

## 20A, 35V - 200V Schottky Barrier Rectifier

### FEATURES

- AEC-Q101 qualified available
- Low power loss, high efficiency
- Guard ring for overvoltage protection
- High surge current capability
- UL Recognized File # E-326243
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

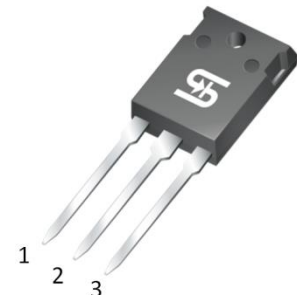
### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Monitor
- DC to DC converters
- TV

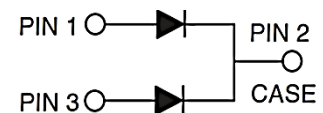
### MECHANICAL DATA

- Case: TO-247AD (TO-3P)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Mounting torque: 1.13 N·m maximum
- Polarity: As marked
- Weight: 6.10g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$I_F$	20	A
$V_{RRM}$	35 - 200	V
$I_{FSM}$	150	A
$T_{JMAX}$	150	°C
Package	TO-247AD (TO-3P)	
Configuration	Dual dies	



TO-247AD (TO-3P)



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)										
PARAMETER	SYMBOL	MBR 2035 PT	MBR 2045 PT	MBR 2050 PT	MBR 2060 PT	MBR 2090 PT	MBR 20100 PT	MBR 20150 PT	MBR 20200 PT	UNIT
Marking code on the device		MBR 2035 PT	MBR 2045 PT	MBR 2050 PT	MBR 2060 PT	MBR 2090 PT	MBR 20100 PT	MBR 20150 PT	MBR 20200 PT	
Repetitive peak reverse voltage	$V_{RRM}$	35	45	50	60	90	100	150	200	V
Reverse voltage, total rms value	$V_{R(RMS)}$	24	31	25	42	63	70	105	140	V
Forward current	$I_F$	20								A
Surge peak forward current 8.3ms single half sine wave superimposed on rated load	$I_{FSM}$	150								A
Peak repetitive reverse surge current <sup>(1)</sup>	$I_{RRM}$	1.0			0.5					A
Peak repetitive forward current (Rated $V_R$ , Square wave, 20KHz)	$I_{FRM}$	20								A

#### Notes:

1.  $t_p = 2.0\mu\text{s}$ , 1.0KHz

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)										
PARAMETER	SYMBOL	MBR 2035 PT	MBR 2045 PT	MBR 2050 PT	MBR 2060 PT	MBR 2090 PT	MBR 20100 PT	MBR 20150 PT	MBR 20200 PT	UNIT
Critical rate of rise of off-state voltage	dV/dt	10,000								V/ $\mu\text{s}$
Junction temperature	$T_J$	-55 to +150								$^\circ\text{C}$
Storage temperature	$T_{\text{STG}}$	-55 to +150								$^\circ\text{C}$

<b>THERMAL PERFORMANCE</b>			
PARAMETER	SYMBOL	TYP	UNIT
Junction-to-case thermal resistance	$R_{\theta\text{JC}}$	1	$^\circ\text{C/W}$

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER		CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage per diode <sup>(1)</sup>	MBR2035PT MBR2045PT	$I_F = 10\text{A}, T_J = 25^\circ\text{C}$	$V_F$	-	-	V
	MBR2050PT MBR2060PT			-	0.80	V
	MBR2090PT MBR20100PT			-	0.85	V
	MBR20150PT MBR20200PT			-	0.95	V
	MBR2035PT MBR2045PT			$I_F = 20\text{A}, T_J = 25^\circ\text{C}$	-	0.84
	MBR2050PT MBR2060PT	-			0.95	V
	MBR2090PT MBR20100PT	-			0.95	V
	MBR20150PT MBR20200PT	-			1.02	V
	MBR2035PT MBR2045PT	$I_F = 10\text{A}, T_J = 125^\circ\text{C}$			-	0.57
	MBR2050PT MBR2060PT			-	0.70	V
	MBR2090PT MBR20100PT			-	0.75	V
	MBR20150PT MBR20200PT			-	0.92	V
	MBR2035PT MBR2045PT			$I_F = 20\text{A}, T_J = 125^\circ\text{C}$	-	0.72
	MBR2050PT MBR2060PT	-			0.85	V
	MBR2090PT MBR20100PT	-			0.85	V
	MBR20150PT MBR20200PT	-			0.98	V

