

ASC20D650DT2C

650V, 20A, Silicon Carbide Schottky Diode

Product Data Sheet

ASTC-3T04-112A A/0



爱仕特科技
AST TECHNOLOGY

General Description

The AST-DT2 series SiC Diode in a TO-247-2LD 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	ASC20D650DT2C
Marking	ASC20D650DT2
Package Type	TO-247-2LD
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)}	60			A	T _C =25°C
		20				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	-	1.33	1.60	V	I _F =20A; T _{VJ} =25°C
		-	1.60	-		I _F =20A; T _{VJ} =175°C
Dynamic characteristics						
Q _C	Total Capacitive Charge	-	63	-	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 $R_{th(j-c,max)}$	60	A	$T_C=25^{\circ}\text{C}$
		20		$T_C=150^{\circ}\text{C}$
I_{FSM}	Non-Repetitive Forward Surge Current, Sine Half-wave	125	A	$T_C=25^{\circ}\text{C}; t_p=10\text{ms}$
		100		$T_C=150^{\circ}\text{C}; t_p=10\text{ms}$
I_{FRM}	Repetitive Forward Surge Current, Sine Half-wave	62	A	$T_C=25^{\circ}\text{C}; t_p=10\text{ms}$
		42		$T_C=150^{\circ}\text{C}; t_p=10\text{ms}$
E_{AS}	Single Pulse Avalanche Energy	39	mJ	$T_C=25^{\circ}\text{C}; L=0.5\text{mH}; V_{DD}=50\text{V}; I_{peak}=12.5\text{A}$
P_{tot}	Power Dissipation for $R_{th(j-c,max)}$	187	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	-	1.33	1.60	V	$I_F=20\text{A}; T_{VJ}=25^{\circ}\text{C}$
		-	1.60	-		$I_F=20\text{A}; T_{VJ}=175^{\circ}\text{C}$
I_R	Reverse Current	-	2	80	μA	$V_R=650\text{V}; T_{VJ}=25^{\circ}\text{C}$
		-	12	-		$V_R=650\text{V}; T_{VJ}=175^{\circ}\text{C}$
Q_C	Total Capacitive Charge	-	63	-	nC	$V_R=400\text{V}$
C	Total Capacitance	-	863	-	pF	$V_R=1\text{V}; f=1\text{MHz}$
		-	124	-		$V_R=200\text{V}; f=1\text{MHz}$
		-	89	-		$V_R=400\text{V}; f=1\text{MHz}$
E_C	Capacitance Stored Energy	-	9.5	-	μJ	$V_R=400\text{V}$

Thermal Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	-	0.80	-	$^{\circ}\text{C/W}$

