

CSD04060 –silicon Carbide Schottky Diode

ZERO RECOVERY[®] RECTIFIER

$V_{RRM} = 600V$
 $I_{F(AVG)} = 4A$
 $Q_c = 9nC$

Features

- 600 Volt Schottky Rectifier
- Zero Reverse Recovery
- Zero Forward Recovery
- High Frequency Operation
- Temperature Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on V_F

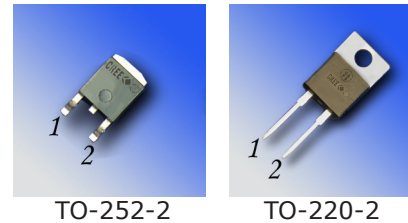
Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction Of Heat Sink Requirements
- Parallel Devices without Thermal Runaway

Applications

- Switch Mode Power Supplies
- Power Factor Correction
 - Typical PFC P_{out} : 400W-800W
- Motor Drives
 - Typical Power : 0.5HP-2HP

Package



Part Number	Package	Marking
CSD04060A	TO-220-2	CSD04060
CSD04060E	TO-252-2	CSD04060

Maximum Ratings

Symbol	Parameter	Value	Unit	Test Conditions	Note
V_{RRM}	Repetitive Peak Reverse Voltage	600	V		
V_{RSM}	Surge Peak Reverse Voltage	600	V		
V_{DC}	DC Blocking Voltage	600	V		
$I_{F(AVG)}$	Average Forward Current	4 7	A	$T_c=150^{\circ}C$ $T_c=125^{\circ}C$	
$I_{F(PEAK)}$	Peak Forward Current	10	A	$T_c=125^{\circ}$, $T_{REP} < 1mS$, Duty=0.5	
I_{FRM}	Repetitive Peak Forward Surge Current	20	A	$T_c=25^{\circ}C$, $t_p=8.3ms$, Half Sine Wave	
I_{FSM}	Non-Repetitive Peak Forward Surge Current	100	A	$T_c=25^{\circ}C$, $t_p=10\mu s$, Pulse	
P_{tot}	Power Dissipation	62.5 20.8	W	$T_c=25^{\circ}C$ $T_c=125^{\circ}C$	
T_J, T_{stg}	Operating Junction and Storage Temperature	-55 to +175	$^{\circ}C$		

Electrical Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
V_F	Forward Voltage	1.5 2.0	1.8 2.4	V	$I_F = 4A$ $T_J = 25^\circ C$ $I_F = 4A$ $T_J = 175^\circ C$	
I_R	Reverse Current	25 50	200 1000	μA	$V_R = 600V$ $T_J = 25^\circ C$ $V_R = 600V$ $T_J = 175^\circ C$	
Q_C	Total Capacitive Charge	9		nC	$V_R = 600V$, $I_F = 1A$ $di/dt = 500 A/\mu s$ $T_J = 25^\circ C$	
C	Total Capacitance	220 26 20		pF	$V_R = 0V$, $T_J = 25^\circ C$, $f = 1MHz$ $V_R = 200V$, $T_J = 25^\circ C$, $f = 1MHz$ $V_R = 400V$, $T_J = 25^\circ C$, $f = 1MHz$	

Note:

1. This is a majority carrier diode, so there is no reverse recovery charge.

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit	Test Conditions	Note
$R_{\theta JC}$	Thermal Resistance from Junction to Case	2.4		$^\circ C/W$		

