

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

### FEATURES

- Low power loss, high efficiency
- Guard ring for overvoltage protection
- High surge current capability
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

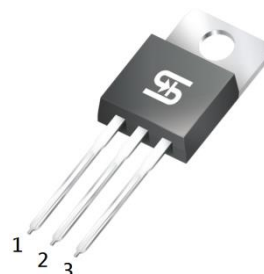
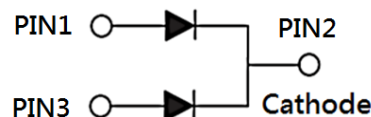
### APPLICATIONS

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

### MECHANICAL DATA

- Case: TO-220AB
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Mounting torque: 0.56 N·m maximum
- Meet JESD 201 class 1A whisker test
- Polarity: As marked
- Weight: 1.88g (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-220AB	
Configuration	Dual dies	


**TO-220AB**


ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)										
PARAMETER	SYMBOL	MBR 2035 CT-Y	MBR 2045 CT-Y	MBR 2050 CT-Y	MBR 2060 CT-Y	MBR 2090 CT-Y	MBR 20100 CT-Y	MBR 20150 CT-Y	MBR 20200 CT-Y	UNIT
Marking code on the device		MBR 2035 CT	MBR 2045 CT	MBR 2050 CT	MBR 2060 CT	MBR 2090 CT	MBR 20100 CT	MBR 20150 CT	MBR 20200 CT	
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	35	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			0.5					A
Peak repetitive forward current (Rated $V_R$ , Square wave, 20KHz)	$I_{FRM}$	20								A

ABSOLUTE MAXIMUM RATINGS (T <sub>A</sub> = 25°C unless otherwise noted)									
PARAMETER	SYMBOL	MBR 2035 CT-Y	MBR 2045 CT-Y	MBR 2050 CT-Y	MBR 2060 CT-Y	MBR 2090 CT-Y	MBR 20100 CT-Y	MBR 20150 CT-Y	UNIT
Critical rate of rise of off-state voltage	dv/dt	10,000							V/μs
Junction temperature	T <sub>J</sub>	-55 to +150							°C
Storage temperature	T <sub>STG</sub>	-55 to +150							°C

**Notes:**

1. t<sub>p</sub> = 2.0μs, 1.0KHz

THERMAL PERFORMANCE				
PARAMETER		SYMBOL	TYP	UNIT
Junction-to-case thermal resistance	MBR2035CT-Y MBR2045CT-Y MBR2050CT-Y MBR2060CT-Y	R <sub>θJC</sub>	1	°C/W
Junction-to-case thermal resistance	MBR2090CT-Y MBR20100CT-Y MBR20150CT-Y MBR20200CT-Y	R <sub>θJC</sub>	2	°C/W

ELECTRICAL SPECIFICATIONS (T <sub>A</sub> = 25°C unless otherwise noted)						
PARAMETER		CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage per diode <sup>(1)</sup>	MBR2035CT-Y MBR2045CT-Y	I <sub>F</sub> = 10A, T <sub>J</sub> = 25°C	V <sub>F</sub>	-	-	V
	MBR2050CT-Y MBR2060CT-Y			-	0.80	V
	MBR2090CT-Y MBR20100CT-Y			-	0.85	V
	MBR20150CT-Y MBR20200CT-Y			-	0.99	V
	MBR2035CT-Y MBR2045CT-Y			-	0.84	V
	MBR2050CT-Y MBR2060CT-Y MBR2090CT-Y MBR20100CT-Y	I <sub>F</sub> = 20A, T <sub>J</sub> = 25°C		-	0.95	V
	MBR20150CT-Y MBR20200CT-Y	-		1.23	V	
	MBR2035CT-Y MBR2045CT-Y	I <sub>F</sub> = 10A, T <sub>J</sub> = 125°C		-	0.57	V
	MBR2050CT-Y MBR2060CT-Y			-	0.70	V
	MBR2090CT-Y MBR20100CT-Y			-	0.75	V
	MBR20150CT-Y MBR20200CT-Y			-	0.87	V
	MBR2035CT-Y MBR2045CT-Y			I <sub>F</sub> = 20A, T <sub>J</sub> = 125°C	-	0.72
	MBR2050CT-Y MBR2060CT-Y MBR2090CT-Y MBR20100CT-Y	-			0.85	V
	MBR20150CT-Y MBR20200CT-Y	-			1.10	V

