

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.

Product Summary

V_{RRM}	650 V
$I_F (T_C 155^\circ\text{C})$	20 A
$V_F (T_j 25^\circ\text{C})$	1.3 V

Features

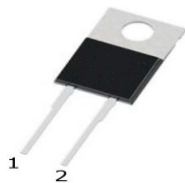
- Low conduction loss due to low V_F
- Extremely low switching loss by tiny Q_C
- Highly rugged due to better surge current
- Industrial standard quality and reliability



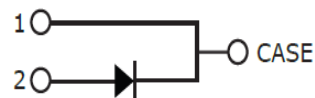
Applications

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

TO-220-2



Equivalent circuit



Package Marking and Ordering Information

Part #	Marking	Package
MX20065A	MX20065A	TO-220-2

Maximum Ratings (at $T_c = 25\text{ }^\circ\text{C}$, 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 $T_c = 25\text{ }^\circ\text{C}$ $T_c = 135\text{ }^\circ\text{C}$ $T_c = 155\text{ }^\circ\text{C}$	I_F	58 30 20	A
Repetitive Peak Forward Surge Current $T_c = 25\text{ }^\circ\text{C}, t_p = 10\text{ms}, \text{Half Sine Pulse}$ $T_c = 110\text{ }^\circ\text{C}, t_p = 10\text{ms}, \text{Half Sine Pulse}$	I_{FRM}	90 54	A
Non-Repetitive Forward Surge Current $T_c = 25\text{ }^\circ\text{C}, t_p = 10\text{ms}, \text{Half Sine Pulse}$ $T_c = 110\text{ }^\circ\text{C}, t_p = 10\text{ms}, \text{Half Sine Pulse}$	I_{FSM}	160 140	A
i^2dt value $T_c = 25\text{ }^\circ\text{C}, t_p = 10\text{ms}, \text{Half Sine Pulse}$ $T_c = 110\text{ }^\circ\text{C}, t_p = 10\text{ms}, \text{Half Sine Pulse}$	$\int i^2 dt$	128 98	A^2s
Power dissipation $T_c = 25\text{ }^\circ\text{C}$ $T_c = 110\text{ }^\circ\text{C}$	P_{tot}	136 59	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}	1.10	$^\circ\text{C}/\text{W}$

Electrical Characteristic (at T_c = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Forward Voltage	V _F	-	1.3	1.5	V	I _F =20A T _j =25°C
		-	1.5			T _j =175°C
Reverse Current	I _R	-	-	80	μA	V _R =650V T _j =25°C
		-	-	200		T _j =175°C
Total Capacitive Charge	Q _C	-	62	-	nC	V _R =400V, T _j =25°C $Q_C = \int_0^{V_R} C(V) dV$
Total Capacitance	C	-	1176	-	pF	T _j =25°C, f=1MHz V _R =0V
		-	119	-		V _R =200V
		-	98	-		V _R =400V

Characteristics Curve:

