

Epub free Design of electrical transmission lines structures and foundations (Read Only)

types of transmission lines there are two main categories of transmission lines overhead and underground overhead lines the most common type are suspended above the ground using transmission towers these structures facilitate electric power transportation over long distances at high voltage levels in electrical engineering a transmission line is a specialized cable or other structure designed to conduct electromagnetic waves in a contained manner the term applies when the conductors are long enough that the wave nature of the transmission must be taken into account transmission lines are the simplest structures that guide electromagnetic waves transmission line in this course a transmission line would be any two arbitrary shaped metal conductors that are very long and uniform in at least one dimension transmission line made up of two metal conductors that are very long and uniform in the z direction x 1 towers transmission towers are the most visible component of the bulk power transmission system their function is to keep the high voltage conductors separated from their surroundings and from each other higher voltage lines require greater separation transmission line theory is expressed in terms of traveling voltage and current waves and these are akin to a one dimensional form of maxwell s equations transmission line definition a transmission line is a designed conductor that carries large volumes of electrical power across large distances at high voltages line types and lengths transmission lines are categorized by length short lines are under 80 km medium lines between 80 and 250 km and long lines over 250 km planar transmission lines are the most common transmission lines for high speed digital rf and microwave circuits two planar transmission line structures are shown in figure 3 2 1 the reason these are so popular is that they can be mass produced a transmission line is a structure intended to transport electromagnetic signals or power a rudimentary transmission line is simply a pair of wires with one wire serving as a datum i e a reference e g ground and the other wire bearing an electrical potential that is defined relative to that datum recognize various transmission line structures define reflection and transmission coefficients and calculate propagation of voltages and currents on ideal transmission lines learn to use s parameters and the smith chart to analyze circuits this in depth course provides you with the latest criteria and practical techniques used in the design of transmission lines structures and foundations you will learn transmission design concepts that use traditional methods and modern software and participate in class design exercises transmission line design bulk transmission high voltage lines the majority of major transmission lines in the u s are either 230 kilovolt kv or 500 kv alternating current lines in some cases 115 kv lines are used lower voltages are far less efficient for moving electricity across hundreds or thousands of miles to where it is needed a transmission tower also known as a power transmission tower power tower or electricity pylon is a tall structure usually a steel lattice tower used to support an overhead power line transmission lines are always built with sets of three conductors with an optional small wire or two at the top of the structure to serve as lightning protection 5 1 introduction to transmission lines distributed parameters this module examines how

signals behave as they travel along transmission lines it also introduces distributed parameters transmission lines are the conductors that serve as a path for transmitting sending electrical waves energy through them these basically forms a connection between transmitter and receiver in order to permit signal transmission refer to appendix c for a diagram of typical overhead transmission line structures typical foundations of transmission line structures are a bored piers b mass concrete c driven cast in situ piles d soil rock anchors and e special foundations e g raft foundations 4 2 transmission line conductors transmission lines are an essential component of the utility infrastructure providing an interstate like network for the efficient transmission of electricity over long distances by transporting electricity at high voltages these lines minimize energy loss and ensure that power reaches its intended destination reliably and without interruption in addition to the structural loading requirements in terms of the different load cases deflections design spans and conductor tensions transmission line structures need to be designed for electrical requirements all of which affect the geometry of the structure the 132kv switchgears consist of two 2 transformer feeders eight 8 outgoing feeders two 2 bus sections and two 2 bus coupler circuits overhead transmission lines consist of a route length of 14 781 km and circuit length of 28 365 km with 50 369 supports while underground transmission lines consist of a route length of 6 391 km and circuit length of 12 325 km

transmission lines types function grid infrastructure

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recognize various transmission line structures define reflection and transmission coefficients and calculate propagation of voltages and currents on ideal transmission lines learn to use s parameters and the smith chart to analyze circuits

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this in depth course provides you with the latest criteria and practical techniques used in the design of transmission lines structures and foundations you will learn transmission design concepts that use traditional methods and modern software and participate in class design exercises

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what are transmission lines definition types parameters

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transmission line general requirements including typical

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transmission line conductors

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geometric considerations of transmission line structures

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