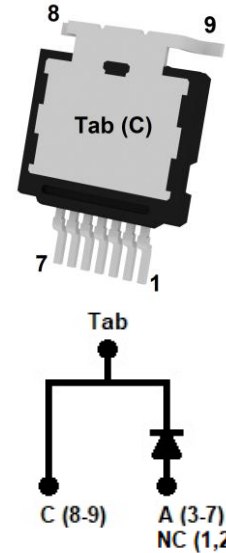


3rd Generation 1200V/50A SiC Schottky Barrier Diode

Features

- AEC-Q101 qualified
- Revolutionary semiconductor material - Silicon Carbide (SiC)
- No reverse recovery
- High-speed switching performance
- Temperature-independent switching behavior
- System cost / size savings due to reduced cooling requirements
- Junction temperature range from -55°C to 175°C
- RoHS compliant



Package Type: SAPKG-9L

Potential Applications

- DC/DC converter for EV/HEV
- On board charger (OBC)



Description

The ADS120J050V3 SiC Schottky Barrier Diode (SBD) has been developed using Sanan’s advanced 3rd generation SiC SBD technology with the highest performance and reliability. It registers higher efficiency, higher operation temperature and lower loss and can be operated at higher frequency than Si-based solutions. As to the Schottky structure, it shows no recovery at turn-off and allows a low leakage current with reverse voltage up to 1200V. It can contribute to system miniaturization and achieve lightweight system design. Using RoHS compliant components and being AEC-Q101 qualified, it is qualified for use in automotive application.

Product Specifications

Device	V _{RRM}	I _F (135°C)	V _F (25°C)	Q _C	Marking
ADS120J050V3	1200V	69A	1.35V	304nC	DS120050V3

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Table 1. Maximum Ratings

(T_c = 25°C, unless otherwise specified)

Parameter	Symbol	Value	Unit	Test conditions
Repetitive peak reverse voltage	V _{RRM}	1200	V	T _C = 25°C
Surge peak reverse voltage	V _{RSM}	1200		T _C = 25°C
DC reverse voltage	V _{DC}	1200		T _C = 25°C
Continuous forward current	I _F	134	A	T _C = 25°C
		69		T _C = 135°C
		50		T _C = 153°C
Surge non-repetitive forward current	I _{FSM}	504	A	T _C = 25°C, t _p = 10ms, half sine pulse
Surge repetitive forward current	I _{FRM}	202	A	T _C = 25°C, t _p = 10ms, half sine wave D = 0.1
Power dissipation	P _{tot}	625	W	T _C = 25°C
i ² t value	∫i ² dt	1270	A ² s	T _C = 25°C, t _p = 10ms
Operating junction temperature	T _j	-55~175	°C	
Storage temperature	T _{stg}	-55~175	°C	
Mounting torque	M	1	Nm	M3 screw

Table 2. Thermal Resistance

Parameter	Symbol	Values			Unit	Test condition
		Min.	Typ.	Max.		
Thermal resistance from junction to case	R _{th(j-c)}	/	0.24	/	°C/W	

Table 3. Static Electrical Characteristics

(T_j = 25°C, unless otherwise specified)

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
DC blocking voltage	V _{DC}	1200	/	/	V	I _R = 200 μA
Forward voltage	V _F	/	1.35	1.50	V	I _F = 50A, T _j = 25°C
		/	1.75	2.20		I _F = 50A, T _j = 175°C
Reverse current	I _R	/	5	120	μA	V _R = 1200V, T _j = 25°C
		/	40	800		V _R = 1200V, T _j = 175°C

Table 4. Dynamic Electrical Characteristics

(T_j = 25°C, unless otherwise specified)

Parameter	Symbol	Values			Unit	Test conditions
		Min.	Typ.	Max.		
Total capacitance	C	/	4547	/	pF	V _R = 0V, f = 1MHz
		/	285	/		V _R = 400V, f = 1MHz
		/	202	/		V _R = 800V, f = 1MHz
Total capacitive charge	Q _C	/	304	/	nC	V _R = 800V
Capacitance stored energy	E _C	/	86	/	μJ	V _R = 800V

