

V_{RRM} = 650 V
 $I_F(T_c=150^{\circ}C)$ = 5 A
 Q_C = 11.3 nC

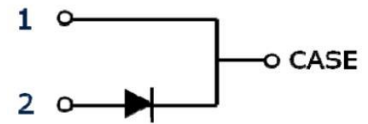
Features:

- 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-Anode

Package Parameters

Part Number	Marking	Package
B1D04065K	B1D04065K	TO-220-2

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	$T_c=25^{\circ}C$ $T_c=135^{\circ}C$ $T_c=150^{\circ}C$	14 6 5	A
I_{FSM}	Non-Repetitive Forward Surge Current	$T_c=25^{\circ}C$, $t_p=10ms$, sine halfwave	30	A
$\int i^2 dt$	i^2t Value	$T_c=25^{\circ}C$, $t_p=10ms$	4.5	A ² S
P_{tot}	Power Dissipation	$T_c=25^{\circ}C$ $T_c=110^{\circ}C$	74 31	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		2.04		K/W
$R_{th(ja)}$	Thermal resistance from junction to ambient		53.4		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 =4A T _j =25°C I _F =4A T _j =175°C		1.45 1.9		V
I _R	Reverse current	V _R =650V T _j =25°C V _R =650V T _j =175°C		0.05 3		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 $Q_c = \int_0^{V_R} C(V)dV$		11.3		nC
C	Total Capacitance	V _R =1V f=1MHz V _R =300V f=1MHz V _R =600V f=1MHz		177 28.6 28.4		pF

