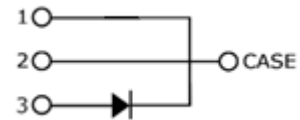
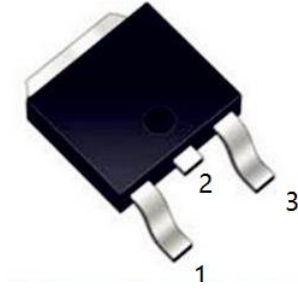


$V_{RRM} = 650\text{ V}$   
 $I_F(T_C=150^\circ\text{C}) = 4\text{ A}$   
 $Q_C = 11.3\text{ nC}$

**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

**Pacakge Pin definitions**

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

**Package Parameters**

Part Number	Marking	Package
B1D04065E	B1D04065E	TO-252-3L

**Maximum ratings**

Symbol	Parameter	Test conditions	Value	Unit
$V_{RRM}$	Repetitive Peak Reverse Voltage		650	V
$V_{RSM}$	Surge Peak Reverse Voltage		650	V
$I_F$	Continuous Forward Current	$T_c=25^\circ\text{C}$ $T_c=135^\circ\text{C}$ $T_c=150^\circ\text{C}$	14 6 4	A
$I_{FSM}$	Non-Repetitive Forward Surge Current	$T_c=25^\circ\text{C}$ , $t_p=10\text{ms}$ , sine halfwave	32	A
$\int i^2 dt$	$i^2 t$ Value	$T_c=25^\circ\text{C}$ , $t_p=10\text{ms}$	5.12	$\text{A}^2\text{S}$
$P_{tot}$	Power Dissipation	$T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$	60 25	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		2.46		K/W
$R_{th(ja)}$	Thermal resistance from junction to ambient		119.7		K/W

**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	650			V
V <sub>F</sub>	Diode forward voltage	I <sub>F</sub> =4A T <sub>j</sub> =25°C I <sub>F</sub> =4A T <sub>j</sub> =175°C		1.45 1.9		V
I <sub>R</sub>	Reverse current	V <sub>R</sub> =650V T <sub>j</sub> =25°C V <sub>R</sub> =650V T <sub>j</sub> =175°C		0.05 3		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> =400V T <sub>j</sub> =25°C $Q_c = \int_0^{V_R} C(V)dV$		11.3		nC
C	Total Capacitance	V <sub>R</sub> =1V f=1MHz V <sub>R</sub> =300V f=1MHz V <sub>R</sub> =600V f=1MHz		177 28.6 28.4		pF

