

V_{RRM} = 650 V
 $I_F(T_c=95^\circ\text{C})$ = 10 A
 Q_c = 31 nC

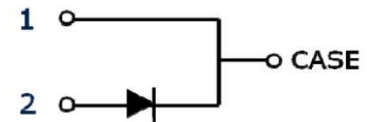
Features:

- 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-Cathode
- Pin2-Anode

Package Parameters

Part Number	Marking	Package
B1D10065KF	B1D10065KF	TO-220F-2L

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	$T_c=25^{\circ}C$ $T_c=95^{\circ}C$ $T_c=150^{\circ}C$	24 10 4.5	A
I_{FSM}	Non-Repetitive Forward Surge Current	$T_c=25^{\circ}C$, $t_p=10ms$, sine halfwave	70	A
$\int i^2 dt$	i^2t Value	$T_c=25^{\circ}C$, $t_p=10ms$	24.5	A ² S
P_{tot}	Power Dissipation	$T_c=25^{\circ}C$ $T_c=110^{\circ}C$	33 14	W
T_j	Operating 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		4.44		K/W
$R_{th(ja)}$	Thermal resistance from junction to ambient		55.85		K/W

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	650			V
V _F	Diode forward voltage	I _F =10A T _j =25°C I _F =10A T _j =175°C		1.48 1.7		V
I _R	Reverse current	V _R =650V T _j =25°C V _R =650V T _j =175°C		0.07 3.5		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 =400V T _j =25°C $Q_c = \int_0^{V_R} C(V)dV$		31		nC
C	Total Capacitance	V _R =1V f=1MHz V _R =300V f=1MHz V _R =500V f=1MHz		450 54.7 52.3		pF

