Preferred Device

Sensitive Gate Silicon Controlled Rectifiers

Reverse Blocking Thyristors

Annular PNPN devices designed for high volume consumer applications such as relay and lamp drivers, small motor controls, gate drivers for larger thyristors, and sensing and detection circuits. Supplied in an inexpensive plastic TO-92/TO-226AA package which is readily adaptable for use in automatic insertion equipment.

Features

- Sensitive Gate Trigger Current 200 µA Maximum
- Low Reverse and Forward Blocking Current 50 μA Maximum, T_C = 110°C
- Low Holding Current 5 mA Maximum
- Passivated Surface for Reliability and Uniformity
- Device Marking: Device Type, e.g., 2N5060, Date Code
- Pb-Free Packages are Available*



ON Semiconductor®

http://onsemi.com

SILICON CONTROLLED RECTIFIERS 0.8 A RMS, 30 – 200 V







50xx Specific Device Code Y = Year WW = Work Week

PIN ASSIGNMENT				
1	Cathode			
2	Gate			
3	Anode			

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

Preferred devices are recommended choices for future use and best overall value.

*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

MAXIMUN5 ATING SHTTTF 帝°C unless otherwise noted)

Rating	Symbol	Value	Unit
$\begin{array}{l} \mbox{Peak Repetitive Off-State Voltage (Note 1)} \\ (T_J = -40 \mbox{ to } 110^{\circ}\mbox{C}, \mbox{ Sine Wave}, \\ 50 \mbox{ to } 60 \mbox{ Hz}, \mbox{ R}_{GK} = 1 \mbox{ k}$	V _{DRM,} V _{RRM}	30 60 100 200	V
On-State Current RMS (180° Conduction Angles; $T_{C} = 80^{\circ}C$)	I _{T(RMS)}	0.8	А
*Average On-State Current (180° Conduction Angles) $(T_C = 67°C)$ $(T_C = 102°C)$	I _{T(AV)}	0.51 0.255	A
*Peak Non-repetitive Surge Current, T _A = 25°C (1/2 cycle, Sine Wave, 60 Hz)	I _{TSM}	10	A
Circuit Fusing Considerations (t = 8.3 ms)	l ² t	0.4	A ² s
*Average On-State Current (180° Conduction Angles) $(T_C = 67°C)$ $(T_C = 102°C)$	I _{T(AV)}	0.51 0.255	A
*Forward Peak Gate Power (Pulse Width $\leq 1.0 \mu\text{sec}$; T _A = 25°C)	P _{GM}	0.1	W
*Forward Average Gate Power ($T_A = 25^{\circ}C$, t = 8.3 ms)	P _{G(AV)}	0.01	W
*Forward Peak Gate Current (Pulse Width $\leq 1.0 \ \mu sec; T_A = 25^{\circ}C$)	I _{GM}	1.0	А
*Reverse Peak Gate Voltage (Pulse Width \leq 1.0 µsec; T _A = 25°C)	V _{RGM}	5.0	V
*Operating Junction Temperature Range	Т _Ј	-40 to +110	°C
*Storage Temperature Range	T _{stg}	-40 to +150	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Thermal Resistance, Junction-to-Case (Note 2)	$R_{ extsf{ heta}JC}$	75	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{ hetaJA}$	200	°C/W

2. This measurement is made with the case mounted "flat side down" on a heatsink and held in position by means of a metal clamp over the curved surface.

*Indicates JEDEC Registered Data.

ELECTINCAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Min	Тур	Max	Unit
			-	-	
ting Current (Note 3) $T_C = 25^{\circ}C$ $T_C = 110^{\circ}C$	I _{DRM} , I _{RRM}			10 50	μΑ μΑ
			-		
	V _{TM}	-	-	1.7	V
te 5) $T_{C} = 25^{\circ}C$ $T_{C} = -40^{\circ}C$	I _{GT}			200 350	μΑ
e 5) $T_{C} = 25^{\circ}C$ $T_{C} = -40^{\circ}C$	V _{GT}			0.8 1.2	V
0°C	V _{GD}	0.1	-	-	V
$T_{C} = 25^{\circ}C$ A) $T_{C} = -40^{\circ}C$	Iн	-	-	5.0 10	mA
5	t _d t _r		3.0 0.2	-	μs
2N5060, 2N5061	tq	_	10	_	μs
	Pristic ing Current (Note 3) $T_{C} = 25^{\circ}C$ $T_{C} = 110^{\circ}C$ ite 5) $T_{C} = 25^{\circ}C$ $T_{C} = -40^{\circ}C$ ite 5) $T_{C} = 25^{\circ}C$ $T_{C} = -40^{\circ}C$ $0^{\circ}C$ A) $T_{C} = 25^{\circ}C$ $T_{C} = -40^{\circ}C$ $T_{C} = -40^{\circ}C$	Symbol Image: Symbol Symbol $T_{C} = 25^{\circ}C$ $T_{C} = 110^{\circ}C$ I_{DRM} , I_{RRM} Image:	symbol Min Ting Current (Note 3) $T_C = 25^{\circ}C$ $T_C = 110^{\circ}C$ IDRM, IRRM - VTM - te 5) T_C = 25^{\circ}C T_C = -40^{\circ}C IGT - te 5) T_C = 25^{\circ}C T_C = -40^{\circ}C VGT - o°C VGD 0.1 T_C = 25^{\circ}C T_C = -40^{\circ}C VGD 0.1 T_C = 25^{\circ}C T_C = -40^{\circ}C IH - td T_C = 25^{\circ}C T_C = -40^{\circ}C IH - td T_C = 25^{\circ}C T_C = -40^{\circ}C IH - td T_C = -40^{\circ}C IH - tq - - - tq - - - tq - - - tq - - - - th - - - - th - <	Symbol Min Typ ing Current (Note 3) T _C = 25°C T _C = 110°C I _{DRM} , I _{RRM} - - - ing Current (Note 3) T _C = 25°C T _C = 110°C V _{TM} - - - - ing Current (Note 3) T _C = 25°C T _C = -40°C I _{GT} - - - - ie 5) T _C = 25°C T _C = -40°C V _{GT} - - - - ie 5) T _C = 25°C T _C = -40°C V _{GT} - - - - o°C V _{GD} 0.1 - - - - - Λ_0 T _C = 25°C T _C = -40°C I _H - - - - Λ_0 T _C = -40°C I _H - - - - Λ_0 T _C = -40°C I _H - - - - Λ_0 T _C = -40°C I _H - - - - - Λ_0 T _C = -40°C I _H - - 10 - <td>Symbol Min Typ Max ing Current (Note 3) $T_C = 25^{\circ}C$ $T_C = 110^{\circ}C$ I_{DRM}, I_{RRM} - - - 10 ing Current (Note 3) $T_C = 110^{\circ}C$ V_{TM} - - - 10 ing Current (Note 3) $T_C = 110^{\circ}C$ V_{TM} - - - 10 ing Current (Note 3) $T_C = 110^{\circ}C$ V_{TM} - - - 10 ing Current (Note 3) $T_C = 25^{\circ}C$ $T_C = -40^{\circ}C$ I_{GT} - - - 200 ing Current (Note 3) $T_C = -40^{\circ}C$ V_{GT} - - - 0.8 ing Current (Note 3) $T_C = -40^{\circ}C$ V_{GD} 0.1 - - - ing Current (Note 3) $T_C = -40^{\circ}C$ I_H - - - 10 ing Current (Note 3) $T_C = -40^{\circ}C$ I_H - - - 10 ing Current (Note 3) $T_C = -40^{\circ}C$ I_H - - - - 10 ing Current (Note 3) $T_C = -40^{\circ}C$ I_H - - 1</td>	Symbol Min Typ Max ing Current (Note 3) $T_C = 25^{\circ}C$ $T_C = 110^{\circ}C$ I _{DRM} , I _{RRM} - - - 10 ing Current (Note 3) $T_C = 110^{\circ}C$ V _{TM} - - - 10 ing Current (Note 3) $T_C = 110^{\circ}C$ V _{TM} - - - 10 ing Current (Note 3) $T_C = 110^{\circ}C$ V _{TM} - - - 10 ing Current (Note 3) $T_C = 25^{\circ}C$ $T_C = -40^{\circ}C$ I _{GT} - - - 200 ing Current (Note 3) $T_C = -40^{\circ}C$ V _{GT} - - - 0.8 ing Current (Note 3) $T_C = -40^{\circ}C$ V _{GD} 0.1 - - - ing Current (Note 3) $T_C = -40^{\circ}C$ I _H - - - 10 ing Current (Note 3) $T_C = -40^{\circ}C$ I _H - - - 10 ing Current (Note 3) $T_C = -40^{\circ}C$ I _H - - - - 10 ing Current (Note 3) $T_C = -40^{\circ}C$ I _H - - 1