Fig 1: Forward Characteristics

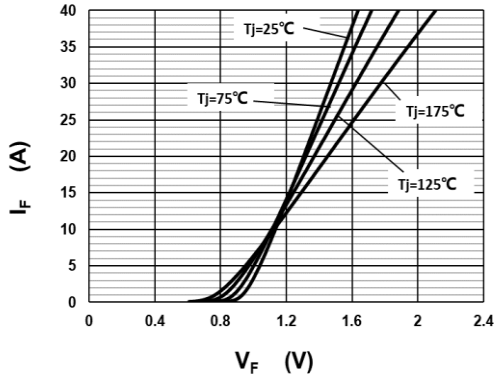


Fig 2: Reverse Characteristics

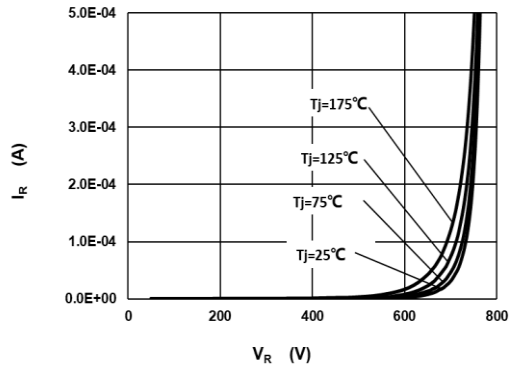


Fig 3: Current Derating

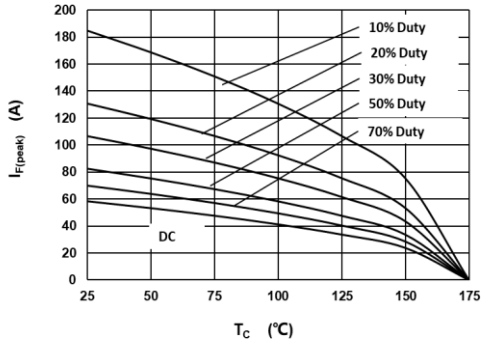


Fig 4: Power Derating

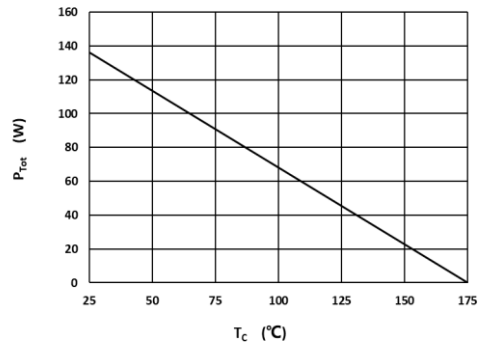


Fig 5: Capacitance vs. Reverse Voltage

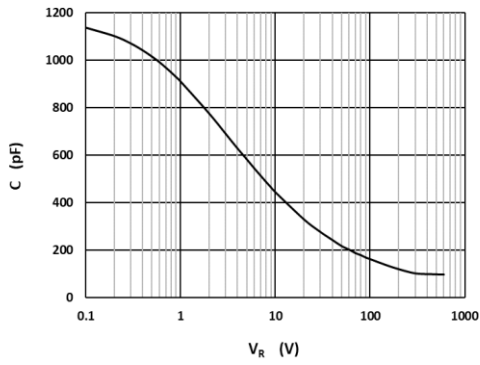


Fig 6: Reverse Charge vs. Reverse Voltage

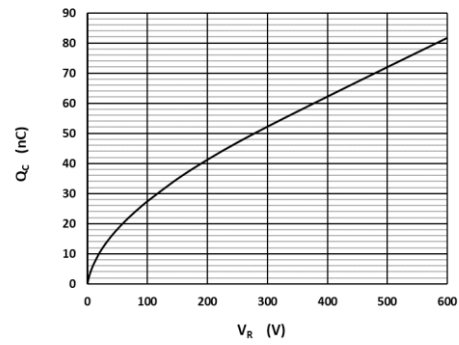


Fig 7: Typical Capacitance Stored Energy

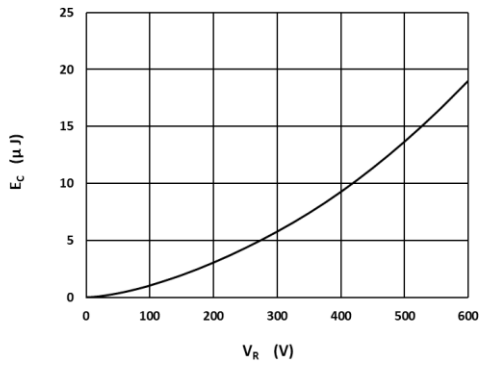
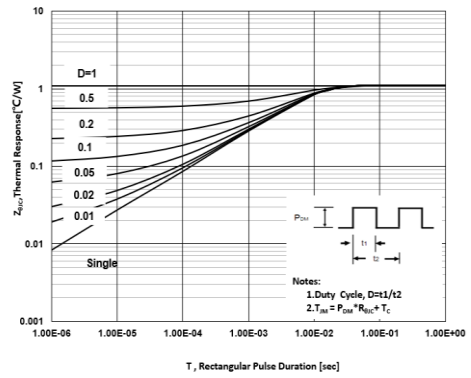
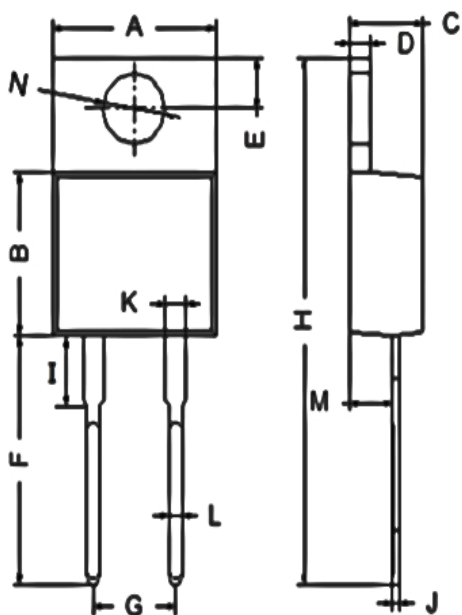


Fig 8: Transient Thermal Impedance



Mechanical Dimensions:


POS	Millimeters	
	Min.	Max.
A	9.80	10.50
B	8.60	9.20
C	4.37	4.77
D	1.07	1.47
E	2.40	3.00
F	13.14	14.20
G	4.90	5.24
H	28.00	29.20
I	3.50	4.00
J	0.28	0.50
K	1.20	1.50
L	0.70	0.90
M	2.40	2.90
N	3.70	4.00

Revision History

Revision	Date	Major changes
1.0		Release of formal version.

Warnings

Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. It is suggested to be used under 80 percent of the maximum ratings of the device.

1. When installing the heatsink, please pay attention to the torsional moment and the smoothness of the heatsink.
2. This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, or air traffic control systems.