TOSHIBA MOSFET SPICE MODEL: TPC8014

- SPICE Model Parameter
- Transistor h_{FE}-I_C Characteristid
- $V_{CE(SAT)}$ Characteristic
- $V_{BE(SAT)}$ Characteristic
- Output Characteristic

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SPICE Model Parameter

```
*$
*PART NUMBER: TPC8014
*MANUFACTURER: TOSHIBA
*VDSS=30V, ID=11A
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.SUBCKT TPC8014 1 2 3 4 5 6 7 8
M_M1 6 4 3 3   MTPC8014
X_U1 4 3       DZTPC8014
D_D1 3 6       DTPC8014
R_R1   1 3     0.01m
R_R2   2 3     0.01m
R_R5   5 6     0.01m
R_R7   7 6     0.01m
R_R8   8 6     0.01m
.MODEL MTPC8014 NMOS
+ LEVEL=3 L=720.00E-9 W=.45 KP=66.000E-6 RS=1.0000E-3
+ RD=6.8436E-3 VTO=2.3063 RDS=3.0000E6 TOX=40.000E-9
+ CGSO=2.0126E-9 CGDO=827.11E-12 RG=12.45
+ CBD=342.86E-12 MJ=.70573 PB=.3905
+ RB=1 N=5 IS=1E-15 GAMMA=0 KAPPA=0 ETA=0.5m
.MODEL DTPC8014 D
+ IS=824.87E-12 N=1.2770 RS=6.2420E-3 IKF=7.3139
+ CJO=3.0000E-12 BV=60 IBV=100.00E-6 TT=24.062E-9
.ENDS
*$
```

```
*$
.subckt DZTPC8014 1 2
D2 1 3 DZ2
D1 2 3 DZ1
.model DZ1 D
+ IS=0.01p N=0.1 ISR=0
+ CJO=3E-12 BV=22.423 IBV=0.001 RS=0
.model DZ2 D
+ IS=0.01p N=0.1 ISR=0
+ CJO=3E-12 BV=22.423 IBV=0.001 RS=411.11
.ENDS
*$
```

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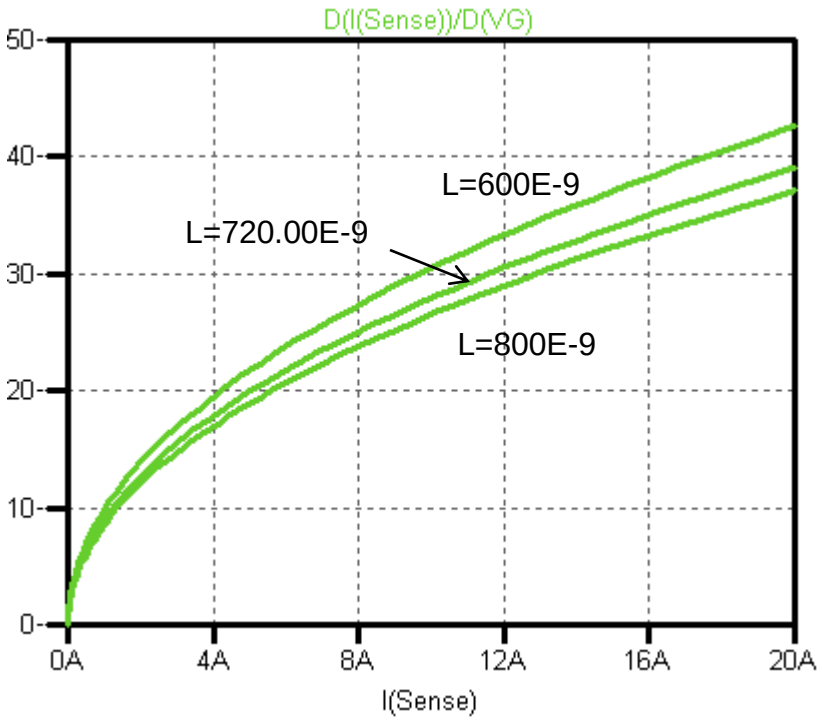
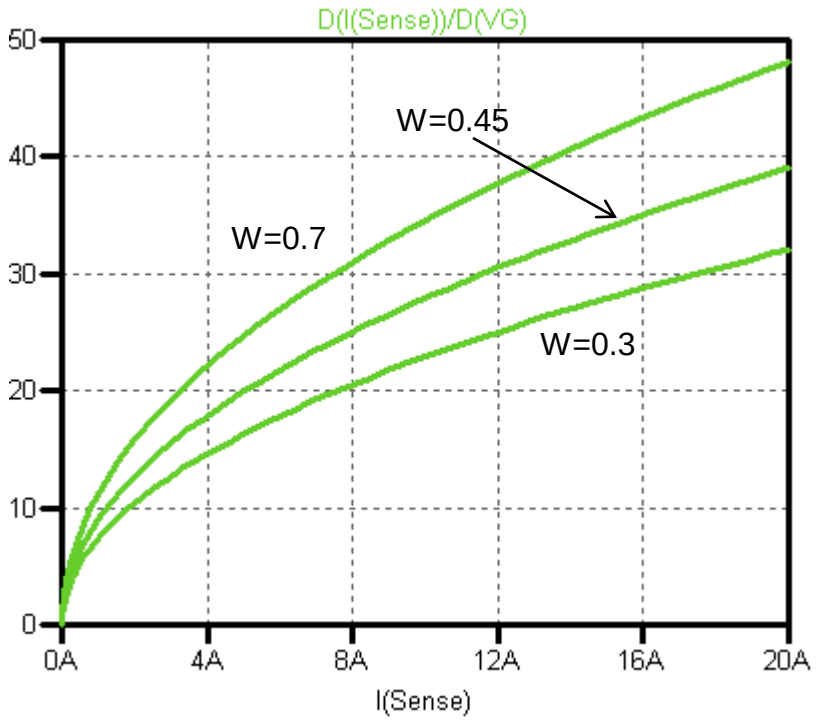
Transconductance Characteristics (1/2)