Electrical Characteristic Diagrams

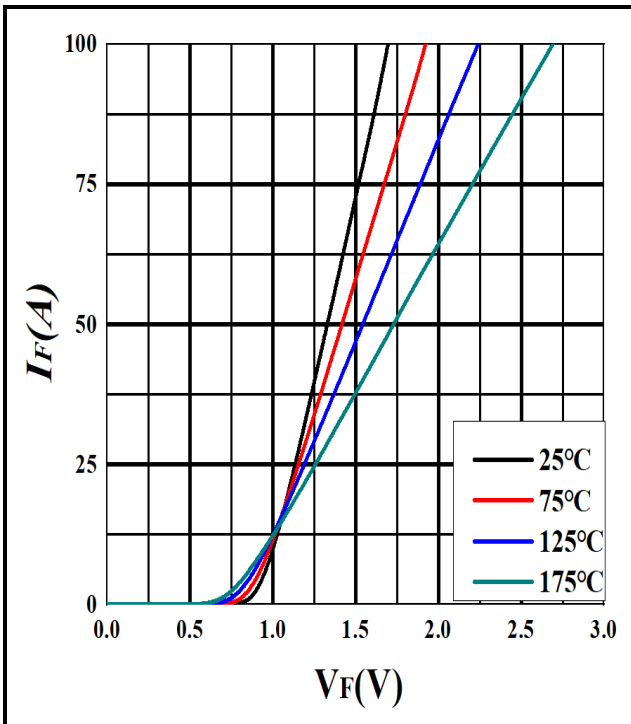


Figure 1. Forward characteristics

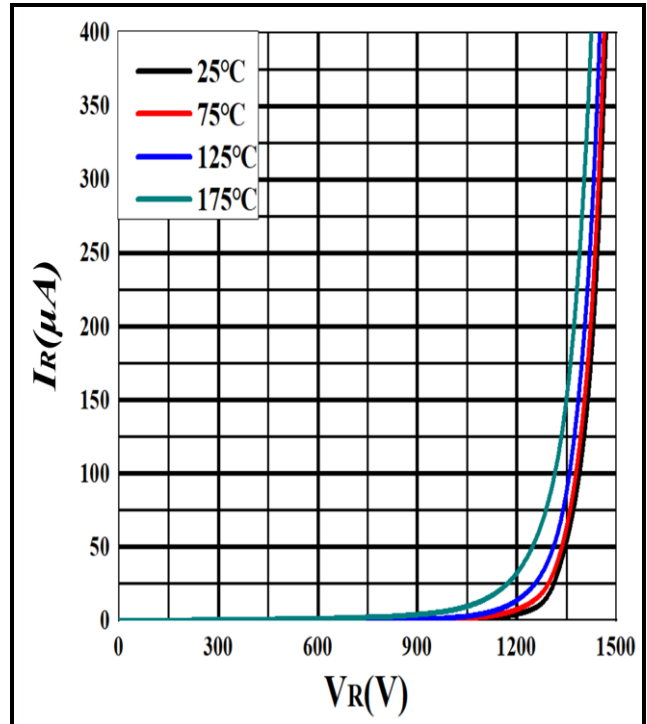


Figure 2. Reverse characteristics

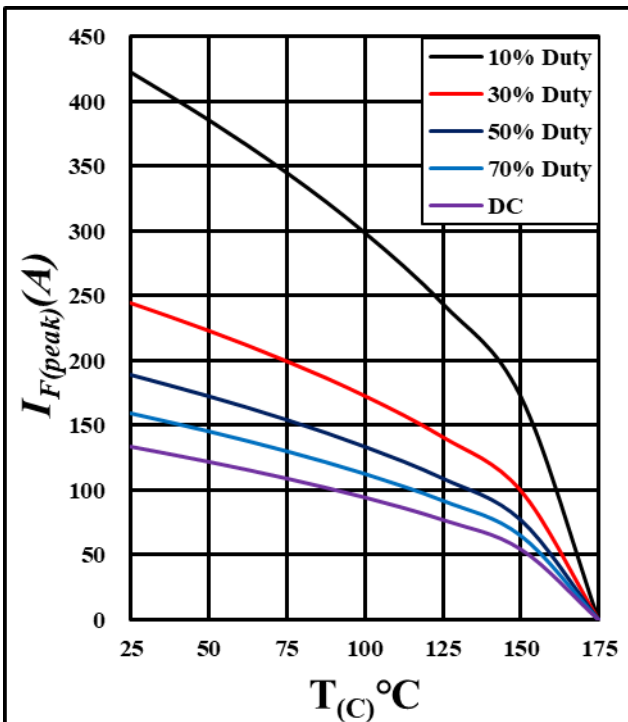


