SDR 504 thru SDR 510
50 AMPS
ULTRA FAST RECOVERY RECTIFIER
400–1000 VOLTS

SSDI
14830 Valley View Avenue
La Mirada, California 90638
(213) 921-9660
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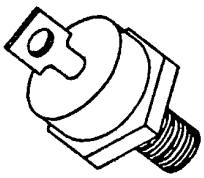
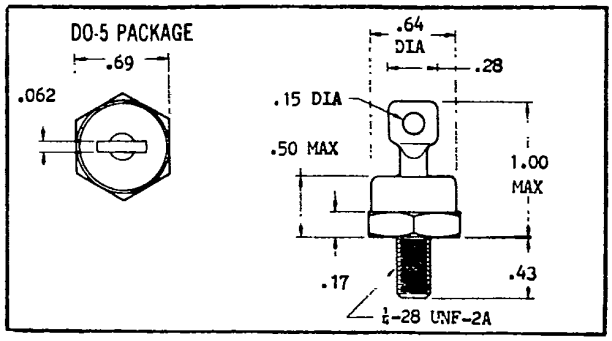
FAX 213-921-2396



FEATURES

- PIV 400 TO 1000 VOLTS
- ULTRA FAST SWITCHING 60 Nsec. TYPICAL
- LOW REVERSE LEAKAGE
- LOW THERMAL IMPEDANCE
- HIGH SURGE CAPABILITY



MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Peak Repetitive Reverse Voltage and DC Blocking Voltage		$V_{RM(rep)}$		Volts
	SDR 504	V_R	400	
	SDR 506		600	
	SDR 508		800	
	SDR 510		1000	
RMS Reverse Voltage	SDR 504	V_r	280	Volts
	SDR 506		420	
	SDR 508		560	
	SDR 510		700	
Average 1/2 Wave Rectified Forward Current (Resistive Load, 60 Hz, T_C = 25°C)		I_O	50	Amp
Peak Repetitive Forward Current (T_C = 55 °C)		$I_{FM(rep)}$	90	Amp
Peak Surge Current (T_C = 55 °C, Superimposed on Rated Current at Rated Voltage)		$I_{FM(surge)}$	625	Amp
Operating and Storage Temperature		T_J, T_{stg}	150	°C

THERMAL CHARACTERISTICS

Characteristics		Symbol	Max	Unit
Thermal Resistance, Junction to Ambient (typical printed circuit board mounting)	L = 3/8"	$R_{\theta JC}$	1.0	°C/W

NOTE: All specifications subject to change without notice.

