

### Features

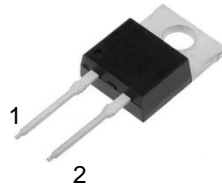
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Positive Temperature Coefficient on  $V_F$
- Temperature-independent Switching
- 175°C Operating Junction Temperature

$V_{RRM}$	=	1200	V
$I_F (T_C \leq 135^\circ C)$	=	9.5	A
$Q_C$	=	18.5	nC

### Benefits

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

### Package



TO-220-2

### Applications

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



Part Number	Package	Marking
AS3D005120A	TO-220-2	ASD5120A

### Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
V <sub>RRM</sub>	Repetitive Peak Reverse Voltage	1200	V	T <sub>C</sub> = 25°C	
V <sub>RSM</sub>	Surge Peak Reverse Voltage	1200	V	T <sub>C</sub> = 25°C	
V <sub>R</sub>	DC Blocking Voltage	1200	V	T <sub>C</sub> = 25°C	
I <sub>F</sub>	Forward Current	19 9.5 5	A	T <sub>C</sub> ≤ 25°C T <sub>C</sub> ≤ 135°C T <sub>C</sub> ≤ 161°C	
I <sub>FSM</sub>	Non-Repetitive Forward Surge Current	50	A	T <sub>C</sub> = 25°C, t <sub>p</sub> = 8.3ms, Half Sine Wave	
P <sub>tot</sub>	Power Dissipation	130	W	T <sub>C</sub> = 25°C	Fig.3
T <sub>C</sub>	Maximum Case Temperature	161	°C		
T <sub>J</sub> , T <sub>STG</sub>	Operating Junction and Storage Temperature	-55 to 175	°C		
	TO-220-2 Mounting Torque	1	Nm	M3 Screw	

### Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V <sub>F</sub>	Forward Voltage	1.55 2.2	1.8 2.5	V	I <sub>F</sub> = 5A, T <sub>J</sub> = 25°C I <sub>F</sub> = 5A, T <sub>J</sub> = 175°C	Fig.1
I <sub>R</sub>	Reverse Current	2 10	20 200	μA	V <sub>R</sub> = 1200V, T <sub>J</sub> = 25°C V <sub>R</sub> = 1200V, T <sub>J</sub> = 175°C	Fig.2
C	Total Capacitance	340 32.5 25	/	pF	V <sub>R</sub> = 0V, T <sub>J</sub> = 25°C, f = 1MHz V <sub>R</sub> = 400V, T <sub>J</sub> = 25°C, f = 1MHz V <sub>R</sub> = 800V, T <sub>J</sub> = 25°C, f = 1MHz	Fig.5
Q <sub>C</sub>	Total Capacitive Charge	18.5	/	nC	V <sub>R</sub> = 800V, I <sub>F</sub> = 5A di/dt = 200A/μs, T <sub>J</sub> = 25°C	Fig.4

### Thermal Characteristics

Symbol	Parameter	Typ.	Unit	Note
R <sub>θJC</sub>	Thermal Resistance from Junction to Case	1.15	°C/W	Fig.6
R <sub>θJA</sub>	Thermal Resistance from Junction to Ambient	80	°C/W	
T <sub>sold</sub>	Soldering Temperature	260	°C	