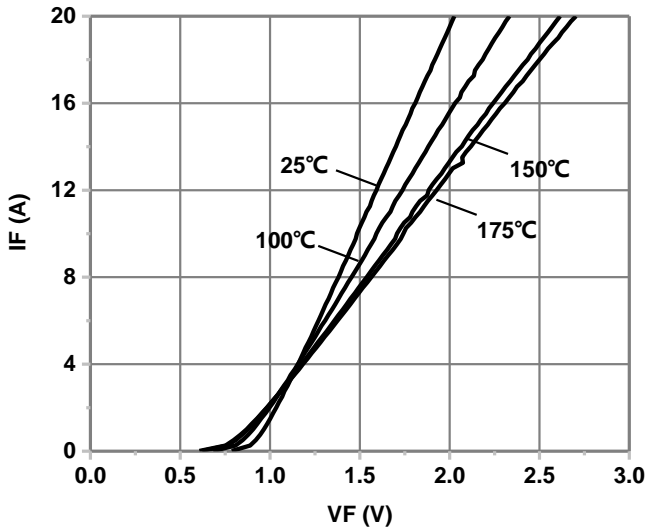


Figure 1. Typical forward characteristics

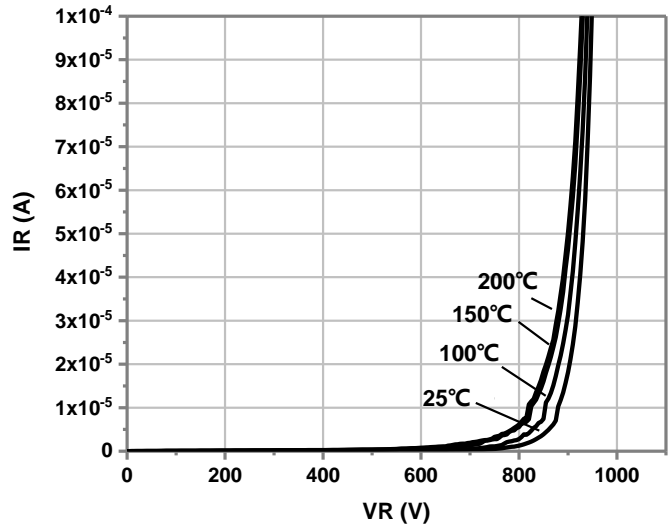


Figure 2. Typical reverse current as function of reverse voltage

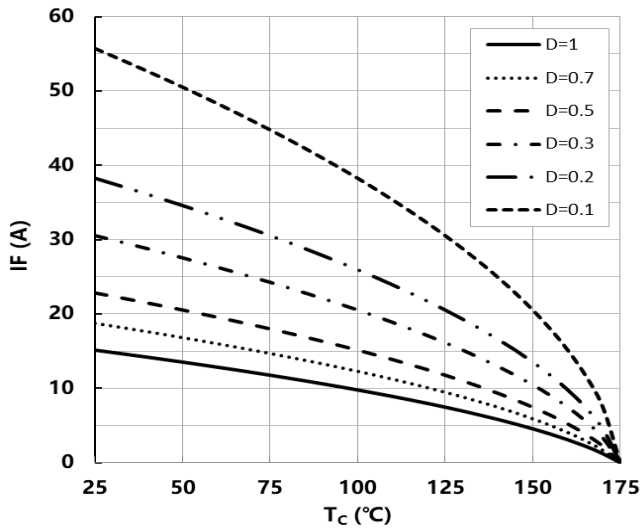


Figure 3. Diode forward current as function of temperature, D=duty cycle

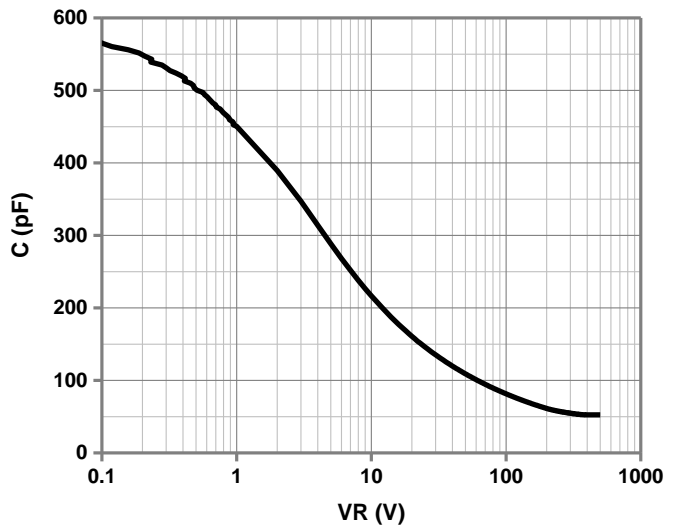


Figure 4. Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_j=25^\circ\text{C}$; $f=1\text{ MHz}$

