

1. General description:

Silicon Carbide Schottky diode in a TO247-3L plastic package, designed for high frequency switched-mode power supplies.



2. Features and benefits:

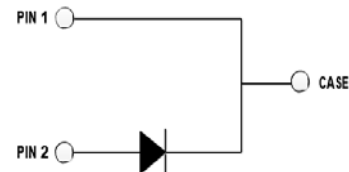
- Zero Reverse Recovery Current
- Positive temperature coefficient
- Temperature-independent performance
- High-speed switching
- Low switching loss
- Low heat dissipation requirements

3. Applications:

- Switching power supply
- Power factor correction
- Motor drive, traction
- Charging pile
- PC Silverbox

4. Typical Performance Diagrams and Package:

V_{RRM}	1200	V
$I_F(135^\circ\text{C})$	22*	A
Q_C	102*	nC



5. Ordering information:

Parts Number	Marking	Package	Vde min	IF max(A)	Pins	SPQ	Packaging
TSSiC120S040G	TSSiC120S040G	TO-247-3L	1200V	40A	3	600	Tube

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6. Absolute Maximum Ratings

Parameter	Symbol	Value	Unit	Test Conditions
Reverse voltage (Repetitive peak)	V_{RRM}	1200	V	$T_C = 25^\circ\text{C}$
Reverse Voltage (Surge peak)	V_{RSM}	1200		$T_C = 25^\circ\text{C}$
Reverse voltage (DC)	V_{DC}	1200		$T_C = 25^\circ\text{C}$
Continuous forward current (PerLeg/Device)	I_F	49/98	A	$T_C = 25^\circ\text{C}$
		22/45		$T_C = 135^\circ\text{C}$
		20/40		$T_C = 142^\circ\text{C}$
Surge non-repetitive forward current	I_{FSM}	180*	A	$T_C = 25^\circ\text{C}, t_p = 10\text{ms}, \text{half Sine Pulse}$
Total power dissipation	P_{TOT}	176*	W	$T_C = 25^\circ\text{C}$
i^2t value	$\int i^2 dt$	171*	A^2s	$T_C = 25^\circ\text{C}, t_p = 10\text{ms}$
Operating temperature	T_j	-55~175	$^\circ\text{C}$	
storage temperature	T_{stg}	-55~175	$^\circ\text{C}$	
Mounting Torque	M	1	Nm	M3 Screw

7. Thermal Characteristics

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
Thermal resistance	$R_{th(j-c)}$	/	0.85*/0.42**	/	$^\circ\text{C/W}$	

** Per device * Per leg

8. Electrical Characteristics $T_j = 25^\circ\text{C}$

Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
DC blocking voltage	V_{DC}	1200	/	/	V	$I_R = 100 \mu\text{A}$
Forward voltage	V_F	/	1.45	1.80	V	$I_F = 20\text{A}, T_j = 25^\circ\text{C}$
		/	2.20	2.70		$I_F = 20\text{A}, T_j = 175^\circ\text{C}$
Reverse current	I_R	/	2	50	μA	$V_R = 1200\text{V}, T_j = 25^\circ\text{C}$
		/	15	300		$V_R = 1200\text{V}, T_j = 175^\circ\text{C}$
Total capacitance	C	/	1453	/	pF	$V_R = 0\text{V}, f = 1\text{MHz}$
		/	95	/		$V_R = 400\text{V}, f = 1\text{MHz}$
		/	72	/		$V_R = 800\text{V}, f = 1\text{MHz}$
Total capacitive charge	Q_C	/	102	/	nC	$V_R = 800\text{V}$
Capacitance Stored Energy	E_C	/	29	/	μJ	$V_R = 800\text{V}$

