

NTS12120EMFS, NRVTS12120EMFS

Very Low Leakage 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
- NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These are Pb-Free and Halide-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
- LED Lighting
- Instrumentation

Mechanical Characteristics:

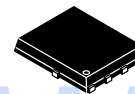
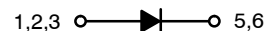
- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94-0 @ 0.125 in.
- Lead Finish: 100% Matte Sn (Tin)
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL 1 Requirements



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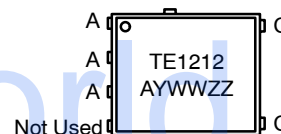
<http://onsemi.com>

**TRENCH SCHOTTKY
RECTIFIERS
12 AMPERES
120 VOLTS**



SO-8 FLAT LEAD
CASE 488AA
STYLE 2

MARKING DIAGRAM



TE1212 = Specific Device Code
A = Assembly Location
Y = Year
W = Work Week
ZZ = Lot Traceability

ORDERING INFORMATION

| Device | Package | Shipping† |
|-------------------|----------------------|-----------------------|
| NTS12120EMFST1G | SO-8 FL (Pb-Free) | 1500 / Tape & Reel |
| NTS12120EMFST3G | SO-8 FL (Pb-Free) | 5000 / Tape & Reel |
| NRVTS12120EMFST1G | SO-8 FL (Pb-Free) | 1500 / Tape & Reel |
| NRVTS12120EMFST3G | SO-8 FL (Pb-Free) | 5000 / Tape & Reel |

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

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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 , $T_C = 165^\circ\text{C}$) | $I_{F(AV)}$ | 12 | A |
| Peak Repetitive Forward Current, (Rated V_R , Square Wave, 20 kHz, $T_C = 163^\circ\text{C}$) | I_{FRM} | 24 | A |
| Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | I_{FSM} | 200 | A |
| Storage Temperature Range | T_{stg} | -65 to +175 | $^\circ\text{C}$ |
| Operating Junction Temperature | T_J | -55 to +175 | $^\circ\text{C}$ |
| Unclamped Inductive Switching Energy (10 mH Inductor, Non-repetitive) | E_{AS} | 100 | mJ |
| ESD Rating (Human Body Model) | | 3B | |
| ESD Rating (Machine Model) | | M4 | |

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.

THERMAL CHARACTERISTICS

| Characteristic | Symbol | Typ | Max | Unit |
|---|-----------------|-----|-----|--------------------|
| Thermal Resistance, Junction-to-Case, Steady State (Assumes 600 mm ² 1 oz. copper bond pad, on a FR4 board) | $R_{\theta JC}$ | 2.0 | - | $^\circ\text{C/W}$ |

ELECTRICAL CHARACTERISTICS

| Rating | Symbol | Typ | Max | Unit |
|--|--------|------------------------------------|----------------------------|--|
| Instantaneous Forward Voltage (Note 1) ($I_F = 6\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 12\text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 6\text{ A}$, $T_J = 125^\circ\text{C}$) ($I_F = 12\text{ A}$, $T_J = 125^\circ\text{C}$) | V_F | 0.6 0.735 0.515 0.588 | - 0.83 - 0.69 | V |
| Instantaneous Reverse Current (Note 1) ($V_R = 90\text{ V}$, $T_J = 25^\circ\text{C}$) (Rated dc Voltage, $T_J = 25^\circ\text{C}$) ($V_R = 90\text{ V}$, $T_J = 125^\circ\text{C}$) (Rated dc Voltage, $T_J = 125^\circ\text{C}$) | I_R | 1.73 3.75 2.4 3.87 | - 55 - 30 | μA μA mA mA |

