ASRD006065AI

650V,6A Silicon Carbide Schottky Diode

Features

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

V_{RRM}	=	650	V
I_F (T_C=145℃)	=	6	A
Q_C	=	19	nC

Benefits

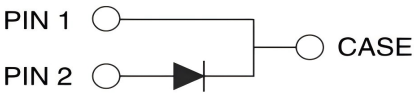
- Increased Power Density
- Essentially no Switching Losses
- Reduction of Heat Sink Requirements
- Higher Efficiency
- Reduced EMI

Package

TO-220-2 Isolated

Applications

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



Part Number	Package	Marking
ASRD006065AI	TO-220-2 Isolated	ASRD006065AI

Maximum Ratings (T_j=25℃ unless otherwise noted)

Symbol	Parameter	Test conditions	Value	Unit
V_{RRM}	Repetitive peak reverse voltage		650	V
I_F	Continuous forward current	T_c=25°C T_c=145°C	16 6	A
I_{FSM}	Non-Repetitive forward surge current	T_c=25°C, t_p=10ms, Half Sine Wave	54	A
$\int i^2dt$	i^2t value	T_c=25°C, t_p=10ms	14	A^2s
P_{tot}	Power dissipation	T_c=25°C T_c=110°C	59 25	W
T_j	Operating junction temperature		-55~175	°C
T_{stg}	Storage temperature		-55~175	°C

Electrical Characteristics (T_j=25℃ unless otherwise noted)

Static Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25°C	650			V
V_F	Diode forward voltage	I_F=6A T_j=25°C I_F=6A T_j=175°C		1.37 1.68		V
I_R	Reverse current	V_R=650V T_j=25°C V_R=650V T_j=175°C		6 16		μA

AC Characteristics

Symbol	Parameter	Test conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capactive charge	V_R=400V T_j=25°C $Q_C = \int_0^{V_R} C(V)dV$		19		nC
C	Total capacitance	V_R=1V f=1MHz V_R=300V f=1MHz V_R=600V f=1MHz		272 36 35		pF
E_C	Capacitance stored energy	V_R=400V		3		μJ

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(jc)}$	Thermal resistance from junction to case		2.53		°C/W

