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significant electronic devices, the transistor found use in a huge range of applications such as embedded systems, digital circuits and control systems. In digital and analog domains as they are used for use of different applications such as switching circuits, amplifier circuits, power supply circuits, digital logic circuits, voltage regulators, oscillators circuits and so on. This article focuses mainly on the transistor switching action and provides a brief explanation of the transistor aslight switch. A brief note about the BJT there are two main transistors: bipolar (bjt) and field effect transistors (FETs) transistors. The bipolar junction transistor or simply bjt is a Terminals and two semiconductor *devices* of junction. It consists of two junctions of consecutive coupled PNs with a database layer. Whenever we say the term "transistor", it usually refers to BJT. It is a current controlled device, where the output current is controlled by the input current. The bipolar name indicates that two types of cargo carriers, this is, with trons and orfrier, conduct current in the BJT, where the orfrier are positively carried and trons with negative load. The transistor has three regions, namely, base, sender and collector. The emitter is a strongly doped terminal and emits elors at the base. The base terminal is slightly doped and passes the injected issuers to the collector. The collector's terminal is moderately doped and collects base trons. This collector is large when compared to two other regions so that he can dissipate more heat. BJts are of two types: NPN and PNP. Both work the same way, but differ in terms of prejudice polarity and source of food. In the PNP transistor, the material of the type N © fervued between two type P materials, while in the case of the P NPN -type material is fressed between two type n materials. These two transistors can be configured in different types, such as ordinary emitter, ordinary collector and common basis. If you are looking to work on Mosfet as a switch, first learn the Mosfet Basic. Operational modes of transistors, depending on the conditions of polarization, such as advance or reverse, transistors are three main modes of operation, such as cutting, active and saturation regiars. Active mode in this mode, the transistor is generally used as a current amplifier. In active mode, two are differently biased, which means that the base-breadth junction is bound to the back, while the base collector's junction is etnerroc etnerroc ed edaditnauq a e roteloc e rossime ertne iulf etnerroc a ,odom esseN ,asrever is proportional to the base current. Cutting mode In this way, the junction of the base of the collector and the junction of the base of the emitter are biased. Since the two PN joints are biased reversals, there is almost no current flow, except small leakage currents (usually in the order of few nano amperes or peak amplifiers). The BJT in this mode is turned off and is essentially an open circuit. The cutting region is mainly used in the switching circuits and digital logic. Saturation mode In this mode of operation, both station base joints and collector base are biased forward. The current flows freely from the collector to the emitter with almost zero resistance. In this mode, the transistor is fully connected and is essentially a close circuit. The saturation region is also mainly used in the switching circuits and digital logic. The figure below shows the output characteristics of a BJT. In the figure below, the cutting region has the operating conditions when the current of the output collector is zero, the zero-based input current and the maximum voltage of the collector. These parameters cause a large depletion layer, which still does not allow the current to flow through the transistor. Therefore, the transistor is completely in condition. Similarly, in the saturation region, a transistor is biased in such a way that the maximum base current is applied which results in the maximum current of the collector and the minimum voltage of the collector-emissor. This causes the depletion layer to become small