



1200V / 10A

# AAC010B12DC

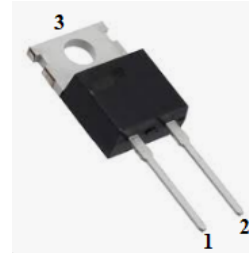
SiC Schottky Barrier Diode

ACTRON TECHNOLOGY CORP.

## Features

- Shorter recovery time
- High speed switching
- High surge current capability
- Enabling higher frequency and increased power density
- System efficiency improvement
- System cost and size savings due to the reduced cooling requirements

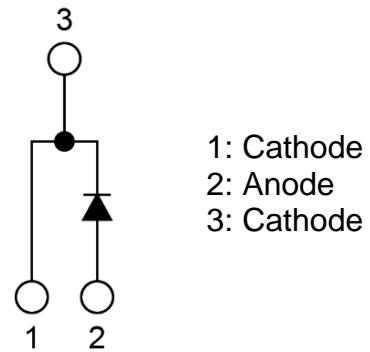
## Outline (TO220-2L)



## Applications

- Power Factor Correction in SMPS
- Solar inverter
- Uninterruptible Power Supply
- Motor Drives
- Data Center

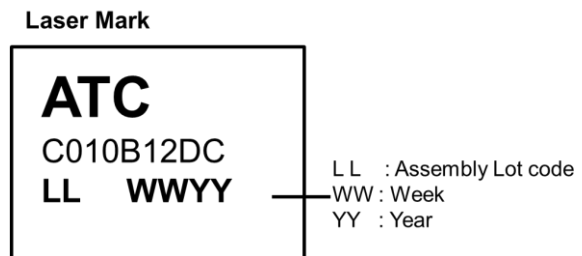
## Circuit Diagram



## Mechanical Characteristics

- TO220-2L package
- Halogen Free
- Pb free lead plating ; RoHS compliant
- Packaging: Tube

## Marking Diagram





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## Parameter and Specification

### Absolute Maximum Rating<sup>(1)</sup>

Parameter	Symbol	Condition	Value	Unit
Repetitive peak reverse voltage	$V_{RM}$	$T_c=25^{\circ}C$	1200	V
Continue forward current	$I_F$	$T_c=135^{\circ}C$	10	A
Surge non-repetitive forward current , sine half-wave	$I_{FSM}$	$T_c=25^{\circ}C, t_p=10ms, \text{Sine half wave}$	120	A
		$T_c=110^{\circ}C, t_p=10ms, \text{Sine half wave}$	90	
Surge repetitive forward current	$I_{FRM}$	$T_c=25^{\circ}C, t_p=10ms, \text{Sine half wave}$	54	A
$I^2t$ value	$\int I^2t$	$T_c=25^{\circ}C, t_p=10ms, \text{Sine half wave}$	72	$A^2s$
Total power dissipation	$P_D$	$T_c=25^{\circ}C$	105	W
		$T_c=110^{\circ}C$	67	
Junction temperature	$T_j$		175	$^{\circ}C$
Storage temperature	$T_{STG}$		-55 ~ 175	$^{\circ}C$

Note :

(1) Exceeding these ratings may damage the device.

### Thermal Characteristics

Parameter	Symbol	Condition	Typ.	Unit
Thermal resistance	$\theta_{jc}$	Junction - Case	0.95	$^{\circ}C / W$



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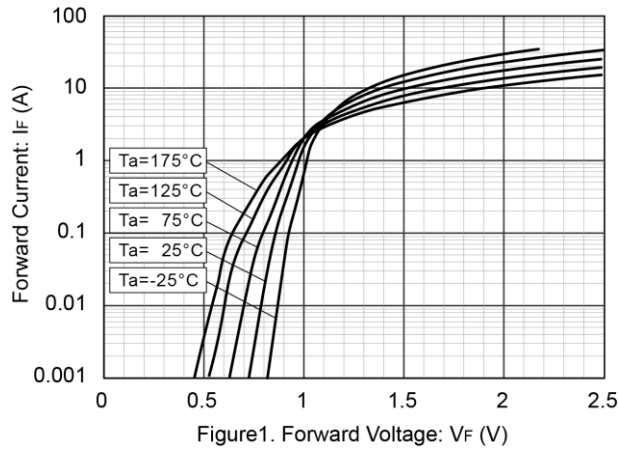
**Electrical Characteristics**

