

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

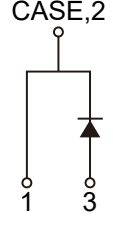
Benefits

- ◆ 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

Part NO.	HX1D20065E		
V_{RRM}	=	650 V	
$I_F(T_c=135^\circ\text{C})$	=	20 A	
Q_C	=	59 nC	

TO-252-2L	
	



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	$T_c=25^\circ\text{C}$ $T_c=135^\circ\text{C}$	52 20	A
I_{FSM}	Non-Repetitive forward surge current	$T_c=25^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Wave	200	A
$\int i^2 dt$	$i^2 t$ value	$T_c=25^\circ\text{C}$, $t_p=10\text{ms}$	200	A^2s
P_{tot}	Power dissipation	$T_c=25^\circ\text{C}$ $T_c=110^\circ\text{C}$	113 49	W
T_j	Operating junction temperature		-55~175	$^\circ\text{C}$
T_{sig}	Storage temperature		-55~175	$^\circ\text{C}$

Electrical Characteristics

Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	$T_j=25^{\circ}\text{C}$	650			V
V_F	Diode forward voltage	$I_F=20\text{A } T_j=25^{\circ}\text{C}$ $I_F=20\text{A } T_j=135^{\circ}\text{C}$ $I_F=20\text{A } T_j=175^{\circ}\text{C}$		1.28 1.34 1.45	1.46 1.63 1.80	V
I_R	Reverse current	$V_R=650\text{V } T_j=25^{\circ}\text{C}$ $V_R=650\text{V } T_j=175^{\circ}\text{C}$		1 19	50 200	μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capacitive charge	$V_R=400\text{V } T_j=25^{\circ}\text{C}$ $Q_C = \int_0^{V_R} C(V)dV$		59		nC
C	Total capacitance	$V_R=1\text{V } f=1\text{MHz}$ $V_R=300\text{V } f=1\text{MHz}$ $V_R=600\text{V } f=1\text{MHz}$		946 94 85		pF
E_C	Capacitance stored energy	$V_R=400\text{V}$		9		μJ

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		1.32		$^{\circ}\text{C/W}$