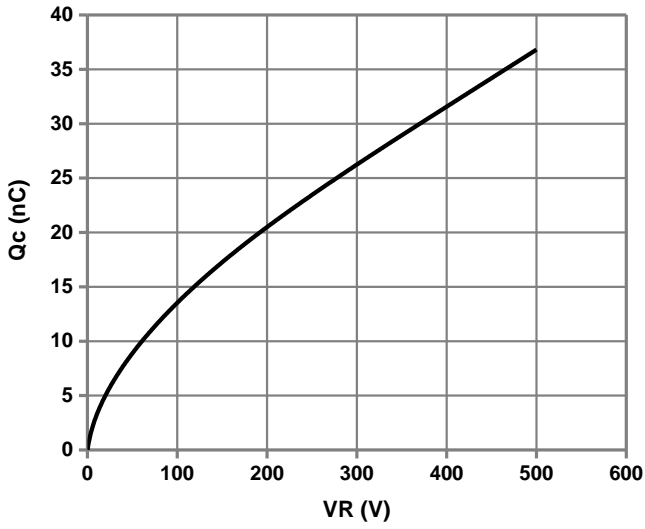


Figure 5. Typical reverse charge as function of reverse voltage

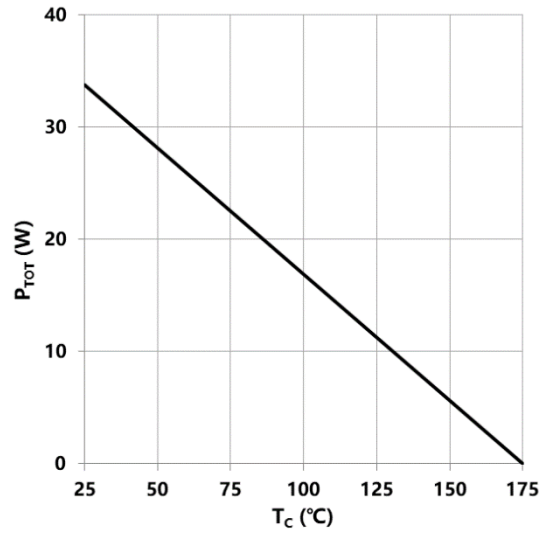


Figure 6. Power dissipation as function of case temperature

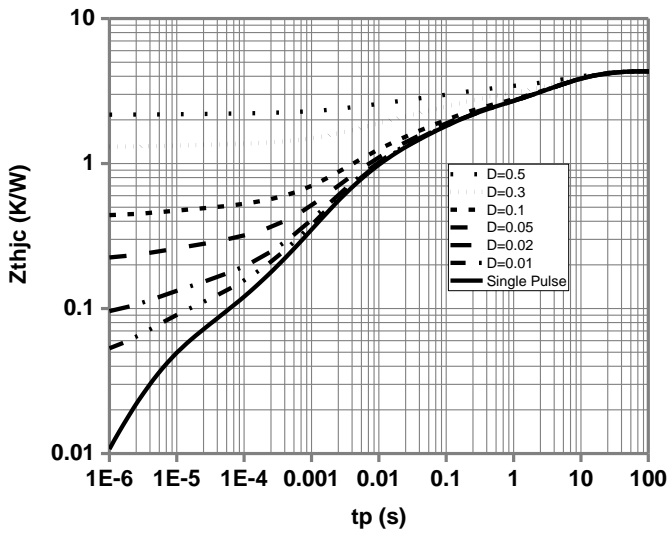
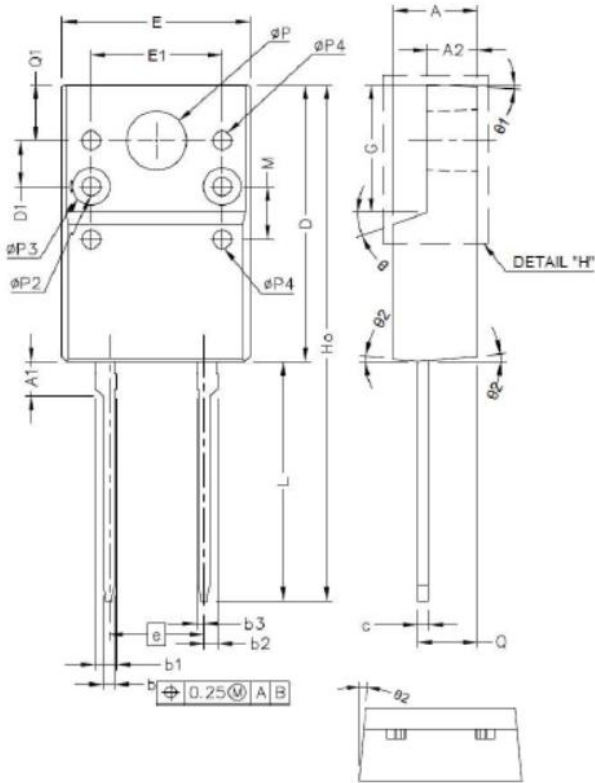


Figure 7. Max. transient thermal impedance, $Z_{th,jc}=f(t)$, parameter: $D=t/T$

Package Dimensions



SYMBOL	MIN (mm)	MAX (mm)
A	4.30	4.93
A1	1.80	3.90
A2	2.34	2.90
b	0.40	0.91
b1	1.00	1.40
b2	0.56	0.93
b3	0.24	0.55
C	0.40	0.80
D	14.70	16.07
D1	2.50 TYP	
D2	2.66 TYP	
e	4.83	5.33
E	9.70	10.36
E1	7.00 TYP	
G	6.50	7.10
H ₀	28 TYP	
L	12.10	13.50
L1		0.50
M	2.86 TYP	
ϕP	2.98	3.40
Q	3.10	3.30
Q1	2.70	3.50
θ	20° TYP	
θ_1	3° TYP	
θ_2	5° TYP	

Revision History:

2019-05-15

Preliminary Version

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Shenzhen, China
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