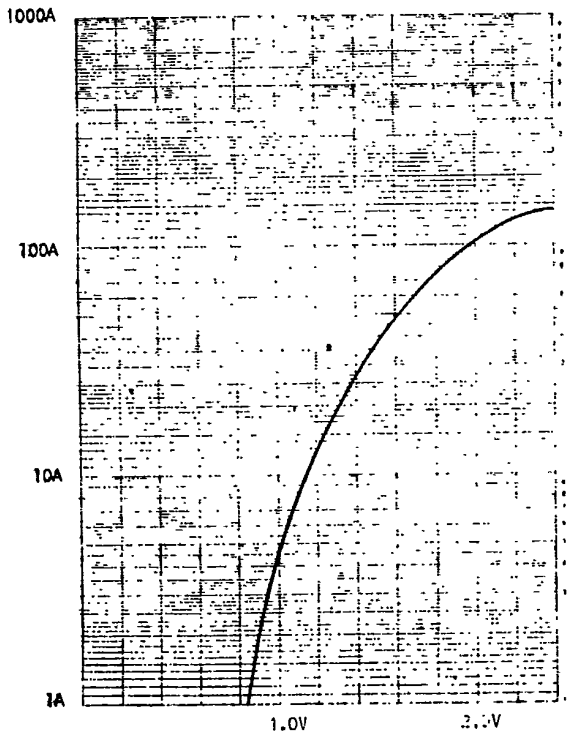
ELECTRICAL CHARACTERISTICS

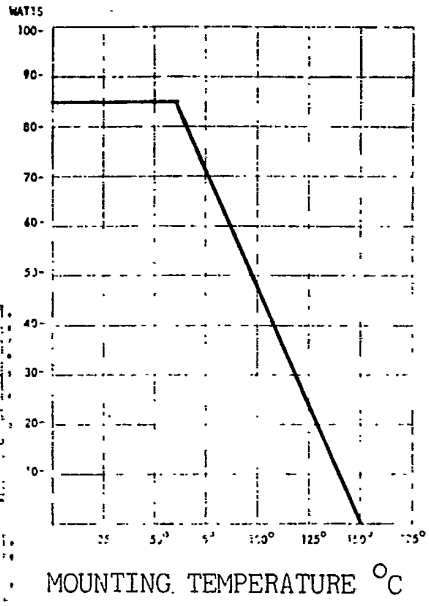
Characteristics	Symbol	Value	Unit
Max Full Cycle Average Forward Voltage Drop ($I_{O\ (Max)}$, rated V_r, 60 Hz, T_C = 55°C)	$V_{F(AV)}$	.85	Volts
Max Instantaneous Forward Voltage Drop (I_F = 50 -Amps, T_J = 25°C)	V_F	1.7	Volts
Max Full Cycle Average Reverse Current ($I_{O\ (max)}$, rated V_r, 60 Hz, T_C = 100°C)	$I_{R(AV)}$	1	mA
Max DC Reverse Current (Rated V_R, T_C = 25°C)	I_R	25	μA

REVERSE RECOVERY CHARACTERISTICS

Characteristics	Symbol	Min	Typ	Max	Unit
Reverse Recovery Time (I_F = 500ma, I_R = 1A, I_{rr} = 250ma)	t_{rr}	-	60	80	ns

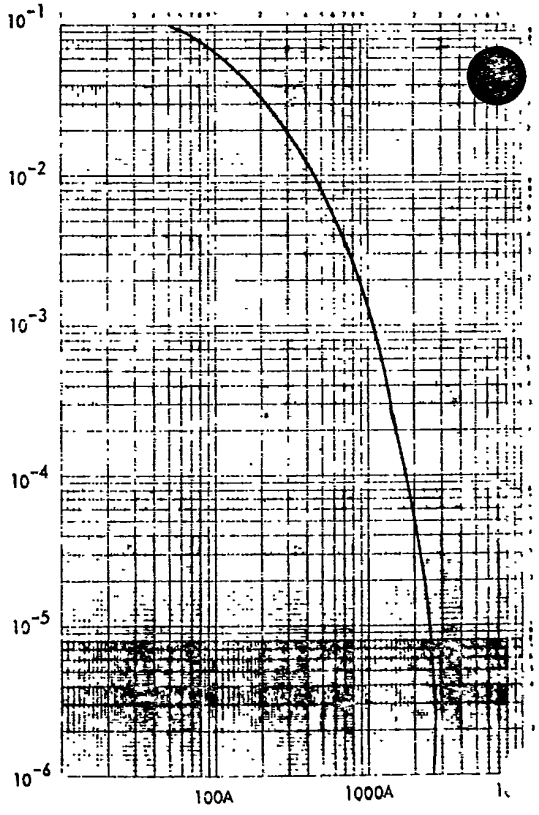
VF - IF @ 25°C





Peak Repetitive

Surge Time in Seconds



SSDI SOLID STATE DEVICES, INC.

P.O. Box 577, La Mirada, California 90637

Telephone: (213) 921-9660 • TWX 910-583-4807 • FAX#213-921-2396

SDR 1004 thru SDR 1010
100 AMPS
ULTRA FAST RECOVERY RECTIFIER
400–1000 VOLTS

SSDI
14830 Valley View Avenue
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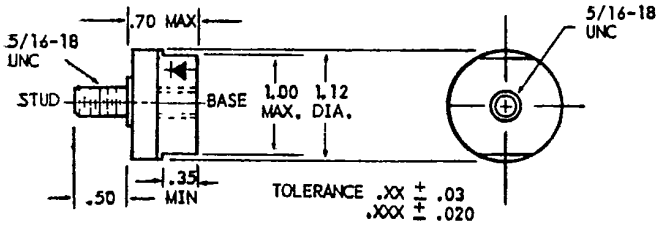
T-03-21

CASE STYLE



FEATURES

- PIV 400 TO 1000 VOLTS
- ULTRA FAST SWITCHING 60 NSEC TYPICAL
- LOW REVERSE LEAKAGE
- LOW THERMAL IMPEDANCE
- HIGH SURGE CAPABILITY
- REVERSE POLARITY UNITS CAN BE SUPPLIED, ADD SUFFIX "R" TO PART NUMBER

