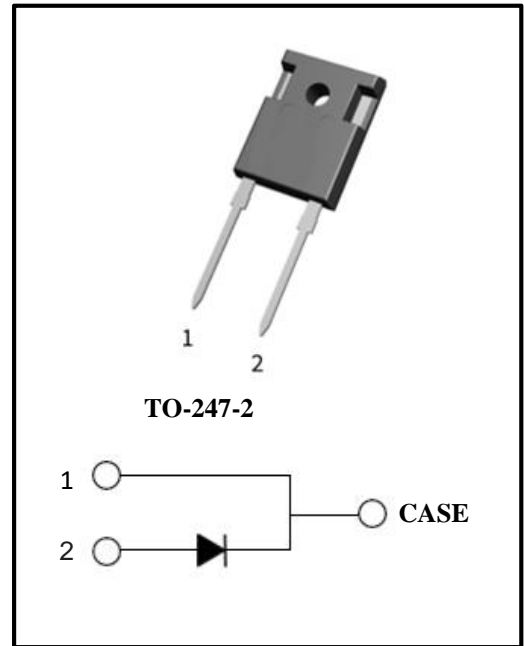


**Features**

- 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

**Applications**

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



Ordering Information		
Type NO.	Marking	Package
MPCK10N120A	MPCK10N120A	TO-247-2

Absolute Maximum Ratings ( $T_C = 25^\circ\text{C}$ , unless otherwise noted)					
Parameter	Symbol	Test Conditions	Value	Unit	Note
Repetitive Peak Reverse Voltage	$V_{RRM}$		1200	V	
Surge Peak Reverse Voltage	$V_{RSM}$		1200	V	
DC Blocking Voltage	$V_{DC}$		1200	V	
Continuous Forward Current	$I_F$	$T_C = 25^\circ\text{C}$	30	A	
		$T_C = 150^\circ\text{C}$	10		
Non-Repetitive Forward Surge Current	$I_{FSM}$	$T_C = 25^\circ\text{C}$ , $t_p=8.3\text{ms}$ , Half Sine Wave	95	A	
Non-Repetitive Peak Forward Current	$I_{F,Max}$	$T_C=25^\circ\text{C}$ , $t_p=10\mu\text{s}$ , pulse	600	A	
Power Dissipation	$P_{tot}$	$T_C = 25^\circ\text{C}$	150	W	
Operating Junction and Storage Temperature	$T_J, T_{stg}$		-55~+175	$^\circ\text{C}$	



# MPCK10N120A

Electrical Characteristics ( $T_J = 25^\circ\text{C}$ , unless otherwise noted)							
Parameter	Symbol	Test Conditions	Value			Unit	Note
			Min.	Typ.	Max.		
Forward Voltage	$V_F$	$I_F = 10\text{A}, T_J = 25^\circ\text{C}$	--	1.55	1.8	V	Fig.1
		$I_F = 10\text{A}, T_J = 175^\circ\text{C}$	--	2.2	2.5		
Reverse Current	$I_R$	$V_R = 1200\text{V}, T_J = 25^\circ\text{C}$	--	1	20	uA	Fig.2
		$V_R = 1200\text{V}, T_J = 175^\circ\text{C}$	--	5	100	uA	
Total Capacitance	C	$V_R = 0\text{V}, f=1\text{ MHz}$	--	650	--	pF	Fig.3
		$V_R = 400\text{V}, f=1\text{ MHz}$	--	49	--		
		$V_R = 800\text{V}, f=1\text{ MHz}$	--	40	--		
Total Capacitive charge	$Q_c$	$V_{DD} = 400\text{V}, T_J = 25^\circ\text{C},$ $Q_c = \int_0^{V_R} C(V) dV$		29		nC	Fig.4
Capacitance Stored Energy	$E_c$	$V_R = 400\text{V}$		15		uJ	Fig.5

Thermal Characteristics				
Parameter	Symbol	Typ.	Unit	Note
Thermal Resistance from Junction to Case	$R_{thJC}$	0.95	$^\circ\text{C/W}$	Fig.8

