

$V_{RRM} = 1200\text{ V}$   
 $I_F(T_c=135^\circ\text{C}) = 33\text{ A}^{**}$   
 $Q_c = 126\text{ nC}^{**}$

### Features:

- Extremely low reverse current
- No reverse recovery current
- Temperature independent switching
- Positive temperature coefficient on  $V_F$
- Excellent surge current capability
- Low Capacitive charge

### Benefits

- Essentially No switching losses
- System efficiency improvement over Si Diodes
- Increased power density
- Enabling higher switching frequency
- Reduction of Heat Sink Requirements
- System Cost savings due to smaller magnetics
- Reduced EMI

### Applications

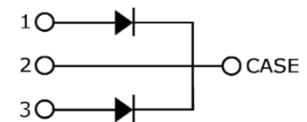
- Switch Mode Power Supplies (SMPS)
- Uninterruptable power supplies
- Motor Drivers
- Power Factor Correction

### Package Pin definitions

- Pin1- Anode
- Pin2- Cathode
- Pin3- Anode

### Package Parameters

Part Number	Marking	Package
B1D20120HC	B1D20120HC	TO-247-3L



\*per leg; \*\* per Device

**Maximum ratings**

Symbol	Parameter	Test conditions	Value	Unit
$V_{RRM}$	Repetitive Peak Reverse Voltage		1200	V
$V_{RSM}$	Surge Peak Reverse Voltage		1200	V
$I_F$	Continuous Forward Current	$T_c=25^{\circ}C$ $T_c=135^{\circ}C$ $T_c=155^{\circ}C$	35* 16.5* 11*	A
$I_{FSM}$	Non-Repetitive Forward Surge Current	$T_c=25^{\circ}C$ , $t_p=10ms$ , sine halfwave	77*	A
$\int i^2 dt$	$i^2t$ Value	$T_c=25^{\circ}C$ , $t_p=10ms$	29.6*	A <sup>2</sup> S
$P_{tot}$	Power Dissipation	$T_c=25^{\circ}C$ $T_c=110^{\circ}C$	205* 89*	W
$T_j$	Operating junction temperature		-55~175	$^{\circ}C$
$T_{stg}$	Storage temperature		-55~135	$^{\circ}C$

**Thermal Characteristics**

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		0.72*		K/W
$R_{th(ja)}$	Thermal resistance from junction to ambient		34.7*		K/W

\*per leg; \*\* per Device

**Electrical Characteristics**
**Static Characteristics (T<sub>j</sub>=25°C unless otherwise specified)**

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V <sub>DC</sub>	DC blocking voltage	T <sub>j</sub> =25°C	1200			V
V <sub>F</sub>	Diode forward voltage	I <sub>F</sub> =10A T <sub>j</sub> =25°C I <sub>F</sub> =10A T <sub>j</sub> =175°C		1.46* 2.05*		V
I <sub>R</sub>	Reverse current	V <sub>R</sub> =1200V T <sub>j</sub> =25°C V <sub>R</sub> =1200V T <sub>j</sub> =175°C		4.5* 45*		μA

**Dynamic Characteristics (T<sub>j</sub>=25°C unless otherwise specified)**

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q <sub>C</sub>	Total capacitive charge	V <sub>R</sub> =800V T <sub>j</sub> =25°C $Q_c = \int_0^{V_R} C(V)dV$		63*		nC
C	Total Capacitance	V <sub>R</sub> =1V f=1MHz V <sub>R</sub> =400V f=1MHz V <sub>R</sub> =800V f=1MHz		614* 62* 51*		pF

\*per leg; \*\* per Device

Typical Performance (Per Leg)

