Switch-mode Power Rectifier 150 V, 20 A

MBRF20H150CTG, MBR20H150CTG

ON Semiconductor®

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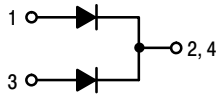
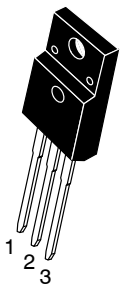
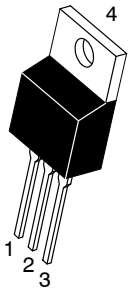
SCHOTTKY BARRIER RECTIFIER 20 AMPERES, 150 VOLTS





TO−220 FULLPAK™
CASE 221D



TO−220
CASE 221A
STYLE 6

Features and Benefits

- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capability
- 20 A Total (10 A Per Diode Leg)
- Guard−Ring for Stress Protection
- These Devices are Pb−Free and are RoHS Compliant

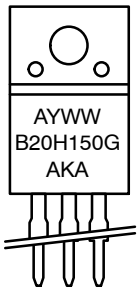
Applications

- Power Supply − Output Rectification
- Power Management
- Instrumentation

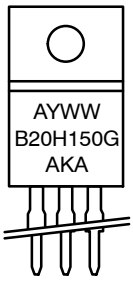
Mechanical Characteristics:

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V−0 @ 0.125 in
- Weight (Approximately): 1.9 Grams (TO−220 & TO−220FP)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds

MARKING DIAGRAMS



TO−220



TO−220FP

A	= Assembly Location
Y	= Year
WW	= Work Week
B20H150	= Device Code
G	= Pb−Free Device
AKA	= Polarity Designator

ORDERING INFORMATION

See detailed ordering and shipping information on page 1 of this data sheet.

MAXIMUM RATINGS (Per Diode Leg)

Rating		Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage		V_{RRM} V_{RWM} V_R	150	V
Average Rectified Forward Current (Rated V_R) T_C = 134°C	(Per Leg) (Per Device)	$I_{F(AV)}$	10 20	A
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)		I_{FSM}	180	A
Operating Junction Temperature (Note 1)		T_J	−20 to +150	°C
Storage Temperature		T_{stg}	−65 to +150	°C
Voltage Rate of Change (Rated V_R)		dv/dt	10,000	V/μs
ESD Ratings:	Machine Model = C Human Body Model = 3B		> 400 > 8000	V

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.

1. The heat generated must be less than the thermal conductivity from Junction−to−Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.

THERMAL CHARACTERISTICS

Rating		Symbol	Value	Unit
Maximum Thermal Resistance (MBR20H150CTG) (MBRF20H150CTG)	 − Junction−to−Case − Junction−to−Ambient − Junction−to−Case	 $R_{\theta JC}$ $R_{\theta JA}$ $R_{\theta JC}$	 2.0 45 2.5	°C/W

ELECTRICAL CHARACTERISTICS (Per Diode Leg)

Rating	Symbol	Typ	Max	Unit
Maximum Instantaneous Forward Voltage (Note 2) (I_F = 5 A, T_C = 25°C) (I_F = 5 A, T_C = 125°C) (I_F = 10 A, T_C = 25°C) (I_F = 10 A, T_C = 125°C)	v_F	 0.72 0.57 0.87 0.65	 0.60 0.68	V
Maximum Instantaneous Reverse Current (Note 2) (Rated DC Voltage, T_C = 25°C) (Rated DC Voltage, T_C = 125°C)	i_R		 50 30	 μA 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.

2. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

ORDERING INFORMATION

Device Order Number	Package Type	Shipping
MBRF20H150CTG	TO−220FP (Pb−Free)	50 Units / Rail
MBR20H150CTG	TO−220 (Pb−Free)	50 Units / Rail