Typical Performance

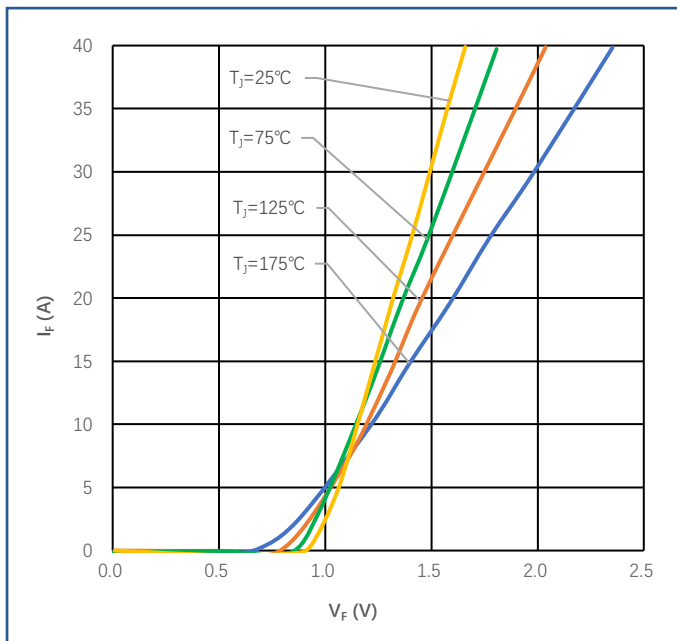


Figure 1

Forward Characteristics

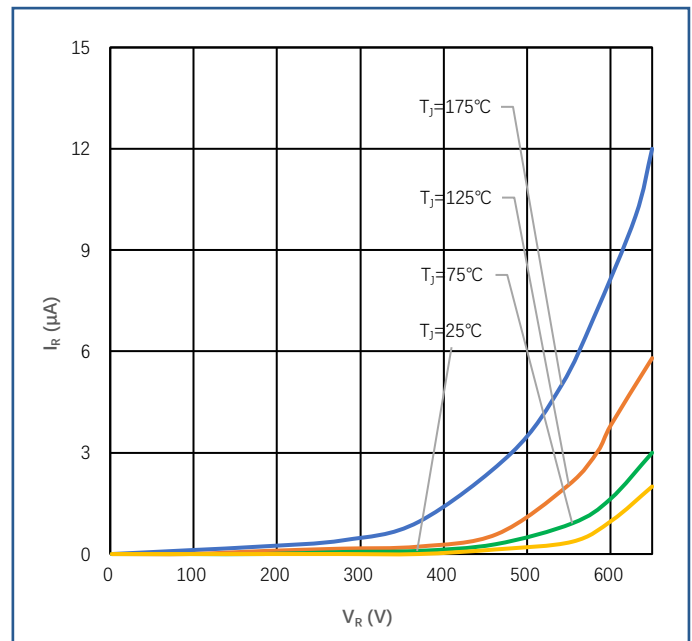


Figure 2

Reverse Characteristics

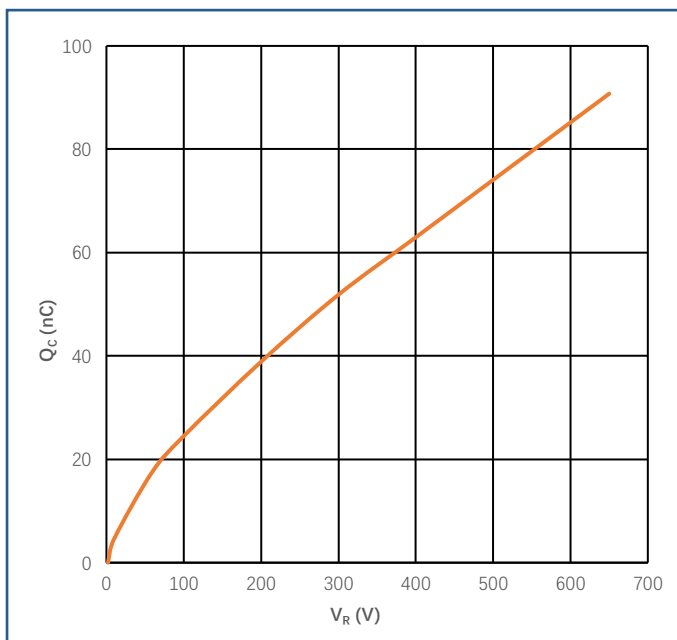


Figure 3

Reverse Charge vs. Reverse Voltage

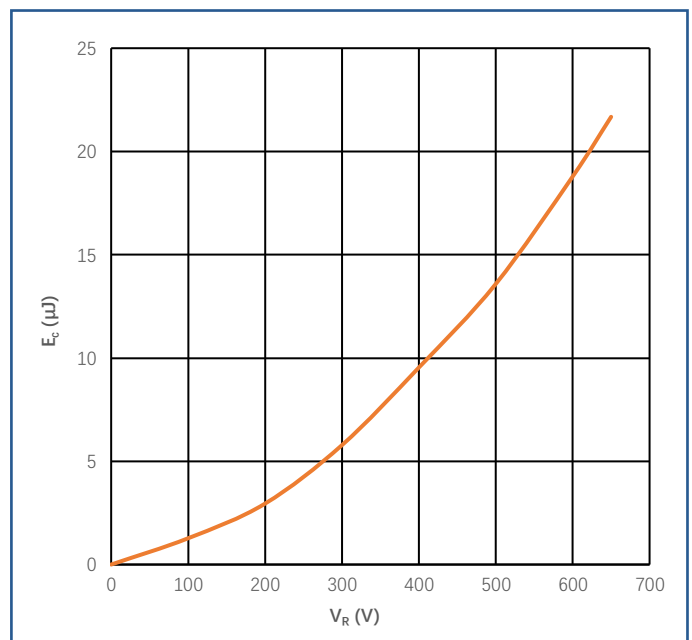


Figure 4

Capacitance Stored Energy

Typical Performance

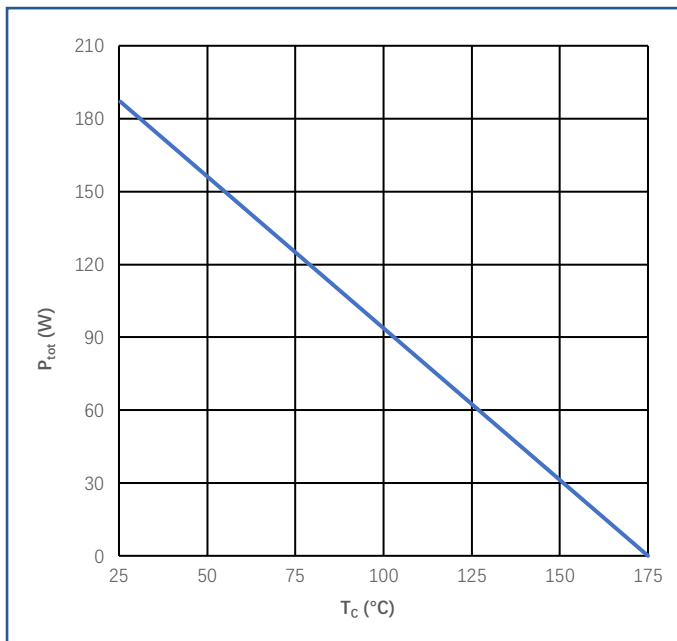


Figure 5
Power Derating

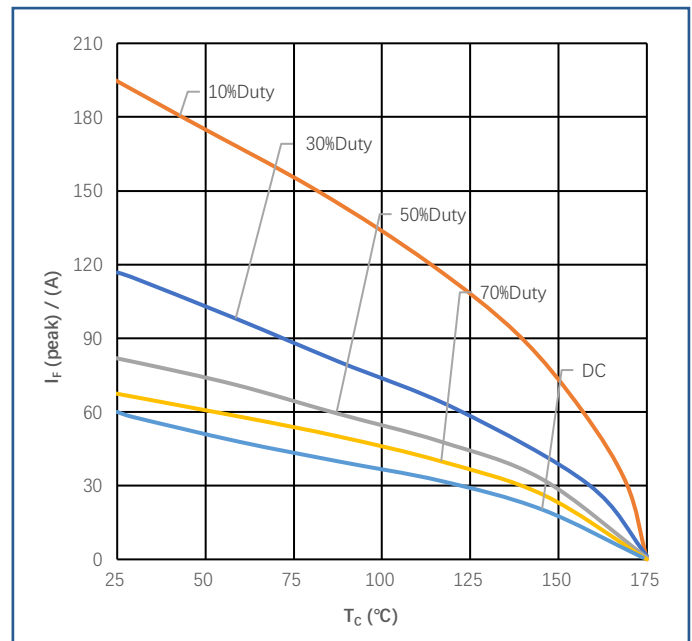


