DOWNLOAD PDF OVERCURRENT AND OVERVOLTAGE PROTECTION

Chapter 1 : Difference Between Over Current and Over voltage.? | Yahoo Answers

Analog Devices' family of high voltage surge stoppers, overvoltage protection, overcurrent protection, and circuit breaker ICs offer solid front-end protection in small, low power, easy to design solutions that increase system reliability.

Moreover, logic inverters may provide additional current driving capability to cope with the passive loss, additive noise picked up by PCB traces, and distortion associated with interconnect cables and electrostatic discharge ESD protection components. Installations with hand-stripped wires are especially prone to such damage. A logic inverter with over-current protection according to one embodiment includes a transistor, an input signal line coupled to a gate terminal or base region of the transistor, an output signal line coupled to a drain terminal or collector region of the transistor, a power supply line coupled to the drain terminal or collector region of the transistor, and a feedback resistor between a source terminal or emitter region of the transistor and ground. An isolated inverter with over-current protection according to one embodiment includes a main photo-component, an output signal line coupled to a collector region of the main photo-component, a power supply line coupled to the collector region of the main photo-component, a feedback resistor between an emitter region of the main photo-component and ground, a main light source positioned to emit light for activating the main photo-component, an input signal line coupled to the main light source, a feedback light source coupled in shunt with the feedback resistor, and a feedback photo-component coupled in shunt with the main light source and positioned to be activated by light from the feedback light source. Other aspects and embodiments of the present invention will become apparent from the following detailed description, which, when taken in conjunction with the drawings, illustrate by way of example the principles of the invention. Further, particular features described herein can be used in combination with other described features in each of the various possible combinations and permutations. Moreover, values and parameters of various components recited herein, such as resistors, may be readily determined by one skilled in the art after having read the present disclosure. In one general embodiment, a logic inverter with over-current protection includes a transistor, an input signal line coupled to a gate terminal or base region of the transistor, an output signal line coupled to a drain terminal or collector region of the transistor, a power supply line coupled to the drain terminal or collector region of the transistor, and a feedback resistor between a source terminal or emitter region of the transistor and ground. In yet another general embodiment, an isolated inverter with over-current protection includes a main photo-component, an output signal line coupled to a collector region of the main photo-component, a power supply line coupled to the collector region of the main photo-component, a feedback resistor between an emitter region of the main photo-component and ground, a main light source positioned to emit light for activating the main photo-component, an input signal line coupled to the main tight source, a feedback light source coupled in shunt with the feedback resistor, and a feedback photo-component coupled in shunt with the main tight source and positioned to be activated by light from the feedback light source. For example, logic inverters may be used when connecting a control panel with one or more remote access readers. In other examples, two distinct areas of a computer hard drive may be connected using logic inverters, at least in part. Moreover, various embodiments described herein include transistor based logic output circuitry with over-current protection mechanisms to prevent damage to the components of the logic inverter, e. According to one approach, an inverter, such as the inverter illustrated in circuit of FIG. For example, in one illustrative implementation, at least one reader is connected to a control panel via the circuit , e. Accordingly, the control panel may be on one PCB board, while each of the readers has their own respective PCB boards. It follows that if a microcontroller is used on one of the aforementioned PCBs, a corresponding signal may be driven to the at least one other PCB, via an interconnection, e. However, the interconnection between the at least two PCBs has a capacitance, inductance and resistance associated therewith, resulting in a voltage drop