

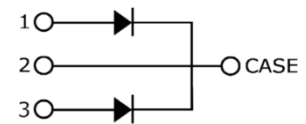
$V_{RRM} = 1200\text{ V}$
 $I_F(T_C=135^\circ\text{C}) = 33\text{ A}^{**}$
 $Q_C = 126\text{ nC}^{**}$

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	$T_c=25^{\circ}\text{C}$ $T_c=135^{\circ}\text{C}$ $T_c=155^{\circ}\text{C}$	35* 16.5* 11*	A
I_{FSM}	Non-Repetitive Forward Surge Current	$T_c=25^{\circ}\text{C}$, $t_p=10\text{ms}$, sine halfwave	77*	A
$\int i^2 dt$	i^2t Value	$T_c=25^{\circ}\text{C}$, $t_p=10\text{ms}$	29.6*	A^2S
P_{tot}	Power Dissipation	$T_c=25^{\circ}\text{C}$ $T_c=110^{\circ}\text{C}$	205* 89*	W
T_j	Operating junction temperature		-55~175	$^{\circ}\text{C}$
T_{stg}	Storage temperature		-55~135	$^{\circ}\text{C}$

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_j=25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V _{DC}	DC blocking voltage	T _j =25°C	1200			V
V _F	Diode forward voltage	I _F =10A T _j =25°C I _F =10A T _j =175°C		1.46* 2.05*		V
I _R	Reverse current	V _R =1200V T _j =25°C V _R =1200V T _j =175°C		4.5* 45*		μA

Dynamic Characteristics (T_j=25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q _C	Total capacitive charge	V _R =800V T _j =25°C $Q_C = \int_0^{V_R} C(V)dV$		63*		nC
C	Total Capacitance	V _R =1V f=1MHz V _R =400V f=1MHz V _R =800V f=1MHz		614* 62* 51*		pF

*per leg; ** per Device

Typical Performance (Per Leg)

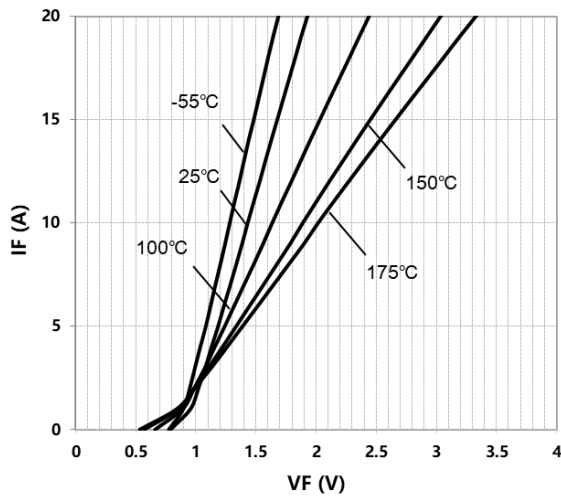


Figure 1. Typical forward characteristics

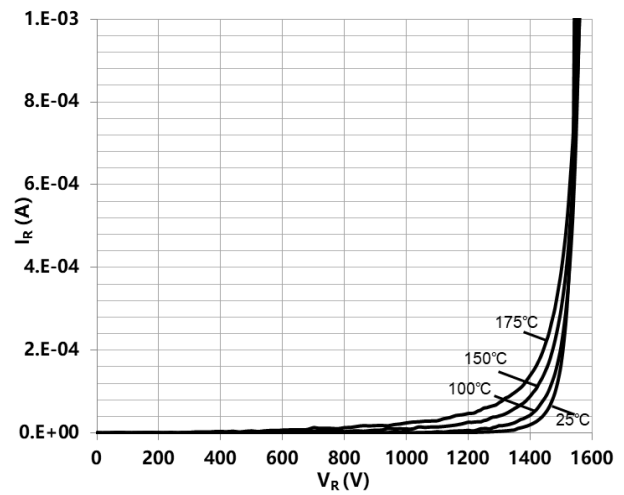


Figure 2. Typical reverse current as function of reverse voltage

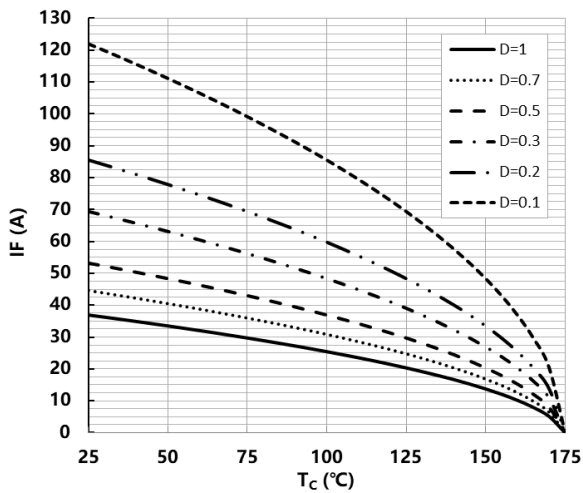


Figure 3. Diode forward current as function of temperature, D=duty cycle

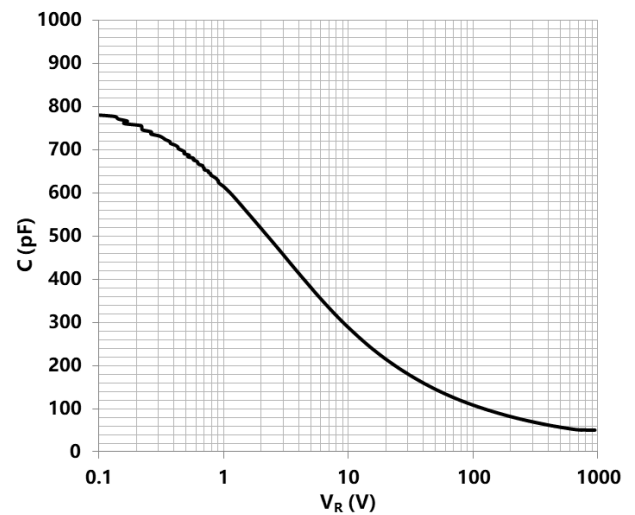


Figure 4. Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_J=25^\circ\text{C}$; $f=1\text{ MHz}$