Typical Performance

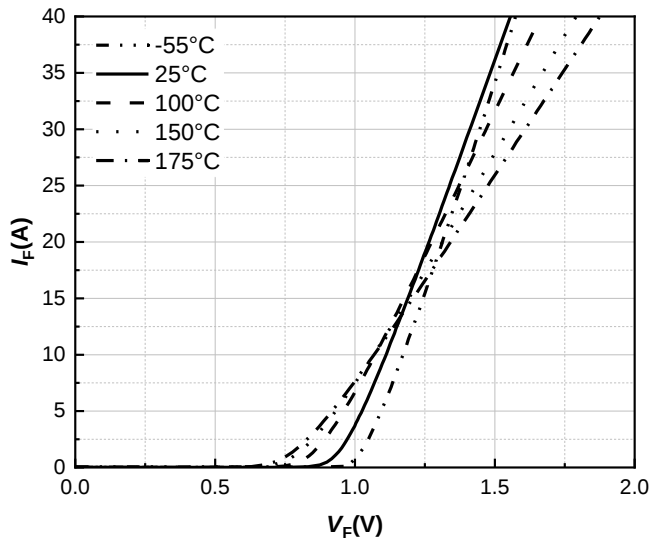


Figure 1. Typical forward characteristics

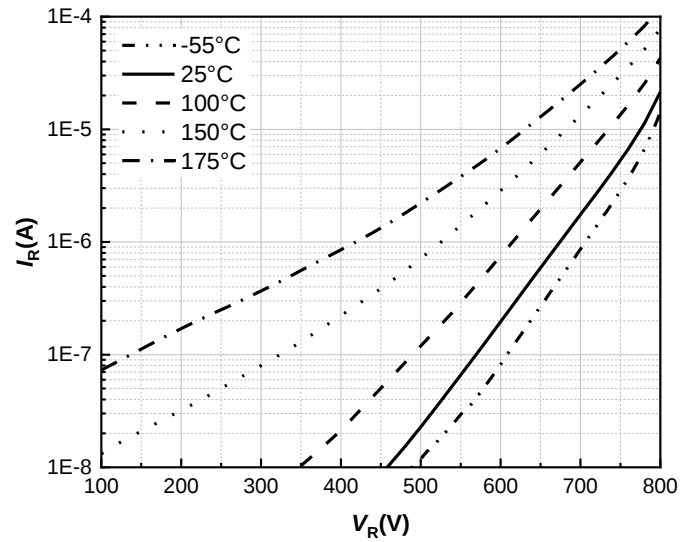


Figure 2. Typical reverse current as function of reverse voltage

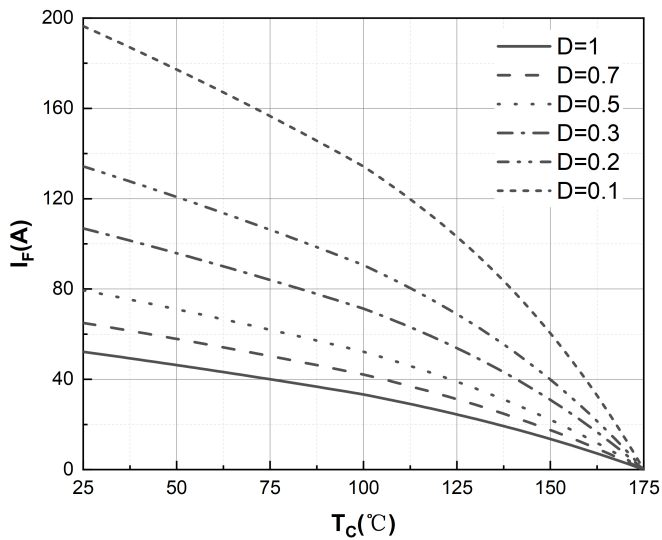


Figure 3. Diode forward current as function of temperature, D =duty cycle

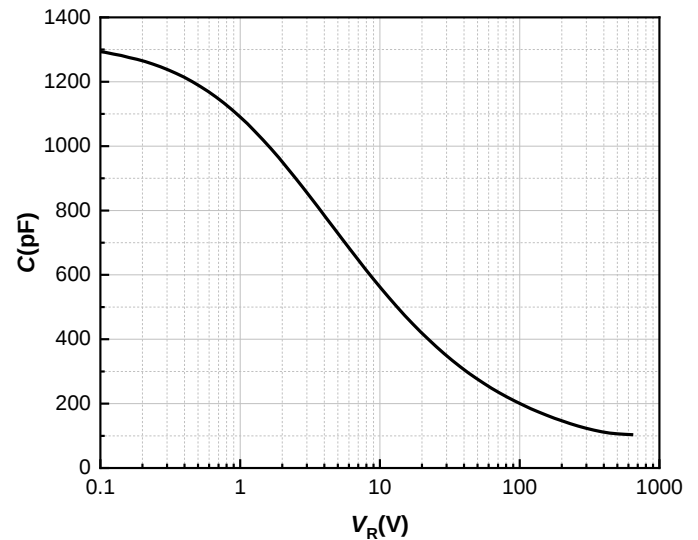


Figure 4. Typical capacitance as function of reverse voltage, $C=f(I_R)$; $T_J=25^\circ\text{C}$; $f=1\text{ MHz}$

