Features

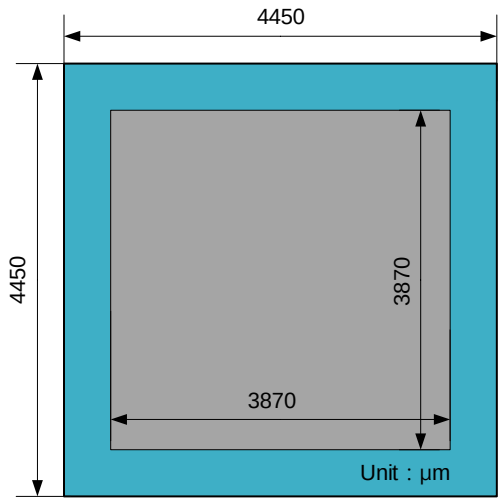
- Zero Forward Recovery Voltage
- Zero Reverse Recovery Current
- Excellent Surge Current Capability
- Temperature Independent Switching
- Positive Temperature Coefficient on V_F
- High Frequency Operation

Part NO.		MS1D40120B
V_{RRM}	=	1200 V
$I_{F(AVG)}$	=	40 A
Q_C	=	204 nC

Wafer Parameters

Parameter	Typ.	Unit
Die Size	4450 x 4450	μm
Anode Pad Opening	3870 x 3870	μm
Wafer Diameter	150	mm
Thickness	175±10	μm
Anode Metalization (Al)	4	μm
Cathode Metalization (Ti/Ni/Ag)	0.1/0.4/1	μm
Grossdie	761	

Chip Outline （unit: μm）



Maximum ratings

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		1200	V
V_{RSM}	Surge peak reverse voltage		1200	V
$I_{F(AVG)}$	Average forward current	T_c=145°C	40*	A
I_{FSM}	Non-Repetitive forward surge current	T_c=25°C, t_p=10ms, Half Sine Wave	272	A
P_{tot}	Power dissipation	T_c=25°C T_c=110°C	452* 196*	W
T_j	Operating junction temperature		-55~175	°C
T_{stg}	Storage temperature		-55~175	°C

* Assumes thermal resistance of 0.332°C/W or less

Electrical Characteristics

Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25°C	1200			V
V_F	Diode forward voltage	I_F=40A T_j=25°C I_F=40A T_j=175°C		1.48 2.17		V
I_R	Reverse current	V_R=1200V T_j=25°C V_R=1200V T_j=175°C		8 54		μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capactive charge	V_R=800V T_j=25°C $Q_C = \int_0^{V_R} C(V)dV$		204		nC
C	Total capacitance	V_R=1V f=1MHz V_R=400V f=1MHz V_R=800V f=1MHz		2270 192 144		pF
E_C	Capacitance stored energy	V_R=800V		105		μJ

