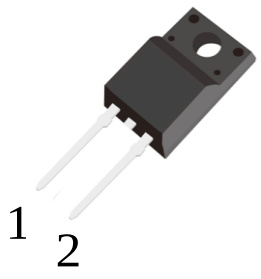
MPCF3N65A

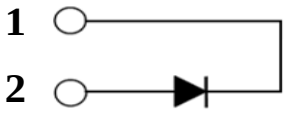
Silicon Carbide Schottky Diode

Features

- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Temperature-independent Switching Behavior
- Positive Temperature Coefficient on V_F
- High-speed switching possible
- High surge current capability



TO-220F-2



Applications

- Switch Mode Power Supply (SMPS)
- Motor Drives
- Power Factor Correction(PFC)

Ordering Information

Type N0.	Marking	Package
MPCF3N65A	MPCF3N65A	TO-220F-2

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value	Unit	Note
Repetitive Peak Reverse Voltage	V_{RRM}		650	V	
Surge Peak Reverse Voltage	V_{RSM}		650	V	
DC Blocking Voltage	V_{DC}		650	V	
Continuous Forward Current	I_F	T_C = 25ºC	11	A	Fig.7
		T_C = 158ºC	3		
Non-Repetitive Forward Surge Current	I_{FSM}	T_C = 25ºC, t_p=8.3ms, Half Sine Wave	30	A	
Non-Repetitive Peak Forward Current	$I_{F,Max}$	T_C = 25ºC, t_p=10us, Pulse	100	A	
Power Dissipation	P_{tot}	T_C = 25ºC	12.5	W	Fig.6
Operating Junction and Storage Temperature	T_J, T_{stg}		-55~+175	ºC	

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Electrical Characteristics T_J = 25ºC, unless otherwise noted							
Parameter	**Symbol**	**Test Conditions**	**Value**			**Unit**	**Note**
			Min.	**Typ.**	**Max.**		
Forward Voltage	V_F	I_F = 3A, T_J = 25ºC	--	1.4	1.65	V	Fig.1
		I_F = 3A, T_J = 175ºC	--	1.7	2.3		
Reverse Current	I_R	V_R = 650V, T_J = 25ºC	--	1	10	uA	Fig.2
		V_R = 650V, T_J = 175ºC	--	5	100	uA	
Total Capacitance	C	V_R = 0V, f=1 MHZ	--	180	--	pF	Fig.3
		V_R = 200V, f=1 MHZ	--	18	--		
		V_R = 400V, f=1 MHZ	--	15	--		
Total Capacitive charge	Q_c	V_{DD} = 400V, T_J = 25ºC, $Q_c=\int_0^{V_R} C(V)dV$		7.7		nC	Fig.4
Capacitance Stored Energy	E_c	V_R = 400V		1.1		uJ	Fig.5

Thermal Characteristics				
Parameter	**Symbol**	**Typ.**	**Unit**	**Note**
Thermal Resistance from Junction to Case	R_{thJC}	12	ºC/W	Fig.8

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Typical Performance T_J = 25ºC, unless otherwise noted