<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>	MBR2035CT-Y MBR2045CT-Y MBR2050CT-Y MBR2060CT-Y MBR2090CT-Y MBR20100CT-Y MBR20150CT-Y MBR20200CT-Y	$T_J = 25^\circ\text{C}$	$I_R$	-	100	$\mu\text{A}$
	MBR2035CT-Y MBR2045CT-Y	$T_J = 125^\circ\text{C}$		-	15	mA
	MBR2050CT-Y MBR2060CT-Y			-	10	mA
	MBR2090CT-Y MBR20100CT-Y MBR20150CT-Y MBR20200CT-Y			-	5	mA
				-	0.15	mA

**Notes:**

1. Pulse test with  $PW = 0.3\text{ms}$
2. Pulse test with  $PW = 30\text{ms}$

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE<sup>(1)</sup></b>	<b>PACKAGE</b>	<b>PACKING</b>
MBR20xCT-Y	TO-220AB	50 / Tube

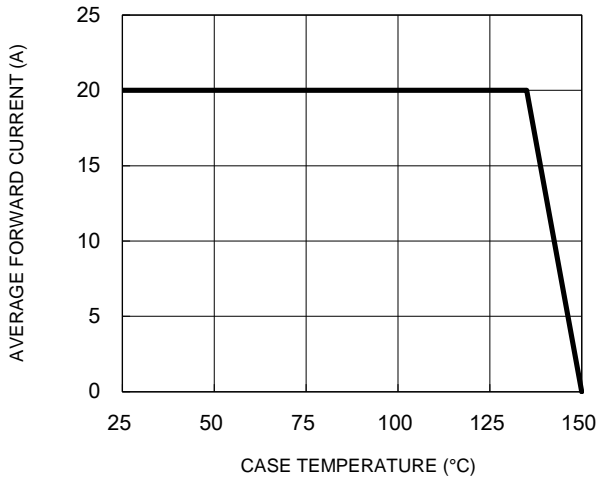
**Notes:**

1. "x" defines voltage from 35V(MBR2035CT-Y) to 200V(MBR20200CT-Y)

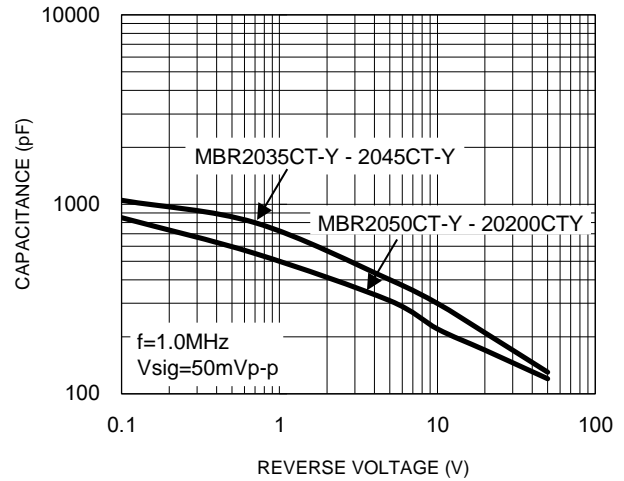
**CHARACTERISTICS CURVES**

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

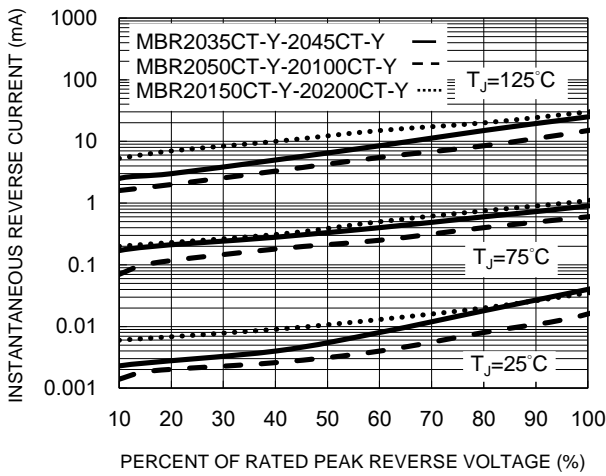
**Fig.1 Forward Current Derating Curve**