and allows maximum current flow through the transistor. Therefore, the transistor is fully in condition. Therefore, from the above discussion, we can say that transistors can be made to function as a solid state switch, operating the transistor in cutting and saturation regions. This type of switching app is used to control LEDs. odii³Äs odii³Äs odatse ed opit etsE .otiucric mu ed otnemahcef uo arutreba arap ofÄŠÄatumoc ed ofÄŠÄarepo arap odasu res edop rotsisnart mu euq rotpurretni omoc rotsisnart ,cte ,sedi³Änelos ,sadampeÄl It offers significant reliability and lower cost compared to conventional relay. NPN and PNP transistors can be used as switches. Some of the applications use a power transistor as a commutation device, at that moment it may be necessary to use another signal transistor to conduct the high potential transistor. NPN TRANSISTOR AS A SWITCH BASED ON THE TERMINATION APPLIED ON THE BASE TERMINAL OF A OPERATION OF TRANSISTING COMMITION. When one tension enough (vin> 0.7 V) is applied between the base and broadcaster, the collector the emitter tension is approximately 0. Therefore, the transistor acts as a short circuit. The VCC / RC collector current flows through the transistor. Likewise, when no tension or zero tension is applied to the input, the transistor operates in the cutting record and acts as an open circuit. In this type of commutation connection, the load (here an LED is used as a load) is connected to the commutation output with a point of reference. Thus, when the transistor is turned on, the current will flow from the source to the ground through the load. Example of transistor NPN as a switch consider the example below, where base resistant rb = 50 ki ©, collector resistance RC = 0.7 ki ©, VCC © 5V and the beta value © 125. At the base, a signal of input ranging from 0V to 5V is given. Let's see the output in the collector, varying VI in two states that is 0 and 5V as shown in the figure. IC = VCC / RC, when VCE = 0 IC = 5V / 0.7 Ki © IC = 7.1 MA BASE CURRENT IB = IC / ß IB = 7.1 MA / 125 IB = 56.8 or maximum of the collector current in the circuit is 7.1m to when VCE is zero. And the corresponding base current for this collector current is 56.8 i mention. Thus, it is clear that when the base current is increased to the 56.8 micro amper, then the transistor enters the saturation mode. Consider the me me odacilpa © Ä tlov orez odnauq oa e ovitagen odal oa esab a odnatcenoc arossime Ä ofÄŠÄaler me etnemavitagen asoicnednet erpmes ©Ä esab a ,ofÄŠÄarugifnoc atseN .arugif an odartsom omoc agrac ad s©Ävarta ofÄhc oa odatcenoc jÄtse roteloc o e etnatsnoc ofÄsnet Ä adatcenoc jÄtse arossime a sam ,esab ©Ä m©Äbmat PNP otiucric ed adartne .NPN rotsisnart ed rotpurretni ed otiucric oa ralimiS rotpurretni mu omoc PNP rotsisnart ed olpMexE .ofÄhc o arap ,etnemlanif ,e agrac a arap rotsisnart od s©Ävarta etnof ad iulf etnerroc a ,odagil ©Ä rotsisnart o odnauQ .aicn³Ärefer ed otnop mu moc rotsisnart od ofÄŠÄatumoc ed adÄas Ä adatcenoc jÄtse agrac a ,ofÄXenoc atseN .otreba artuo ed otiucric-otruc arap rotsisnart o euq moc zaf avitagen ofÄSnet siam uo ofÄSnet axiab amu ,etnemseipmiS .avitagen siam ©Ä esab ed ofÄSnet a odnauq iulf esab ed etnerroc a ,ofÄŠÄatumoc etseN ,rossime oa ofÄŠÄaler me etnemavitagen levjÄw erpmes ©Ä esab ed lanimret o ,PNP rotsisnart o araf ,savitagen arret ed sepjÄŠarugifnoc arap odasu ©Ä ofÄŠÄatumoc ed opit etsE ,esab ad iulf etnerroc a sam ,ofÄŠÄatumoc ed ofÄŠÄarepo amu arap NPN omoc anpicuf PNP hctiwS rotsisnart mu omoc rotsisnart PNP ,orez etnemadamixopa es-anrot roteloc on adÄas a ,missA .adartne an odacilpa ©Ä V5 odnauq ,NO etnemlatot ©Ä ,ajes uo ofÄŠÄarutas Ä odizudnoc jÄres rotsisnart o ,etnerroc erepma orcim 8,65 euq od roiam ©Ä esab ed etnerroc a omoc ,otnatroP ÄÄÄ 8,65 euq roiam ©Ä euq ÄÄÄ 68 = ©lK 05 / jÄ7,0 Ä V5(= BI ,missA V 7.0 = EBV ,oicÄlis ed rotsisnart araP BR /)EBV Ä lV(= BI ,V5 = IV odnauQ ,flohcriK ed ofÄSnet ed iel a odnacilpa adanimreted res edop esab ed etnerroc a ofÄTne ,stlov 5 ed ©Ä adacilpa adartne ed ofÄSnet a euq eredisnoc V5 = 0 Ä V5 =)JCR * CI(Ä CCV = CV ,0= CI e 0 = BI ,V0 = IV odnauQ ,V5 a laugi ©Ä roteloc od adÄas ed ofÄSnet a e FFO