Typical Performance

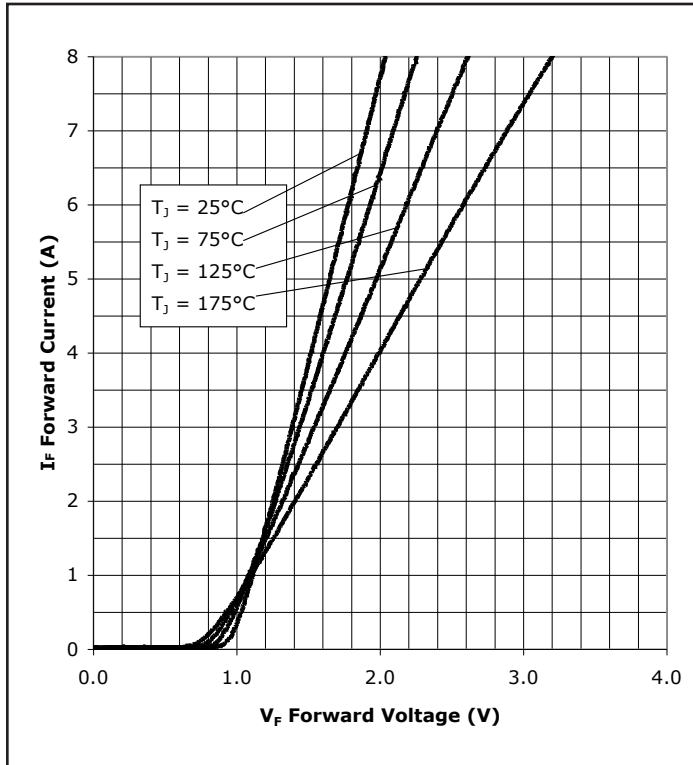


Figure 1. Forward Characteristics

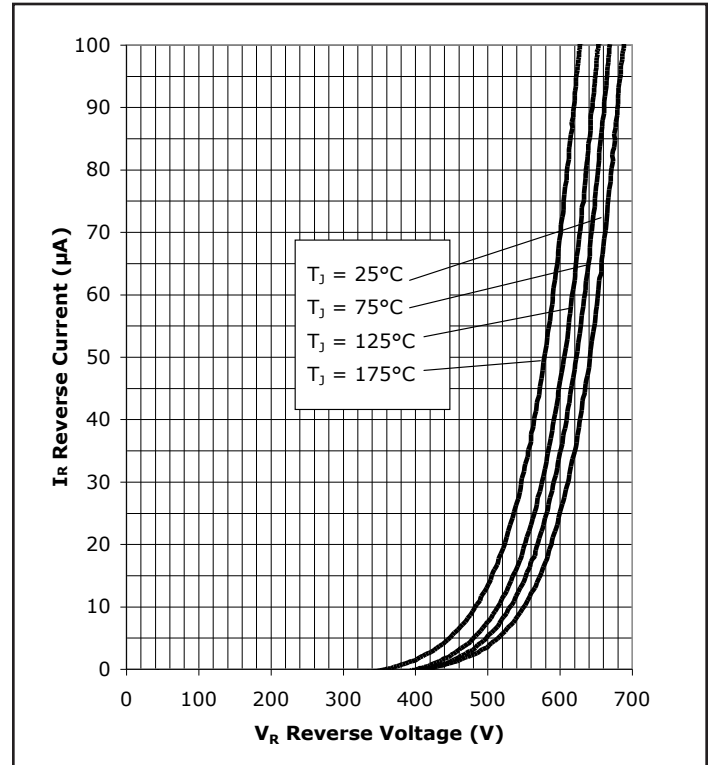


