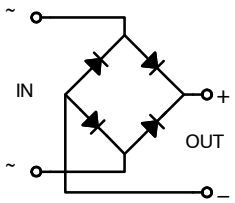
Bridge Rectifiers

DF005S - DF10S

PDIP−4 GW
CASE 709AE



SDIP

Description

With the ever−pressing need to improve power supply efficiency, improve surge rating, improve reliability, and reduce size, the DFxS family sets a standard in performance.

The design offers an surge rating of 50 A. This is important when improving reliability and increasing efficiency. High efficiency designs strive to reduce circuit resistance, which, unfortunately can result in increased inrush surge. As such high surge current ratings can be required to maintain or improve reliability.

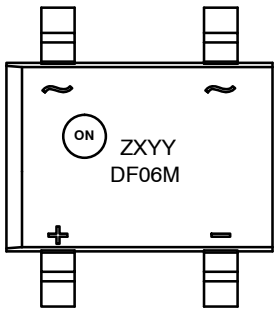
The design also offers better efficiency by achieving a 1.5 A V_F of 1.1 V maximum at 25°C. This lower V_F also supports cooler and more efficient operation.

Finally, the DFxS achieves all this in a SDIP surface mount form factor, reducing board space and volumetric requirements vs. competitive devices.

Features

- Maximum Surge Rating: I_{FSM} = 50 A, I^2t = 10 A^2Sec
- Optimized V_F: Typical 0.94 V at 1.5 A, 25°C
- Glass Passivated Junctions
- Lead Free Compliant to EU RoHS 2002/95/EU Directives
- Green Molding Compound: IEC61249
- Qualified with IR Reflow and Wave Soldering
- UL Certified, UL #E258596

MARKING DIAGRAM



Z = Subcon Assembly Plant Code
X = Last Digit of Calendar Year
YY = Weekly Payweek Date code
DFXXXM = Specific Device Number
xxx = 01, 02, 04, 06, 08, 10, or 005

ORDERING INFORMATION

See detailed ordering and shipping information on page 4 of this data sheet.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 4.

ABSOLUTE MAXIMUM RATINGS Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Value							Unit
		DF005S	DF01S	DF02S	DF04S	DF06S	DF08S	DF10S	
V_{RRM}	Maximum Repetitive Reverse Voltage	50	100	200	400	600	800	1000	V
V_{RMS}	Maximum RMS Bridge Input Voltage	35	70	140	280	420	560	700	V
V_{DC}	DC Reverse Voltage at Rated I_R	50	100	200	400	600	800	1000	V
$I_{F(AV)}$	Average Rectified Forward Current at T_A = 40°C	1.5							A
I_{FSM}	Non−Repetitive Peak Forward Surge Current 8.3 ms Single Half−Sine Wave	50							A
T_{STG}	Storage Temperature Range	−55 to +150							°C
T_J	Operating Junction Temperature	−55 to +150							°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter		Value	Unit
P_D	Power Dissipation		3.1	W
$R_{\theta JA}$	Thermal Resistance, Junction−to−Ambient	Single−Die Measurement (Note 1) (Maximum Land Pattern: 13 x 13 mm)	62	°C/W
		Multi−Die Measurement (Note 2) (Maximum Land Pattern: 13 x 13 mm)	50	
		Multi−Die Measurement (Note 2) (Minimum Land Pattern: 1.3 x 1.5 mm)	105	
ψ_{JL}	Thermal Characterization Parameter, Junction to Lead	Single−Die Measurement (Note 2) (Maximum and Minimum Land Pattern)	27	°C/W

1. Device mounted on PCB with 0.5 inch x 0.5 inch (13 mm x 13 mm). Minimum Pads of 2 oz Copper.
2. The thermal resistances ($R_{\theta JA}$ & ψ_{JL}) are characterized with the device mounted on the following FR4 printed circuit boards, as shown in Figure 1 and Figure 2. PCB size: 76.2 x 114.3 mm. Heating effect from adjacent dice is considered and only tow dices are powered at the same time.

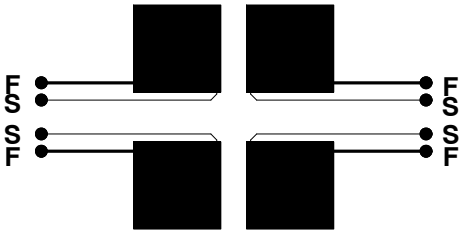


Figure 1. Maximum pads of 2 oz copper

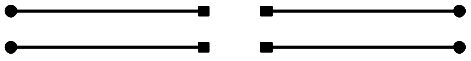


Figure 2. Minimun pads of 2 oz copper

ELECTRICAL CHARACTERISTICS
Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_F	Forward Voltage, per Element	I_F = 1.5 A	–	–	1.1	V
I_R	Reverse Current, per Element at Rated V_R	T_A = 25°C	–	–	5.0	μA
		T_A = 125°C	–	–	500	
I^2t	Rating for Fusing (t < 8.35 ms)	–	–	–	10	A^2s
C_J	Typical Capacitance, per Leg	V_R = 4.0 V, f = 1.0 MHz	–	25	–	pF

