

NRTSV30H120CT

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 Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

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

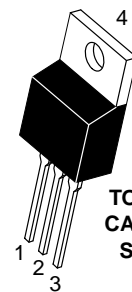
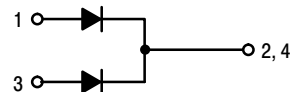
- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94-0 @ 0.125 in
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Maximum for 10 sec



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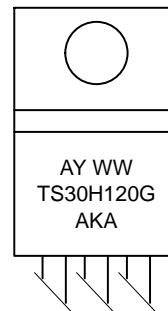
www.onsemi.com

PIN CONNECTIONS



TO-220AB
CASE 221A
STYLE 6

MARKING DIAGRAM



TS30H120G = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
AKA = Polarity Designator
G = Pb-Free Package

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

NRTSV30H120CT

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 , $T_C = 124^\circ\text{C}$) (Rated V_R , $T_C = 134^\circ\text{C}$) | $I_{F(AV)}$ Per device Per diode | 30 15 | A |
| Peak Repetitive Forward Current (Rated V_R , Square Wave, 20 kHz, $T_C = 119^\circ\text{C}$) (Rated V_R , Square Wave, 20 kHz, $T_C = 132^\circ\text{C}$) | I_{FRM} Per device Per diode | 60 30 | A |
| Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz) | I_{FSM} | 125 | A |
| Operating Junction Temperature | T_J | -55 to +150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

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 | Value | Unit |
|---|------------------------------------|-------------|--|
| Maximum Thermal Resistance per Device (Note 1) Junction-to-Case Junction-to-Ambient | $R_{\theta JC}$ $R_{\theta JA}$ | 1.0 69.3 | $^\circ\text{C/W}$ $^\circ\text{C/W}$ |

1. Assumes 150 mm² 1 oz. copper bond pad, on a FR4 board.

ELECTRICAL CHARACTERISTICS (Per Leg unless otherwise noted)

| Rating | Symbol | Typ | Max | Unit |
|--|--------|----------------------------------|----------------------------|--|
| Maximum Instantaneous Forward Voltage (Note 2) ($I_F = 7.5\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 15\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 7.5\text{ A}$, $T_J = 125^\circ\text{C}$) ($I_F = 15\text{ A}$, $T_J = 125^\circ\text{C}$) | V_F | 0.65 0.87 0.56 0.66 | - 0.93 - 0.70 | V |
| Maximum Instantaneous Reverse Current (Note 2) ($V_R = 90\text{ V}$, $T_J = 25^\circ\text{C}$) ($V_R = 90\text{ V}$, $T_J = 125^\circ\text{C}$) (Rated dc Voltage, $T_J = 25^\circ\text{C}$) (Rated dc Voltage, $T_J = 125^\circ\text{C}$) | I_R | 3.8 4.3 8.6 7.2 | 35 15 | μA mA μA mA |
| Diode Capacitance (Rated dc Voltage, $T_J = 25^\circ\text{C}$) | C_d | 95 | - | pF |

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.

2. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$

ORDERING INFORMATION

| Device | Package | Shipping |
|----------------|-----------------------|-----------------|
| NRTSV30H120CTG | TO-220AB (Pb-Free) | 50 Units / Rail |

