



1200V / 2x20A

ACC040B12DD

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

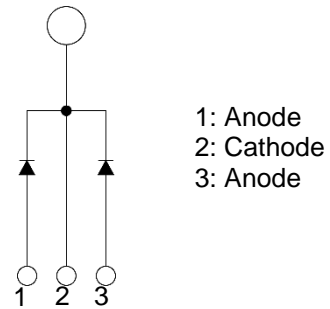
Outline (TO247-3L)



Applications

- Power Factor Correction in SMPS
- Solar inverter
- Uninterruptible Power Supply
- EV Charging Stations
- Data Center

Circuit Diagram

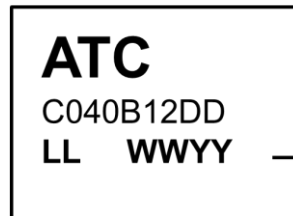


Mechanical Characteristics

- TO247-3L package
- Halogen Free
- Pb free lead plating ; RoHS compliant
- Packaging: Tube

Marking Diagram

Laser Mark



LL : Assembly Lot code
WW : Week
YY : Year



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Parameter and Specification

Absolute Maximum Rating⁽¹⁾

Parameter	Symbol	Condition	Value	Unit
Repetitive peak reverse voltage	V_{RM}	$T_c=25^{\circ}C$	1200	V
Continue forward current	I_F	$T_c=135^{\circ}C$	$2X20^{*1}$	A
Surge non-repetitive forward current , sine half-wave	I_{FSM}	$T_c=25^{\circ}C, t_p=10ms, \text{Sine half wave}$	$216^{*2}/432^{*3}$	A
		$T_c=110^{\circ}C, t_p=10ms, \text{Sine half wave}$	$162^{*2}/324^{*3}$	
Surge repetitive forward current	I_{FRM}	$T_c=25^{\circ}C, t_p=10ms, \text{Sine half wave}$	$97^{*2}/194^{*3}$	A
I^2t value	$\int I^2t$	$T_c=25^{\circ}C, t_p=10ms, \text{Sine half wave}$	$233^{*2}/933^{*3}$	A^2s
Total power dissipation	P_D	$T_c=25^{\circ}C$	$144^{*2}/288^{*3}$	W
		$T_c=110^{\circ}C$	$46^{*2}/92^{*3}$	
Junction temperature	T_j		175	$^{\circ}C$
Storage temperature	T_{STG}		-55 ~ 175	$^{\circ}C$

Note :

- (1) *1 Dual dice
- (2) *2 per Leg
- (3) *3 per Device
- (4) Exceeding these ratings may damage the device.

Thermal Characteristics

Parameter	Symbol	Condition	Typ.	Unit	
Thermal resistance	θ_{jc}	Junction - Case	Per Leg	0.69	$^{\circ}C / W$
			Per Device	0.35	



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Electrical Characteristics

Characteristic	Symbol	Condition	MIN	TYP	MAX	Unit
DC reverse voltage	V_{DC}	$T_j = 25^{\circ}C, I_R = 100\mu A$	1200	-	-	V
Forward voltage	V_F	$T_j = 25^{\circ}C, I_F = 20A$	-	1.4	1.6	V
		$T_j = 150^{\circ}C, I_F = 20A$	-	1.8	-	
		$T_j = 175^{\circ}C, I_F = 20A$	-	1.9	-	
Reverse current	I_R	$T_j = 25^{\circ}C, V_R = 1200V$	-	10	100	uA
		$T_j = 150^{\circ}C, V_R = 1200V$	-	40	-	
		$T_j = 175^{\circ}C, V_R = 1200V$	-	75	-	
Total capacity charge	Q_C	$T_j = 25^{\circ}C, V_R = 800V,$ $Q_C = \int_0^{V_R} C(V)dV$	-	116	-	nC
Total capacitance	C_{TOT}	$T_j = 25^{\circ}C, V_R = 1V,$ $F = 1MHz$	-	1430	-	pF
		$T_j = 25^{\circ}C, V_R = 800V,$ $F = 1MHz$	-	85	-	
		$T_j = 25^{\circ}C, V_R = 1200V,$ $F = 1MHz$	-	83	-	
Capacitance Stored Energy	E_C	$V_R = 800V$	-	35	-	μJ