Characteristic	Symbol	Condition	MIN	TYP	MAX	Unit
DC reverse voltage	V <sub>DC</sub>	T <sub>j</sub> = 25°C, I <sub>R</sub> = 50μA	1200	-	-	V
Forward voltage	V <sub>F</sub>	T <sub>j</sub> = 25°C, I <sub>F</sub> = 10A	-	1.4	1.6	V
		T <sub>j</sub> = 150°C, I <sub>F</sub> = 10A	-	1.8	-	
		T <sub>j</sub> = 175°C, I <sub>F</sub> = 10A	-	1.9	-	
Reverse current	I <sub>R</sub>	T <sub>j</sub> = 25°C, V <sub>R</sub> = 1200V	-	5	50	μA
		T <sub>j</sub> = 150°C, V <sub>R</sub> = 1200V	-	20	-	
		T <sub>j</sub> = 175°C, V <sub>R</sub> = 1200V	-	37.5	-	
Total capacity charge	Q <sub>C</sub>	T <sub>j</sub> = 25°C, V <sub>R</sub> = 800V, Q <sub>C</sub> = ∫ <sub>0</sub> <sup>V<sub>R</sub></sup> C(V)dV	-	50	-	nC
Total capacitance	C <sub>TOT</sub>	T <sub>j</sub> = 25°C, V <sub>R</sub> = 1V, F = 1MHz	-	565	-	pF
		T <sub>j</sub> = 25°C, V <sub>R</sub> = 800V, F = 1MHz	-	36	-	
		T <sub>j</sub> = 25°C, V <sub>R</sub> = 1200V, F = 1MHz	-	35	-	
Capacitance Stored Energy	E <sub>C</sub>	V <sub>R</sub> = 800V	-	15.5	-	μJ

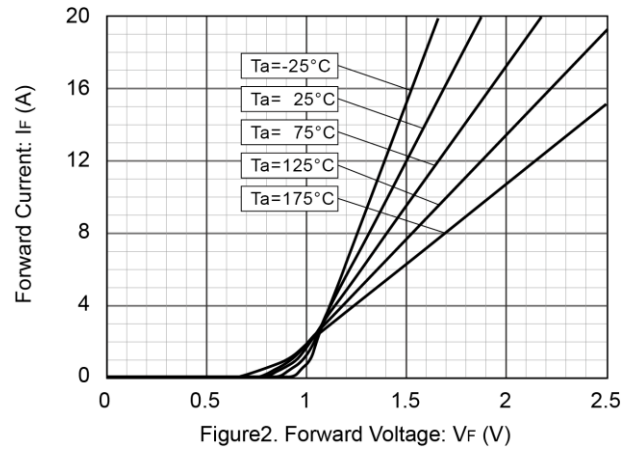


## Electrical Characteristic Curves

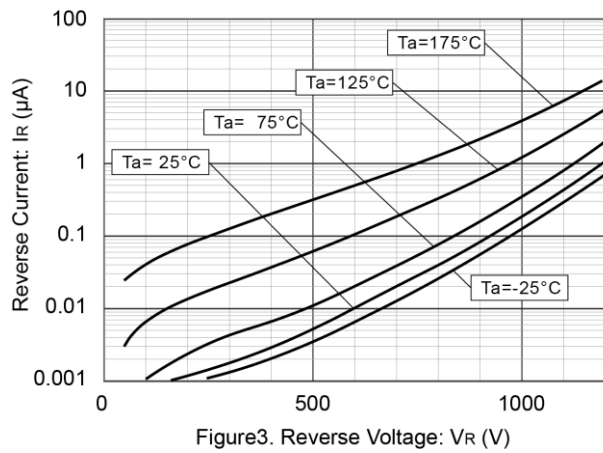
### V<sub>F</sub> – I<sub>F</sub> Characteristics



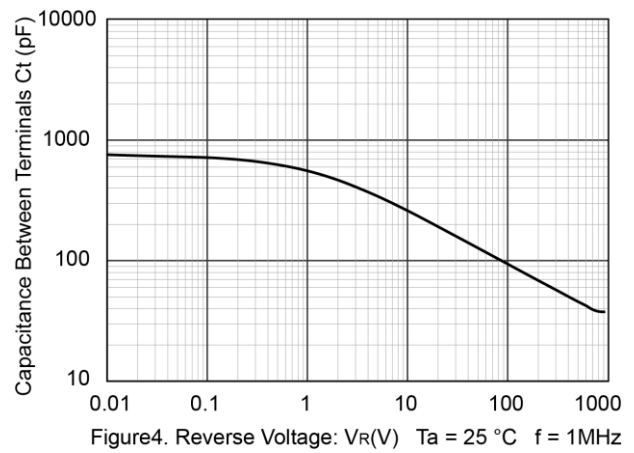
### V<sub>F</sub> – I<sub>F</sub> Characteristics