Figure 3. Current derating

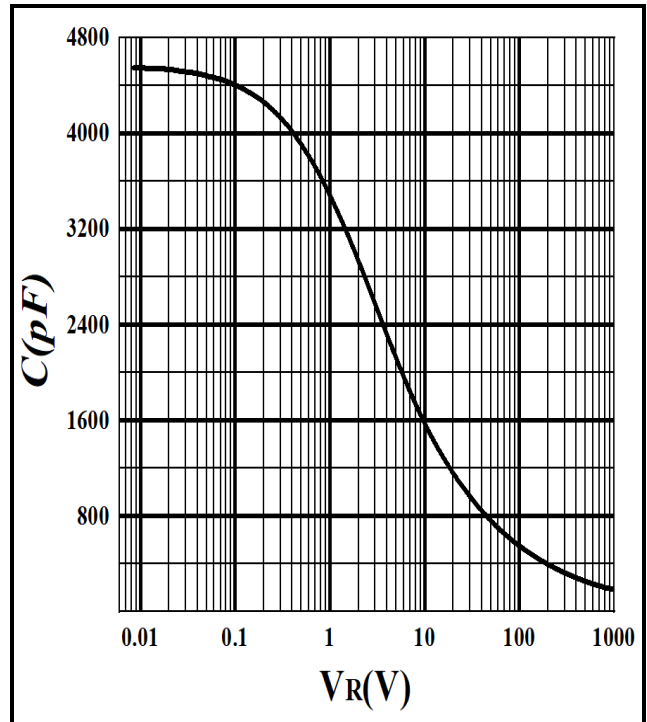


Figure 4. Capacitance vs. reverse voltage

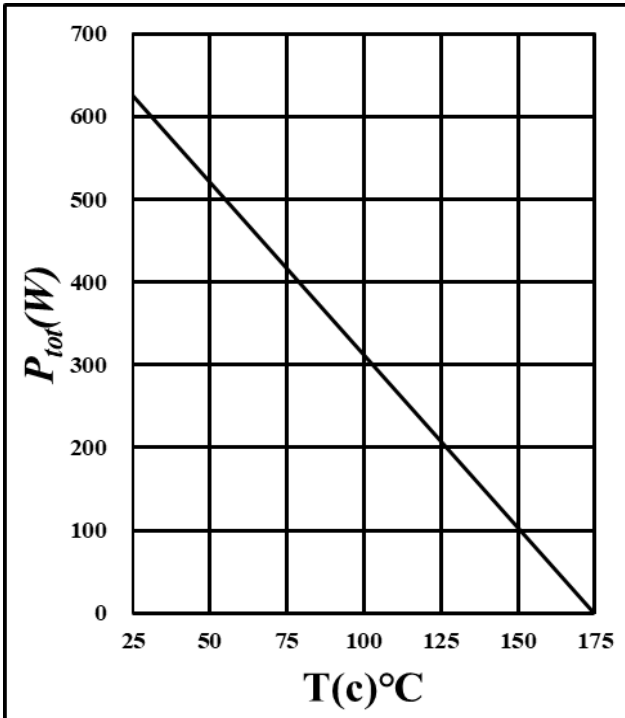


Figure 5. Power derating

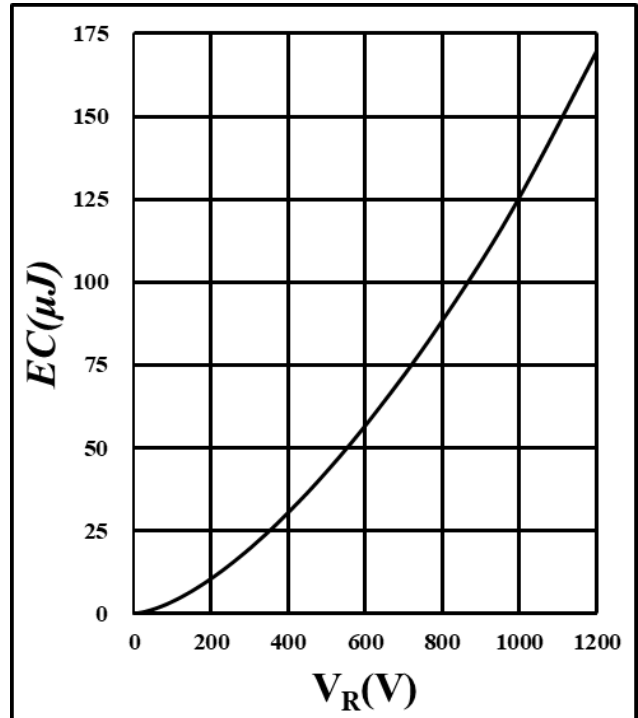


Figure 6. Capacitance stored energy

