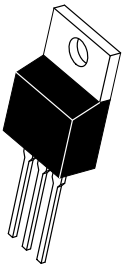
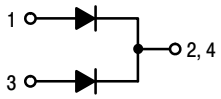
Switch-mode Power Rectifier

BYW51-200

ULTRAFAST RECTIFIER
16 AMPERES, 200 VOLTS
t_{rr} = 35 ns



TO−220
CASE 221A
PLASTIC



Features and Benefits

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capacity
- 175°C Operating Junction Temperature
- 16 A Total (8 A Per Diode Leg)
- These Devices are Pb−Free and are RoHS Compliant*

Applications

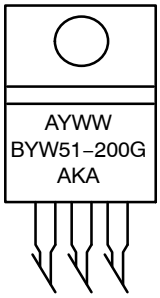
- Power Supply − Output Rectification
- Power Management
- Instrumentation

Mechanical Characteristics

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V−0 @ 0.125 in
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- ESD Rating: Human Body Model 3B
  Machine Model C

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

MARKING DIAGRAM



A	= Assembly Location
Y	= Year
WW	= Work Week
BYW51−200	= Device Code
G	= Pb−Free Package
AKA	= Diode Polarity

ORDERING INFORMATION

Device	Package	Shipping
BYW51−200G	TO−220 (Pb−Free)	50 Units/Rail

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MAXIMUM RATINGS

Symbol	Rating	Value	Unit
V_{RRM} V_{RWM} V_R	Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	200	V
$I_{F(AV)}$	Average Rectified Forward Current T_C = 156°C Per Leg Total Device	 8.0 16	A
I_{FM}	Peak Rectified Forward Current (Square Wave, 20 kHz), T_C = 153°C − Per Diode Leg	16	A
I_{FSM}	Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	100	A
T_J, T_{stg}	Operating Junction Temperature and Storage Temperature	−65 to +175	°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

Symbol	Characteristic	Conditions	Value	Unit
$R_{\theta JC}$	Maximum Thermal Resistance, Junction−to−Case	Min. Pad	3.0	°C/W
$R_{\theta JA}$	Maximum Thermal Resistance, Junction−to−Ambient	Min. Pad	60.0	

ELECTRICAL CHARACTERISTICS

Symbol	Characteristic	Min	Typical	Max	Unit
v_F	Instantaneous Forward Voltage (Note 1) (i_F = 8.0 A, T_j = 100°C) (i_F = 8.0 A, T_j = 25°C)	 − −	 0.8 0.89	 0.89 0.97	V
i_R	Maximum Instantaneous Reverse Current (Note 1) (Rated dc Voltage, T_j = 100°C) (Rated dc Voltage, T_j = 25°C)	 − −	 21 3.8	 1000 10	μA
t_{rr}	Maximum Reverse Recovery Time (I_F = 1.0 A, di/dt = 50 A/s) (I_F = 0.5 A, I_R = 1.0 A, I_{REC} = 0.25 A)	 −	 −	 35 25	ns

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 s, Duty Cycle ≤ 2.0%.

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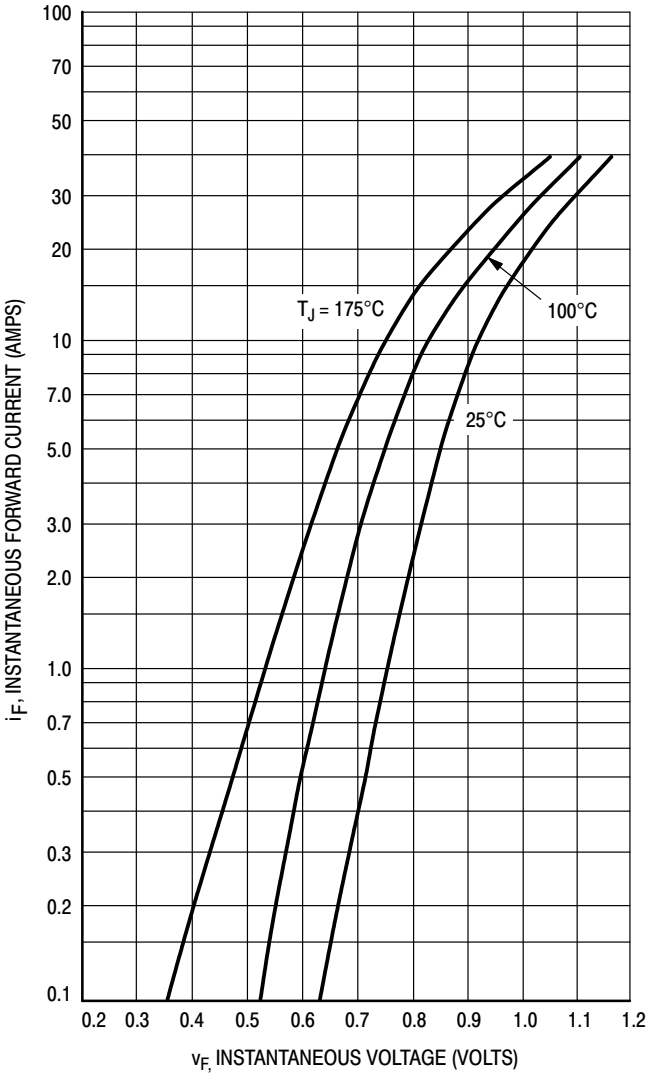