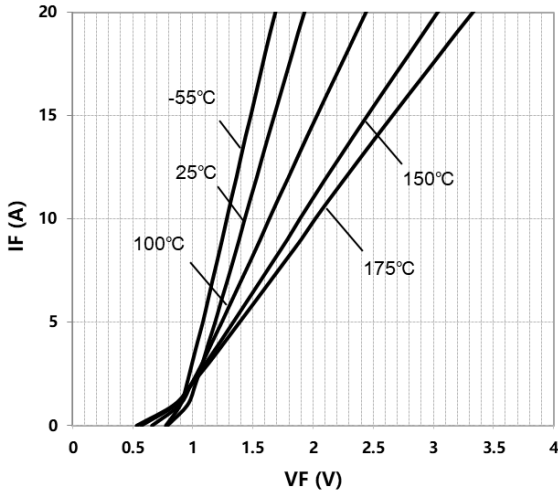


Figure 1. Typical forward characteristics

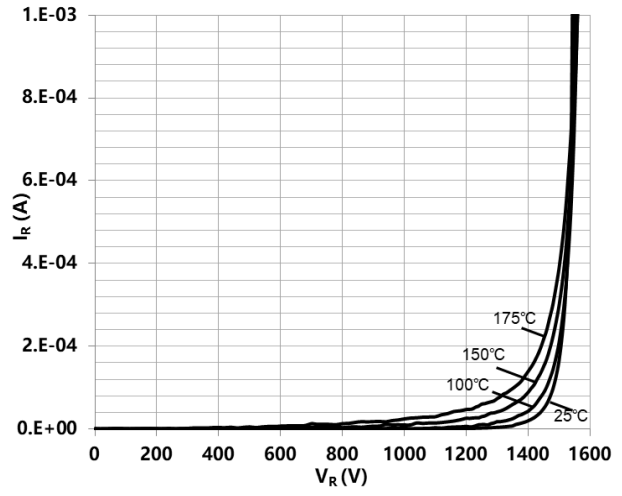


Figure 2. Typical reverse current as function of reverse voltage

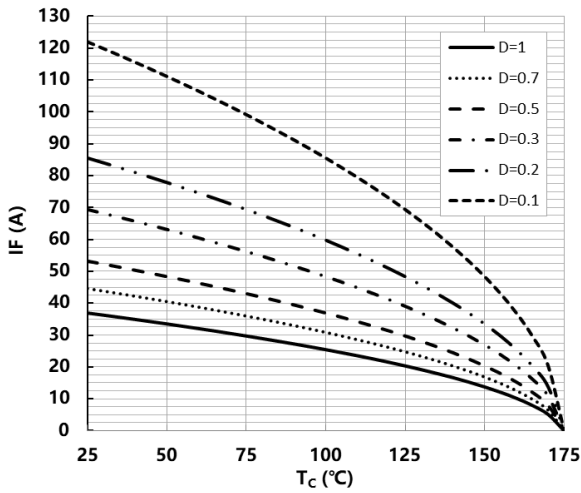


Figure 3. Diode forward current as function of temperature, D=duty cycle

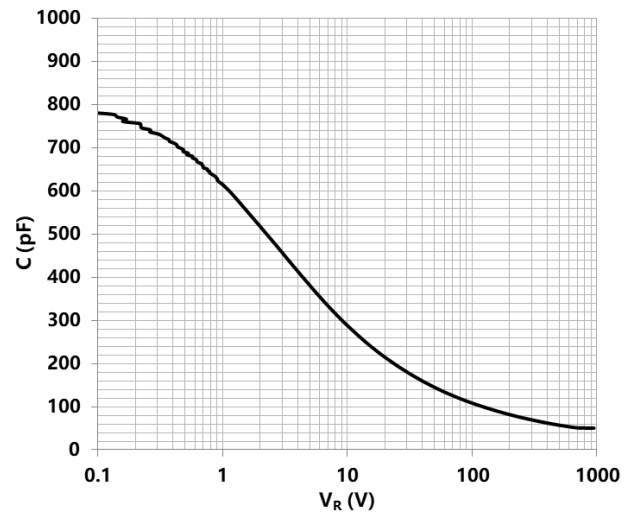


Figure 4. Typical capacitance as function of reverse voltage,  $C=f(V_R)$ ;  $T_j=25^\circ\text{C}$ ;  $f=1\text{ MHz}$

