



650V / 16A

AAC016H06DC

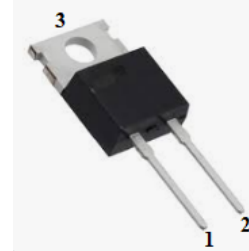
SiC Schottky Barrier Diode

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

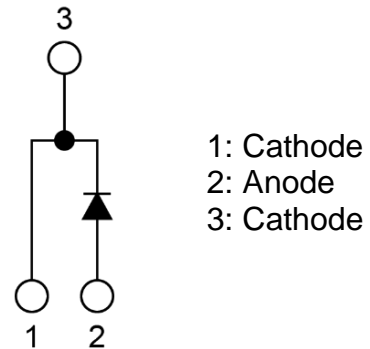
Outline (TO220-2L)



Applications

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

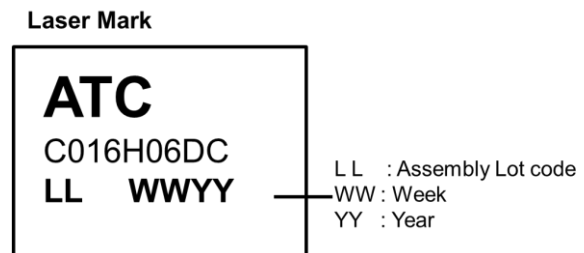
Circuit Diagram



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⁽¹⁾

Parameter	Symbol	Condition	Value	Unit
Repetitive peak reverse voltage	V_{RM}	$T_c=25^{\circ}C$	650	V
Continue forward current	I_F	$T_c=135^{\circ}C$	16	A
Surge non-repetitive forward current , sine half-wave	I_{FSM}	$T_c=25^{\circ}C, t_p=10ms, \text{Sine half wave}$	132	A
		$T_c=110^{\circ}C, t_p=10ms, \text{Sine half wave}$	106	
Surge repetitive forward current	I_{FRM}	$T_c=25^{\circ}C, t_p=10ms, \text{Sine half wave}$	61	A
I^2t value	$\int I^2t$	$T_c=25^{\circ}C, t_p=10ms, \text{Sine half wave}$	88	A^2s
Total power dissipation	P_D	$T_c=25^{\circ}C$	142	W
		$T_c=110^{\circ}C$	62	
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	θ_{jc}	Junction - Case	0.9	$^{\circ}C / W$



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Electrical Characteristics

Characteristic	Symbol	Condition	MIN	TYP	MAX	Unit
DC reverse voltage	V_{DC}	$T_j = 25^{\circ}C, I_R = 80\mu A$	650	-	-	V
Forward voltage	V_F	$T_j = 25^{\circ}C, I_F = 16A$	-	1.35	1.5	V
		$T_j = 150^{\circ}C, I_F = 16A$	-	1.6	-	
		$T_j = 175^{\circ}C, I_F = 16A$	-	1.7	-	
Reverse current	I_R	$T_j = 25^{\circ}C, V_R = 650V$	-	3.2	80	uA
		$T_j = 150^{\circ}C, V_R = 650V$	-	12.8	-	
		$T_j = 175^{\circ}C, V_R = 650V$	-	24	-	
Total capacity charge	Q_C	$T_j = 25^{\circ}C, V_R = 400V,$ $di/dt = 350A/us$	-	42	-	nC
Total capacitance	C_{TOT}	$T_j = 25^{\circ}C, V_R = 1V,$ $F = 1MHz$	-	510	-	pF
		$T_j = 25^{\circ}C, V_R = 400V,$ $F = 1MHz$	-	54	-	
		$T_j = 25^{\circ}C, V_R = 650V,$ $F = 1MHz$	-	53	-	
Capacitance Stored Energy	E_C	$V_R = 400V$	-	7	-	μJ



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Electrical Characteristic Curves