Figure 1. Typical Forward Voltage, Per Leg

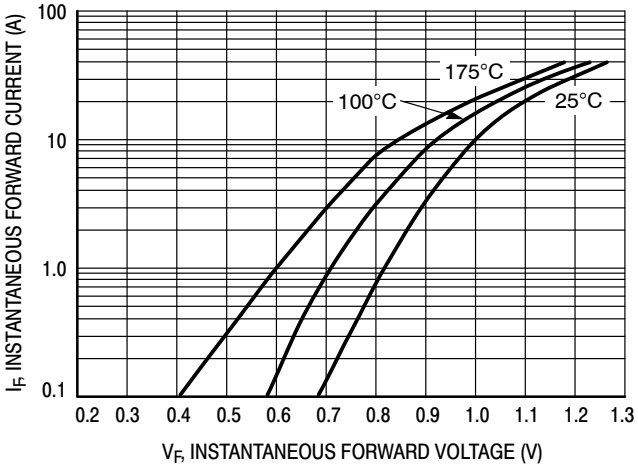

Figure 2. Maximum Forward Voltage

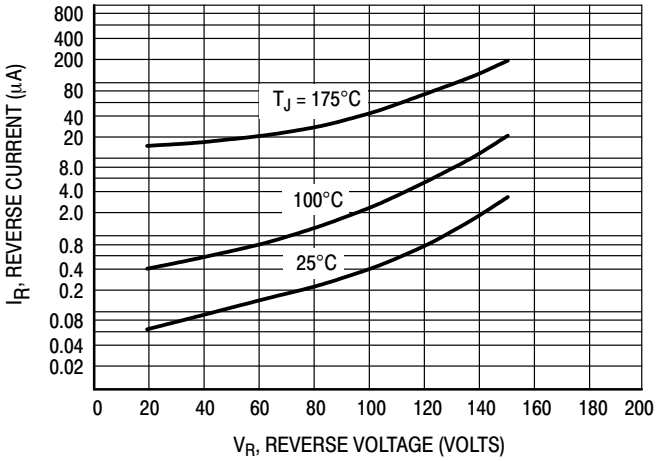

Figure 3. Typical Reverse Current, Per Leg*

* The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if V_R is sufficiently below rated V_R.