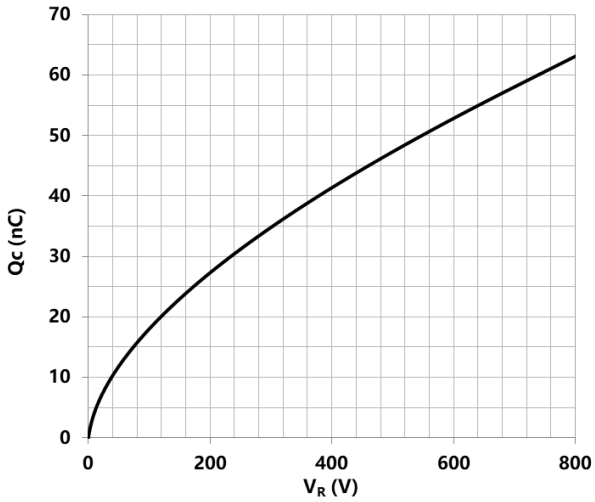


Figure 5. Typical reverse charge as function of reverse voltage

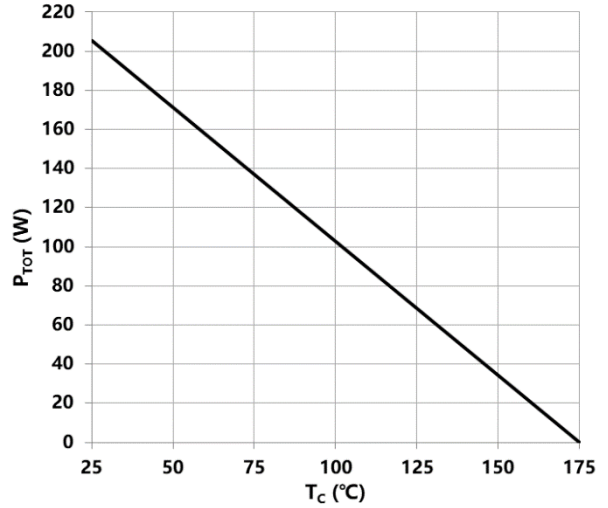


Figure 6. Power dissipation as function of case temperature

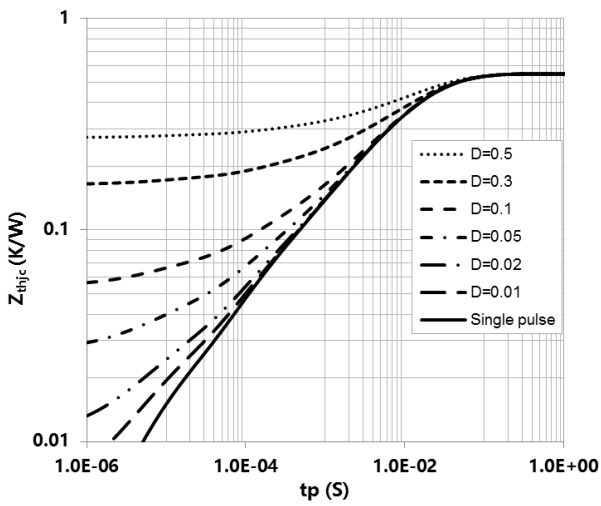
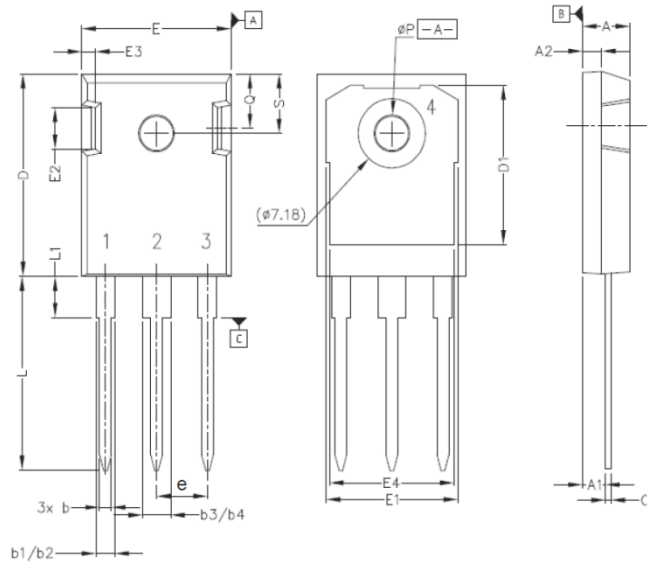


Figure 7. Max. transient thermal impedance,  $Z_{th,jc}=f(t)$ , parameter:  $D=t/T$

**Package Dimensions**



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.042	.052	1.07	1.33
b1	.075	.095	1.91	2.41
b2	.075	.085	1.91	2.16
b3	.113	.133	2.87	3.38
b4	.113	.123	2.87	3.13
c	.022	.027	0.55	0.68
D	.819	.831	20.80	21.10
D1	.640	.695	16.25	17.65
D2	.037	.049	0.95	1.25
E	.620	.635	15.75	16.13
E1	.516	.557	13.10	14.15
E2	.145	.201	3.68	5.10
E3	.039	.075	1.00	1.90
E4	.487	.529	12.38	13.43
N	3		3	
L	.780	.800	19.81	20.32
L1	.161	.173	4.10	4.40
ØP	.138	.144	3.51	3.65
Q	.216	.236	5.49	6.00
S	.238	.248	6.04	6.30
e	.214 BSC		5.44 BSC	

**Revision History****Revision: 2019-03-01, Rev. 1.1, Characteristics updated****Previous Revision:****Rev.1.0 Release of datasheet****BASiC Semiconductor Ltd.**  
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