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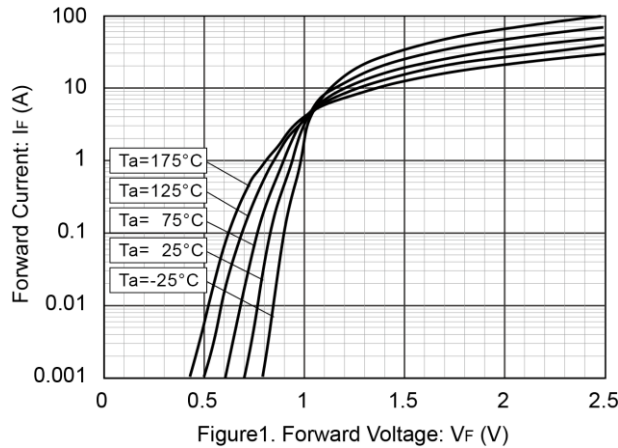
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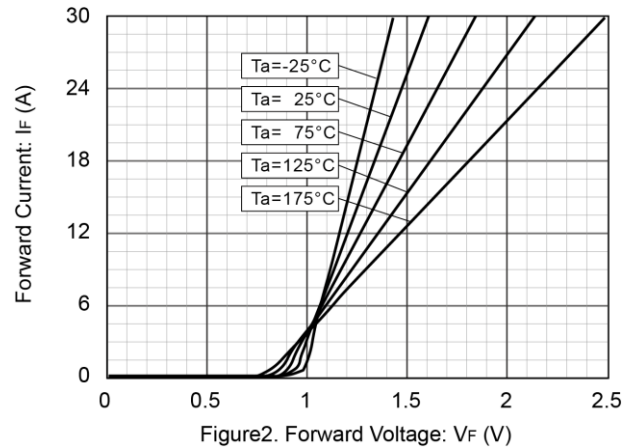
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Electrical Characteristic Curves

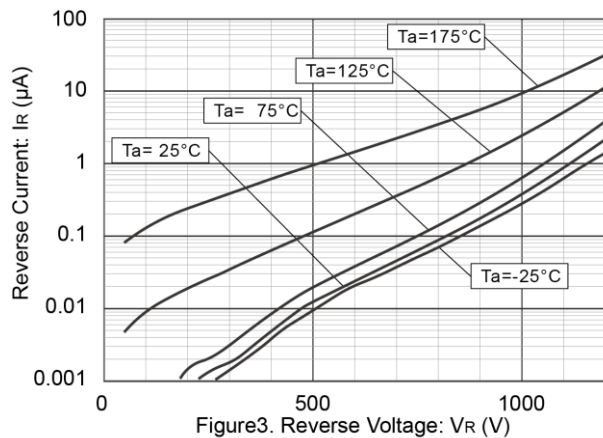
$V_F - I_F$ Characteristics (Per Leg)



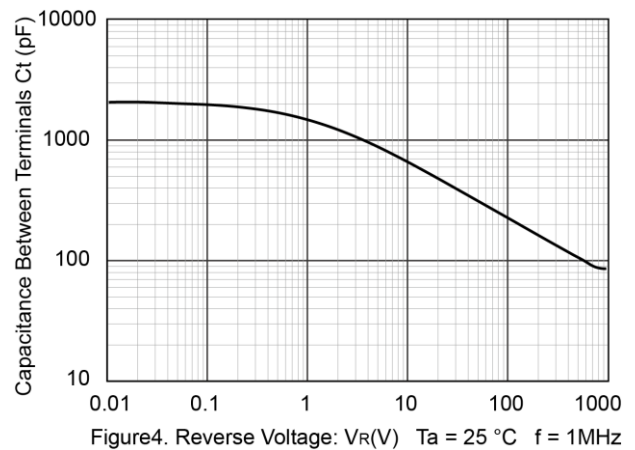
$V_F - I_F$ Characteristics (Per Leg)



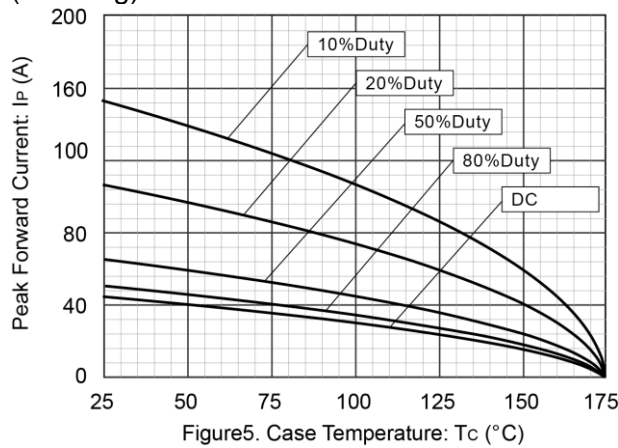
$V_R - I_R$ Characteristics (Per Leg)



