

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

Benefits

- ◆ Increased Power Density
- ◆ Essentially no Switching Losses
- ◆ Reduction of Heat Sink Requirements
- ◆ Higher Efficiency
- ◆ Reduced EMI

Applications

- ◆ Uninterruptible Power Supplies
- ◆ Switch Mode Power Supplies
- ◆ Power Factor Correction
- ◆ Motor Drivers

Description

Pin 1, 2 and Case - Cathode

Pin 3 - Anode

Part NO.	HX1D06065E
V_{RRM}	= 650 V
$I_F(T_c=160^\circ\text{C})$	= 6 A
Q_C	= 25 nC

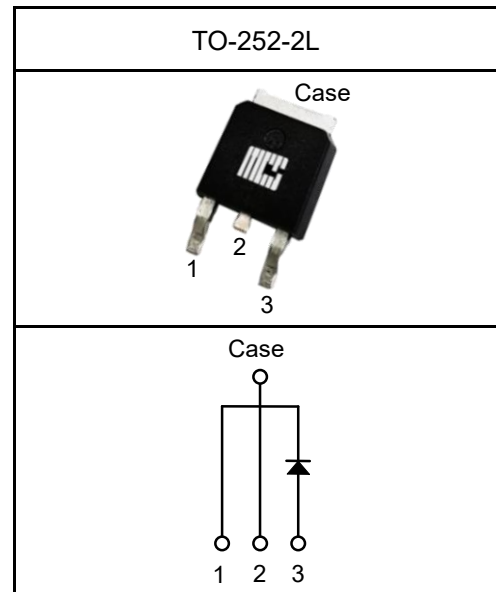


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Maximum Ratings ($T_j=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		650	V
I_F	Continuous Forward Current	$T_c=25^{\circ}\text{C}$ $T_c=135^{\circ}\text{C}$ $T_c=160^{\circ}\text{C}$	25 11 6	A
I_{FRM}	Repetitive Forward Surge Current	$T_c=25^{\circ}\text{C}$, $t_p=10\text{ms}$, Half Sine Wave	47	A
I_{FSM}	Non-Repetitive Forward Surge Current	$T_c=25^{\circ}\text{C}$, $t_p=10\text{ms}$, Half Sine Wave $T_c=150^{\circ}\text{C}$, $t_p=10\text{ms}$, Half Sine Wave	54 45	A
$I_{F,max}$	Non-Repetitive Forward Surge Current	$T_c=25^{\circ}\text{C}$, $t_p=10\mu\text{s}$, Pulse	630	A
$\int i^2 dt$	i^2t Value	$T_c=25^{\circ}\text{C}$, $t_p=10\text{ms}$ $T_c=150^{\circ}\text{C}$, $t_p=10\text{ms}$	14 10	A^2s
P_{tot}	Power Dissipation	$T_c=25^{\circ}\text{C}$ $T_c=110^{\circ}\text{C}$	93 40	W
E_{AS}	Non-Repetitive Avalanche Switching Energy	$V_{DD}=50\text{V}$, $L=1\text{mH}$, $I_D=8.5\text{A}$	36	mJ
E_{AR}	Repetitive Avalanche Energy	$V_{DD}=50\text{V}$, $L=770\mu\text{H}$, $I_D=8.5\text{A}$	27	mJ
T_j	Operating Junction Temperature		-40~175	$^{\circ}\text{C}$
T_{stg}	Storage Temperature		-40~150	$^{\circ}\text{C}$
T_{sld}	Soldering Temperature		260	$^{\circ}\text{C}$

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(j-c)}$	Thermal Resistance from Junction to Case		1.6		$^{\circ}\text{C/W}$

