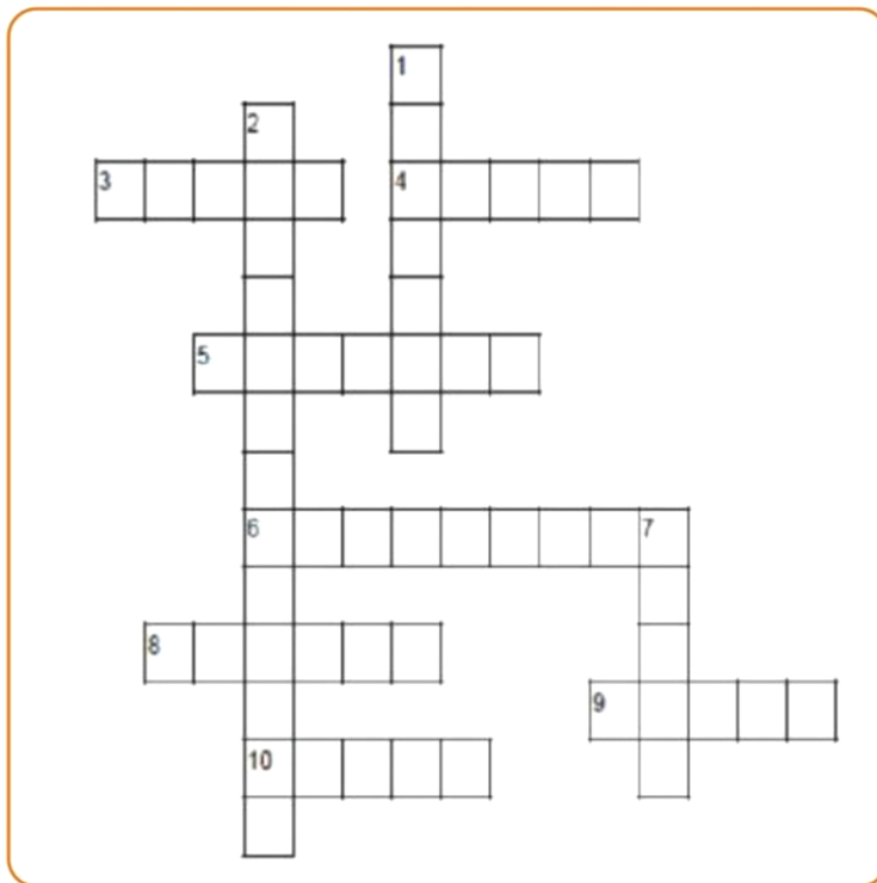
PUZZLES

Across

3. There is a magnetic _____ around a magnet.
4. When LIKE poles come together they...
5. When OPPOSITE poles come together they...
6. An ability to attract or charm
8. When an object becomes magnetized and exerts magnetic force, it's called a _____.
9. The Earth has a North and _____ pole.
10. The _____ is a giant magnet.

Down

1. He invented the first electric motor (Last Name).
2. _____ is a magnet that works with electricity and can be switched on or off.
7. A small compact engine.



VTU17929 PRANAV KUMAR ROWLA

◆ Riddles

1. What word, when written in capital letters are the same forwards backwards and upside down?
2. Two boys play checkers. They play 5 games. They win the same amount. How?
3. What is that when you take away the whole, you still have some left?
4. There is a common English word that is nine letters long. Each time you remove a letter from it, it still remains an English word, from nine letters right down to a single letter. What is the original word and what are the words that it becomes after removing one letter at a time?
5. There is only one ten letter word in the English language which can be typed using only the top row of the keys on a type writer (or keyboard) what is it?
6. The day before yesterday I was 25 and the next year I will be 28. This is true only one day in a year. What day is my birthday?
7. What mathematical symbol can be placed between 5 and 9 to get a number greater than 5 and smaller than 9?
8. What can you break but not touch?
9. Say my name and I disappears what am I?
10. What kind of pet always stays on the floor?

