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

FEATURES

- AEC-Q101 qualified
- 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

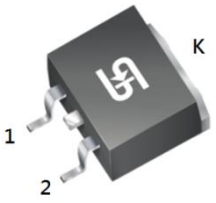
- Low voltage, high freq. inverter
- DC/DC converter
- Freewheeling diodes
- Reverse battery protection
- Car lighting

MECHANICAL DATA

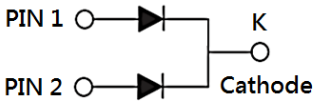
- Case: TO-263AB (D^2PAK)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 1.37g (approximately)

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
I_F	20	A
V_{RRM}	35 - 150	V
I_{FSM}	150	A
$T_{J\,MAX}$	150	°C
Package	TO-263AB (D^2PAK)	
Configuration	Dual dies	

Pb-Free RoHS COMPLIANT HALOGEN FREE



TO-263AB (D^2PAK)



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

PARAMETER	SYMBOL	MBRS 2035 CTH	MBRS 2045 CTH	MBRS 2050 CTH	MBRS 2060 CTH	MBRS 2090 CTH	MBRS 20100 CTH	MBRS 20150 CTH	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(1)	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/μs

Notes:

1. tp = 2.0μs, 1.0KHz

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)									
PARAMETER	**SYMBOL**	**MBRS 2035 CTH**	**MBRS 2045 CTH**	**MBRS 2050 CTH**	**MBRS 2060 CTH**	**MBRS 2090 CTH**	**MBRS 20100 CTH**	**MBRS 20150 CTH**	**UNIT**
Junction temperature	T_J	-55 to +150							°C
Storage temperature	T_{STG}	-55 to +150							°C

THERMAL PERFORMANCE				
PARAMETER		**SYMBOL**	**TYP**	**UNIT**
Junction-to-case thermal resistance	MBRS2035CTH MBRS2045CTH MBRS2050CTH MBRS2060CTH	$R_{\Theta JC}$	1.5	°C/W
Junction-to-case thermal resistance	MBRS2090CTH MBRS20100CTH MBRS20150CTH	$R_{\Theta JC}$	2	°C/W

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)						
PARAMETER		**CONDITIONS**	**SYMBOL**	**TYP**	**MAX**	**UNIT**
Forward voltage per diode [1]	MBRS2035CTH MBRS2045CTH	I_F = 10A, T_J = 25°C	V_F	-	0.65	V
	MBRS2050CTH MBRS2060CTH			-	0.80	V
	MBRS2090CTH MBRS20100CTH			-	0.85	V
	MBRS20150CTH			-	0.99	V
	MBRS2035CTH MBRS2045CTH	I_F = 20A, T_J = 25°C		-	0.84	V
	MBRS2050CTH MBRS2060CTH			-	0.95	V
	MBRS2090CTH MBRS20100CTH			-	0.95	V
	MBRS20150CTH			-	1.23	V
	MBRS2035CTH MBRS2045CTH	I_F = 10A, T_J = 125°C		-	0.57	V
	MBRS2050CTH MBRS2060CTH			-	0.70	V
	MBRS2090CTH MBRS20100CTH			-	0.75	V
	MBRS20150CTH			-	0.87	V
	MBRS2035CTH MBRS2045CTH	I_F = 20A, T_J = 125°C		-	0.72	V
	MBRS2050CTH MBRS2060CTH			-	0.85	V
	MBRS2090CTH MBRS20100CTH			-	0.85	V
	MBRS20150CTH			-	1.10	V

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

PARAMETER		CONDITIONS	SYMBOL	TYP	MAX	UNIT
Reverse current @ rated V_R per diode (2)	MBRS2035CTH MBRS2045CTH MBRS2050CTH MBRS2060CTH MBRS2090CTH MBRS20100CTH MBRS20150CTH	T_J = 25°C	I_R	-	100	μA
	MBRS2035CTH MBRS2045CTH	T_J = 125°C		-	15	mA
	MBRS2050CTH MBRS2060CTH			-	10	mA
	MBRS2090CTH MBRS20100CTH MBRS20150CTH			-	5	mA

Notes:

1. Pulse test with PW = 0.3ms
2. Pulse test with PW = 30ms

ORDERING INFORMATION

ORDERING CODE(1)	PACKAGE	PACKING
MBRS20xCTH	TO-263AB (D^2PAK)	800 / Tape & Reel

Notes:

1. "x" defines voltage from 35V(MBRS2035CTH) to 150V(MBRS20150CTH)

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Forward Current Derating Curve

