| | | | | | | |
|---|---|---|---|---|---|---|
| L15Q1 | Given these constraints, can the "dependent" current source deliver power? | | No. P=Ic*Vout always > 0 | | | |
| L15Q2 | Right-side KVL: Find equation relating Imax to Imin | | Imax=(Vcc-Vmin)/Rc | | | |
| L15Q3 | Left-side KVL: Find the smallest Vin such that Ib > 0 (if Von=0.7V) | | Vin > 0.7V | | | |
| L15Q4 | What is Ib if Vin = 3V and Rb = 4.6kΩ? | | 0.5 | mA | 0.0005 | A |
| L15Q5 | Let Vcc = 6V, Rc = 580Ω, Vmin = 0.2V, β = 100. What is Ic under the same input settings as the previous quation? | | transistor in SATURATION | | | |
| | Ic=Imax | | 10 | mA | 0.01 | A |
| L15Q6 | Approximate values of β(hfe), Vbeon, Vceesat from the datasheet. | | If used under conditions similar to those used in the lab β ~ 50, Vbeon ~ 0.9V, and Vcesat ~ 0.6V | | | |
| L15Q7 | Find Ib | | Ib = 100μA | | | |
| L15Q8 | Find Ic | | Ic = 10mA | | | |
| L15Q9 | Find Ib | | Ib = 0 | | | |
| L15Q10 | Find Ic | | Ic = 0 | | | |
| L15Q11 | Find Ib | | Ib = 0.4mA | | | |
| L15Q12 | Find Ic | | Ic = 19.33333mA | | | |
| L15Q13 | Find Ic and identify which regime the transistor is operating | | operating at the transistion between the CUTOFF and ACTIVE regions | | | |
| | Ib | | 0 | mA | | |
| | Ic | | 0 | mA | | |
| L15Q14 | Find Ic and identify in which regime the transistor is operating. | | operating in the ACTIVE region | | | |
| | Ic | | 10 | mA | 0.01 | A |
| L15Q15 | Determine the power consumed by the transistor. | | P=Ib*Vbe+Ic*Vce | | | |
| | | | 62.1 | mW | 0.062 | W |