AEC006H06DC

650V / 6A

SiC Schottky Barrier Diode

ACTRON TECHNOLOGY CORP.

Features

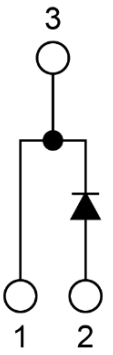
- Shorter recovery time
- High speed switching
- High surge current capability
- Enabling higher frequency and increased power density
- System efficiency improvement
- System cost and size savings due to the reduced cooling requirements

Outline (TO252-2L)

Applications

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

Circuit Diagram



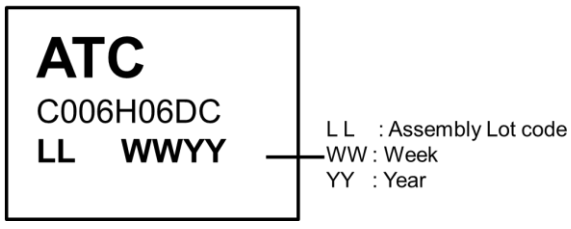
1: Cathode
2: Anode
3: Cathode

Mechanical Characteristics

- TO252 package
- Halogen Free
- Pb free lead plating ; RoHS compliant
- Packaging: Embossed Tape

Marking Diagram

Laser Mark



Parameter and Specification

Absolute Maximum Rating(1)

Parameter	Symbol	Condition	Value	Unit
Repetitive peak reverse voltage	V_{RM}	Tc=25℃	650	V
Continue forward current	I_F	Tc=135℃	6	A
Surge non-repetitive forward current , sine half-wave	I_{FSM}	Tc=25℃, tp=10ms, Sine half wave	52	A
		Tc=110℃, tp=10ms, Sine half wave	41	
Surge repetitive forward current	I_{FRM}	Tc=25℃, tp=10ms, Sine half wave	25	A
I^2t value	$\int I^2t$	Tc=25℃, tp=10ms, Sine half wave	13	A^2s
Total power dissipation	P_D	Tc=25℃	85	W
		Tc=110℃	37	
Junction temperature	T_j		175	℃
Storage temperature	T_{STG}		-55 ~ 175	℃

Note :

(1) Exceeding these ratings may damage the device.

Thermal Characteristics

Parameter	Symbol	Condition	Typ.	Unit
Thermal resistance	θ jc	Junction - Case	2.9	℃ / W

Electrical Characteristics

Characteristic	Symbol	Condition	MIN	TYP	MAX	Unit
DC reverse voltage	V_{DC}	T_j = 25℃, I_R = 30 μA	650	-	-	V
Forward voltage	V_F	T_j = 25℃, I_F = 6A	-	1.35	1.5	V
		T_j = 150℃, I_F = 6A	-	1.6	-	
		T_j = 175℃, I_F = 6A	-	1.7	-	
Reverse current	I_R	T_j = 25℃, V_R = 650V	-	1.2	30	uA
		T_j = 150℃, V_R = 650V	-	4.8	-	
		T_j = 175℃, V_R = 650V	-	9	-	
Total capacity charge	Q_C	T_j = 25℃, V_R = 400V, di/dt = 350A/us	-	15	-	nC
Total capacitance	C_{TOT}	T_j = 25℃, V_R = 1V, F = 1MHz	-	240	-	pF
		T_j = 25℃, V_R = 400V, F = 1MHz	-	26	-	
		T_j = 25℃, V_R = 650V, F = 1MHz	-	25	-	
Capacitance Stored Energy	E_C	V_R = 400V	-	2.5	-	μJ