**Notes:**

1. Pulse test with PW = 0.3ms

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
<b>PARAMETER</b>		<b>CONDITIONS</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>MAX</b>	<b>UNIT</b>
Reverse current @ rated $V_R$ per diode <sup>(2)</sup>	MBR2035PT MBR2045PT MBR2050PT MBR2060PT MBR2090PT MBR20100PT MBR20150PT MBR20200PT	$T_J = 25^\circ\text{C}$	$I_R$	-	100	$\mu\text{A}$
	MBR2035PT MBR2045PT	$T_J = 125^\circ\text{C}$		-	15	mA
	MBR2050PT MBR2060PT			-	10	mA
	MBR2090PT MBR20100PT MBR20150PT MBR20200PT			-	5	mA

**Notes:**

- Pulse test with  $PW = 30\text{ms}$

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE</b> <sup>(1)(2)</sup>	<b>PACKAGE</b>	<b>PACKING</b>
MBR20xPT	TO-247AD (TO-3P)	30 / Tube
MBR20xPTH	TO-247AD (TO-3P)	30 / Tube

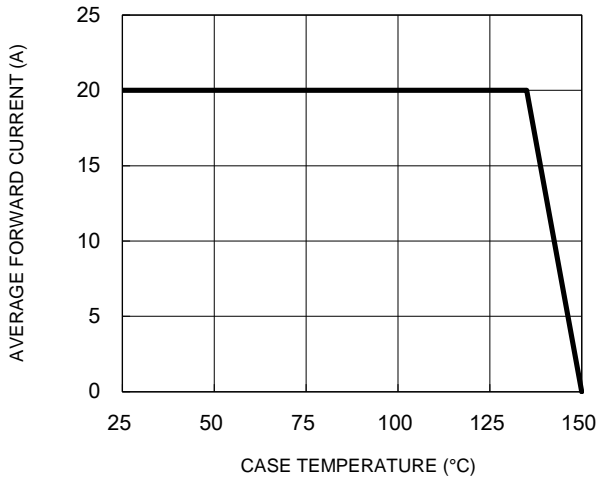
**Notes:**

- "x" defines voltage from 35V(MBR2035PT) to 200V(MBR20200PT)
- "H" means AEC-Q101 qualified

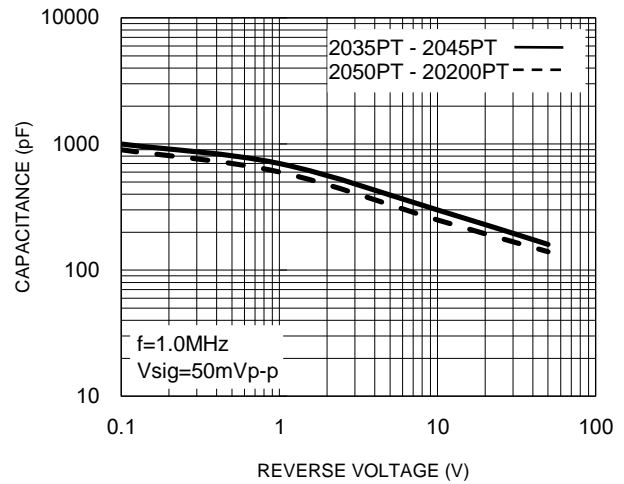
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

