

Other loss

$$\begin{aligned} P_{\text{other}} &= P_D - P_{\text{FET}} - P_L \\ &= 0.92 - 0.36 - 0.2 \\ &= \boxed{0.36 \text{ W}} \end{aligned}$$

calculations for

$$\text{Input voltage} = 28 \text{ V}$$

$$\text{output voltage} = 14.8 \text{ V}$$

$$\text{Output current} = 1.9 \text{ A}$$

$$R_{\text{DS(on)1}} = 0.29 \Omega$$

$$R_{\text{DS(on)2}} = 0.13 \Omega$$

$$P_{\text{other}} = 0.36 \text{ W}$$

$$R_{\text{DCR}} = 0.089 \Omega$$

$$P_L = I_o^2 \times R_{\text{DCR}}$$

$$= 1.9 \times 1.9 \times 0.089$$

$$= \boxed{0.32 \text{ W}}$$

$$P_{\text{FET}} = I_o^2 \left[ \frac{V_o}{V_{in}} \times [R_{\text{DS(on)1}} - R_{\text{DS(on)2}}] + R_{\text{DS(on)2}} \right]$$

$$= 1.9 \times 1.9 \left[ \frac{14.8}{28} \times [0.29 - 0.13] + 0.13 \right]$$

$$= \boxed{0.76 \text{ W}}$$

$$P_D = P_{\text{FET}} + P_L + P_{\text{other}}$$

$$= 0.76 + 0.32 + 0.36$$

$$= \boxed{1.44 \text{ W}}$$

$$\eta = \frac{V_o \times I_o}{V_o \times [I_o + P_D / (14.8)]}$$

$$= \frac{14.8 \times 1.9}{[14.8 \times 1.9] + 1.441}$$

$$= \frac{28.12}{29.561}$$

$$= 0.95 \times 100$$

$$\boxed{\eta = 95\%}$$

$T_J$  at Ambient temperature  $50^\circ\text{C}$

$$T_J = T_A + (P_D \cdot \theta_{JA})$$

$$= 50 + (1.441 \cdot 83.4)$$

$$= \boxed{98.129}$$

$T_J$  at ambient temperature  $85^\circ\text{C}$

$$T_J = T_A + (P_D \cdot \theta_{JA})$$

$$85 + (1.441 \cdot 83.4)$$

$$= \boxed{103.1}$$