Electrical Characteristic Curves

V_F – I_F Characteristics

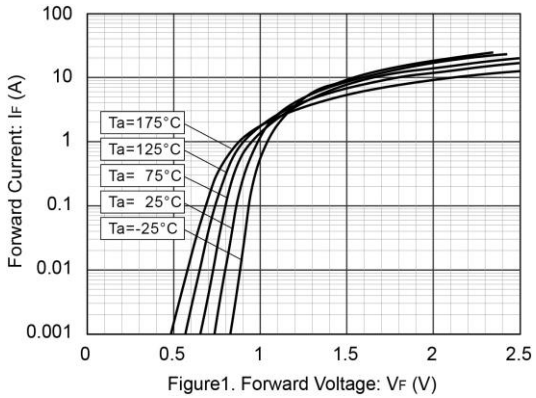


Figure1. Forward Voltage: V_F (V)

V_F – I_F Characteristics

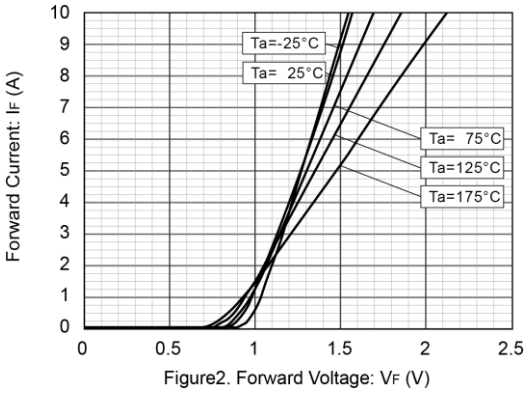


Figure2. Forward Voltage: V_F (V)

V_R – I_R Characteristics

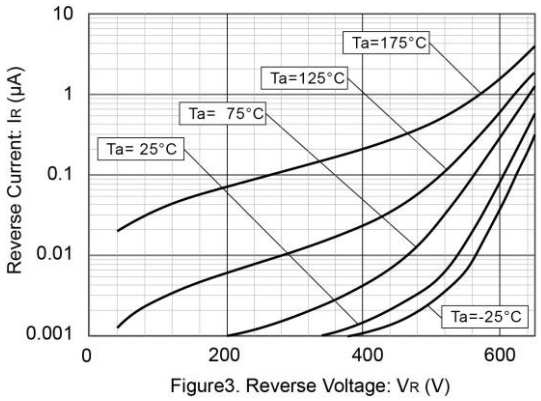


Figure3. Reverse Voltage: V_R (V)

V_R – C_t Characteristics

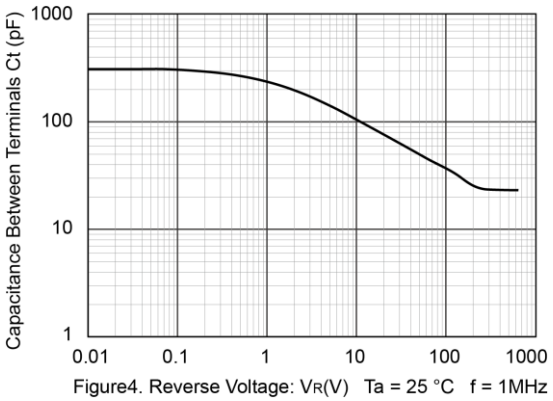


Figure4. Reverse Voltage: V_R(V) Ta = 25 °C f = 1MHz

Maximum I_P –T_C Characteristics

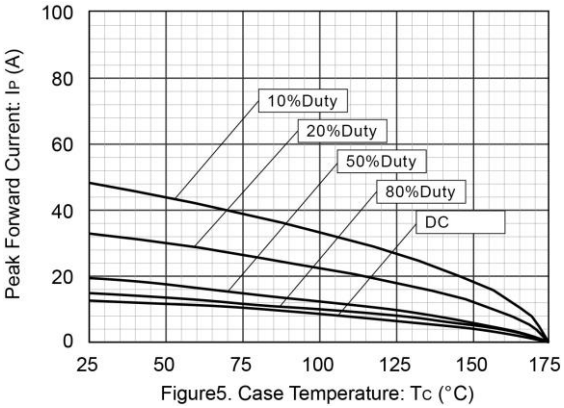


Figure5. Case Temperature: T_C (°C)

