List of the SPICE Gummel-Poon Parameters

Name	Parameter explanation	SPICE default	typ.value	Unit
DC:				
IS	transport saturation current	.1E-15	1.E-15	A
XTI	temperature exponent for effect on IS	3	3	
EG	energy gap for temperature effect on IS	1.11	1.11	eV
BF	ideal forward maximum beta	100	150	
BR	ideal reverse maximum beta	1	.5	
XTB	forward & reverse beta temp.coeff.	0	2.5	
VAF	forward Early voltage	infinite	100	V
VAR	reverse Early voltage	infinite	50	V
NF	forward current emission coeff.	1	1.0	
NR	reverse current emission coeff.	1	1.0	
NE	B-E leakage emission coeff.	1.5	1.7	
NC	B-C leakage emission coeff.	2	1.3	
ISE	B-E leakage saturation current	0	.1E-12	A
ISC	B-C leakage saturation current	0	1.E-13	A
IKF	forward beta hi current roll-off	infinite	.05	A
IKR	reverse beta hi current roll-off	infinite	.3	A
OHMIC PARASITICS:				
RB	zero bias base resistance	0	100	Ohm
IRB	current at medium base resistance	infinite	.0001	A
RBM	min.base resistance at hi current	RB	25	Ohm
RE	emitter resistance	0	5	Ohm
RC	collector resistance	0	10	Ohm
CBE:				
CJE	B-E zero-bias deplet.capacitance	0	1.E-12	F
VJE	B-E built-in potential	.75	.6	V
MJE	B-E junction exponential factor	.33	.4	
CBC:				
CJC	B-C zero-bias deplet.capacitance	0	.5E-12	F
VJC	B-C built-in potential	.75	.6	V
MJC	B-C junction exponential factor	.33	.4	
XCJC	fraction of B-C capacitor connected to int.base	1	1	
CCS:				
CJS	zero-bias collector-substrate capacacitance	0	0	F
VJS	substrate junction built-in potential	.75	0	V
MJS	substrate junction exponential factor	0	0	
CAPACITOR FORWARD CHARACTERISTICS:				
FC	forward bias depletion cap.coeff.	.5	.5	
TRANSIT TIME:				
TF	ideal forward transit time	0	1.E-12	sec
XTF	coeff.for bias dependence of TF	0	10	
VTF	voltage describing VBC dependence of TF	infinite	5	V
ITF	hi-current parameter for effect on TF	0	20.E-3	A
PTF	excess phase at frequency 1/(TF*2PI)	0	0	deg
TR	ideal reverse transit time	0	50.E-12	sec
NOISE:				
KF	flicker noise coeff.	0		
AF	flicker noise exponent	1		
TEMPERATURE EFFECTS				
.TEMP	device temperature for simulation /'C	27	27	'C
.OPTIONS TNOM	device meas. and param. extraction temp	27	27	'C