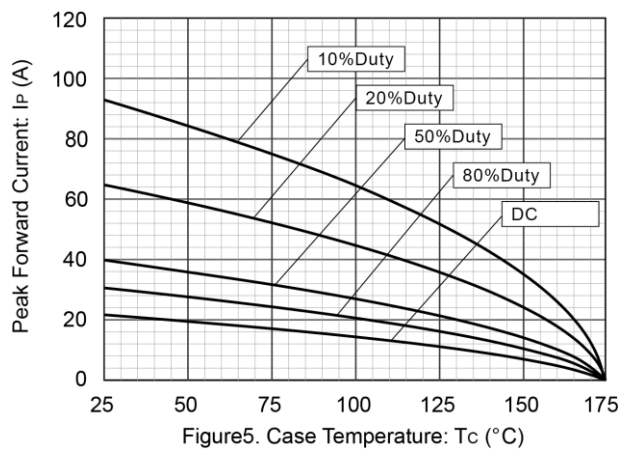
### V<sub>R</sub> – I<sub>R</sub> Characteristics



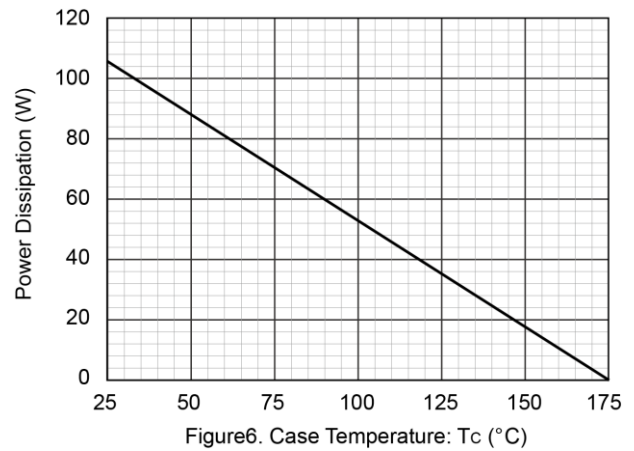
### V<sub>R</sub> – C<sub>t</sub> Characteristics



### Maximum I<sub>P</sub> – T<sub>C</sub> Characteristics



### Power Dissipation





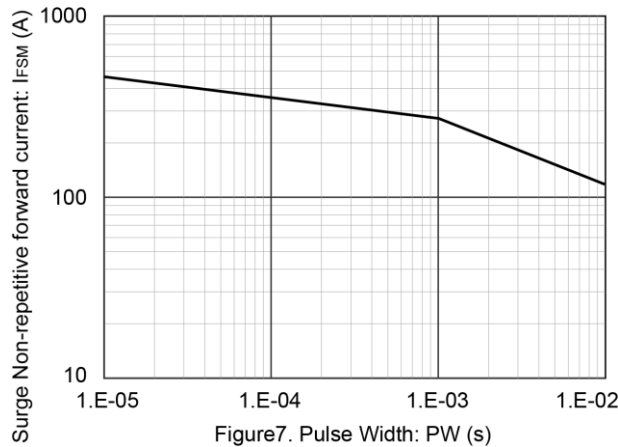
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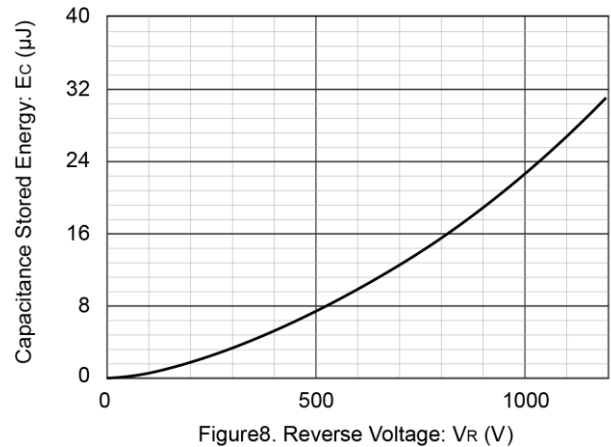
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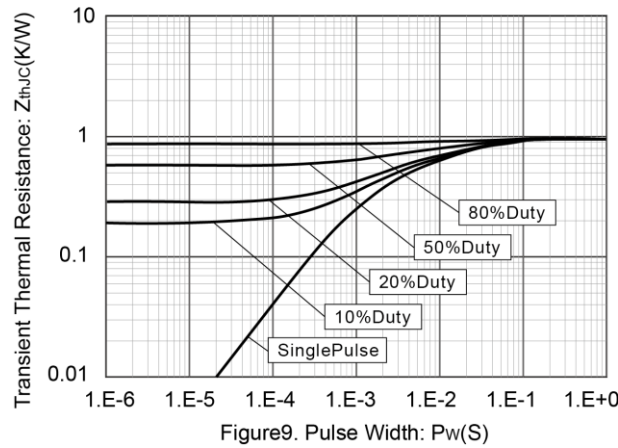
**I<sub>FSM</sub> – PW Characteristics**