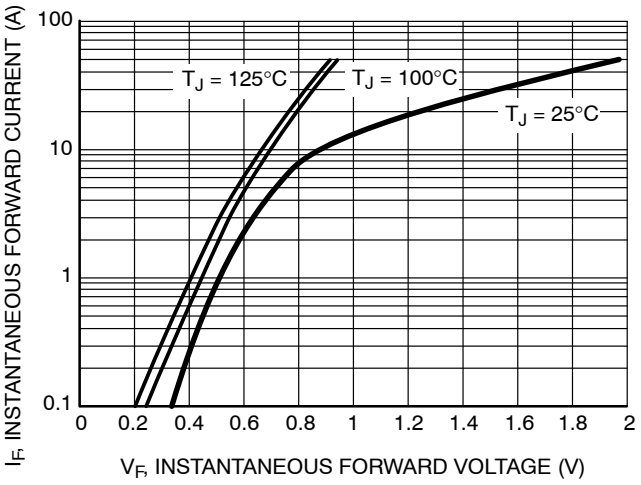


Figure 1. Typical Forward Voltage

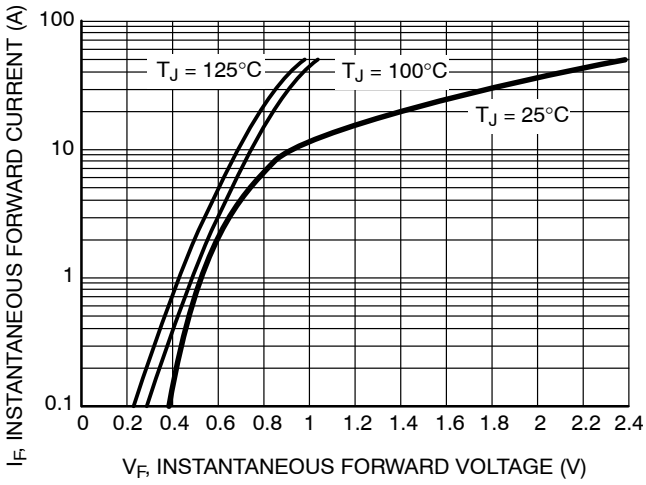


Figure 2. Maximum Forward Voltage

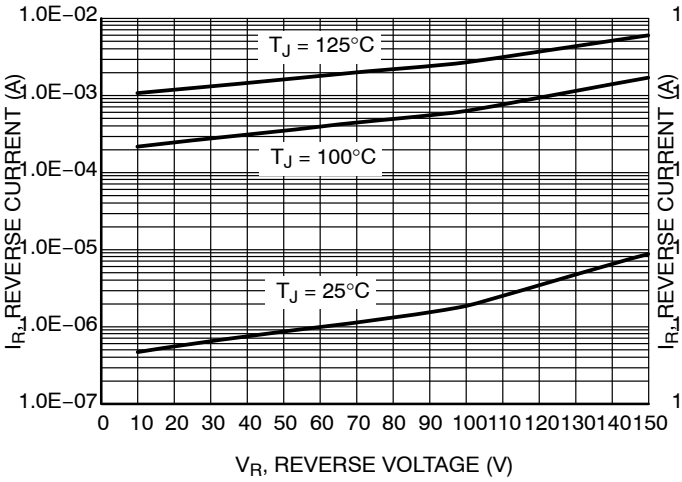


Figure 3. Typical Reverse Current

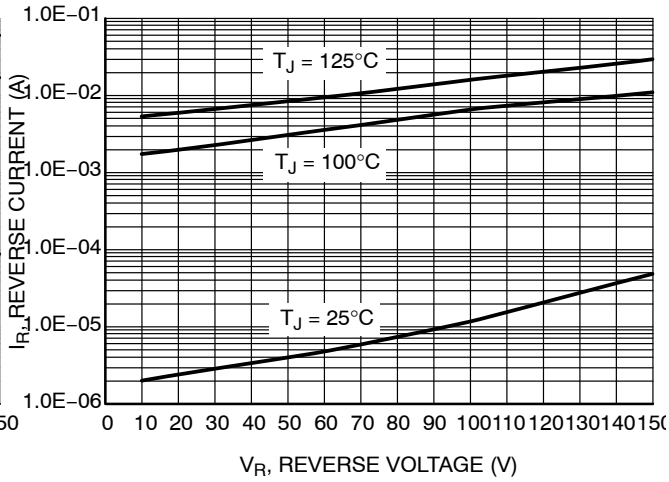


Figure 4. Maximum Reverse Current

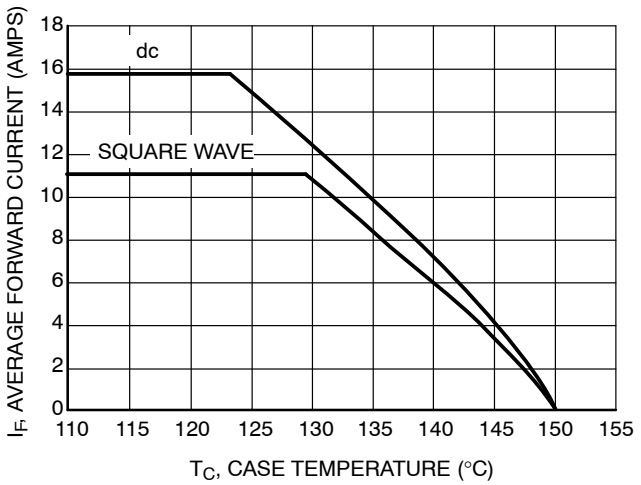


Figure 5. Current Derating

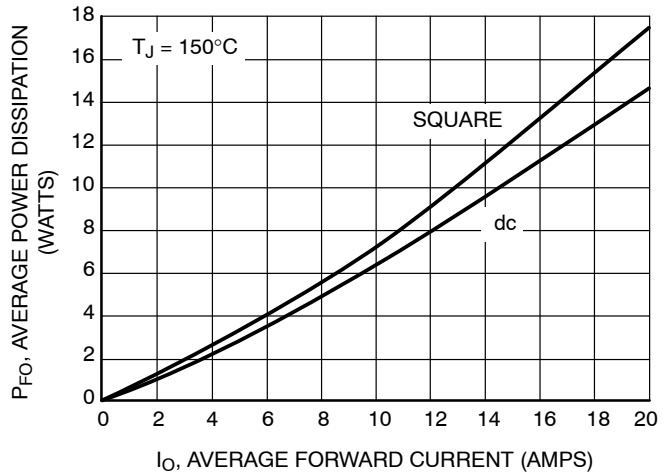


Figure 6. Forward Power Dissipation

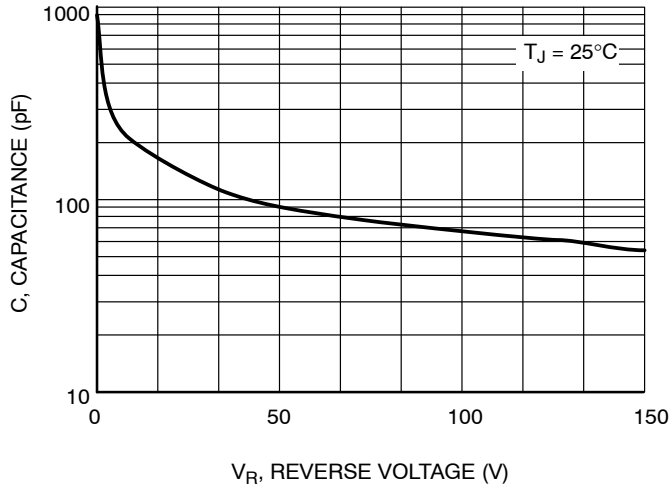


Figure 7. Capacitance

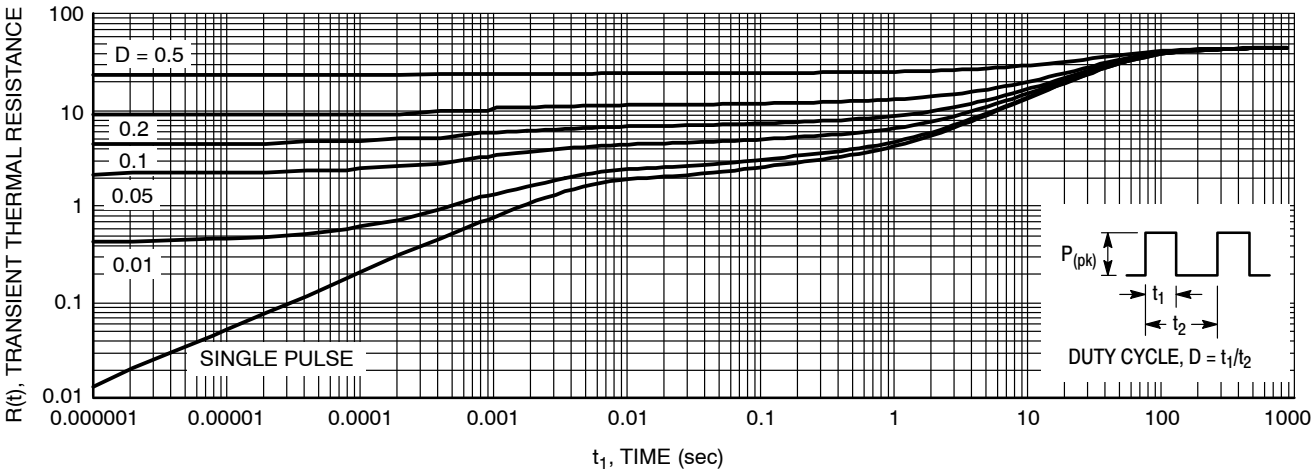


Figure 8. Thermal Response Junction−to−Ambient for MBR20H150CTG

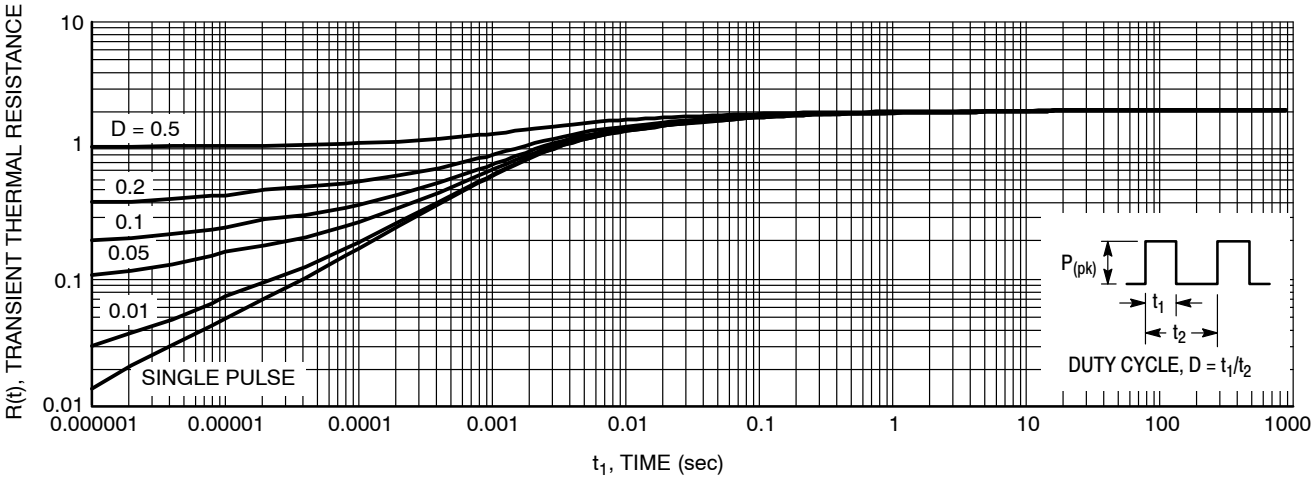


Figure 9. Thermal Response Junction−to−Case for MBR20H150CTG