Electrical Characteristic Curves

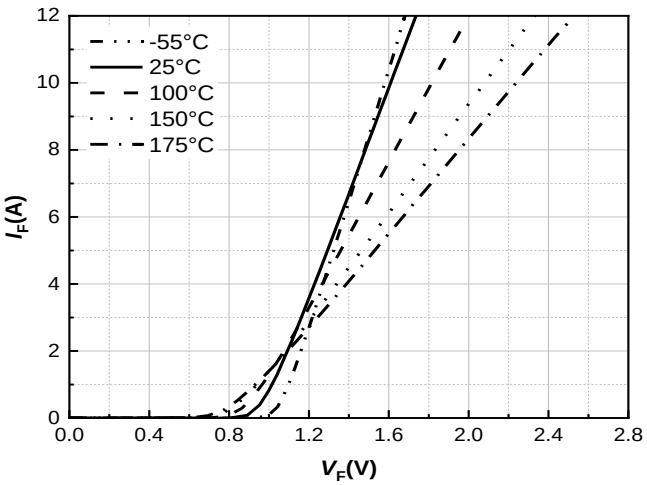


Figure 1. **Typical forward characteristics**

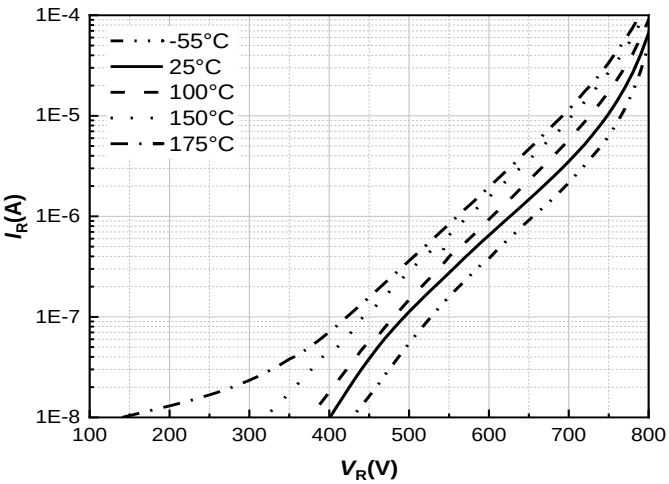


Figure 2. **Typical reverse current as function of reverse voltage**

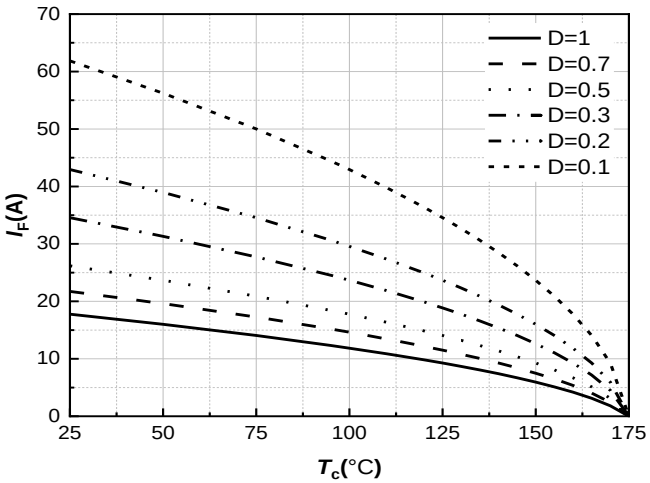


Figure 3. **Diode forward current as function of temperature, D=duty cycle**

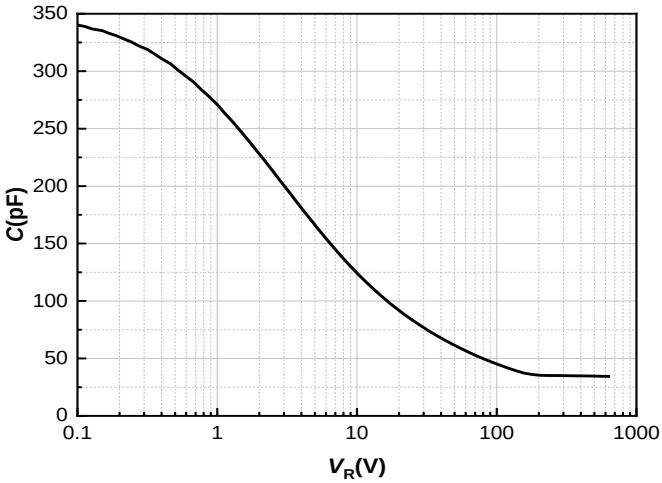


Figure 4. **Typical capacitance as function of reverse voltage, C=f(V_R); T_j=25°C; f=1 MHz**

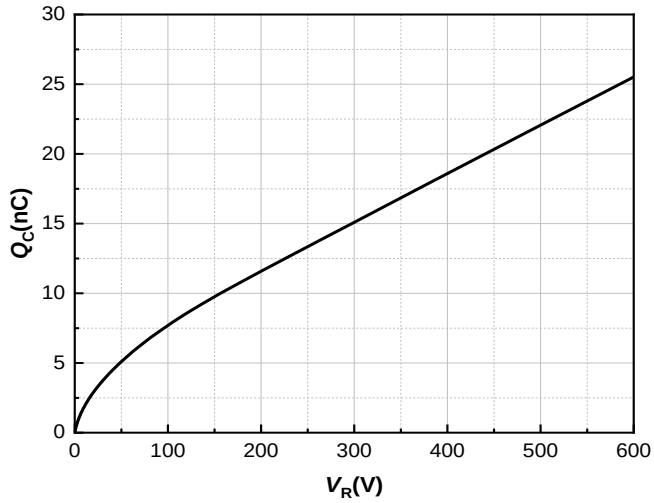


Figure 5. **Typical reverse charge as function of reverse voltage**

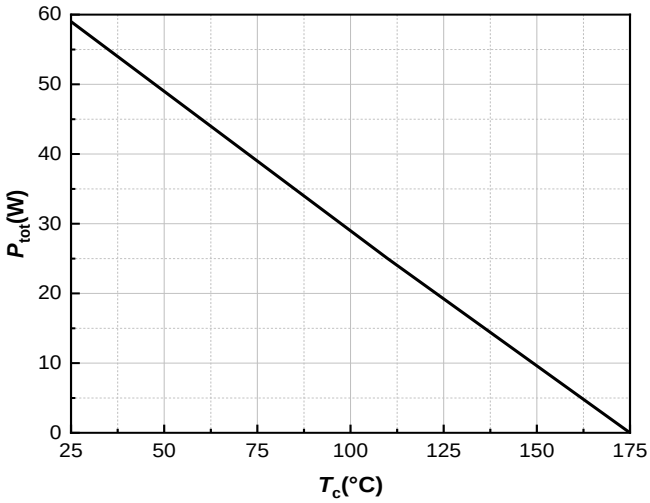


Figure 6. **Power dissipation as function of case temperature**

Electrical Characteristic Curves

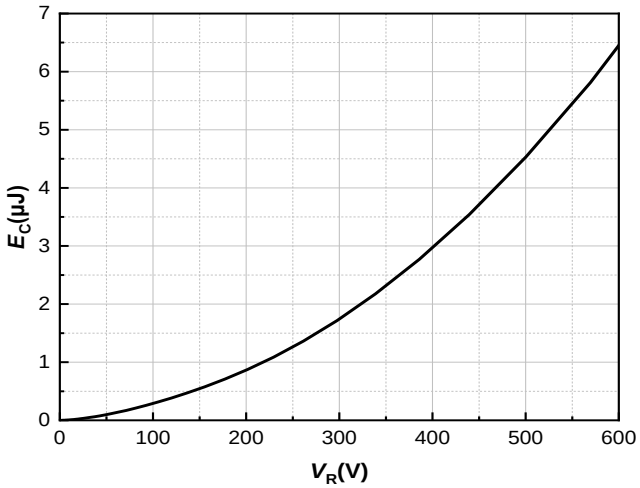


Figure 7.**Capacitance stored energy**

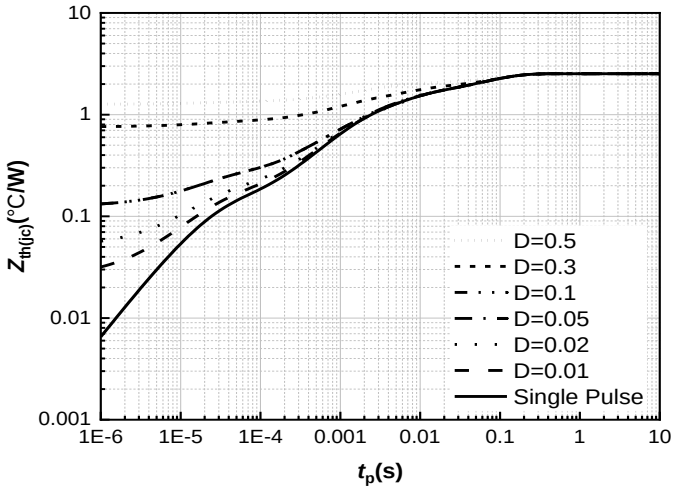
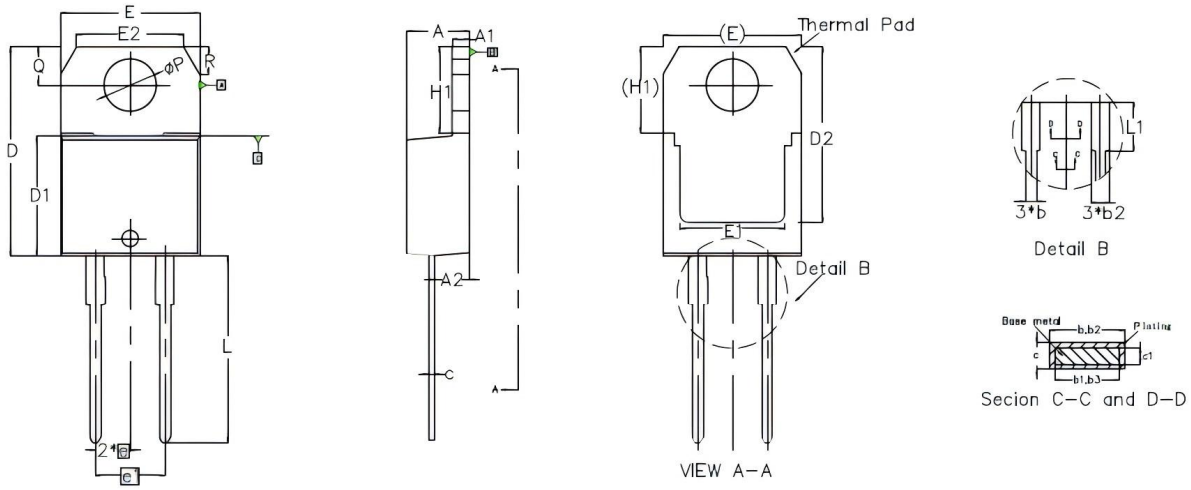


Figure 8. **Max. transient thermal impedance, $Z_{th(jc)}$= f(t_p), parameter: $D=t_p/T$**

TO-220-2 Isolated Package Dimensions



SYMBOL	MILLIMETERS			NOTES		SYMBOL	MILLIMETERS			NOTES
	Normal	MIN.	MAX.				Normal	MIN.	MAX.	
A	4.45	4.35	4.75			E1	7.60	6.86	8.89	
A1	1.27	1.14	1.40			e	2.54	2.41	2.67	
A2	2.60	2.40	2.80			e1	5.08	4.88	5.28	
b	0.85	0.69	1.01			H1	6.20	6.00	6.40	
b1	0.83	0.38	0.97			L	13.35	13.00	13.70	
b2	1.46	1.20	1.73			L1	3.00	2.70	3.30	
b3	1.44	1.14	1.73			øP	3.80	3.70	3.95	
c	0.50	0.36	0.61			Q	2.80	2.60	3.00	
c1	0.48	0.36	0.56			E2	7.80	7.50	8.10	
D	15.50	15.20	15.80			R	2.00	1.70	2.20	
D1		8.50	9.02							
D2	12.85	12.20	12.88							
E	10.18	10.00	10.40							