- | | |
|---------------------------------|---------------------|
| 1) NOON | 6) Born on Dec 31st |
| 2) They did not play each other | 7) Decimal |
| 3) wholesome | 8) Promise |
| 4) startling | 9) Silence |
| 5) Type writer | 10) Carpet |

Quiz: Brain On Fire

•What is the primary application of a Zener diode in analog electronic circuits?

- A) Rectification B) Voltage regulation C) Amplification D) Signal filtering

Answer: B) Voltage regulation

•In which region must a BJT be biased in order to operate properly as a linear amplifier?

- A) Cut-off region B) Saturation region C) Active region D) Breakdown region

Answer: C) Active region

What is the theoretical input impedance of an ideal operational amplifier (Op-amp)?

- A) Zero B) Unity C) Infinite D) Fifty ohms

Answer: C) Infinite

What is the primary effect of introducing negative feedback in an electronic amplifier?

- A) Increases voltage gain B) Decreases bandwidth C) Improves stability and increases bandwidth D) Increases signal distortion

Answer: C) Improves stability and increases bandwidth

A Field Effect Transistor (FET) is fundamentally controlled by which of the following parameters?

- A) Input current B) Input voltage C) Collector resistance D) Junction temperature

Answer: B) Input voltage

According to the Barkhausen criterion, what must the magnitude of the loop gain be for an oscillator to sustain continuous oscillations?

- A) Less than one B) Equal to zero C) Exactly equal to one D) Greater than one hundred

Answer: C) Exactly equal to one

Which transistor configuration is most commonly chosen for general-purpose voltage and power amplification because it provides both voltage and current gain?

