

# DF3A6.8FUT1

Preferred Device

## Zener Transient Voltage Suppressor

### Dual Common Anode Zeners for ESD Protection

These dual monolithic silicon zener diodes are designed for applications requiring transient overvoltage protection capability. They are intended for use in voltage and ESD sensitive equipment such as computers, printers, business machines, communication systems, medical equipment and other applications. Their dual junction common anode design protects two separate lines using only one package. These devices are ideal for situations where board space is at a premium.

#### Features

- Pb-Free Package is Available
- SC-70 Package Allows Two Separate Unidirectional Configurations
- Low Leakage < 1.0  $\mu$ A @ 5.0 V
- Breakdown Voltage: 6.4–7.2 V @ 5.0 mA
- ESD Protection Meeting: 16 kV Human Body Model  
30 kV Contact = IEC61000–4–2
- Peak Power: 24 W @ 1.0 ms (Unidirectional), per Figure 1
- Peak Power: 150 W @ 20  $\mu$ s (Unidirectional), per Figure 2

#### Mechanical Characteristics

- Void Free, Transfer–Molded, Thermosetting Plastic Case
- Corrosion Resistant Finish, Easily Solderable
- Package Designed for Optimal Automated Board Assembly
- Small Package Size for High Density Applications

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Steady State Power Dissipation Derate above 25°C (Note 1)	$P_D$	200 1.6	mW mW/°C
Thermal Resistance Junction–to–Ambient	$R_{\theta JA}$	618	°C/W
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	– 55 to +150	°C
Peak Power Dissipation @ 1.0 ms (Note 2) @ $T_A = 25^\circ\text{C}$	$P_{PK}$	20	W
Peak Power Dissipation @ 20 $\mu$ s (Note 3) @ $T_A = 25^\circ\text{C}$	$P_{PK}$	150	W
ESD Discharge MIL STD 883C – Method 3015–6 IEC61000–4–2, Air Discharge IEC61000–4–2, Contact Discharge	$V_{PP}$	16 30 30	kV

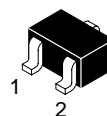
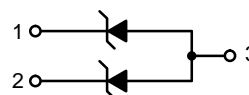
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. Mounted on FR–5 Board = 1.0 X 0.75 X 0.062 in.
2. Non–repetitive pulse per Figure 1.
3. Non–repetitive pulse per Figure 2.



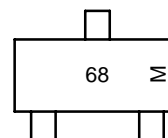
ON Semiconductor®

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SC-70/SOT-323  
CASE 419  
STYLE 4

#### MARKING DIAGRAM



68 = Specific Device Code  
M = Date Code

#### ORDERING INFORMATION

Device	Package	Shipping†
DF3A6.8FUT1	SC-70	3000/Tape & Reel
DF3A6.8FUT1G	SC-70 (Pb-Free)	3000/Tape & 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.

Preferred devices are recommended choices for future use and best overall value.

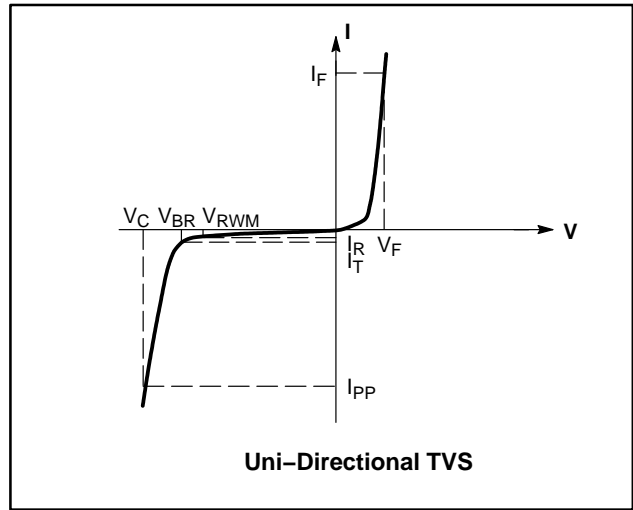
# DF3A6.8FUT1

## ELECTRICAL CHARACTERISTICS

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**UNIDIRECTIONAL** (Circuit tied to Pins 1 and 3 or 2 and 3)

Symbol	Parameter
$V_{RWM}$	Working Peak Reverse Voltage
$I_R$	Maximum Reverse Leakage Current @ $V_{RWM}$
$V_{BR}$	Breakdown Voltage @ $I_T$
$I_T$	Test Current
$I_F$	Forward Current
$V_F$	Forward Voltage @ $I_F$
$Z_{ZT}$	Maximum Zener Impedance @ $I_{ZT}$
$Z_{ZK}$	Maximum Zener Impedance @ $I_{ZK}$



