

## 20A, 35V - 150V Schottky Barrier Surface Mount Rectifier

### FEATURES

- Low power loss, high efficiency
- Ideal for automated placement
- Guard ring for overvoltage protection
- High surge current capability
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

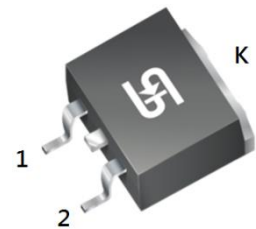
### APPLICATIONS

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

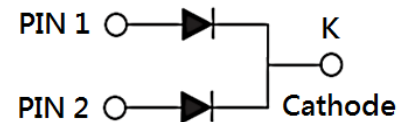
### MECHANICAL DATA

- Case: TO-263AB (D<sup>2</sup>PAK)
- 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
- Polarity: As marked
- Weight: 1.37g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$I_F$	20	A
$V_{RRM}$	35 - 150	V
$I_{FSM}$	150	A
$T_{JMAX}$	150	°C
Package	TO-263AB (D <sup>2</sup> PAK)	
Configuration	Dual dies	



TO-263AB (D<sup>2</sup>PAK)



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)									
PARAMETER	SYMBOL	MBRS 2035 CT	MBRS 2045 CT	MBRS 2050 CT	MBRS 2060 CT	MBRS 2090 CT	MBRS 20100 CT	MBRS 20150 CT	UNIT
Marking code on the device		MBRS 2035CT	MBRS 2045CT	MBRS 2050CT	MBRS 2060CT	MBRS 2090CT	MBRS 20100CT	MBRS 20150CT	
Repetitive peak reverse voltage	$V_{RRM}$	35	45	50	60	90	100	150	V
Reverse voltage, total rms value	$V_{R(RMS)}$	24	31	35	42	63	70	105	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
Critical rate of rise of off-state voltage	dv/dt	10,000							V/ $\mu\text{s}$

#### 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	MBRS 2035 CT	MBRS 2045 CT	MBRS 2050 CT	MBRS 2060 CT	MBRS 2090 CT	MBRS 20100 CT	MBRS 20150 CT	UNIT
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	MBRS2035CT MBRS2045CT MBRS2050CT MBRS2060CT	$R_{\theta\text{JC}}$	1.5	$^\circ\text{C/W}$
Junction-to-case thermal resistance	MBRS2090CT MBRS20100CT MBRS20150CT	$R_{\theta\text{JC}}$	2	$^\circ\text{C/W}$

<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>	MBRS2035CT MBRS2045CT	$I_F = 10\text{A}, T_J = 25^\circ\text{C}$	$V_F$	-	0.65	V
	MBRS2050CT MBRS2060CT			-	0.80	V
	MBRS2090CT MBRS20100CT			-	0.85	V
	MBRS20150CT			-	0.99	V
	MBRS2035CT MBRS2045CT			$I_F = 20\text{A}, T_J = 25^\circ\text{C}$	-	0.84
	MBRS2050CT MBRS2060CT	-			0.95	V
	MBRS2090CT MBRS20100CT	-			0.95	V
	MBRS20150CT	-			1.23	V
	MBRS2035CT MBRS2045CT	$I_F = 10\text{A}, T_J = 125^\circ\text{C}$			-	0.57
	MBRS2050CT MBRS2060CT			-	0.70	V
	MBRS2090CT MBRS20100CT			-	0.75	V
	MBRS20150CT			-	0.87	V
	MBRS2035CT MBRS2045CT			$I_F = 20\text{A}, T_J = 125^\circ\text{C}$	-	0.72
	MBRS2050CT MBRS2060CT	-			0.85	V
	MBRS2090CT MBRS20100CT	-			0.85	V
MBRS20150CT	-	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>	MBRS2035CT MBRS2045CT MBRS2050CT MBRS2060CT MBRS2090CT MBRS20100CT MBRS20150CT	$T_J = 25^\circ\text{C}$	$I_R$	-	100	$\mu\text{A}$
	MBRS2035CT MBRS2045CT	$T_J = 125^\circ\text{C}$		-	15	mA
	MBRS2050CT MBRS2060CT			-	10	mA
	MBRS2090CT MBRS20100CT MBRS20150CT			-	5	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>
MBRS20xCT	TO-263AB (D <sup>2</sup> PAK)	800 / Tape & Reel

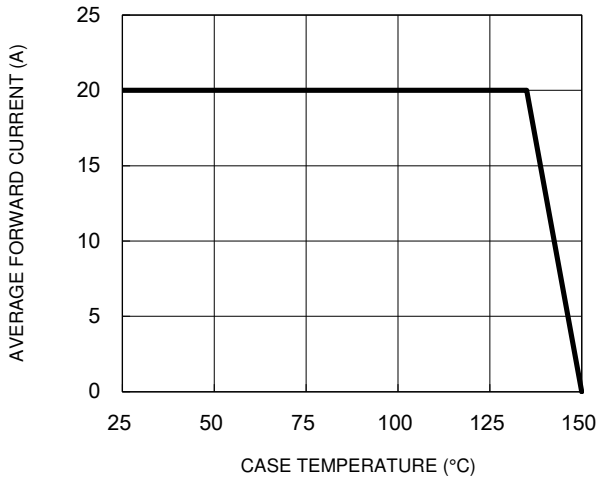
**Notes:**

1. "x" defines voltage from 35V(MBRS2035CT) to 150V(MBRS20150CT)