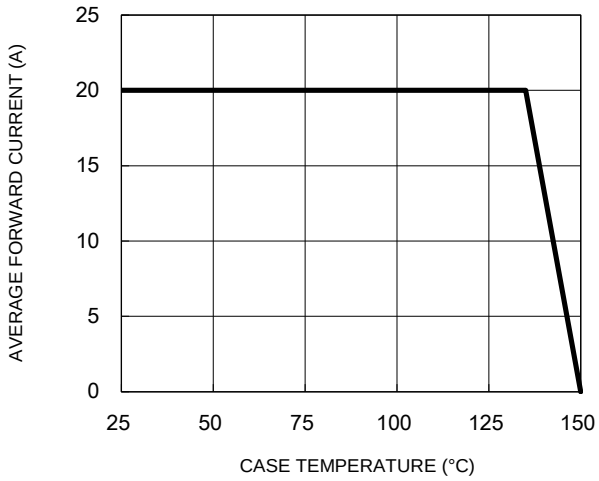


Fig.2 Typical Junction Capacitance

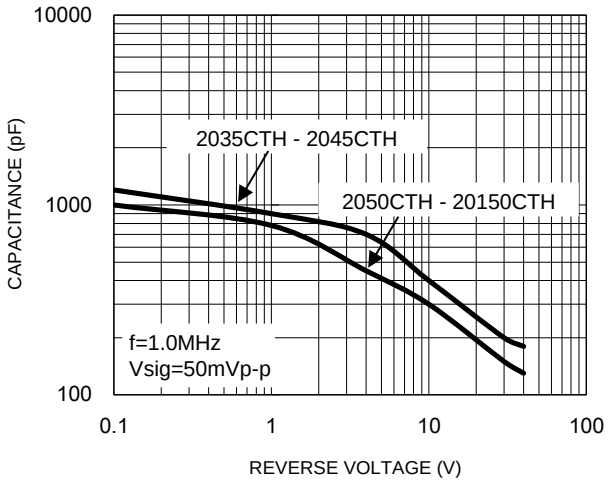


Fig.3 Typical Reverse Characteristics

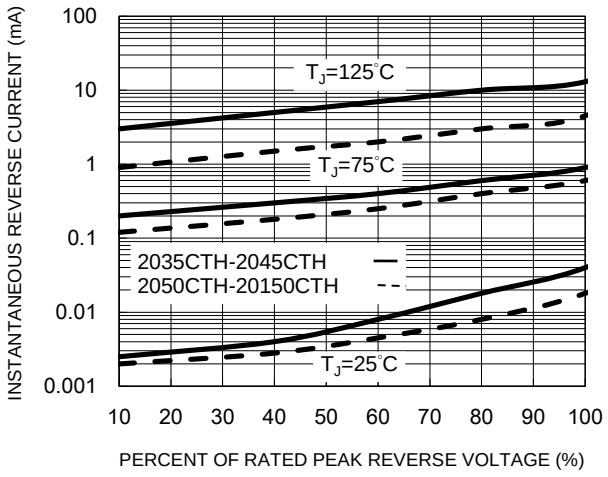


Fig.4 Typical Forward Characteristics

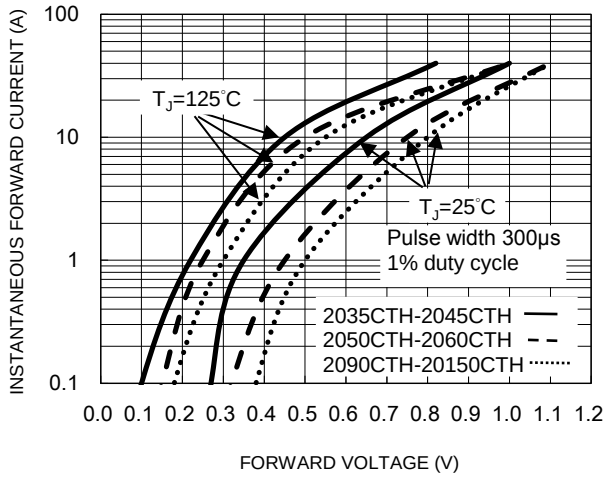
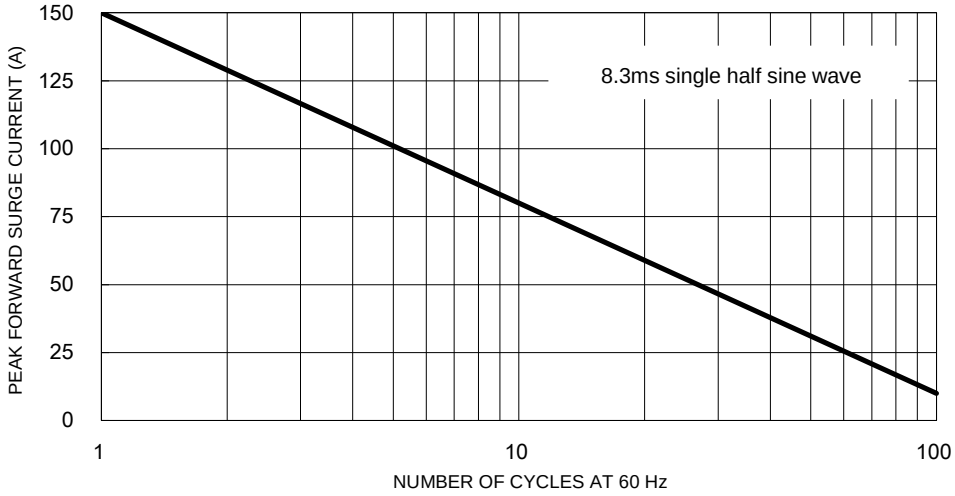