Power Dissipation

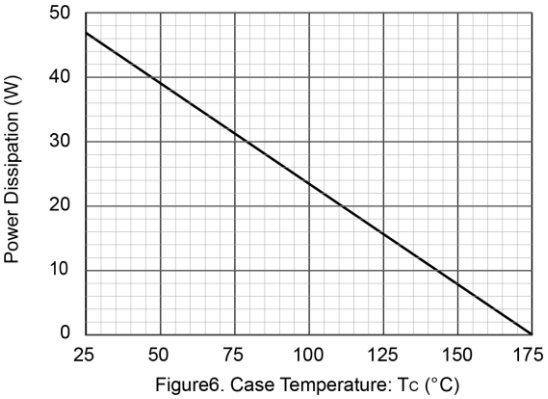


Figure6. Case Temperature: T_C (°C)

I_{FSM} – Pw Characteristics

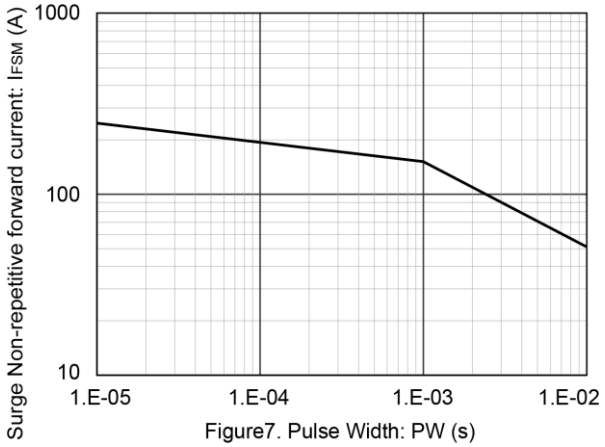


Figure7. Pulse Width: PW (s)

Ec – V_R Characteristics

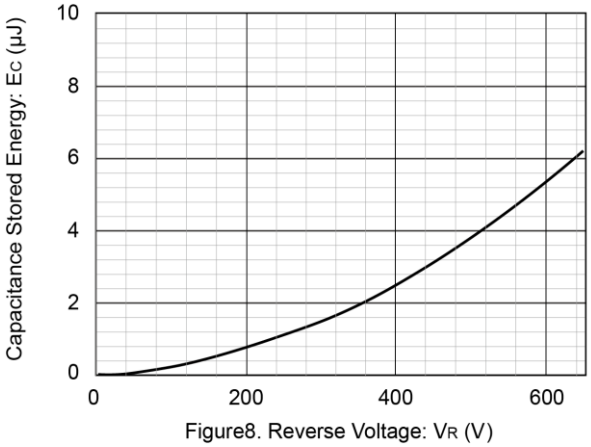


Figure8. Reverse Voltage: VR (V)

Typical Transient Thermal Resistance vs. Pulse Width

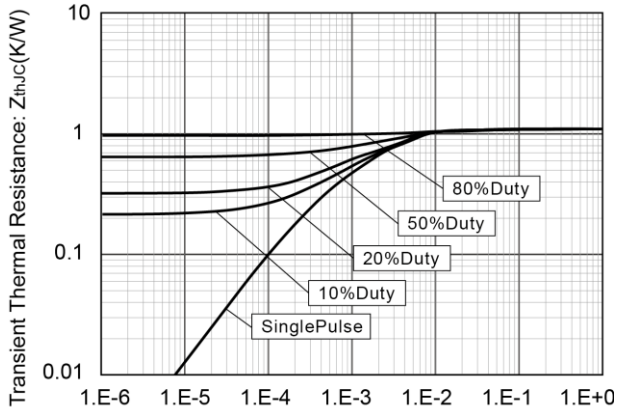
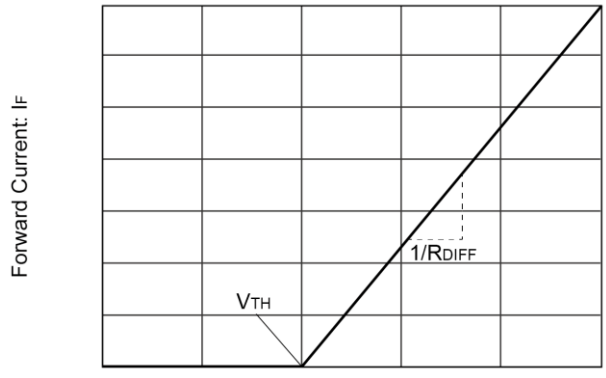