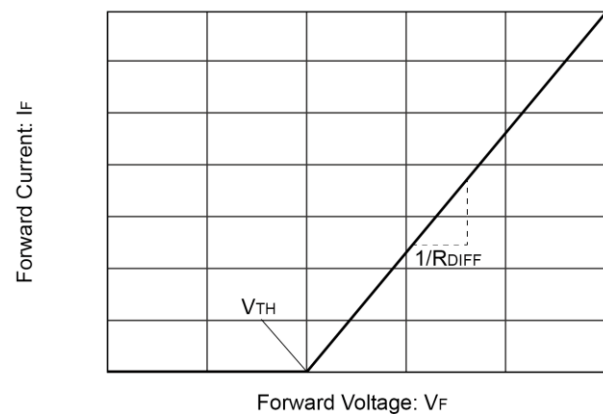
**E<sub>C</sub> – V<sub>R</sub> Characteristics**



**Typical Transient Thermal Resistance vs. Pulse Width**



**Simplified Forward Characteristic**



**V<sub>F</sub>=V<sub>TH</sub>+R<sub>DIFF</sub>×I<sub>F</sub>**

**Threshold Voltage(V<sub>TH</sub>):**  
**V<sub>TH</sub>(T<sub>j</sub>)=-0.001×T<sub>j</sub>+0.953[V]**

**Differential Resistance(R<sub>DIFF</sub>):**  
**R<sub>DIFF</sub>(T<sub>j</sub>)=A×T<sub>j</sub><sup>2</sup>+B×T<sub>j</sub>+C[Ω]**  
**A=9.0×10<sup>-7</sup>**  
**B=2.6×10<sup>-4</sup>**  
**C=4.0×10<sup>-2</sup>**



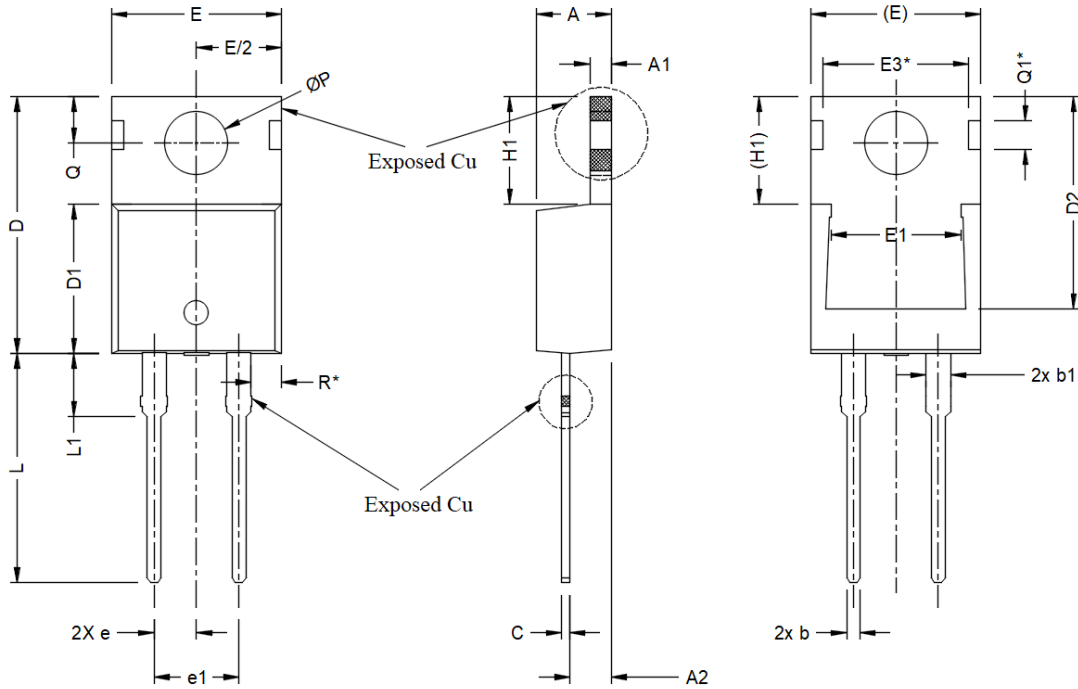
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**Package Outline**



Unit : mm

SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	4.24	4.44	4.64
A1	1.15	1.27	1.40
A2	2.30	2.48	2.70
b	0.70	0.80	0.90
b1	1.20	1.45	1.70
c	0.40	0.50	0.60
D	14.70	15.37	16.00
D1	8.82	8.92	9.02
D2	12.43	12.73	12.83
E	9.96	10.16	10.36
E1	6.86	7.77	8.89
E3*	8.70 REF.		
e	2.54 BSC		
e1	5.08 BSC		
H1	6.30	6.45	6.60
L	13.47	13.72	13.97
L1	3.60	3.80	4.00
$\varnothing P$	3.75	3.84	3.93
Q	2.60	2.80	3.00
Q1*	1.73 REF.		
R*	1.82 REF.		