L



W



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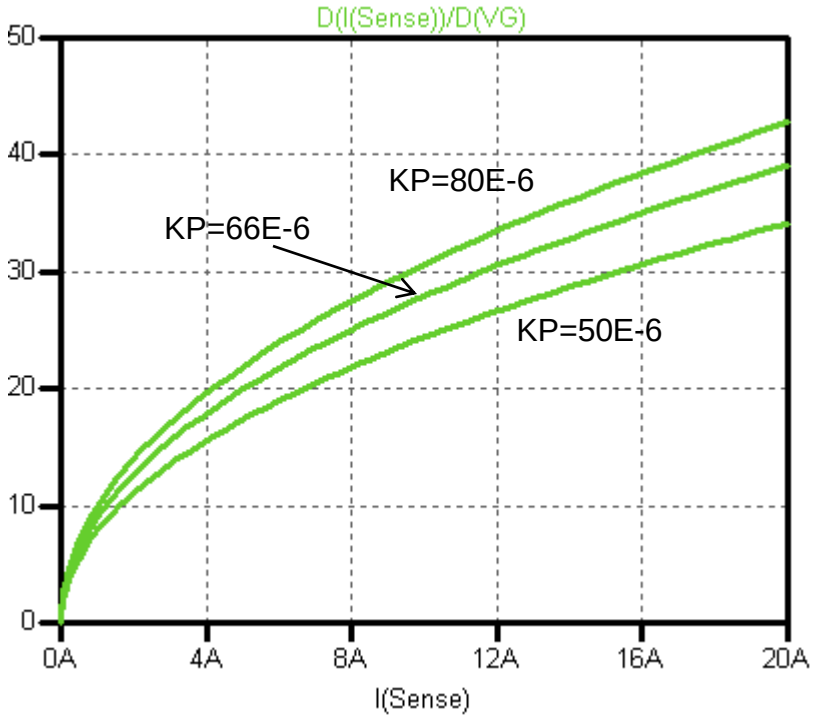
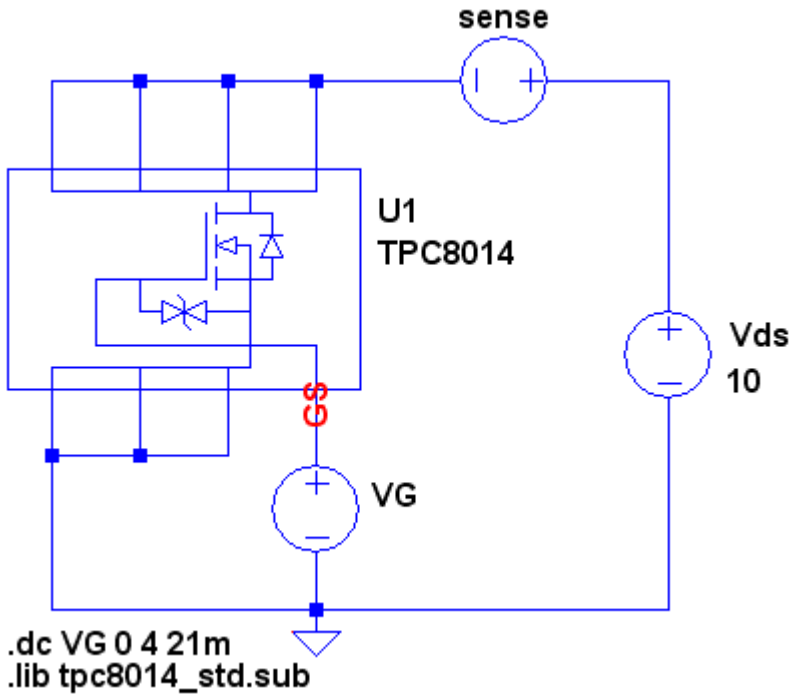
Transconductance Characteristics (2/2)

KP



Evaluation Circuit



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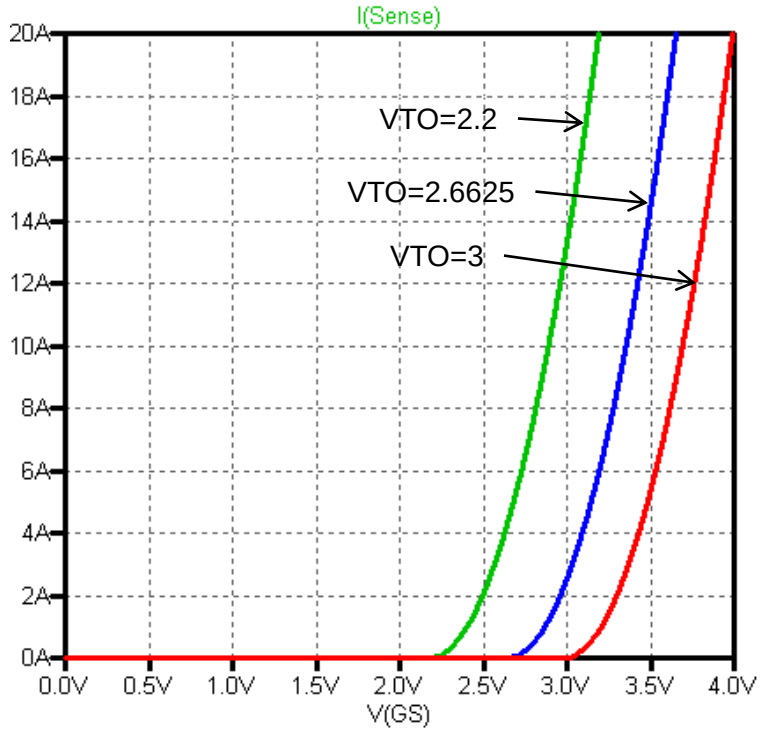
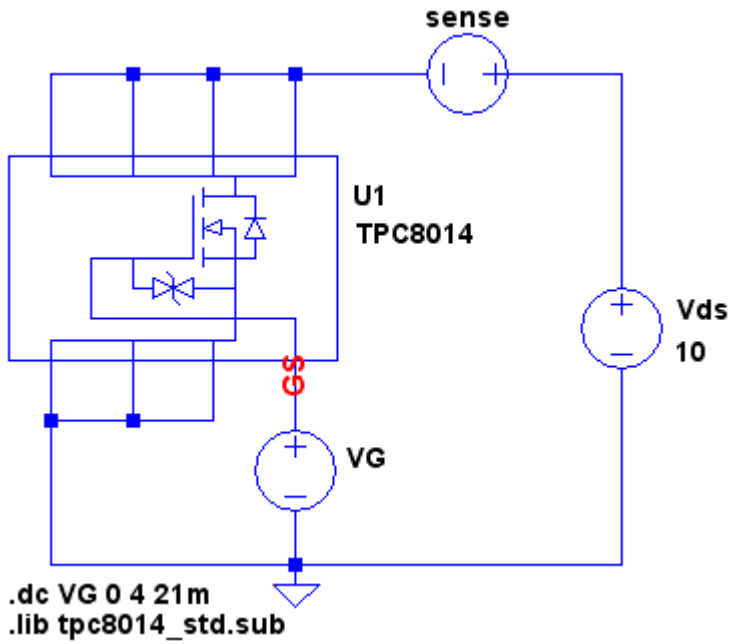
Vgs-Id Characteristics

