

**Product Summary**

$V_{RRM}$	650 V
$I_F (T_C=160^\circ\text{C})$	6 A
$Q_C$	17 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**

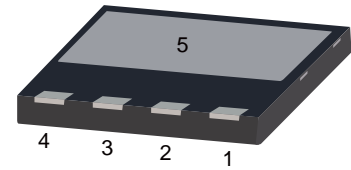
- Switch mode power supplies (SMPS)
- Uninterruptible power supplies
- Motor drivers
- Power factor correction

**Package Pin Definitions**

- Pin 1,2 - NC
- Pin 3,4 - Anode
- Pin 5 - Cathode

**Package Parameters**

Part Number	Marking	Package
B2D06065Q	B2D06065Q	DFN 8*8

**Package: DFN 8\*8**

**Electrical Connection**


**Maximum Ratings ( $T_c=25^\circ\text{C}$  unless otherwise specified)**

Symbol	Parameter	Test conditions	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		650	V
$V_{RSM}$	Non-repetitive peak reverse voltage		650	V
$I_F$	Continuous forward current	$T_c=25^\circ\text{C}$ $T_c=160^\circ\text{C}$	23 6	A
$I_{FSM}$	Non-repetitive forward surge current	$T_c=25^\circ\text{C}$ , $t_p=10\text{ms}$ Half sine wave	45	A
$\int i^2 dt$	$i^2t$ value	$T_c=25^\circ\text{C}$ , $t_p=10\text{ms}$	10.12	$\text{A}^2\text{S}$
$P_{tot}$	Power dissipation	$T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$	98 42	W
$T_j$	Operating junction temperature		-55~175	$^\circ\text{C}$
$T_{slg}$	Storage temperature		-55~175	$^\circ\text{C}$

**Thermal Characteristics**

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		1.52		K/W

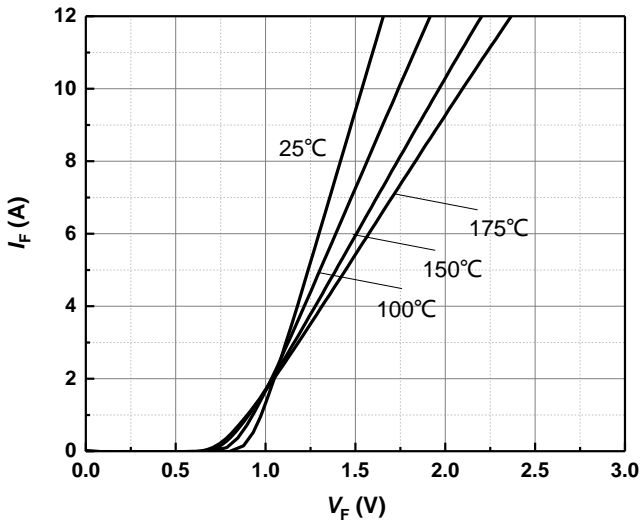
**Electrical Characteristics**  
**Static Characteristics**

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
$V_{DC}$	DC blocking voltage	$T_j=25^{\circ}C$	650			V
$V_F$	Diode forward voltage	$I_F=6A$ $T_j=25^{\circ}C$ $I_F=6A$ $T_j=175^{\circ}C$		1.33 1.63	1.5 2.2	V
$I_R$	Reverse current	$V_R=650V$ $T_j=25^{\circ}C$ $V_R=650V$ $T_j=175^{\circ}C$		1 20	50 200	$\mu A$