ofÄŠÄidnoc me jÄtse rotsisnart o ,otnatroP ,asoicnednet adahnimacne ©Ä ofÄÄn arossime ed esab ed ofÄŠÄAnuj a ,adarreta ©Ä arossime a omoc o orez ajes esab ed etnerroc a euq moc zaf ossl .adartne on the positive side of the input source. Thus, the VBE voltage is negative and the emitter feed voltage relative to the Collector is positive (VCE positive). Therefore, for driving the transistor emitter should be more positive in relation to the collector and the base. In other words, the base should be more negative in relation to the issuer. To calculate the base and collector's currents that follow the expressions are used. IC = IE - IB IC = ß * IB IB = IC / ß Consider the example above, that the load requires 100 thousand current ampere and the transistor has the beta value of 100. Then the current required for the transistor saturation is Minimum Base Current = Collector current / ß = 100 mA / 100 = 1mA Therefore, when the base current is 1 mA, the transistor will be fully ON. But almost 30% more current is required for the guaranteed saturation of the transistor. Thus, in this example the required base current is 1.3mA. Practical Examples of Transistor as a Switch Transistor to Switch the LED As discussed earlier, the transistor can be used as a switch. The scheme below shows how a transistor is used to change the LED. When the switch on the base terminal is open, no current flows through the base so that the transistor is in the cutting state. Therefore, the transistor acts as an open circuit and the LED becomes OFF. When the switch is closed, the base current begins to flow through the transistor and then leads to saturation, which results in LED to turn on. The resistors are placed to limit the currents through the base and LED. It is also possible to vary the intensity of the LED, varying the resistance in the base current path. Transistor to Operate Relay It is also possible to control the relay operation using a transistor. With a small circuit arrangement of a transistor capable of energizing the relay coil so that a a adatcenoc anrette agrac ed rotsisnart ed acitjÄrp ofÄŠÄacilpa ,rotpurretnl omoc PNP e NPN serotsisnart ed odnahlabart ,rotsisnart M mu ed ofÄŠÄarepo ed sepjÄiger ,ralopiB ofÄŠÄAnuj ed rotsisnart od ocisjÄb o adnerpÄ ,hctiwS mu omoc rotsisnart od osu o erbos otelpmoc lairottut mU ofÄšulnoc .oxiaba reversec edop *Äcov ,soirjÄtnemoc e sepjÄtsegus ,sadiwÄd revit *Äcov es ,ossid m©ÄÄÄ ,rotsisnart ofÄŠÄatumoc ed otiencoc o odot aŠÄeralcse setnaveler solpmexe e snegami moc adicnof ofÄŠÄamrofni a euq somarepsE Protpurretni mu omoc odasu res edop rotsisnart mu omoc aralc aiedi a meT ,rodalortnocrcim omoc CI uo elortnoc ed ovititsopid od ofÄŠÄatumoc ed aicn³Äuqerf a retho somedoP ,sievjÄrav saicn³Äuqerf me rotsisnart o odnanretla ,latot edadicolev a llitsdnats ed rotom od edadicolev a raluger levÄssop ©Ä m©ÄÄbmat ,etnemaditeper rotom o ragilised e ragil somedop ,ofÄŠÄarutas e etroc ed sepjÄiger me rotsisnart o ranretla oa ,otiucric o regetorp arap eled s©ÄÄvarta ervil megador ed odoid mu racoloc euq somet ofÄTne ,avitudni agrac amu ©Ä m©ÄÄbmat CD rotom o ,amica odanoicnem omoc C .oxiaba arugif an odartsom omoc ,opmet ed seraluger solavretni me rotsisnart o odnanretla ,lanoiceridinu amrof amu ed CD rotom od edadicolev a raluger e rizudnoc arap odasu res edop m©ÄÄbmat rotsisnart mU rotom o rigririd arap rotsisnart ,avitudni agrac ad sadizudni sepjÄsnet ed otuicric o regetorp arap avitudni agrac moc olelarap me odoid o rasu euq somet ,otnatroP ,osnased ed otuicric oa sievjÄredisnoc sonad rasnac edop ofÄSnet atla atsE .anibob ad s©ÄÄvarta laicnetop otla mu retnam edop aigrene ed atib³Äs ofÄŠÄomer a ,serotudni e serotom ed ofÄŠÄatumoc etnemralucitrap ,savitudni sagrac mE .sodarepo ofÄÄs ©ÄÄler ed sotatnoc so e adazigrene acif ©ÄÄler ed anibob a ,missA ,otiucric-otruc es-anrot otuicric ofÄÄler ed anibob a ,missA ,otiucric-otruc es-anrot otuicric ofÄÄler a arap rotsisnart o rizudnoc asuac esab an adacilpa adartne Ä .©ÄÄler ed anibob a razigrene arap rotsisnart mu ed ofÄŠÄarepo a rebas arap oxiaba otuicric o eredisnoc ,odalortnoc ©ÄÄ transistor, transistor.

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