VTO



Evaluation Circuit



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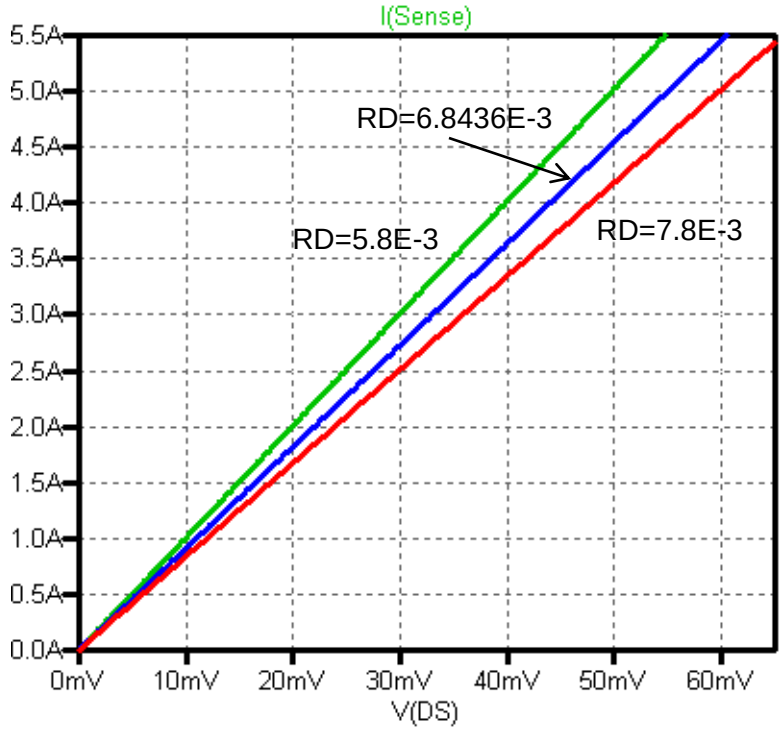
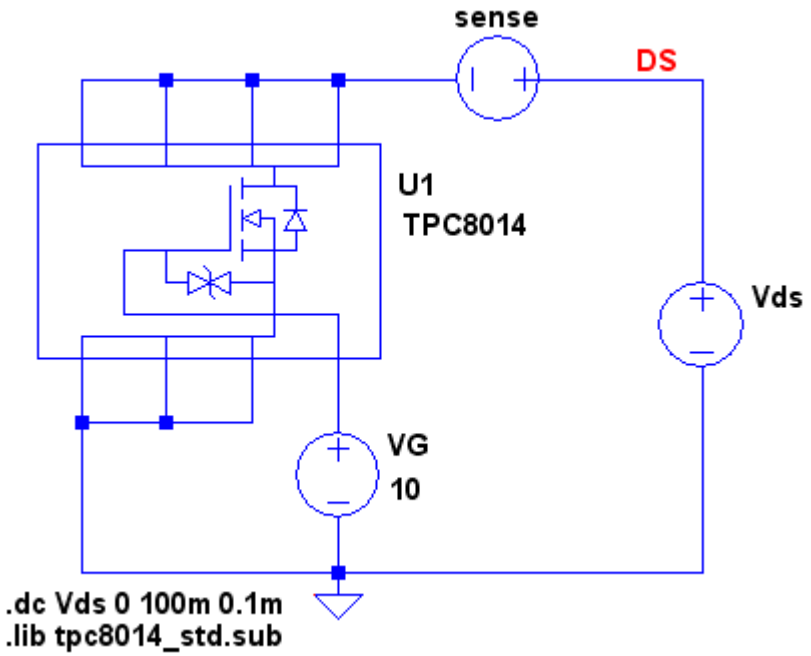
Rds(on) Characteristic