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

TYPICAL CHARACTERISTICS

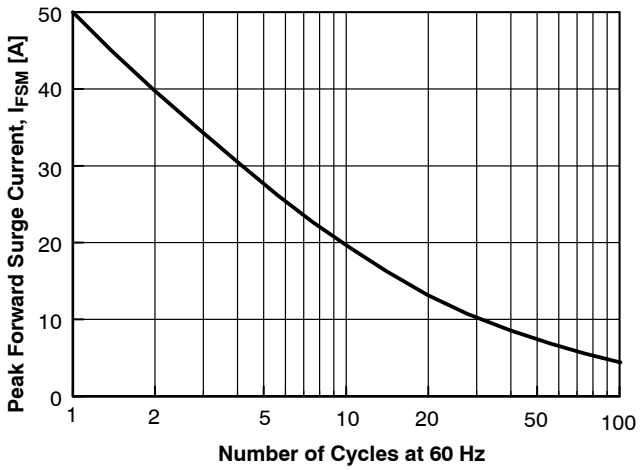


Figure 3. Non−Repetitive Surge Current

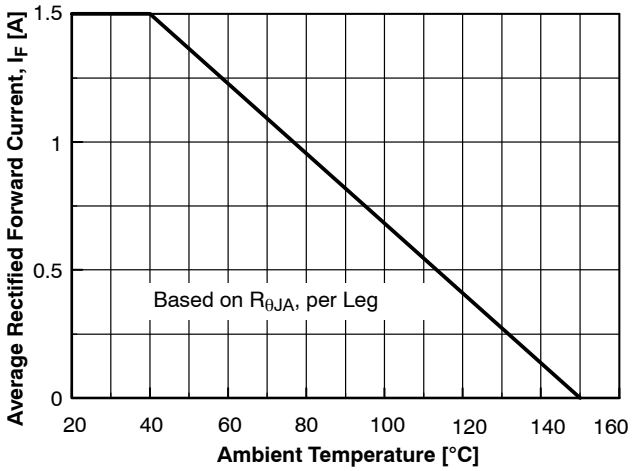


Figure 4. Forward Current Derating Curve

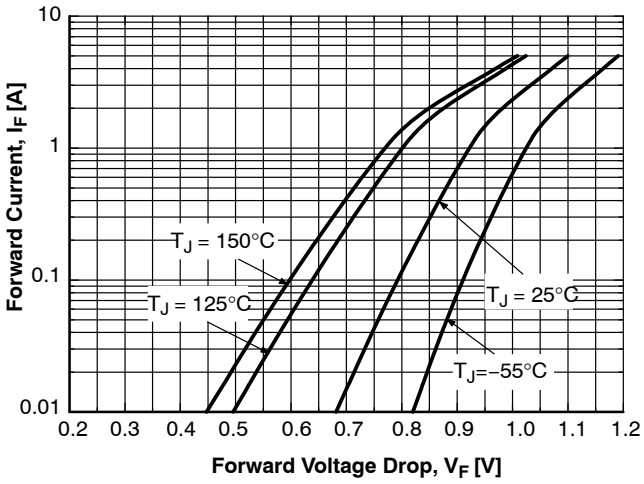


Figure 5. Forward Voltage Characteristics

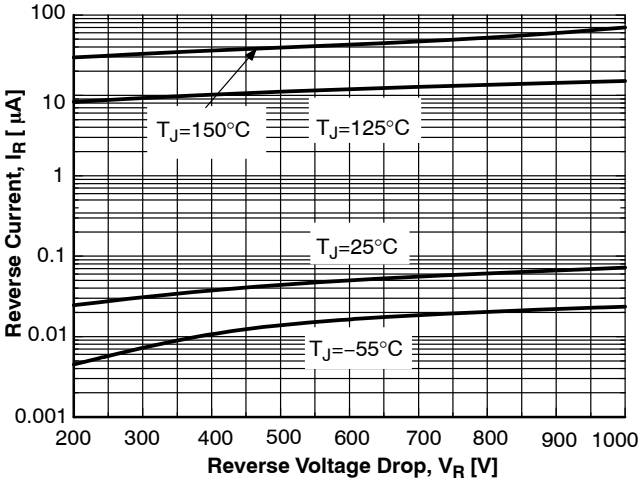


Figure 6. Reverse Current vs. Reverse Voltage

ORDERING INFORMATION

Product Number	Device Code Marking	Package	Shipping†
DF01S	DF01S	PDIP−4, GW (Pb−Free, Halide Free)	1500 / Tape and Reel
DF02S	DF02S	PDIP−4, GW (Pb−Free, Halide Free)	1500 / Tape and Reel
DF04S	DF04S	PDIP−4 GW (Pb−Free, Halide Free)	1500 / Tape and Reel
DF06S	DF06S	PDIP−4, GW (Pb−Free, Halide Free)	1500 / Tape and Reel
DF08S	DF08S	PDIP−4, GW (Pb−Free, Halide Free)	1500 / Tape and Reel
DF10S	DF10S	PDIP−4, GW (Pb−Free, Halide Free)	1500 / Tape and Reel

