ON Semiconductor

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NTST30120CT, NTSJ30120CTG, NTSB30120CT-1G, NTSB30120CTG, NTSB30120CTT4G

Very Low Forward Voltage Trench-based Schottky Rectifier

Exceptionally Low $V_F = 0.50 \text{ V}$ at $I_F = 5 \text{ A}$

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

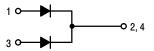


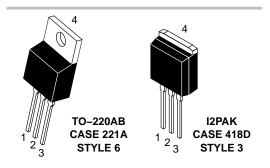
ON Semiconductor®

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VERY LOW FORWARD VOLT-AGE, LOW LEAKAGE SCHOT-TKY BARRIER RECTIFIERS 30 AMPERES, 120 VOLTS

PIN CONNECTIONS









ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

NTST30120CT, NTSJ30120CTG, NTSB30120CT-1G, NTSB30120CTG, NTSB30120CTT4G

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 , $T_C = 125$ °C)	Per device Per diode	I _{F(AV)}	30 15	А
Peak Repetitive Forward Current (Rated V _R , Square Wave, 20 kHz, T _C = 130°C)	Per device Per diode	I _{FRM}	60 30	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)		I _{FSM}	150	А
Operating Junction Temperature		TJ	-40 to +150	°C
Storage Temperature		T _{stg}	-40 to +150	°C
Voltage Rate of Change (Rated V _R)		dv/dt	10,000	V/μs

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	NTST30120CTG NTSB30120CT-1G	NTSB30120CTG	NTSJ30120CTG	Unit
Maximum Thermal Resistance per Diode Junction-to-Case Junction-to-Ambient	$R_{ heta JC} \ R_{ heta JA}$	2.5 70	1.14 46.6	4.05 105	°C/W

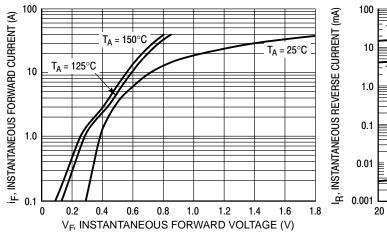
ELECTRICAL CHARACTERISTICS (Per Leg unless otherwise noted)

Rating	Symbol	Тур	Max	Unit
Maximum Instantaneous Forward Voltage (Note 1)	V _F			V
$(I_F = 5 \text{ A}, T_J = 25^{\circ}\text{C})$		0.56	_	
$(I_F = 7.5 \text{ A}, T_J = 25^{\circ}\text{C})$		0.71	_	
$(I_F = 15 \text{ A}, T_J = 25^{\circ}\text{C})$		0.90	1.08	
$(I_F = 5 \text{ A}, T_A = 125^{\circ}\text{C})$		0.50	_	
$(I_F = 7.5 \text{ A}, T_J = 125^{\circ}\text{C})$		0.60	_	
(I _F = 15 A, T _J = 125°C)		0.68	0.76	
Maximum Instantaneous Reverse Current (Note 1)	I _R			
$(V_R = 90 \text{ V}, T_J = 25^{\circ}\text{C})$		16	_	μΑ
$(V_R = 90 \text{ V}, T_J = 125^{\circ}\text{C})$		11	_	mA
(Rated dc Voltage, T _J = 25°C)		_	800	μΑ
(Rated dc Voltage, T _J = 125°C)		25	100	mA

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 = $300 \,\mu s$, Duty Cycle $\leq 2.0\%$

NTST30120CT, NTSJ30120CTG, NTSB30120CT-1G, NTSB30120CTG, NTSB30120CTT4G

TYPICAL CHARACTERISITICS



100

T_A = 150°C

T_A = 125°C

1.0

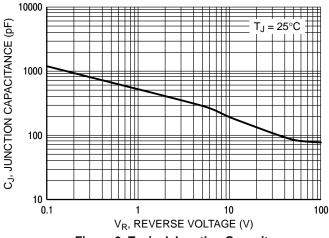
T_A = 25°C

1.0

V_R, INSTANTANEOUS REVERSE VOLTAGE (V)