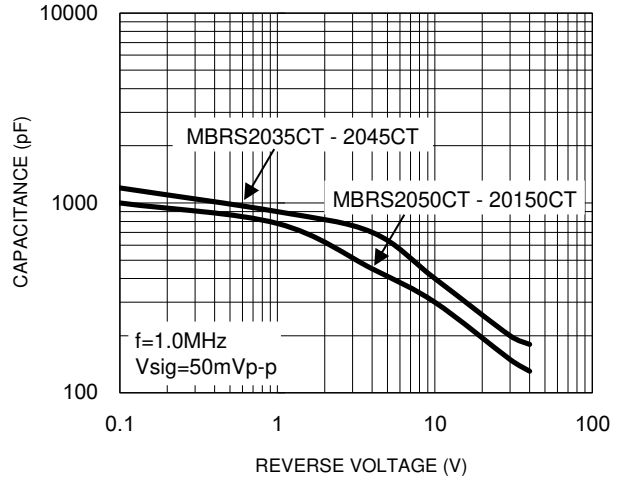
**CHARACTERISTICS CURVES**

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

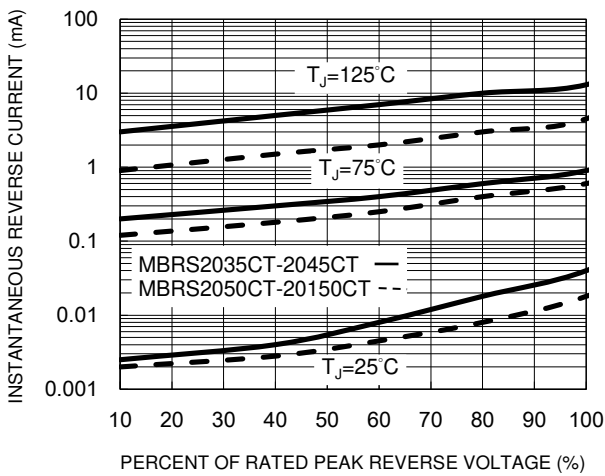
**Fig.1 Forward Current Derating Curve**



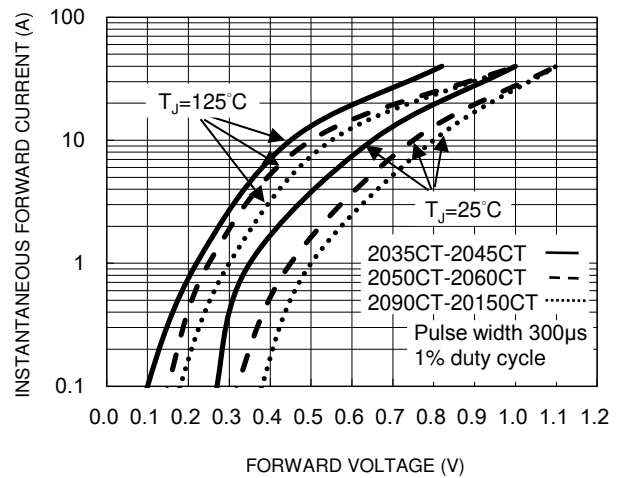
**Fig.2 Typical Junction Capacitance**



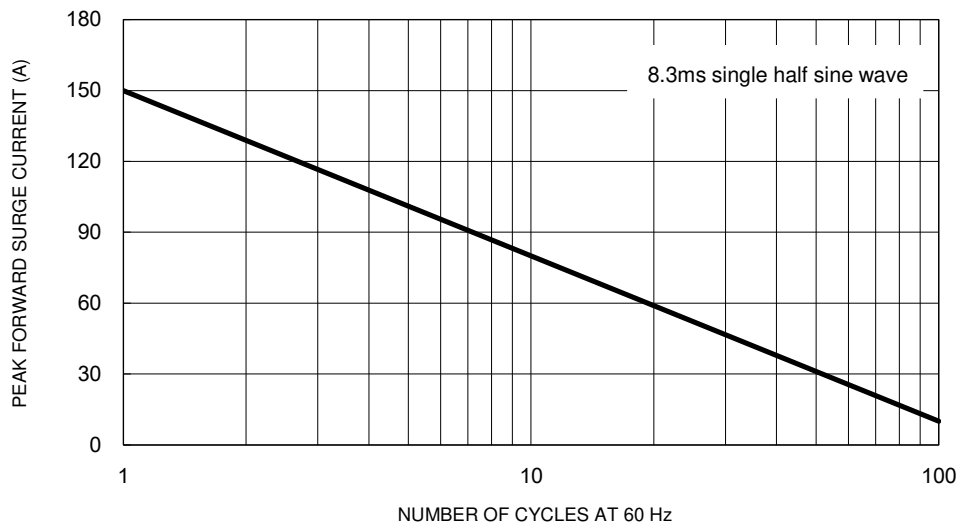
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