- A) Common Base B) Common Collector C) Common Emitter D) Common Drain

Answer: C) Common Emitter

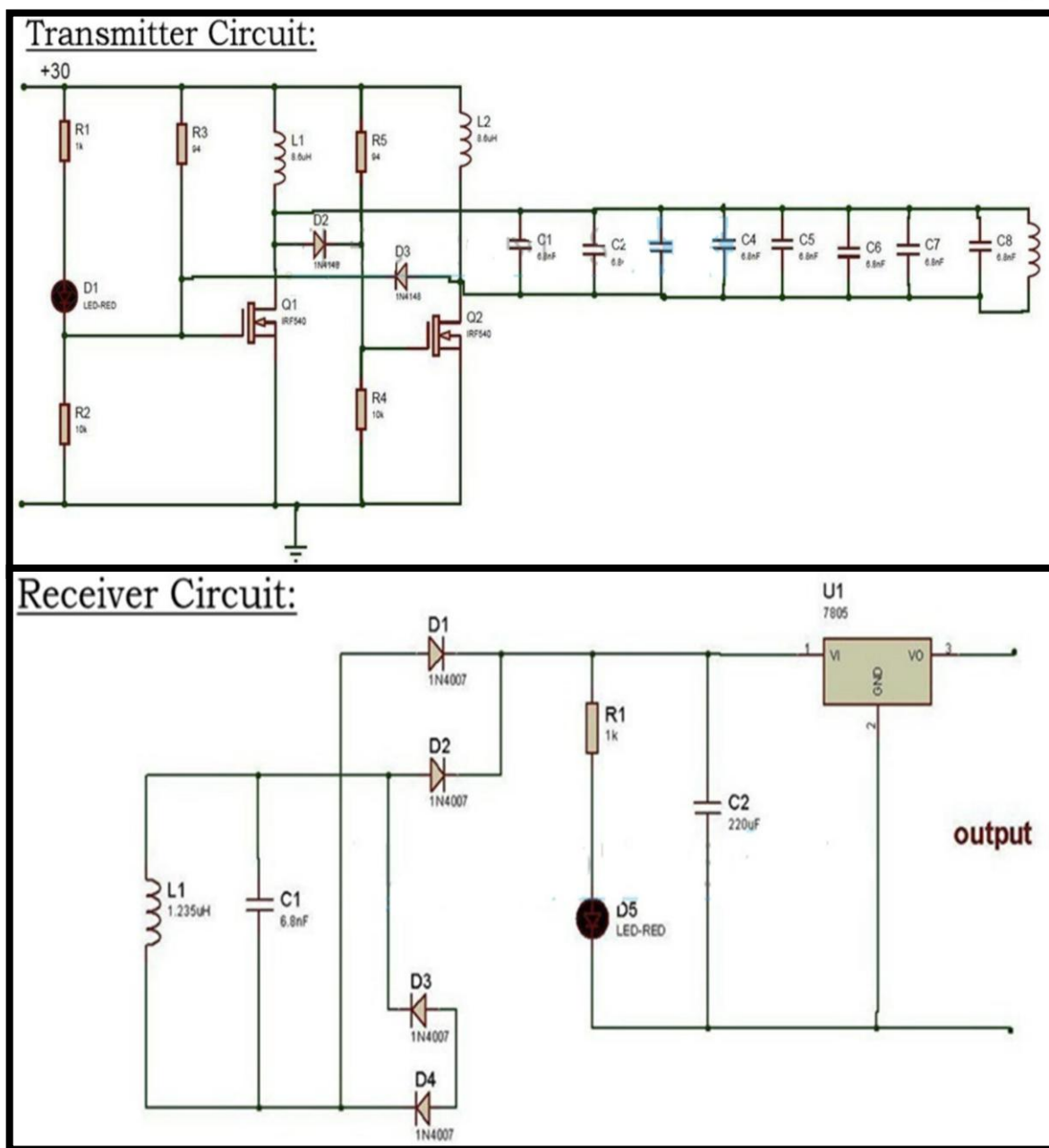
TTS 2652 Mr.R.Sreedhar

PROJECT IDEA

Wireless Mobile Battery Charger Circuit

Circuit Diagram

The circuit diagram for the Wireless Mobile Battery Charger Circuit is given below.



The relay changes its own settings when the network changes, instead of relying on one fixed setting for every case

Principle of the Project

In our Wireless battery charger, we use two circuits. The first circuit is transmitter circuit used to produce voltage wirelessly. The transmitter circuit consists of DC source, oscillator circuit and a transmitter coil. oscillator circuit consists of two n channel MOSFETS IRF 540 , 4148 diodes. When the DC power is given to the oscillator, current starts flowing through the two coils L1, L2 and drain terminal of the transistor. At the same time some voltage is appeared at the gate terminals of the transistors. One of the transistors is in on state while the other is in off state.

Thus voltage at drain of transistor which is in off state raises and it fall through the tank circuit made of 6.8nf capacitors and transmitter coil of 0.674. Thus operating frequency is determined by using formula $F=1/[2\pi\sqrt{LC}]$.

In the second circuit that is receiver circuit consists of receiver coil, rectifier circuit and regulator. When the receiver coil is placed at a distance near the inductor Ac power is induced in the coil. This is rectified by the rectifier circuit and is regulated to DC 5v using 7805 regulator. The rectifier circuit consists of 1n4007 diode and capacitor of 6.8nf. The output of regulator is connected to the battery.

Working of the Project

- Initially, connect the circuit as shown in the circuit diagram.
- Switch on the supply.
- Connect the battery charger at the output of the circuit.
- Place the receiver coil near the transmitter coil .
- You can observe the charging of battery.

Applications

- Wireless chargers can be used to charge mobiles, camera batteries, Bluetooth headsets etc.
- This can also be used in applications like car battery charger with little modification. Go to Simple Car Battery Charger Circuit post for more information.
- This can also be used in medical devices.

TTS 2652 Mr.R.Sreedhar

◆ CREDITS

Editorial Team & Acknowledgements**ACKNOWLEDGEMENTS**

The editorial team thanks the management of Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology for their constant encouragement, the Head of the Department for guidance, the faculty members who contributed articles, and student's who shared their contents

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