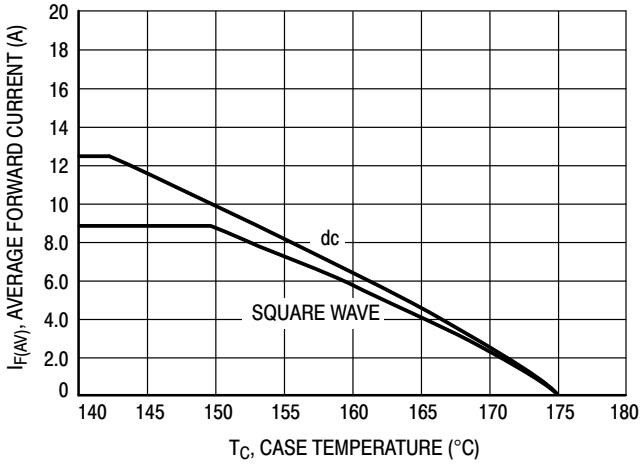

Figure 4. Current Derating, Case, Per Leg

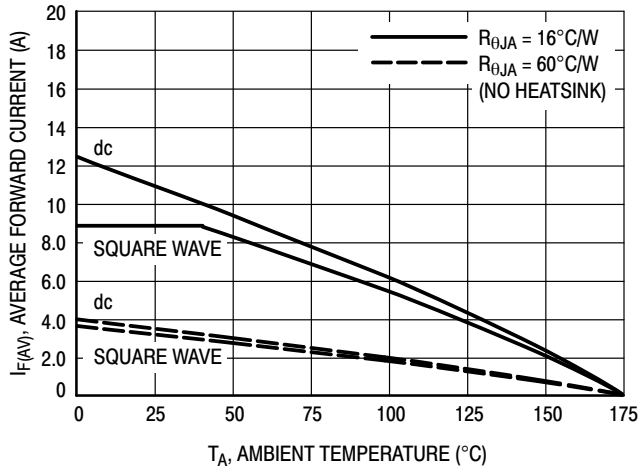

Figure 5. Current Derating, Ambient, Per Leg

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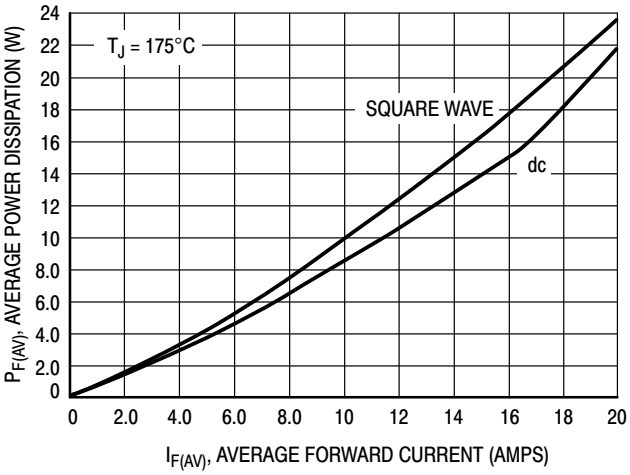

Figure 6. Power Dissipation, Per Leg

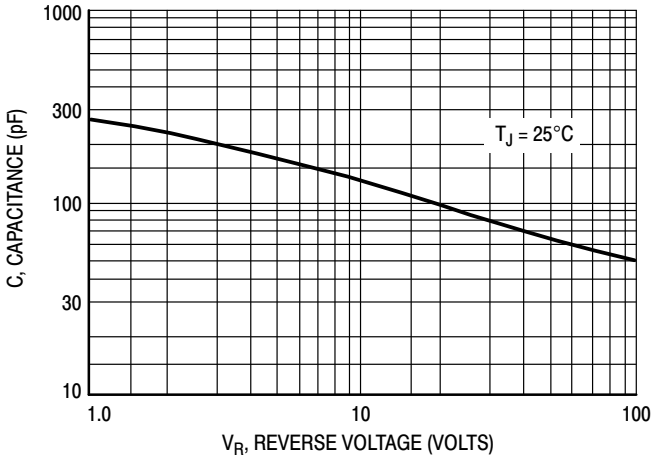

Figure 7. Typical Capacitance, Per Leg

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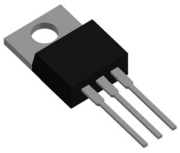
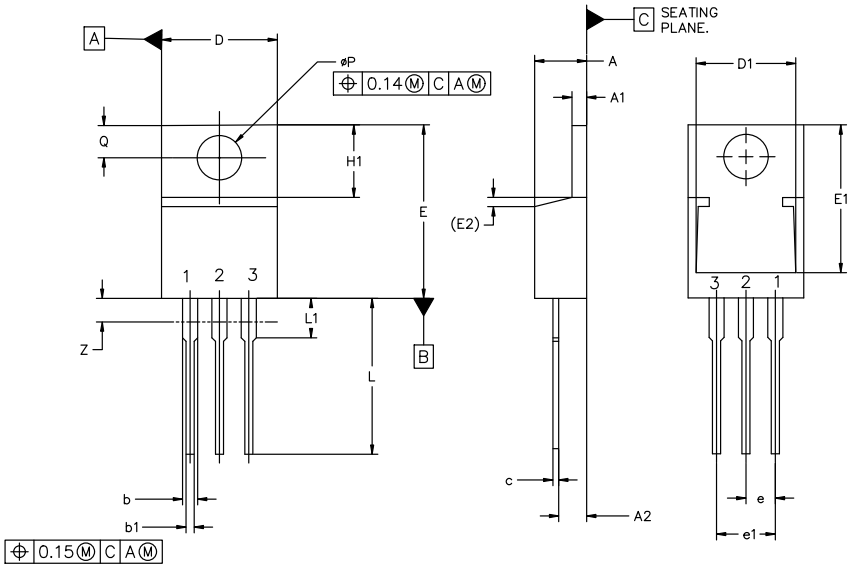


TO−220−3 10.10x15.12x4.45, 2.54P
CASE 221A
ISSUE AL

DATE 05 FEB 2025



MILLIMETERS			
DIM	MIN	NOM	MAX
A	4.07	4.45	4.83
A1	1.15	1.28	1.41
A2	2.04	2.42	2.79
b	1.15	1.34	1.52
b1	0.64	0.80	0.96
c	0.36	0.49	0.61
D	9.66	10.10	10.53
D1	8.43	8.63	8.83
E	14.48	15.12	15.75
E1	12.58	12.78	12.98
E2	1.27 REF		

MILLIMETERS			
DIM	MIN	NOM	MAX
e	2.42	2.54	2.66
e1	4.83	5.08	5.33
H1	5.97	6.22	6.47
L	12.70	13.49	14.27
L1	2.80	3.45	4.10
Q	2.54	2.79	3.04
øP	3.60	3.85	4.09
Z	–.––	–.––	3.48

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

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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