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

TYPICAL CHARACTERISTICS

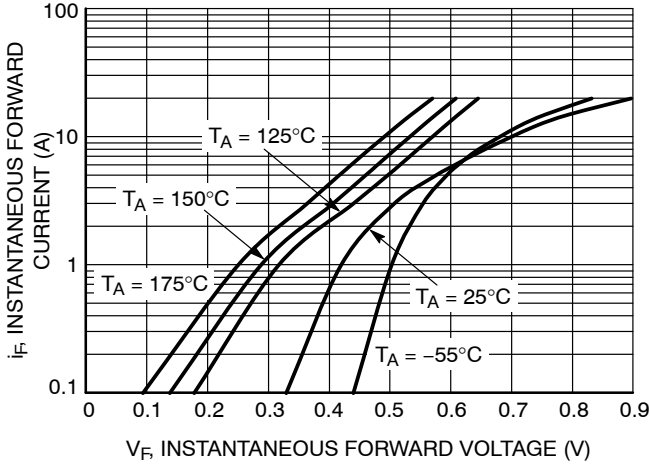


Figure 1. Typical Instantaneous Forward Characteristics

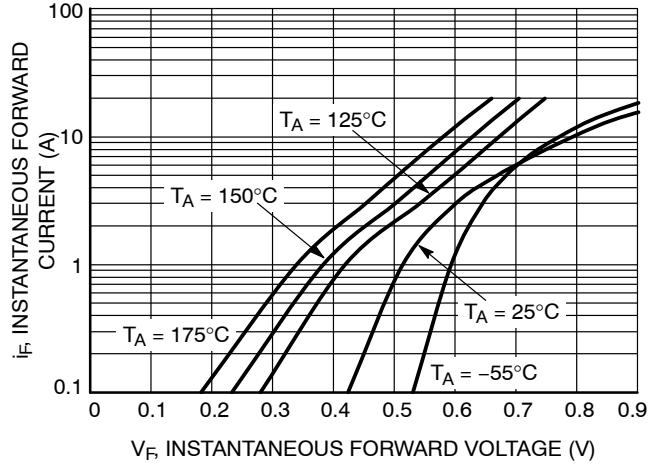


Figure 2. Maximum Instantaneous Forward Characteristics