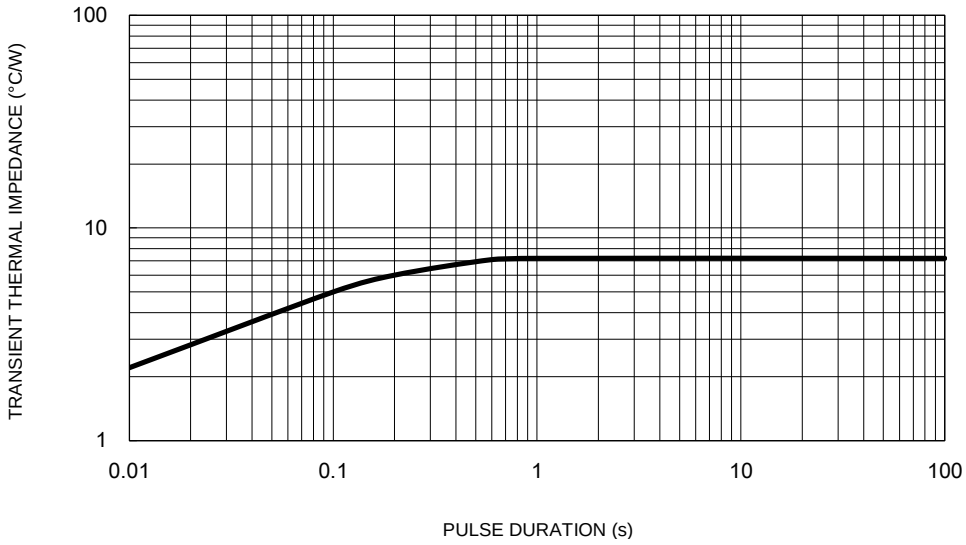
Fig.5 Maximum Non-Repetitive Forward Surge Current



CHARACTERISTICS CURVES

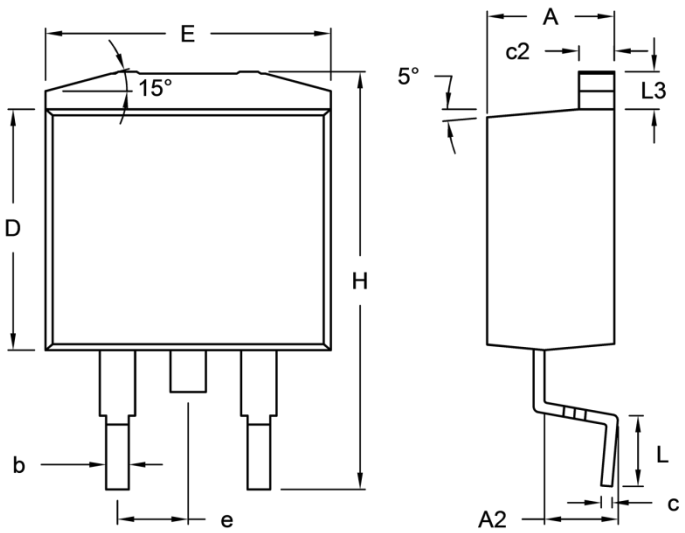
(T_A = 25°C unless otherwise noted)

Fig.6 Typical Transient Thermal Impedance



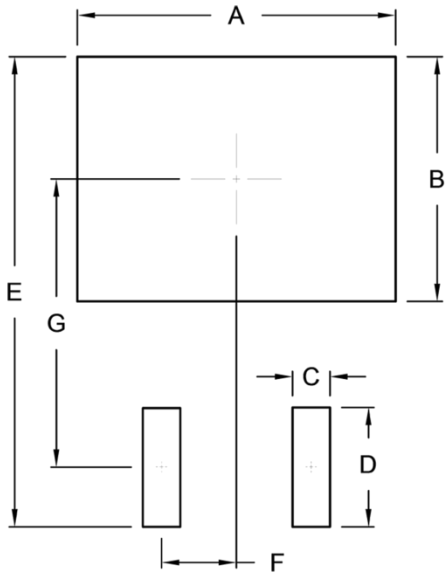
PACKAGE OUTLINE DIMENSIONS

TO-263AB (D^2PAK)



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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