********** Silicon Controlled Rectifier Model **********
* Copyright ©2020 VISHAY Semiconductor
* SPICE MODEL MAKER TOOL Version 1.1
* All Rights Reserved
* From Harald Stix
*
* Date: Thursday, June 25, 2020
****
*
* INPUT VALUES:
* Page 1
* General
* Name of Model Builder:
* Device Type No.
* Electrical Characteristics
* Holding Current = 7.700e+001 mA
* Gate Trigger Current = 2.315e+001 mA
* Gate Trigger Voltage = 8.330e-001 V
* Peak Forward Blocking Current = 2.232e+000 uA
* Peak Forward Blocking Voltage = 1.200e+003 V
* 1.05 Peak Reverse Blocking Voltage = 1.260e+003 V
* Critical Rate of Rise of Off-State Voltage = 5.000e+002 V/us
* Maximum Forward Voltage Chart
* Instantaneous Forward Current = 1.000e+000 A
* at Minimum Value of Instantaneous Voltage = 8.530e-001 V
* Instantaneous Forward Current = 5.000e+000 A
* at Intermid. Value of Instantaneous Voltage = 9.530e-001 V
* Instantaneous Forward Current = 8.000e+001 A
* at Max. Value of Instantaneous Voltage = 1.712e+000 V
* Page 2
* Electrical Characteristics
* Turn-On Time = 9.000e-001 us
* Turn-Off Time = 4.000e+000 us
* Maximum Ratings Chart
* Forward Current = 1.600e+001 A
* Reverse Current = 3.104e-006 A
* Reverse Voltage = 1.200e+003 V
* Identifier = 0
* Parameter related to "off-state" (forw. current) = 1.600e+001 A
* Parameter related to "off-state" (peak.rev.bloc.volt.) = 1.200e+003 V
* SCR SUBCIRCUIT

.SUBCKT VS-16TTS12 10 20 30
.MODEL DMOD D (N=0.001)
.MODEL DON1 D(N = 2.437e+000, IS = 1.091e-006, RS = 7.334e-003,)
.MODEL DGAT D (IS=1E-12)
.MODEL DBREAK D(IS = 3.591e-008, BV = 1.512e+003, XTI = 3.000e+000)
V5 10 14 DC 0
DON 14 22 DON1
E1 22 20 POLY(2)10 20 3 20 0 0 0 0 1
*
VGD 7 0 DC 2.364e-001
DGATE 30 7 DGAT

```
*
CRISE 14 20 1.540e-010
DBREAK1 20 27 DBREAK
DBREAK2  14 27 DBREAK
VREV 65 14 DC 0
GOFF 20 65 66 67 1
RLEAK 10 20 5.376e+008
*
D1 3 1 DMOD
D2 20 3 DMOD
FCTRL 3 20 POLY(3) VGD V5 VREV -2.315e-002,  1,3.006e-001, 1
V1 1 20 DC 0.999
CON 3 20 2.084e-008, IC=1.5
*
D3 67 56 DMOD
D4 56 70 DMOD
D5 20 56 DMOD
E2 66 20 10 20 -1
COFF 56 20 5.572e-008
ROFF 66 67 3.000e+000
R10 66 70 1
.ENDS




*
* INPUT VALUES:
* Page 1
* General
* Name of Model Builder:
* Device Type No.
* Electrical Characteristics
* Holding Current                                = 7.700e+001 mA
* Gate Trigger Current                           = 2.315e+001 mA
* Gate Trigger Voltage                           = 8.330e-001 V
* Peak Forward Blocking Current                  = 2.232e+000 uA
* Peak Forward Blocking Voltage                  = 1.200e+003 V
* 1.05 Peak Reverse Blocking Voltage             = 1.260e+003 V
* Critical Rate of Rise of Off-State Voltage     = 5.000e+002 V/us
* Maximum Forward Voltage Chart
* Instantaneous Forward Current                  = 1.000e+000 A
* at Minimum Value of Instantaneous Voltage      = 8.530e-001 V
* Instantaneous Forward Current                  = 5.000e+000 A
* at Intermid. Value of Instantaneous Voltage    = 9.530e-001 V
* Instantaneous Forward Current                  = 8.000e+001 A
* at Max. Value of Instantaneous Voltage         = 1.712e+000 V
* Page 2
* Electrical Characteristics
* Turn-On Time                                   = 9.000e-001 us
* Turn-Off Time                                  = 4.000e+000 us
* Maximum Ratings Chart
* Forward Current                                = 1.600e+001 A
```

```
* Reverse Current                    = 2.230e-006 A
* Reverse Voltage                    = 1.200e+003 V
* Identifier                         = 0
* Parameter related to "off-state"  (forw. current)       = 1.600e+001 A
* Parameter related to "off-state" (peak.rev.bloc.volt.) = 1.200e+003 V
* SCR SUBCIRCUIT

.SUBCKT VS-16TTS12 10 20 30
.MODEL DMOD D (N=0.001)
.MODEL DON1 D(N = 2.437e+000, IS = 1.091e-006, RS = 7.334e-003,)
.MODEL DGAT D (IS=1E-12)
.MODEL DBREAK D(IS = 3.591e-008, BV = 1.512e+003, XTI = 3.000e+000)
V5 10 14 DC 0
DON 14 22 DON1
E1 22 20 POLY(2)10 20 3 20 0 0 0 0 1
*
VGD 7 0 DC 2.364e-001
DGATE 30 7 DGAT
*
CRISE 14 20 1.540e-010
DBREAK1 20 27 DBREAK
DBREAK2  14 27 DBREAK
VREV 65 14 DC 0
GOFF 20 65 66 67 1
RLEAK 10 20 5.376e+008
*
D1 3 1 DMOD
D2 20 3 DMOD
FCTRL 3 20 POLY(3) VGD V5 VREV -2.315e-002,  1,3.006e-001, 1
V1 1 20 DC 0.999
CON 3 20 2.084e-008, IC=1.5
*
D3 67 56 DMOD
D4 56 70 DMOD
D5 20 56 DMOD
E2 66 20 10 20 -1
COFF 56 20 5.572e-008
ROFF 66 67 3.000e+000
R10 66 70 1
.ENDS
```

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay’s knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer’s technical experts. Product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.