DISCONTINUED (Note 3)

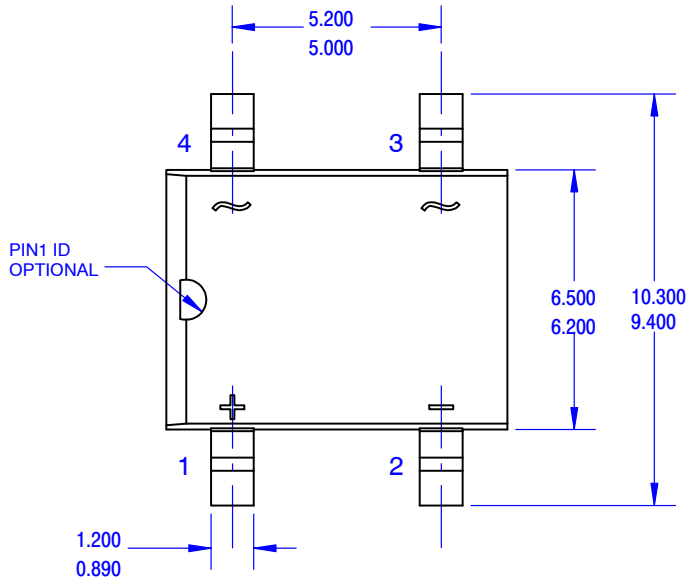
DF005S	DF005S	PDIP−4, GW (Pb−Free, Halide Free)	1500 / Tape and Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

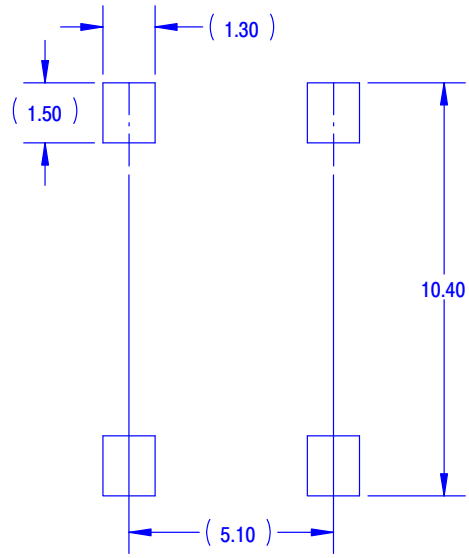
3. **DISCONTINUED:** This device is not recommended for new design. Please contact your **onsemi** representative for information. The most current information on this device may be available on www.onsemi.com.

PDIP4 GW
CASE 709AE
ISSUE O

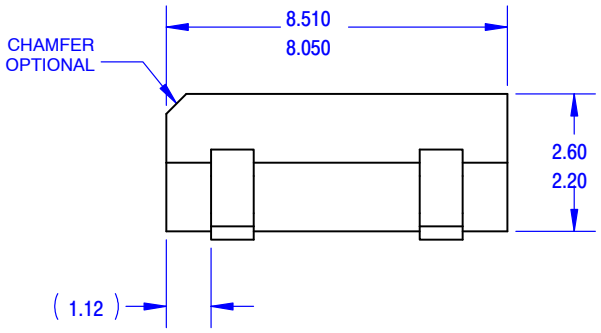
DATE 31 JUL 2016



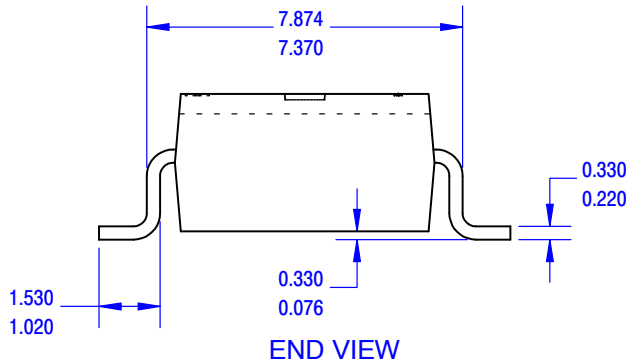
TOP VIEW



LAND PATTERN RECOMMENDATION



SIDE VIEW



END VIEW

NOTES:

A. THIS PACKAGE DOES NOT CONFORM TO ANY REFERENCE STANDARD.
B. ALL DIMENSIONS ARE IN MILLIMETERS.
C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.

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