

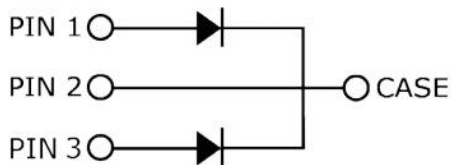
S4D40120D 1200V SiC POWER SCHOTTKY RECTIFIER



Description

S4D40120D is a single SiC Schottky rectifier packaged in TO-247AD(TO-247-3) case. The device is a high voltage Schottky rectifier that has very low total conduction losses and very stable switching characteristics over temperature extremes. The S4D40120D is ideal for energy sensitive, high frequency applications in challenging environments.

Circuit Diagram



Features

- 175°C T_J operation
- Ultra-low switching loss
- Switching speeds independent of operating temperature
- Low total conduction losses
- High forward surge current capability
- High package isolation voltage
- Terminals finish: 100% Pure Tin
- “-A” is an AEC-Q101 qualified device
- Pb - Free Device
- All SMC parts are traceable to the wafer lot
- Additional electrical and life testing can be performed upon request

Applications

- Alternative energy inverters
- Power Factor Correction (PFC)
- Free-Wheeling diodes
- Switching supply output rectification
- Reverse polarity protection

Maximum Ratings:

Characteristics	Symbol	Condition	Max.	Units
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	-	1200	V
Average Rectified Forward Current (per leg)	$I_{F(AV)1}$	@Tc=25°C	59	A
	$I_{F(AV)2}$	@Tc=151°C	20	A
Repetitive Peak Forward Surge Current (per leg)	I_{FRM1}	10 ms, Half Sine pulse, Tc =25°C	86	A
	I_{FRM2}	10 ms, Half Sine pulse, Tc =110°C	56	A
Peak One Cycle Non-Repetitive Surge Current (per leg)	I_{FSM1}	10ms, Half Sine pulse, Tc =25°C	248	A
	I_{FSM2}	10ms, Half Sine pulse, Tc =110°C	205	A
Non-Repetitive Peak Forward Surge Current (per leg)	$I_{F,Max1}$	10µs. Pulse, Tc=25°C	1150	A
	$I_{F,Max2}$	10µs. Pulse, Tc =110°C	950	A
Power Dissipation (per leg)	P_{tot1}	Tc=25°C	263.2	W
	P_{tot2}	Tc=110°C	114.0	W

Electrical Characteristics:

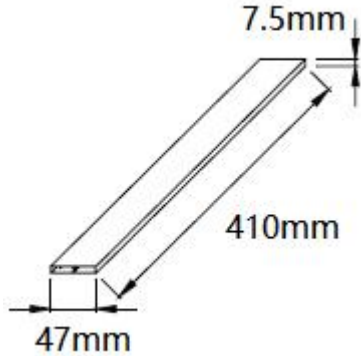
Characteristics	Symbol	Condition	Typ.	Max.	Units
Forward Voltage Drop(per leg)*	V_{F1}	@ 20A, Pulse, T _J = 25 °C	1.5	1.8	V
	V_{F2}	@ 20A, Pulse, T _J = 175 °C	2.2	3.0	V
Reverse Current(per leg)*	I_{R1}	@V _R = rated V _R T _J = 25 °C	1	25	µA
	I_{R2}	@V _R = rated V _R T _J = 175 °C	10	150	µA
Junction Capacitance(per leg)	C_T	V _R =0V, T _J =25°C, f=1MHz	1620	-	pF
Reverse Recovery Charge(per leg)	Q_c	I _F = 20A, di/dt = 200A/µs V _R = 800 V, T _J =25°C	124.89	-	nC
Capacitance Stored Energy(per leg)	E_C	V _R = 800 V, T _J =25°C	64.20	-	µJ

* Pulse width < 300 µs, duty cycle < 2%

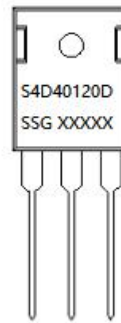
Thermal-Mechanical Specifications:

Characteristics	Symbol	Condition	Specification	Units
Junction Temperature	T _J	-	-55 to +175	°C
Storage Temperature	T _{stg}	-	-55 to +175	°C
Typical Thermal Resistance Junction to Case	R _{θJC}	DC operation, T _J =25°C	0.57(per leg) 0.29(both leg)	°C/W

Tube Specification



Marking Diagram



Where XXXXX is YYWWL

S4D = Device Type
D = Package type
40 = Forward Current (40A)
120 = Reverse Voltage (1200V)
SSG = SSG
YY = Year
WW = Week
L = Lot Number