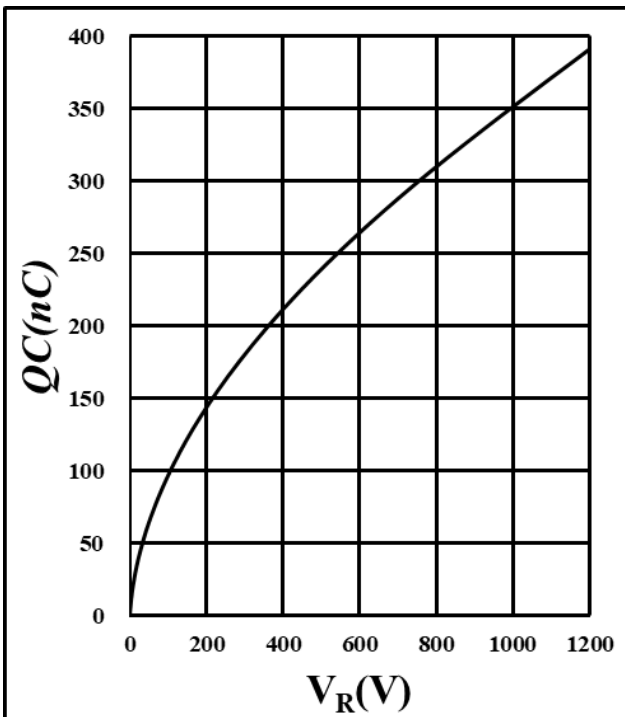
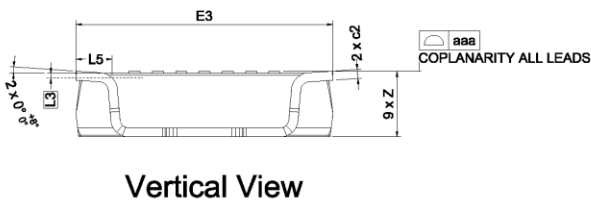
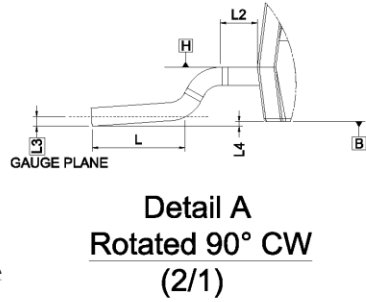
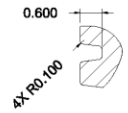
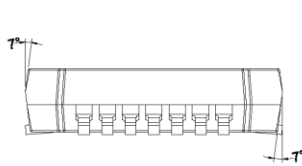
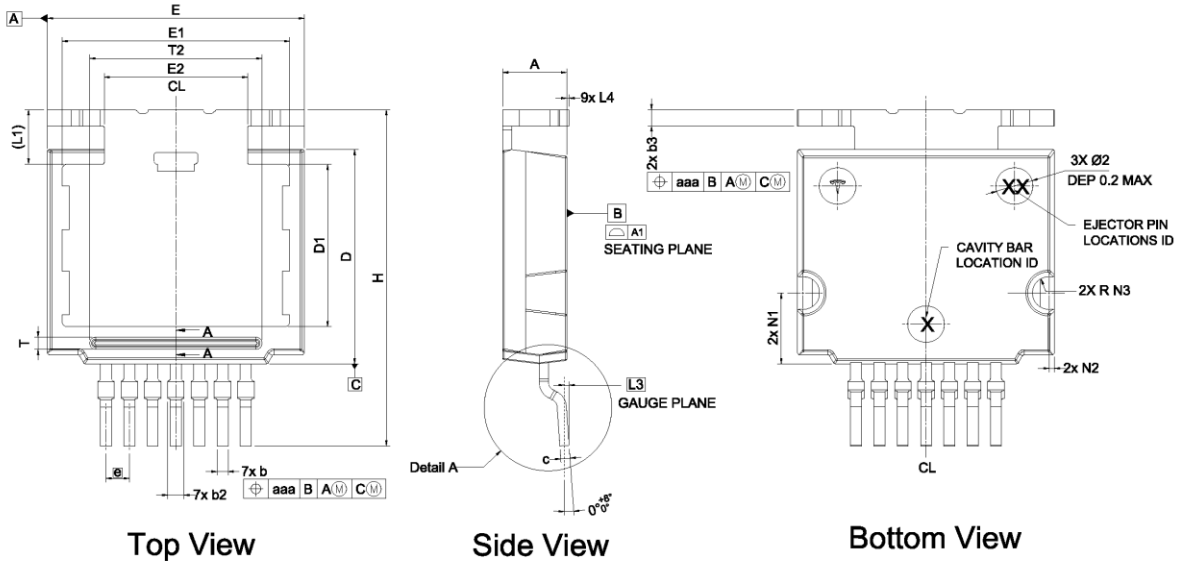


