GP3D020A120B

V_{DC}	1200 V
Q_C	106 nC
I_F	20 A
$T_{j,max}$	175 °C

1200V SiC Schottky Diode

Amp+™ Features

- Unipolar rectifier with surge current
- Zero reverse recovery current
- Fast, temperature-independent switching
- Avalanche tested to 275mJ*
- All parts tested to greater than 1,400V

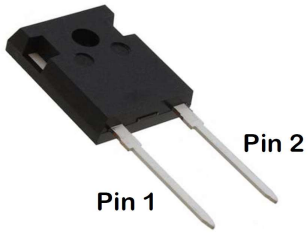
Amp+™ Benefits

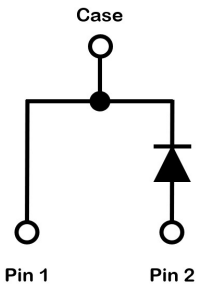
- Near zero switching loss
- Higher efficiency
- Smaller heat sink
- Easy to parallel

Amp+™ Applications

- Solar Inverters
- Switch mode power supplies, UPS
- Power factor correction
- EV charging stations

Package





Part #	Package	Marking
GP3D020A120B	TO-247-2L	3D020A120

RoHS

Maximum Ratings, at T_j=25 °C, unless otherwise specified

Characteristics	Symbol	Conditions	Values	Unit
Continuous forward current	I_{F**}	T_C=25 °C, T_j=175 °C	59	A
		T_C=125 °C, T_j=175 °C	32	
		T_C=150 °C, T_j=175 °C	21	
Surge non-repetitive forward current sine halfwave	I_{FSM}	T_C=25 °C, t_p=8.3 ms	210	A
		T_C=110 °C, t_p=8.3 ms	180	
Non-repetitive peak forward current	$I_{F,max}$	T_C=25 °C, t_p=10 µs	1100	A
i^2t value	$\int i^2dt$	T_C=25 °C, t_p=8.3 ms	183	A^2s
		T_C=110 °C, t_p=8.3 ms	134	
Repetitive peak reverse voltage	V_{RRM}	T_j=25 °C	1200	V
Diode *dv/dt* ruggedness	*dv/dt*	Turn-on slew rate, repetitive	200	V/ns
Power dissipation	P_{tot**}	T_C=25 °C	302	W
Operating junction & storage temperature	T_j, $T_{storage}$	Continuous	-55…175	°C
Soldering temperature	T_{solder}	Wave soldering leads	260	°C
Mounting torque		M3 Screw	1	N-m

Notes:

* EAS of 275 mJ is based on starting Tj = 25°C, L = 1.0 mH, IAS = 23.45 A, V = 50 V.

** Typical Rth_{JC} used

Electrical Characteristics, at T_j=25 °C, unless otherwise specified

Characteristics	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
DC blocking voltage	V_{DC}	T_j=25 °C	1200	-	-	V
Breakdown voltage	V_{BR}	I_R=1.00mA, T_j=25 °C	1400	-	-	V
Diode forward voltage	V_F	I_F=20A, T_j=25 °C	-	1.54	1.65	V
		I_F=20A, T_j=125 °C	-	1.95	-	
		I_F=20A, T_j=175 °C	-	2.24	2.70	
Reverse current	I_R	V_R=1,200V, T_j=25 °C	-	1	40	μA
		V_R=1,400V, T_j=25 °C	-	5	-	
		V_R=1,200V, T_j=125 °C	-	11	-	
		V_R=1,200V, T_j=175 °C	-	48	600	
Total capacitive charge	Q_C	V_R=800V, T_j=25 °C	-	106	-	nC
Total capacitance	C	V_R=1V, f=1 MHz	-	1179	-	pF
		V_R=400V, f=1 MHz	-	101	-	
		V_R=800V, f=1 MHz	-	73	-	

Thermal Characteristics

Characteristics	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Thermal resistance, junction-case	R_{thJC}	-	-	0.50	0.80	°C/W