Electrical Characteristics

Static Characteristics

Symbol	Parameter	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	$T_J=25^{\circ}C$	650			V
V_F	Diode forward voltage	$I_F=6A, T_J=25^{\circ}C$ $I_F=6A, T_J=135^{\circ}C$ $I_F=6A, T_J=175^{\circ}C$		1.25 1.32 1.38	1.48 1.74 1.90	V
I_R	Reverse current	$V_R=650V, T_J=25^{\circ}C$ $V_R=650V, T_J=175^{\circ}C$		0.5 15	50 200	μA

AC Characteristics

Symbol	Parameter	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	$V_R=400V, T_J=25^{\circ}C,$ $Q_C = \int_0^{V_R} C(V)dV$		25		nC
C	Total capacitance	$V_R=1V, f=1MHz$ $V_R=300V, f=1MHz$ $V_R=600V, f=1MHz$		350 42 36		pF
E_C	Capacitance stored energy	$V_R=400V$		3.8		μJ

Typical Performance

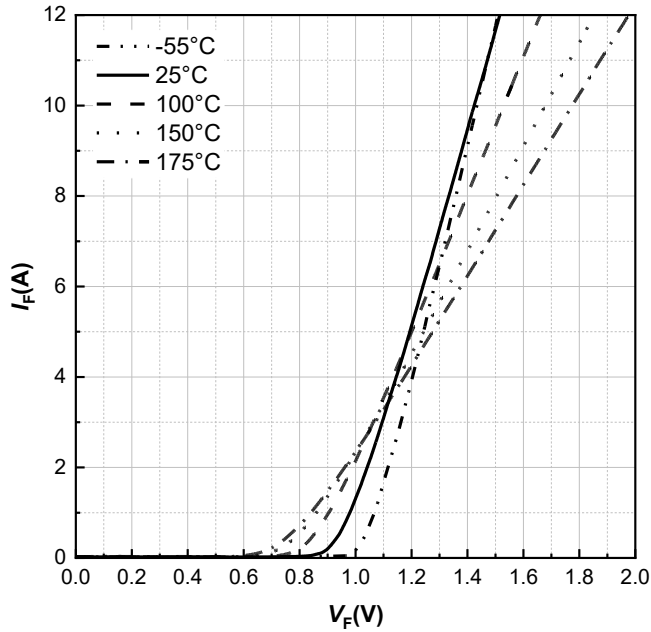


Figure 1. Typical forward characteristics

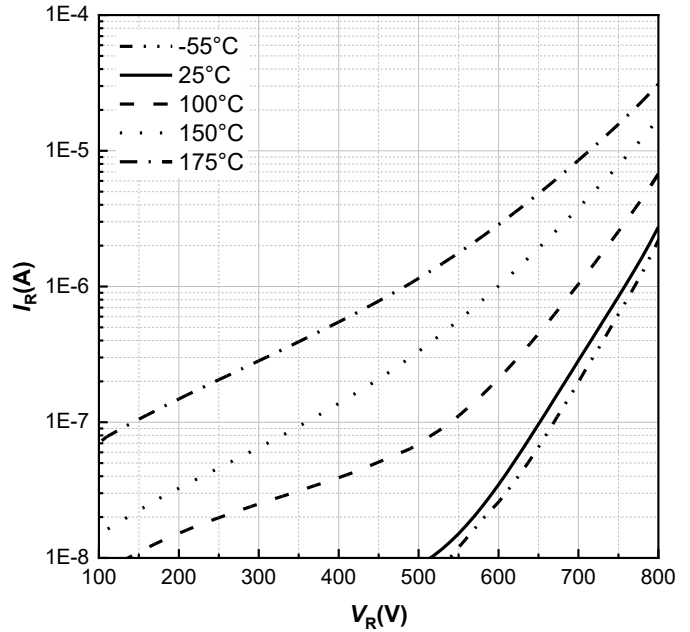


Figure 2. Typical reverse current as function of reverse voltage

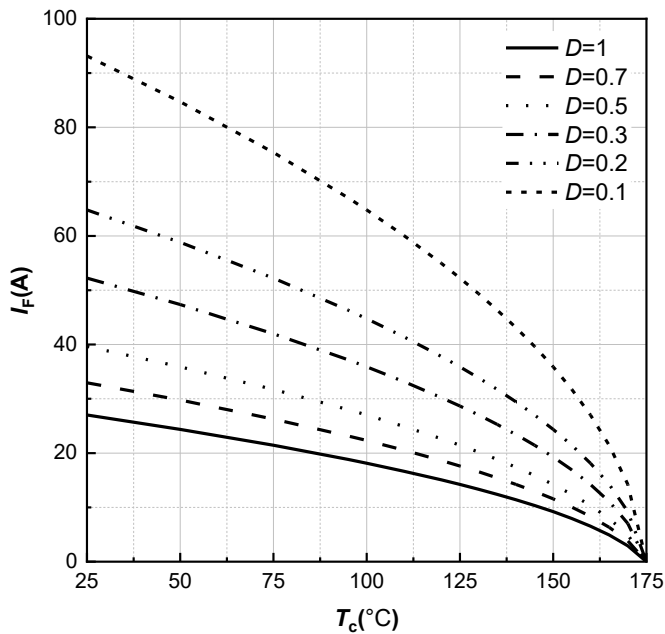


Figure 3. Diode forward current as function of temperature, D =duty cycle

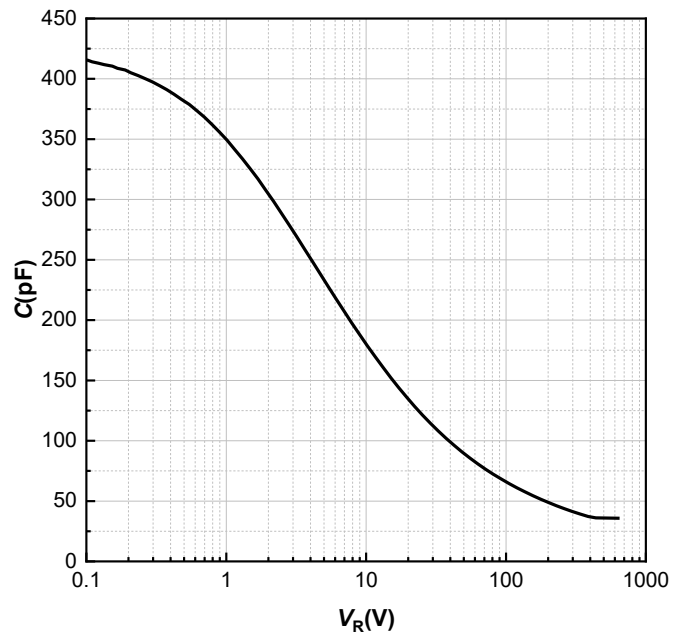


Figure 4. Typical capacitance as function of reverse voltage, $C=f(V_R)$, $T_j=25^\circ\text{C}$, $f=1\text{ MHz}$