## Typical Performance ( $T_j = 25^\circ\text{C}$ , unless otherwise noted)

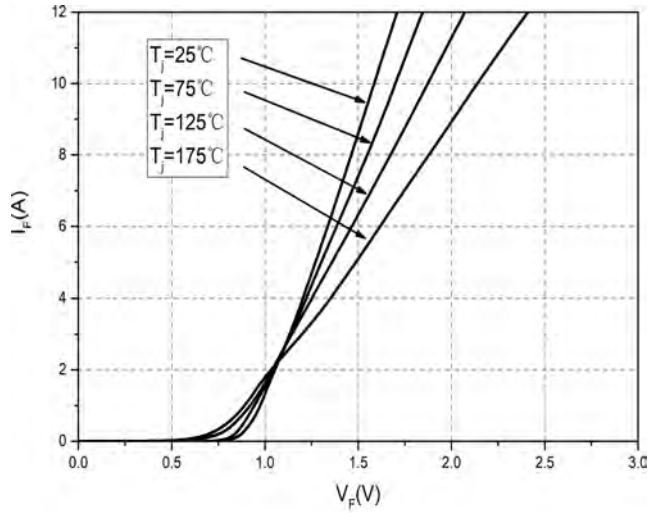


Figure 1. Forward Characteristics

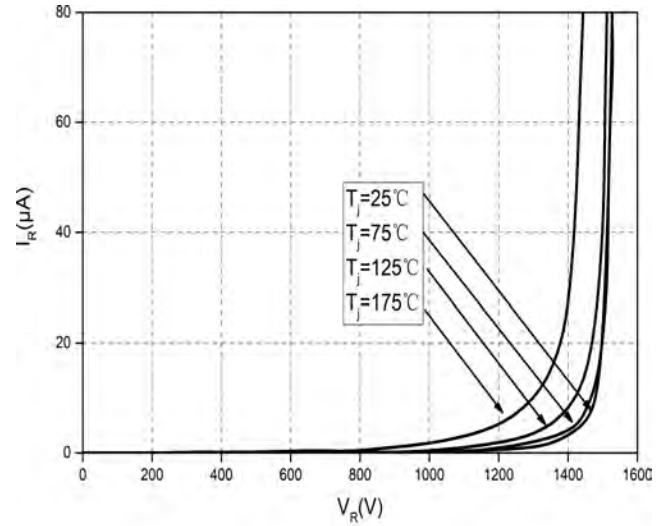


Figure 2. Reverse Characteristics

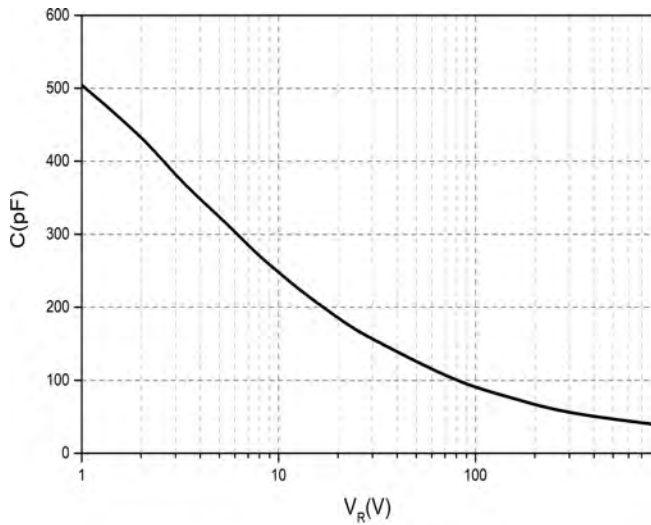


Figure 3. Capacitance vs. Reverse Voltage

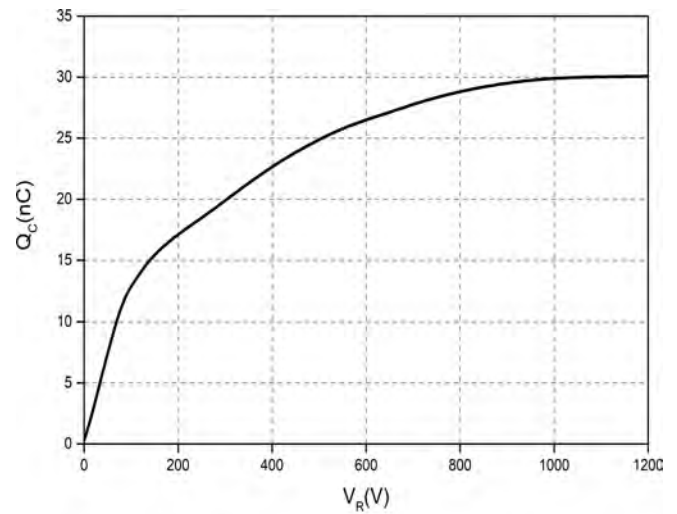


Figure 4. Total Capacitance Charge vs. Reverse Voltage



# MPCK10N120A

Typical Performance ( $T_j = 25^\circ\text{C}$ , unless otherwise noted)