$V_F - I_F$ Characteristics

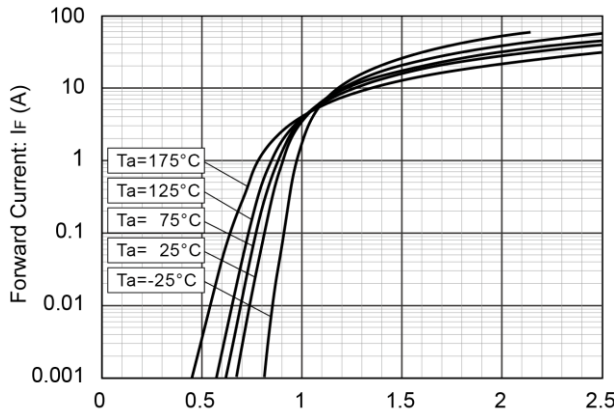


Figure1. Forward Voltage: V_F (V)

$V_F - I_F$ Characteristics

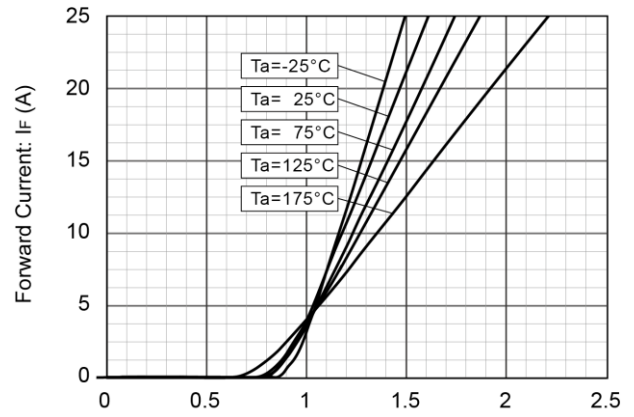


Figure2. Forward Voltage: V_F (V)

$V_R - I_R$ Characteristics

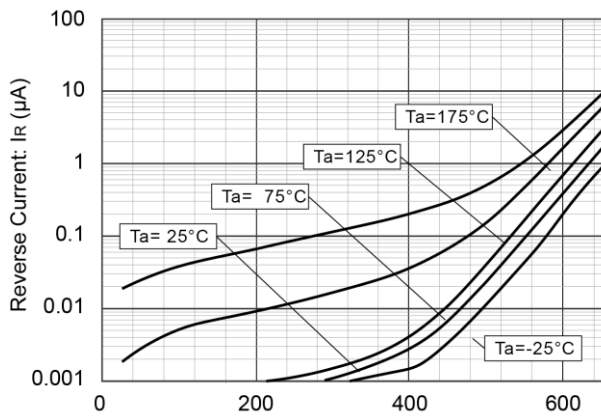


Figure3. Reverse Voltage: V_R (V)

$V_R - C_t$ Characteristics

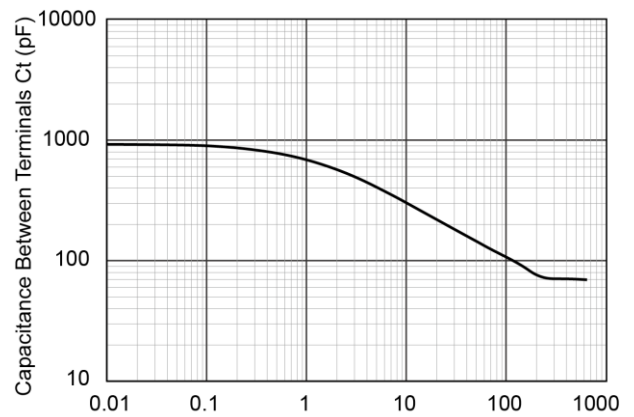


Figure4. Reverse Voltage: V_R (V) $T_a = 25^\circ\text{C}$ $f = 1\text{MHz}$

-Maximum $I_P - T_C$ Characteristics

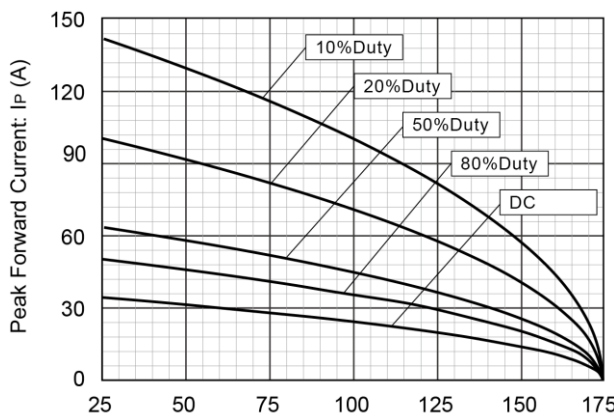


Figure5. Case Temperature: T_C ($^\circ\text{C}$)