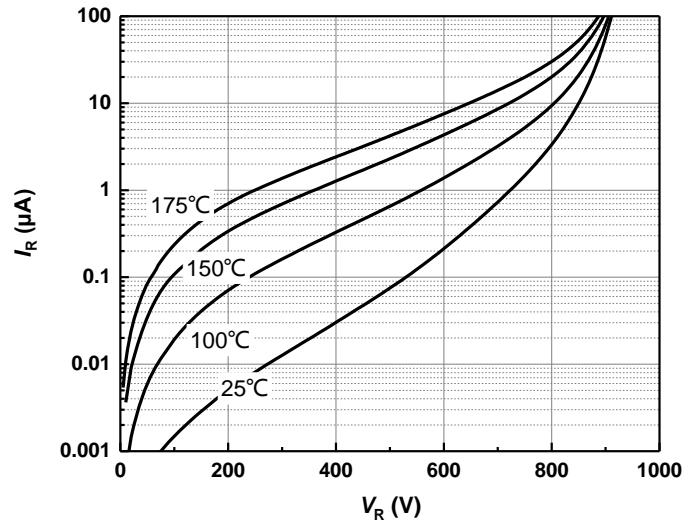
**AC Characteristics**

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
$Q_C$	Total capacitive charge	$V_R=400V$ $T_j=25^{\circ}C$ $Q_C=\int_0^{V_R} C(V)dV$		17		nC
$C$	Total capacitance	$V_R=1V$ $f=1MHz$ $V_R=300V$ $f=1MHz$ $V_R=600V$ $f=1MHz$		271 30.1 29.8		pF
$E_C$	Capacitance stored energy	$V_R=400V$		4.5		$\mu J$

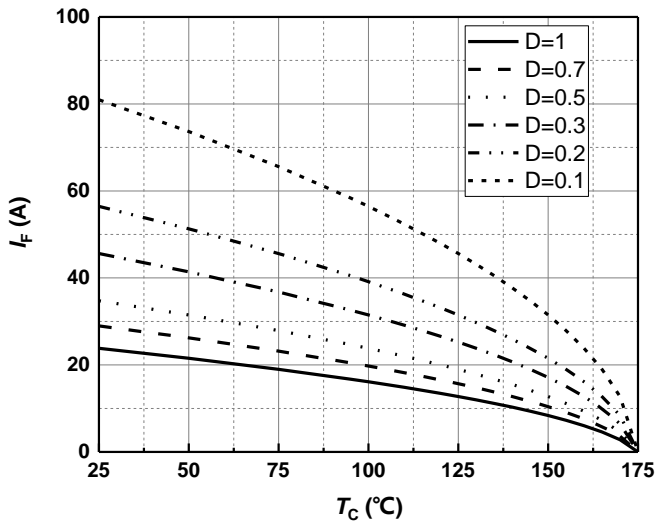
**Typical Performance**



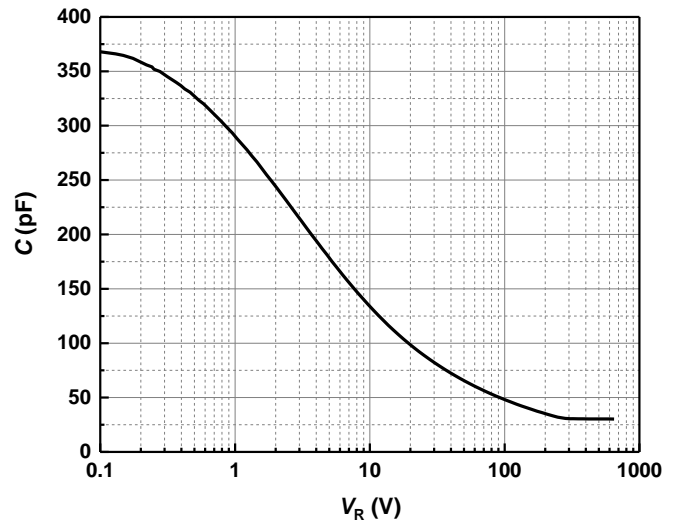
**Figure 1** Typical forward characteristics