Figure 1. Typical Instantaneous Forward Characteristics

Figure 2. Typical Reverse Current Characteristics



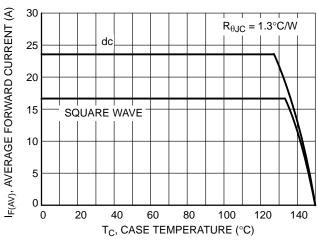
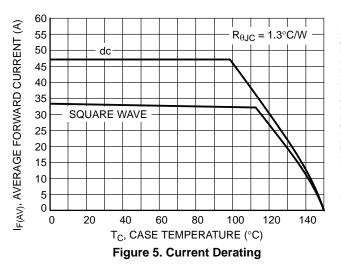


Figure 3. Typical Junction Capacitance

Figure 4. Current Derating per Leg



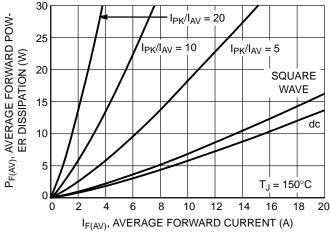


Figure 6. Forward Power Dissipation

NTST30120CT, NTSJ30120CTG, NTSB30120CT-1G, NTSB30120CTG, NTSB30120CTT4G

TYPICAL CHARACTERISITICS

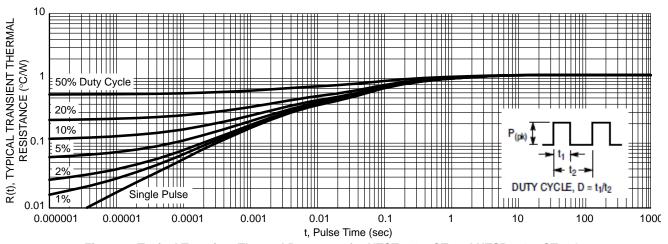


Figure 7. Typical Transient Thermal Response for NTST30120CT and NTSB30120CT-1G

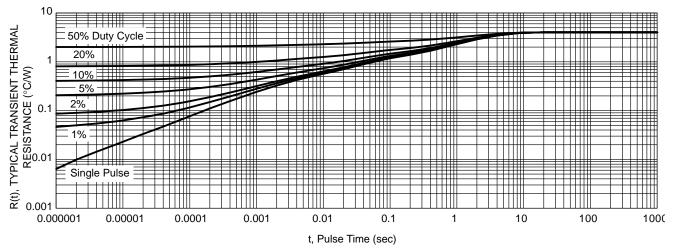


Figure 8. Typical Transient Thermal Response for NTSJ30120CTG

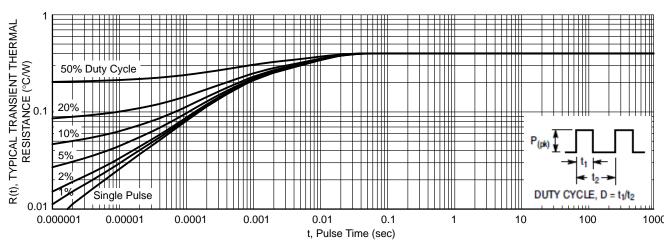


Figure 9. Typical Transient Thermal Response for NTSB30120CTG

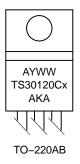
NTST30120CT, NTSJ30120CTG, NTSB30120CT-1G, NTSB30120CTG, NTSB30120CTT4G

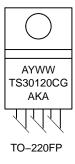
ORDERING INFORMATION

Device	Package	Shipping [†]
NTST30120CTG	TO-220AB (Pb-Free)	50 Units / Rail
NTSJ30120CTG TO-220FP 50 U (Halide-Free)		50 Units / Rail
NTSB30120CT-1G	I ² PAK (Pb-Free)	50 Units / Rail
NTSB30120CTG	D ² PAK (Pb-Free)	50 Units / Rail
NTSB30120CTT4G	D ² PAK (Pb-Free)	800 / Tape & Reel

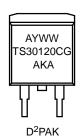
[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MARKING DIAGRAMS









A = Assembly Location

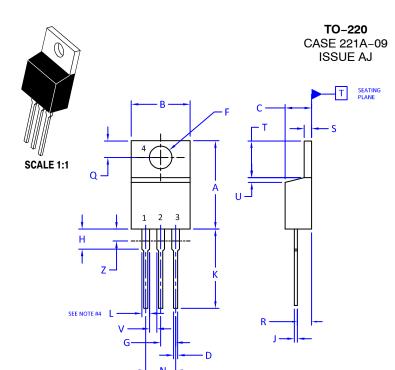
Y = Year

WW = Work Week
AKA = Polarity Designator

x = G or H

G = Pb–Free Package

H = Halide-Free Package



DATE 05 NOV 2019

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.