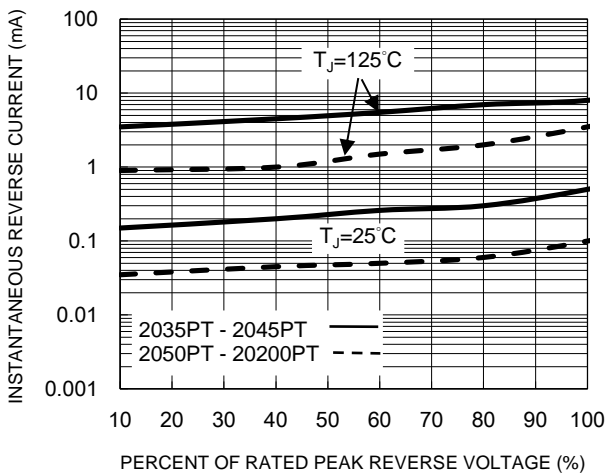
**Fig.1 Forward Current Derating Curve**



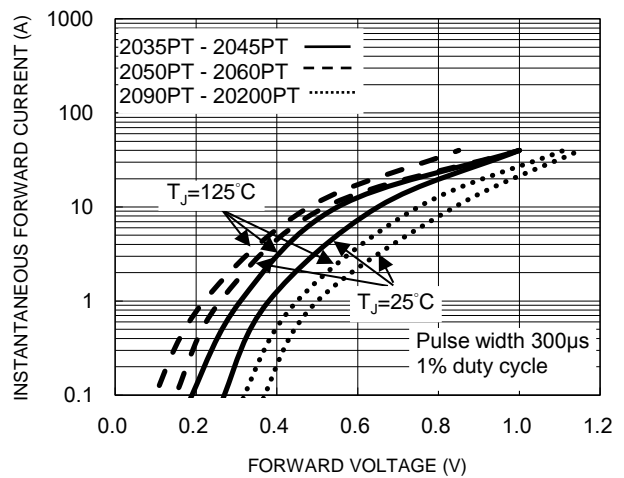
**Fig.2 Typical Junction Capacitance**



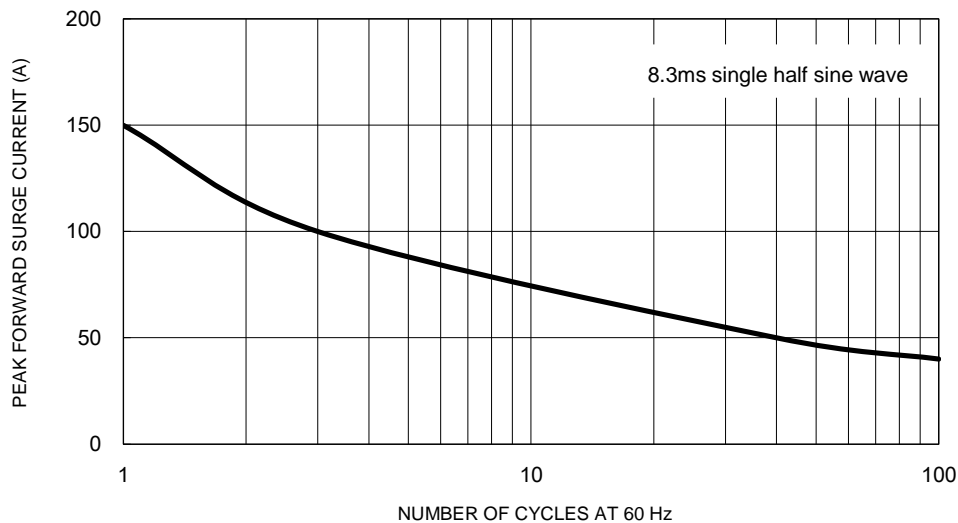
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