**Figure 2** Typical reverse current as function of reverse voltage

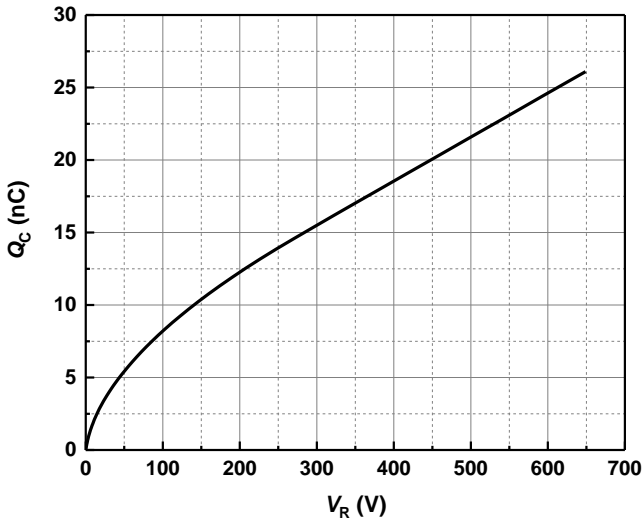


**Figure 3** Diode forward current as function of temperature, D=duty cycle

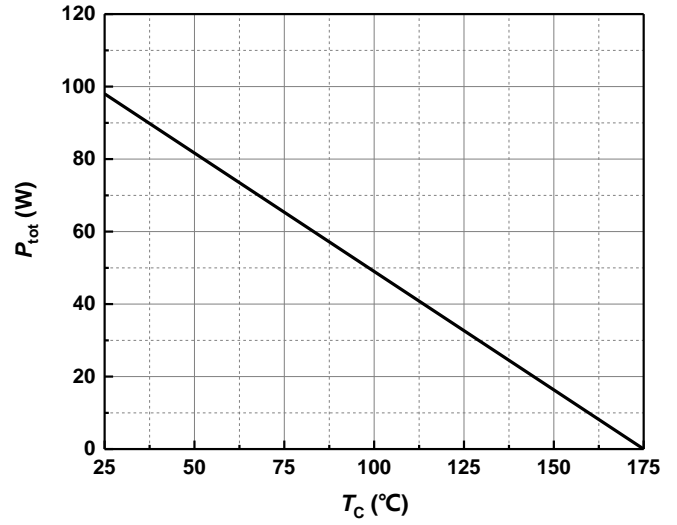


**Figure 4** Typical capacitance as function of reverse voltage,  $C=f(V_R)$ ;  $T_j=25^{\circ}$ C;  $f=1$  MHz

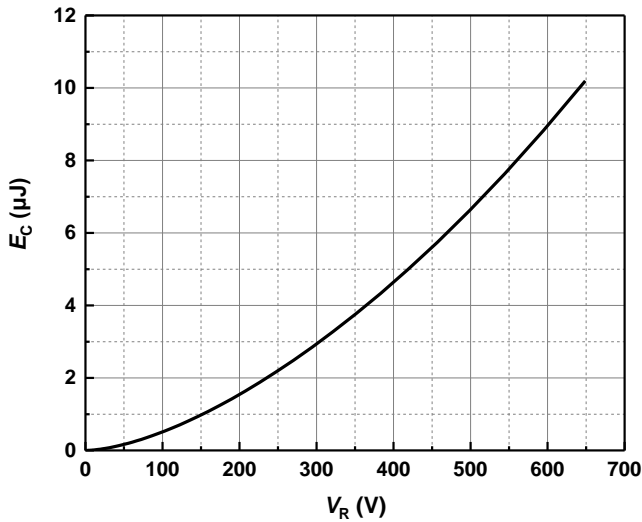
**Typical Performance**



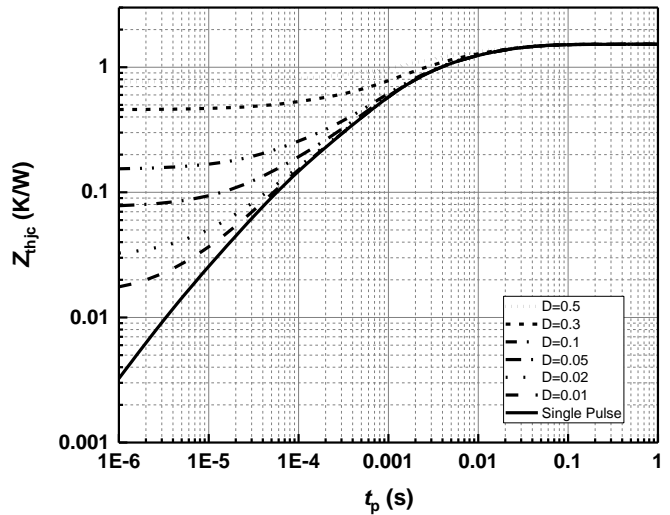
**Figure 5** Typical reverse charge as function of reverse voltage



