AS3D030120P2

1200V,30A Silicon Carbide Schottky Diode

Features

- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Positive Temperature Coefficient on V_F
- Temperature-independent Switching
- 175°C Operating Junction Temperature

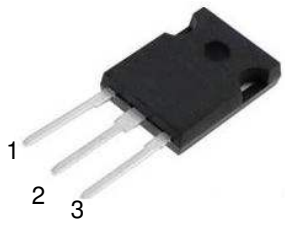
V_{RRM}	=	1200	V
I_F (T_C≤135℃)	=	39	A**
Q_C	=	86	nC**

*Per Leg, **Per Device

Benefits

- Replace Bipolar with Unipolar Device
- Reduction of Heat Sink Size
- Parallel Devices Without Thermal Runaway
- Essentially No Switching Losses

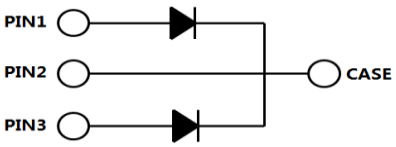
Package



TO-247-3

Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor drive, PV Inverter, Wind Power Station



Part Number	Package	Marking
AS3D030120P2	TO-247-3	ASD30120P2

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Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V	T_C = 25˚C	
V_{RSM}	Surge Peak Reverse Voltage	1200	V	T_C = 25˚C	
V_R	DC Blocking Voltage	1200	V	T_C = 25˚C	
I_F	Forward Current (Per leg/Device)	42/84 19.5/39 15/30	A	T_C ≤ 25˚C T_C ≤ 135˚C T_C ≤ 150˚C	
I_{FSM}	Non-Repetitive Forward Surge Current	137*	A	T_C = 25˚C, t_p = 8.3ms, Half Sine Wave	
P_{tot}	Power Dissipation (Per leg/Device)	214/ 428	W	T_C = 25˚C	Fig.3
T_C	Maximum Case Temperature	150	˚C		
T_J, T_{STG}	Operating Junction and Storage Temperature	-55 to 175	˚C		
	TO-247 Mounting Torque	1	Nm	M3 Screw	

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.55 2.2	1.8 2.5	V	I_F = 15A, T_J = 25˚C I_F = 15A, T_J = 175˚C	Fig.1
I_R	Reverse Current	5 20	20 200	μA	V_R = 1200V, T_J = 25˚C V_R = 1200V, T_J = 175˚C	Fig.2
C	Total Capacitance	940 70 57	/	pF	V_R = 0V, T_J = 25˚C, f = 1MHz V_R = 400V, T_J = 25˚C, f = 1MHz V_R = 800V, T_J = 25˚C, f = 1MHz	Fig.5
Q_C	Total Capacitive Charge	43	/	nC	V_R = 800V, I_F = 15A di/dt = 200A/μs, T_J = 25˚C	Fig.4

Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.7* 0.35**	˚C/W	Fig.6
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	80	˚C/W	
T_{sold}	Soldering Temperature	260	˚C	

*Per Leg, **Per Device

Typical Performance (Per Leg)