NRTSV30H120CT

TYPICAL CHARACTERISTICS

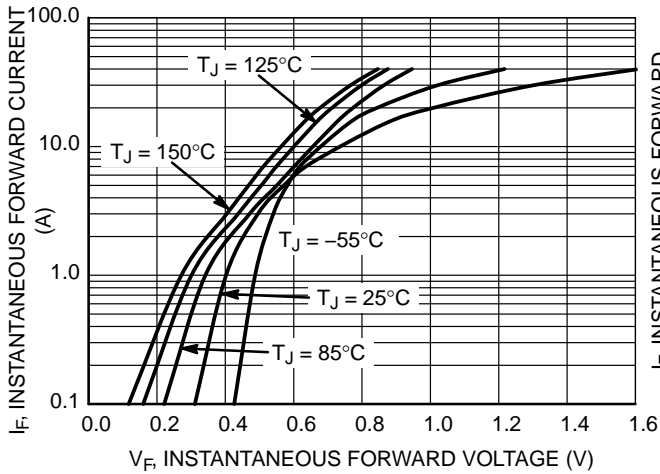


Figure 1. Typical Instantaneous Forward Characteristics

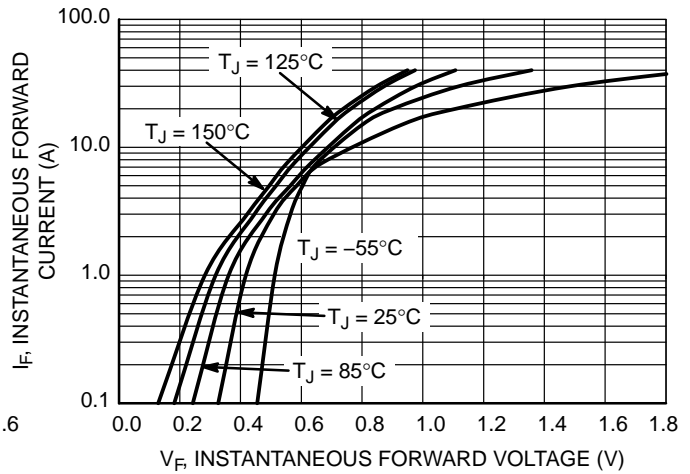


Figure 2. Maximum Instantaneous Forward Characteristics

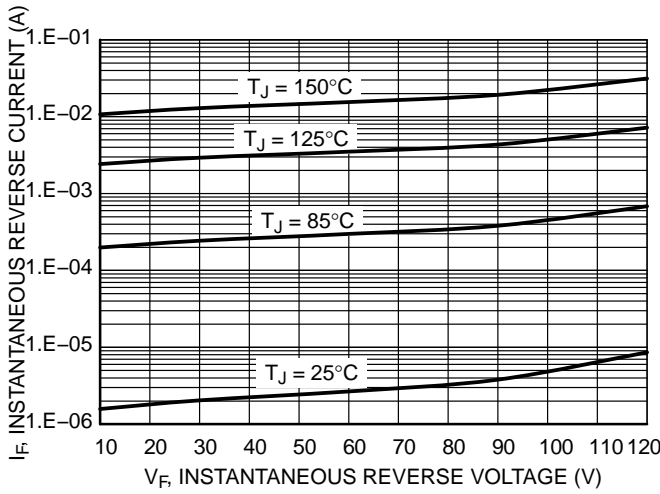


Figure 3. Typical Reverse Characteristics

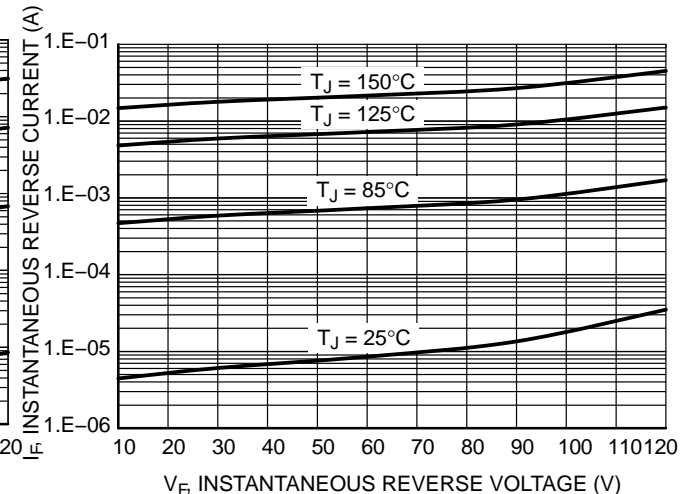


Figure 4. Maximum Reverse Characteristics

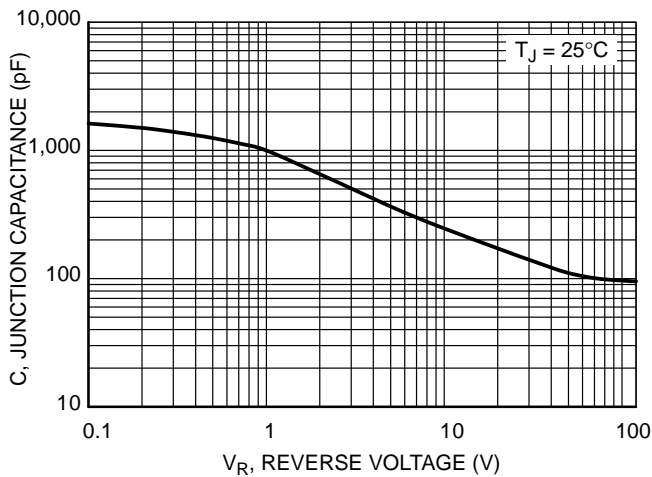


Figure 5. Typical Junction Capacitance

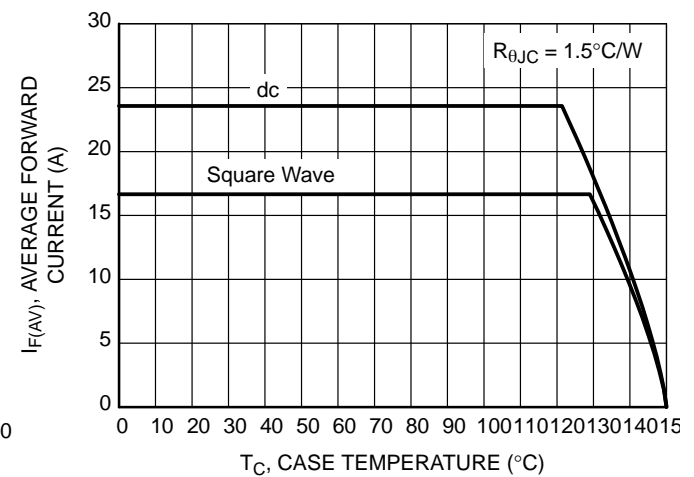


Figure 6. Current Derating per Leg

NRTSV30H120CT

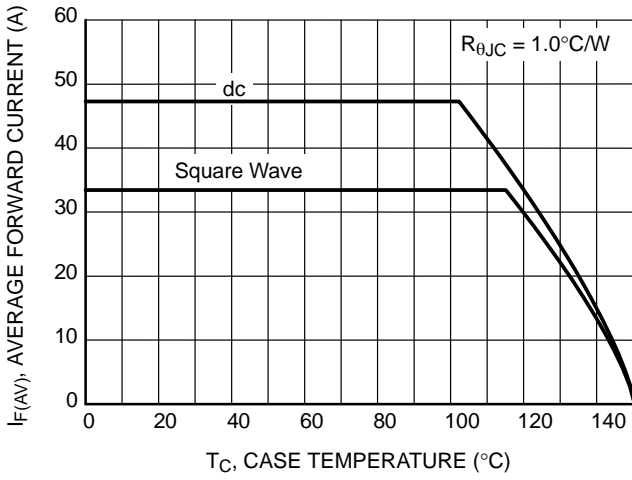


Figure 7. Current Derating, per Device

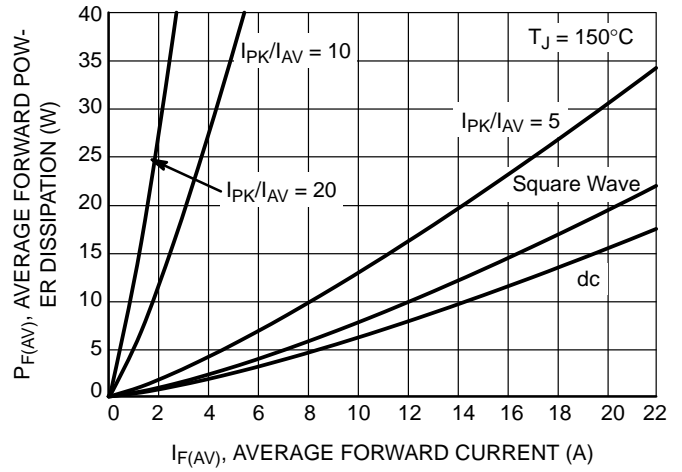


Figure 8. Forward Power Dissipation

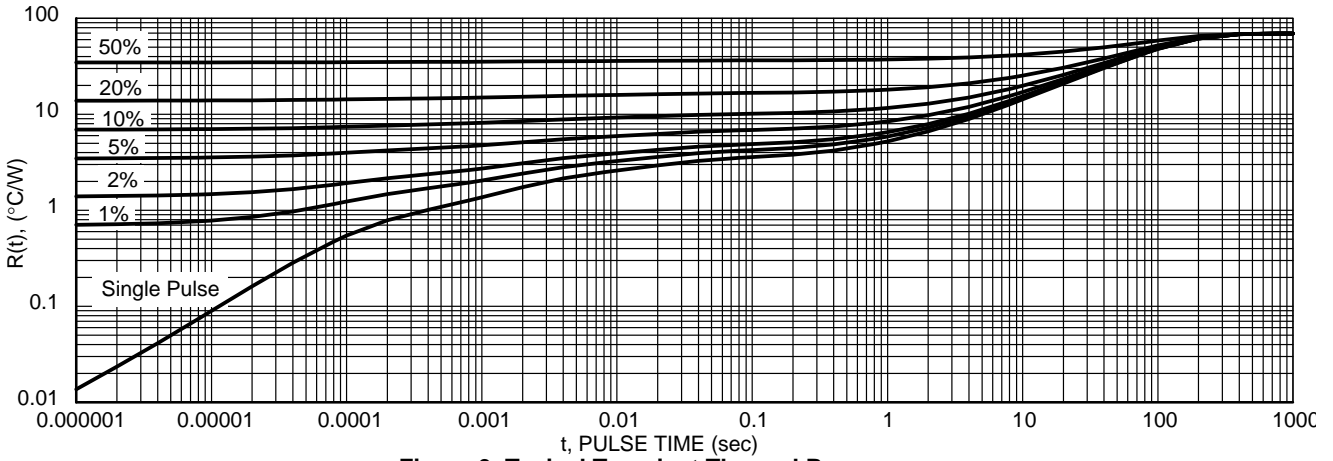
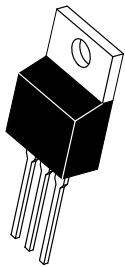