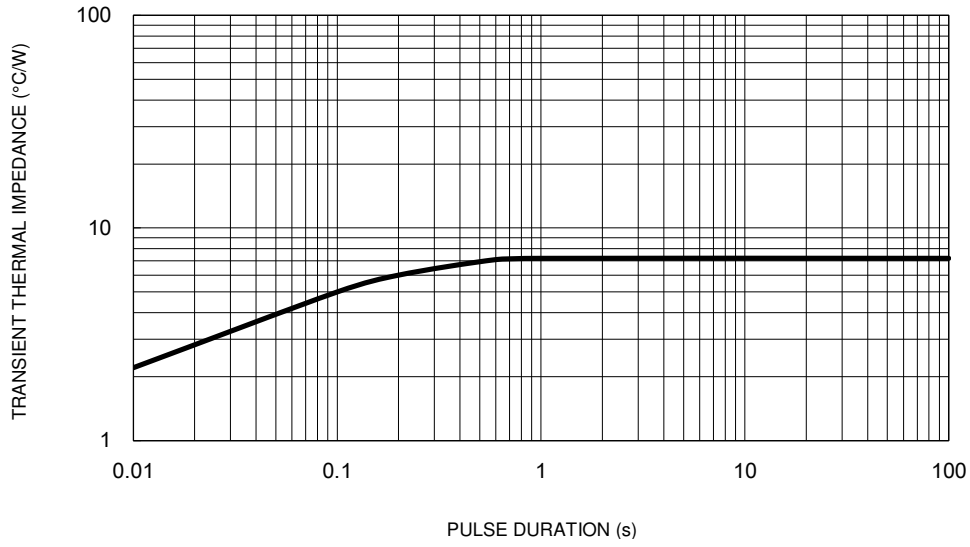
**Fig.5 Maximum Non-Repetitive Forward Surge Current**



**CHARACTERISTICS CURVES**

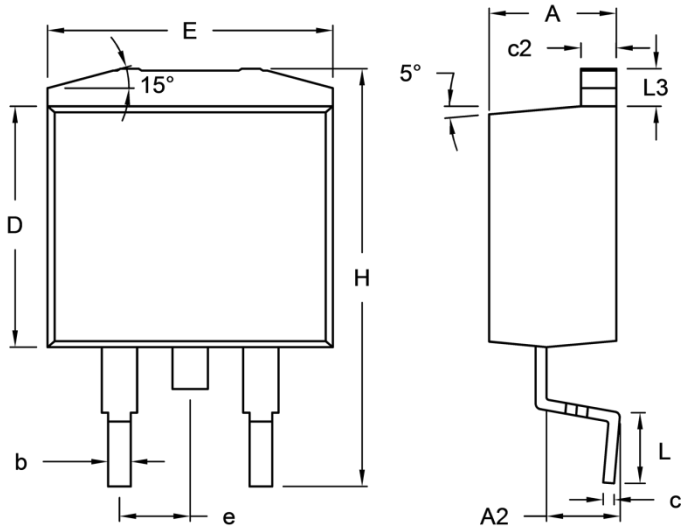
( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**Fig.6 Typical Transient Thermal Impedance**



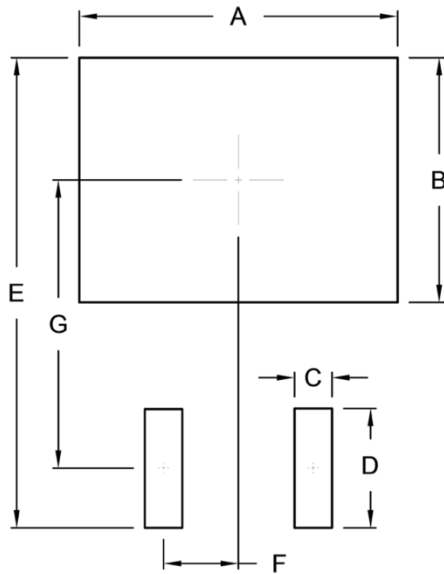
**PACKAGE OUTLINE DIMENSIONS**

TO-263AB (D<sup>2</sup>PAK)



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	4.44	4.70	0.175	0.185
A2	2.03	2.79	0.080	0.110
b	0.68	0.94	0.027	0.037
c	0.36	0.53	0.014	0.021
c2	1.14	1.40	0.045	0.055
D	8.25	9.25	0.325	0.364
E	-	10.50	-	0.413
e	2.41	2.67	0.095	0.105
H	14.60	15.88	0.575	0.625
L	2.29	2.79	0.090	0.110
L3	1.14	1.40	0.045	0.055

**SUGGESTED PAD LAYOUT**



Symbol	Unit (mm)	Unit (inch)
A	10.80	0.425
B	8.30	0.327
C	1.27	0.050
D	4.05	0.159
E	15.95	0.628
F	2.54	0.100
G	9.775	0.385

**MARKING DIAGRAM**



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

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