ASYD010170C

1700V,10A Silicon Carbide Schottky Diode

Features

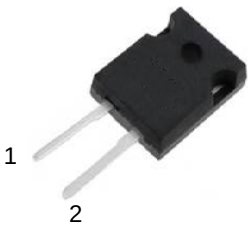
- Zero or negligible reverse recovery
- Low forward voltage
- Positive temperature coefficient
- Extended surge current capability
- High junction temperature
- Temperature invariant switching behavior

V_{RRM}	=	1700	V
I_F (T_C=165℃)	=	10	A
Q_C (V_R=1200V)	=	110	nC

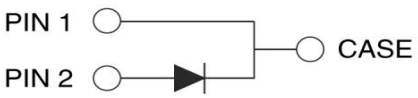
Benefits

- System efficiency improvement over Si diodes
- Higher switching frequency
- Increased power density
- Essentially no switching losses

Package



TO-247-2



Applications

- Solar inverters
- Motor drivers
- Power Factor Correction
- SMPS

Part Number	Package	Marking
ASYD010170C	TO-247-2	ASYD010170C

Electrical Specifications (T_C=25°C, unless otherwise specified.)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
V_R	Reverse Blocking Voltage	I_R=250uA	1700			V
I_R	Reverse Current	V_R=1700V T_J= 25°C T_J= 175°C		 0.5 10	 100 200	uA
V_F	Forward Voltage	I_F=10A T_J= 25°C T_J=175°C		 1.4 2.1	 1.7 3.0	V

Note: All characteristics are tested with the parts assembled in TO-247-2 package.

Dynamic Characteristics (T_C=25°C, unless otherwise specified.)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
Cj	Typical Junction Capacitance	V_R=0.1 V, f=1 MHz V_R=400 V, f=1 MHz V_R=800 V, f=1 MHz V_R=1200 V, f=1 MHz		1200 85 60 55		pF
Q_C	Total Capacitive Charge	V_R=400V V_R=800V V_R=1200V		60 88 110		nC
E_C	Capacitive Stored Energy,	V_R=400V V_R=800V V_R=1200V		7 20 40		uJ

Note: All characteristics are tested with the parts assembled in TO-247-2 package.

Thermal Resistances (T_C=25°C, unless otherwise specified.)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
Rth(j-c)	Thermal Resistance, Junction – Case			0.465	0.5	°C/W
Rth(j-a)	Thermal Resistance, Junction –Ambient			31.8	60	°C/W

Note: All characteristics are tested with the parts assembled in TO-247-2 package.

Absolute Maximum Ratings (T_C=25°C, unless otherwise specified.)

Symbol	Parameter	Rating
V_{RRM}	Repetitive Peak Reverse Voltage	1700V
I_F	Continuous Forward Current T_C=25 °C, D=1 T_C=100 °C, D=1 T_C=165 °C, D=1	 45 A 31.5A 10 A
I_{FSM}	Non-Repetitive Forward Surge Current T_C=25 °C, t_P =10ms T_C=125 °C, t_P =10ms	 177 A 102 A
I_{FRM}	Repetitive Forward Surge Current T_C=25 °C, t_P =10ms T_C=125 °C, t_P =10ms	 73 A 41 A
P_{TOT}	Power dissipation for $R_{th(j\text{-}c,max)}$, T_C=25 °C	300 W
T_j, T_{stg}	Operating and Storage Temperature	-55℃ to 175℃

Note: All characteristics are tested with the parts assembled in TO-247-2 package ，and exposure to absolute maximum ratings for prolonged time periods may affect device reliability.

