Very Low Forward Voltage Trench-based Schottky Rectifier

Features

- Fine Lithography Trench-based Schottky Technology for Very Low Forward Voltage and Low Leakage
- Fast Switching with Exceptional Temperature Stability
- Low Power Loss and Lower Operating Temperature
- Higher Efficiency for Achieving Regulatory Compliance
- Low Thermal Resistance
- High Surge Capability
- These are Pb-Free Devices

Typical Applications

- Switching Power Supplies including Notebook / Netbook Adapters, ATX and Flat Panel Display
- High Frequency and DC-DC Converters
- Freewheeling and OR-ing diodes
- Reverse Battery Protection
- Instrumentation

Mechanical Characteristics

- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94-0 @ 0.125 in
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Maximum for 10 sec

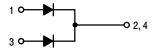


ON Semiconductor®

www.onsemi.com

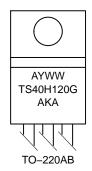
VERY LOW FORWARD VOLT-AGE, SCHOTTKY BARRIER RECTIFIERS 40 AMPERES, 120 VOLTS

PIN CONNECTIONS





MARKING DIAGRAM



A = Assembly Location

Y = Year
WW = Work Week
AKA = Polarity Designator
G = Pb-Free Package

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage		V _{RRM} V _{RWM} V _R	120	V
Average Rectified Forward Current (Rated V_R , $T_C = 124^{\circ}C$) (Rated V_R , $T_C = 132^{\circ}C$)	Per device Per diode	I _{F(AV)}	40 20	А
Peak Repetitive Forward Current (Rated V_R , Square Wave, 20 kHz, T_C = 119°C) (Rated V_R , Square Wave, 20 kHz, T_C = 130°C)	Per device Per diode	I _{FRM}	80 40	А
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)		I _{FSM}	250	А
Operating Junction Temperature		TJ	-40 to +150	°C
Storage Temperature		T _{stg}	-40 to +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Rating	Symbol	NTST40H120CTG	Unit
Maximum Thermal Resistance per Device Junction—to-	-to-Case R _{θJC} -Ambient R _{θJA}	0.81 70	°C/W

ELECTRICAL CHARACTERISTICS (Per Leg unless otherwise noted)

Rating	Symbol	Тур	Max	Unit
Maximum Instantaneous Forward Voltage (Note 1)	V _F			V
$(I_F = 5 \text{ A}, T_J = 25^{\circ}\text{C})$		0.52	_	
$(I_F = 10 \text{ A}, T_J = 25^{\circ}\text{C})$		0.65	_	
$(I_F = 20 \text{ A}, T_J = 25^{\circ}\text{C})$		0.85	0.91	
$(I_F = 5 \text{ A}, T_J = 125^{\circ}\text{C})$		0.46	_	
$(I_F = 10 \text{ A}, T_J = 125^{\circ}\text{C})$		0.55	_	
$(I_F = 20 \text{ A}, T_J = 125^{\circ}\text{C})$		0.66	0.69	
Maximum Instantaneous Reverse Current (Note 1)	I _R			
$(V_R = 90 \text{ V}, T_J = 25^{\circ}\text{C})$		6	_	μΑ
$(V_R = 90 \text{ V}, T_J = 125^{\circ}\text{C})$		7	-	mA
(Rated dc Voltage, T _J = 25°C)		_	65	μА
(Rated dc Voltage, T _J = 125°C)		20	42	mΑ