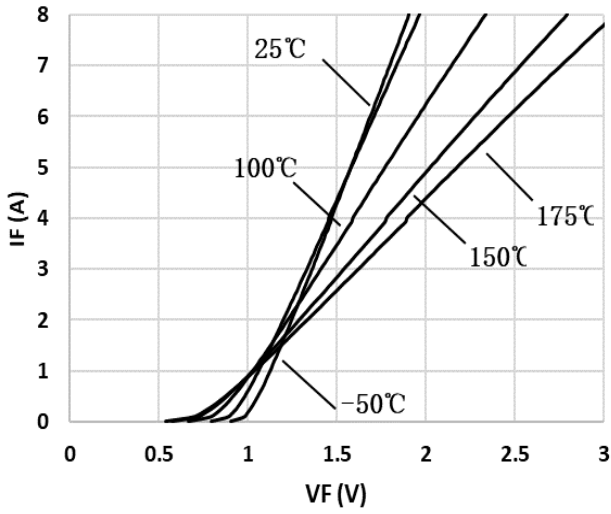


Figure 1. Typical forward characteristics

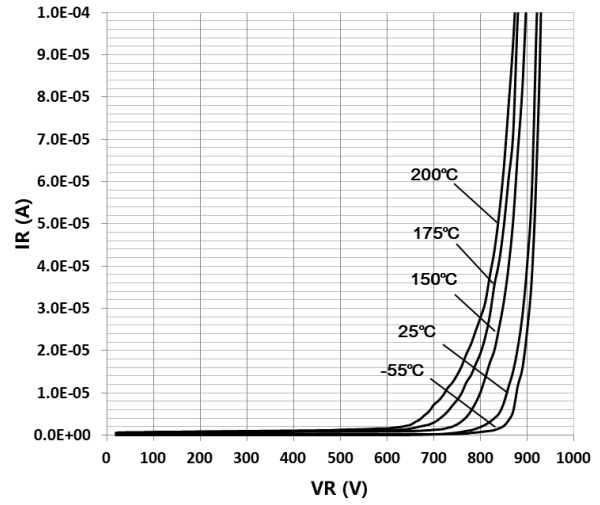


Figure 2. Typical reverse current as function of reverse voltage

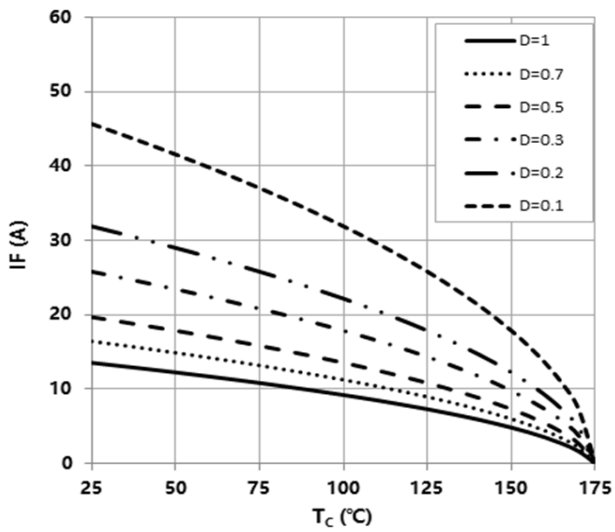


Figure 3. Diode forward current as function of temperature, D=duty cycle

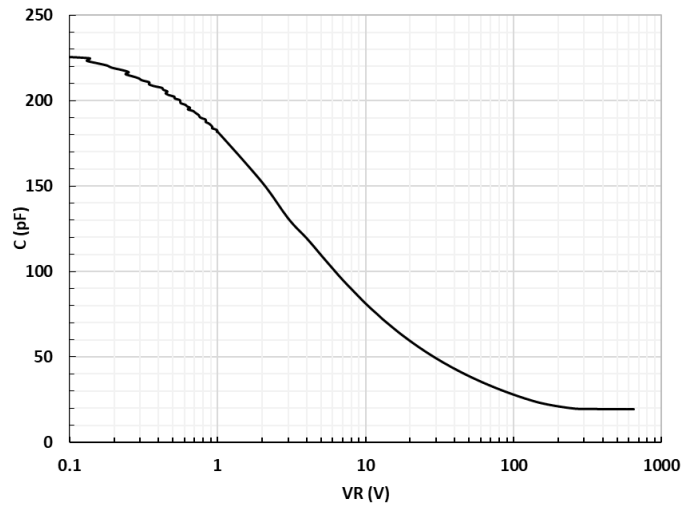


Figure 4. Typical capacitance as function of reverse voltage,  $C=f(V_R)$ ;  $T_J=25^\circ\text{C}$ ;  $f=1\text{ MHz}$

