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******************************
*Varistor PSpice Model Netlist*
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*
* ©  Harris Suppression Products
*     a business unit of Littelfuse Inc.
*
*     December 3, 1999
*    version 4.2
*
* Representing typical characteristics for the following MLA-, MLE-
and AUMLA-Series varistors:
*
* V3.5MLA0603 V5.5MLA0603 V9MLA0603 V14MLA0603
* V18MLA0603 V26MLA0603 V30MLA0603
*
* V3.5MLA0805 V5.5MLA0805 V14MLA0805 V18MLA0805
* V26MLA0805
*
* V3.5MLA0805L V5.5MLA0805L V9MLA0805L V12MLA0805L
* V14MLA0805L V18MLA0805L V26MLA0805L V30MLA0805L
*
* V3.5MLA1206 V5.5MLA1206 V14MLA1206 V18MLA1206
* V26MLA1206 V33MLA1206 V42MLA1206 V56MLA1206
* V68MLA1206
*
* V18MLA1210 V26MLA1210 V30MLA1210 V48MLA1210
* V60MLA1210 V85MLA1210 V120MLA1210
*
* V30MLA1210L V48MLA1210L
*
* V18AUMLA2220 V18AUMLA1812 V18AUMLA1210 V18AUMLA1206
*
* V18MLE0603 V18MLE0805 V18MLE0805L V18MLE1206
*
*
*
.SUBCKT MLMOV  1 2 PARAMS: T=1 C=1pF L=1nH a1=1 a2=0 a3=0 a4=0 a5=0
a6=100u a7=100u
Enonln1    3 1   VALUE {T*(
+     10**(
+     +a1+a2*(log10(limit(v(4),a7,1g))-3)
+     +a3*2**(-log10(limit(v(4),a7,1g))+3)
+     +a4*exp(-log10(limit(v(4),a7,1g))+3)
+     +a5*exp(log10(limit(v(4),a7,1g))-3)
+     +a6*2**(log10(limit(v(4),a7,1g))-3)
+     )
+     -10**(
+     a1+a2*(log10(-limit(v(4),-1g,-a7))-3)
+     +a3*2**(-log10(-limit(v(4),-1g,-a7))+3)
+     +a4*exp(-log10(-limit(v(4),-1g,-a7))+3)
+     +a5*exp(log10(-limit(v(4),-1g,-a7))-3)
+     +a6*2**(log10(-limit(v(4),-1g,-a7))-3)
+     )
+     +limit(v(4)/a7*v(8),-v(8),v(8))
+     )}
L_series   5 6  {L}
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H_H1        4 0  VH_H1 1k
VH_H1       5 70 0V
R_R2        0 4  1G
R_series    6 2  100u
V_V1        3 70  0V
E_x_zero    8 0   VALUE {10**(
+     a1+a2*(log10(a7/1e3))
+     +a3*2**(-log10(a7/1e3))
+     +a4*exp(-log10(a7/1e3))
+     +a5*exp(log10(a7/1e3))
+     +a6*2**(log10(a7/1e3))
+     )}
R_x_zero    8 0  1G
C_parallel 1 5 {C}
.ENDS
.SUBCKT V3pt5MLA0603 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=1.1nF a1=0.8328 a2=
6.278E-2 a3=1.418E-2 a4=-2.047E-3 a5=1.778E-2 a6=9.065E-2
.ENDS
*
.SUBCKT V5pt5MLA0603 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=660pF a1=1.018 a2=
6.278E-2 a3=1.418E-2 a4=-2.047E-3 a5=1.778E-2 a6=9.065E-2
.ENDS
*
.SUBCKT V9MLA0603 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=420pF a1=1.454 a2=
0.1467 a3=0.02598 a4=-3.182E-3 a5=0.1367 a6=-0.2794
.ENDS
*
.SUBCKT V14MLA0603 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=150pF a1=1.582 a2=
0.1467 a3=0.02598 a4=-3.182E-3 a5=0.1367 a6=-0.2794
.ENDS
*
.SUBCKT V18MLA0603 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=125pF a1=1.566 a2=
0.0709 a3=9.496E-3 a4=-1.201E-3 a5=7.945E-2 a6=-8.674E-2
.ENDS
*
.SUBCKT V18MLE0603 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=125pF a1=1.566 a2=
0.0709 a3=9.496E-3 a4=-1.201E-3 a5=7.945E-2 a6=-8.674E-2
.ENDS
*
.SUBCKT V18MLE0603L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=60pF a1=1.581 a2=
0.07091 a3=8.142E-3 a4=-9.616E-4 a5=9.942E-2 a6=-0.1014
.ENDS
*
.SUBCKT V26MLA0603 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=90pF a1=1.706 a2=