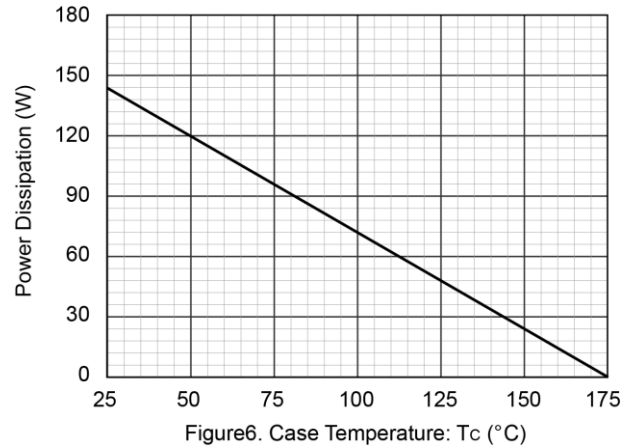
$V_R - C_t$ Characteristics (Per Leg)



Maximum $I_P - T_C$ Characteristics (Per Leg)



Power Dissipation (Per Leg)





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I_{FSM} – PW Characteristics (Per Leg)

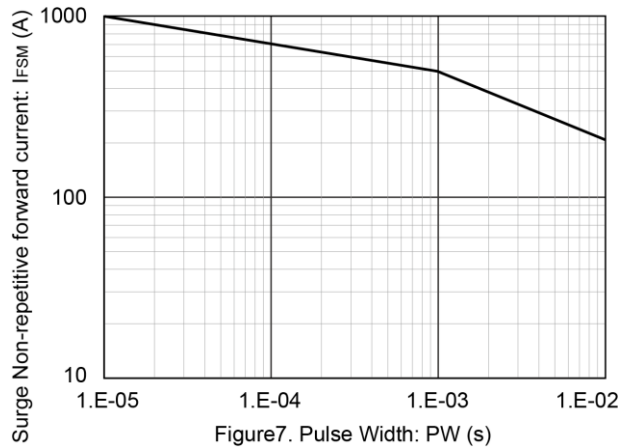


Figure7. Pulse Width: PW (s)

E_C – V_R Characteristics (Per Leg)

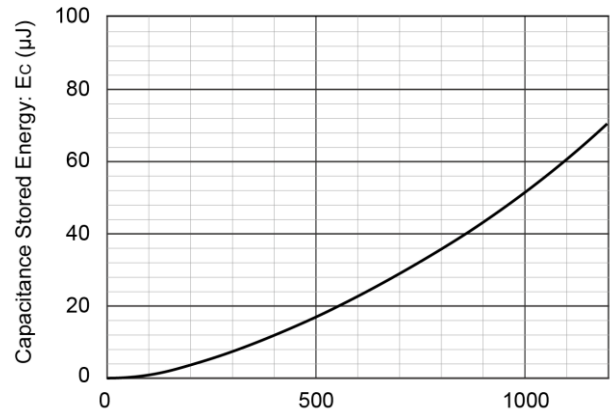


Figure8. Reverse Voltage: V_R (V)

Typical Transient Thermal Resistance vs. Pulse Width (Per Leg)

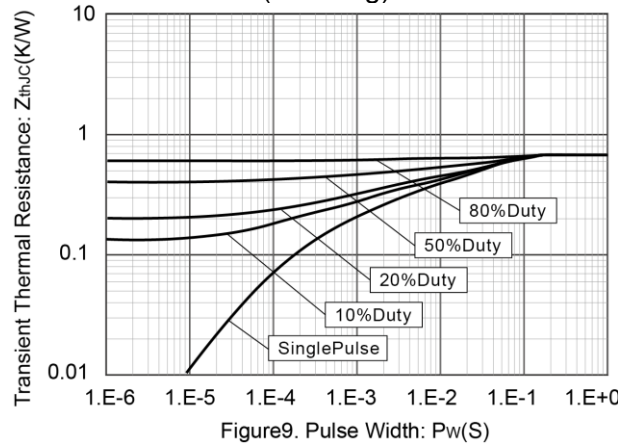


Figure9. Pulse Width: Pw(S)

Simplified Forward Characteristic (Per Leg)