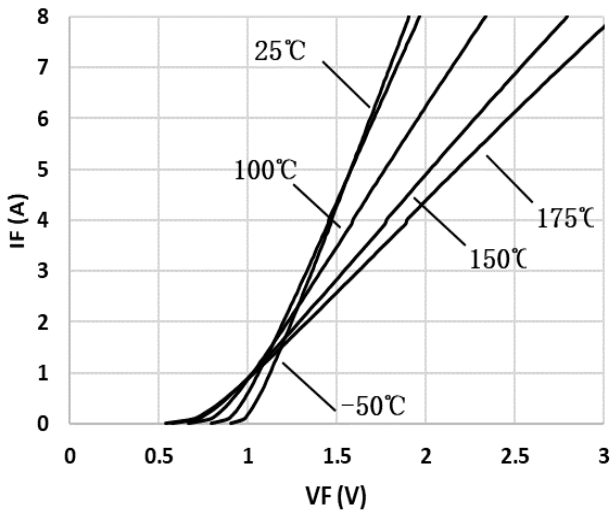


Figure 1. Typical forward characteristics

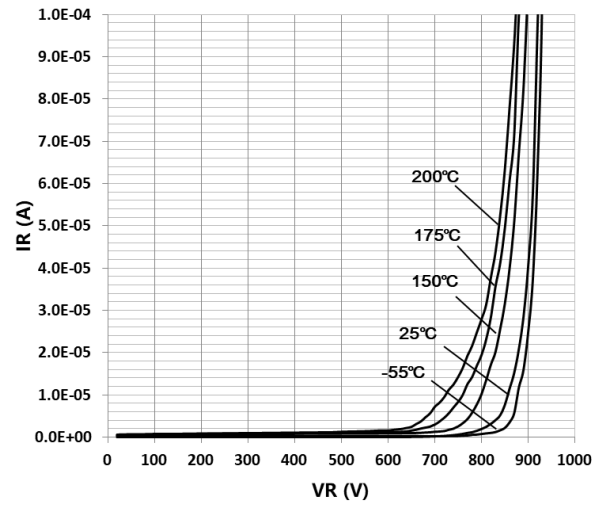


Figure 2. Typical reverse current as function of reverse voltage

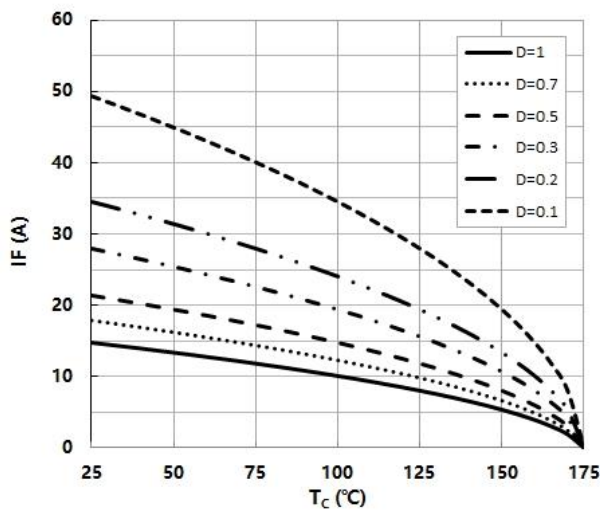


Figure 3. Diode forward current as function of temperature, D=duty cycle

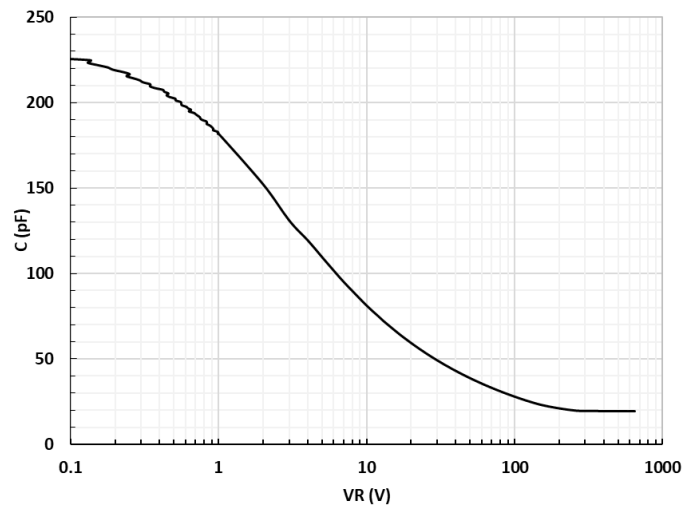


Figure 4. Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_j=25^\circ\text{C}$; $f=1\text{ MHz}$