Critical Rate of Rise of Off-State Voltage	dv/dt	_	30	_	V/μs
(Rated V _{DRM} , Exponential, R_{GK} = 1 k Ω)					

R_{GK} = 1000 Ω is included in measurement.
 Forward current applied for 1 ms maximum duration, duty cycle ≤ 1%.
 R_{GK} current is not included in measurement.
 *Indicates JEDEC Registered Data.

Voltage Current Characteristic of SCR

Symbol	Parameter
V _{DRM}	Peak Repetitive Off State Forward Voltage
I _{DRM}	Peak Forward Blocking Current
V _{RRM}	Peak Repetitive Off State Reverse Voltage
I _{RRM}	Peak Reverse Blocking Current
V _{TM}	Peak on State Voltage
I _H	Holding Current



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v_T, INSTANTANEOUS ON-STATE VOLTAGE (VOLTS) Figure 3. Typical Forward Voltage

I_{T(AV)}, AVERAGE ON-STATE CURRENT (AMP) Figure 5. Power Dissipation













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Device	Package	Shipping [†]
2N5060	TO-92	5,000 Units / Box
2N5060G	TO-92 (Pb-Free)	5,000 Units / Box
2N5060RLRA	TO-92	2,000 / Tape & Reel
2N5060RLRAG	TO-92 (Pb-Free)	2,000 / Tape & Reel
2N5060RLRM	TO-92	2,000 / Ammo Pack
2N5060RLRMG	TO-92 (Pb-Free)	2000 / Ammo Pack
2N5061	TO-92	5,000 Units / Box
2N5061G	TO-92 (Pb-Free)	5,000 Units / Box
2N5061RLRA	TO-92	2,000 / Tape & Reel
2N5061RLRAG	TO-92 (Pb-Free)	2,000 / Tape & Reel
2N5062	TO-92	5,000 Units / Box
2N5062G	TO-92 (Pb-Free)	5,000 Units / Box
2N5062RLRA	TO-92	2,000 / Tape & Reel
2N5062RLRAG	TO-92 (Pb-Free)	2,000 / Tape & Reel
2N5064	TO-92	5,000 Units / Box
2N5064RLRA	TO-92	2,000 / Tape & Reel
2N5064RLRM	TO-92	2,000 / Ammo Pack
2N5064RLRMG	TO-92 (Pb-Free)	2,000 / Ammo Pack
2N5064RLRAG	TO-92 (Pb-Free)	2000 / Tape & Reel
2N5064G	TO-92 (Pb-Free)	5000 Units / Box

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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PACKAGE DIMENSIONS

TO-92 (TO-226) CASE 29-11 **ISSUE AM**



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В	0.170	0.210	4.32	5.33
С	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
Н	0.095	0.105	2.42	2.66
ſ	0.015	0.020	0.39	0.50
Κ	0.500		12.70	
L	0.250		6.35	
Ν	0.080	0.105	2.04	2.66
Ρ		0.100		2.54
R	0.115		2.93	
V	0.135		3.43	

1. DIMENSIONING AND TOLERANCING PER

CONTOUR OF PACKAGE BEYOND

AND BEYOND DIMENSION K MINIMUM.

GATE 2. 3. ANODE

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