**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**UNIDIRECTIONAL** (Circuit tied to Pins 1 and 3 or 2 and 3)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Forward Voltage	$V_F$	$I_F = 10 \text{ mA}$		0.8	0.9	V
Zener Voltage (Note 4)	$V_Z$	$I_{ZT} = 5 \text{ mA}$	6.4	6.8	7.2	V
Operating Resistance (Note 5)	$Z_{ZK}$	$I_{ZK} = 0.5 \text{ mA}$			200	$\Omega$
	$Z_{ZT}$	$I_{ZT} = 5 \text{ mA}$			50	$\Omega$
Reverse Current	$I_{R1}$	$V_{RWM} = 5 \text{ V}$			0.5	$\mu\text{A}$
Clamping Voltage	$V_C$	$I_{PP} = 2.0 \text{ A}$ (Figure 1)			9.6	V
		$I_{PP} = 9.37 \text{ A}$ (Figure 2)			16	V
ESD Protection	Human Body Model (HBM) Contact – IEC61000-4-2 Air Discharge				16	kV
					30	
					30	

4.  $V_Z$  measured at pulse test current  $I_{ZT}$  at an ambient temperature of  $25^\circ\text{C}$ .

5.  $Z_{ZT}$  and  $Z_{ZK}$  is measured by dividing the AC voltage drop across the device by the AC current supplied. AC frequency = 1.0 kHz.