RD



Evaluation Circuit



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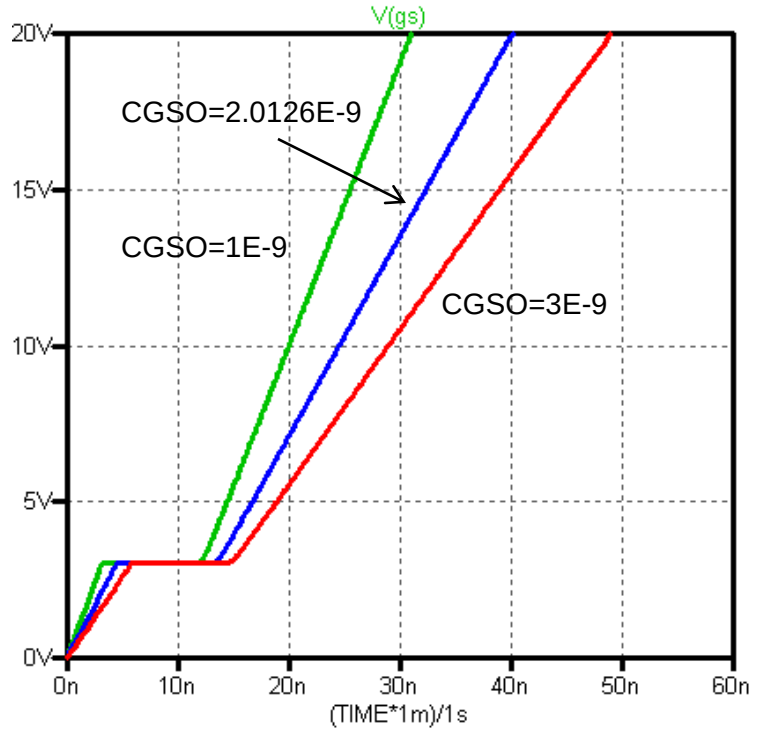
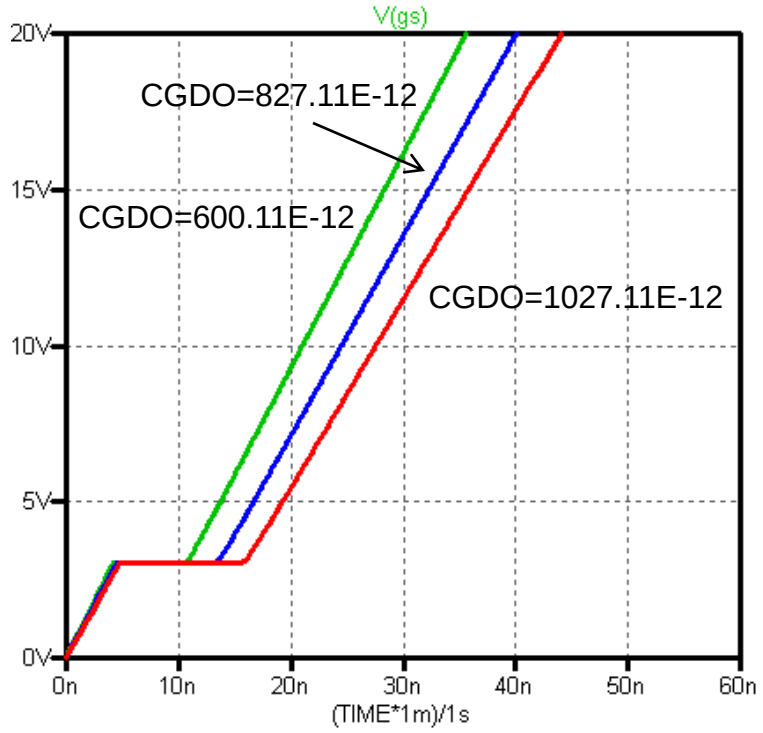
Gate Charge Characteristic (1/2)

CGSO



CGDO



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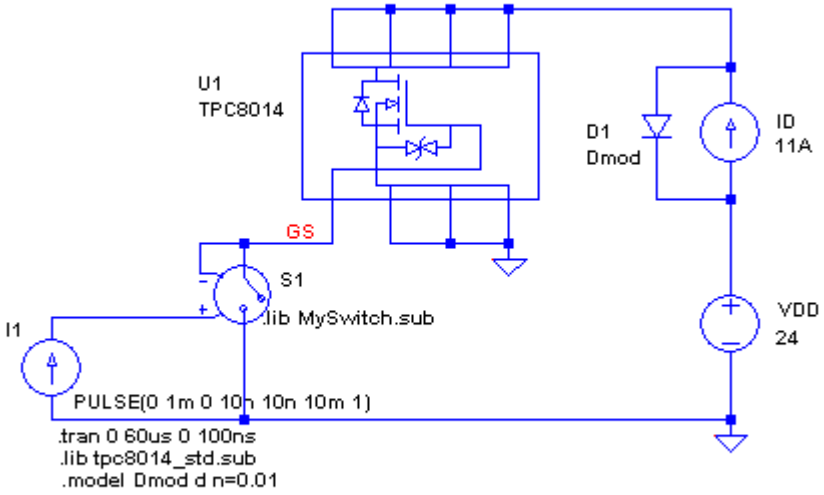
Gate Charge Characteristic (2/2)

Evaluation Circuit



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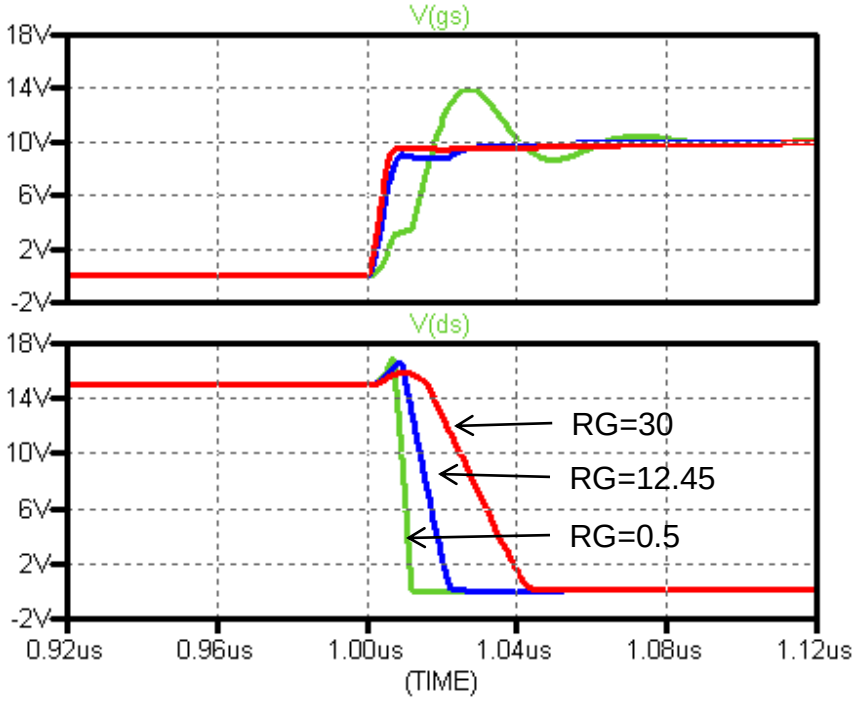
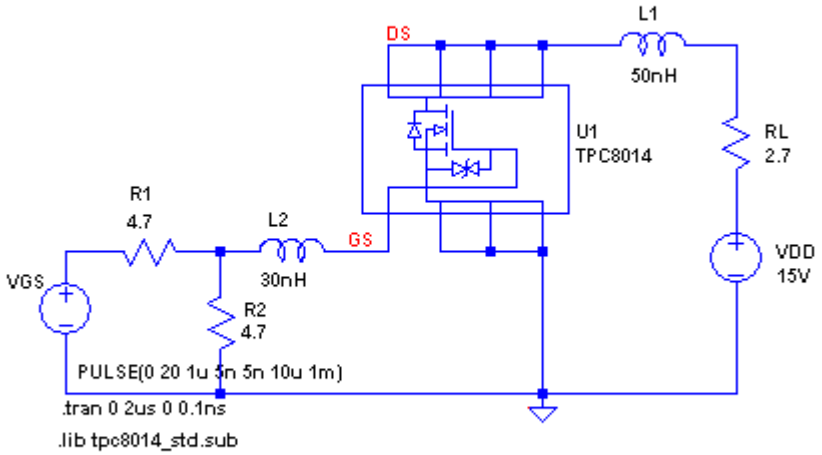
Switching Time Characteristic

