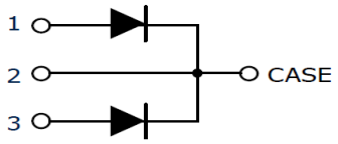
MPCE40N120A

Silicon Carbide Schottky Diode

Features

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

TO-247-3



Applications

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

Ordering Information

Ordering Information		
Type N0.	**Marking**	**Package**
MPCE40N120A	MPCE40N120A	TO-247-3

Maximum Ratings (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Value(leg)	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V		
V_{RSM}	Surge Peak Reverse Voltage	1200	V		
V_{DC}	DC Blocking Voltage	1200	V		
I_F	Continuous Forward Current	55 20	A	T_C=25°C T_C=150°C	Fig. 7
I_{FSM}	Non-Repetitive Forward Surge Current	145	A	T_C=25°C, t_P=8.3ms, Half Sine Wave	
$I_{F,Max}$	Non-Repetitive Peak Forward Current	1575	A	T_C=25°C, t_P= 10 μs, Pulse	
P_{tot}	Power Dissipation	201	W	T_C=25°C	Fig. 6
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	°C		

Electrical Characteristics(leg)

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.6 2.25	1.8 2.5	V	I_F= 20 A T_J=25°C I_F= 20 A T_J=175°C	Fig. 1
I_R	Reverse Current	5 30	20 200	μA	V_R= 1200 V T_J=25°C V_R= 1200 V T_J=175°C	Fig. 2
Q_C	Total Capacitive Charge	59		nC	V_R= 1200 V, T_J= 25°C $Q_C=\int_0^{V_R} C(V)dV$	Fig. 4
C	Total Capacitance	1280 95 77		pF	V_R= 0 V, T_J= 25°C, f = 1 MHz V_R= 400 V, T_J= 25°C, f = 1 MHz V_R= 800 V, T_J= 25°C, f = 1 MHz	Fig. 3
E_C	Capacitance Stored Energy	18		μJ	V_R= 600 V	Fig. 5

Thermal Characteristics(leg)

Symbol	Parameter	Typ.	Unit	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	0.6	°C/W	Fig. 8

Typical Performance(leg)