9. Typical Electrical Characteristics Curves

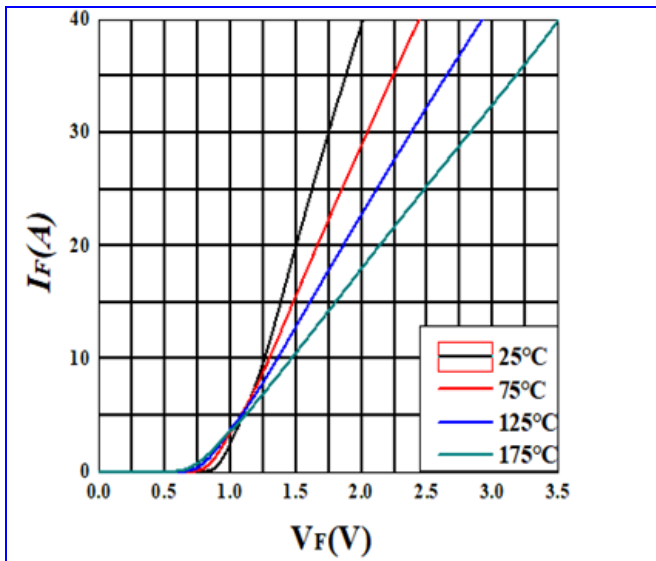


Figure 1. Forward Characteristics

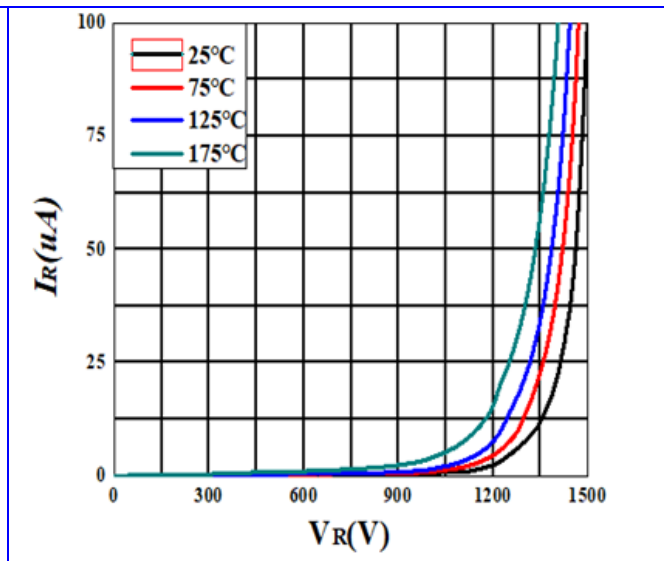


Figure 2. Reverse Characteristics

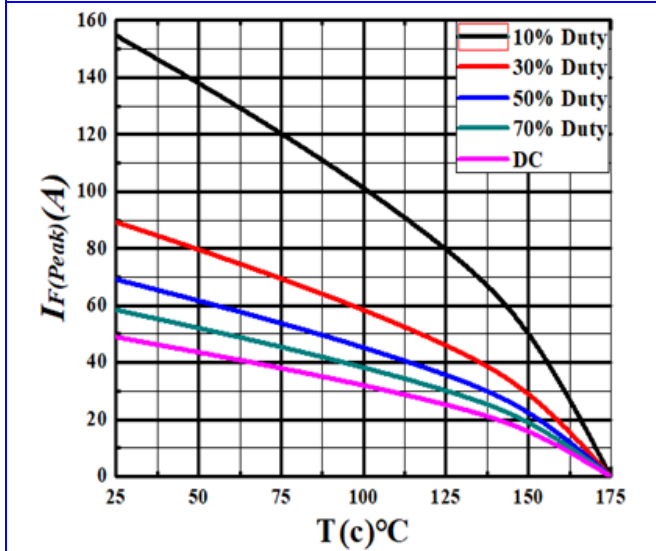


Figure 3. Current Derating

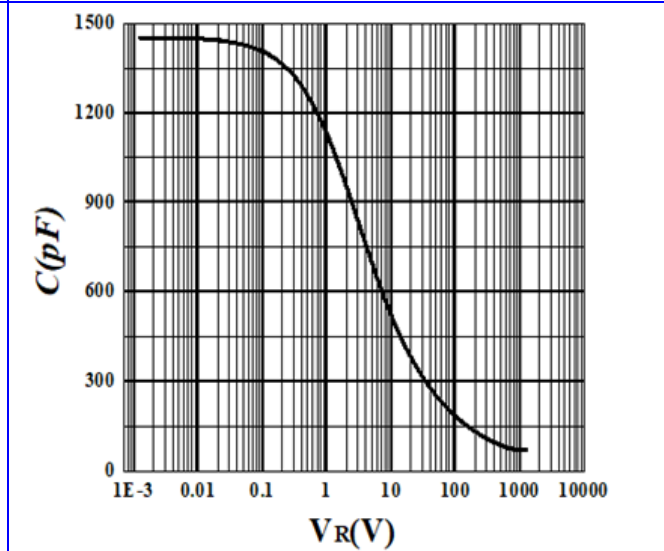


Figure 4. Capacitance vs. Reverse Voltage

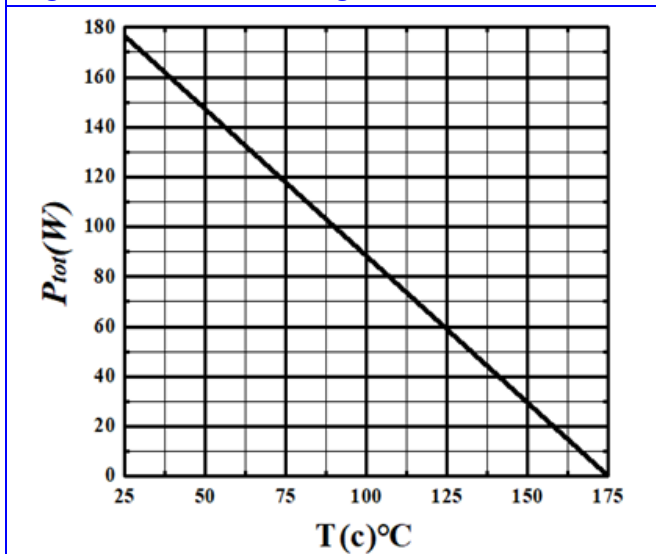


Figure 5. Power Derating

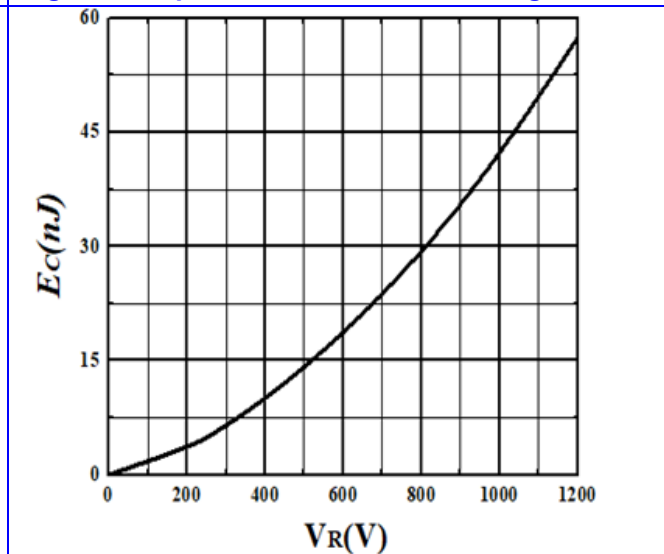
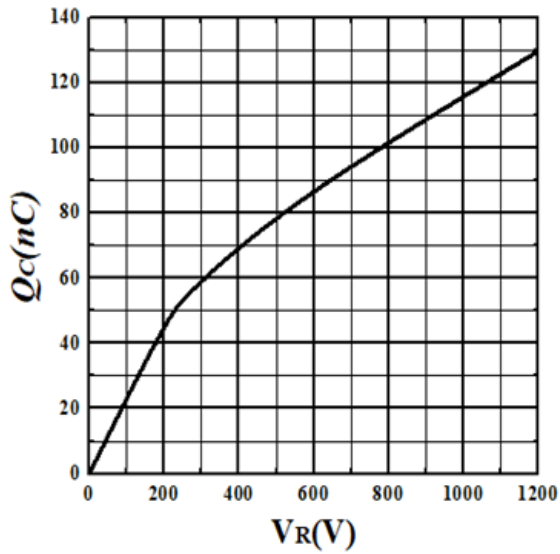
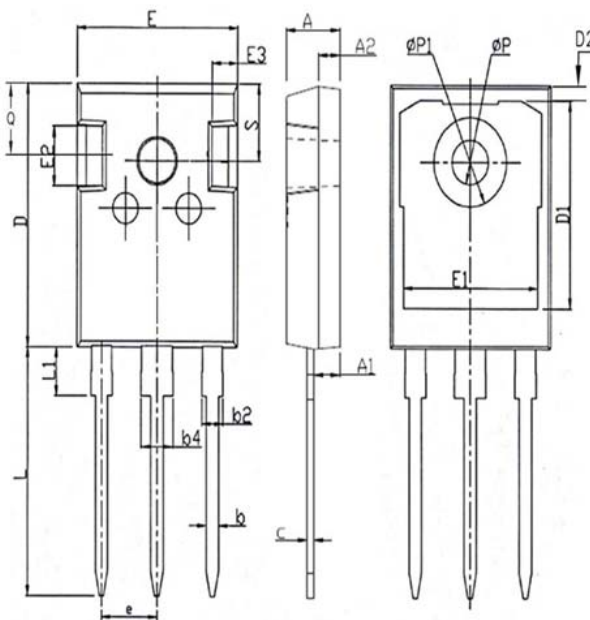


Figure 6. Capacitance Stored Energy


Figure 7. Total Capacitance Charge vs. Reverse Voltage

10. Package



SYMBOL	mm		
	MIN	NOM	MAX
A	4.8	5	5.2
A1	2.21	2.41	2.61
A2	1.85	2	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.6	0.75
D	20.7	21	21.3
D1	16.25	16.55	16.85
D2	1	1.2	1.35
E	15.5	15.8	16.1
E1	13	13.3	13.6
E2	4.8	5	5.2
E3	2.3	2.5	2.7
e	5.44 BSC		
L	19.62	19.92	20.22
L1	-	-	4.3
øP	3.4	3.6	3.8
øP1	-	-	7.3
Q	5.4	5.8	6.2
S	6.20 BSC		

11. Ordering information

Part Number	TSSiC120S040G
Package	TO-247-3L
Marking	TSSiC120S040G
Unit Quantity	600 EA
Packing Type	Tube
RoHS	Yes

12. Notes

SiC Schottky diode portfolio: <http://www.thrivesemi.com/>

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