Power Dissipation

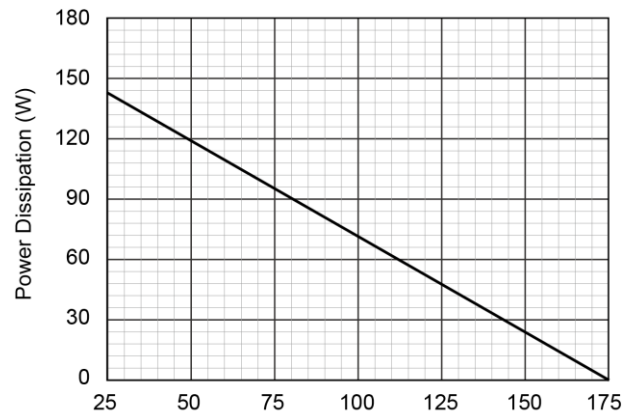
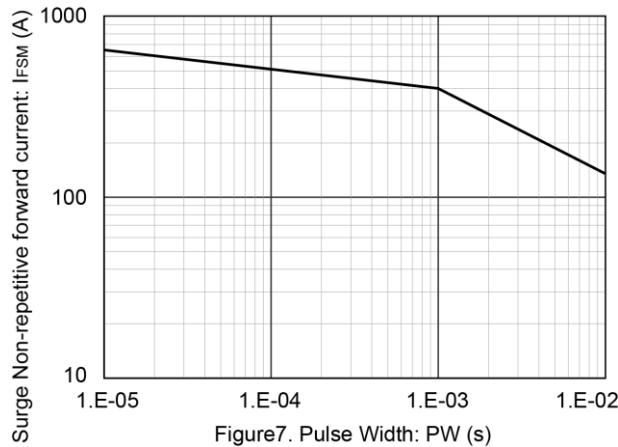


Figure6. Case Temperature: T_C ($^\circ\text{C}$)

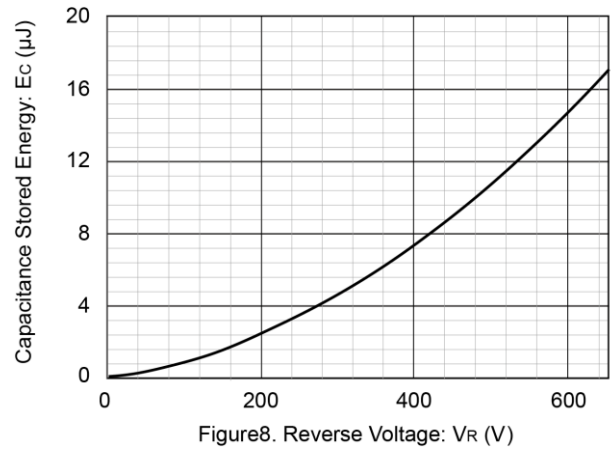


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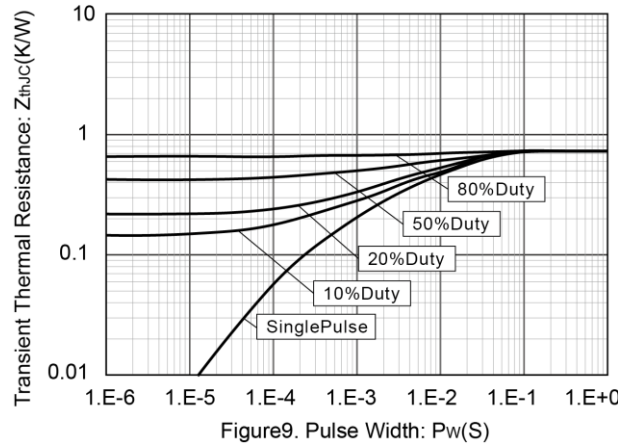
I_{FSM} – PW Characteristics