Typical Performance

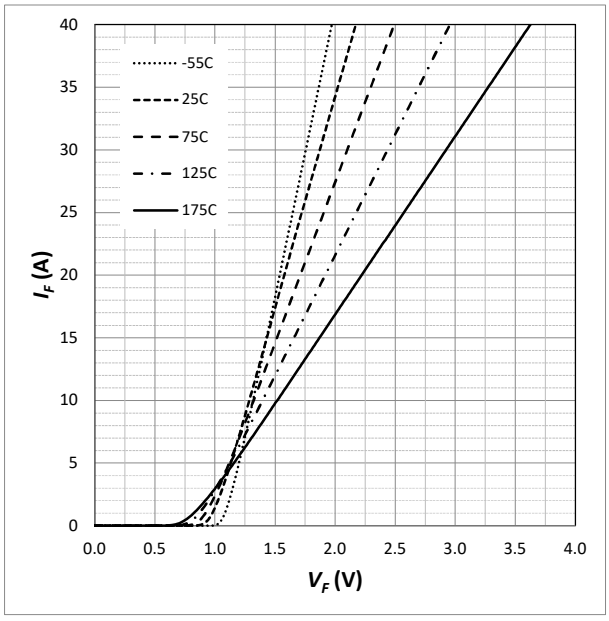


Fig. 1 Forward Characteristics (parameterized on T_j)

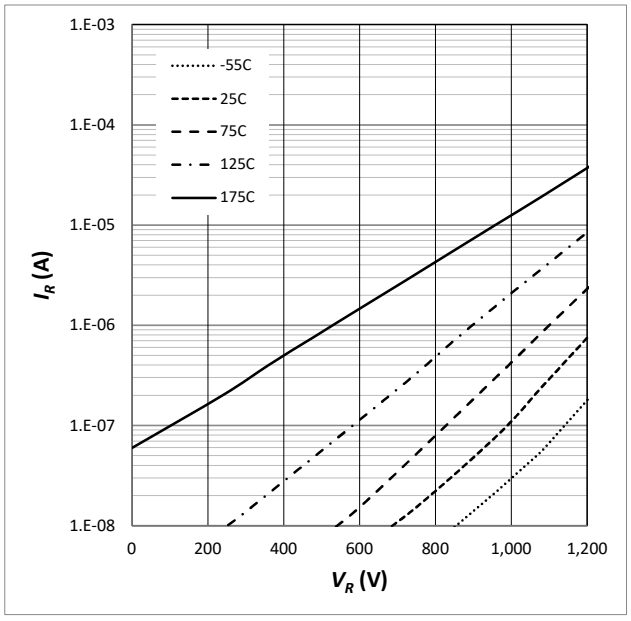


Fig. 2 Reverse Characteristics (parameterized on T_j)

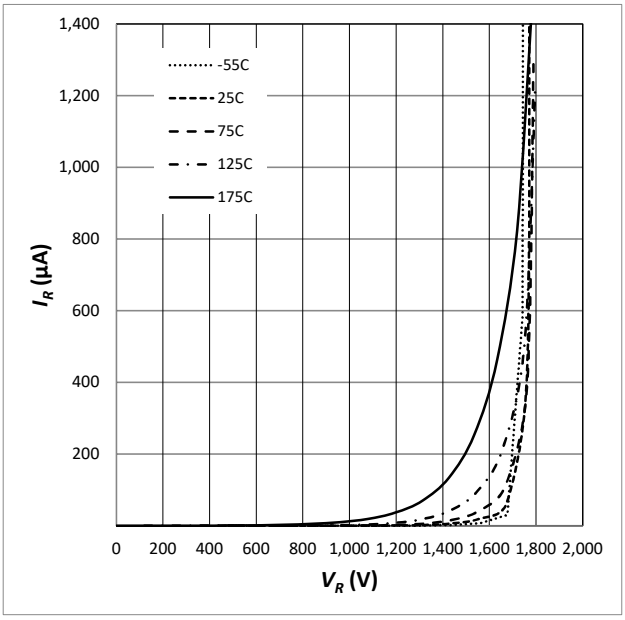


Fig. 3 Reverse Characteristics (parameterized on Tj)