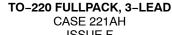
4. MAX WIDTH FOR F102 DEVICE = 1.35MM

	INCHES		MILLIMI	ETERS
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	3.60	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
К	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
Т	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

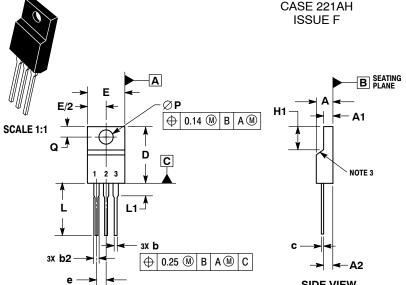
STYLE 1:		STYLE 2:		STYLE 3:		STYLE 4:	
PIN 1.	BASE	PIN 1.	BASE	PIN 1.	CATHODE	PIN 1.	MAIN TERMINAL 1
2.	COLLECTOR	2.	EMITTER	2.	ANODE	2.	MAIN TERMINAL 2
3.	EMITTER	3.	COLLECTOR	3.	GATE	3.	GATE
4.	COLLECTOR	4.	EMITTER	4.	ANODE	4.	MAIN TERMINAL 2
STYLE 5:		STYLE 6:		STYLE 7:		STYLE 8:	
PIN 1.	GATE	PIN 1.	ANODE	PIN 1.	CATHODE	PIN 1.	CATHODE
2.	DRAIN	2.	CATHODE	2.	ANODE	2.	ANODE
3.	SOURCE	3.	ANODE	3.	CATHODE	3.	EXTERNAL TRIP/DELAY
4.	DRAIN	4.	CATHODE	4.	ANODE	4.	ANODE
STYLE 9:		STYLE 10:		STYLE 11:		STYLE 12:	:
PIN 1.	GATE	PIN 1.	GATE	PIN 1.	DRAIN	PIN 1.	MAIN TERMINAL 1
2.	COLLECTOR	2.	SOURCE	2.	SOURCE	2.	MAIN TERMINAL 2
3.	EMITTER	3.	DRAIN	3.	GATE	3.	GATE
4.	COLLECTOR	4.	SOURCE	4.	SOURCE	4.	NOT CONNECTED

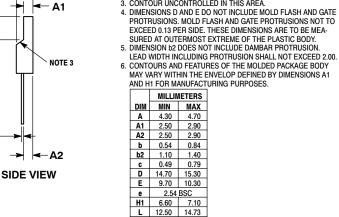
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DATE 30 SEP 2014

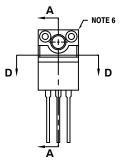


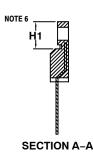


NOTES:



FRONT VIEW





ALTERNATE CONSTRUCTION

GENERIC MARKING DIAGRAM*

4.70

2.90

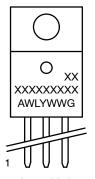
1.40

0.79

7.10

2.80 3.00 3.40

 DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994. 2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR UNCONTROLLED IN THIS AREA.



= Assembly Location

WL = Wafer Lot

= Year

WW = Work Week

G = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot " ■", may or may not be present.