Figure 2. Reverse Characteristics

Typical Performance

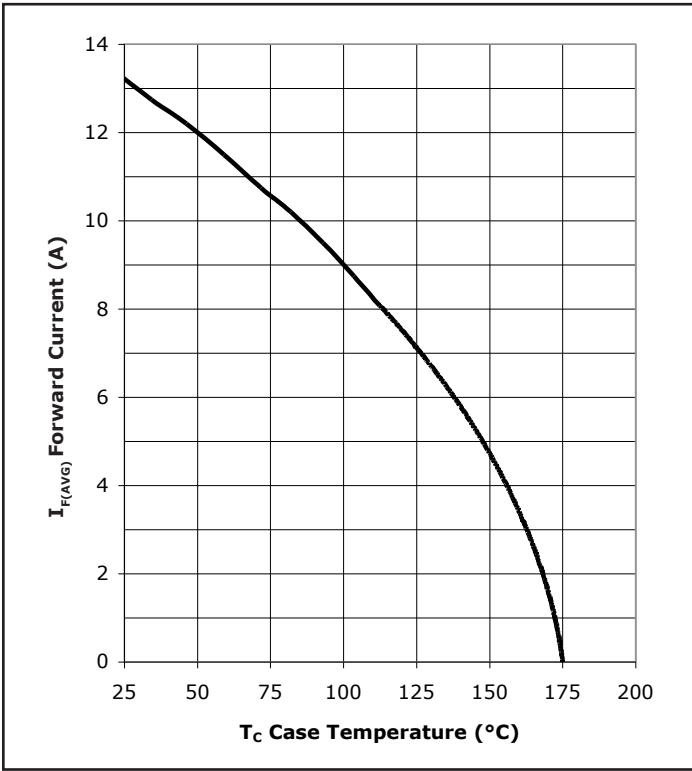


Figure 3. Current Derating

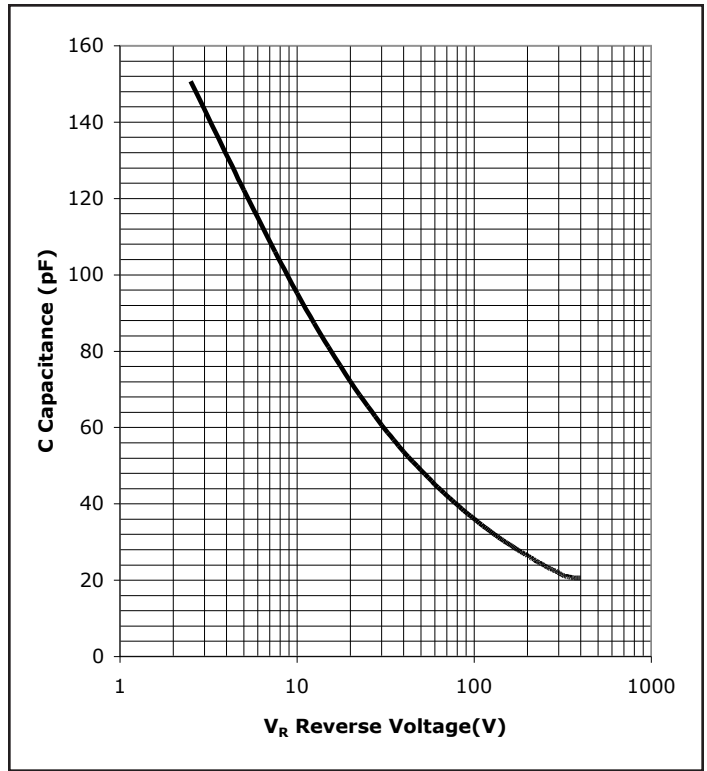