Typical Performance

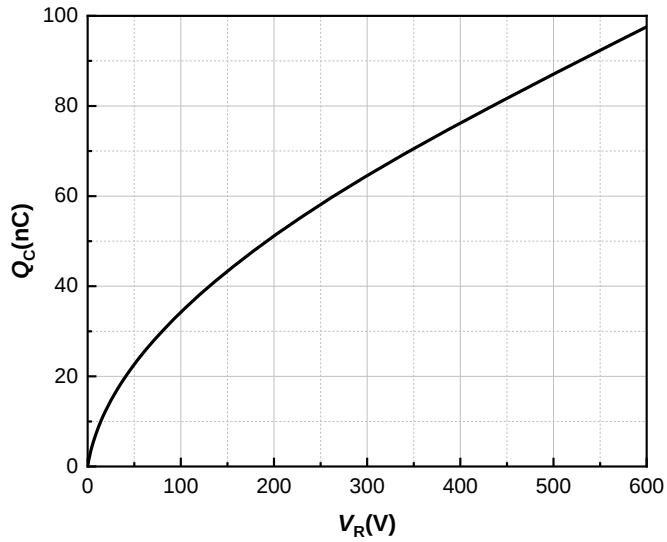


Figure 5. Typical reverse charge as function of reverse voltage

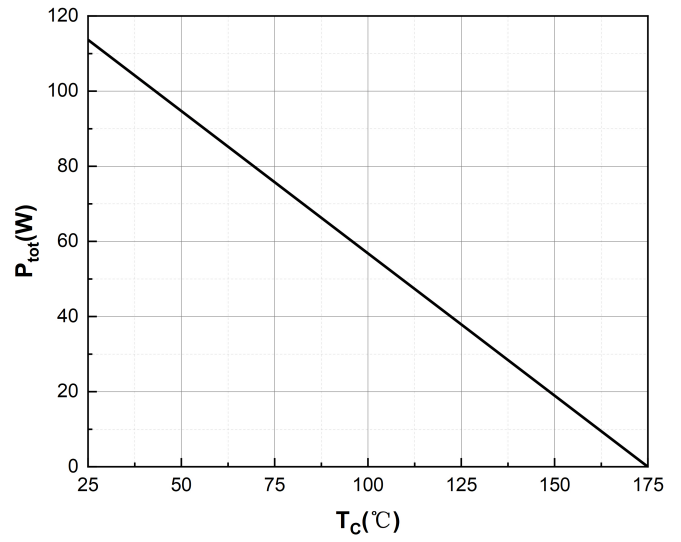


Figure 6. Power dissipation as function of case temperature

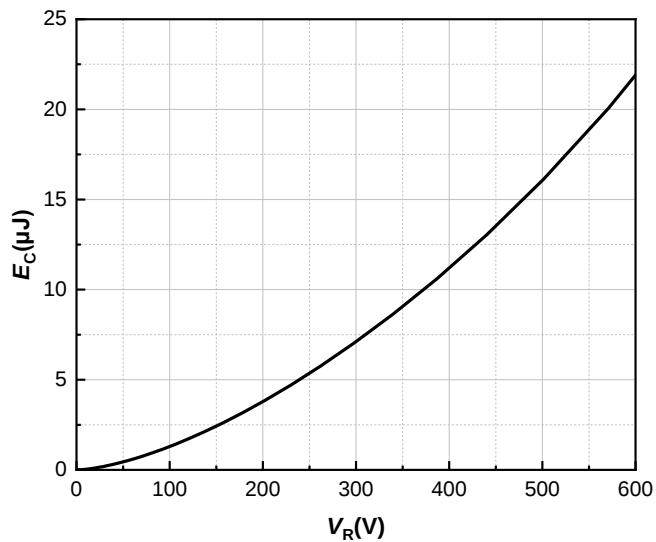


Figure 7. Capacitance stored energy

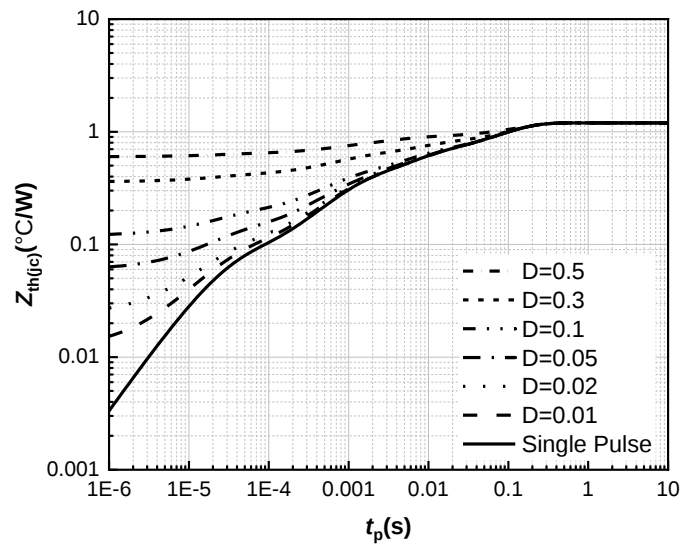
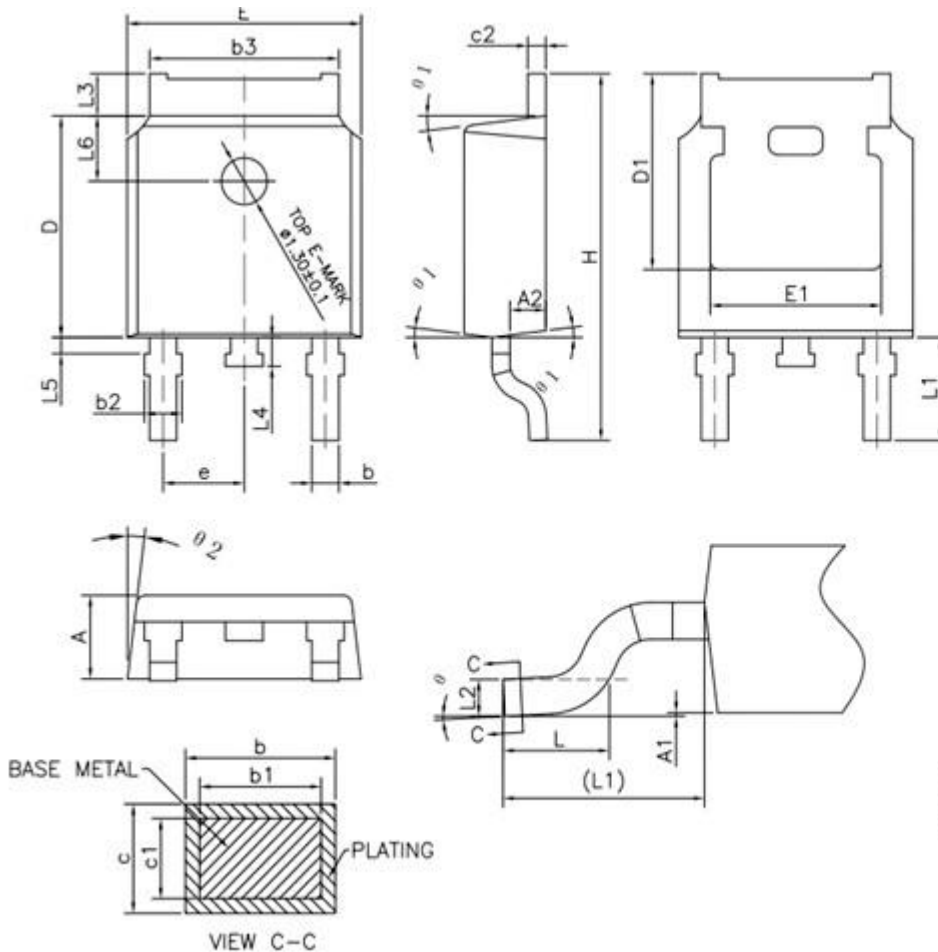


Figure 8. Max. transient thermal impedance, $Z_{th(jc)} = f(t_p)$, parameter: $D = t_p / T$

Package Outlines



COMMON DIMENSIONS
(UNITS OF MEASURE =MILLIMETER)

SYMBOL	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°

NOTES:
ALL DIMENSIONS REFER TO JEDEC STANDARD
TO-252 AA DO NOT INCLUDE MOLD FLASH OR
PROTRUSIONS

Revision History

Document Version	Date of Release	Description of Changes
Preliminary	2025-03-25	Release of the datasheet.
Preliminary A	2025-08-10	Characteristics update.

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Information

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