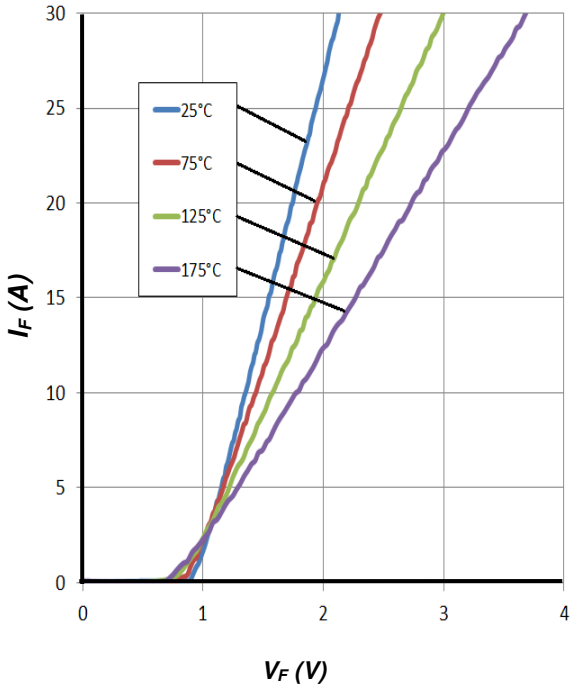


Figure 1. Forward Characteristics

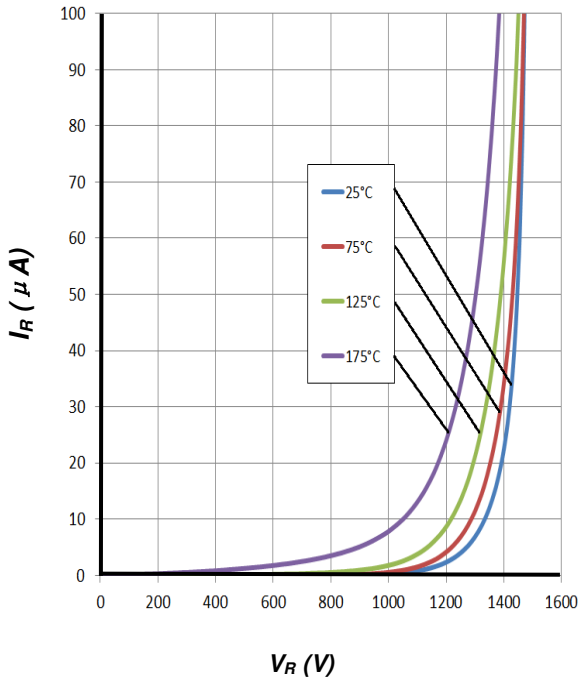


Figure 2. Reverse Characteristics

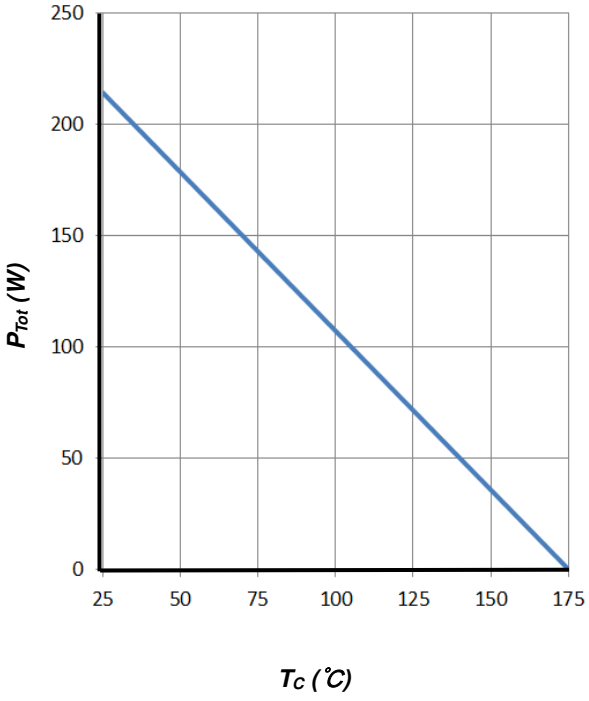


Figure 3. Power Derating

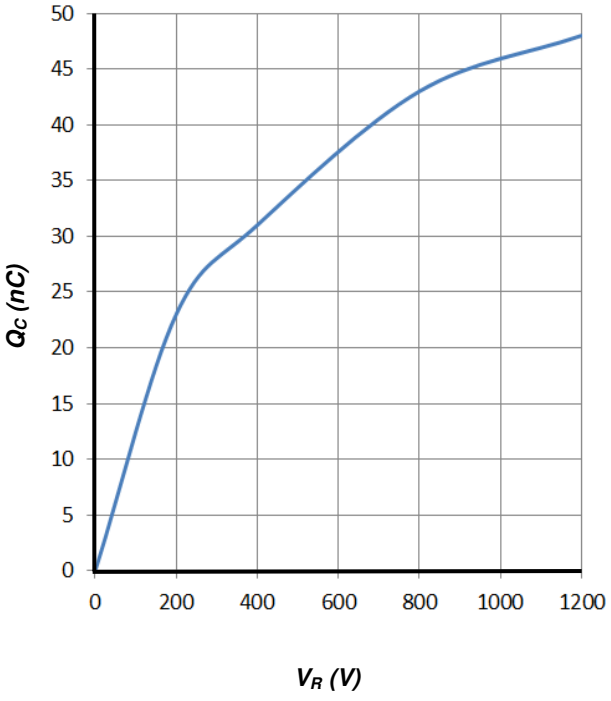


Figure 4. Total Capacitive Charge vs. Reverse Voltage

Typical Performance (Per Leg)

