Design process for 12v -> 24v 200mA regulator using LM2577-ADJ

See National Semiconductor LM1577/LM2577 Simple Switcher specification sheet / application note DS011468 (June 1999)
Starting from circuit on p12:
Vin(min) = 12; Vout = 24; Iload(max) = 0.2
Vout required is less than both limits of 60V & 10 * 12 = 120V
Limit for Iload(max) is (2.1 * 12) / 24 = 1.05A (well above 0.2A required)

Inductor selection
D(max) = (24 + 0.5 - 12) / (24 + 0.5 - 0.6) = 0.52
E * T = (0.52 * (12 - 0.6) * 1000000) / 52000 = 114.65
Iind,dc = (1.05 * 0.2) / (1 - 0.52) = 0.44
From fig 9, inductor code is H1000
As D is < 0.85, go to step C
Inductor H1000 (1000µH) is Schott 67127110, Pulse PE-53120 or Renco RL1959.
Avoid Renco as they generate more EMI.

Compensation network
Rc < (750 * 0.2 * 24 * 24) / (12 * 12) = 600Ω
Rc must lie between this value and 3k. Choose 1kΩ.

Cout > (0.19 * 0.001 * 1000 * 0.2) / (12 * 24) = 132µF
and
Cout > (12 * 1000 * (12 + (3.74 * 100000 * 0.001))) / (487800 * 24 * 24 * 24) = 686µF
Choose 1000µF.
Working voltage must be at least 30V.
Iripple(rms) = (0.2 * 0.52) / (1 - 0.52) = 0.22A
Ripple current rating must be at least 0.35A at 52kHz.
Equivalent series resistance is minimised by choosing capacitors above 470µF, with high WVDC.
Dubilier 239, 250, 251, UFT, 300, 350
Nichicon PF, PX, PZ
Sprague 672D, 673D, 674D
United Chemi-Con LX, SXF, SXJ

Cc > (58.5 * 24 * 24 * 0.00075) / (1000000 * 12) = 2.1µF
Choose 3.3µF.

Vout = 1.23 * (1 + R1 / R2); transposing, R1 / R2 = (24 / 1.23) - 1 = 18.51
Close approximation to ratio yielded by preferred values R1 = 56kΩ & R2 = 3kΩ giving a nominal output of 24.19V. With 1% tolerance resistors, actual output voltage could be from 23.74V (R1 low, R2 high) to 24.65V (R1 high, R2 low).

Cin: 0.1µF good quality with short leads, plus 47µF electrolytic in parallel.

Diode: Schottky recommended; 30V 1A types 1N5818, MBR130P, 11DQ03

12V to 24V Converter: Circuit Schema