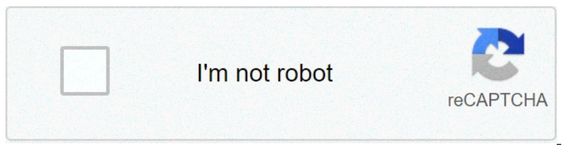

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Copyright 2003, 2005 by John Wiley & Sons 1 Solutions to Supplementary trouble keeping up with the 3rd Edition of Power Electronics: Converters, Applications and Design by Ned Mohan, Tore Undeland, and William Robbins Copyright 2002 Copyright 2003, 2005 by John Wiley & Sons 2 chapter 1 - Power Electronic Systems S1.1. In linear Electronics Sa £ semiconductor devices used in the middle of its regiÃµes of the linear amplificaÃ§Ã £, where both the voltage £ © s atravÃ component and current atravÃ it sÃ £ © s relatively large. This results in high power dissipation of the £. In potÃªncia of Electronics, £ semiconductor devices are used as the switches. When the device is in (a £ the aproximaÃ§Ã a closed switch) to the voltage atravÃ £ © © s device to very low (typically 1-3 volts mÃ¡ximo) and the current atravÃ s © © it the large . The dissipation £ the potÃªncia, substantially at the same time, © much less than the operating regia £ £ amplificaÃ§Ã the linear at the same current navel. When the device © off (aproximaÃ§Ã one o £ an open switch) to the voltage atravÃ £ © © component A are large, but the current is very small and © £ dissipation in the off state potÃªncia It can usually be considered as zero. S1.2. 1. advancements in microelectrÃ³nica that allow the fabrication £ high-performance controllers in both digital and both analog forms. 2. Improvements in the capabilities revolutionary (£ the voltage, current, power dissipation and the £ speeds comutaÃ§Ã £ o) of semiconductor devices that function as switches in power converters electrÃ³nicos. 3. Great expansa £ eletrÃ'nicos the converters market potÃªncia. S1.3. The table below features the Ã¡reas of aplicaÃ§Ã £ o, in terms of matters concerning INSTANCE ¢ or priority Electronics designer potÃªncia should put in each of the listed specs. The assesments in the table sÃ £ highly qualitative. £ AplicaÃ§Ã the Pwr Evaluation £ Dynamics Cost Efficiency Size and Weight Residential Copyright 2003, 2005 by John Wiley & Sons 3 S1.4. a) Figure 1-3a already estÃ¡ diagrammed showing that the converter has two rectifiers, an inverter, a transformer and two energy storage capacitors. b) Block Diagram shown below. Rectifier & filterInverterRectifier low pass & low pass filterUtilityControllerLoadVrefVoSafety IsolationCopyright 2003, 2005 by John Wiley & Sons 4 chapter 2 - £ Vision general of semiconductor switches S2.1 potÃªncia. a) Ideal i-v curves for a diode and a thyristor sÃ £ shown below. A more complete Number for dÃodo Ã © shown in Fig. 2-1 text and the thyristor, Fig. 2-3 text. b) Characteristics sÃ £ ideal when used bÃ¡sico the operation of a converter circuit estÃ¡ to be analyzed or designed from a viewpoint from above (system). This situaÃ§Ã £ o, the idealized characteristics greatly simplify the esforÃ§o ManiMa with loss of precision £ o. The characteristics nA £ £ the ideal What sane disposed in the sÃ £ idealizaÃ§Ãµes the second order effects which tÃªm-Only minor effects on the general characteristics of the converter. The actual characteristics used sÃ £ Â when the actual effects of the estimated £ sÃ characteristics. These effects sÃ £ usually the most important in prÃ³prio device and may cause the device to mÃ¡ximas capacity being exceeded. For example, the Resistance in the state of a dÃodo a caracterÃstica nA £ o-optimal, causes the dissipation £ potÃªncia the diode when it estÃ¡ in the state. An accurate knowledge of the energy losses Ã © Required to properly scale the heat sink. If the dissipation £ potÃªncia exceed the potÃªncia mÃ¡xima dÃodo, the diode may exceed the internal temperature mÃ¡ximo admissÃvel value and at least the reliability of dÃodo serÃ¡ significantly reduced. S2.2. a) £ the diode voltage and the voltage endurance £ load shown below. ivivIdeal diode curve iv iv curve0 Ideal thyristor V322 V322 VInput Voltage322 V0 VLoad VOLTAGE20 MILLSECONDSDIODVOLTAGE-322 V0 VTTCOPYRIGHT 2003, 2005 by John Wiley & Sounds 5 Vd = 10,02 00.01326sin (2x50t) DT = 322 = 102 volts b) Devices in parallel have the same impressed voltage through them. The device with the inferior tension is through it for a given current, will will a chain larger than other paralleled devices. This means that the current transport device will dissipate more energy than other paralled devices. Consequently, the temperature will be higher in this device than on other devices. This higher temperature will lead to an even greater portion of the current through this device. The end result may be that the current in this device may exceed the classification of the device. Copyright 2003, 2005 by John Wiley & Sounds 6 Chapter 3 - Revision of Basic Concepts S3.1. a) The input voltage shown below. 30 v6 s4 s 2 st0vi in the state station, there is no meaning of the inductor in the way the man of vi is equal to the mother of vo. = (30) (4) 6 = 20 V = VO. b) 250 w = (20) 2R, r = 400250 = 1.6; (Io) 2 (1,6) = 250; IO = 2501.6 = 12.5A C) Tension Inductor = VI (T) - You are assumed that the variable portion with the time of the skirt voltage is very small (C very large). Hence inducing tension and chain waveforms are shown below. For the VL (t) = ldil (t) dt inducer. During the time intervals when the tension is constant inducer, the inductor will change linearly over time. During the 4 s interval the current in the inductor = i1 + 10 v 5 h t = i1 + 2x106 t at the end of the 4 sec interval i1 + 8 = i2 or i2 - i1 = 8 a mother current = IO = 12.5 = I1 (6s) + (8a) (4S) (0.5) + (8-a) (2S) (0.5) 6 S = i1 + 4a So i1 = 8.5AE I2 = 16.5 A Copyright 2003, 2005 by John Wiley & Sons 7 10 V6 S4 S Two R-20 VVITI1I2I (t) = 12.5 LIU A = +