MAXIMUM RATINGS

Rating		Symbol	Value	Unit
Peak Repetitive Reverse Voltage and DC Blocking Voltage	SDR 1004	$V_{RM\ (rep)}$, V_R	400	Volts
	SDR 1006		600	
	SDR 1008		800	
	SDR 1010		1000	
RMS Reverse Voltage	SDR 1004	V_r	280	Volts
	SDR 1006		420	
	SDR 1008		560	
	SDR 1010		700	
Average 1/2 Wave Rectified Forward Current (Resistive Load, 60 Hz, T_C = 25°C)		I_O	100	Amp
Peak Repetitive Forward Current (T_C = 55 °C)		$I_{FM\ (rep)}$	180	Amp
Peak Surge Current (T_C = 55 °C, Superimposed on Rated Current at Rated Voltage)		$I_{FM\ (surge)}$	1250	Amp
Operating and Storage Temperature		T_J, T_{stg}	150	°C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient (typical printed circuit board mounting)	$R_{\theta JC}$	.5	°C/W

NOTE: All specifications subject to change without notice.

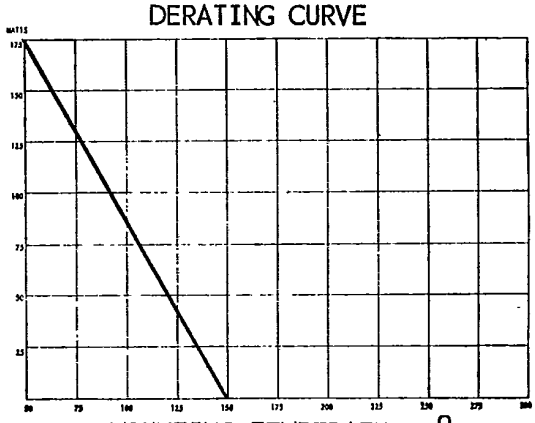
ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Value	Unit
Max Full Cycle Average Forward Voltage Drop	$V_{F(AV)}$	.85	Volts
Max Instantaneous Forward Voltage Drop (I_F = 100 Amps, T_J = 25°C)	V_F	1.7	Volts
Max Reverse Current rated V_r, 60 Hz, T_C = 100°C)	I_R	2	mA
Max DC Reverse Current (Rated V_R, T_C = 25°C)	I_R	50	μA

REVERSE RECOVERY CHARACTERISTICS

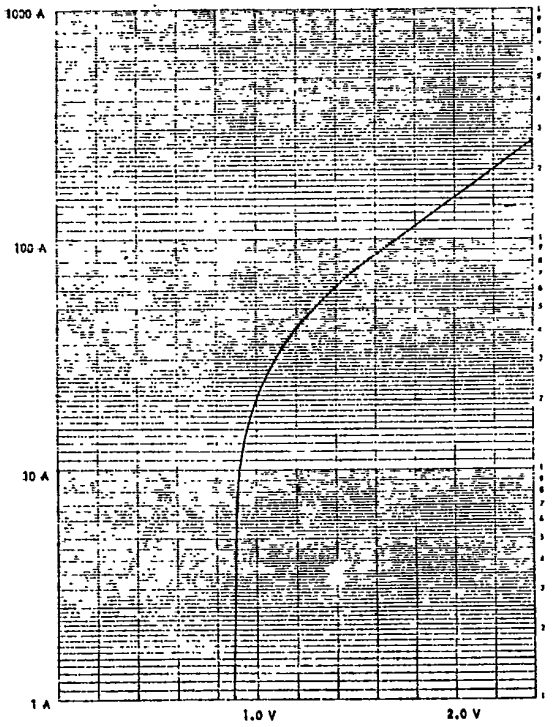
Characteristics	Symbol	Min	Typ	Max	Unit
Reverse Recovery Time (I_F = 500ma, I_R = 1A, I_{rr} = 250ma)	t_{rr}	-	60	80	ns