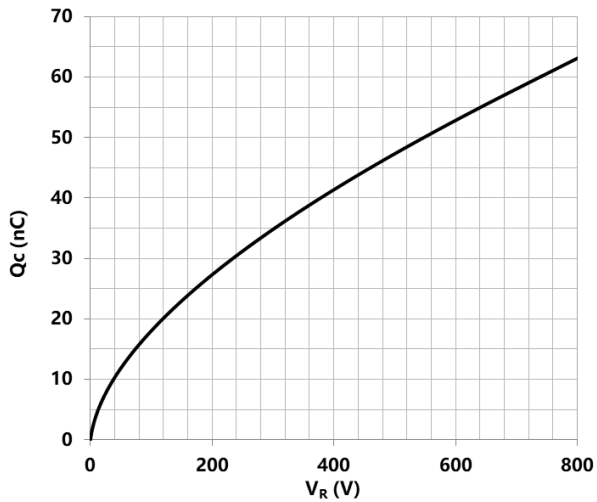


Figure 5. Typical reverse charge as function of reverse voltage

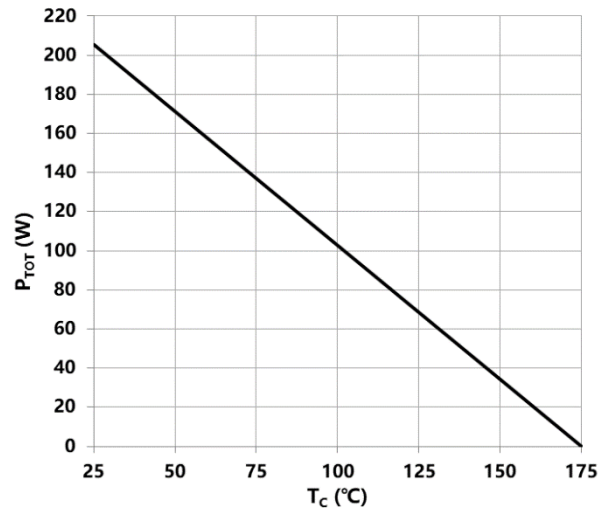


Figure 6. Power dissipation as function of case temperature

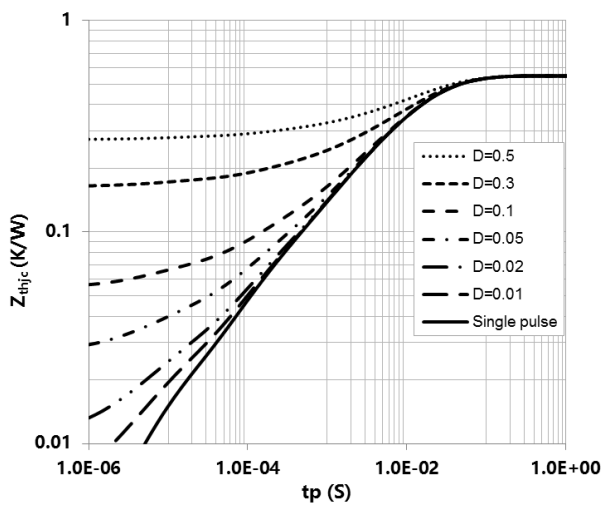
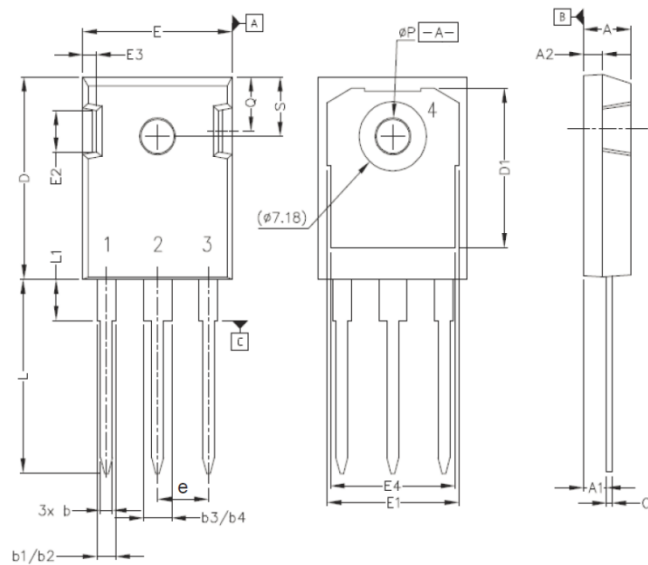


Figure 7. Max. transient thermal impedance, $Z_{th,jc}=f(t)$, parameter: $D=t/T$

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, Chracteristics updated

Previous Revision:

Rev.1.0 Release of datasheet

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