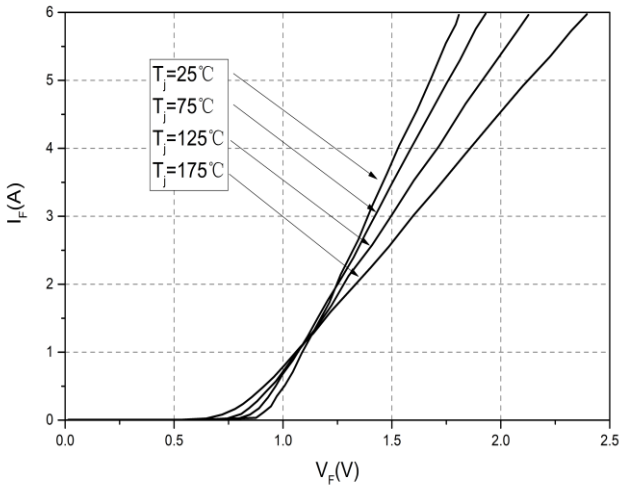


Figure 1. Forward Characteristics

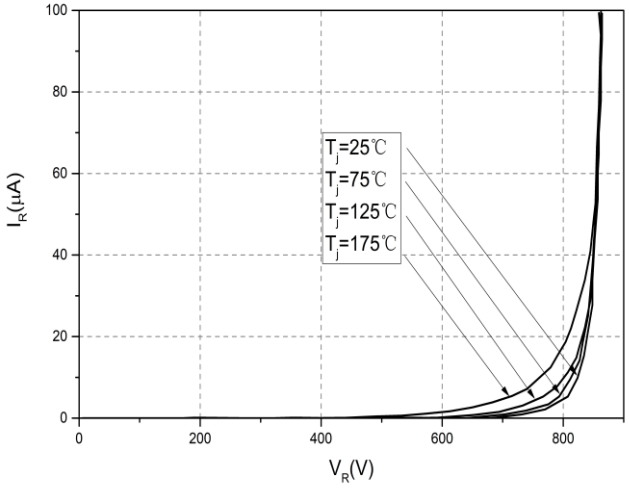


Figure 2. Reverse Characteristics

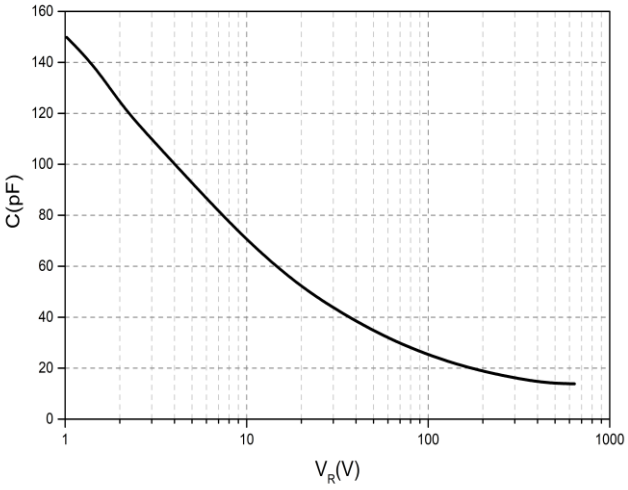


Figure 3. Capacitance vs. Reverse Voltage

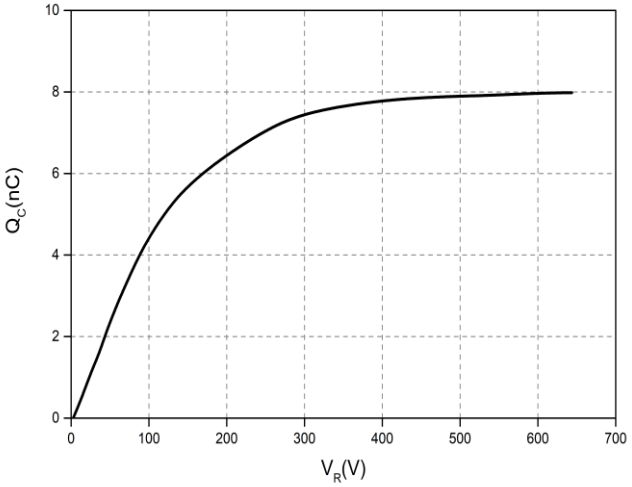


Figure 4. Total Capacitance Charge vs. Reverse Voltage

Typical Performance T_J = 25ºC, unless otherwise noted

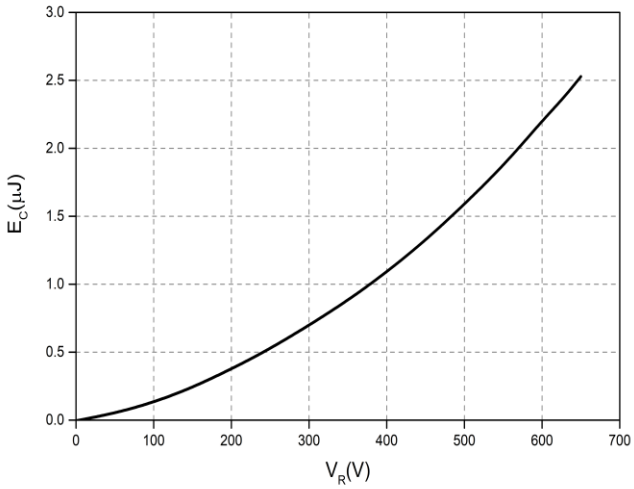


Figure 5. Capacitance Stored Energy

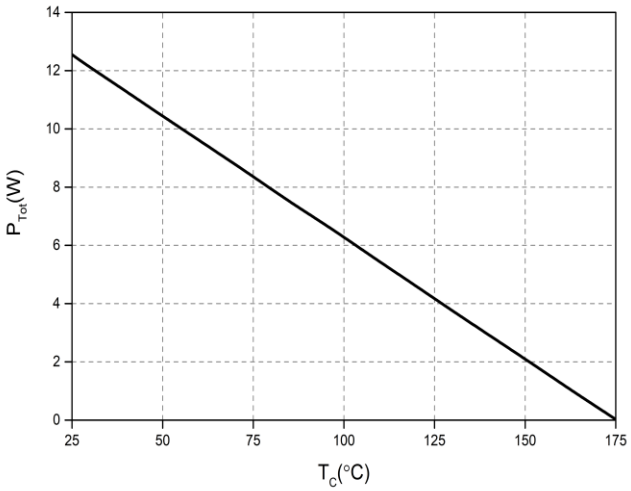


Figure 6. Power derating

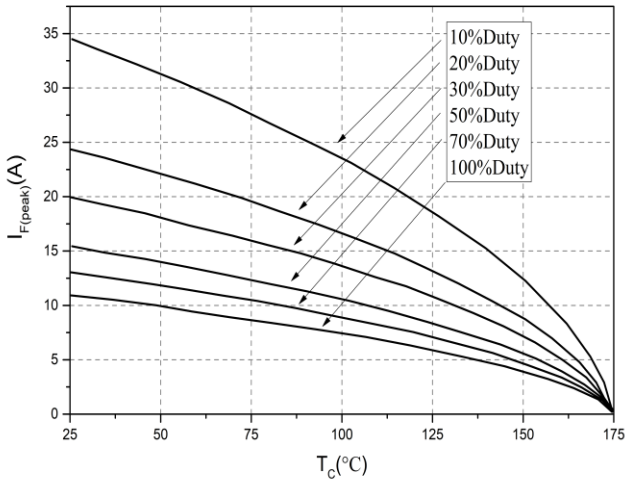


Figure 7. Current Derating

