



General Description

This product family offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required.

Features

- Low conduction loss due to low V_F
- Extremely low switching loss by tiny Q_c
- Highly rugged due to better surge current
- Industrial standard quality and reliability

Applications

- UPS
- Power Inverter
- High performance SMPS
- Power factor correction



TO-220F-2L



Ordering Part Number	Package	Marking
HC1D04065F	TO-220F-2L	HC1D04065F





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

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}	650	V
Surge Peak Reverse Voltage	V_{RSM}	650	V
DC Peak Reverse Voltage	V_R	650	V
Continuous Forward Current $T_c = 25^\circ\text{C}$ $T_c = 135^\circ\text{C}$ $T_c = 152^\circ\text{C}$	I_F	10 5 4	A
Repetitive Peak Forward Surge Current $T_c = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ $T_c = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$	I_{FRM}	23 15	A
Non-Repetitive Forward Surge Current $T_c = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ $T_c = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$	I_{FSM}	36 28	A
i^2dt value $T_c = 25^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$ $T_c = 110^\circ\text{C}, t_p=10\text{ms}, \text{Half Sine Pulse}$	$\int i^2 dt$	6.5 3.9	A^2s
Power dissipation $T_c = 25^\circ\text{C}$ $T_c = 110^\circ\text{C}$	P_{tot}	30 13	W
Operating junction Range	T_j	-55 to +175	$^\circ\text{C}$
Storage temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

Thermal Resistance

Parameter	Symbol	Typ.	Unit
Thermal resistance, junction – case.	R_{thJC}	4.90	$^\circ\text{C/W}$



Electrical Characteristic (at $T_c = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Forward Voltage	V_F	-	1.3	1.5	V	$I_F=4\text{A}$ $T_J=25^\circ\text{C}$ $T_J=175^\circ\text{C}$
Reverse Current	I_R	-	10	50	μA	$V_R=650\text{V}$ $T_J=25^\circ\text{C}$ $T_J=175^\circ\text{C}$
Total Capacitive Charge	Q_C	-	10.6	-	nC	$V_R=400\text{V}$, $T_J=25^\circ\text{C}$ $Q_C = \int_0^{V_R} C(V)dV$
Total Capacitance	C	-	203	-	pF	$T_J=25^\circ\text{C}$, $f=1\text{MHz}$ $V_R=0\text{V}$ $V_R=200\text{V}$ $V_R=400\text{V}$