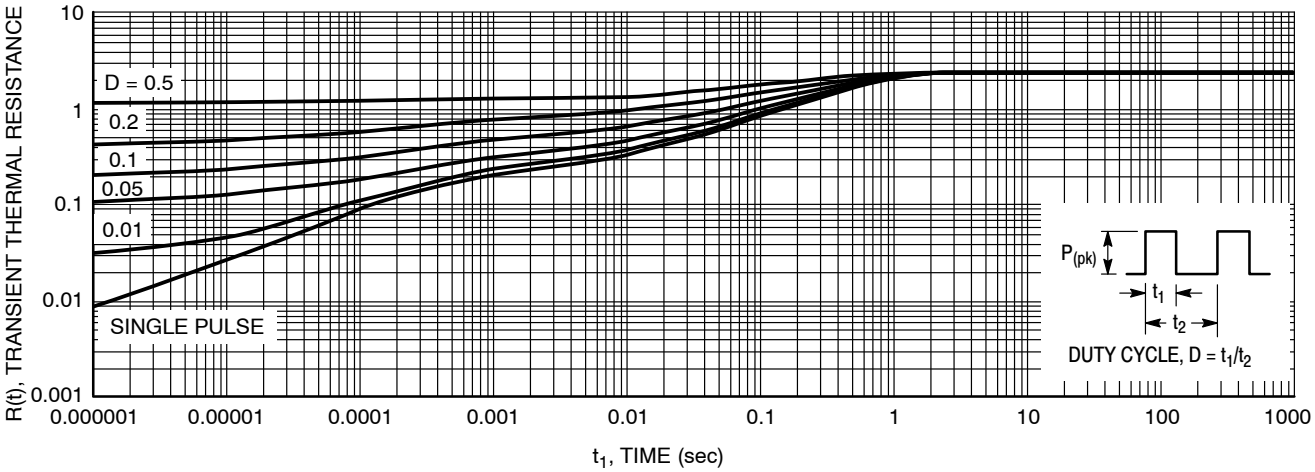


Figure 10. Thermal Response Junction−to−Case for MBRF20H150CTG

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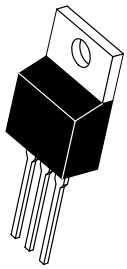
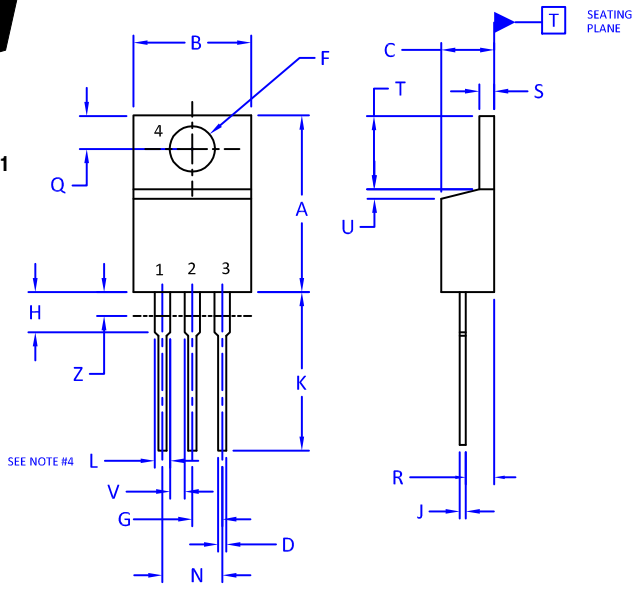
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

TO−220
CASE 221A
ISSUE AK

DATE 13 JAN 2022



SCALE 1:1



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		MILLIMETERS	
DIM	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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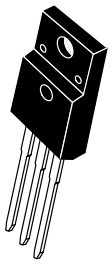
DESCRIPTION:	TO−220	PAGE 1 OF 1

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

ON Semiconductor®

TO−220 FULLPAK
CASE 221D−03
ISSUE K

DATE 27 FEB 2009