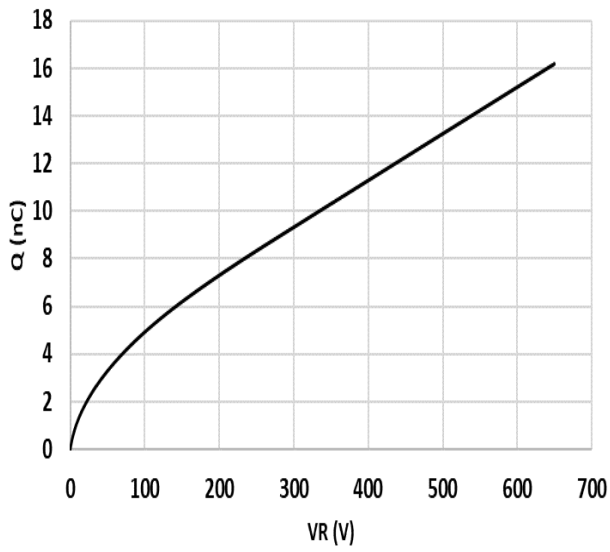


Figure 5. Typical reverse charge as function of reverse voltage

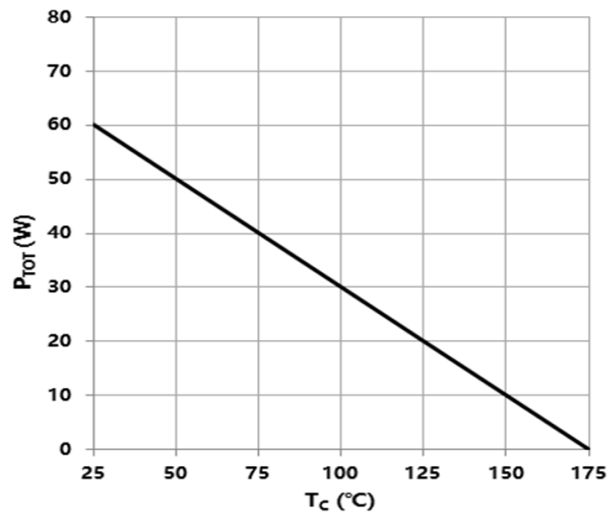


Figure 6. Power dissipation as function of case temperature

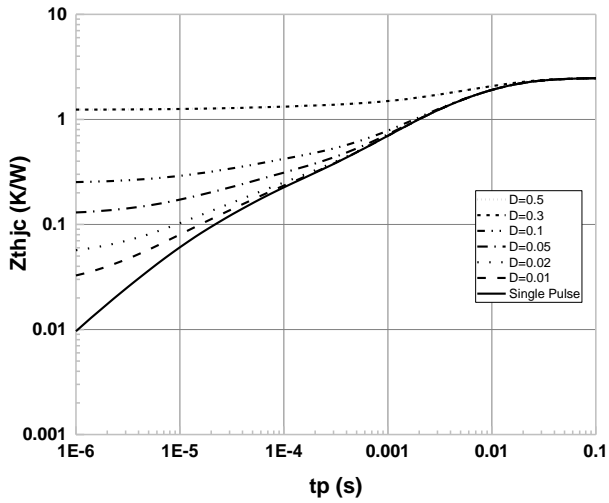
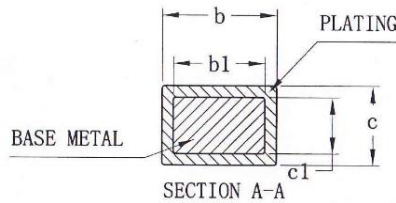
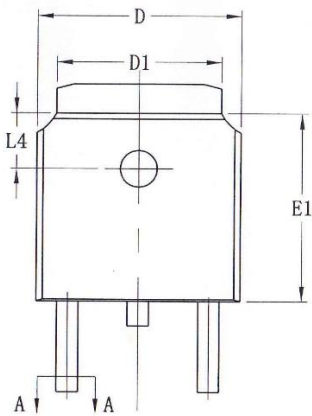
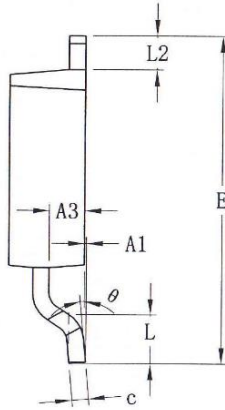
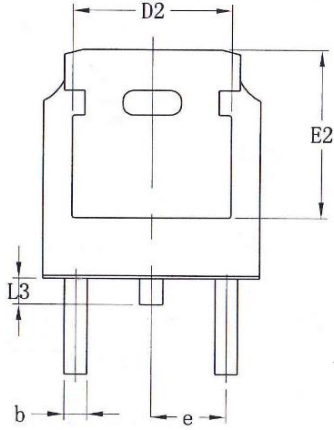


Figure 7. Max. transient thermal impedance,  $Z_{th,jc}=f(t)$ , parameter:  $D=t/T$

**Package Dimensions**



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A1	0.00	—	0.10
A2	2.20	2.30	2.40
A3	1.02	1.07	1.12
b	0.74	—	0.82
b1	0.73	0.76	0.79
c	0.51	—	0.55
c1	0.50	0.51	0.52
D	6.50	6.60	6.70
D1	5.33REF		
D2	4.83REF		
E	9.90	10.10	10.30
E1	6.00	6.10	6.20
E2	5.30REF		
e	2.286BSC		
L	1.40	1.50	1.60
L2	0.90	—	1.25
L3	0.60	0.80	1.00
L4	1.70	1.80	1.90
$\theta$	0		8°

**Revision History:**

**2019-05-30,Rev.1.0**

**Previous Revision:**

Rev.1.0 Release of datasheet

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**Shenzhen, China**  
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