

## SiC SBD P3D12020GS

### 1200V SiC Schottky Diode

#### Features

- Qualified to AEC-Q101
- Ultra-Fast Switching
- Zero Reverse Recovery Current
- High-Frequency Operation
- Positive Temperature Coefficient on  $V_F$
- High Surge Current
- 100% UIS tested

#### Benefits

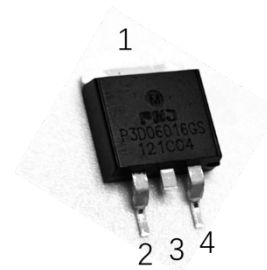
- Improve System Efficiency
- Reduction of Heat Sink Requirement
- Essentially No Switching Losses
- Parallel Devices Without Thermal Runaway

#### Application

- Consumer SMPS
- Boost Diodes in PFC or DC/DC Stages
- AC/DC Converters

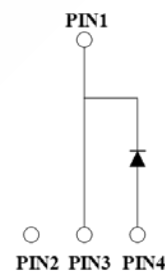
#### Order Information

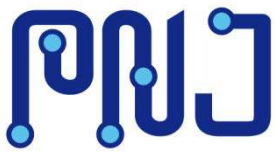
Part Number	Package	Marking
P3D12020GS	TO-263S	P3D12020GS



TO-263S

Cathode	1,3
N/C	2
Anode	4





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## 1. Maximum Ratings

At  $T_J = 25^\circ\text{C}$ , unless specified otherwise

Parameter	Symbol	Value	Unit	Test condition
Repetitive Peak Reverse Voltage	$V_{RRM}$	1200	V	$T_C = 25^\circ\text{C}$
Surge Peak Reverse Voltage	$V_{RSM}$	1200	V	$T_C = 25^\circ\text{C}$
DC Blocking Voltage	$V_R$	1200	V	$T_C = 25^\circ\text{C}$
Forward Current	$I_F$	50 31 20	A	$T_C = 25^\circ\text{C}$ $T_C = 125^\circ\text{C}$ $T_C = 145^\circ\text{C}$
Repetitive Peak Forward Surge Current	$I_{FRM}$	98 51	A	$T_C = 25^\circ\text{C}, t_p = 10\text{ms}$ $T_C = 125^\circ\text{C}, t_p = 10\text{ms}$
Non-Repetitive Forward Surge Current	$I_{FSM}$	150 140	A	$T_C = 25^\circ\text{C}, t_p = 10\text{ms}$ $T_C = 125^\circ\text{C}, t_p = 10\text{ms}$
Power Dissipation	$P_{tot}$	250	W	$T_C = 25^\circ\text{C}$
Operating Junction and Storage Temperature	$T_J, T_{STG}$	-55 to +175	$^\circ\text{C}$	
TO-247 Mounting Torque M3 Screw	$T_{orq}$	1 8.8	Nm lbf-in	

## 2. Thermal Characteristics

Parameter	Symbol	Values	Unit
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.6	$^\circ\text{C}/\text{W}$

### 3. Electrical Characteristics

At  $T_J = 25^\circ\text{C}$ , unless specified otherwise

Parameter	Symbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
Forward Voltage	$V_F$	/	1.5	1.8	V	$I_F = 20\text{A}, T_J = 25^\circ\text{C}$
			2.1	/		$I_F = 20\text{A}, T_J = 175^\circ\text{C}$
Reverse Current	$I_R$	/	8.42	60	$\mu\text{A}$	$V_R = 1200\text{V}, T_J = 25^\circ\text{C}$
			1820	/		$V_R = 1200\text{V}, T_J = 175^\circ\text{C}$
Total Capacitance	C	/	1070	/	$\text{pF}$	$V_R = 0\text{V}, T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$
			112			$V_R = 400\text{V}, T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$
			106			$V_R = 800\text{V}, T_J = 25^\circ\text{C}$ $f = 1\text{MHz}$
Total Capacitive Charge	$Q_C$	/	110	/	nC	$V_R = 800\text{V}, I_F = 20\text{A}$ $T_J = 25^\circ\text{C}$
Capacitance Stored Energy	$E_C$	/	33.6	/	$\mu\text{J}$	$V_R = 800\text{V}$