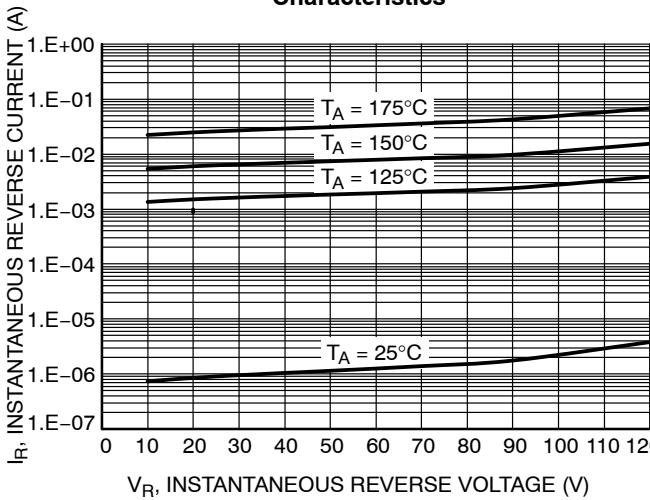


Figure 3. Typical Reverse Characteristics

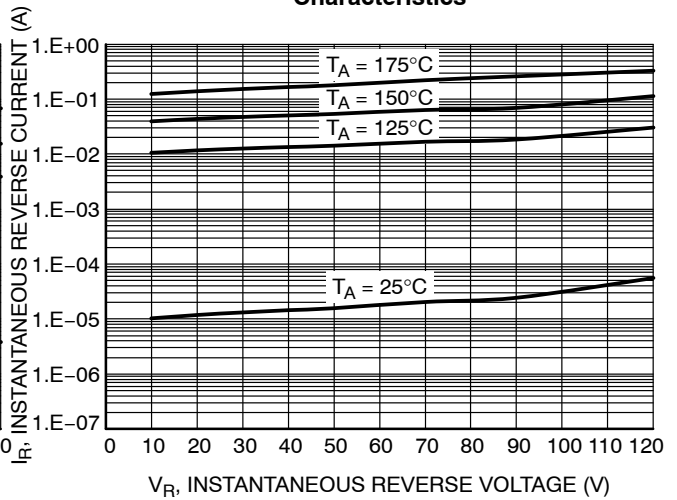


Figure 4. Maximum Reverse Characteristics

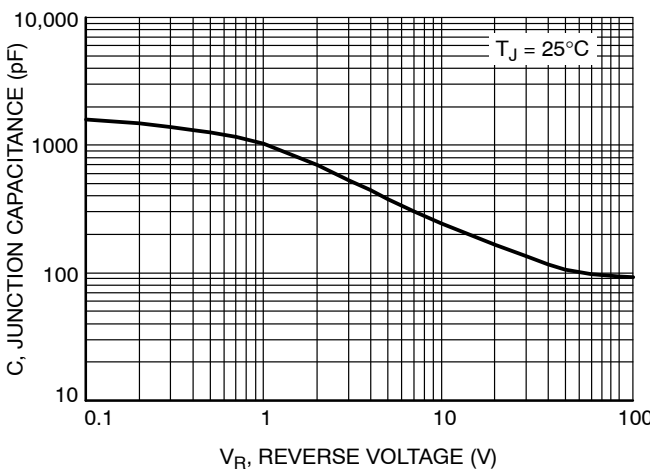


Figure 5. Typical Junction Capacitance

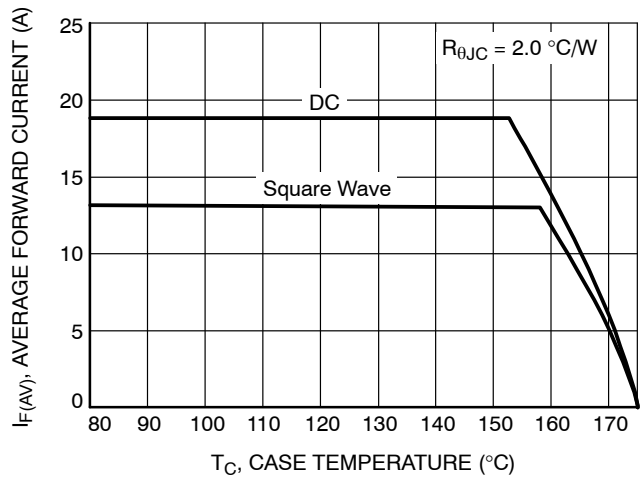


