



ZTX458 / ZTX558
 $V_{cbo} = 400V$
 $I_c = 300mA$ (200mA ZTX558)
 $V_{ebo} = 5V$
 $P = 1W$
 (ZTX558)
 $T_{on} = 95nS$
 $T_{off} = 1.6uS$
 $H_{fe} = 100$ (300 MAX)
 $V_g(\text{threshold for } I_c=1mA) = 0.6V$

P10NK60Z
 $Q_g = 70nC$ MAX
 $C_g = 1.37nF$
 Gate current:
 $Q = I \times t$
 $I = Q / t$
 $I = 70nC / 1uS$
 $I = 0.000\ 000\ 070 / 0.000\ 001$
 $I = 0.07A$
 $I = 70mA$
 $V_g(\text{threshold}) = 3v$ MIN / 4.5v MAX
 V_5 (for $I_d = 10A$) = 5.5v MIN
 $V_{gs} = +/- 30v$ MAX
 $P_{max} = 115W$
 $I_{max} = 10A$ (25C)
 $V_{ds} = 600V$

$V(\text{TR2 gate}) = 12v$
 $V = I \times R$
 $I(R16) = 12v / 2.2k$
 $I(R16) = 0.055$
 $I(R16) = 55mA$
 $P(R16) = V \times I / R$
 $P(R16) = 12v \times 12v / 2.2k$
 $P(R16) = 12 \times 12 / 2200$
 $P(R16) = 0.065W$
 $P(R16) = 65mW$

R11:
 $I = I(R16) + I_b(Q13)$
 $I = 55mA + 700uA$
 $I = 0.055 + 0.000\ 7$
 $I = 0.055\ 7$
 $I = 56mA$

$V_{cc} = +12v$
 $V_{batt} = -300v$
 $V = V_{cc} - V_{batt} - V(R16)$
 $V = 12v - (-300v) - 12v$
 $V = 12 + 300 - 12$
 $V = 300v$

$V = I \times R$
 $R = V / I$
 $R = 300v / 56mA$
 $R = 5357$ ohms
 $R = 4.7k$ (preferred)

$P = V \times I$
 $P = 300v \times 56mA$
 $P = 16.8W$ (for 1uS)

No pin output:
 $V = V_0 \times R_a / (R_a + R_b)$
 $V = 5v \times 1k / (1k + (4.7k+4.7k+1k))$
 $V = 5 \times 1000 / (1000 + (4700+4700+1000))$
 $V = 0.439v$

Pin output at supply:
 $V = V_0 \times R_a / (R_a + R_b)$
 $V = 5v \times 1k / (1k + 4.7k)$
 $V = 5 \times 1000 / (1000 + (4700))$
 $V = 0.877v$

$V = I \times R$
 $I = V / R$
 $I = 500v / 10k$
 $I = 500 / 10\ 000$
 $I = 0.05$
 $I = 50mA$

$P = V \times I / R$
 $P = 500v \times 500v / 10k$
 $P = 25w$

$I = 70mA$
 Q14:
 $I_c = 70mA$
 $I_c = I_b \times H_{fe}$
 $I_b = I_c / H_{fe}$
 $I_b = 70mA / 100$
 $I_b = 0.07 / 100$
 $I_b = 0.000\ 7$
 $I_b = 700uA$
 R14 / R16: P10NK60Z
 $V = I \times R$
 $R = V / I$
 $R = 3v / 700uA$
 $R = 3 / 0.000\ 7$
 $R = 4286$ ohms
 $R = 2.2k$ (preferred up)