Characteristics Curve

Fig 1: Forward Characteristics

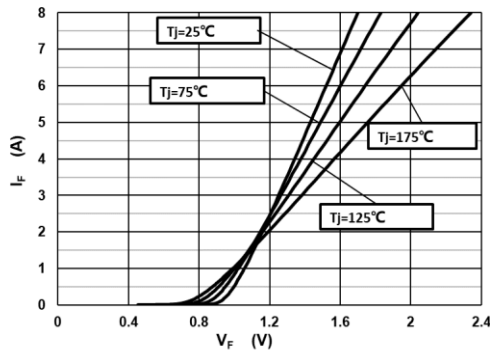


Fig 2: Reverse Characteristics

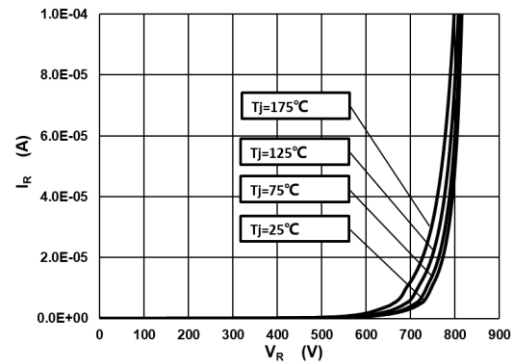


Fig 3: Current Derating

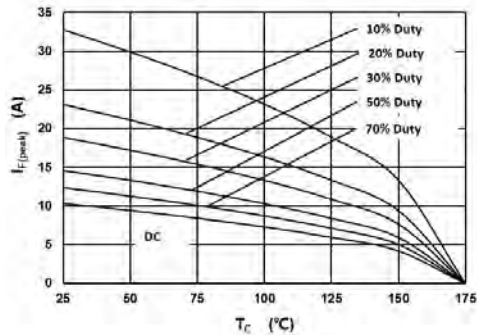


Fig 4: Power Derating

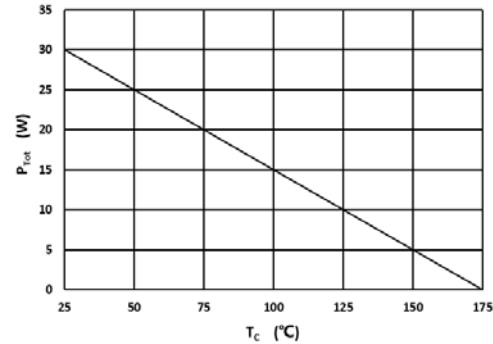




Fig 5: Capacitance vs. Reverse Voltage

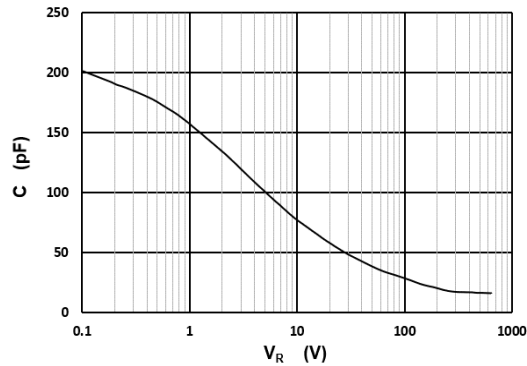


Fig 6: Reverse Charge vs. Reverse Voltage

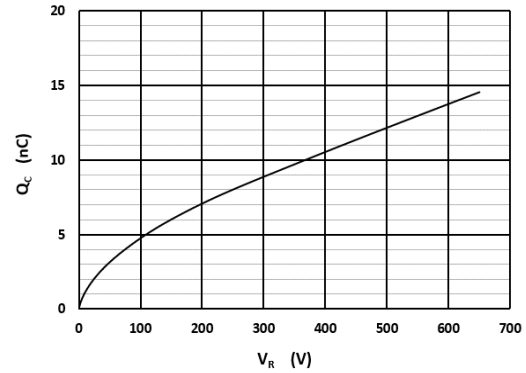


Fig 7: Typical Capacitance Stored Energy

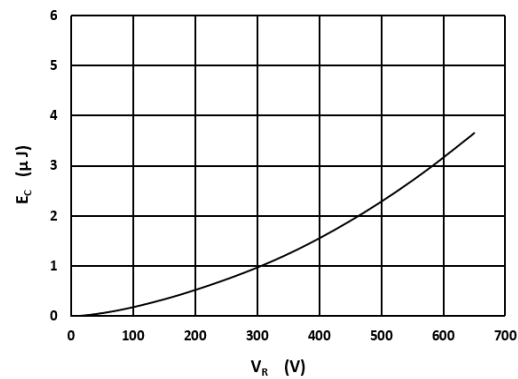
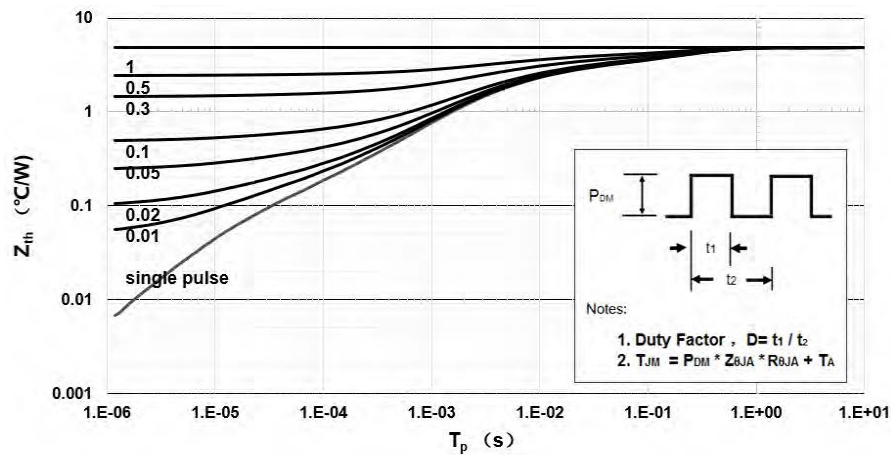