Figure 6. Current Derating

TYPICAL CHARACTERISTICS

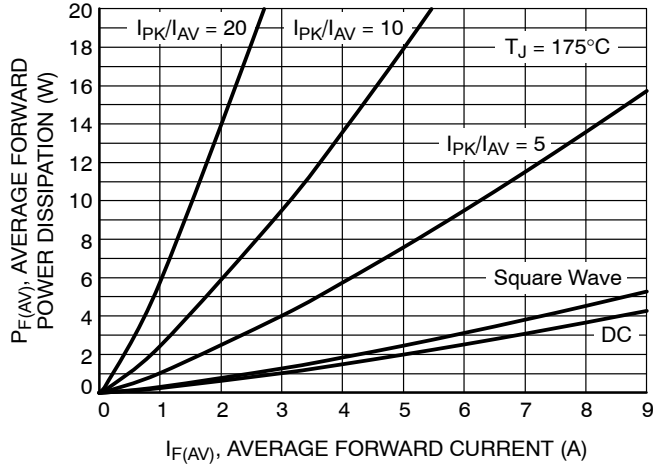


Figure 7. Forward Power Dissipation

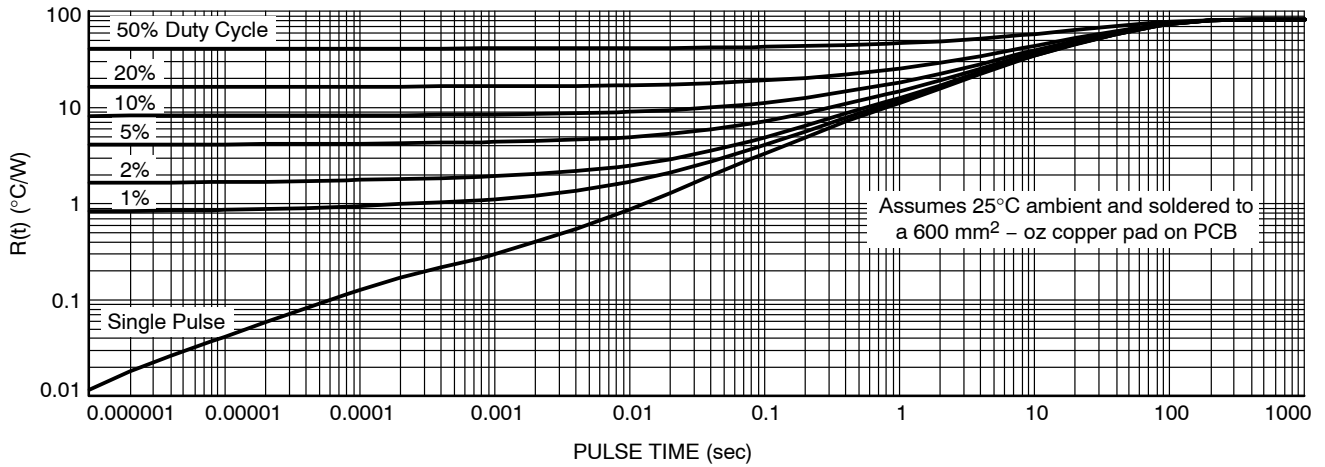


Figure 8. Thermal Characteristics

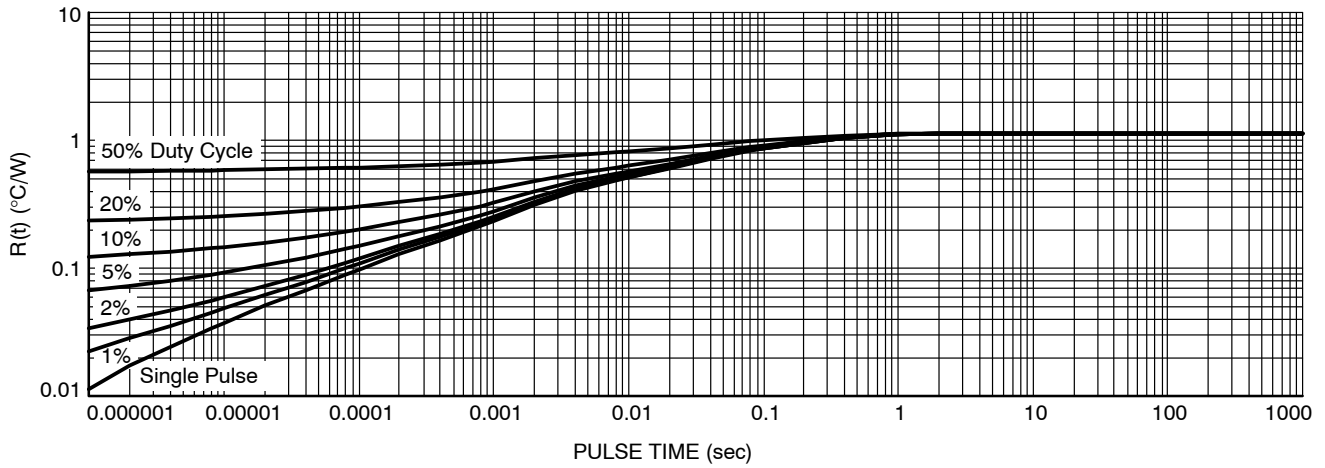
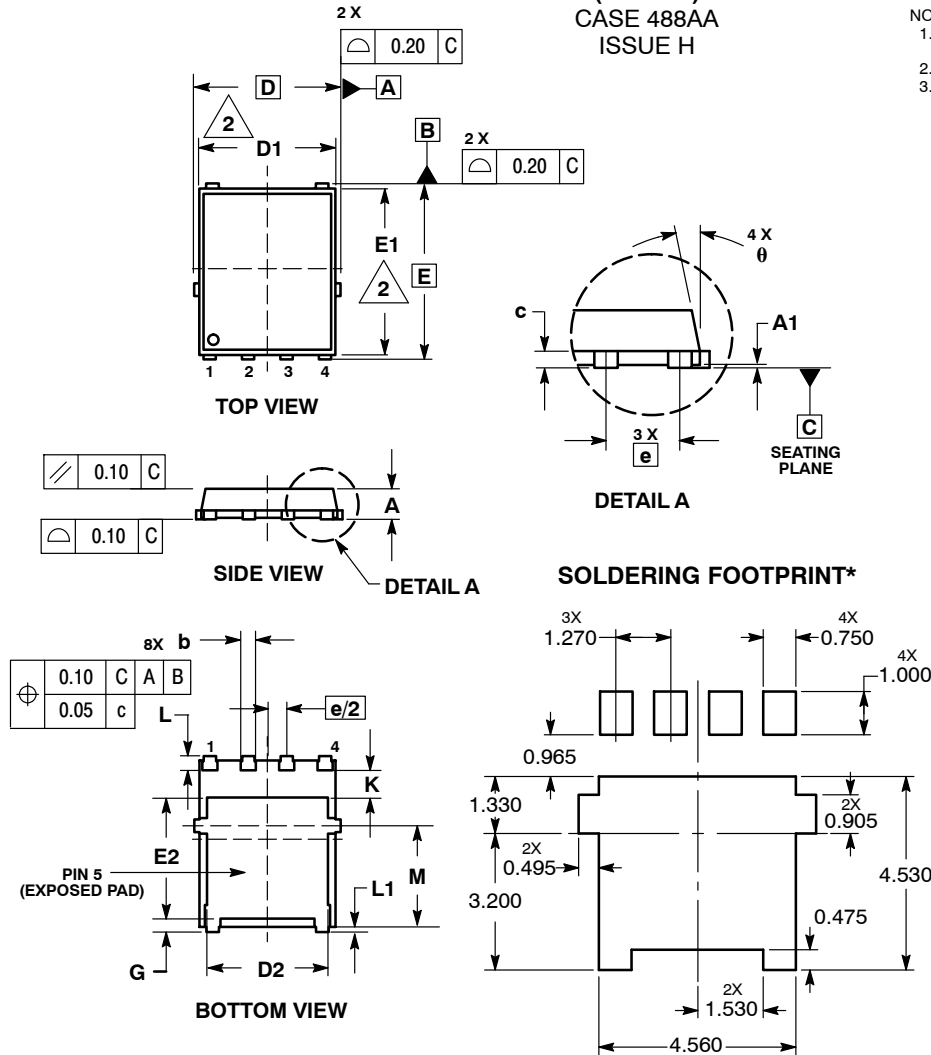