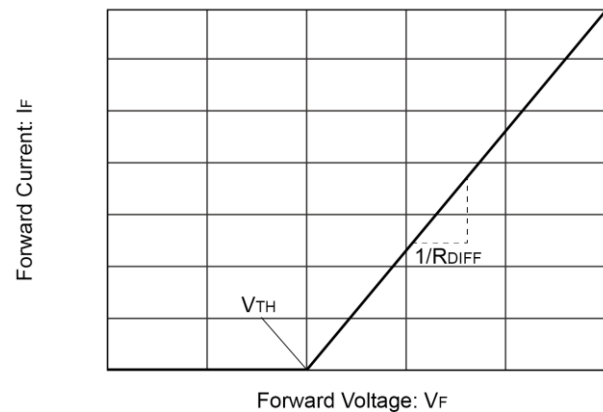
E_C – V_R Characteristics



Typical Transient Thermal Resistance vs. Pulse Width



Simplified Forward Characteristic



$$V_F = V_{TH} + R_{DIFF} \times I_F$$

Threshold Voltage (V_{TH}):

$$V_{TH}(T_j) = -0.002 \times T_j + 0.778 [V]$$

Differential Resistance (R_{DIFF}):

$$R_{DIFF}(T_j) = A \times T_j^2 + B \times T_j + C [\Omega]$$

$$A = 5.0 \times 10^{-7}$$

$$B = 2.0 \times 10^{-4}$$

$$C = 2.91 \times 10^{-2}$$



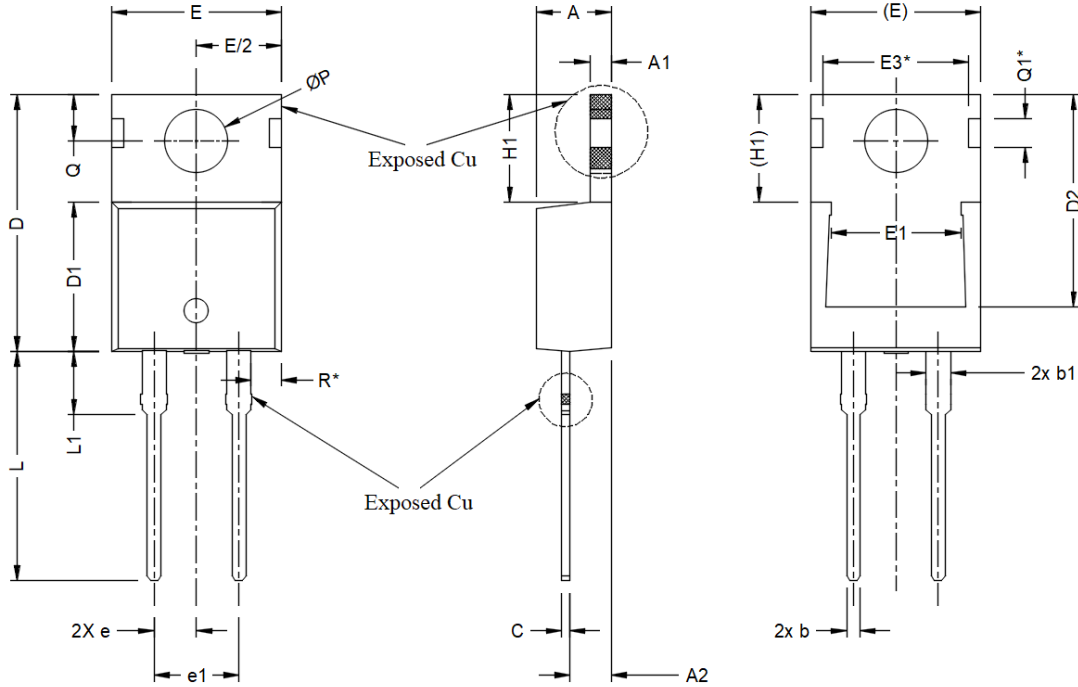
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Package Outline



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.		