thereacross. Thus, if an interconnection spans a sufficiently long distance, it may be desired that driver circuits be distributed across both the local and remote PCBs, e. Moreover, when connecting multiple readers to a controller, driver symmetry is desirable. As an option, the present circuit may be implemented in conjunction with features from any other embodiment listed herein, such as those described with reference to the other FIGS. Further, the circuit presented herein may be used in any desired environment. As mentioned above, FIG. Moreover, the logic inverter circuit includes a transistor In the present embodiment, the transistor is an n-channel field-effect transistor FET. However, although transistor is illustrated in the present embodiment as being a n-channel field-effect transistor FET , in various other approaches, transistor may include an a metal-oxide-semiconductor field-effect transistor MOSFET , single pole-double throw SPDT switch, etc. Accordingly, the transistor includes a gate terminal G , a drain terminal D and a source terminal S. An input signal line is coupled to the gate terminal G of the transistor and an output signal line is coupled to the drain terminal D of the transistor. Furthermore, a power supply line is coupled to the drain terminal D of the transistor Although not explicitly shown in FIG. The desired effect of the inverter is to invert the incoming signal VIN being introduced to the transistors along the input signal line , into an inverted signal VOUT being output from the transistors along, the output signal line Moreover, it is preferred that VOUT has a load whose impedance does not exceed the range limited by the local driver circuit. The inverter circuit also includes a pull up resistor Rd, which is positioned in series between the drain terminal D of transistor and power supply VDD. Moreover, the pull up resistor Rd is also positioned between the power supply VDD and the output signal line The pull up resistor Rd preferably protects the circuitry e. According to one approach, the pull up resistor Rd may be placed on a remote PCB without affecting the function of circuit as an inverter. A feedback resistor is also positioned between the source terminal S of the transistor and ground e. According to exemplary embodiments, the load impedance of the logic inverter circuit may be assumed to be Rl. Thereby the lower limit of Rl and upper limit of transistor current may be used to determine the proper resistance value of Rf according to various approaches. Following an illustrative in-use embodiment of the inverter circuit , in operation, when a sufficiently high level signal comes from a MCU, e. As a result, a low impedance path is formed through the transistor to ground , and the voltage VOUT on output signal line will fall from a higher voltage to a tower voltage, thereby indicating a logic inversion. Moreover, it is preferred that the impedance value of feedback resistor Rf is significantly lower than the impedance value of pull up resistor Rd. As a result, the functionality of the inverter circuit may be preserved. In the event of a fault current occurring on the output signal line of the inverter circuit , e. Contrary to conventional wisdom, the feedback resistor Rf may be included in digital circuitry, e. According to conventional wisdom, in digital circuitry, any resistance added between the drain of a given transistor and ground may significantly hinder switching of the inverter, in addition to decreasing the quality of the switching by reducing the flow of current to ground when the switch is dosed. One skilled in the art will appreciate that pursuant to conventional knowledge, no resistance is added between the drain of a transistor and ground in such digital systems in order to avoid such problems. According to an example, which is in no way intended to limit the invention, as described immediately above, a transistor is turned on when the value of the resistor Rf is equal to zero, and the input signal is high, VIH logic high. As a result, the transistor channel between the source and load may be turned on, and the channel current Id through the transistor is limited by a source resistor Rs. Therefore, according to one approach, the value Rf is preferably calculated based on the maximum channel current Id,max, the transistor turn-on voltage Vth, and VIH as follows. For example, according to various approaches, the value of Rd may be from about 0. The value of feedback resistor Rf may be from about 0. Thus, according to a further approach, the power rating of the feedback resistor is desirably higher than the value Pmax, which may be determined by VIH, Vth, and the resistance Rf as follows:

Chapter 2 : Surge Stopper, Overvoltage & Overcurrent Protection | Analog Devices

The MAX adjustable overvoltage and overcurrent protection device is ideal for protecting systems against positive and negative input voltage faults up to Â±40V, and feature low mÎ© (typ) R ON integrated FETs. The adjustable overvoltage range is between 6V and 36V, while the adjustable.

Over Voltage Protection It is the most important protection scheme w. Maximum time thyristor failures happen due to over-voltage transients. A thyristor may be subjected to internal or external over-voltages. These are caused due to various reasons in the supply line like lightning, surge conditions abnormal voltage spike etc. External over voltage may cause different types of problem in thyristor operation like increase in leakage current, permanent breakdown of junctions, unwanted turn-on of devices etc. So, we have to suppress the over-voltages. The effect of over-voltages can be minimized by using non-linear resistors called voltage clamping devices like metal oxide like metal oxide varistor. At the time of normal operation it offers high impedance and acts as it is not present in the circuit. But when the voltage exceeds the rated voltage then it serves as a low impedance path to protect SCR. Over Current Protection Over current mainly occurs due to different types of faults in the circuit. Due to over current i2R loss will increase and high generation of heat may take place that can exceed the permissible limit and burn the device. CB are used for protection of thyristor against continuous overloads or against surge currents of long duration as a CB has long tripping time. But fast-acting fuses is used for protecting SCR against high surge current of very short duration. This current can turn-on the device even when the gate signal is absent. It consists of a capacitor connected in series with a resistor which is applied parallel with the thyristor, when S is closed then voltage Vs is applied across the device as well as Cs suddenly. At first Snubber circuit behaves like a short circuit. Therefore voltage across the device is zero. Gradually voltage across Cs builds up at a slow rate. Before turning on of thyristor Cs is fully charged and after turning on of thyristor it discharges through the SCR. This discharging current can be limited with the help of a resistance Rs connected in series with the capacitor Cs to keep the value of current and rate of change of current in a safe limit. But if rate of rise of anode current, i. This may damage the thyristor. To avoid local hot spots we use an inductor in series with the device as it prevents high rate of change of current through it. High Temperature Protection With the increase in the temperature of the junction, insulation may get failed. So we have to take proper measures to limit the temperature rise. We can achieve this by mounting the thyristor on heat sink which is mainly made by high thermal conductivity metals like aluminium Al , Copper Cu etc. Mainly aluminium Al is used due to its low cost. There are several types of mounting techniques for SCR such as â€" Lead-mounting, stud-mounting, Bolt-down mounting, press-fit mounting, press-pack mounting etc. Gate Protection of Thyristor Like thyristor , Gate circuit should also be protected from over voltages and over currents. Over voltages in the gate circuit can cause false triggering and over current can cause high junction temperature. Over voltages thyristor protection is achieved by using a zener diode and a resistor can be used to protect the gate circuit from over current. Noise in gate circuit can also cause false triggering which can be avoided by using a resistor and a capacitor in parallel. A diode D may be connected in series or in parallel with the gate to protect it from high reverse voltage. Overall Protection of a Thyristor Lead mounting: In such mounting technique housing of SCR itself is used as heat radiator. Hence no need of additional heat zink arrangement. Hence, this technique of thyristor Protection is generally used for low current application, normally less than one ampere. The anode of the thyristor is in the form of threaded stud which is screwed to a metalling heat sink block. Here the device is connected to the heat sink with the help of nut-bolt mechanism. It is mainly used in small and medium rating circuit. This kind of mounting is obtained by inserting the whole SCR into the metallic block. It is used in high rating circuit. This kind of mounting for thyristor protection is obtained by sandwiching the thyristor between to heat sink with the help of clamps. It is used for very high rating circuit.

Chapter 3 : Overvoltage n Overcurrent | Electronics Forum (Circuits, Projects and Microcontrollers)

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The NCP is an overvoltage, overcurrent and reverse control device. Two main modes are available by setting logic pins. First mode is Direct Mode from Wall Adapter to the system.

Chapter 4 : Thyristor Protection or SCR Protection

During overvoltage transients, the LTC turns off the MOSFET within 1Î¼s, isolating downstream components from the input supply. Inductive cable transients are absorbed by the MOSFET and load capacitance.

Chapter 5 : Hardware Protection â€“ OverVoltage and OverCurrent -Use Arduino for Projects

bq Overvoltage and Overcurrent Protection IC and Li+ Charger Front-End Protection IC 1 Features 3 Description The bq device is a highly integrated circuit (IC).

Chapter 6 : Overvoltage - Wikipedia

Over-current would be caused by too much load on a power circuit. That's what load protection in the form of circuit breakers and fuses are for. Aircraft circuit breakers are not designed to protect an electronic unit, they are installed to protect the electrical wiring, which will suffer damage if rated current is exceeded.

Chapter 7 : Overcurrent Overvoltage Protection - Hp LaserJet Service Manual [Page 99]

2 Overcurrent and Overvoltage Protection Changes in the Code Contents 1. Short Circuit Current Ratings are Clarified.

Chapter 8 : NCP Full Overvoltage and Overcurrent Protection Circuit

OFF HOOK = Ringer circuit protection is insured with intrinsic breakdown voltage at V ON HOOK = In dialing mode and in conversationmode, the breakdown voltage of TPP can be adapted at different levels with zener diodes.

Chapter 9 : USB2 - Over-current and/or over-voltage protection circuit - Google Patents

Introduction Selecting fused circuit protection The following fuse selection tables are based on the NEC and provide fuse recommendations for the listed applications.