



## 650V/ 40A Silicon Carbide Power Schottky Barrier Diode

### Features

- Zero reverse recovery current
- Zero forward recovery voltage
- Temperature independent switching behavior
- High temperature operation
- High frequency operation

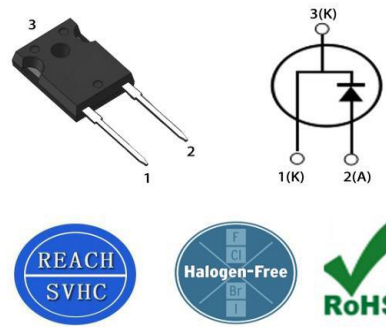
### Benefits

- Unipolar rectifier
- Substantially reduced switching losses
- No thermal run-away with parallel devices
- Reduced heat sink requirements

### Applications

- SMPS, e.g., CCM PFC;
- Motor drives, Solar application, UPS, Wind turbine, Rail traction, EV/HEV

Key Characteristics		
$V_{RRM}$	<b>650</b>	<b>V</b>
$I_F, T_c \leq 130^\circ\text{C}$	<b>40</b>	<b>A</b>
$Q_c$	<b>93.6</b>	<b>nC</b>



Part No.	Package Type	Marking
G4S06540PT	TO-247AC	G4S06540PT

**Maximum Ratings**

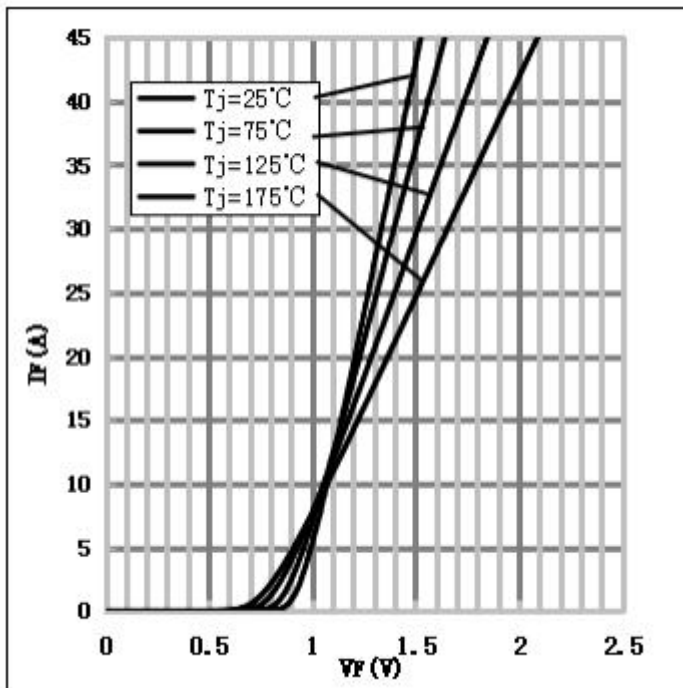
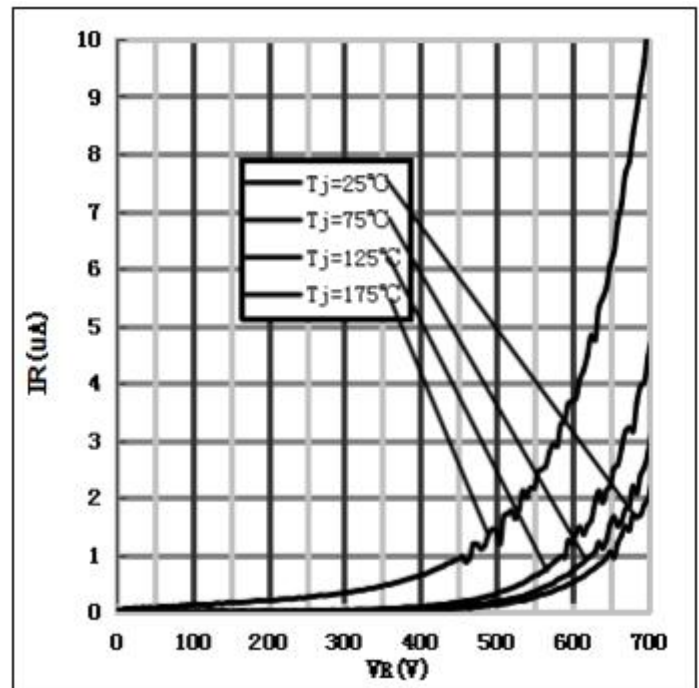
Parameter	Symbol	Test Condition	Value	Unit
Repetitive Peak Reverse Voltage	$V_{RRM}$		650	V
Surge Peak Reverse Voltage	$V_{RSM}$		650	V
DC Blocking Voltage	$V_{DC}$		650	V
Continuous Forward Current	$I_F$	$T_C=25^{\circ}C$ $T_C=125^{\circ}C$ $T_C=130^{\circ}C$	81.8 42.2 40	A
Repetitive Peak Forward Surge Current	$I_{FRM}$	$T_C=25^{\circ}C$ , $t_p=10ms$ , Half Sine Wave, $D=0.3$	150	A
Non-repetitive Peak Forward Surge Current	$I_{FSM}$	$T_C=25^{\circ}C$ , $t_p=10ms$ , Half Sine Wave	268	A
Power Dissipation	$P_{TOT}$	$T_C=25^{\circ}C$	261	W
		$T_C=110^{\circ}C$	113	W
Operating Junction	$T_j$		-55°C to 175°C	°C
Storage Temperature	$T_{stg}$		-55°C to 175°C	°C
Mounting Torque		M3 Screw	1	Nm
		6-32 Screw	8.8	lbf-in

**Thermal Characteristics**

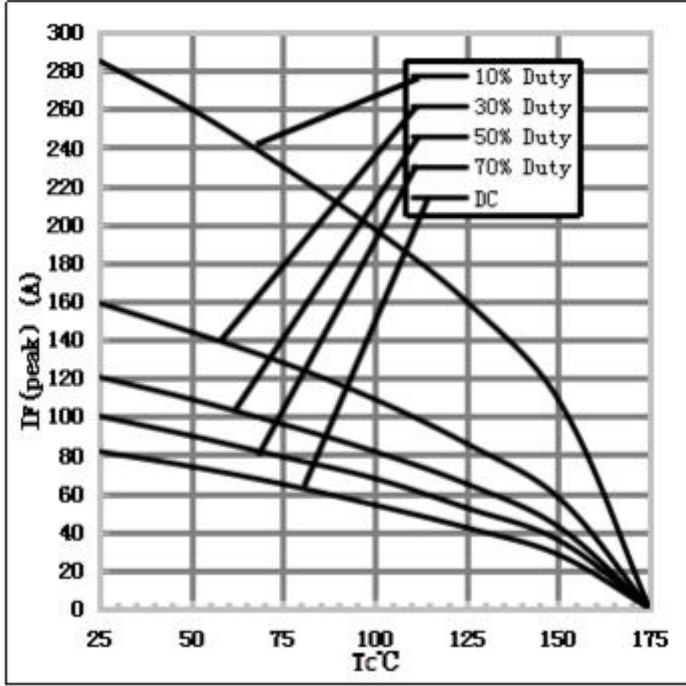
Parameter	Symbol	Test Condition	Value	Unit
			Typ.	
Thermal resistance from junction to case	$R_{thJC}$		0.58	°C/W

Electrical Characteristics

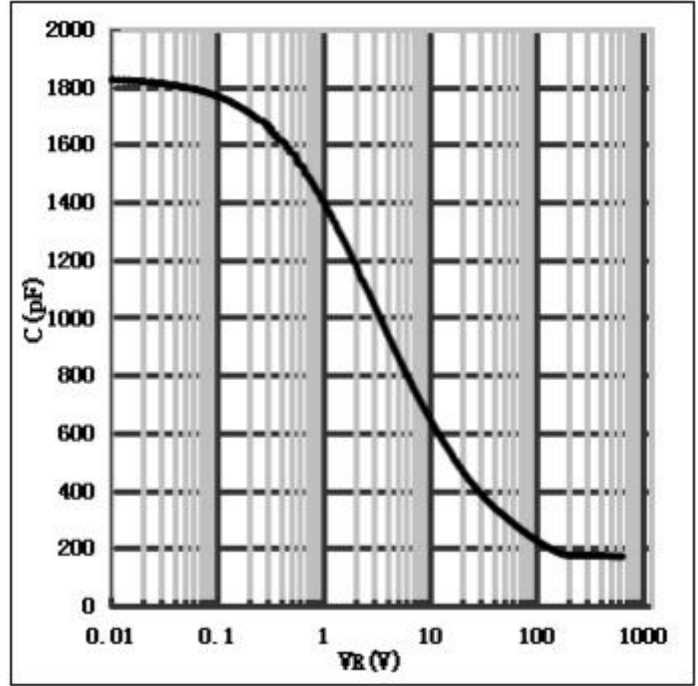
Parameter	Symbol	Test Conditions	Numerical		Unit
			Typ.	Max.	
Forward Voltage	$V_F$	$I_F=40A, T_j=25^\circ C$	1.46	1.7	V
		$I_F=40A, T_j=175^\circ C$	1.96	2.5	
Reverse Current	$I_R$	$V_R=650V, T_j=25^\circ C$	1	50	$\mu A$
		$V_R=650V, T_j=175^\circ C$	6	100	
Total Capacitive Charge	$Q_C$	$V_R=400V, T_j=150^\circ C$ $Q_C = \int_0^{V_R} C(V)dV$	93.6	-	nC
Total Capacitance	C	$V_R=0V, T_j=25^\circ C, f=1MHz$	1860	2000	pF
		$V_R=200V, T_j=25^\circ C, f=1MHz$	176	200	
		$V_R=400V, T_j=25^\circ C, f=1MHz$	173	183	

Performance Graphs1) Forward IV characteristics as a function of  $T_j$  :2) Reverse IV characteristics as a function of  $T_j$  :

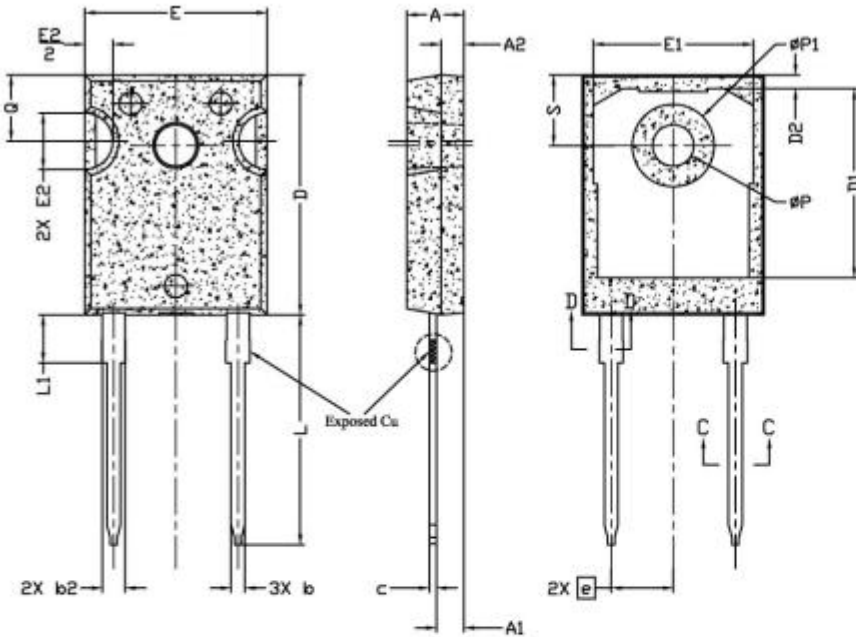
3) Current Derating:



4) Capacitance vs. reverse voltage:



Package TO-247AC

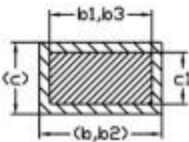


单位 : mm

SYMBOL	DIMENSIONS			NOTES
	MIN.	NOM.	MAX.	
A	4.83	5.02	5.21	
A1	2.29	2.41	2.55	
A2	1.50	2.00	2.49	
b	1.12	1.20	1.33	
b1	1.12	1.20	1.28	
b2	1.91	2.00	2.39	6
b3	1.91	2.00	2.34	
c	0.55	0.80	0.69	6
c1	0.55	0.60	0.65	
D	20.80	20.95	21.10	4
D1	16.25	16.55	17.65	5
D2	0.51	1.19	1.35	
E	15.75	15.94	16.13	4
E1	13.46	14.02	14.16	5
E2	4.32	4.91	5.49	3
e	5.44BSC			
L	19.81	20.07	20.32	
L1	4.10	4.19	4.40	6
\$\phi P\$	3.56	3.61	3.65	7
\$\phi P1\$	7.19REF.			
Q	5.39	5.79	6.20	
S	6.04	6.17	6.30	

Note:

1. Package Reference: JEDEC TO247, Variation AD.
2. All Dimensions Are In mm.
3. Slot Required, Notch May Be Rounded
4. Dimension D & E Do Not Include Mold Flash. Mold Flash Shall Not Exceed 0.127mm Pre Side. These Dimensions Are Measured At The Outermost Extreme Of The Plastic Body.
5. Thermal Pad Contour Optional Within Dimension D1 & E1.
6. Lead Finish Uncontrolled In L1.
7. \$\phi P\$ To Have A Maximum Draft Angle Of 1.5° To The Top Of The Part With A Maximum Hole Diameter Of 3.91mm.
8. Dimension "b2" And "b4" Does Not Include Dambar Protrusion. Allowable Dambar Protrusion Shall Be 0.10mm Total In Excess Of "b2" And "b4" Dimension At Maximum Material Condition.



Section C-C, D-D

**Note:** The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU Directive 2011/65/EC(RoHS2). RoHS Certification and other certifications can be obtained from GPT sales representatives or GPT website: <http://globalpowertech.cn/English/index.asp>

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