Chris Thomas

11/4/2022

CST 315

HW 3

**VcAVG = (VcMax + Vcmin) / 2 = (16.3V + 13.8V) / 2 = 15.05V**

**T = 1/f = 1/60Hz = 16.67 mS**

**t90º = (90º/360º) \* T = ¼ \* 16.67mS = 4.17 mS**

**t180º = (180º/360º) \* T = ½ \* 16.67mS = 8.33 mS**

**tƟ1 = (Ɵ1/360º) \* T = (sin^-1(Vcmin/vcmax)/360º) \* T = (57.85/360) \* 16.67mS = 2.68mS**

**toff = t90º + t180º + tƟ1 = 4.17mS + 8.33mS + 2.68mS = 15.18mS**

**IlAVG = Vrlavg / Rl = 15.05V/40Ω = 376.25mA  
C = (IL \* t1) / Vripple = (376.25mA \* 15.18mS) / 2.5 = 2.28mF**

**Ton = T – toff = 16.67mS – 15.18mS = 1.48mS**

**Ifrep = Ilavg(T) / t2 = 376.25mA \* 16.67mS / 1.48mS = 4.24mA**