Cautions: Molding resin
Epoxy resin UL:94V-0

Ordering Information

Device	Package	Shipping
S4D40120D	TO-247AD(TO-247-3)	25pcs /tube

Ratings and Characteristics Curves (per leg)

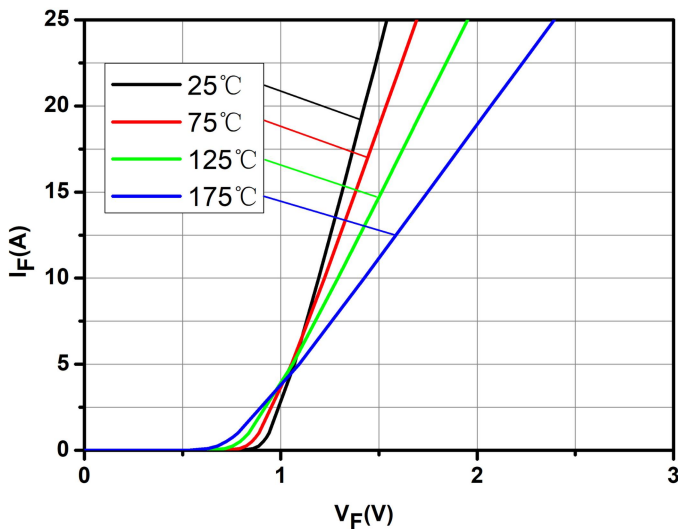


Fig.1-Typical Forward Voltage Characteristics