Typical Performance

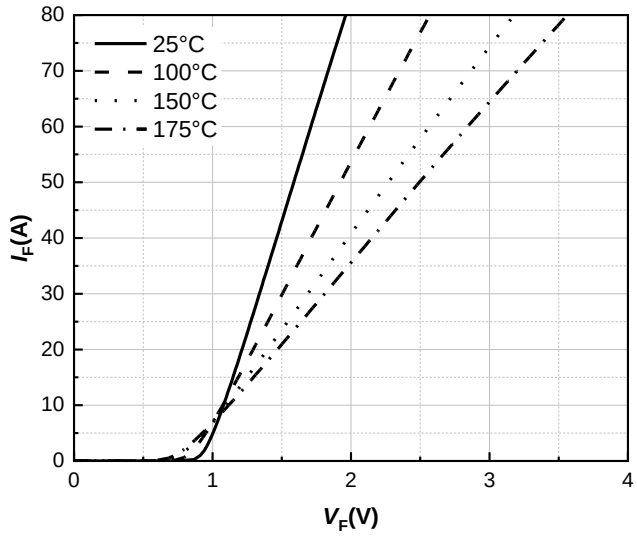


Figure 1. **Typical forward characteristics**

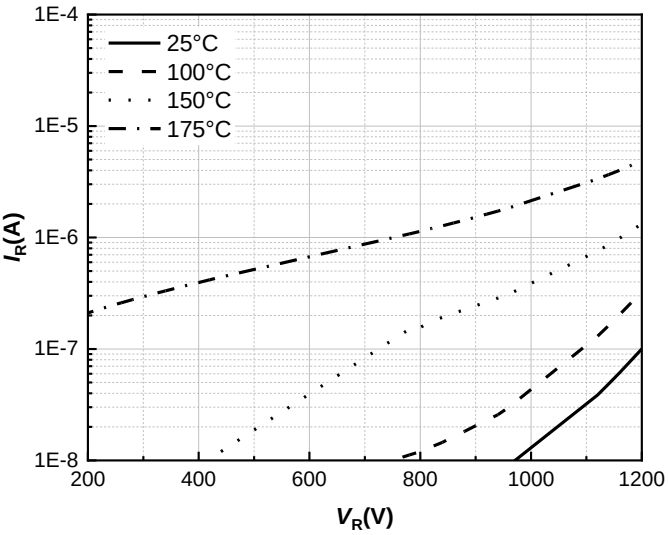


Figure 2. **Typical reverse current as function of reverse voltage**

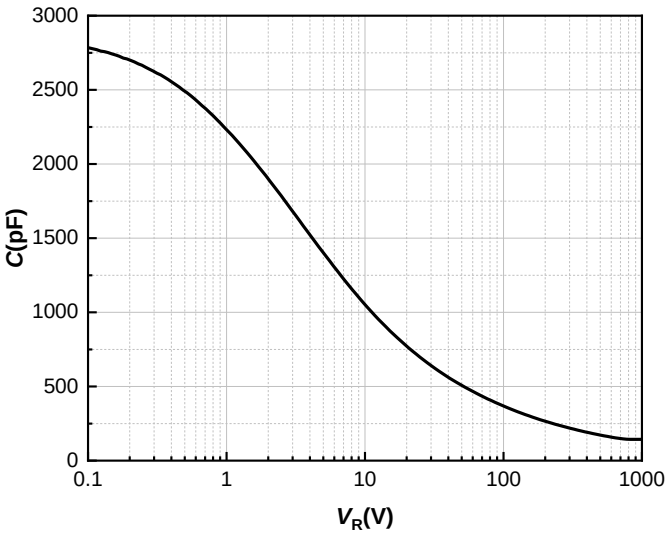


Figure 3**. Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25°C; f=1 MHz**

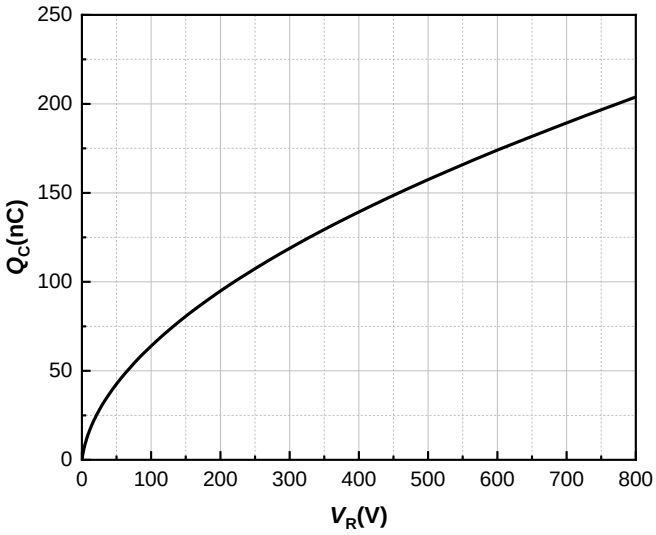


Figure 4**. Typical reverse charge as function of reverse voltage**