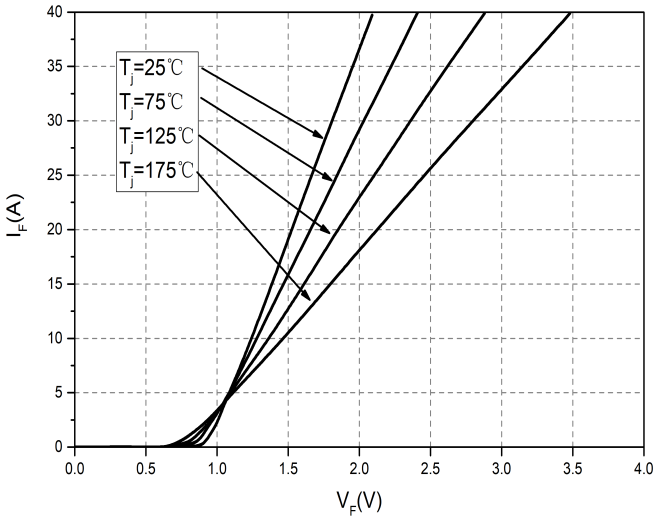


Figure 1. Forward Characteristics

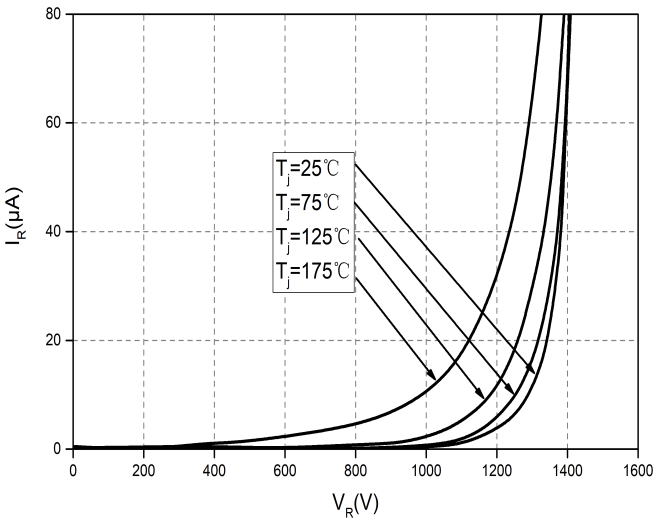


Figure 2. Reverse Characteristics

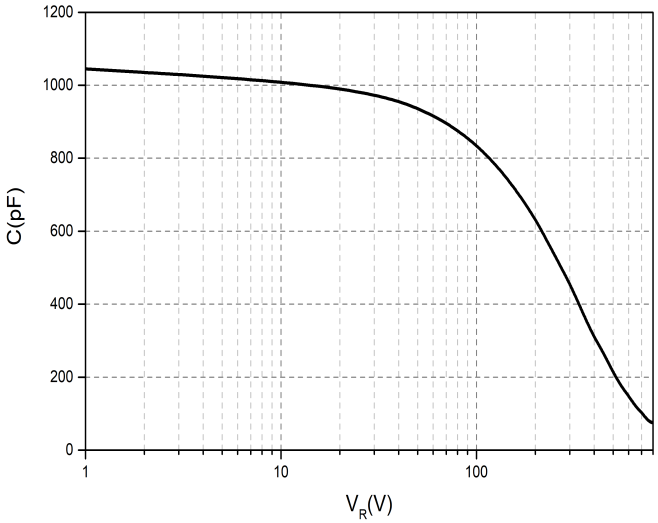


Figure 3. Capacitance vs. Reverse Voltage

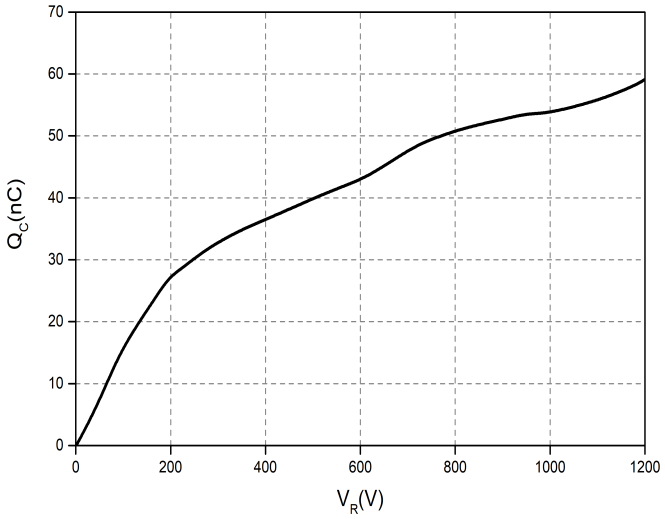


Figure 4. Total Capacitance Charge vs. Reverse Voltage

Typical Performance(leg)