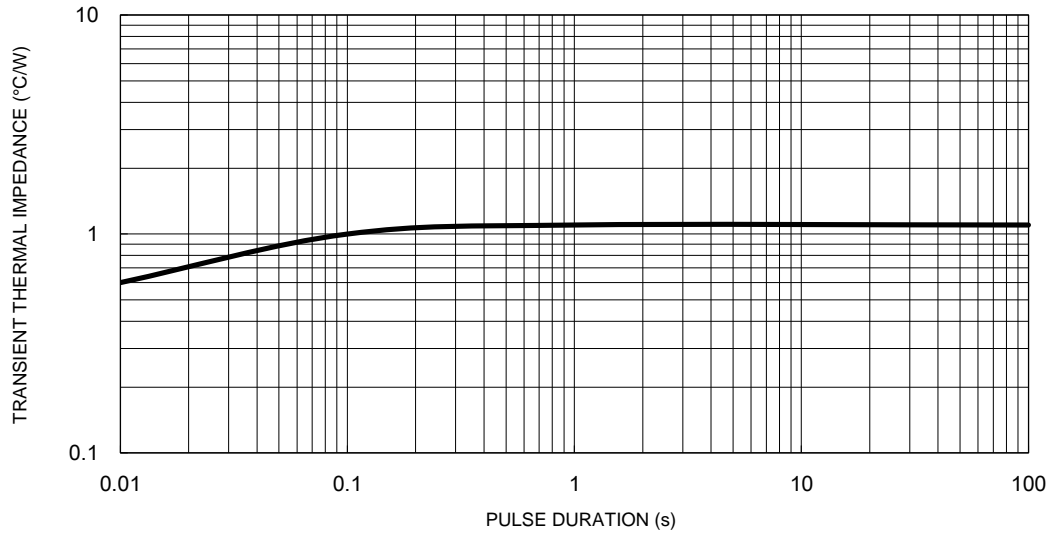
**Fig.5 Maximum Non-Repetitive Forward Surge Current**



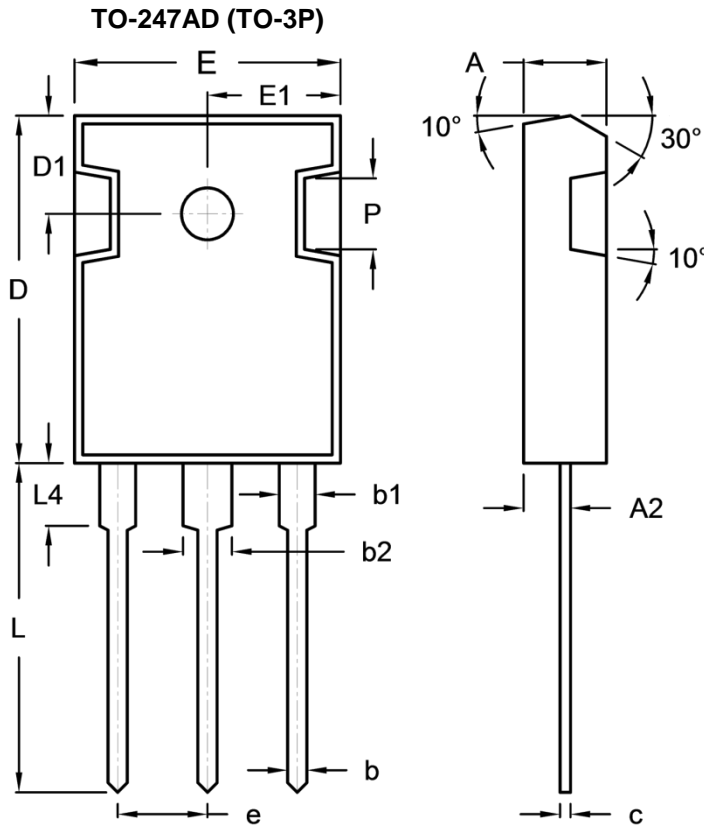
**CHARACTERISTICS CURVES**

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**Fig.6 Typical Transient Thermal Impedance**



**PACKAGE OUTLINE DIMENSIONS**



DIM	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	4.90	5.16	0.193	0.203
A2	2.70	3.00	0.106	0.118
b	1.12	1.22	0.044	0.048
b1	1.93	2.18	0.076	0.086
b2	2.97	3.22	0.117	0.127
c	0.51	0.76	0.020	0.030
D	20.80	21.30	0.819	0.839
D1	5.70	6.20	0.224	0.244
E	15.90	16.40	0.626	0.646
E1	7.90	8.20	0.311	0.323
e	5.20	5.70	0.205	0.224
H	2.90	3.40	0.114	0.134
L	19.70	20.20	0.776	0.795
L4	3.50	4.10	0.138	0.161
P	-	4.30	-	0.169

**MARKING DIAGRAM**



- P/N = Marking Code
- G = Green Compound
- YWW = Date Code
- F = Factory Code