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## TYPICAL CHARACTERISTICS

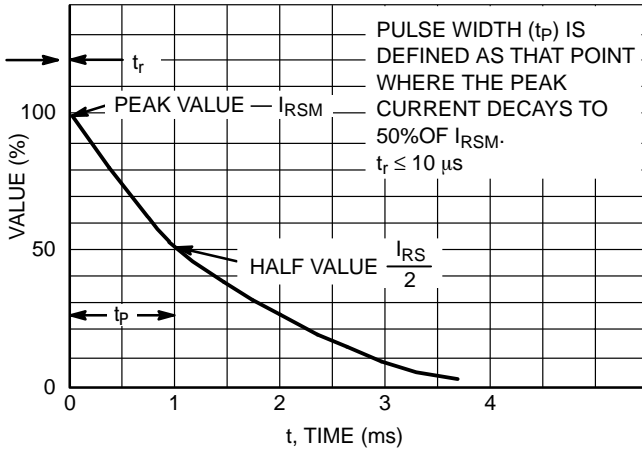


Figure 1. 10 × 1000 μs Pulse Waveform

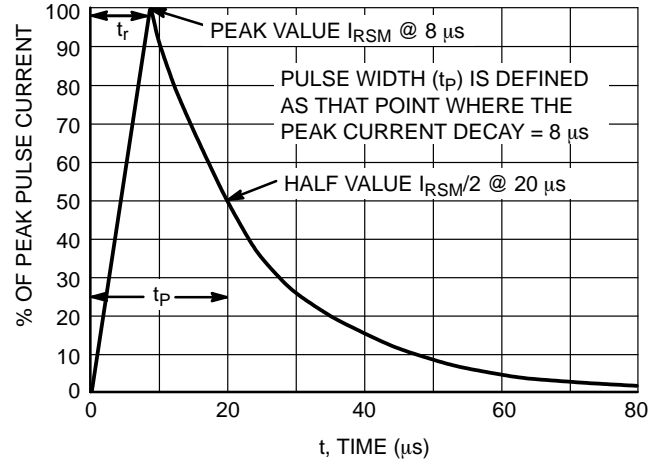


Figure 2. 8 × 20 μs Pulse Waveform

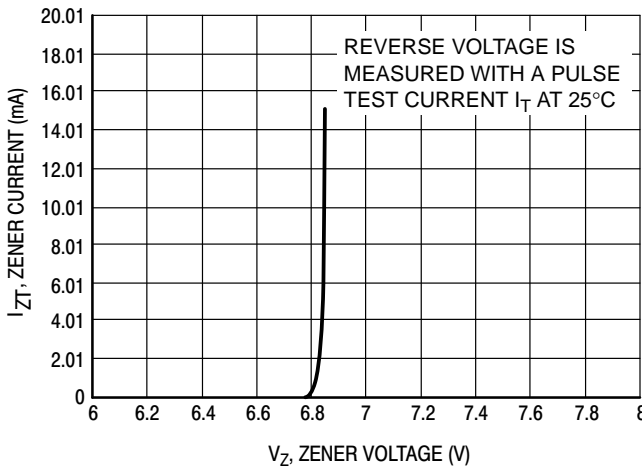


Figure 3. Zener Voltage vs. Zener Current

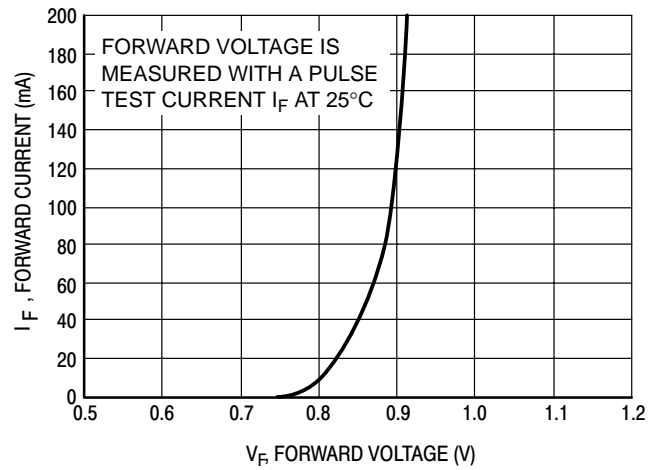


Figure 4. Forward Voltage vs. Forward Current

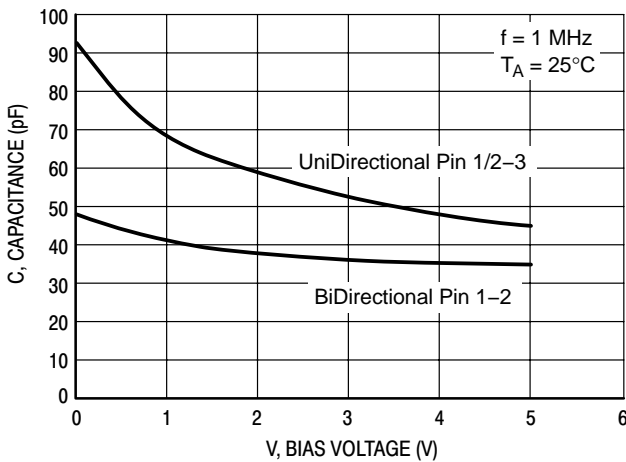


Figure 5. Capacitance vs. Bias Voltage

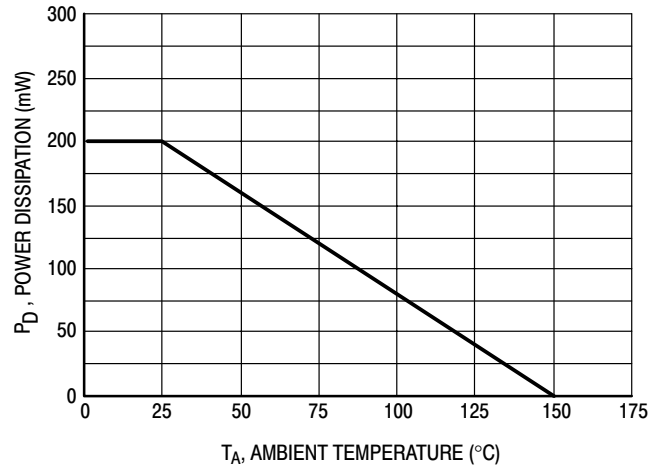
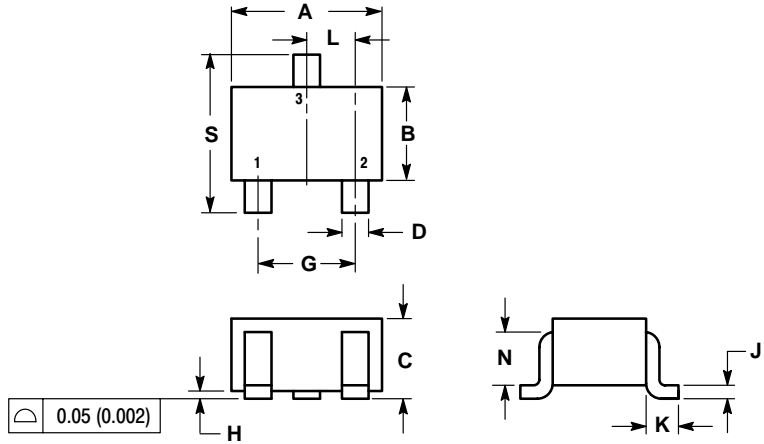


Figure 6. Steady State Power Derating Curve

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## PACKAGE DIMENSIONS

SC-70 (SOT-323)  
CASE 419-04  
ISSUE L



NOTES:

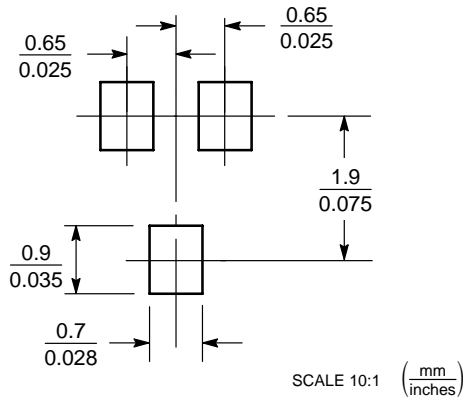
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.071	0.087	1.80	2.20
B	0.045	0.053	1.15	1.35
C	0.032	0.040	0.80	1.00
D	0.012	0.016	0.30	0.40
G	0.047	0.055	1.20	1.40
H	0.000	0.004	0.00	0.10
J	0.004	0.010	0.10	0.25
K	0.017 REF		0.425 REF	
L	0.026 BSC		0.650 BSC	
N	0.028 REF		0.700 REF	
S	0.079	0.095	2.00	2.40

STYLE 4:

- PIN 1. CATHODE
- CATHODE
- ANODE

### SOLDERING FOOTPRINT\*



\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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