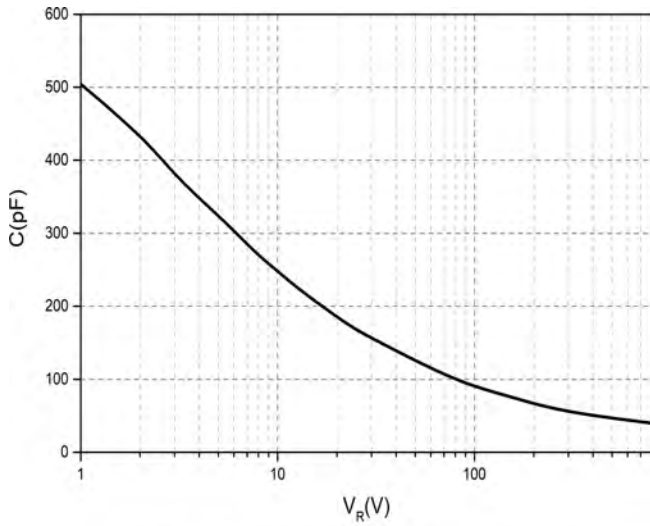


Figure 5. Capacitance Stored Energy

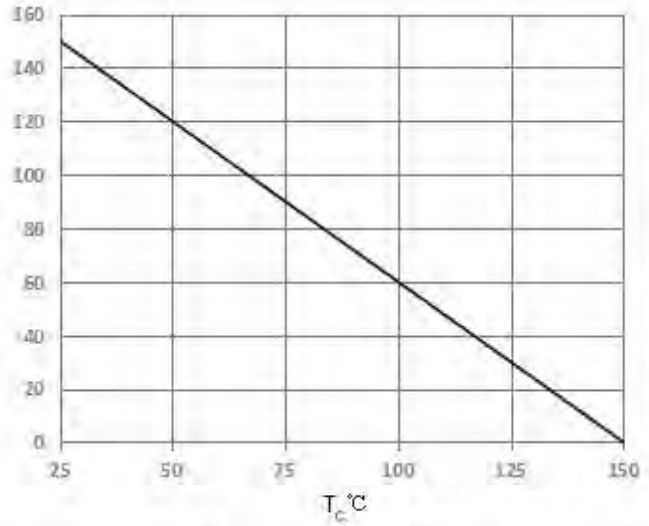


Figure 6. Power Derating

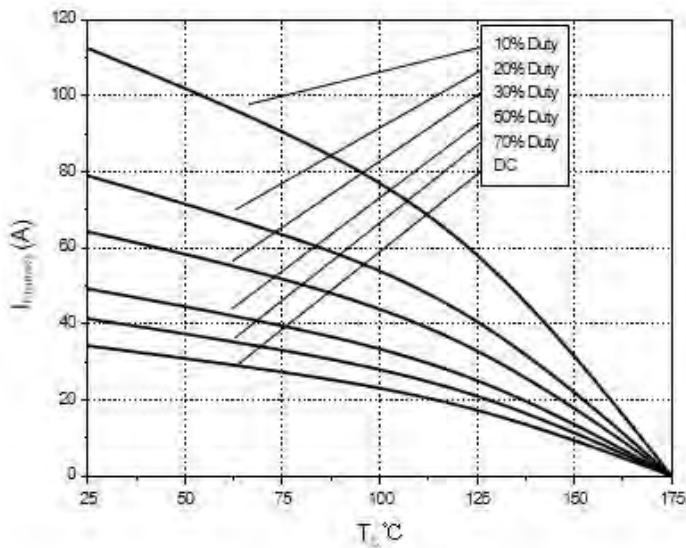


Figure 7. Current Derating

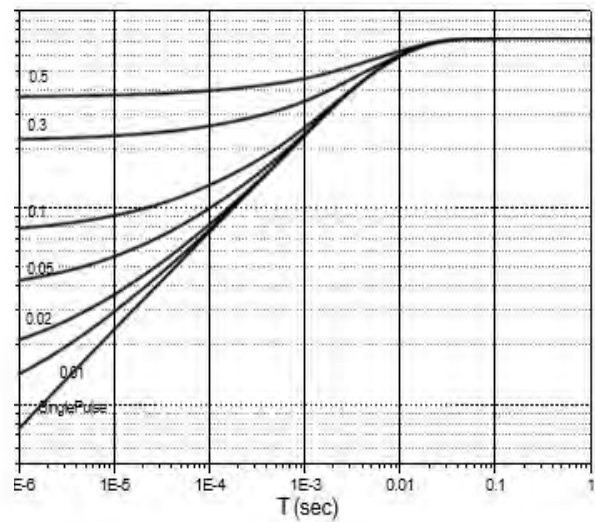
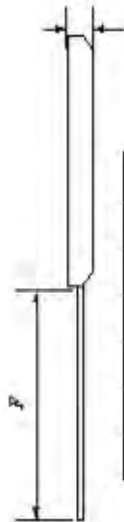
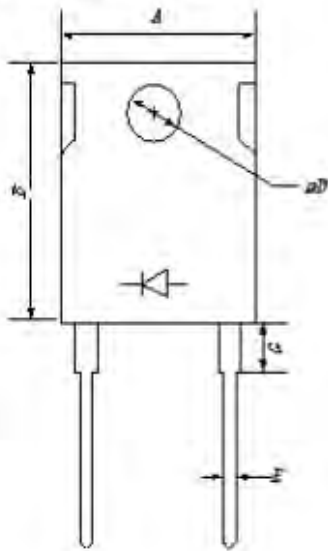


Figure 8. Transient Thermal Impedance

## Outline Dimensions

Unit: um

Package TO-247-2



Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	14.18	15.75	17.33
B	18.45	20.5	22.55
C	4.50	5.00	5.50
D	3.15	3.50	3.85
E	1.08	1.20	1.32
F	18.27	20.30	22.33