

ASC10D650DF2C

650V, 10A, 29nC, Silicon Carbide Schottky Diode

Product Data Sheet

ASTC-3T04-119A A/0



爱仕特科技
AST TECHNOLOGY

General Description

The AST-DF2 series SiC Diode in a TO-220F-2L package delivers ultra-low conduction loss and rugged reliability for high-frequency switched-mode power supplies, with safe paralleling capability and automotive-grade compliance.

Features

- Zero Reverse / Forward Recovery
- No Reverse Recovery Current
- Max Junction Temperature 175°C
- 100% Avalanche (UIL) Tested
- Temperature Independent Switching Behavior
- High-speed Switching



Applications

- Motor Drives
- Photovoltaic
- UPS
- Switched-mode Power Supplies (SMPS)
- Power Factor Correction (PFC)
- Wind Power
- Locomotive Traction

Ordering Informations

Order Number	ASC10D650DF2C
Marking	ASC10D650DF2
Package Type	TO-220F-2L
Packing Method	Tube

Key Parameters

Symbol	Parameter	Values			Unit	Test Conditions
Absolute maximum rating						
V _{RRM}	Repetitive Peak Reverse Voltage	650			V	T _c =25°C
I _F	Continuous Forward Current for R _{th(j-c,max)}	27			A	T _c =25°C
		10				T _c =150°C
T _{VJ} ; T _{STG}	Operating Junction and Storage Temperature	-55 to 175			°C	
Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
Static characteristics						
V _F	Forward Voltage	-	1.36	1.65	V	I _F =10A; T _{VJ} =25°C
		-	1.66	-		I _F =10A; T _{VJ} =175°C
Dynamic characteristics						
Q _C	Total Capacitive Charge	-	29	-	nC	V _R =400V; T _{VJ} =25°C

Absolute Maximum Ratings (at $T_{VJ}=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Values	Unit	Test Conditions
V_{RRM}	Repetitive Peak Reverse Voltage	650	V	$T_C=25^{\circ}\text{C}$
I_F	Continuous Forward Current for $R_{th(j-c,max)}$	27	A	$T_C=25^{\circ}\text{C}$
		10		$T_C=150^{\circ}\text{C}$
I_{FRM}	Repetitive Forward Surge Current (Half Sine Pulse)	60	A	$T_C=25^{\circ}\text{C}; t_p=10\text{ms}$
		52		$T_C=110^{\circ}\text{C}; t_p=10\text{ms}$
I_{FSM}	Non-Repetitive Forward Surge Current (Half Sine Pulse)	75	A	$T_C=25^{\circ}\text{C}; t_p=10\text{ms}$
		66		$T_C=110^{\circ}\text{C}; t_p=10\text{ms}$
P_{tot}	Power Dissipation for $R_{th(j-c,max)}$	64	W	$T_C=25^{\circ}\text{C}$
$T_{VJ}; T_{STG}$	Operating Junction and Storage Temperature	-55 to 175	$^{\circ}\text{C}$	

Electrical Characteristics (at $T_{VJ}=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
V_{DC}	DC Blocking Voltage	650	-	-	V	$I_R=100\mu\text{A}$
V_F	Forward Voltage	-	1.36	1.65	V	$I_F=10\text{A}; T_{VJ}=25^{\circ}\text{C}$
		-	1.66	-		$I_F=10\text{A}; T_{VJ}=175^{\circ}\text{C}$
I_R	Reverse Current	-	1	40	μA	$V_R=650\text{V}; T_{VJ}=25^{\circ}\text{C}$
		-	8.5	-		$V_R=650\text{V}; T_{VJ}=175^{\circ}\text{C}$
Q_C	Total Capacitive Charge	-	29	-	nC	$V_R=400\text{V}$
C	Total Capacitance	-	390	-	pF	$V_R=1\text{V}; f=1\text{MHz}$
		-	56	-		$V_R=200\text{V}; f=1\text{MHz}$
		-	41	-		$V_R=400\text{V}; f=1\text{MHz}$
E_C	Capacitance Stored Energy	-	4.2	-	μJ	$V_R=400\text{V}$