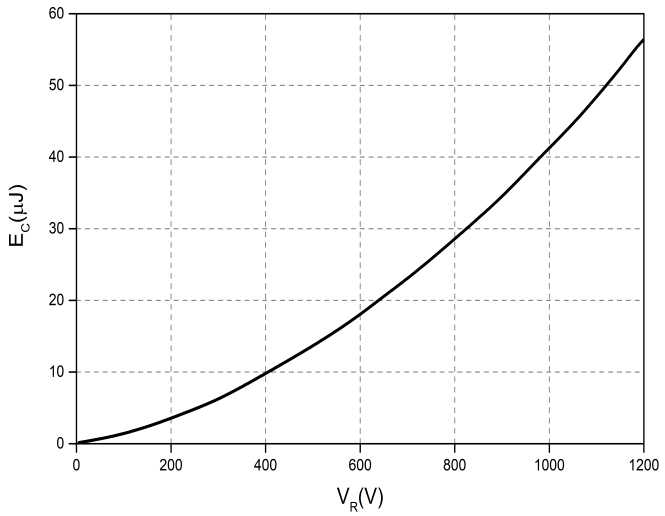


Figure 5. Capacitance Stored Energy

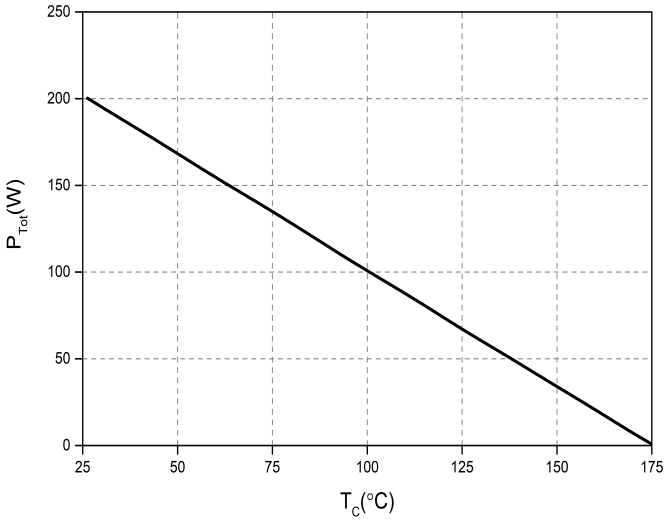


Figure 6. Power derating

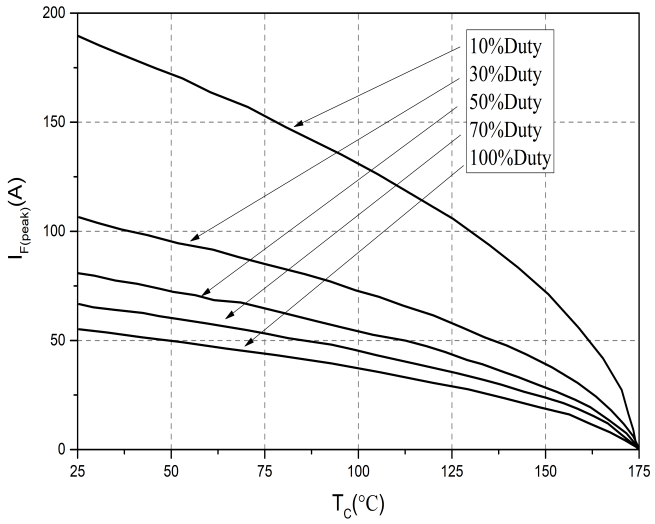


Figure 7. Current Derating

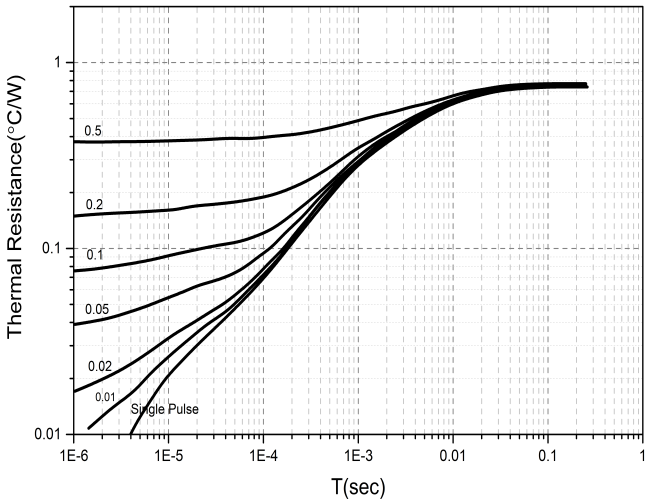


Figure 8. Transient Thermal Impendance

Outline Dimensions

unit : mm

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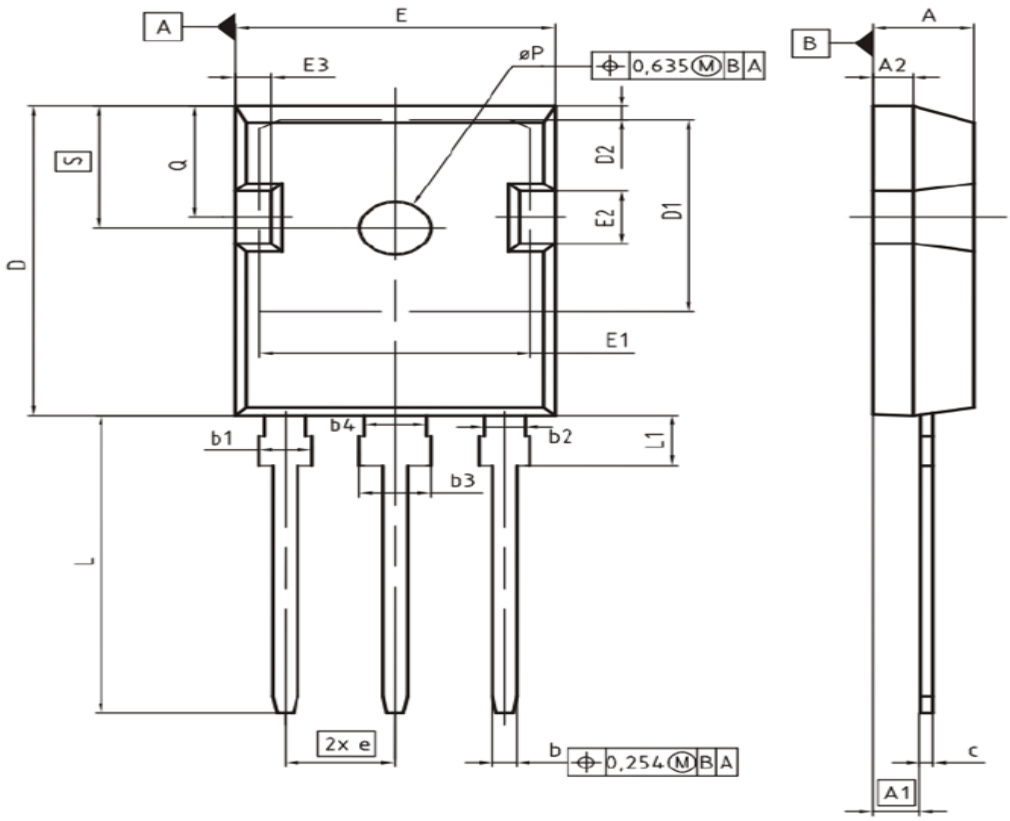

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.83	5.21	0.190	0.205
A1	2.27	2.54	0.089	0.100
A2	1.85	2.16	0.073	0.085
b	1.07	1.33	0.042	0.052
b1	1.90	2.41	0.075	0.095
b2	1.90	2.16	0.075	0.085
b3	2.87	3.38	0.113	0.133
b4	2.87	3.13	0.113	0.123
c	0.55	0.68	0.022	0.027
D	20.80	21.10	0.819	0.831
D1	16.25	17.65	0.640	0.695
D2	0.95	1.35	0.037	0.053
E	15.70	16.13	0.618	0.635
E1	13.10	14.15	0.516	0.557
E2	3.68	5.10	0.145	0.201
E3	1.00	2.60	0.039	0.102
e	5.44 (BSC)		0.214 (BSC)	
N	3		3	
L	19.60	20.32	0.780	0.800
L1	4.10	4.47	0.161	0.176
øP	3.50	3.70	0.138	0.146
Q	5.49	6.00	0.216	0.236
S	6.04	6.30	0.238	0.248