Typical Performance

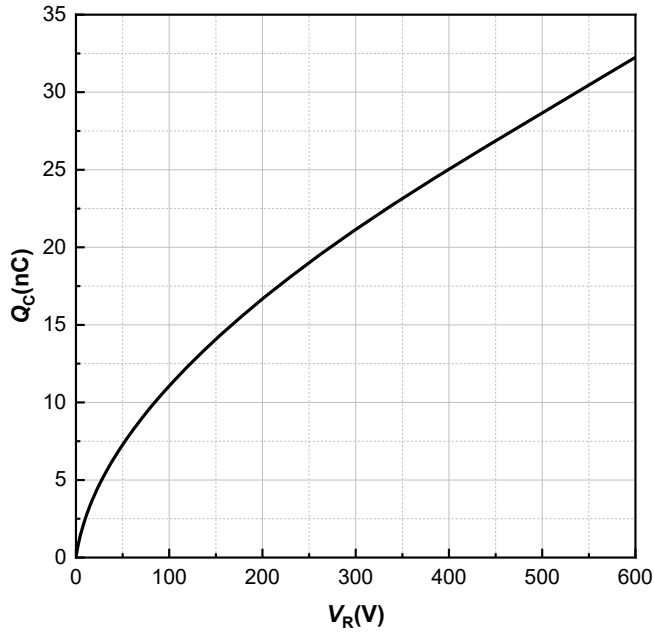


Figure 5. Typical reverse charge as function of reverse voltage

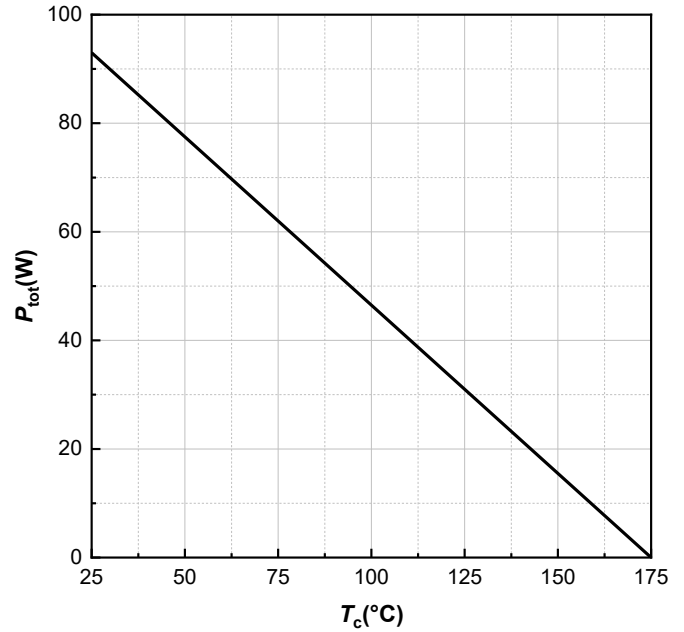


Figure 6. Power dissipation as function of case temperature

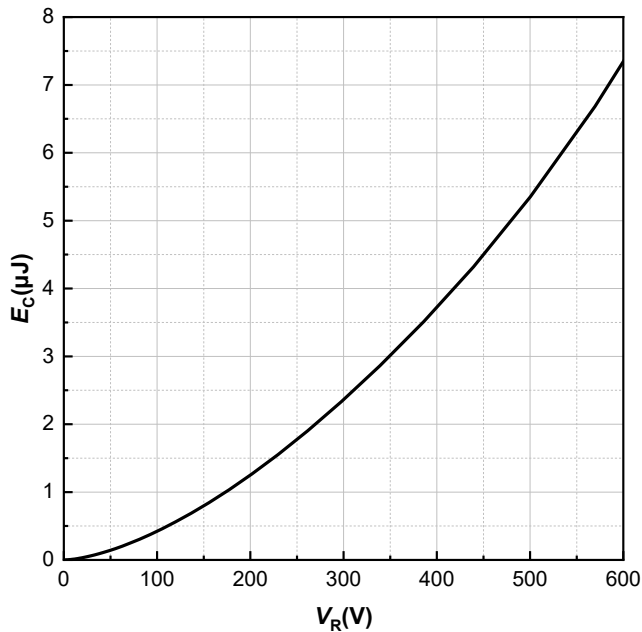


Figure 7. Capacitance stored energy

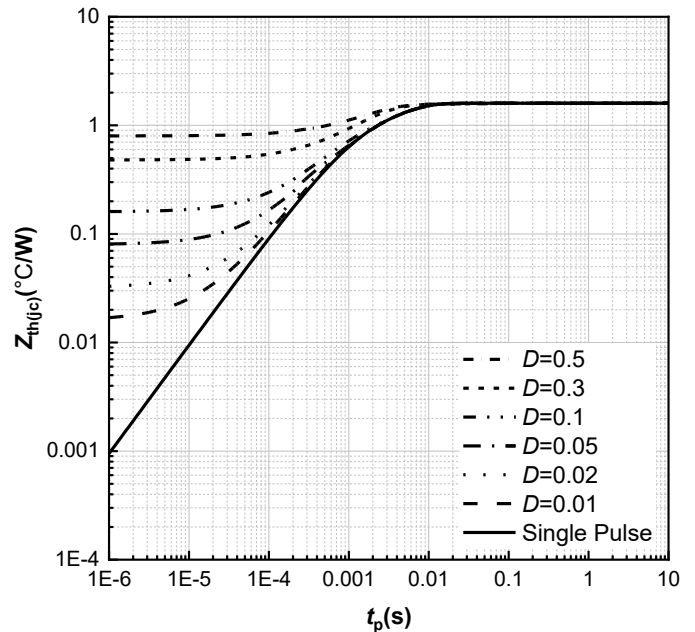
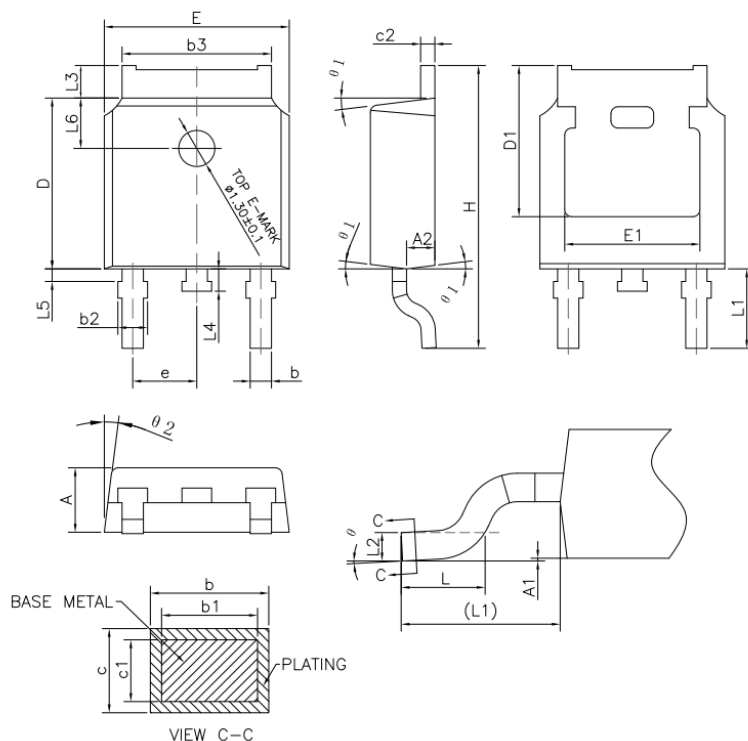


Figure 8. Max. transient thermal impedance, $Z_{th(jc)} = f(t_p)$, parameter: $D = t_p / T$

Package Outlines



SYMBOL	Unit: mm		
	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0	-	0.10
A2	0.90	1.01	1.10
b	0.72	-	0.85
b1	0.71	0.76	0.81
b2	0.72	-	0.90
b3	5.13	5.33	5.46
c	0.47	-	0.60
c1	0.46	0.51	0.56
c2	0.47	-	0.60
D	6.00	6.10	6.20
D1	5.25	-	-
E	6.50	6.60	6.70
E1	4.70	-	-
e	2.186	2.286	2.386
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1	2.90 REF		
L2	0.508 BSC		
L3	0.90	-	1.25
L4	0.60	0.80	1.00
L5	0.15	-	0.75
L6	1.80 REF		
θ	0°	-	8°
θ1	5°	7°	9°
θ2	5°	7°	9°

Revision History

Document Version	Date of Release	Description of Changes
Rev. A	2024-05-08	Release of the datasheet.
Rev. A1	2025-07-03	Characteristics update.

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Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest MCS office.

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