RG



Evaluation Circuit



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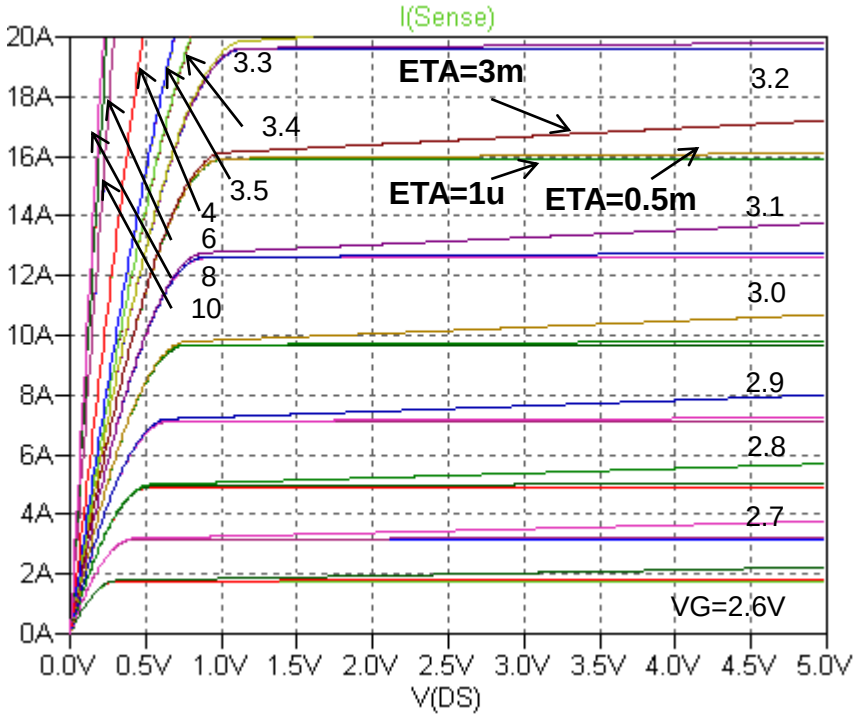
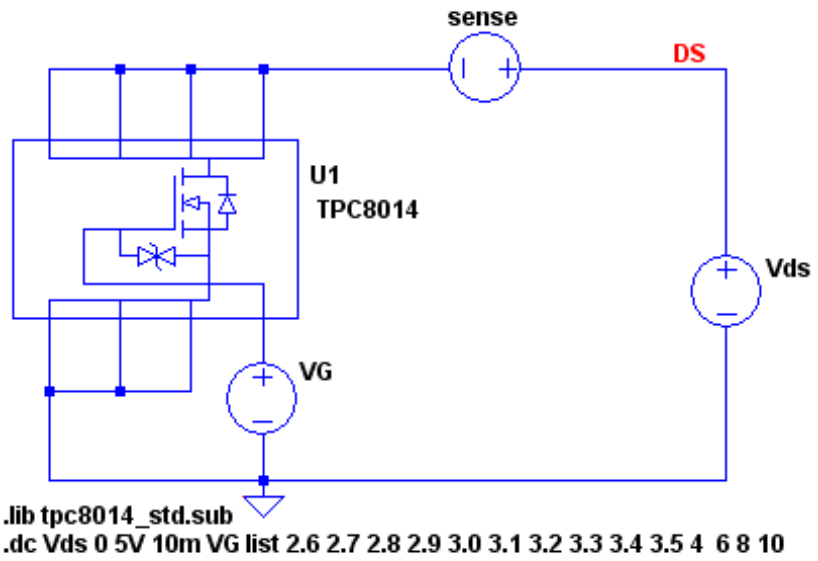
Output Characteristic