Figure9. Pulse Width: PW(S)

Simplified Forward Characteristic



Forward Voltage: VF

Figure10. Equivalent forward current curve

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

Threshold Voltage(V_{TH}):

$V_{TH}(T_j)=-0.0019\times T_j+0.78$[V]

Differential Resistance(R_{DIFF}):

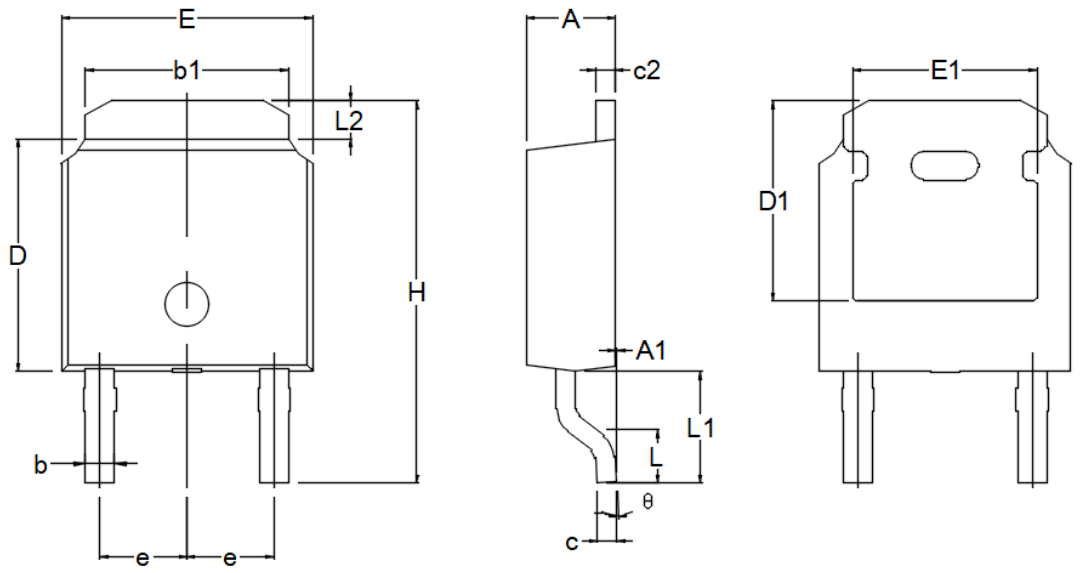
$R_{DIFF}(T_j)=A\times T_j^2+B\times T_j+C[\Omega]$

$A=2.0\times10^{-6}$

$B=4.0\times10^{-4}$

C=7.68x10-2

Package Outline.



Unit : mm

SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	1.40	1.52	1.77
L1	2.743 REF		
L2	0.89	--	1.27
D	6.00	6.10	6.223
H	9.40	10.00	10.40
b	0.64	0.76	0.88
b1	5.21	5.34	5.46
e	2.286 BSC		
A	2.20	2.30	2.38
A1	0	--	0.127
c	0.46	0.50	0.60
c2	0.46	0.50	0.58
D1	5.21	--	--
E1	4.40	--	--
θ	0°	--	10°