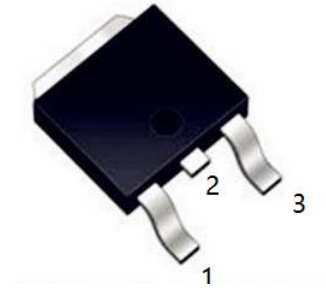


$V_{RRM} = 650\text{ V}$
 $I_F(T_C=150^{\circ}\text{C}) = 4\text{ A}$
 $Q_C = 11.3\text{ nC}$

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

Packag 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	A^2S
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_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

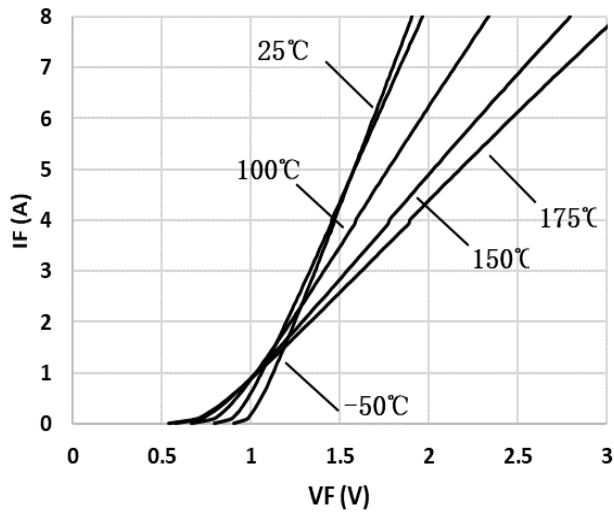


Figure 1. Typical forward characteristics

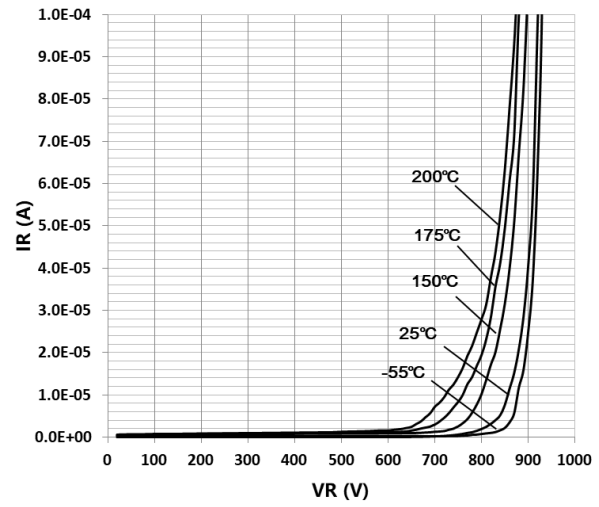


Figure 2. Typical reverse current as function of reverse voltage

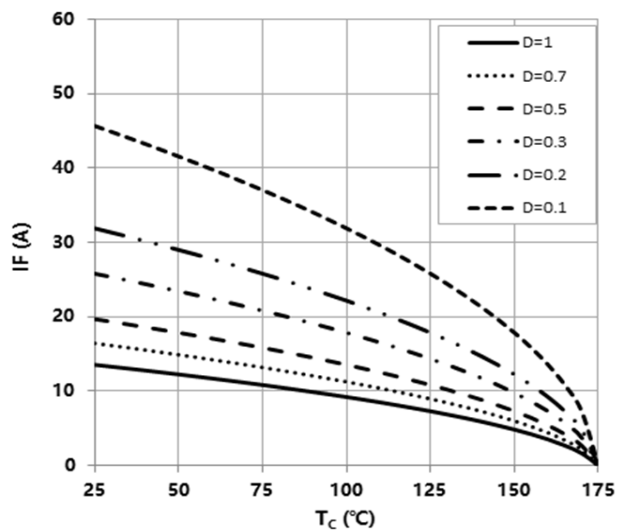


Figure 3. Diode forward current as function of temperature, D=duty cycle

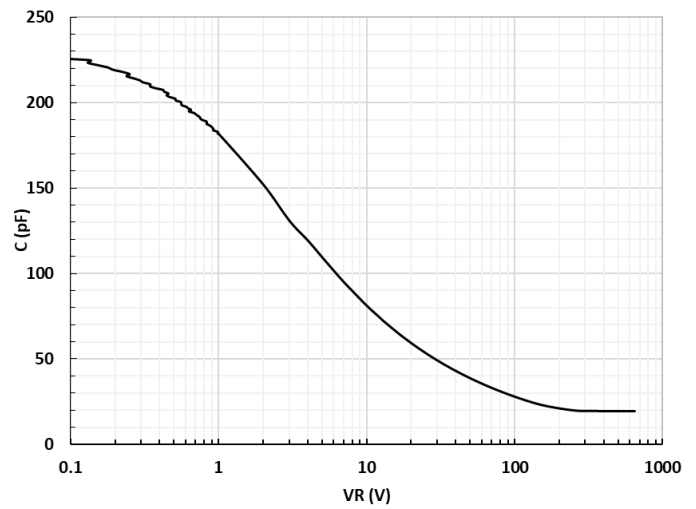


Figure 4. Typical capacitance as function of reverse voltage, $C=f(V_R)$; $T_J=25^\circ\text{C}$; $f=1\text{ MHz}$

