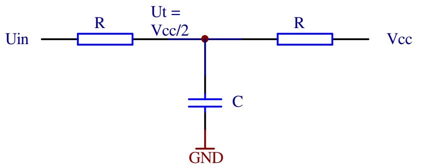
calculations to find real Umin and Umax



First, C needs to be charged until Ut > Vcc/2

$Ut(t) = (Uin/2 + Vcc/2)*(1 - e^{(-t/(C*R/2))})$

$t = m*Ti$

$K = Ti / (C*R/2)$

$Ut(m) = (Uin/2 + Vcc/2)*(1 - e^{-mK})$ $m = 0,1,2...$

$(Uin/2 + Vcc/2)*(1 - e^{-mK}) > Vcc/2$

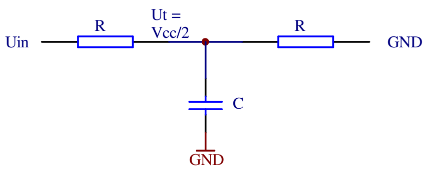
$e^{mK} > 1 + Vcc/Uin$

$m > \ln(1 + Vcc/Uin) / K$

$M = INT(1 + \ln(1 + Vcc/Uin) / K)$

$Umax = (Uin/2 + Vcc/2)*(1 - e^{-MK})$

at t = M*Ti the discharge starts and this takes one Ti



$Umin = Umax*e^{-K} +(Uin/2)*(1 - e^{-K})$

EXAMPLES

Ti = 4.34u, R=10k, C=0.1u	Ti = 4.34u, R=10k, C=0.1u
K = Ti / (C*R/2) = 0.00868	K = 0.00868
Uin = Vcc/10, Vcc=5	Uin = Vcc/2, Vcc=5
M = INT(1 + ln(11) / 0.00868) = INT(1 + 276.25) = 277	M = 127
$e^{-MK} = 0.090323$	$e^{-MK} = 0.332086$
Umax = 0.500322*Vcc	Umax = 0.500936*Vcc
$e^{-K} = 0.991358$	$e^{-K} = 0.991358$
Umin = 0.496430*Vcc	Umin = 0.498767*Vcc
Uripple = Umax - Umin = 0.003892*Vcc = 19.46mV	Uripple = 0.002169*Vcc = 10.85mV
Checking with formulea:	
$Uripple = (Vcc/2)*(1 - e^{-K}) / (1 + e^{-K}) = 0.002170*Vcc = 10.85mV$	
$Umax = Uin/2 + (Vcc/2) / (1 + e^{-K}) = 0.301085*Vcc$	Umax = 0.501085*Vcc
$Umin = Uin/2 + (Vcc/2)*(e^{-K}) / (1 + e^{-K}) = 0.298915*Vcc$	Umin = 0.498915*Vcc

So the M correction is required to find the real Umin and Umax

The formulea apparently are only correct when Uin = Vcc/2