## Typical Performance

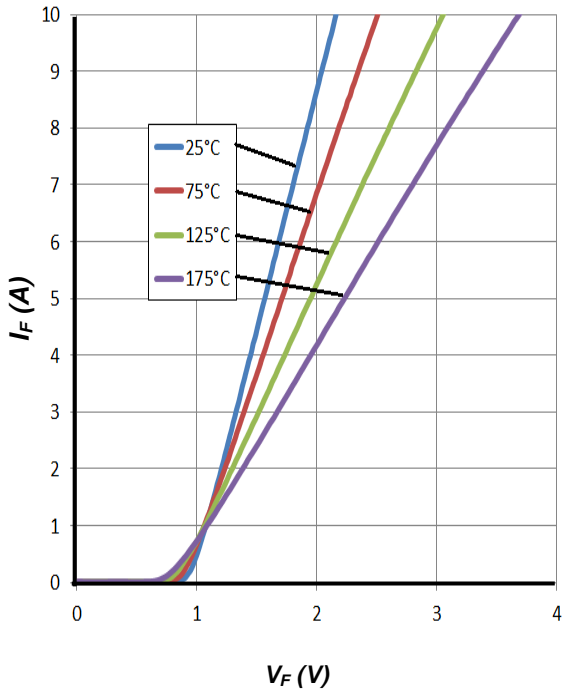


Figure 1. Forward Characteristics

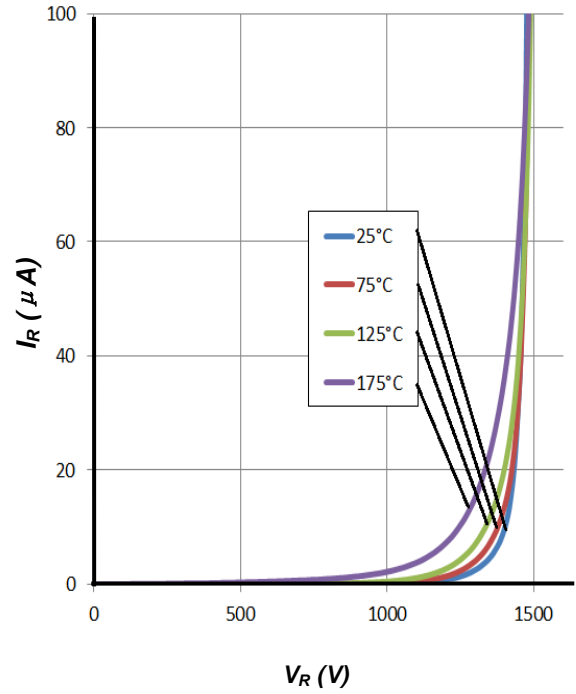


Figure 2. Reverse Characteristics

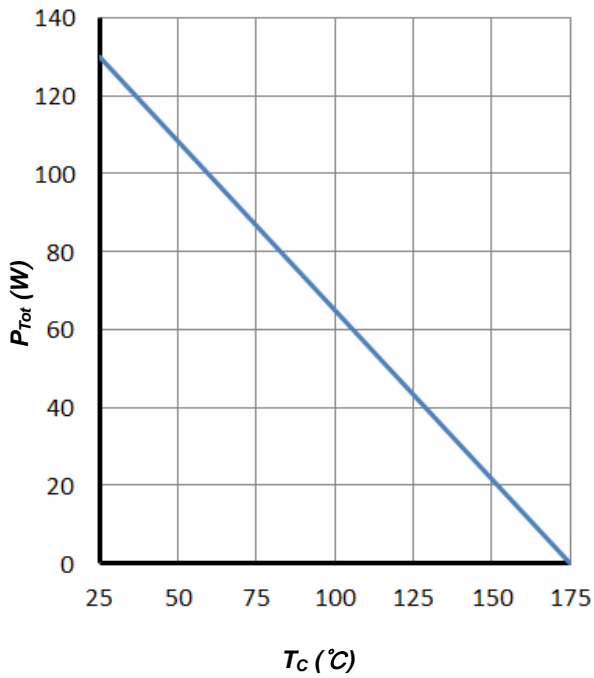


Figure 3. Power Derating

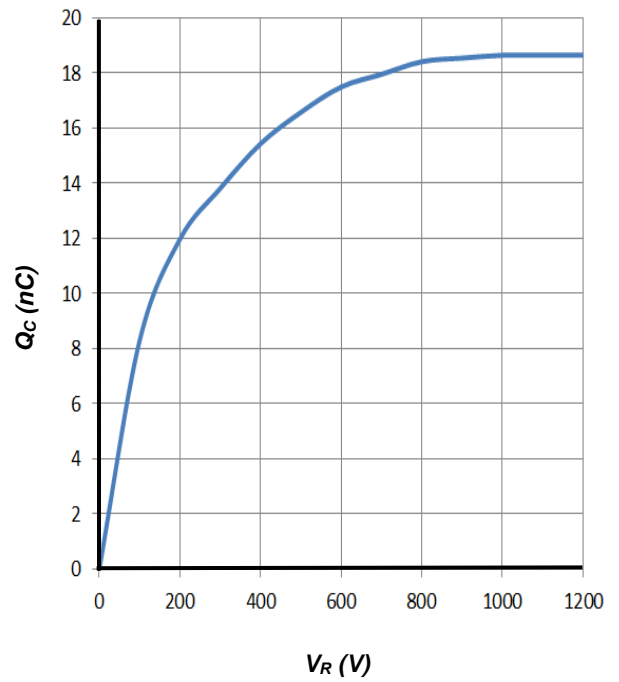


Figure 4. Total Capacitive Charge vs. Reverse Voltage

## Typical Performance

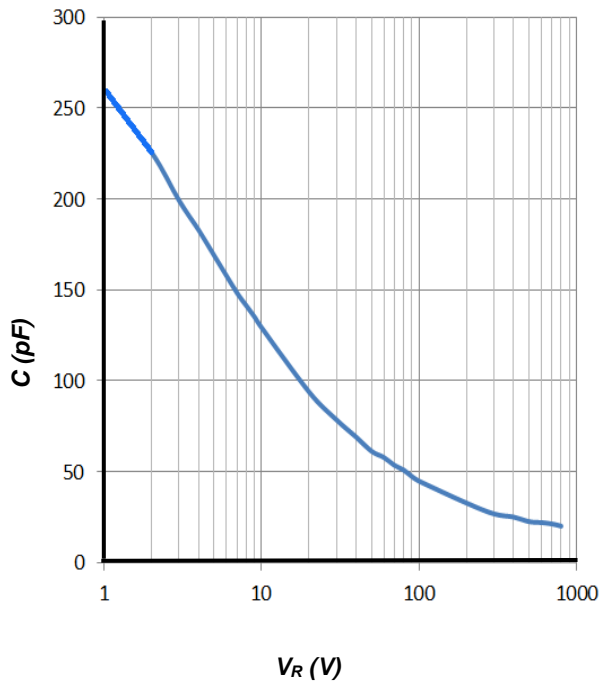