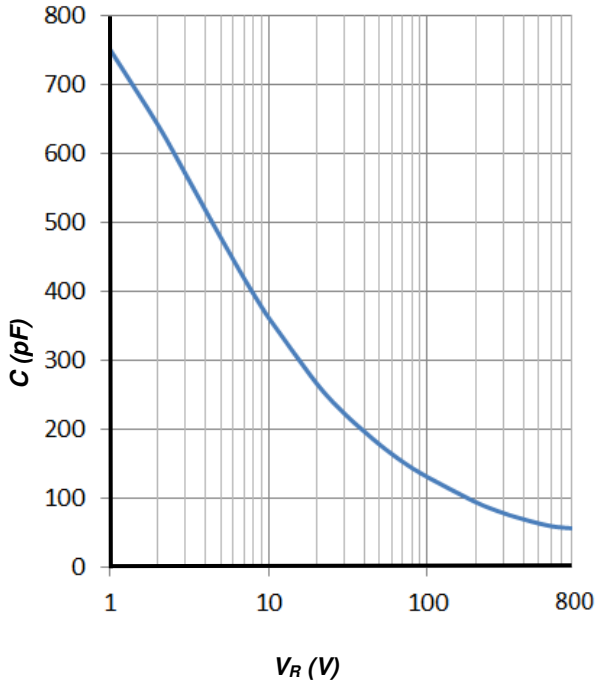


Figure 5. Total Capacitance vs. Reverse Voltage

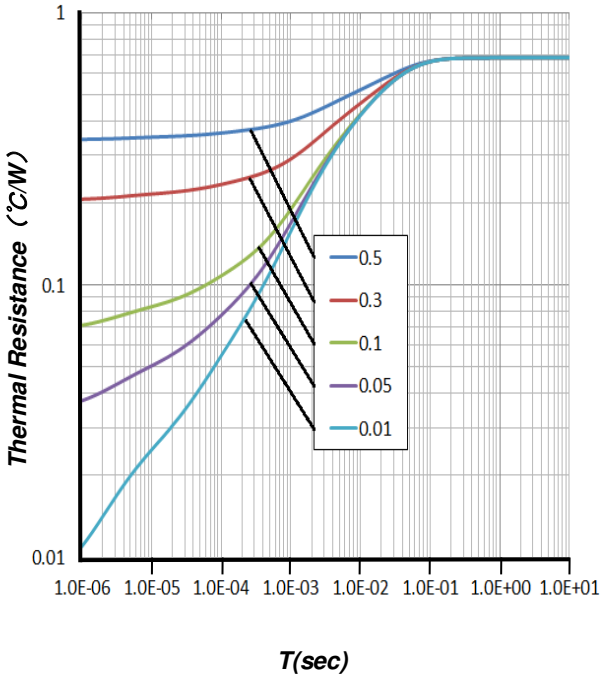
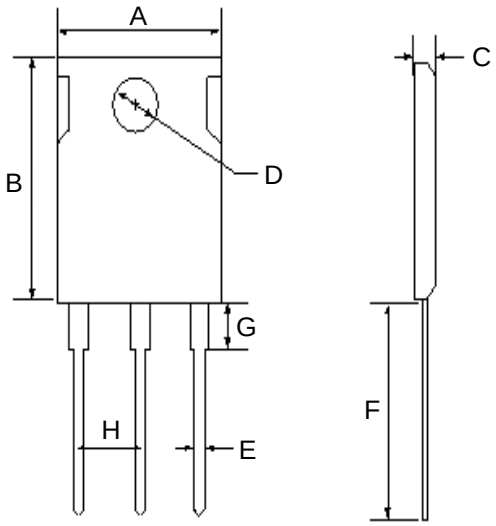


Figure 6. Transient Thermal Impedance

Package Dimensions

Package TO-247-3



Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	14.18	15.75	17.33
B	18.45	20.5	22.55
C	4.50	5.00	5.50
D	3.15	3.50	3.85
E	1.08	1.20	1.32
F	18.27	20.30	22.33
G	4.21	4.68	5.15
H	4.91	5.46	6.01