0.0709 a3=9.496E-3 a4=-1.201E-3 a5=7.945E-2 a6=-8.674E-2
.ENDS
*
.SUBCKT V30MLA0603 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=75pF a1=1.786 a2=
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0.0709 a3=9.496E-3 a4=-1.201E-3 a5=7.945E-2 a6=-8.674E-2
.ENDS
*
.SUBCKT V18MLA1210 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=1250pF a1=1.579 a2=
0.09722 a3=0.027833 a4=-4.832E-3 a5=0.06432 a6=-0.1449
.ENDS
*
.SUBCKT V26MLA1210 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=1nF a1=1.651 a2=
0.06252 a3=0.01648 a4=-2.811E-3 a5=0.04796 a6=-0.0742
.ENDS
*
.SUBCKT V30MLA1210 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=1.575nF a1=1.71 a2=
0.06252 a3=0.01648 a4=-2.811E-3 a5=0.04796 a6=-0.0742
.ENDS
*
.SUBCKT V48MLA1210 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=450pF a1=1.706 a2=-
0.0422 a3=-0.00955 a4=2.331E-4 a5=-.04556 a6=0.1886
.ENDS
*
.SUBCKT V60MLA1210 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=375pF a1=1.799 a2=-
0.0422 a3=-0.00955 a4=2.331E-4 a5=-.04556 a6=0.1886
.ENDS
*
.SUBCKT V85MLA1210 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=225pF a1=1.945 a2=-
0.0422 a3=-0.00955 a4=2.331E-4 a5=-.04556 a6=0.1886
.ENDS
*
.SUBCKT V120MLA1210 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=65pF a1=2.233 a2=
0.02499 a3=0.00452 a4=-9.542E-4 a5=0.02925 a6=-0.00593
.ENDS
*
.SUBCKT V30MLA1210L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=1.53nF a1=1.71 a2=
0.06252 a3=0.01648 a4=-2.811E-3 a5=0.04796 a6=-0.0742
.ENDS
*
.SUBCKT V48MLA1210L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=430pF a1=1.706 a2=-
0.0422 a3=-0.00955 a4=2.331E-4 a5=-.04556 a6=0.1886
.ENDS
*
.SUBCKT V3pt5MLA1206 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=6nF a1=0.907 a2=
0.09247 a3=2.223E-2 a4=-3.342E-3 a5=0.06777 a6=-0.1232
.ENDS
*
.SUBCKT V5pt5MLA1206 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=4.5nF a1=1.093 a2=
0.09247 a3=2.223E-2 a4=-3.342E-3 a5=0.06777 a6=-0.1232
.ENDS
```

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*
.SUBCKT V14MLA1206 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=1.6nF a1=1.386 a2=
0.05368 a3=7.598E-3 a4=-1.077E-3 a5=0.04129 a6=-0.06871
.ENDS
*
.SUBCKT V18MLA1206 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=1.1nF a1=1.526 a2=
0.05368 a3=7.598E-3 a4=-1.077E-3 a5=0.04129 a6=-0.06871
.ENDS
*
.SUBCKT V18MLE1206 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=1.1nF a1=1.526 a2=
0.05368 a3=7.598E-3 a4=-1.077E-3 a5=0.04129 a6=-0.06871
.ENDS
*
.SUBCKT V26MLA1206 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=900pF a1=1.655 a2=
0.06112 a3=1.328E-2 a4=-1.995E-3 a5=0.04145 a6=-0.07086
.ENDS
*
.SUBCKT V33MLA1206 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=550pF a1=1.762 a2=
0.06112 a3=1.328E-2 a4=-1.995E-3 a5=0.04145 a6=-0.07086
.ENDS
*
.SUBCKT V42MLA1206 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=550pF a1=1.848 a2=
0.06112 a3=1.328E-2 a4=-1.995E-3 a5=0.04145 a6=-0.07086
.ENDS
*
.SUBCKT V56MLA1206 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=150pF a1=1.908 a2=
0.02679 a3=3.536E-3 a4=-7.262E-4 a5=0.04608 a6=-0.03745
.ENDS
*
.SUBCKT V68MLA1206 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=150pF a1=1.988 a2=