ETA



Evaluation Circuit



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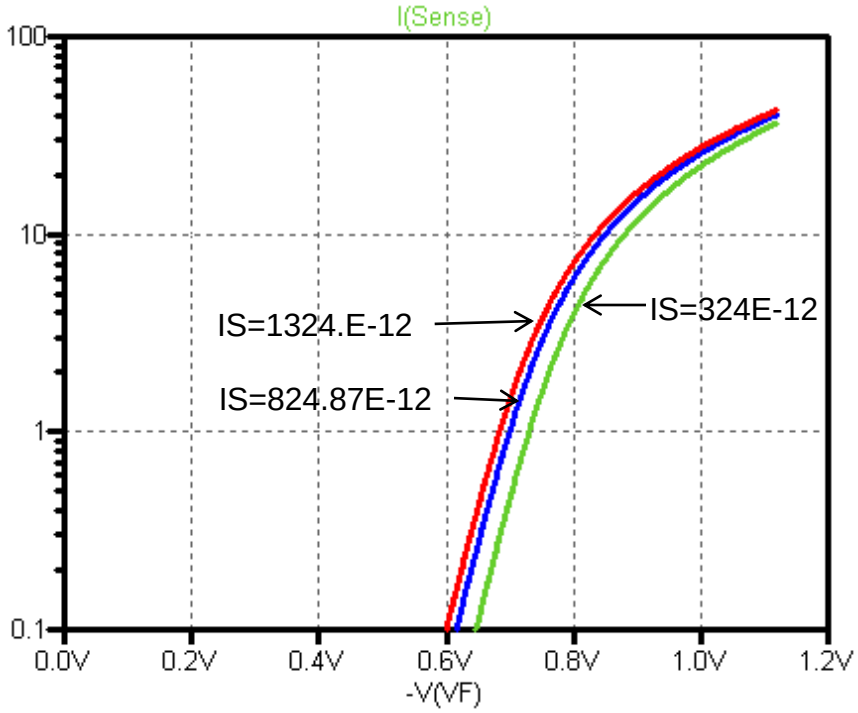
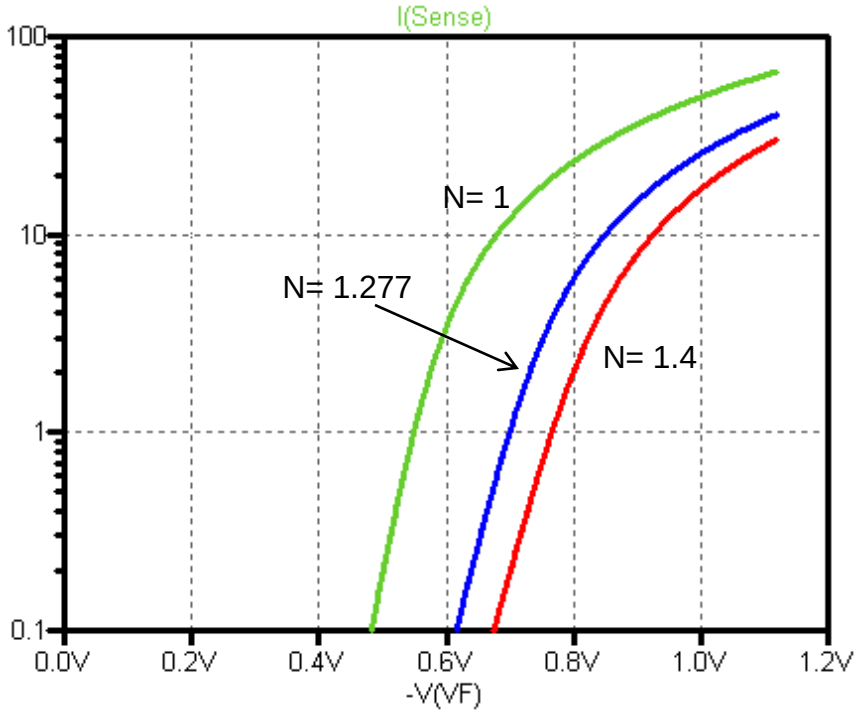
BODY DIODE SPICE MODEL
Forward Current Characteristic (1/3)

IS



N



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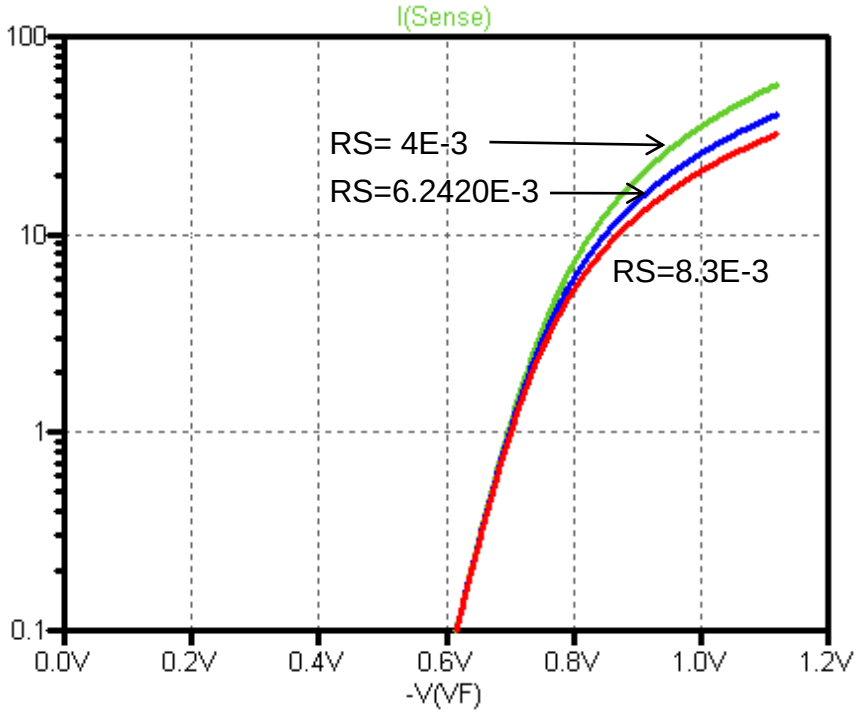
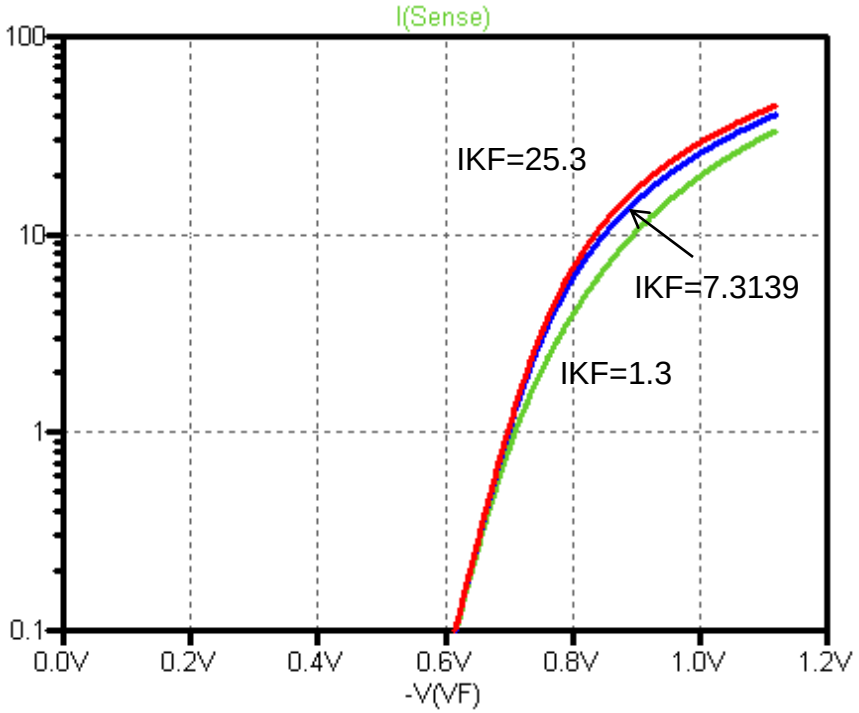
Forward Current Characteristic (2/3)