DERATING CURVE

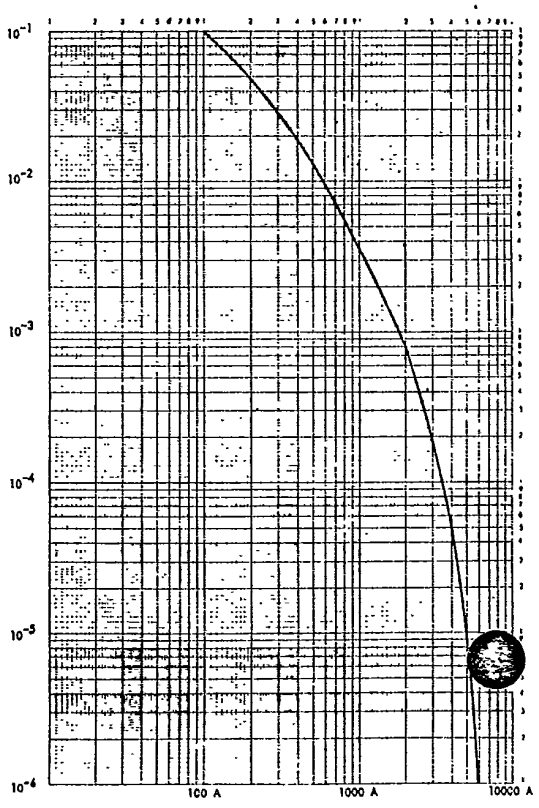


MOUNTING TEMPERATURE °C

VF - IF @ 25°C



PEAK REPETITIVE SURGE
TIME IN SECONDS



SSDI

Solid State Devices, Incorporated

14830 Valley View Avenue La Mirada, California 90638 • Telephone: (213) 921-9660 • TWX 910-583-4807

T-03-09
T-03-11

NEW EPION ION-IMPLANTED DIODES NOW AVAILABLE FROM SSDI

Solid State Devices, Inc. makes the world's only available ion-implanted semiconductors, with all standard catalog items available for off-the-shelf delivery. SSDI's breakthrough in semiconductor construction permits an unusual combination of features not obtainable with diodes and rectifiers manufactured by other processes. These include extremely fast turn-on and reverse recovery times, exceptionally low power dissipation (one-sixth to one-half the conventional voltage drop) and high current pulse handling capability, both continuous and surge. Applications for these diodes and rectifiers include clamps, shunts, high frequency switching, miniaturized power supplies, core memories, modulators and other applications where the combination of high speed, high current-carrying capability and low forward voltage drop is important.

WHY ION-IMPLANTATION? The Epion implantation of ions into semiconductor crystal surfaces is a new method of controlling electrical behavior. Because maximum impurity concentration is just below the crystal surface (depths of a few hundred angstroms), forward and reverse recovery characteristics are improved by the inability of the thin implanted junction to store carriers. In the actual manufacture of Epion implanted semiconductors, a lower temperature can be used for doping, or implanting the ions, than is necessary with other methods. Dopants are directionally placed in the crystal lattice with virtually no lateral migration. This provides low surface spreading resistance for high pulse current capability and fast forward recovery. Further high speed characteristics are achieved without requiring gold doping or other forms of crystal degradation. SSDI's ultra-high speed characteristics are achieved without affecting radiation resistance.

The Epion diodes described in this catalog are available for immediate delivery. If you have special requirements, please contact SSDI.

DIODES EPION™

Epion implanted silicon-diodes are hermetically sealed with weldable gold-plated leads.

HSA/18

Vf1 = 250 mV max. (A)
200 to 600 mA

ELECTRICAL CHARACTERISTICS @ 25°C

Tfr	Forward Recovery**	0.5 NSec Max.
Trr	Reverse Recovery*	3 NSec Max.
Vfl	Forward Threshold @ 1 mA	0.225 Volt Max.
P	Power Dissipation***	500 mw Max.
Isurge	Surge Current 1 μSec	50 Amps Max.
J, Tstg	Operating and Storage Temp.	-65°C to +200°C

*Lower Forward Voltages Available, Consult Factory

TYPE NO. PRV, V_f, I_r, I_o	PRV VOLTS	MAX I_r @ .5 PRV μA	I_o @ P = 500 mw mA	I_o @ P = 500 mw mA	I_o @ P = 500 mw mA	I_o @ P = 500 mw mA	I_o @ P = 500 mw mA
5A1 ( )†	50	10	200	300	400	500	600
5A2 ( )†	50	20	200	300	400	500	600
5A5 ( )†	50	50	200	300	400	500	600
7A1 ( )†	75	10	200	300	400	500	600
7A2 ( )†	75	20	200	300	400	500	600
7A5 ( )†	75	50	200	300	400	500	600
10A1 ( )†	100	10	200	300	400	500	600
10A2 ( )†	100	20	200	300	400	500	600
10A5 ( )†	100	50	200	300	400	500	600