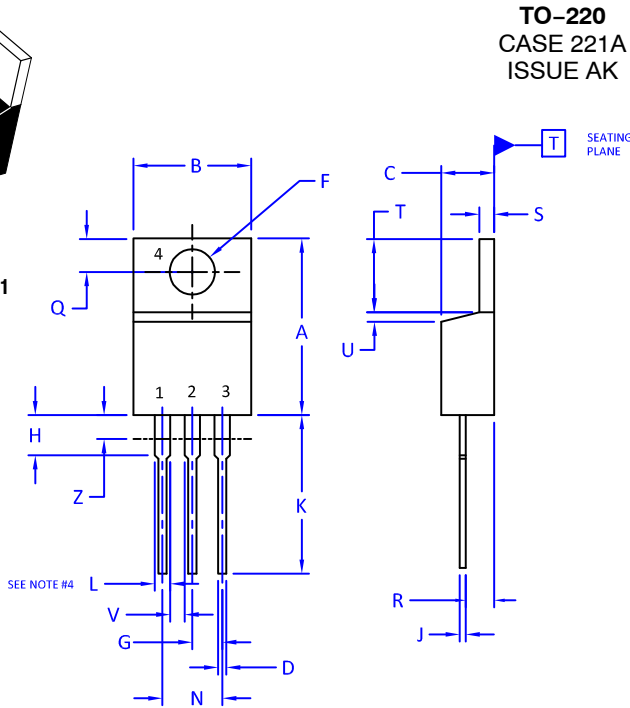


Figure 9. Typical Transient Thermal Response

MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



SCALE 1:1



TO-220 CASE 221A ISSUE AK

DATE 13 JAN 2022

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 2009.
2. CONTROLLING DIMENSION: INCHES
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.
4. MAX WIDTH FOR F102 DEVICE = 1.35MM

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.570 | 0.620 | 14.48 | 15.75 |
| B | 0.380 | 0.415 | 9.66 | 10.53 |
| C | 0.160 | 0.190 | 4.07 | 4.83 |
| D | 0.025 | 0.038 | 0.64 | 0.96 |
| F | 0.142 | 0.161 | 3.60 | 4.09 |
| G | 0.095 | 0.105 | 2.42 | 2.66 |
| H | 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 | 1.41 |
| T | 0.235 | 0.255 | 5.97 | 6.47 |
| U | 0.000 | 0.050 | 0.00 | 1.27 |
| V | 0.045 | --- | 1.15 | --- |
| Z | --- | 0.080 | --- | 2.04 |

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 2:
PIN 1. BASE
2. EMITTER
3. COLLECTOR
4. EMITTER

STYLE 3:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 4:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. MAIN TERMINAL 2

STYLE 5:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

STYLE 6:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 7:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. ANODE

STYLE 8:
PIN 1. CATHODE
2. ANODE
3. EXTERNAL TRIP/DELAY
4. ANODE

STYLE 9:
PIN 1. GATE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 10:
PIN 1. GATE
2. SOURCE
3. DRAIN
4. SOURCE

STYLE 11:
PIN 1. DRAIN
2. SOURCE
3. GATE
4. SOURCE

STYLE 12:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. NOT CONNECTED

| | | |
|------------------|-------------|--|
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