Typical Performance

Figure 1. Forward Characteristics

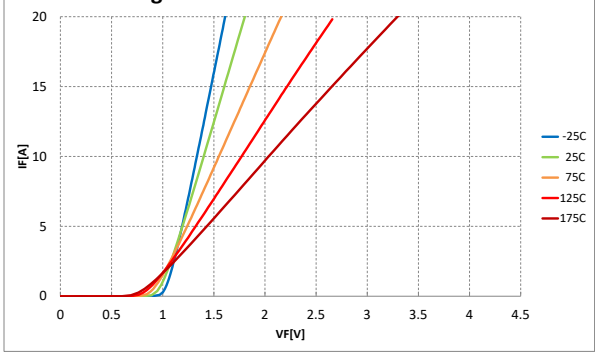


Figure 2. Reverse Characteristics

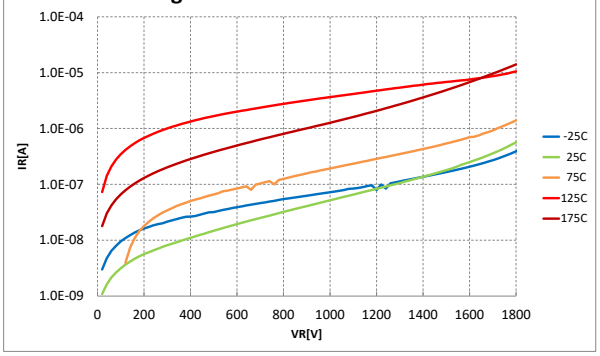


Figure 3. Typical Junction Capacitance

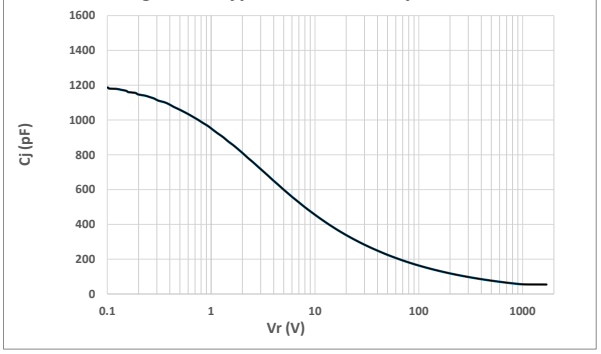


Figure 4. Total Capacitance Charge

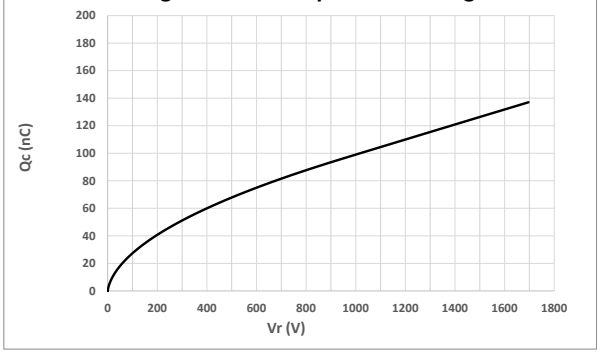


Figure 5. Capacitance Stored Energy

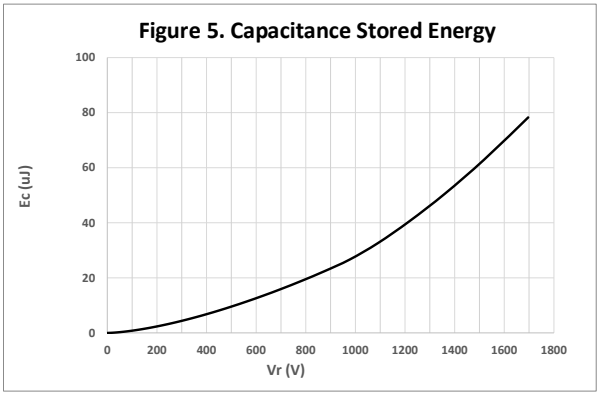


Figure 6. Transient Thermal Impedance Rthjc

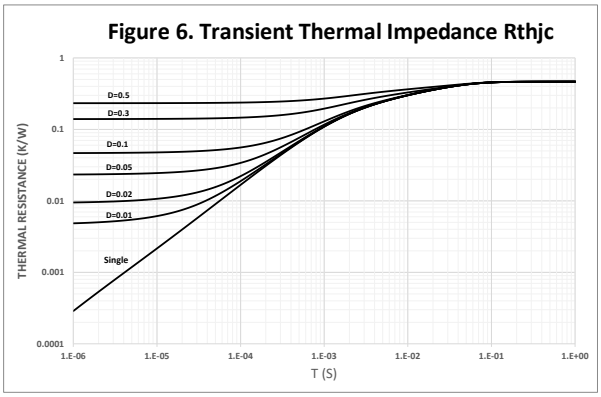


Figure 7. Transient Thermal Impedance Rthja

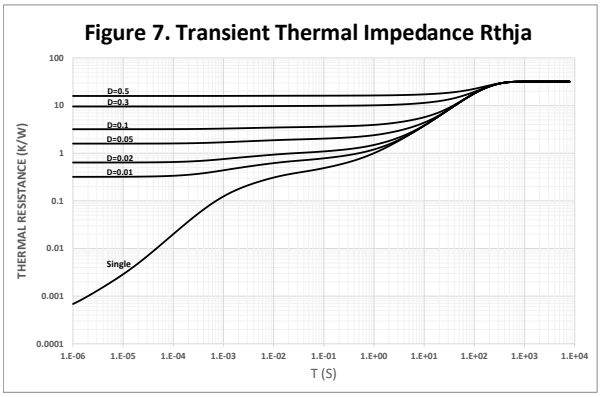
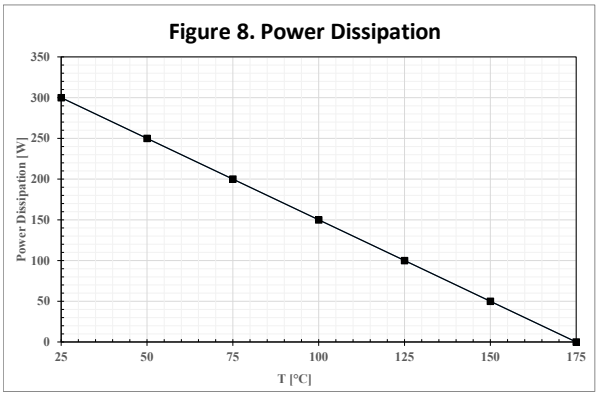
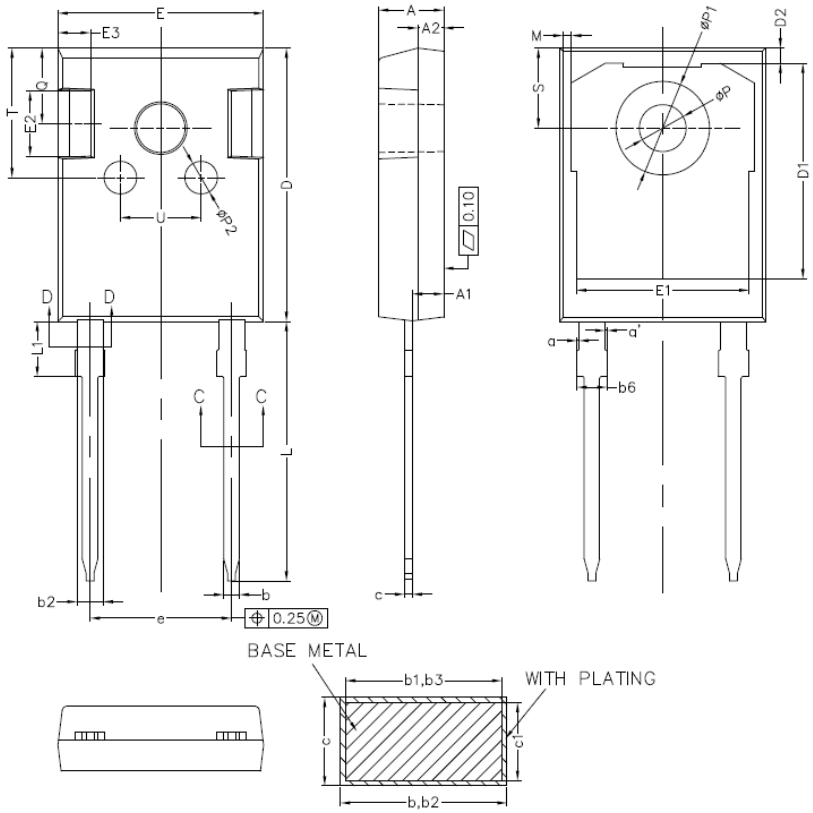


Figure 8. Power Dissipation



Package Dimensions

Package TO-247-2



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
a	0	–	0.15
a'	0	–	0.15
b	1.16	–	1.29
b1	1.15	1.20	1.25
b2	1.96	–	2.06
b3	1.95	2.00	2.02
b6	–	–	2.25
c	0.59	–	0.66
c1	0.58	0.60	0.62
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.20	1.35
E	15.70	15.80	15.90
E1	13.06	13.26	13.46
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
e	10.78	10.88	10.98
L	19.80	19.92	20.10
L1	3.93	–	4.46
M	0.35	–	0.95
P	3.50	3.60	3.70
P1	7.00	–	7.40
P2	2.40	2.50	2.60
Q	5.60	–	6.00
S	6.05	6.15	6.25
T	9.80	–	10.20
U	6.00	–	6.40

NOTES:
1.ALL DIMENSIONS REFER TO JEDEC STANDARD TO-247 AD DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS.
2.EJECTION MARK DEPTH $0.10^{+0.15}_{-0.05}$.