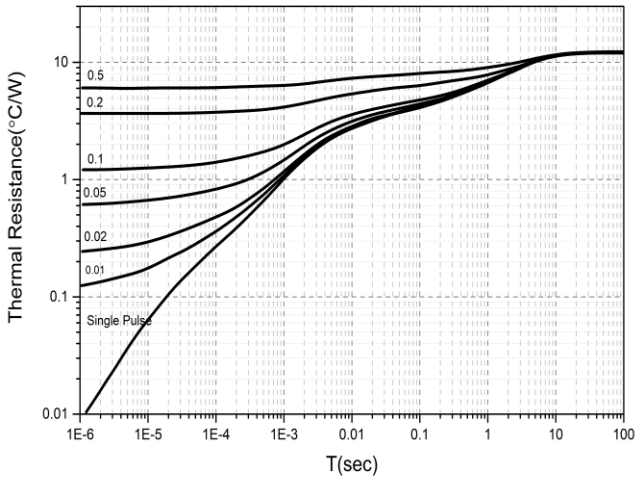
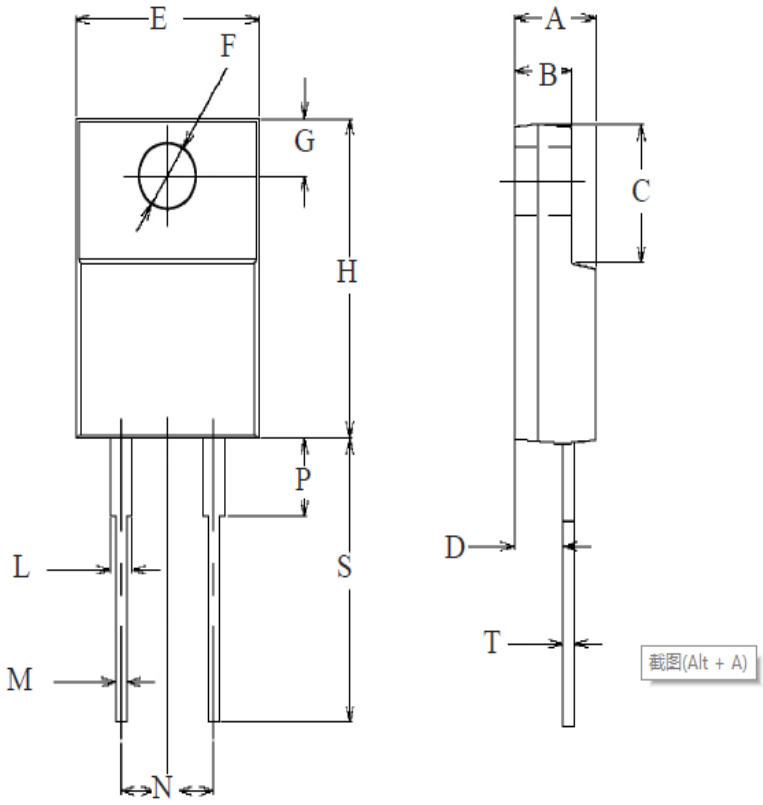


Figure 8. Transient Thermal Impendance

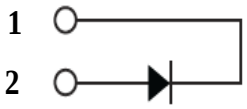
Outline Dimensions

Unit: um

TO-220F



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	0.177	0.194	4.5	4.93
B	0.092	0.108	2.34	2.74
C	0.256	0.272	6.5	6.9
D	0.098	0.117	2.5	2.96
E	0.39	0.408	9.9	10.36
F	0.117	0.134	2.98	3.4
G	0.122	0.138	3.1	3.5
H	0.617	0.633	15.67	16.07
L	0.039	0.055	1	1.4
M	0.016	0.036	0.4	0.91
N	0.200 TYP		5.08 TYP	
P	0.114	0.154	1.9	3.9
S	0.476	0.519	12.1	13.18
T	0.016	0.031	0.4	0.8

NOTE:

1. Dimension L, M, T apply for Solder Dip Finish