## 4. Typical Performance

At  $T_J = 25^\circ\text{C}$ , unless specified otherwise

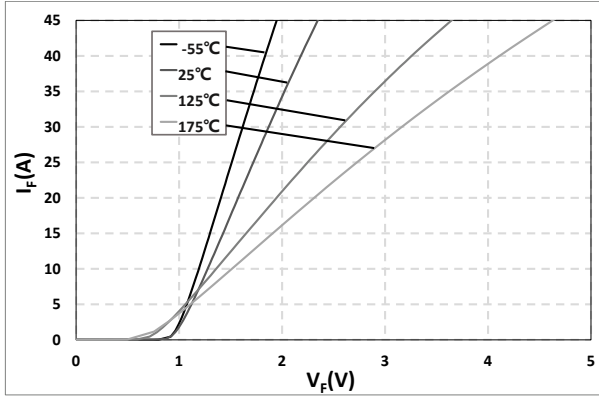


Fig. 1 Typical Forward Characteristics  
 $I_F = f(V_F)$ ;  $T_J = -55^\circ\text{C}, 25^\circ\text{C}, 125^\circ\text{C}, 175^\circ\text{C}$

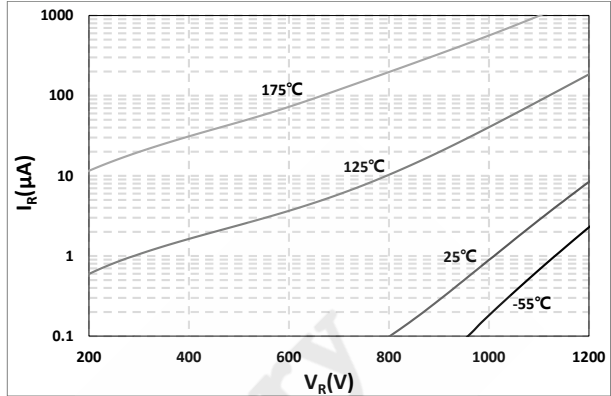


Fig. 2 Reverse Characteristics  
 $I_R = f(V_R)$ ;  $T_J = -55^\circ\text{C}, 25^\circ\text{C}, 125^\circ\text{C}, 175^\circ\text{C}$