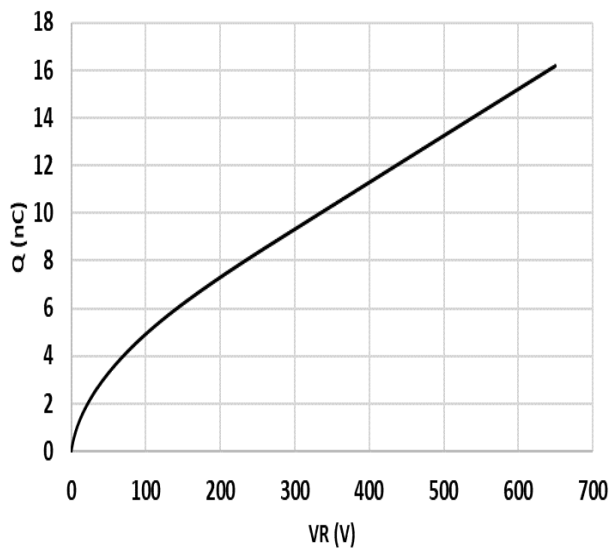


Figure 5. **Typical reverse charge as function of reverse voltage**

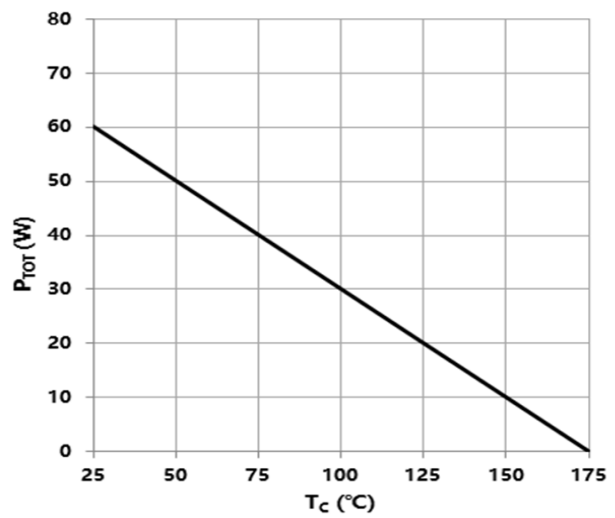


Figure 6. **Power dissipation as function of case temperature**

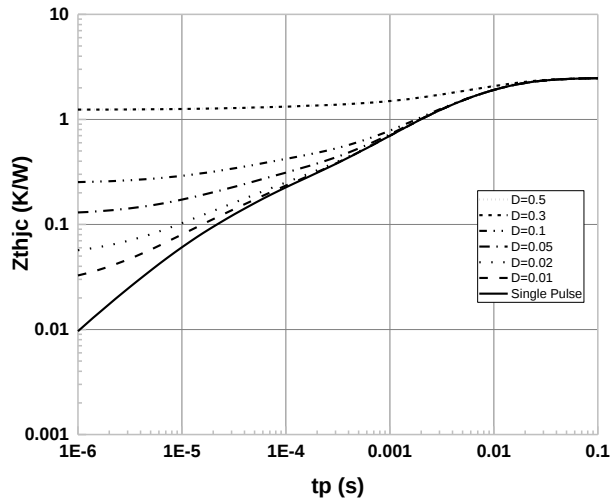
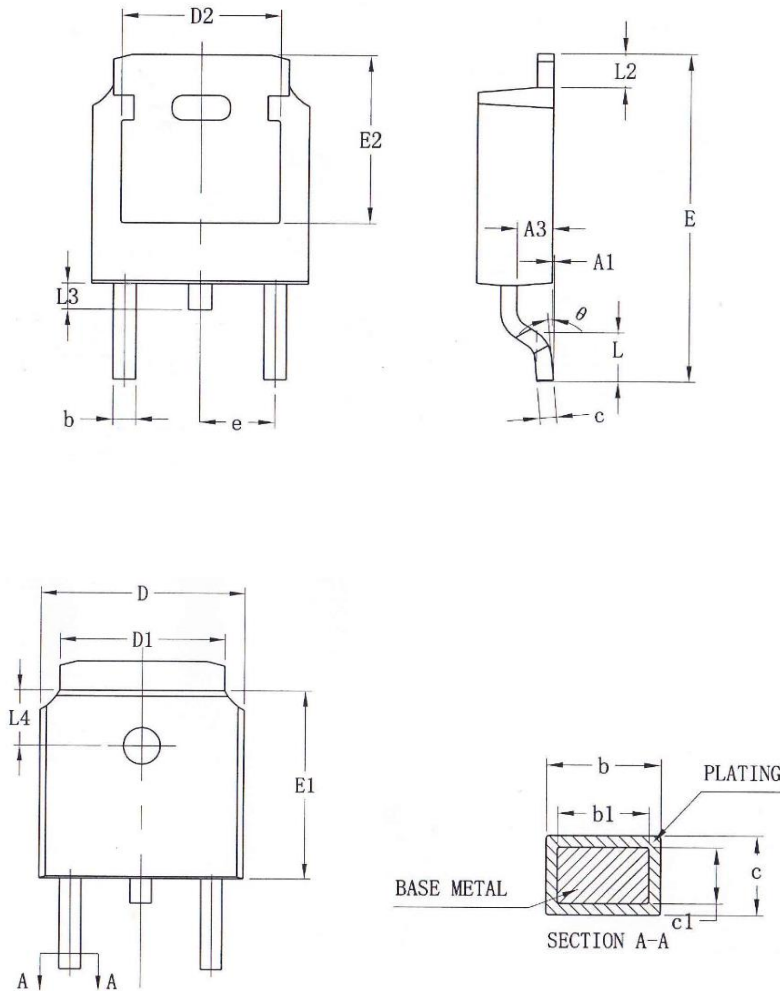


Figure 7. **Max. transient thermal impedance, $Z_{th,jc}=f(t)$, parameter: $D=t / T$**

Package Dimensions



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
θ	0		8°

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Rev.1.0 Release of datasheet

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