```
Q[x_] := 0.5 * Erfc[x / Sqrt[2]];

Tf = 21.3 * 10^-3;
Ta = 50 * 10^-6;
SF = Tf / Ta;

ratio = 15;
crit = 4;

pu = 70;
pb = 0.66968;  (*Percentagem a ON*)
(*p=30 → 0.30328 , p=50 →0.49895 , p=70 → 0.66968*)
pa = 1 - pb;         (*Percentagem a OFF*)

TON = ratio * Tf;
TOFF = (TON - (pu / 100) * TON) / (pu / 100);
SON = TON / Ta;
SOFF = TOFF / Ta;

p00 = (SOFF - 1) / SOFF;
p01 = 1 - p00;
p11 = (SON - 1) / SON;
p10 = 1 - p11;

us = 5;
vars = 3;
un = 1;
varn = 1;

lambda10A[k_] := k * ((us + un)^(2) / (vars + varn));
lambda10B[S_, k_] := (S - k) * ((un)^(2) / (varn));
lambda01A[k_] := k * ((un)^(2) / (varn));
lambda01B[S_, k_] := (S - k) * ((us + un)^(2) / (vars + varn));

Pd[S_, k_, thres_] := Q[(thres - S - lambda01A[k] - lambda01B[S, k]) /
     (Sqrt[2 * S + 4 * lambda01A[k] + 4 * lambda01B[S, k]])];
Pf[S_, k_, thres_] := Q[(thres - S - lambda10A[k] - lambda10B[S, k]) /
     (Sqrt[2 * S + 4 * lambda10A[k] + 4 * lambda10B[S, k]])];


data = Import["C:\\Users\\Miguel Luis\\Documents\\My
       Dropbox\\Doutoramento\\Artigos\\CogMAC\\scripts_antonio\\Fase4\\
       old_param\\c" <> ToString[crit] <> "_p" <>
     ToString[pu] <> ".txt", "Table"];

Pr = pa * p00^(SF) + pb * p11^(SF) +
    pa * Sum[p00^(k) * p01 * p11^(SF - k - 1), {k, 0, SF - 1}] +
    pb * Sum[p11^(k) * p10 * p00^(SF - k - 1), {k, 0, SF - 1}];

G = {{}};
samp {{}};
For[i = 1, i ≤ Length[data], i++,
 Clear[S, thres, ECA, ECB, ECC, ECD, ECE, ECF, Gaux, sampaux];

 S = data[[i, 1]];
 thres = data[[i, 2]];

 ECA = (pb / Pr) * Sum[(k + 0.5) * p11^(k) * p10 * p00^(SF - k - 1), {k, 1, S}];
 ECB = (pb / Pr) * p11^(S) * Sum[p11^(k) * p10 *
```

```
      p00^(SF - S - k - 1) * (S + (k + 0.5) * Pd[S, 0, thres]), {k, 1, SF - S - 1}];
 ECC = (pb / Pr) * p11^(SF) * SF * Pd[S, 0, thres];
 ECD = (pa / Pr) * p00^(S) * Pf[S, 0, thres] *
   Sum[(k + 0.5) * p00^(SF - S - k - 1) * p01 * p11^(k), {k, 1, SF - S - 1}];
 ECE = (pa / Pr) * p00^(S - 1) * p01 * (SF - S + 0.5) * p11^(SF - S) * Pd[S, (S - 1), thres];
 ECF = (pa / Pr) * p11^(SF - S) * Sum[p00^(S - k - 1) * p01 *
      p11^(k) * ((k + 0.5) + (SF - S) * Pd[S, (S - k), thres]), {k, 1, S - 1}];

 Gaux = (ECA + ECB + ECC + ECD + ECE + ECF) / SF;
 sampaux = S / SF;

 If[i == 1, G = {Gaux}, G = Append[G, Gaux]];
 If[i == 1, samp = {sampaux}, samp = Append[samp, sampaux]];

 Export["C:\\Users\\Miguel Luis\\Documents\\My
      Dropbox\\Doutoramento\\Artigos\\CogMAC\\scripts_antonio\\Fase5\\
      results_theo\\com_probs_un1\\p" <> ToString[pu] <>
   "\\tf_" <> ToString[ratio] <> "ts\\output_c" <>
   ToString[crit] <> ".m", Transpose[{samp, G}], "Table"]

]
```