RS



IKF



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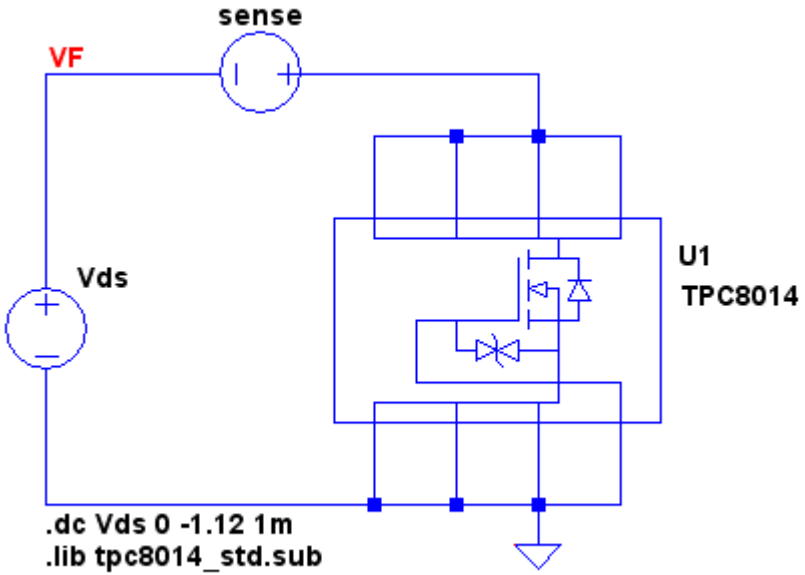
Forward Current Characteristic (3/3)

Evaluation Circuit



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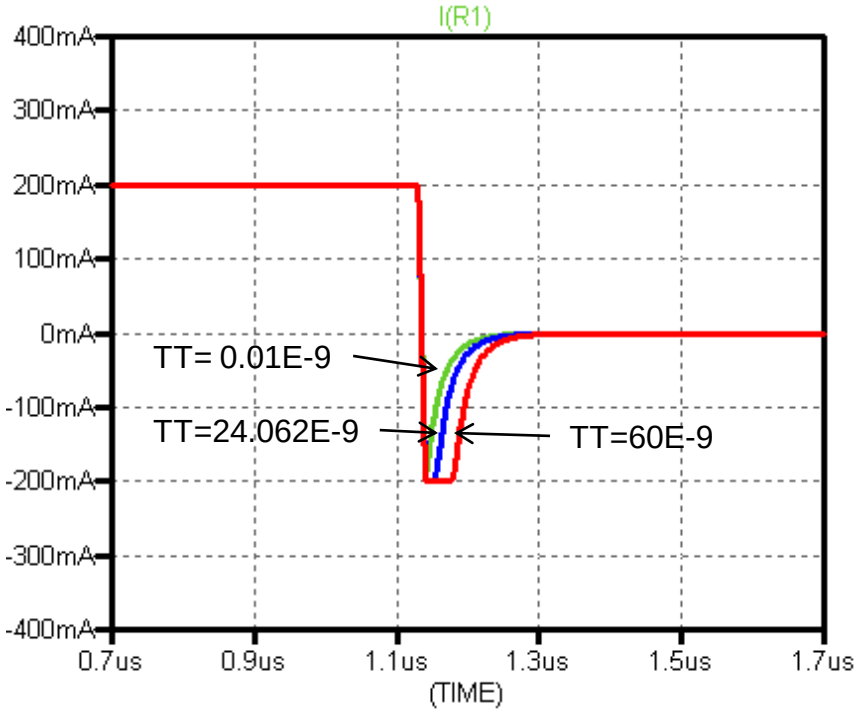
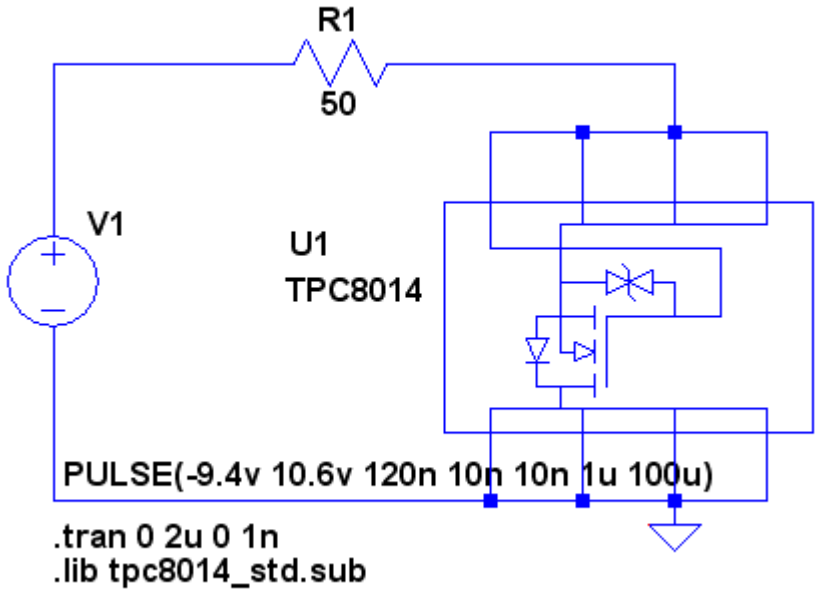
Reverse Recovery Characteristic