Figure 9. Typical Transient Thermal Response Characteristics, Junction-to-Case

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PACKAGE DIMENSIONS

DFN5 5x6, 1.27P
(SO-8FL)
CASE 488AA
ISSUE H



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
 2. CONTROLLING DIMENSION: MILLIMETER.
 3. DIMENSION D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

| DIM | MILLIMETERS | | |
|-----|-------------|------|------|
| | MIN | NOM | MAX |
| A | 0.90 | 1.00 | 1.10 |
| A1 | 0.00 | --- | 0.05 |
| b | 0.33 | 0.41 | 0.51 |
| c | 0.23 | 0.28 | 0.33 |
| D | 5.15 BSC | | |
| D1 | 4.70 | 4.90 | 5.10 |
| D2 | 3.80 | 4.00 | 4.20 |
| E | 6.15 BSC | | |
| E1 | 5.70 | 5.90 | 6.10 |
| E2 | 3.45 | 3.65 | 3.85 |
| e | 1.27 BSC | | |
| G | 0.51 | 0.61 | 0.71 |
| K | 1.20 | 1.35 | 1.50 |
| L | 0.51 | 0.61 | 0.71 |
| L1 | 0.05 | 0.17 | 0.20 |
| M | 3.00 | 3.40 | 3.80 |
| θ | 0° | --- | 12° |

- STYLE 2:
- PIN 1. ANODE
 - ANODE
 - ANODE
 - NO CONNECT
 - CATHODE

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

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