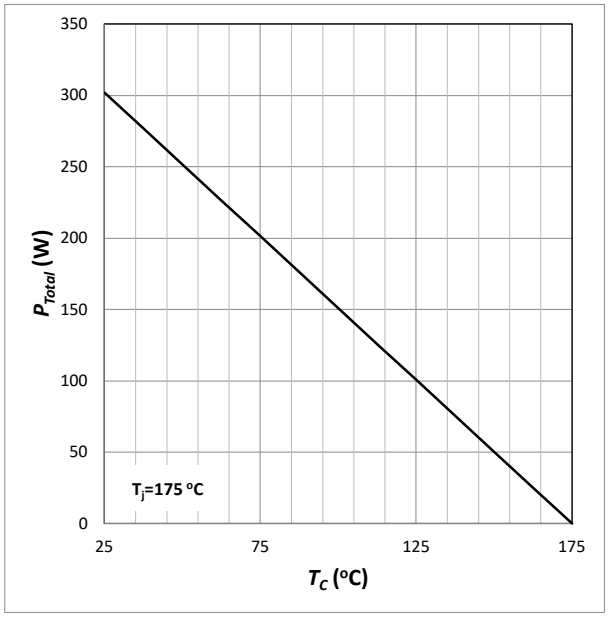


Fig. 4 Power Derating

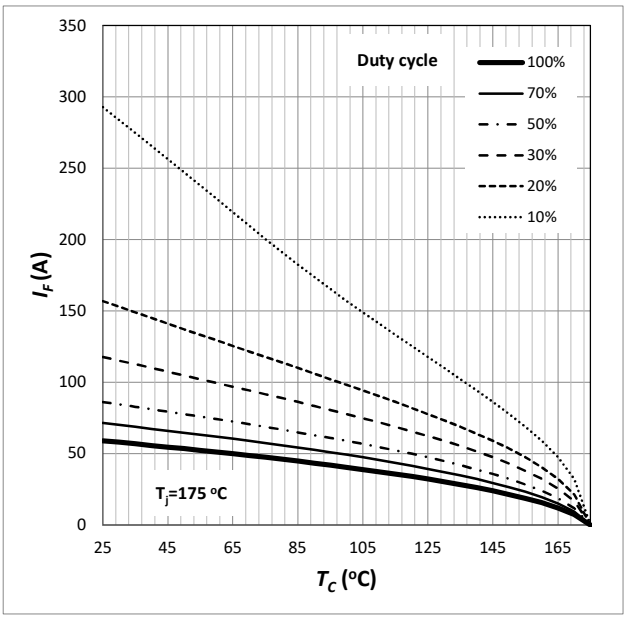


Fig. 5 Capacitance

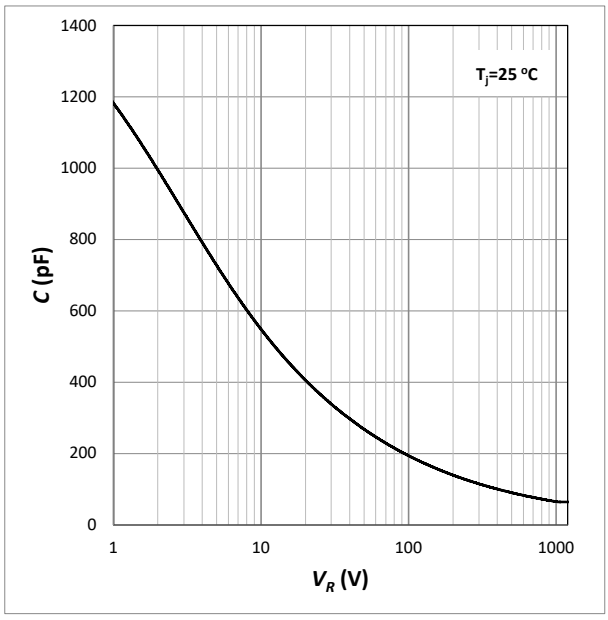


Fig. 6 Capacitance

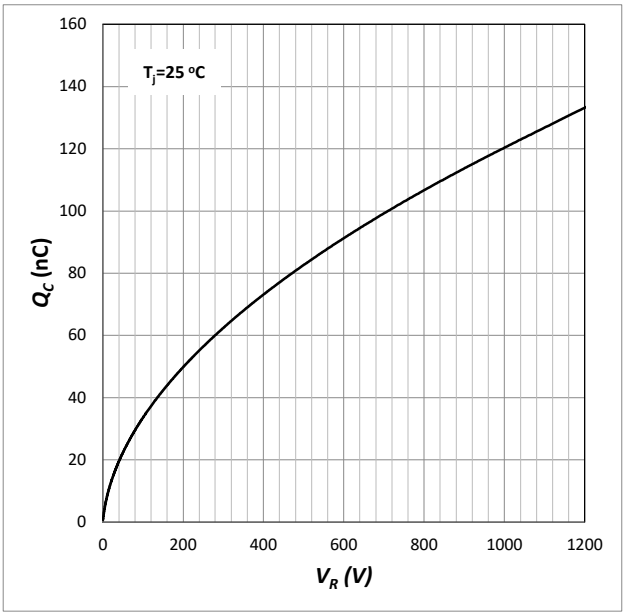


Fig. 7 Capacitive Charge

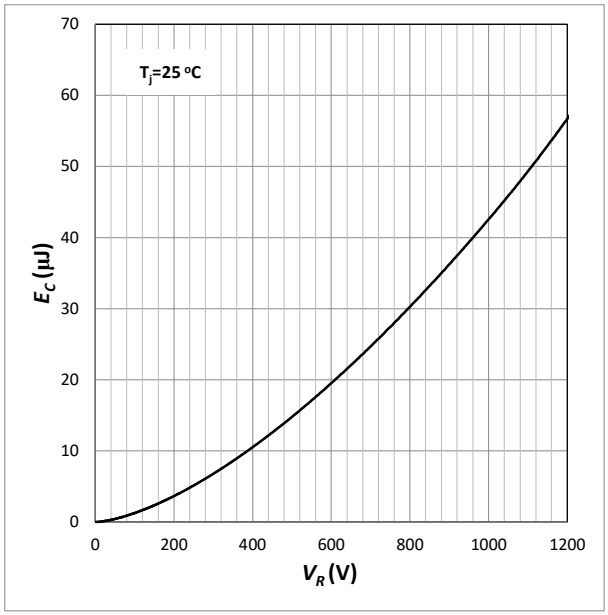


Fig. 8 Typical Capacitance Stored Energy

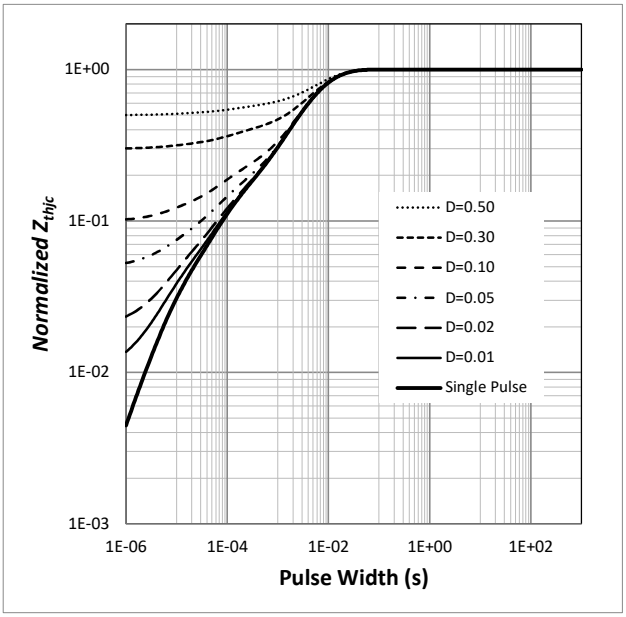
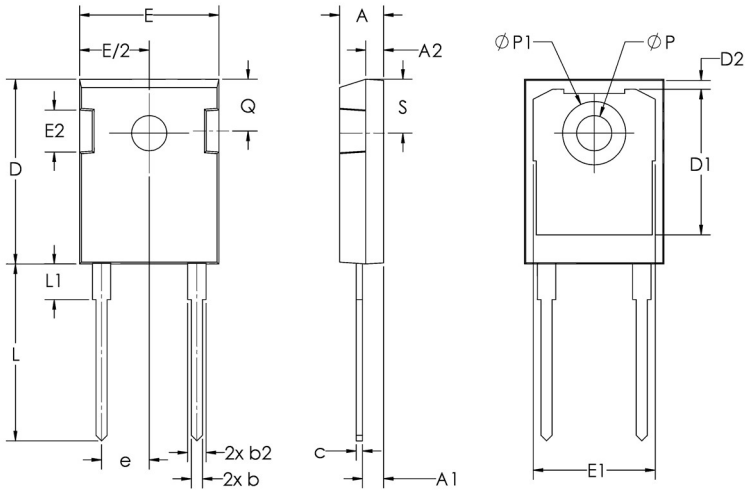


Fig. 9 Transient Thermal Impedance

Package Dimensions TO-247-2L



Sym	Millimeters		Inches	
	Min	Max	Min	Max
A	4.70	5.31	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
c	0.38	0.89	0.015	0.035
D	20.80	21.46	0.819	0.845
D1	13.08	17.65	0.515	0.695
D2	0.51	1.35	0.020	0.053
E	15.49	16.26	0.610	0.640
E1	13.46	14.16	0.530	0.557
E2	3.43	5.49	0.135	0.216
e	5.44 BSC		.214 BSC	
L	19.81	20.32	0.780	0.800
L1	4.10	4.50	0.161	0.177
ØP	3.56	3.66	0.140	0.144
ØP1	7.06	7.39	0.278	0.291
Q	5.38	6.20	0.212	0.244
S	6.04	6.30	0.238	0.248

Notes

RoHS Compliance

The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC (RoHS2), as implemented March, 2013. RoHS Declarations for this product can be obtained from the Product Documentation sections of www.SemiQ.com.

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