0.02679 a3=3.536E-3 a4=-7.262E-4 a5=0.04608 a6=-0.03745
.ENDS
*
.SUBCKT V3pt5MLA0805 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=2.2nF a1=1.026 a2=
0.1944 a3=4.071E-2 a4=-5.078E-3 a5=0.1594 a6=-0.3414
.ENDS
*
.SUBCKT V5pt5MLA0805 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=1.6nF a1=1.277 a2=
0.1944 a3=4.071E-2 a4=-5.078E-3 a5=0.1594 a6=-0.3414
.ENDS
*
.SUBCKT V14MLA0805 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=480pF a1=1.359 a2=
0.0465 a3=9.33E-3 a4=-1.827E-3 a5=0.02188 a6=-0.004146
.ENDS
*
.SUBCKT V18MLA0805 1 2 PARAMS: TOL=0
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X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=450pF a1=1.504 a2=
0.0465 a3=9.33E-3 a4=-1.827E-3 a5=0.02188 a6=-0.004146
.ENDS
*
.SUBCKT V18MLE0805 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=450pF a1=1.504 a2=
0.0465 a3=9.33E-3 a4=-1.827E-3 a5=0.02188 a6=-0.004146
.ENDS
*
.SUBCKT V26MLA0805 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=190pF a1=1.632 a2=
0.0465 a3=9.33E-3 a4=-1.827E-3 a5=0.02188 a6=-0.004146
.ENDS
*
.SUBCKT V3pt5MLA0805L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=1.2nF a1=0.865 a2=
0.069 a3=1.21E-2 a4=-1.656E-3 a5=0.0249 a6=0.04338
.ENDS
*
.SUBCKT V5pt5MLA0805L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=860pF a1=1.051 a2=
0.069 a3=1.21E-2 a4=-1.656E-3 a5=0.0249 a6=0.04338
.ENDS
*
.SUBCKT V9MLA0805L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=450pF a1=1.266 a2=
0.0753 a3=1.053E-2 a4=-1.227E-3 a5=0.03887 a6=-0.03557
.ENDS
*
.SUBCKT V12MLA0805L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=350pF a1=1.381 a2=
0.0753 a3=1.053E-2 a4=-1.227E-3 a5=0.03887 a6=-0.03557
.ENDS
*
.SUBCKT V14MLA0805L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=270pF a1=1.426 a2=
0.0753 a3=1.053E-2 a4=-1.227E-3 a5=0.03887 a6=-0.03557
.ENDS
*
.SUBCKT V18MLA0805L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=250pF a1=1.567 a2=
0.0753 a3=1.053E-2 a4=-1.227E-3 a5=0.03887 a6=-0.03557
.ENDS
*
.SUBCKT V18MLE0805L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=250pF a1=1.567 a2=
0.0753 a3=1.053E-2 a4=-1.227E-3 a5=0.03887 a6=-0.03557
.ENDS
*
.SUBCKT V26MLA0805L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=115pF a1=1.7 a2=
0.0753 a3=1.053E-2 a4=-1.227E-3 a5=0.03887 a6=-0.03557
.ENDS
*
.SUBCKT V30MLA0805L 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=80pF a1=1.787 a2=
0.0753 a3=1.053E-2 a4=-1.227E-3 a5=0.03887 a6=-0.03557
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.ENDS
*
.SUBCKT V18AUMLA2220 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=19nF a1=1.624 a2=
0.0901 a3=1.336E-2 a4=-1.732E-3 a5=0.1175 a6=-0.2438
.ENDS
*
.SUBCKT V18AUMLA1812 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=1.2nF a1=1.523 a2=
0.04106 a3=5.46E-3 a4=-1.088E-3 a5=0.0878 a6=-0.1104
.ENDS
*
.SUBCKT V18AUMLA1210 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=900pF a1=1.61 a2=
0.08893 a3=1.552E-2 a4=-2.149E-3 a5=0.1169 a6=-0.22
.ENDS
*
.SUBCKT V18AUMLA1206 1 2 PARAMS: TOL=0
X1    1 2   MLMOV PARAMS: T={1+TOL/100} L=1nH C=200pF a1=1.483 a2=
0.02273 a3=1.217E-3 a4=-2.461E-4 a5=-.0068 a6=0.08386
.ENDS
*
```