Figure 6
Current Derating

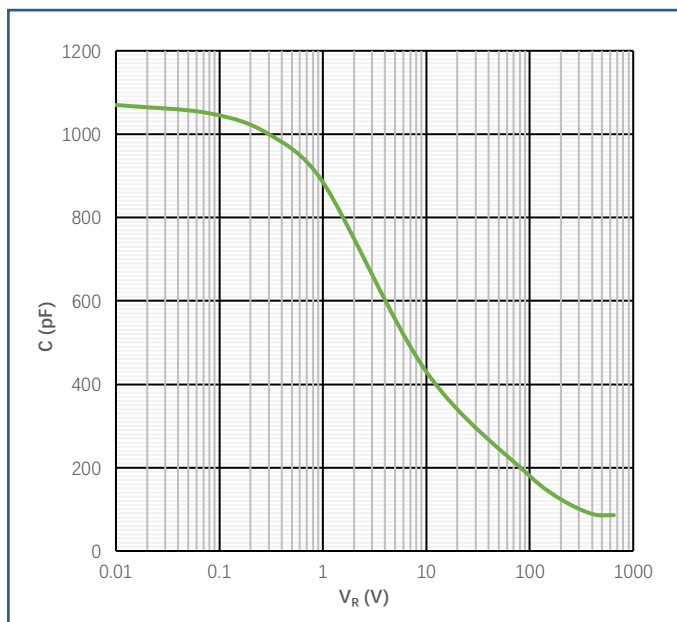


Figure 7
Capacitance vs. Reverse Voltage

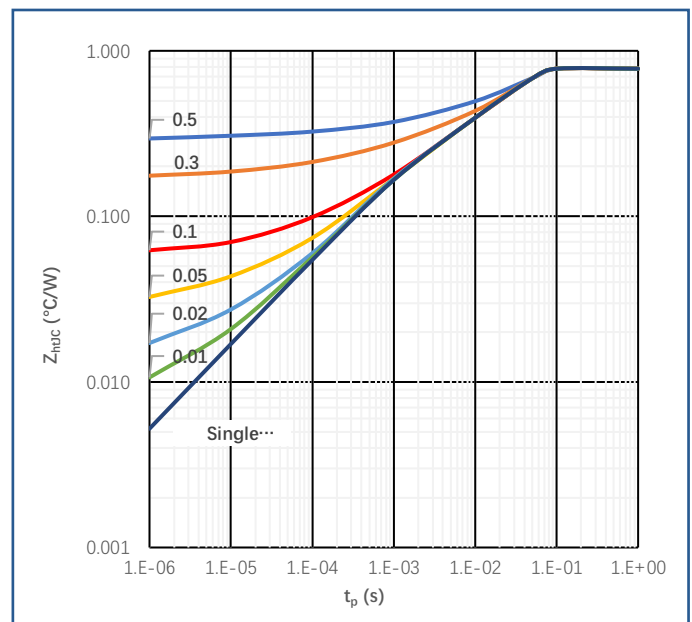
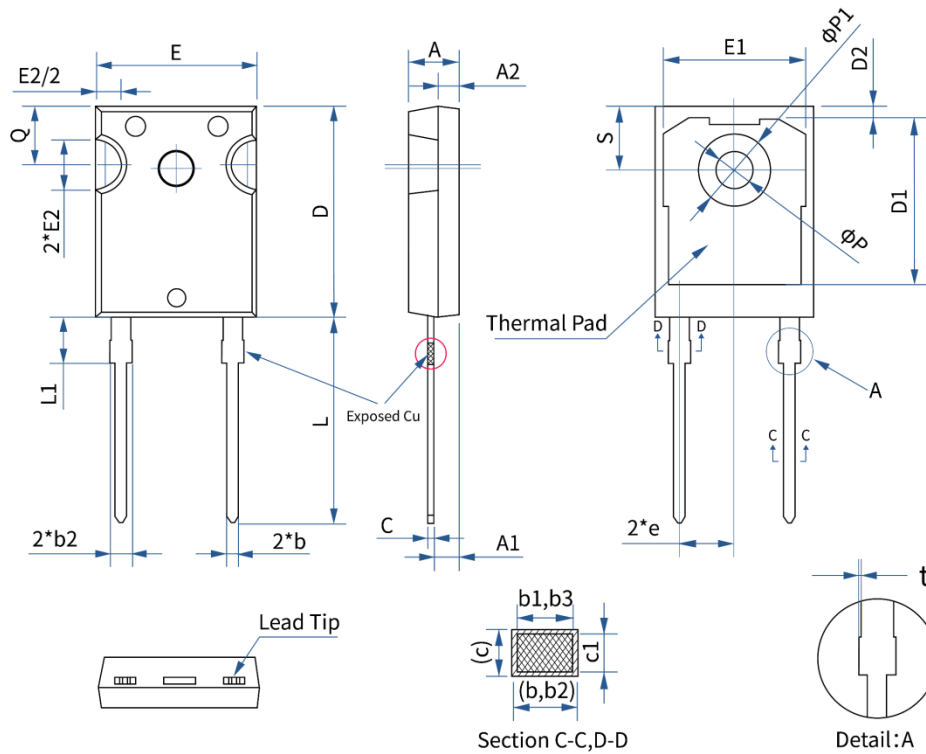


Figure 8
Transient Thermal Impedance

Package Dimensions (mm)

Package Type: TO-247-2LD



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.90	5.10	0.193	0.201
A1	2.31	2.51	0.091	0.099
A2	1.9	2.1	0.075	0.083
b	1.16	1.26	0.046	0.050
b1	1.15	1.22	0.045	0.048
b2	1.96	2.06	0.077	0.081
b3	1.95	2.02	0.077	0.080
c	0.59	0.66	0.023	0.026
c1	0.58	0.62	0.023	0.024
D	20.9	21.1	0.823	0.831
D1	16.25	16.85	0.640	0.663
D2	1.05	1.35	0.041	0.053
E	15.75	15.9	0.620	0.626
E1	13.26	-	0.552	-
E2	4.90	5.10	0.193	0.201
e	5.44BSC		0.214BSC	
L	19.80	20.10	0.780	0.791
L1	-	4.30	-	0.169
ϕP	3.50	3.70	0.138	0.146
$\phi P1$	-	7.40	-	0.291
S	6.22	6.42	0.238	0.246
t	0.00	0.15	0.000	0.006

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