Figure 4. Capacitance vs. Reverse Voltage

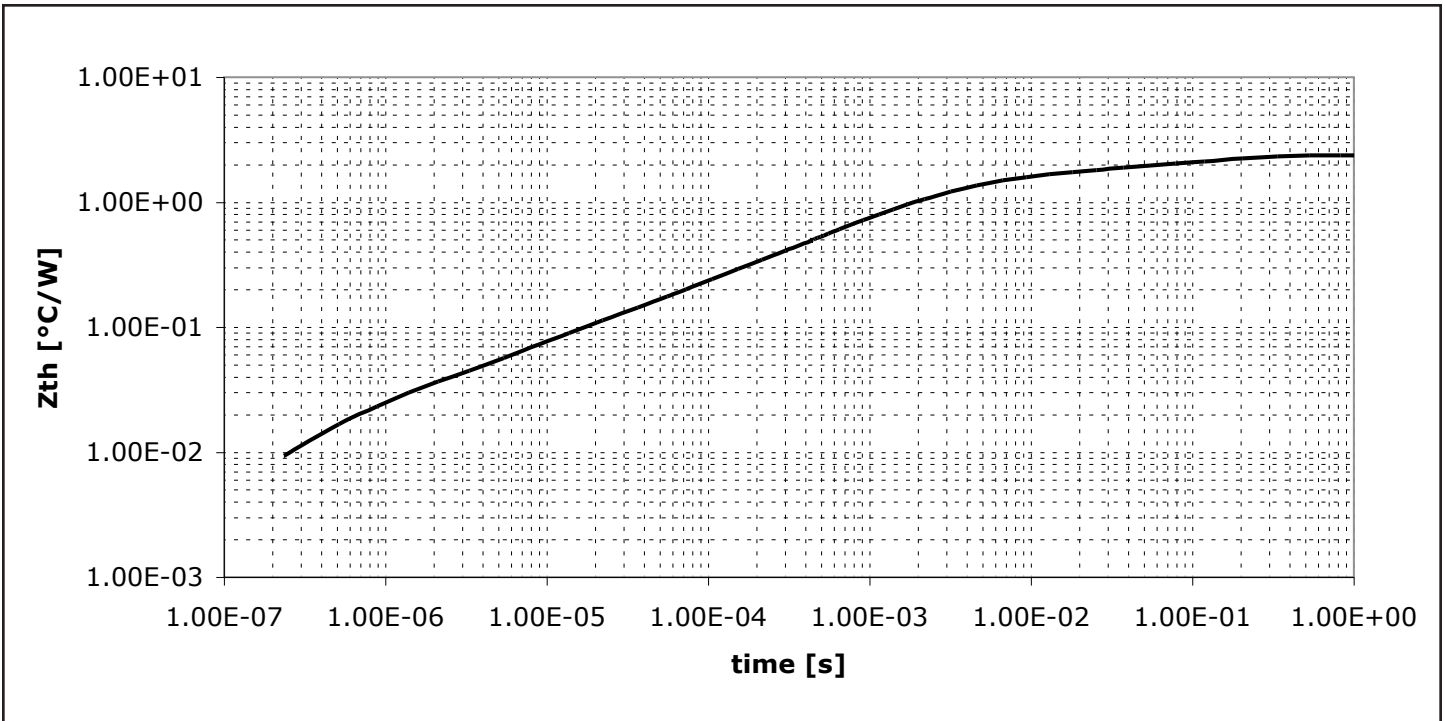
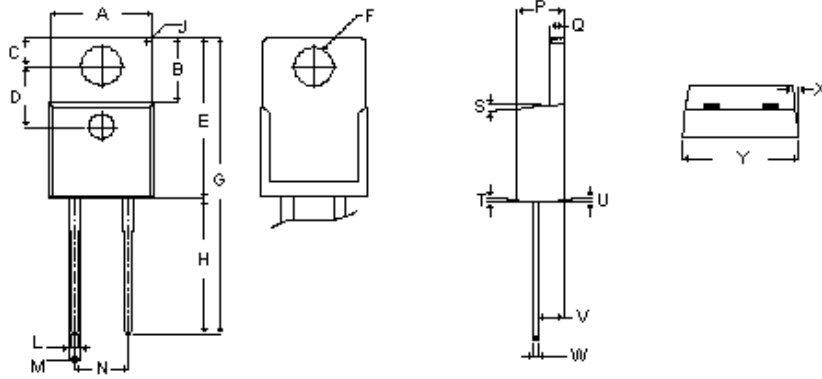