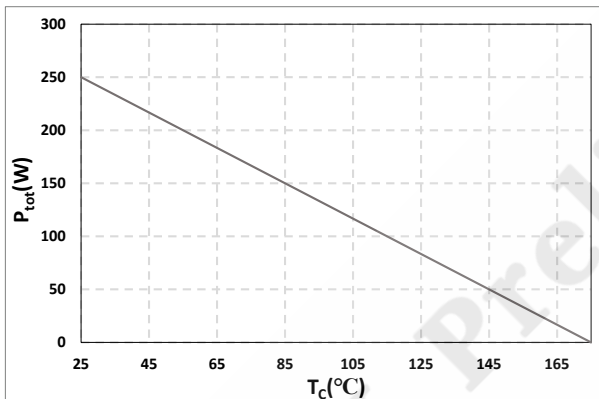


Fig. 3 Typical Power Derating  
 $P_{tot} = f(T_c)$

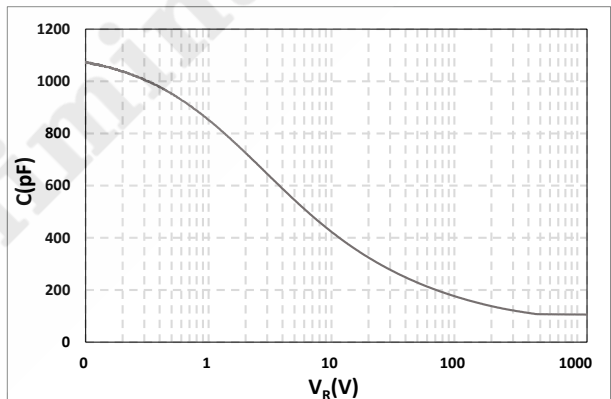


Fig. 4 Typical Total Capacitance  
 $C = f(V_R)$

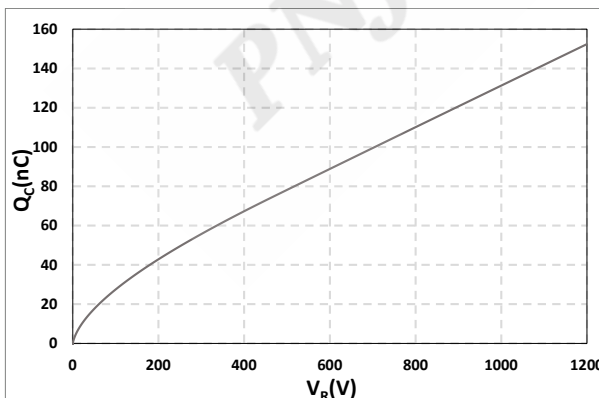


Fig. 5 Typical Total Capacitive Charge  
 $Q_c = f(V_R)$

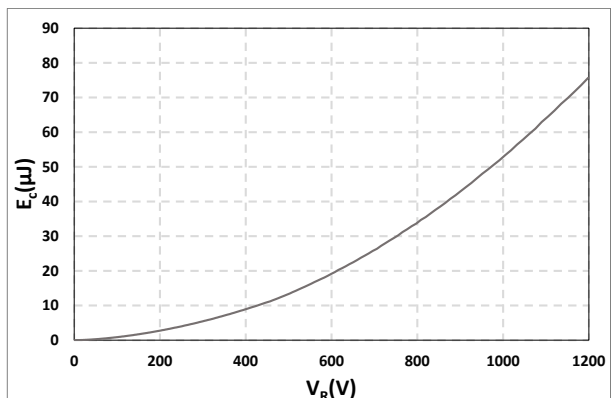
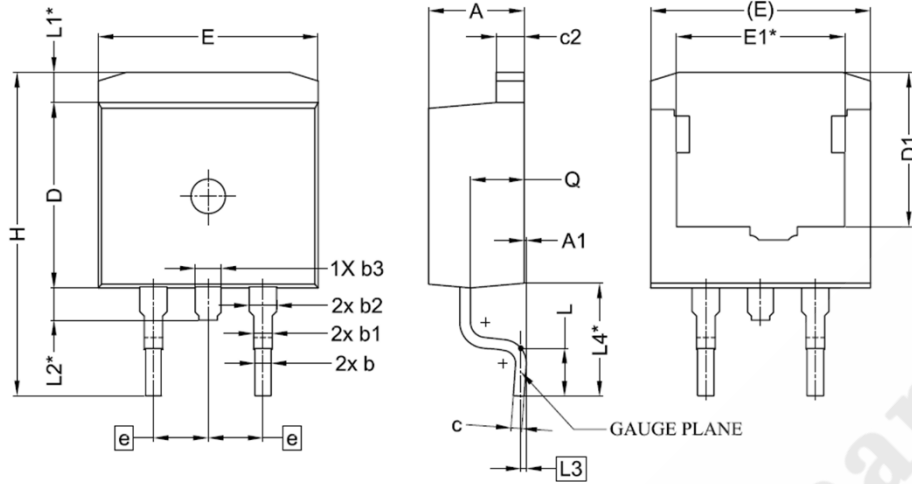


Fig. 6 Capacitance Stored Energy  
 $E_c = f(V_R)$

## 5. Package Outlines



SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	4,24	4,44	4,64
A1	0,00	0,10	0,25
b	0,66	0,76	0,96
b1	0,76	0,86	1,06
b2	1,14	1,27	1,47
b3	1,00	1,20	1,40
c	0,40	0,50	0,60
c2	1,15	1,30	1,45
D	8,38	8,60	8,90
D1	6,86	7,16	—
E	9,90	10,20	10,50
E1	7,80 REF.		
e	2,54 BSC		
H	14,61	15,00	15,88
L	1,78	2,20	2,79
L1	1,40 REF.		
L2	1,50 REF.		
L3	0,25 BSC		
L4	5,25 REF.		
Q	—	2,49	2,70

Drawing and Dimensions

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