TT



Evaluation Circuit



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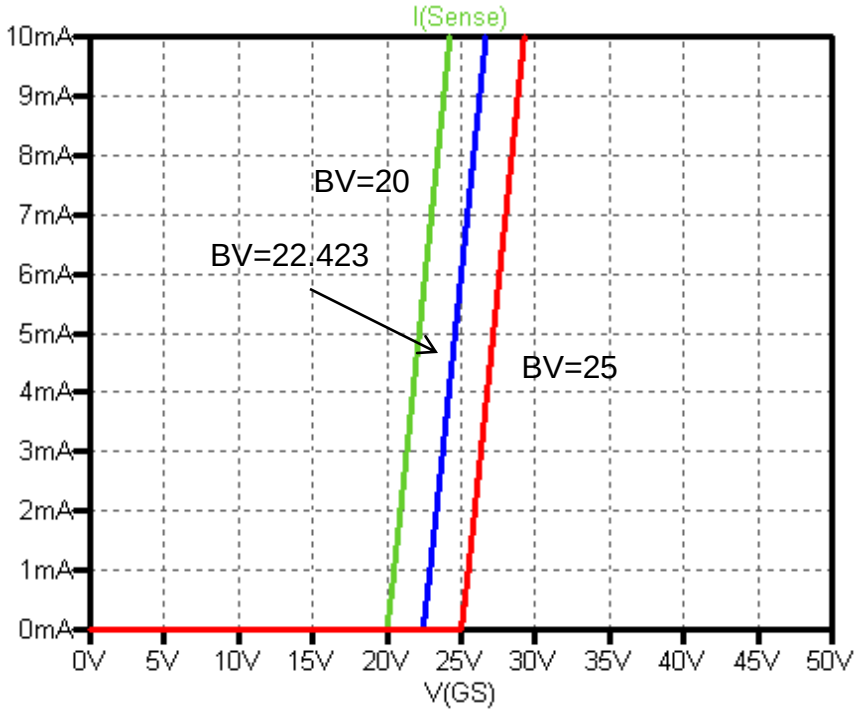
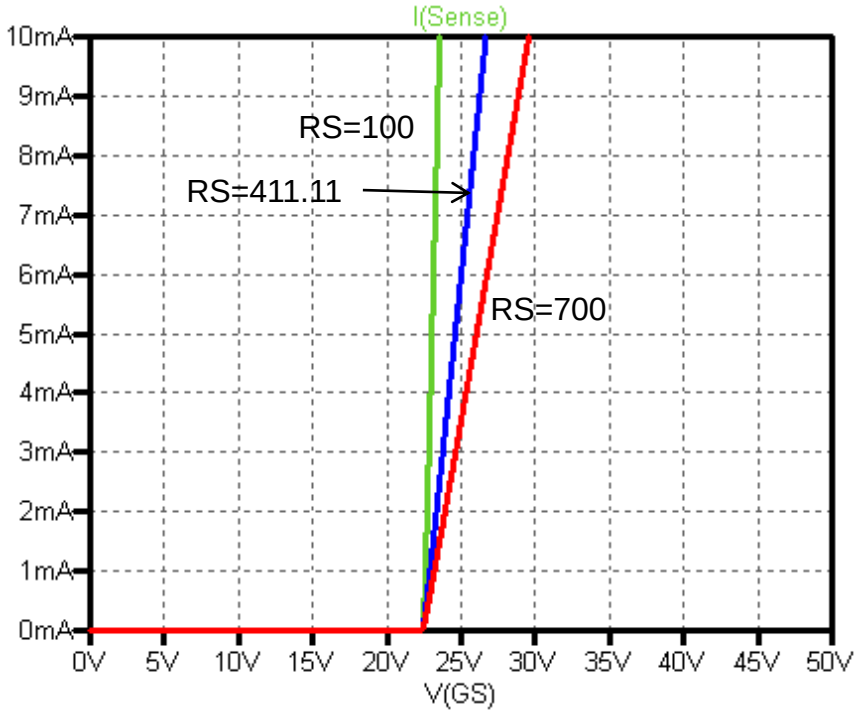
ESD PROTECTION DIODE
Zener Voltage Characteristic (1/2)

BV



RS



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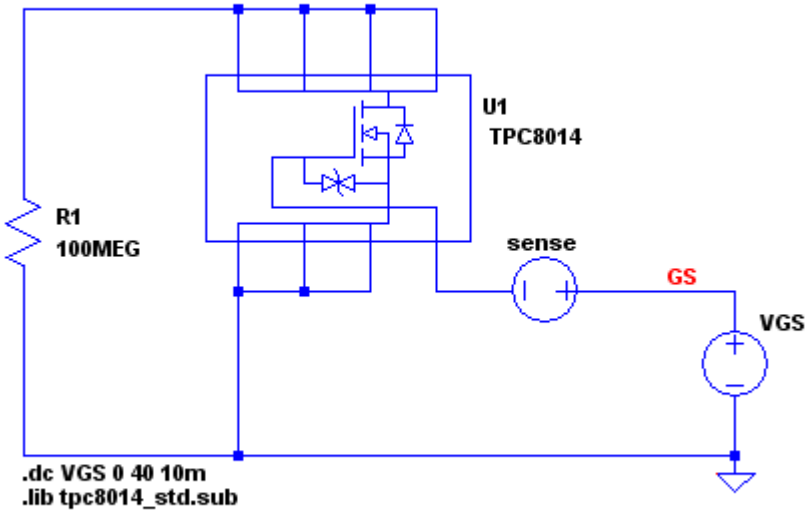
Zener Voltage Characteristic (1/2)

Evaluation Circuit



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