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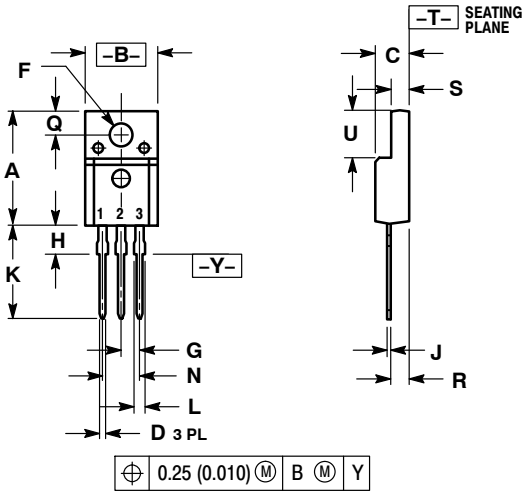


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH
3. 221D−01 THRU 221D−02 OBSOLETE, NEW STANDARD 221D−03.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.617	0.635	15.67	16.12
B	0.392	0.419	9.96	10.63
C	0.177	0.193	4.50	4.90
D	0.024	0.039	0.60	1.00
F	0.116	0.129	2.95	3.28
G	0.100 BSC		2.54 BSC	
H	0.118	0.135	3.00	3.43
J	0.018	0.025	0.45	0.63
K	0.503	0.541	12.78	13.73
L	0.048	0.058	1.23	1.47
N	0.200 BSC		5.08 BSC	
Q	0.122	0.138	3.10	3.50
R	0.099	0.117	2.51	2.96
S	0.092	0.113	2.34	2.87
U	0.239	0.271	6.06	6.88

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

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

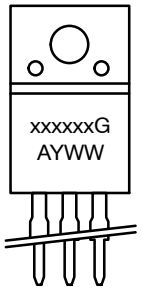
STYLE 3:
PIN 1. ANODE
2. CATHODE
3. ANODE

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

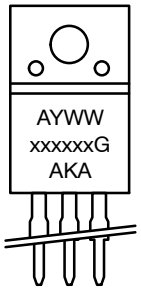
STYLE 5:
PIN 1. CATHODE
2. ANODE
3. GATE

STYLE 6:
PIN 1. MT 1
2. MT 2
3. GATE

MARKING DIAGRAMS



Bipolar



Rectifier

xxxxxx	= Specific Device Code
G	= Pb−Free Package
A	= Assembly Location
Y	= Year
WW	= Work Week

A	= Assembly Location
Y	= Year
WW	= Work Week
xxxxxx	= Device Code
G	= Pb−Free Package
AKA	= Polarity Designator

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PUBLICATION ORDERING INFORMATION

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For additional information, please contact your local Sales Representative

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