Figure 5. Total Capacitance vs. Reverse Voltage

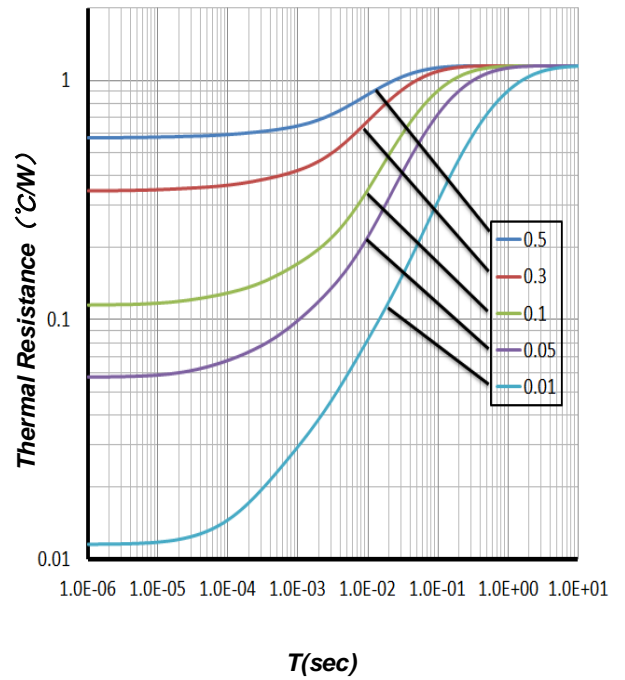
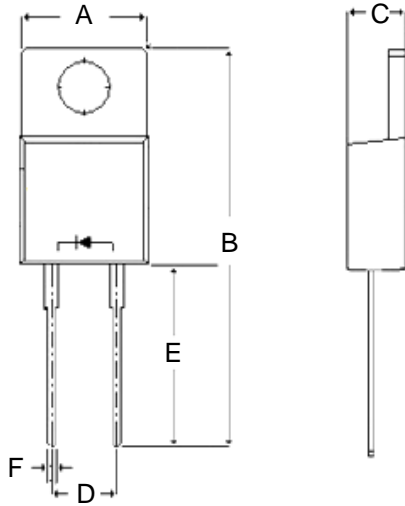


Figure 6. Transient Thermal Impedance



### Package Dimensions

Package TO-220-2



Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	9.17	10.08	10.91
B	27.00	28.58	30.00
C	3.89	4.50	5.00
D	4.20	5.10	5.80
E	11.70	13.30	14.97
F	0.50	0.80	1.21