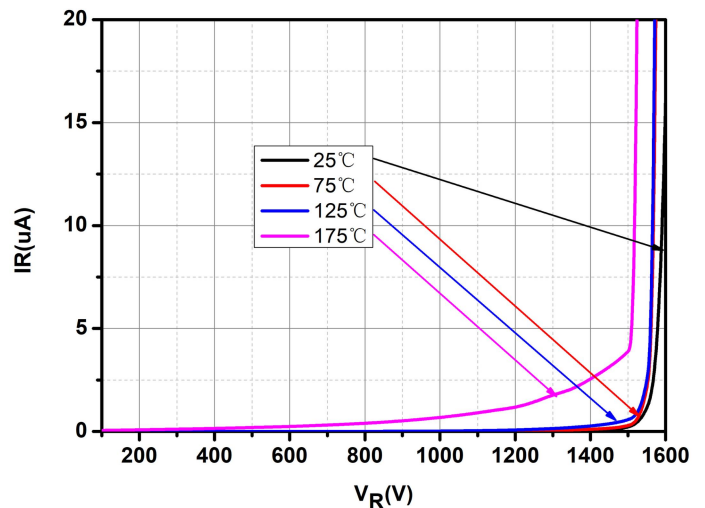


Fig.2-Typical Reverse Characteristics

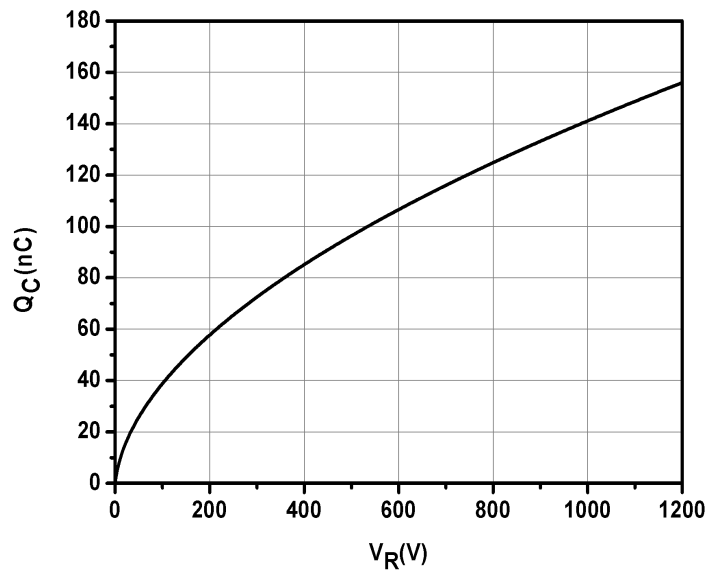
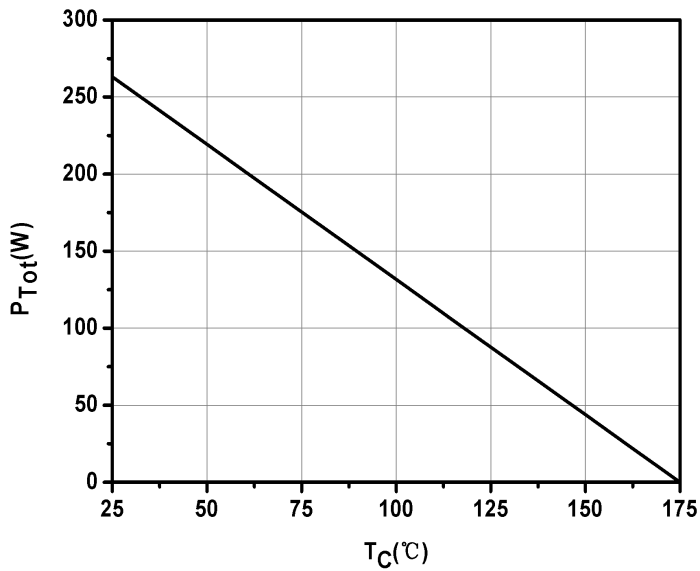
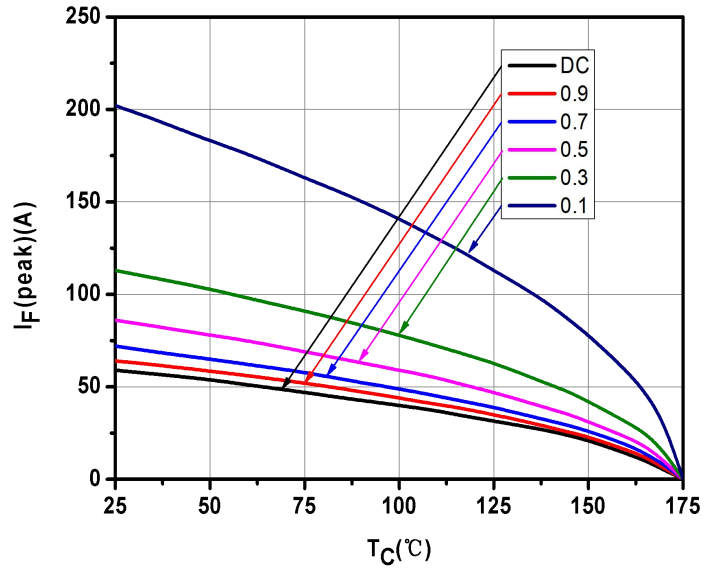
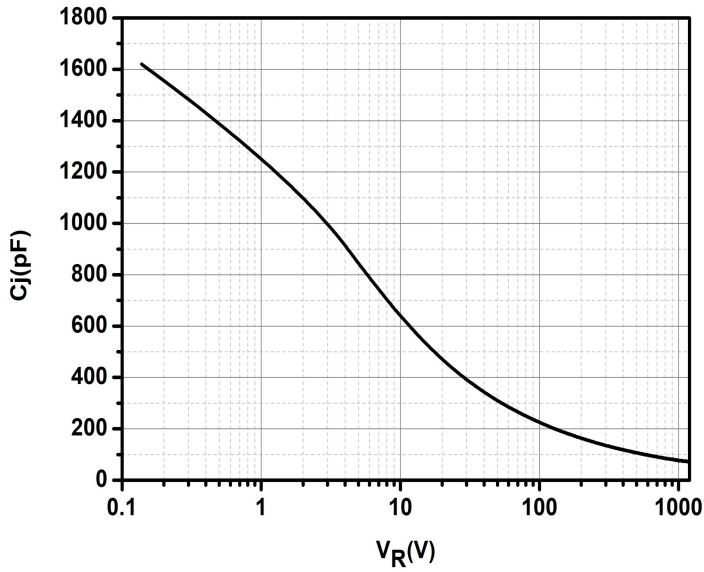