Figure 5. Transient Thermal Impedance

Package Dimensions

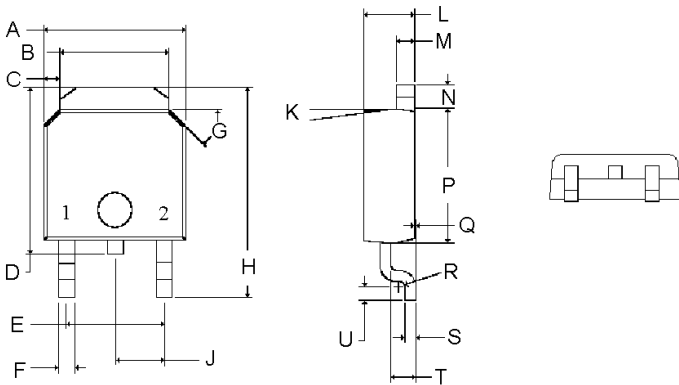
Package TO-220-2



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.381	.391	9.677	9.931
B	.240	.250	6.096	6.350
C	.100	.120	2.540	3.048
D	.223	.227	5.664	5.766
E	.595	.615	15.113	15.621
F	.143	.147	3.632	3.734
G	1.105	1.115	28.067	28.321
H	.500	.510	12.700	12.954
J	R 0.197		R 5.004	
L	.025	.035	.635	.889
M	.045	.055	1.143	1.397
N	.198	.202	5.029	5.131
P	.165	.185	4.191	4.699
Q	.048	.052	1.219	1.321
S	4°	6°	4°	6°
T	4°	6°	4°	6°
U	4°	6°	4°	6°
V	.094	.098	2.387	2.489
W	.018	.025	.458	.635
X	4.5°	5.5°	4.5°	5.5°
Y	.385	.405	9.779	10.287

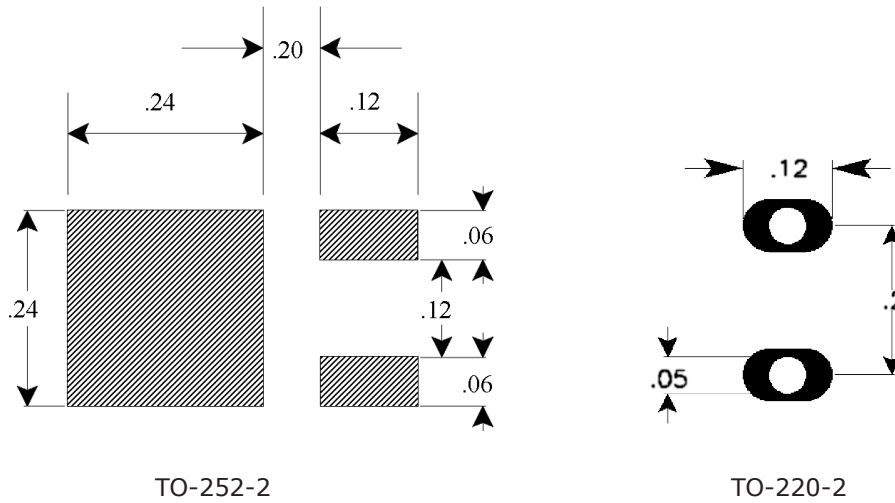
Package Dimensions

Package TO-252 -2



POS	Inches		Millimeters	
	Min	Max	Min	Max
A	.255	.265	6.477	6.731
B	.197	.205	5.004	5.207
C	.027	.033	.686	.838
D	.292	.322	7.417	8.179
E	.178	.182	4.521	4.623
F	.025	.035	.635	.889
G	44°	46°	44°	46°
H	.382	.397	9.703	10.084
J	.090 TYP		2.286 TYP	
K	6°	8°	6°	8°
L	.086	.094	2.184	2.388
M	.030	.034	.762	.864
N	.040	.044	1.016	1.118
P	.235	.245	5.969	6.223
Q	0.00	.004	0.00	.102
R	R0.01 TYP		R0.31 TYP	
S	.017	.023	.428	.588
T	.040	.044	1.016	1.118
U	.021	.027	.534	.686

Recommended solder pad layout



TO-252-2

TO-220-2

Part Number	Package	Marking
CSD04060A	TO-220-2	CSD04060
CSD04060E	TO-252-2	CSD04060

This product has not been designed or tested for use in, and is not intended for use in, applications implanted into the human body nor in applications in which failure of the product could lead to death, personal injury or property damage, including but not limited to equipment used in the operation of nuclear facilities, life-support machines, cardiac defibrillators or similar emergency medical equipment, aircraft navigation or communication or control systems, air traffic control systems, or weapons systems.

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