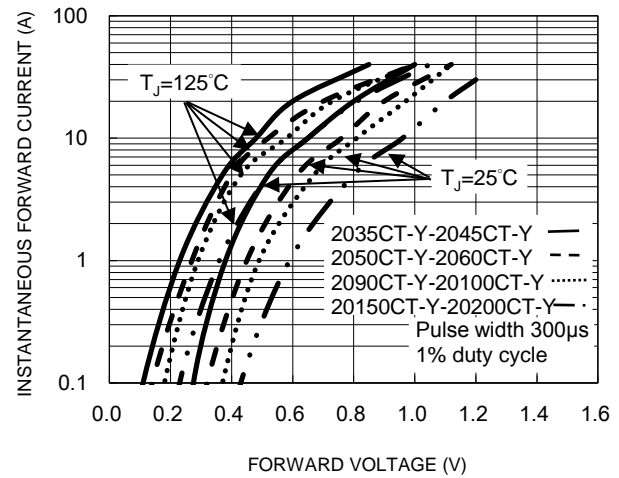
**Fig.2 Typical Junction Capacitance**



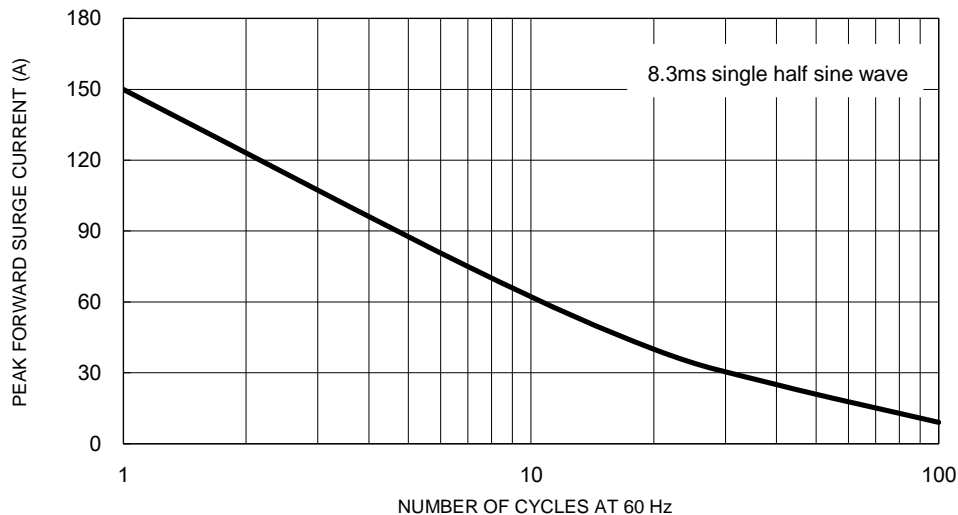
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