Fig.5-Power Derating

Fig.6-Total Capacitance Charge vs. Reverse Voltage

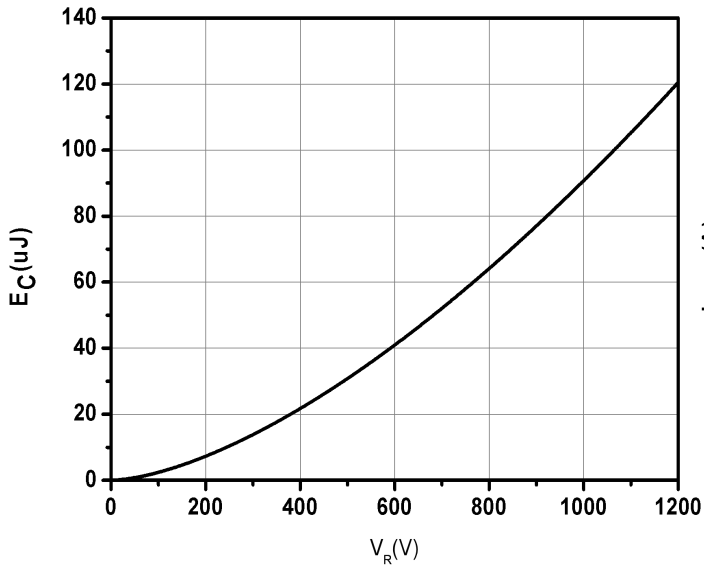


Fig.7-Capacitance Stored Energy

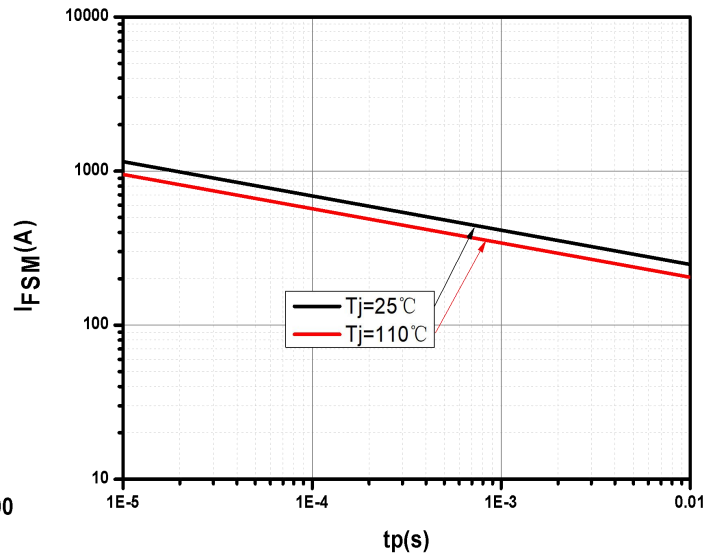
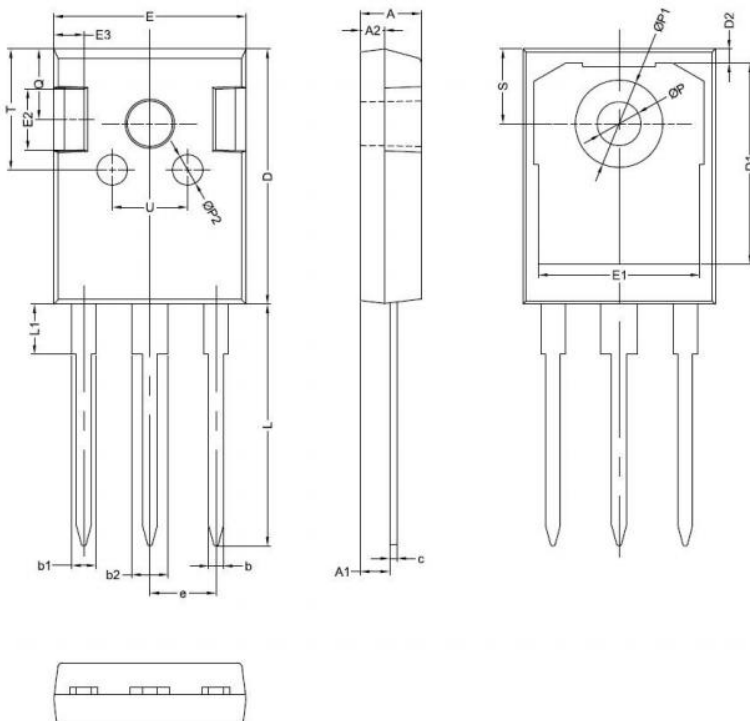


Fig.8-Non-repetitive peak forward surge current versus pulse duration (sinusoidal waveform)

Mechanical Dimensions TO-247AD



SYMBOL	Millimeters		
	MIN.	TYP.	MAX.
A	4.80	5.00	5.20
A1	2.20	2.41	2.61
A2	1.90	2.00	2.10
b	1.10	1.20	1.40
b1	1.80	2.00	2.20
b2	2.80	3.00	3.20
c	0.50	0.60	0.75
D	20.30	21.00	21.20
D1		16.55	
D2		1.20	
E	15.45	15.80	16.00
E1		13.30	
E2		5.00	
E3		2.50	
e		5.44	
L	19.42	19.92	20.70
L1		4.13	
P	3.50	3.60	3.70
P1	7.1		7.40
P2		2.50	
Q		5.80	
S	6.05	6.15	6.25
T		10.00	
U		6.20	

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