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

^{1.} Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%

TYPICAL CHARACTERISTICS

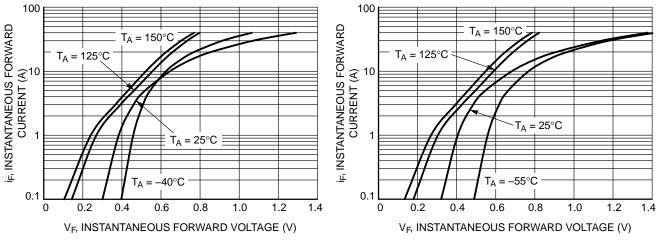


Figure 1. Typical Instantaneous Forward Characteristics

Figure 2. Maximum Instantaneous Forward Characteristics

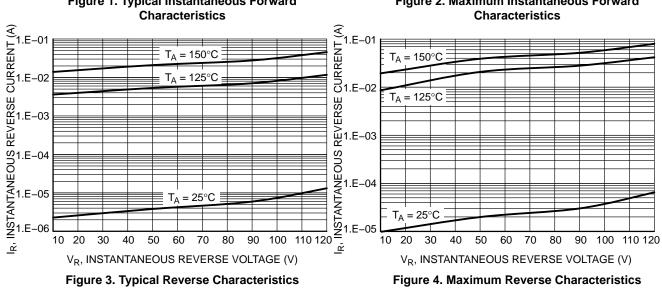


Figure 3. Typical Reverse Characteristics

Figure 4. Maximum Reverse Characteristics

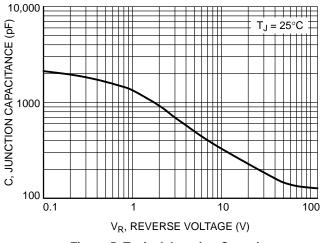


Figure 5. Typical Junction Capacitance

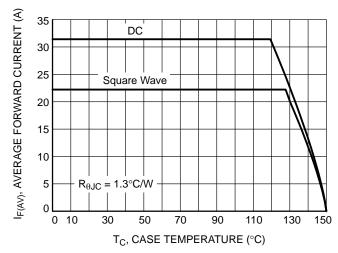


Figure 6. Current Derating per Diode

TYPICAL CHARACTERISTICS

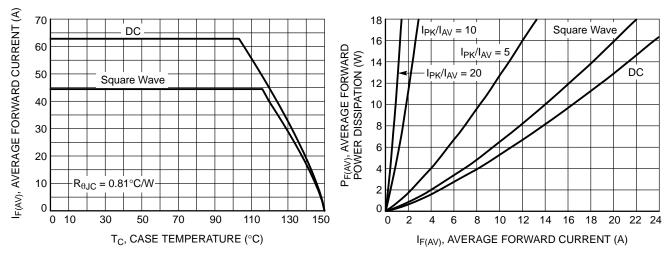


Figure 7. Current Derating per Device

Figure 8. Forward Power Dissipation

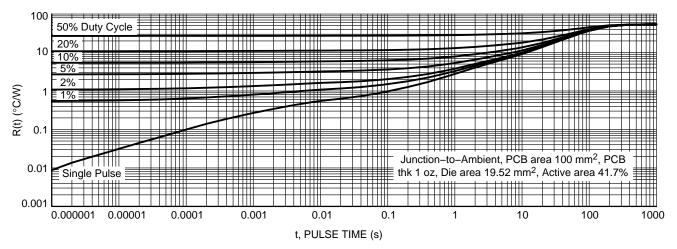


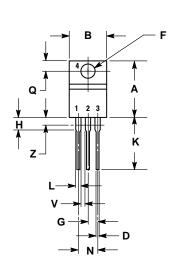
Figure 9. Thermal Characteristics

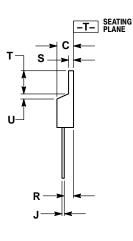
ORDERING INFORMATION

Device	Package	Shipping
NTST40H120CTG	TO-220AB (Pb-Free)	50 Units / Rail

PACKAGE DIMENSIONS

TO-220 CASE 221A-09 ISSUE AH





NOTES:

- DIMENSIONING AND TOLERANCING PER ANSI
 V14 FM 1092
- Y14.5M, 1982. 2. CONTROLLING DIMENSION: INCH.
- DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

	INCHES		MILLIN	IETERS
DIM	MIN	MAX	MIN	MAX
Α	0.570	0.620	14.48	15.75
В	0.380	0.415	9.66	10.53
С	0.160	0.190	4.07	4.83
D	0.025	0.038	0.64	0.96
F	0.142	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
Н	0.110	0.161	2.80	4.10
J	0.014	0.024	0.36	0.61
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
٧	0.045		1.15	
Z		0.080		2.04

STYLE 6:

- PIN 1. ANODE
 - 2. CATHODE
 - 3. ANODE
 - 4. CATHODE

ON Semiconductor and are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor dates sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify a

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor 19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA Phone: 303–675–2175 or 800–344–3860 Toll Free USA/Canada Fax: 303–675–2176 or 800–344–3867 Toll Free USA/Canada Email: orderlit@onsemi.com N. American Technical Support: 800–282–9855 Toll Free USA/Canada

Europe, Middle East and Africa Technical Support: Phone: 421 33 790 2910 Japan Customer Focus Center Phone: 81-3-5817-1050 ON Semiconductor Website: www.onsemi.com

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative