

650V/ 50A Silicon Carbide Power Schottky Barrier Diode

Features

- Rated to 650V at 50 Amps
- Zero reverse recovery current
- Zero forward recovery voltage
- Temperature independent switching behaviour
- High temperature operation
- High frequency operation

Key Characteristics		
V_{RRM}	650	V
$I_F, T_c \leq 100^\circ\text{C}$	50	A
Q_C	168	nC

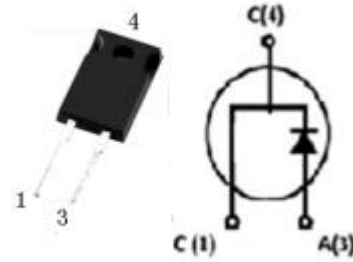
(* : for per leg ; **: for both legs)

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



Part No.	Package Type	Marking
HSS5065H	TO-247	HSS5065H

Maximum Ratings

Parameter	Symbol	Test Condition	Value	Unit
Repetitive Peak Reverse Voltage	V_{RRM}		650	V
Surge Peak Reverse Voltage	V_{RSM}		650	
DC Blocking Voltage	V_{DC}		650	
Continuous Forward Current	I_F	$T_C=25^{\circ}C$	74	A
		$T_C=100^{\circ}C$	50	
		$T_C=150^{\circ}C$	25	
Repetitive Peak Forward Surge Current	I_{FRM}	$T_C=25^{\circ}C$, $t_p=10ms$, Half Sine Wave, $D=0.3$	TBD	A
Non-repetitive Peak Forward Surge Current	I_{FSM}	$T_C=25^{\circ}C$, $t_p=10ms$, Half Sine Wave	TBD	A
Power Dissipation	P_{TOT}	$T_C=25^{\circ}C$	206.5	W
		$T_C=110^{\circ}C$	89.5	W
Operating Junction	T_j		$-55^{\circ}C$ to $175^{\circ}C$	$^{\circ}C$
Storage Temperature	T_{stg}		$-55^{\circ}C$ to $175^{\circ}C$	$^{\circ}C$
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}		0.73	$^{\circ}C/W$

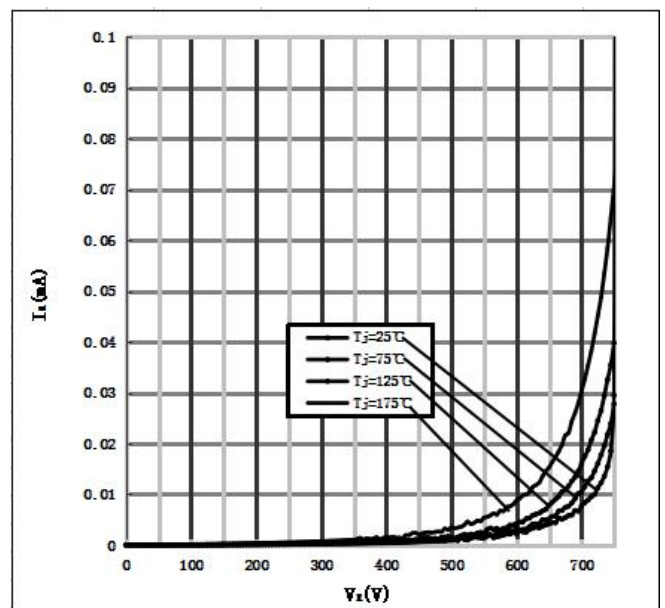
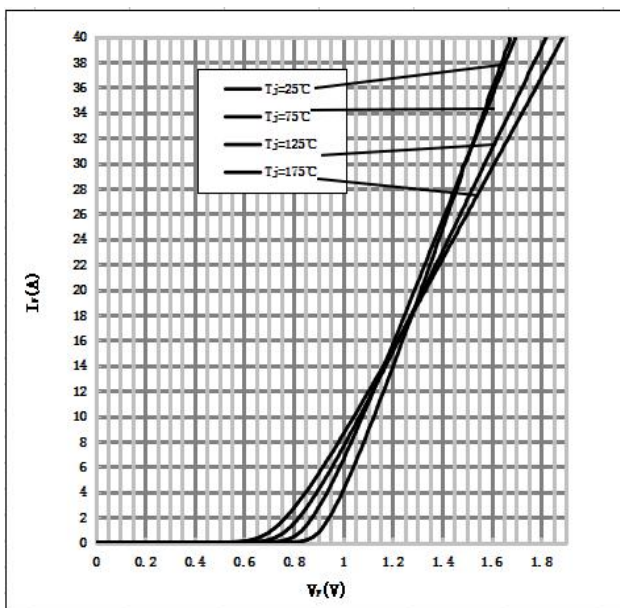
Electrical Characteristics

Parameter	Symbol	Test Conditions	Numerical		Unit
			Typ.	Max.	
Forward Voltage	V_F	$I_F=40A, T_j=25^\circ C$	1.68	1.8	V
		$I_F=40A, T_j=175^\circ C$	1.9	2.5	
Reverse Current	I_R	$V_R=650V, T_j=25^\circ C$	10	100	μA
		$V_R=650V, T_j=175^\circ C$	20	200	
Total Capacitive Charge	Q_C	$V_R=400V, T_j=150^\circ C$ $Q_C = \int_0^{V_R} C(V)dV$	168	-	nC
Total Capacitance	C	$V_R=0V, T_j=25^\circ C, f=1MHz$	4400	450	pF
		$V_R=400V, T_j=25^\circ C, f=1MHz$	306	320	
		$V_R=800V, T_j=25^\circ C, f=1MHz$	302.5	310	

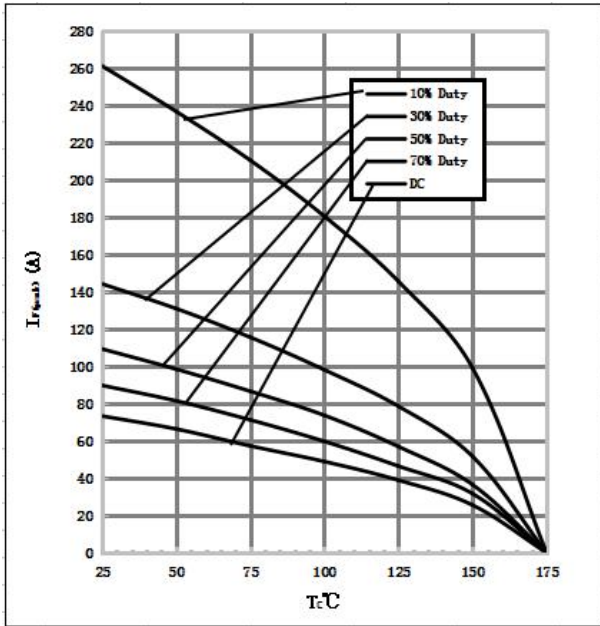
Performance Graphs

1) Forward IV characteristics as a function of T_j :

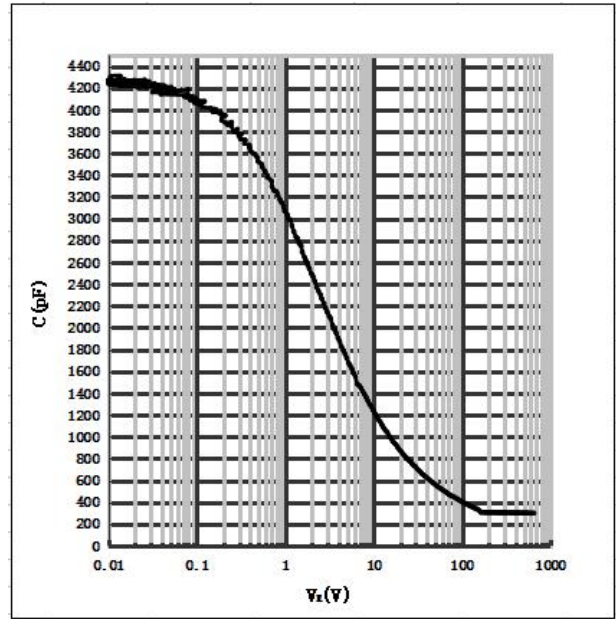
2) Reverse IV characteristics as a function of T_j :



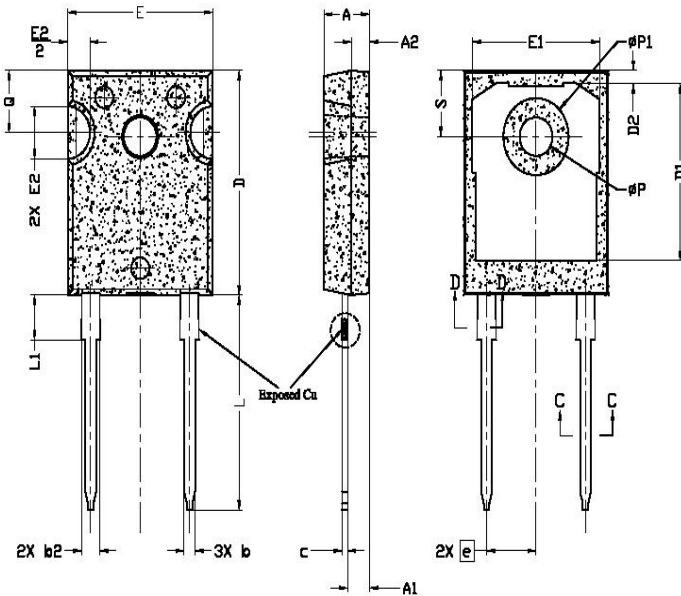
3) Current Derating



4) Capacitance vs. reverse voltage :



Package TO-247



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	0,60	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
ϕP	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	