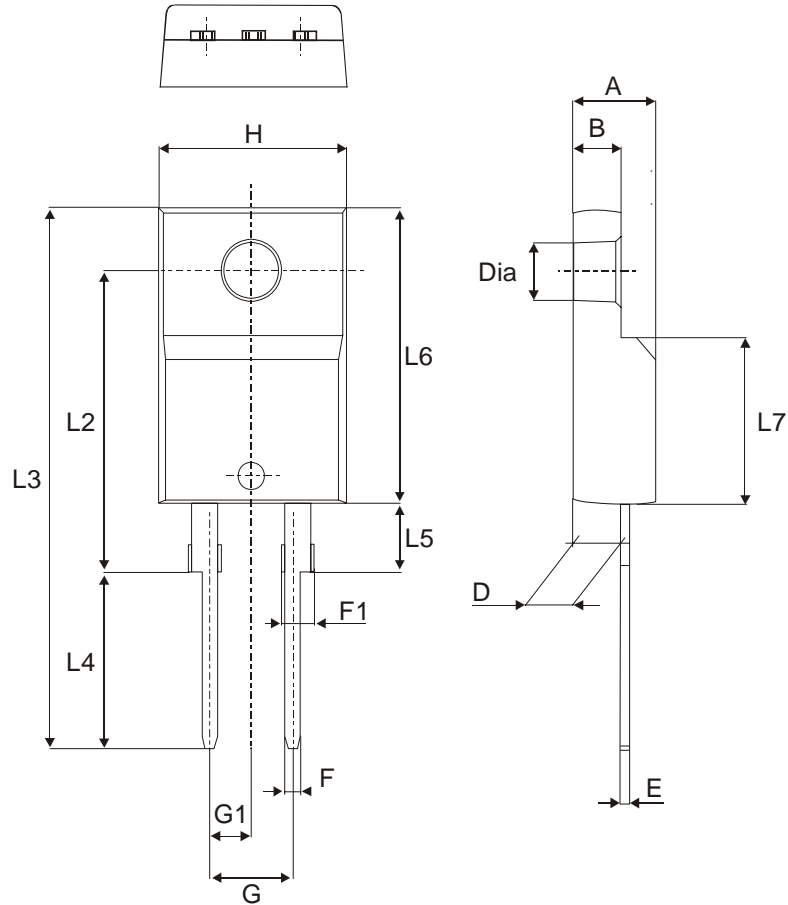
Fig 8: Transient Thermal Impandance





Package Dimensions

Package TO-220F-2L



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	2.50	2.70	0.098	0.106
D	2.50	2.75	0.098	0.108
E	0.45	0.70	0.018	0.027
F	0.75	1.00	0.030	0.039
F1	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.40	2.70	0.094	0.106
H	10.00	10.40	0.393	0.409
L2	16.00 typ.		0.630 typ.	
L3	28.60	30.60	0.126	1.205
L4	9.80	10.60	0.386	0.417
L5	2.90	3.60	0.114	0.142
L6	15.90	16.40	0.626	0.646
L7	9.00	9.30	0.354	0.366
Dia.	3.00	3.20	0.118	0.126



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