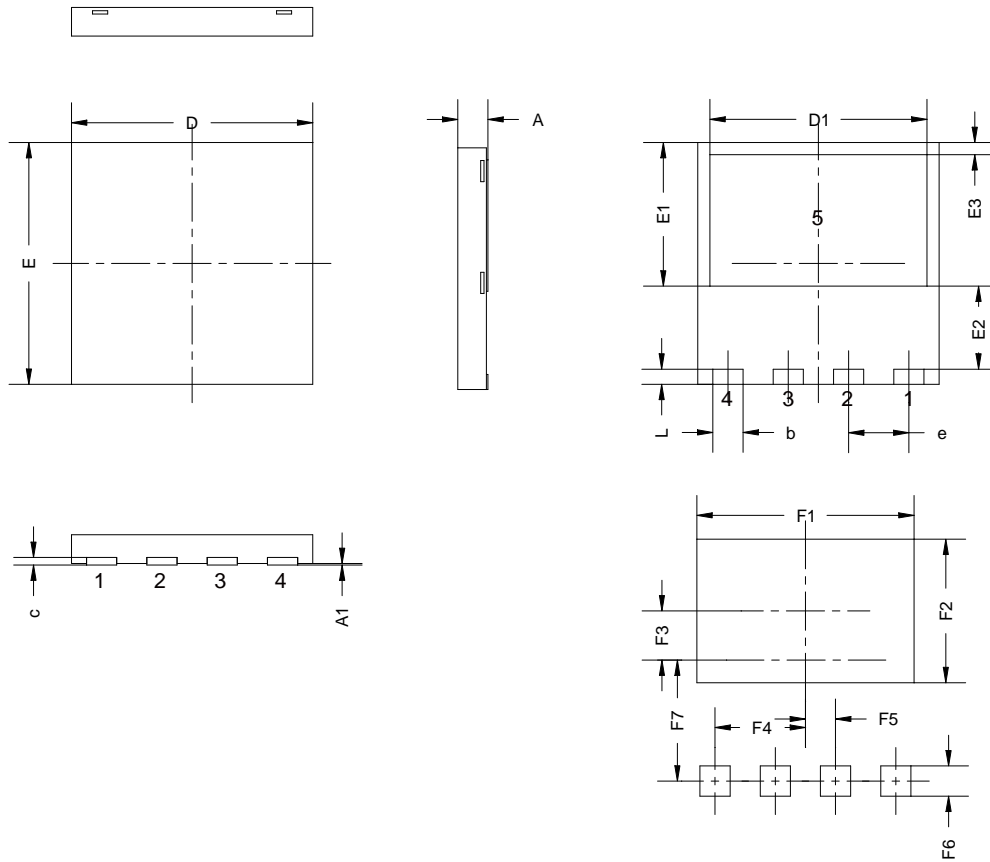
**Figure 6** Power dissipation as function of case temperature



**Figure 7** Capacitance stored energy



**Figure 8** Max. transient thermal impedance,  $Z_{thjc} = f(t)$ , parameter:  $D = t / T$

**Package Dimensions**


SYMBOL	mm		
	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0.00	-	0.05
b	0.90	1.00	1.10
c	0.10	0.20	0.30
D	7.90	8.00	8.10
D1	7.10	7.20	7.30
E	7.90	8.00	8.10
E1	4.65	4.75	4.85
E2	2.65	2.75	2.85
E3	0.30	0.40	0.50
e	2.00 BSC		
L	0.40	0.50	0.60
F1	-	7.20	-
F2	-	4.75	-
F3	-	1.43	-
F4	-	3.00	-
F5	-	1.00	-
F6	-	1.00	-
F7	-	4.20	-

**Revision History**

<b>Document Version</b>	<b>Date of Release</b>	<b>Description of Changes</b>
Rev. 1.0	2021-10-21	Release of the datasheet.
Rev. 1.1	2022-10-18	Characteristics updated.

**BASiC Semiconductor Ltd.**  
**Shenzhen, China**  
**© 2022 BASiC Semiconductor Ltd.**  
**All Rights Reserved.**

**Information**

For further information on technology, delivery terms and conditions and prices, please contact the nearest BASiC Semiconductor Office

**Disclaimer**

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, BASiC semiconductor Ltd. hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.