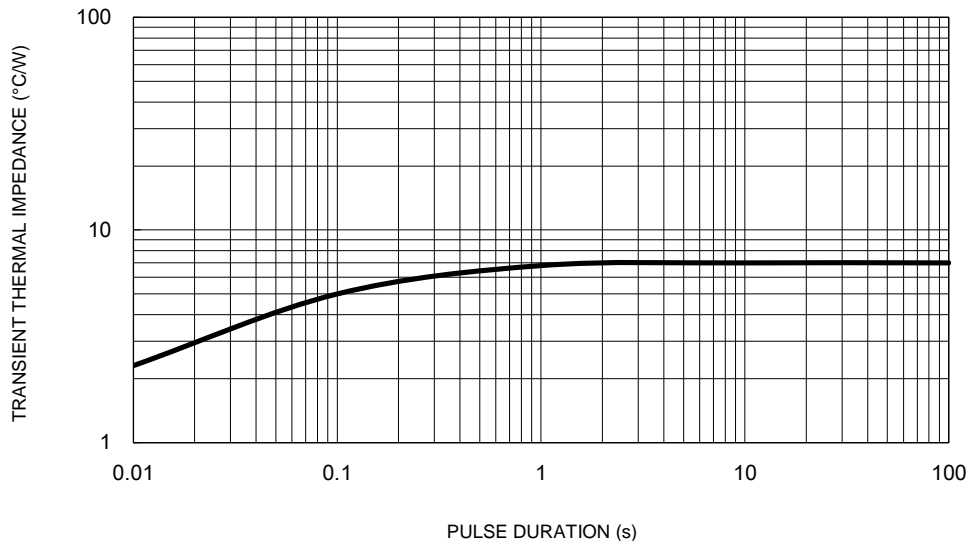
**Fig.5 Maximum Non-Repetitive Forward Surge Current**



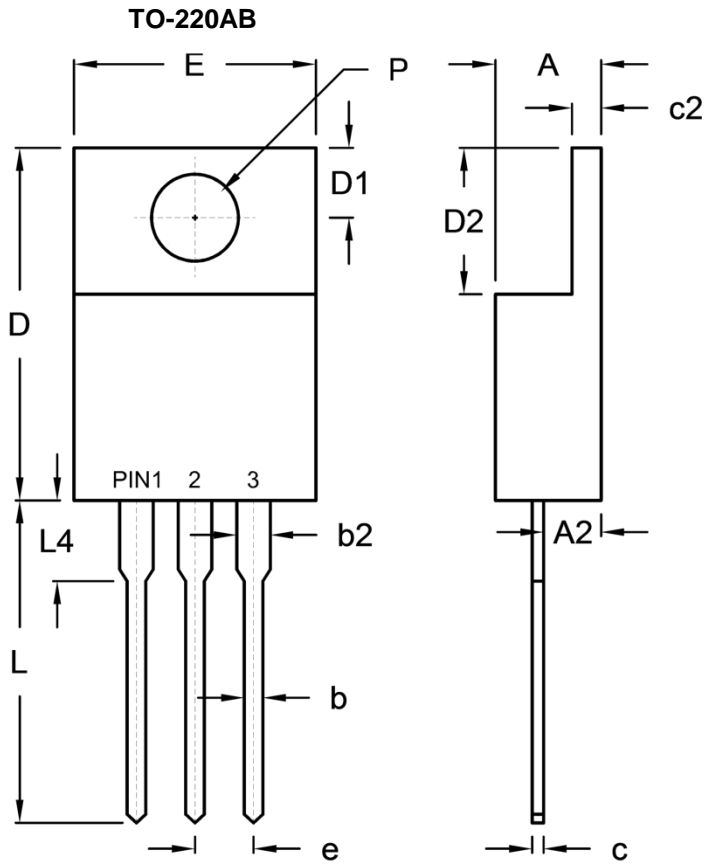
**CHARACTERISTICS CURVES**

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

**Fig.6 Typical Transient Thermal Impedance**



**PACKAGE OUTLINE DIMENSIONS**



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	4.42	4.76	0.174	0.187
A2	2.20	2.80	0.087	0.110
b	0.68	0.94	0.027	0.037
b2	1.14	1.77	0.045	0.070
c	0.35	0.64	0.014	0.025
c2	1.14	1.40	0.045	0.055
D	14.60	16.00	0.575	0.630
D1	2.62	3.44	0.103	0.135
D2	5.84	6.86	0.230	0.270
E	-	10.50	-	0.413
e	2.41	2.67	0.095	0.105
L	13.19	14.79	0.519	0.582
L4	2.80	4.20	0.110	0.165
P	3.54	4.00	0.139	0.157

**MARKING DIAGRAM**



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

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