HSB/18

Vf1 = 325 mV max. (B)
200 to 600 mA

ELECTRICAL CHARACTERISTICS @ 25°C

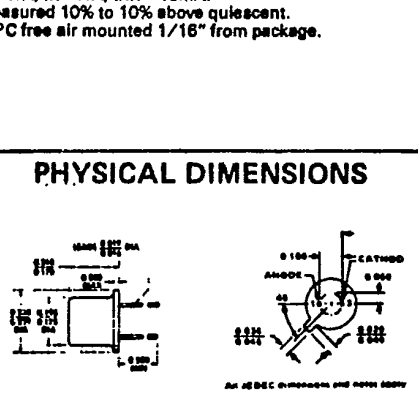
Tfr	Forward Recovery**	0.5 NSec Max.
Trr	Reverse Recovery*	3 NSec Max.
Vfl	Forward Threshold @ 1 mA	0.325 Volt Max.
P	Power Dissipation***	500 mw Max.
Isurge	Surge Current 1 μSec	50 Amps Max.
J, Tstg	Operating and Storage Temp.	-65°C to +200°C

TYPE NO. PRV, V_f, I_r, I_o	PRV VOLTS	MAX I_r @ .5 PRV μA	I_o @ P = 500 mw mA	I_o @ P = 500 mw mA	I_o @ P = 500 mw mA	I_o @ P = 500 mw mA	I_o @ P = 500 mw mA
5B1 ( )†	50	10	200	300	400	500	600
5B2 ( )†	50	20	200	300	400	500	600
5B5 ( )†	50	50	200	300	400	500	600
7B1 ( )†	75	10	200	300	400	500	600
7B2 ( )†	75	20	200	300	400	500	600
7B5 ( )†	75	50	200	300	400	500	600
10B1 ( )†	100	10	200	300	400	500	600
10B2 ( )†	100	20	200	300	400	500	600
10B5 ( )†	100	50	200	300	400	500	600

* IF = .1A, IR = .1A, IRR = 10mA.
** Measured 10% to 10% above quiescent.
*** 25°C free air mounted 1/16" from package.

TO-18

PHYSICAL DIMENSIONS



Ordering Information: first digit indicates PRV, letter indicates forward voltage drop at 1 mA, second digit indicates leakage at half the PRV, and the last digit indicates the forward voltage for a power dissipation of 500 mw at the rated current. Example: 5A15/18 - this is a 50 volt device, with a V_F at 1 mA of 225 mV, I_R (leakage) is 10 uA at .5 PRV (which is 25 V), plus a forward voltage of 1 V maximum at 500 mA current handling capacity. The /18 indicates the TO 18 package.

See reverse side for HSA/18.C

DIODES EPION™

Epion implanted silicon-diodes are hermetically sealed with weldable gold-plated leads.

HSC/18
Vf1 = 450 mV max. (C)
400 to 700 mA

ELECTRICAL CHARACTERISTICS @ 25°C

Trr	Forward Recovery**	1 NSec Max.
Trr	Reverse Recovery*	9 NSec Max.
Vfl	Forward Threshold @ 1 mA	0.450 Volt Max.
P	Power Dissipation***	500 mw Max.
Isurge	Surge Current 1 μSec	50 Amps Max.
J, Tstg	Operating and Storage Temp.	-65°C to +200°C

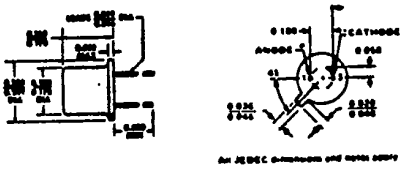
TYPE NO. PRV, V_{f_1}, I_r, I_R	PRV VOLTS	MAX I_r @ .5 PRV μA	I_o @ P 500 mw mA	I_o @ P 500 mw mA	I @ P 500 mw mA	I_o @ P 500 mw ****mA
5C1 ( )1	50	10	400	500	600	700
5C2 ( )1	50	20	400	500	600	700
5C05 ( )1	50	5	400	500	600	700
7C1 ( )1	75	10	400	500	600	700
7C2 ( )1	75	20	400	500	600	700
7C05 ( )1	75	5	400	500	600	700
10C1 ( )1	100	10	400	500	600	700
10C2 ( )1	100	20	400	500	600	700
10C05 ( )1	100	5	400	500	600	700

* IF = .1A, IR = .1A, IRR = 10mA.
** Measured 10% to 10% above quiescent.
*** 25°C free air mounted 1/16" from package.

Ordering Information: first digit indicates PRV, letter indicates forward voltage drop at 1 mA, second digit indicates leakage at half the PRV, and the last digit indicates the forward voltage for a power dissipation of 500 mw at the rated current. Example: 5A15/18 - this is a 50 volt device, with a V_F at 1 mA of 225 mV, I_R (leakage) is 10 uA at .5 PRV (which is 25 V), plus a forward voltage of 1 V maximum at 500 mA current handling capacity. The /18 indicates the TO 18 package.

TO-18

PHYSICAL DIMENSIONS



NOTE: Specifications are subject to change without notice.

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