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	-	2.35	-	$^{\circ}\text{C/W}$

Typical Performance

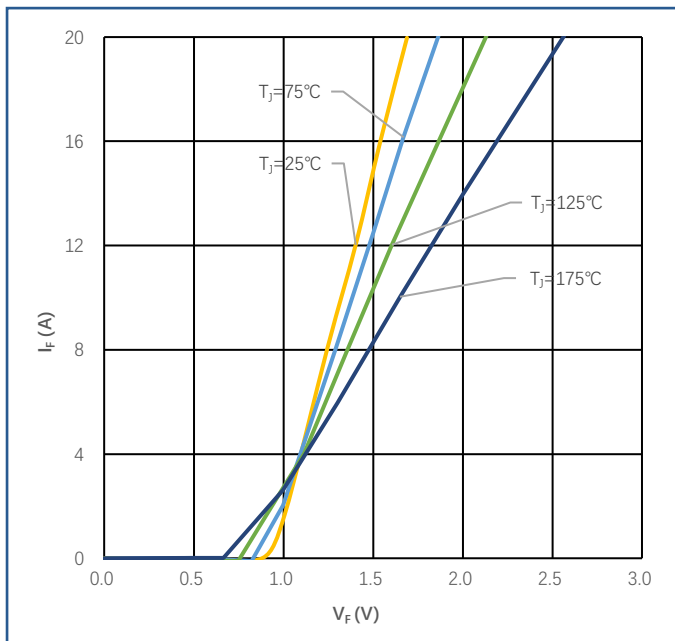


Figure 1

Forward Characteristics

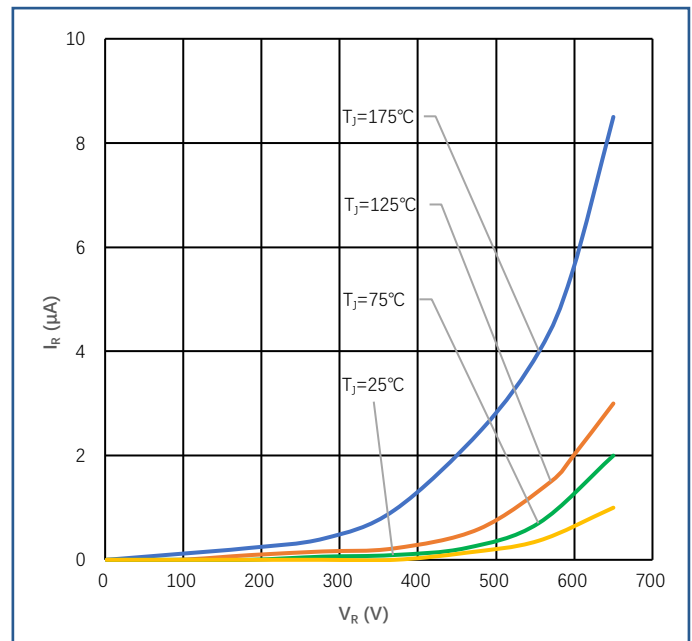


Figure 2

Reverse Characteristics

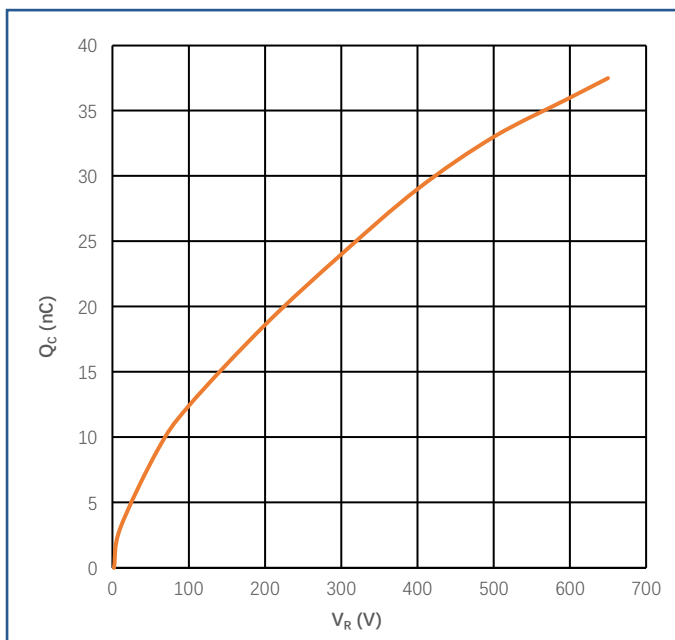


Figure 3

Reverse Charge vs. Reverse Voltage

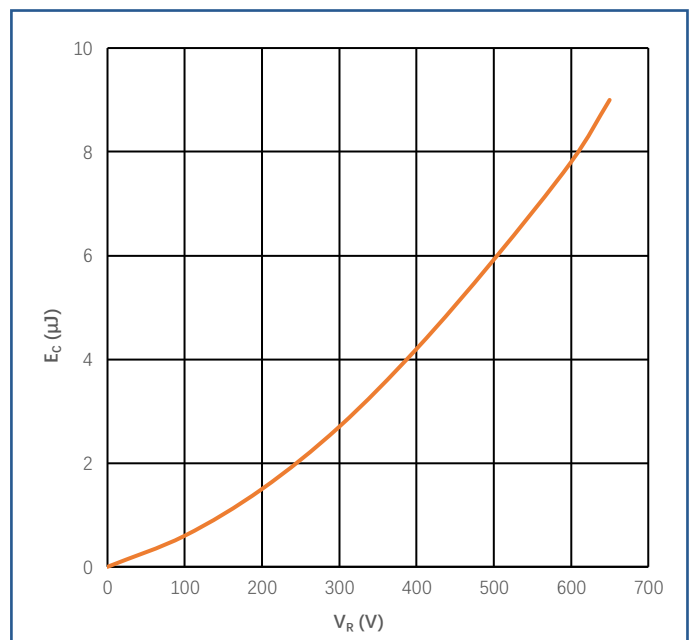


Figure 4