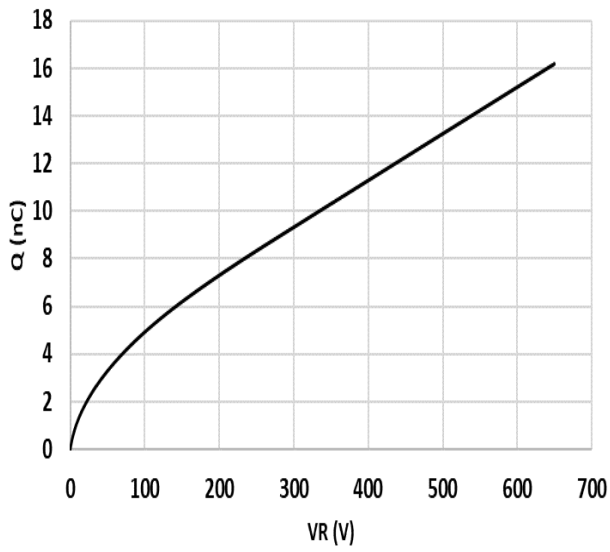


Figure 5. Typical reverse charge as function of reverse voltage

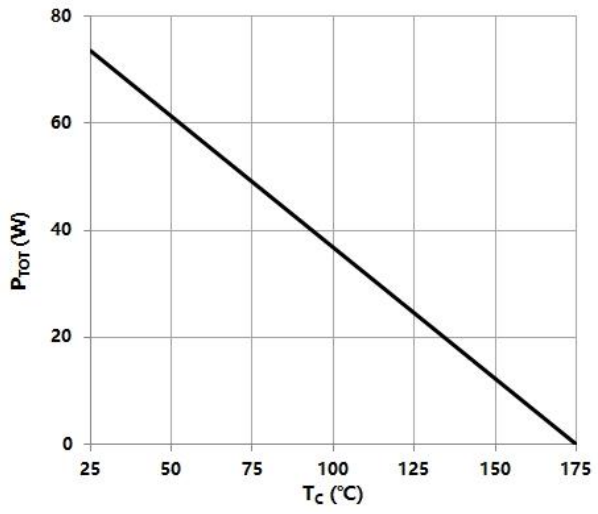


Figure 6. Power dissipation as function of case temperature

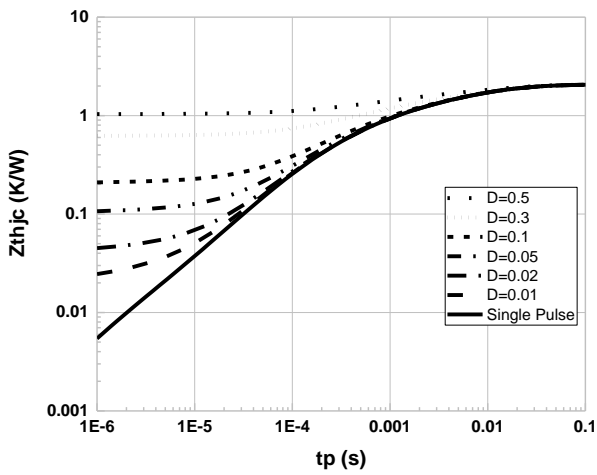
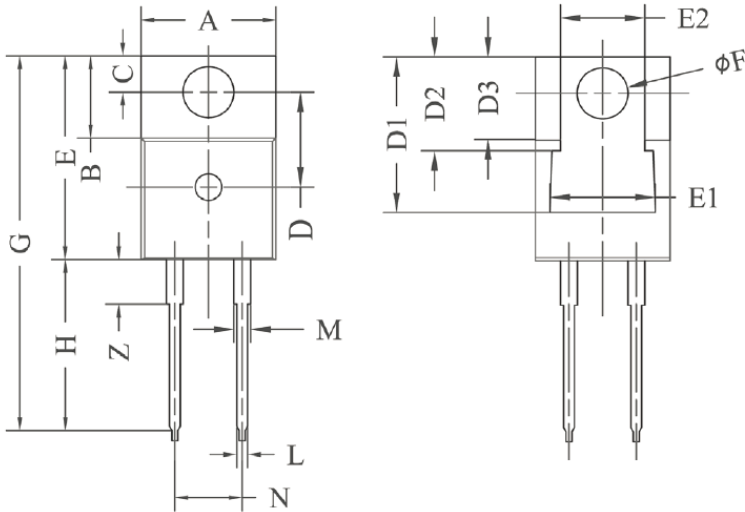


Figure 7. Max. transient thermal impedance, $Z_{th,jc}=f(t)$, parameter: $D=t / T$

Package Dimensions


POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.381	.410	9.677	10.414
B	.235	.255	5.969	6.477
C	.100	.120	2.540	3.048
D	.223	.337	5.664	8.560
D1	.457-.490		11.60-12.45 typ	
D2	.277-.303 typ		7.04-7.70 typ	
D3	.244-.252 typ		6.22-6.4 typ	
E	.590	.615	14.986	15.621
E1	.302	.326	7.68	8.28
E2	.227	.251	5.77	6.37
F	.143	.153	3.632	3.886
G	1.105	1.147	28.067	29.134
H	.500	.550	12.700	13.970
L	.025	.036	.635	.914
M	.045	.055	1.143	1.550
N	.195	.205	4.953	5.207
X	3°	5.5°	3°	5.5°
Y	.385	.410	9.779	10.414
Z	.130	.150	3.302	3.810

Revision History:

2019-02-25,Rev.1.0

Previous Revision:

Rev.1.0 Release of datasheet

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