Microsemi
SCOTTSDALE DIVISION

USD520, USD520HR2, USD535, USD535HR2, USD545, USD545HR2, USD550, USD550HR2

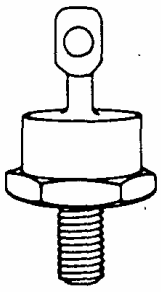
POWER SCHOTTKY RECTIFIERS™

DESCRIPTION

This series of 75 Amp rated average forward current series of Schottky barrier power rectifiers in 20 through 50 volt selections is ideally suited for output rectifiers and catch diodes in low voltage power supplies. The Microsemi high conductivity design, using a heavy copper top post and 4-point crimp, ensures cool thermal operation and low dynamic impedance with applicable heat sinking for peak repetitive forward currents up to 150 Amps at 50% duty cycle. This rugged DO-5 hermetically sealed design absorbs stress that can otherwise damage glass-to-metal seals during installation and operation. It is also available in a flexible top lead as described herein.

APPEARANCE

DO-5



IMPORTANT: For the most current data, consult *MICROSEMI's* website: **http://www.microsemi.com**

FEATURES

- Very Low Forward Voltage (0.6V at 60A, 125°C)
- Low Recovered Charge
- Rugged Package Design (DO-5)
- Low Reverse Current (<50mA at rated V_R at 125°C)
- Hermetically sealed
- High Reliability Screening Option with HR2 Suffix (ie. USD520HR2)
- Available with Flexible Top Lead with F suffix to part number

APPLICATIONS / BENEFITS

- Output Schottky Rectifiers for Low Voltage Power Supplies
- Catch Diodes for Low Voltage Power Supplies
- High Efficiency for Low Voltage Supplies
- Robust Construction with Heavy Copper Top Post and Four-Point Crimp
- High Peak Operating Temperature
- Low Thermal Resistance (0.8°C/W)
- High Surge Current (1000A)

ABSOLUTE MAXIMUM RATINGS

- DC Blocking Voltage V_R: Same as V_{RWM} (see below)
- Peak Repetitive Forward Current I_{FRM}: 150 A

@ T_C = 115 °C (Rated V_R, Sq Wave, 20 kHz, 50 % Duty Cycle)

- Average Forward Current, $I_{F(AV)}$: 75 A @ T_C = 115 °C
- Non-Repetitive Peak Surge Current (8.3 ms), I_{FSM}: 1000 A
- Peak Reverse Transient Current, I_{RM}: 2 A
- Storage Temperature Range, T_{STG}: -55°C to +200°C
- Operating Junction Temperature $T_{J(PK)}$: 175 °C
- Thermal Resistance, Junction to Case, $R_{?JC}$: 0.8°C/W

MECHANICAL AND PACKAGING

- Industry Standard DO-5 (DO-203AB) Package with 11/16 inch Hex and 1/4-28 Threaded Stud
- Hermetically Sealed Metal and Glass Case Body
- Metal Surface Finish: Tin Plated
- Weight: 16 grams (approximate)
- Maximum Unlubricated Stud Torque: 30 inch pounds
- Angular Orientation of Terminal Undefined
- Marking: Part Number and Logo
- Flexible Top Lead Option: Add an "F" Suffix to Part Number (see mechanical specifications on page 3)

ELECTRICAL CHARACTERISTICS (T_{CASE} = 25°C)

Microsemi Part Number		Working Peak Reverse Voltage V_{RWM}	Non Repetitive Peak Reverse Voltage V_{RSM} @ I_{RM}	Maximum Forward Voltage V_F			Maximum Reverse Current (pulsed)* I_R @ V_{RWM}		Maximum Capacitance @V_R = 5.0 V
				@10 A, 25°C	@60 A, 25°C	@60 A, 125 °C	@T_C = 25°C	@T_C = 125°C	
USD520	USD520HR2	20 V	24 V	0.50 V	0.68 V	0.60 V or 0.63 V with flexible lead option	20 mA	50 mA	4000 pF
USD535	USD535HR2	35 V	42 V					50 mA	
USD545	USD545HR2	45 V	54 V					50 mA	
USD550	USD550HR2	50 V	60 V					75 mA	

* Duty Cycle = 1%

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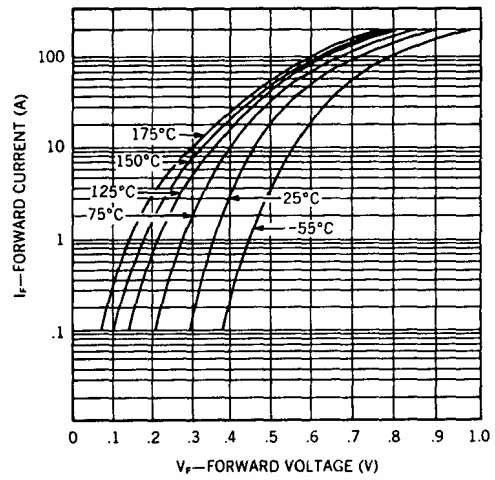
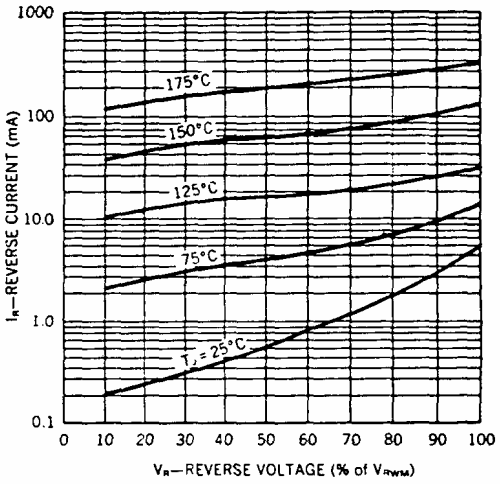
OUTLINE AND CIRCUIT