STYLE 1:		STYLE 2:	
PIN 1.	MAIN TERMINAL 1	PIN 1.	CATHODE
2.	MAIN TERMINAL 2	2.	ANODE
3.	GATE	3.	GATE

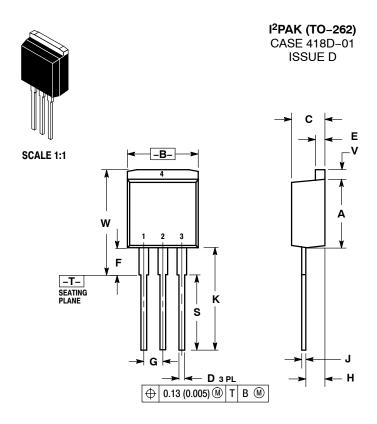
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MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS





DATE 16 OCT 2007

NOTES:

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- 2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIN	IETERS
DIM	MIN	MAX	MIN	MAX
Α	0.335	0.380	8.51	9.65
В	0.380	0.406	9.65	10.31
С	0.160	0.185	4.06	4.70
D	0.026	0.035	0.66	0.89
Ε	0.045	0.055	1.14	1.40
F	0.122	REF	3.10 REF	
G	0.100	BSC	2.54 BSC	
Н	0.094	0.110	2.39	2.79
J	0.013	0.025	0.33	0.64
K	0.500	0.562	12.70	14.27
S	0.390 REF		9.90	REF
٧	0.045	0.070	1.14	1.78
W	0.522	0.551	13.25	14.00

STYLE 1:	STYLE 2:	STYLE 3:	STYLE 4:
PIN 1. BASE	PIN 1. GATE	PIN 1. ANODE	PIN 1. GATE
2. COLLECTOR	2. DRAIN	2. CATHODE	2. COLLECTOR
3. EMITTER	SOURCE	3. ANODE	3. EMITTER
COLLECTOR	4. DRAIN	4. CATHODE	COLLECTOR

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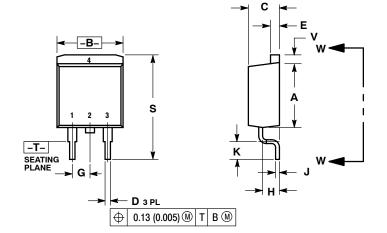
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D²PAK 3 CASE 418B-04 **ISSUE L**

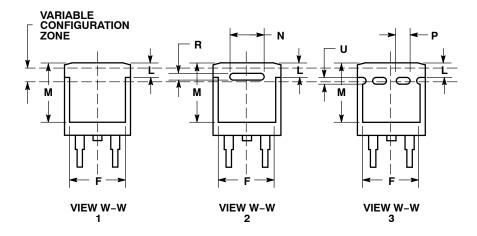
DATE 17 FEB 2015

SCALE 1:1



- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 CONTROLLING DIMENSION: INCH.
- 3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
Α	0.340	0.380	8.64	9.65
В	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.83
D	0.020	0.035	0.51	0.89
Е	0.045	0.055	1.14	1.40
F	0.310	0.350	7.87	8.89
G	0.100 BSC		2.54 BSC	
Н	0.080	0.110	2.03	2.79
7	0.018	0.025	0.46	0.64
K	0.090	0.110	2.29	2.79
L	0.052	0.072	1.32	1.83
М	0.280	0.320	7.11	8.13
N	0.197 REF		5.00 REF	
Р	0.079 REF		2.00 REF	
R	0.039 REF		0.99 REF	
S	0.575	0.625	14.60	15.88
٧	0.045	0.055	1.14	1.40



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

3. SOURCE 4. DRAIN

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

STYLE 4:

PIN 1. GATE 2. COLLECTOR 3. EMITTER 4. COLLECTOR

STYLE 5: PIN 1. CATHODE 2. ANODE 3. CATHODE 4. ANODE

STYLE 6: PIN 1. NO CONNECT 2. CATHODE 3. ANODE

4. CATHODE

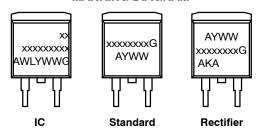
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DATE 17 FEB 2015

GENERIC MARKING DIAGRAM*



xx = Specific Device Code A = Assembly Location

 WL
 = Wafer Lot

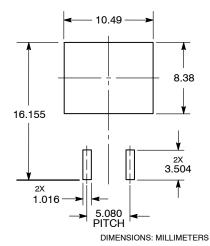
 Y
 = Year

 WW
 = Work Week

 G
 = Pb-Free Package

 AKA
 = Polarity Indicator

SOLDERING FOOTPRINT*



*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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