Capacitance Stored Energy

Typical Performance

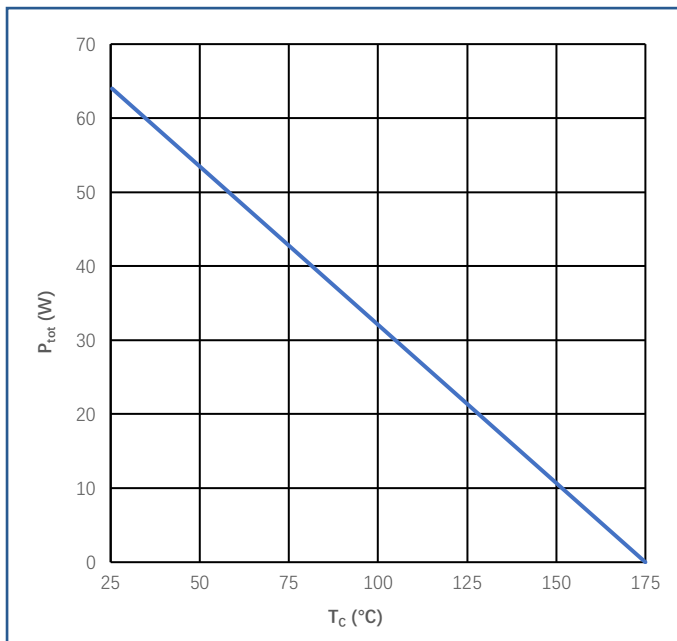


Figure 5
Power Derating

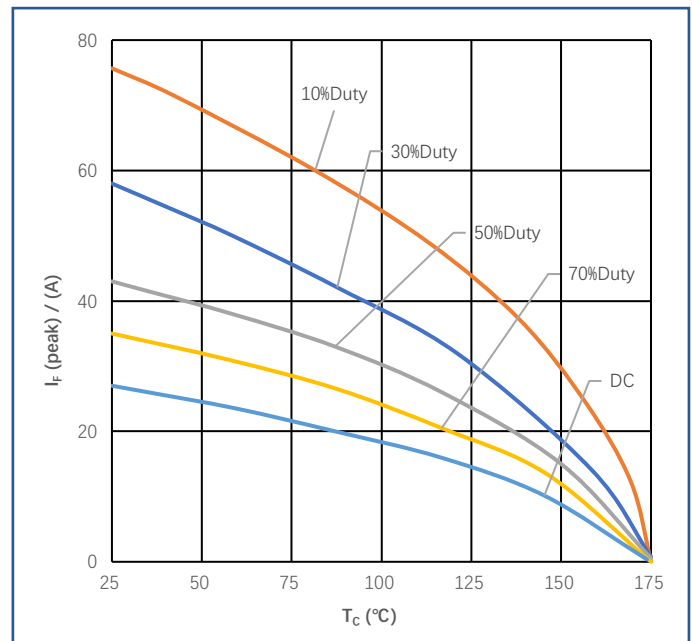


Figure 6
Current Derating

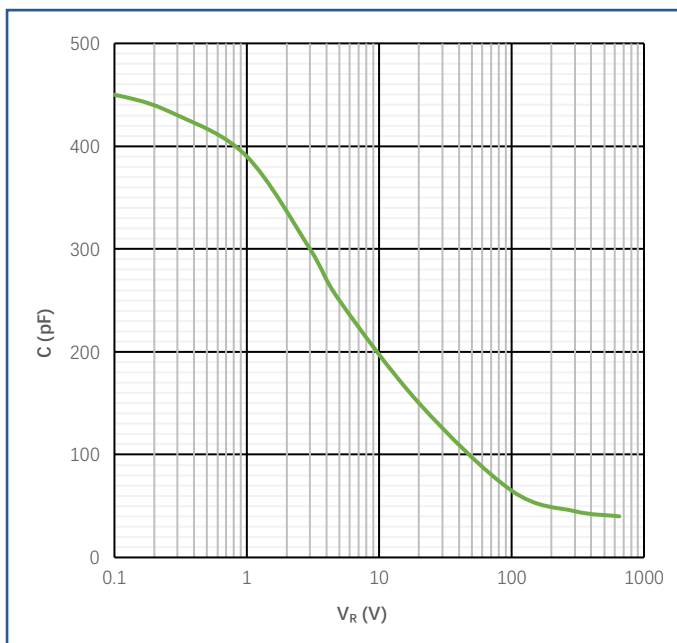


Figure 7
Capacitance vs. Reverse Voltage

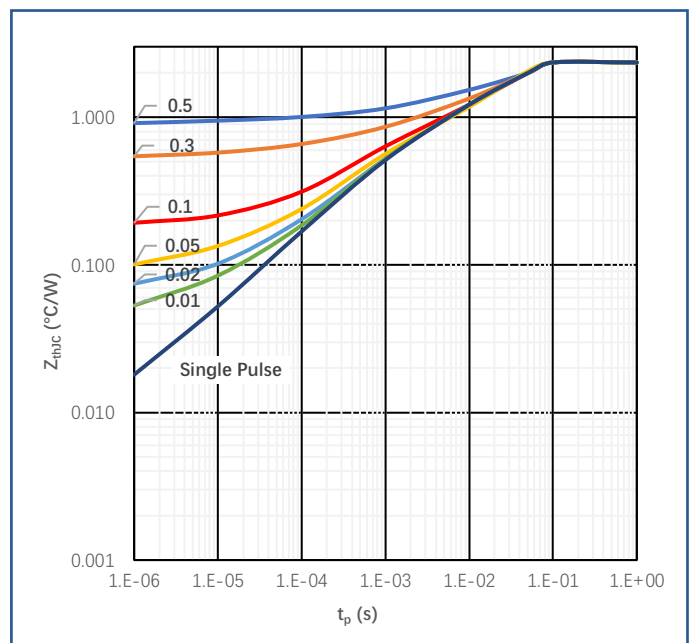
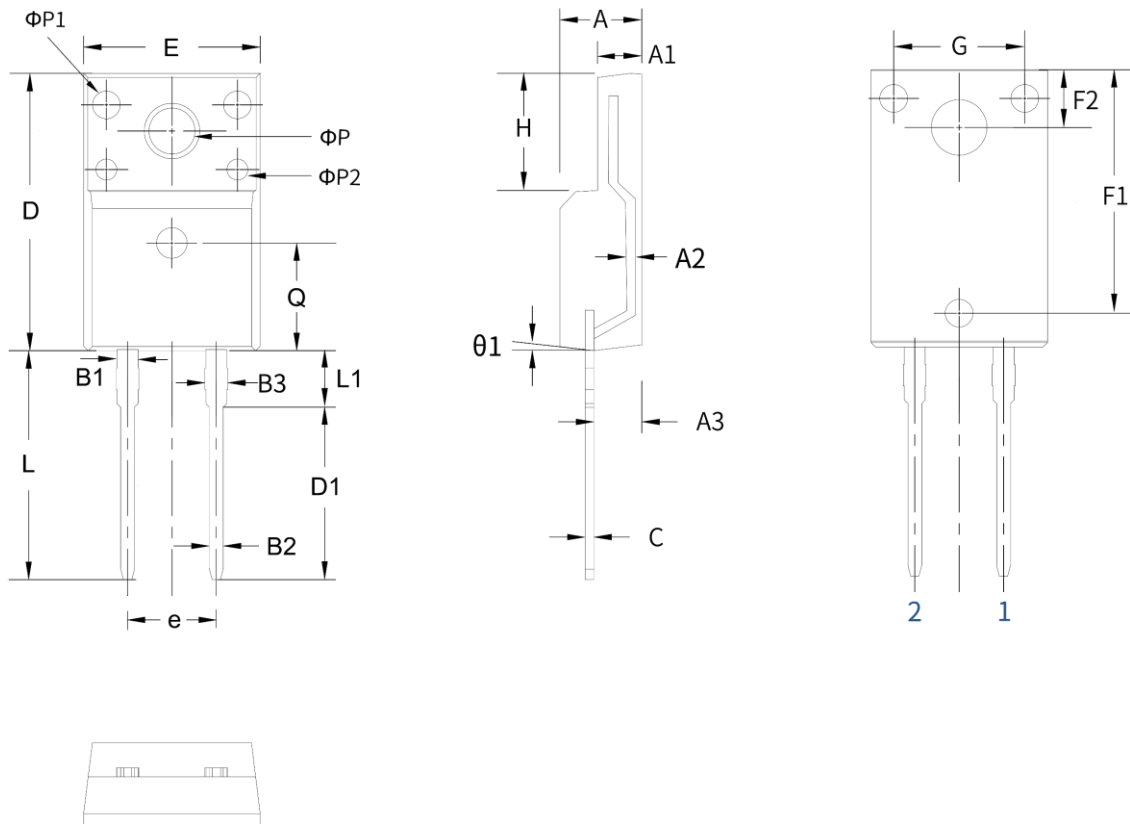


Figure 10
Transient Thermal Impedance

Package Dimensions (mm)