Figure 7. Total capacitance charge vs. reverse voltage

Package Information



NOTES:

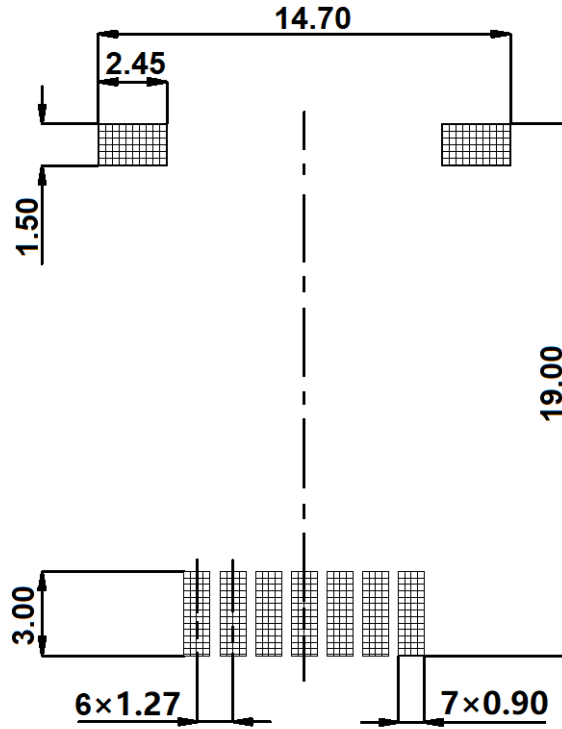
- RADIUS ON ALL CORNES UNLESS OTHER SHPECIFIED R0.2
- MARKINGS SHALL BE FLUSH OR BELOW SEATING PLANE.
- MAXIMUM MOLD GATE MARK PROTRUSION 0.3mm.
- MAXIMUM FLASH 0.1mm ALONG PARTING LINES AND SHUTOFFS INCLUDING DAM BAR.
- DEBURR AND BREAK ALL SHARP EDGES 0.1mm UNLESS OTHERWISE SPECIFIED.
- ALL EXTERIOR DRAFT ANGLES ARE NOMINALLY 7±1 DEGREES UNLESS OTHERWISE SPECIFIED.
- MOLD FLASH ON LEAD FRAME PERMITTED ONLY WITHIN DAM BAR AREA 7L AND 2L. SURFACE OF LEAD FRAME AT MOLD CLOSURE: 0.5mm MAX LATERAL LENGTH, 0.25mm MAX THICKNESS STAMPED LEAD FRAME EDGES: 0.25mm MAX LATERAL THICKNESS
- TOLERANCES UNLESS OTHERWISE NOTED:

\square 0.02 A B H	\square 0.02 A B H	\oplus 0.02 (M) A B H	SIZE ±0.02
SURFACES WITH BLENDED UNIFORMITY	ALL TRIM EDGES	CIRCULAR FEATURES	NON-CIRCULAR FEATURES

Dimension unit: [mm]			
Symbol	Min	Nom	Max
A	3.40	3.500	3.60
A1	-	0.050	-
b	0.50	0.600	0.70
b2	0.50	0.700	1.00
b3	0.80	0.900	1.00
c	0.40	0.500	0.60
c2	0.40	0.500	0.60
D	11.70	11.800	11.90
D1	8.90	8.955	9.10
E	13.90	14.000	14.10
E1	12.30	12.400	12.50
E2	7.75	7.800	7.85
E3	13.90	14.000	14.10
e		1.270 BSC	
H	18.00	18.580	19.00
L	2.40	2.523	2.60
L1	-	3.000	-
L2	0.90	1.000	1.10
L3		0.255 BSC	
L4	0.075	0.125	0.175
L5	1.83	1.930	2.03
aaa	-	0.100	-
N1	3.80	3.900	4.00
N2	0.25	0.300	0.35
N3	0.80	0.900	1.00
T	0.60	0.668	0.70
T2	9.33	9.378	9.43
Z	3.525	3.625	3.725

Recommended Solder Pad Layout

Note: All dimensions are in mm



SAPKG-9L

Ordering Information

Part number	ADS120J050V3-ASARR
Package	SAPKG-9L
Unit quantity	600 EA
Packing type	Tape & Reel

Important Notices – Read Carefully

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