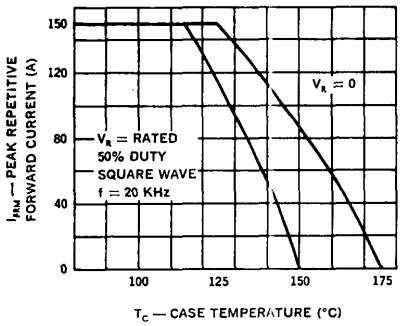
Typical Forward Current vs Forward Voltage



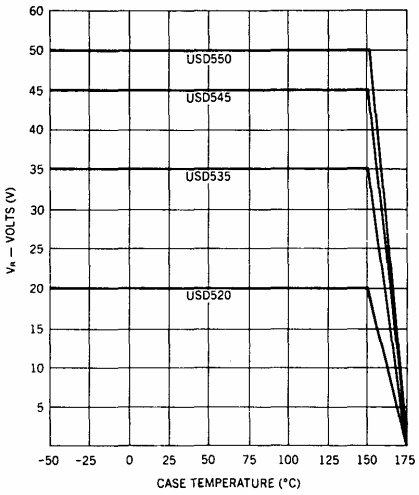
Typical Reverse Current vs Reverse Voltage



Maximum Current vs Case Temperature



$V_{R(MAX)}$ Rating vs Case Temperature



OPTIONAL HIGH RELIABILITY (HR2) SCREENING

SCREEN	MIL-STD-750 METHOD	CONDITIONS
1. High Temperature	1032	24 Hours @ TA = 150°C
2. Temperature Cycle	1051	F, 20 Cycles, -55 to +150°C. No dwell required @ 25°C, T≥10 min. @ extremes
3. Hermetic Seal a. Fine Leak b. Gross Leak	1071	 H, Helium C, Liquid
4. Thermal Impedance	3101	
5. Interim Electrical Parameters	GO/NO GO	As Applicable
6. High Temperature Reverse Blocking	As Applicable	T=48 hrs, Tc=125°C with applicable bias conditions
7. Final Electrical Parameters	GO/NO GO	As Applicable

The following tests are performed on 100% of the devices.

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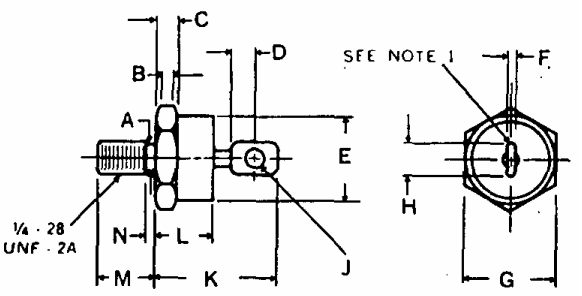
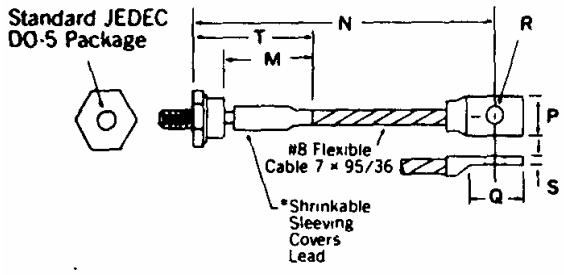
MECHANICAL SPECIFICATIONS



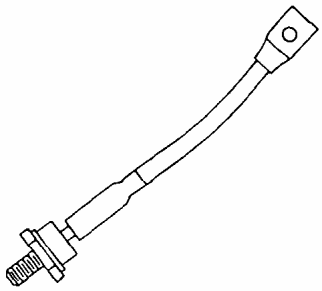
	INCHES	MILLIMETERS
A	.225 +/- .005	5.72 +/- 0.13
B	.060 MIN.	1.52 MIN.
C	.156 +/- .020	3.96 +/- 0.51
D	.156 MIN. FLAT	3.96 MIN. FLAT
E	.667 DIA. MAX	16.94 DIA. MAX.
F	.090 MAX	2.29 MAX.
G	.677 +/- .010	17.20 +/- 0.25
H	.375 MAX.	9.53 MAX.
J	.140 MIN. DIA.	3.56 MIN. DIA.
K	1.000 MAX.	25.40 MAX.
L	.450 MAX.	11.43 MAX.
M	.438 +/- .015	11.13 +/- 0.38
N	.078 MAX.	1.98 MAX.

Notes:
1. Cathode is stud
2. Maximum unlubricated stud torque: 30 inch pounds.
3. Angular Orientation of terminal is undefined.
4. Maximum tension (90°) anode terminal 15 pounds for 30 seconds

FLEXIBLE TOP LEAD (OPTIONAL) Add an "F" suffix to Part Number.



	INCHES	MILLIMETERS
M	.718 MAX	18.24 MAX
N	4.50 +/- .250	114.3 +/- 6.35
P	.525 MAX.	13.23 MAX.
Q	.675 +/- .035	17.15 +/- 0.89
R	.205 +/- .005	5.21 +/- 0.13
S	.075 +/- .010	1.91 +/- 0.25
T	1.125 MAX.	28.58 MAX.



DO-5 with Flexible Lead

*To 125°C (Ambient)
Note: Consult Factory for Non-standard Lead Lengths.

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