Package Type: TO-220F-2L



Symbol	Millimeters			Symbol	Millimeters		
	Min.	Type.	Max.		Min.	Type.	Max.
A	4.50	4.70	4.90	E1	9.92	10.02	10.12
A1	2.34	2.54	2.74	F1	13.80	13.90	14.00
A2	0.38	0.43	0.48	F2	3.20	3.30	3.40
A3	2.66	2.76	2.86	G	6.90	7.00	7.10
B1	1.24	1.29	1.34	K	0.65	0.70	0.75
B2	0.75	0.80	0.85	L	12.76	12.96	13.16
B3	1.28	1.36	1.44	L1	-	-	3.33
C	0.45	0.50	0.60	Q	6.47 REF		
D	15.67	15.87	16.07	ΦP	3.00	3.18	3.38
D1	9.6	9.80	10.00	$\Phi P1$	1.40	1.50	1.60
e	5.08 BSC			$\Phi P2$	0.95	1.00	1.05
H	6.48	6.68	6.88	$\theta 1$	3°	5°	7°
E	9.96	10.16	10.36				

Pin	Symbol	Description
1	K	Cathode
2	A	Anode

Note:

1. All metal surfaces are Sn plated (matte), except area of cut.
2. Burr or mold flash size (0.5 mm) is not included in the dimensions.

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