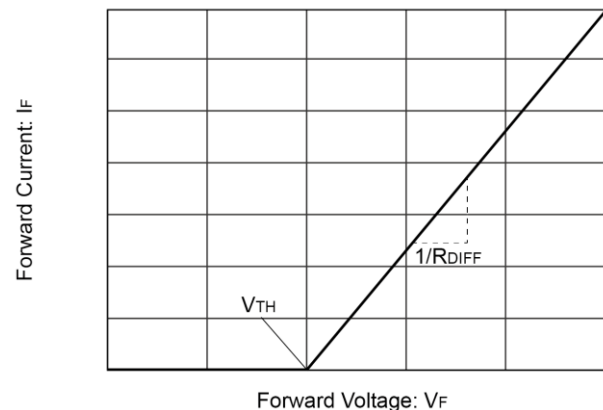


Figure10. Equivalent forward current curve

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

Threshold Voltage (V_{TH}):

$$V_{TH}(T_j) = -0.001 \times T_j + 0.953 [V]$$

Differential Resistance (R_{DIFF}):

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

$$A = 4.0 \times 10^{-7}$$

$$B = 1.5 \times 10^{-4}$$

$$C = 1.85 \times 10^{-2}$$



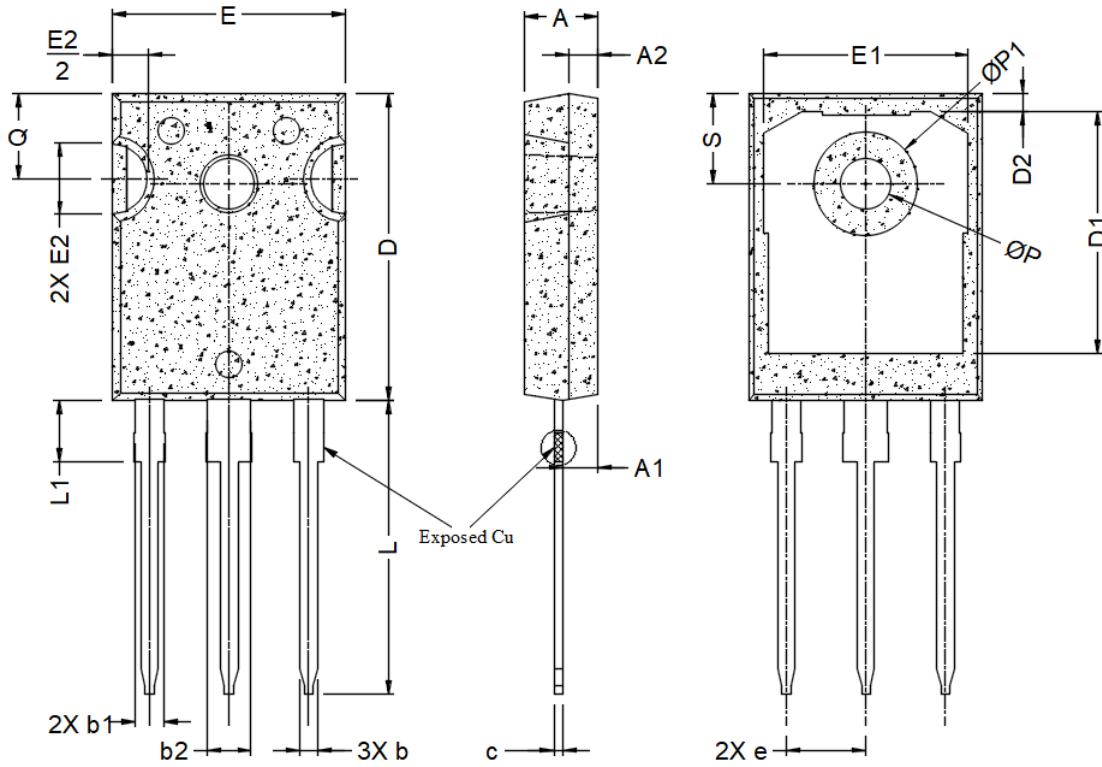
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Package Outline



Unit : mm

SYMBOL	DIMENSIONS		
	MIN.	NCM.	MAX.
A	4.83	5.02	5.21
A1	2.29	2.41	2.55
A2	1.50	2.00	2.49
b	1.12	1.20	1.33
b1	1.91	2.00	2.39
b2	2.87	3.00	3.22
c	0.55	0.60	0.69
D	20.80	20.95	21.10
D1	16.25	16.55	17.65
D2	0.51	1.19	1.35
E	15.75	15.94	16.13
E1	13.46	14.02	14.16
E2	4.32	4.91	5.49
e	5.44BSC		
L	19.81	20.07	20.32
L1	4.10	4.19	4.40
ØP	3.56	3.61	3.65
ØP1	7.19REF.		
Q	5.39	5.79	6.20
S	6.04	6.17	6.30