

NZF220DFT1

EMI Filter with ESD Protection

Features:

- 2 EMI/RFI Bi-directional “Pi” Low-Pass Filters
- ESD Protection Meets IEC61000-4-2
- Diode Capacitance: 7 – 10 pF
- Zener/Resistor Line Capacitance: $22 \pm 20\%$ pF
- Low Zener Diode Leakage: 1 μ A Maximum
- Zener Breakdown Voltage: 6 – 8 Volts

Benefits:

- Designed to suppress EMI/RFI Noise in Systems Subjected to Electromagnetic Interference
- Nominal Cutoff Frequency of 220 MHz (per Figure 2)
- Small Package Size Minimizes Parasitic Inductance, Thus a More “Ideal” Low Pass Filtering Response

Typical Applications:

- Cellular Phones
- Communication Systems
- Computers
- Portable Products with Input/Output Conductors

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Power Dissipation (Note 1) 8 × 20 μ s Pulse	P_{PK}	14	Watts
Maximum Junction Temperature	T_J	150	$^{\circ}$ C

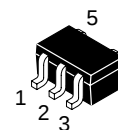
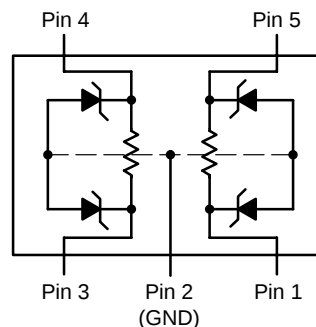
1. Between I/O Pins



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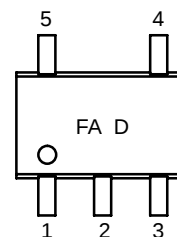
<http://onsemi.com>

CIRCUIT DESCRIPTION



**SC-88A
CASE 419A
DF SUFFIX**

MARKING DIAGRAM



FA = Specific Device Code
D = Date Code

ORDERING INFORMATION

Device	Package	Shipping
NZF220DFT1	SC-88A	3000/Tape & Reel

ELECTRICAL CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Unit
V_Z	Zener Breakdown Voltage, @ $I_{ZT} = 1 \text{ mA}$	6.0	–	8.0	V
I_r	Zener Leakage Current, @ $V_R = 3 \text{ V}$	N/A	–	1.0	μA
V_F	Zener Forward Voltage, @ $I_F = 50 \text{ mA}$	N/A	–	1.5	V
Capacitance	Zener Internal Capacitance, @ 0 V Bias	7.0	–	10	pF
Capacitance	Zener/Resistor Array Line Capacitance	17.6	–	26.4	pF
Resistor	Resistance	90	–	110	Ω
F_C (Note 2)	Cutoff Frequency	–	220	–	MHz

2. 50 Ω Source and 50 Ω Lead Termination per Figure 2

Applications Information

Suppressing Noise at the Source

- Filter all I/O signals leaving the noisy environment
- Locate I/O driver circuits close to the connector
- Use the longest rise/fall times possible for all digital signals

Reducing Noise at the Receiver

- Filter all I/O signals entering the unit
- Locate the I/O filters as close as possible to the connector

Minimizing Noise Coupling

- Use multilayer PCBs to minimize power and ground inductance
- Keep clock circuits away from the I/O connector
- Ground planes should be used whenever possible
- Minimize the loop area for all high speed signals
- Provide for adequate power decoupling

ESD Protection

- Locate the suppression devices as close to the I/O connector as possible
- Minimize the PCB trace length to the suppression device
- Minimize the PCB trace length for the ground return for the suppression device

Frequency Response Specification

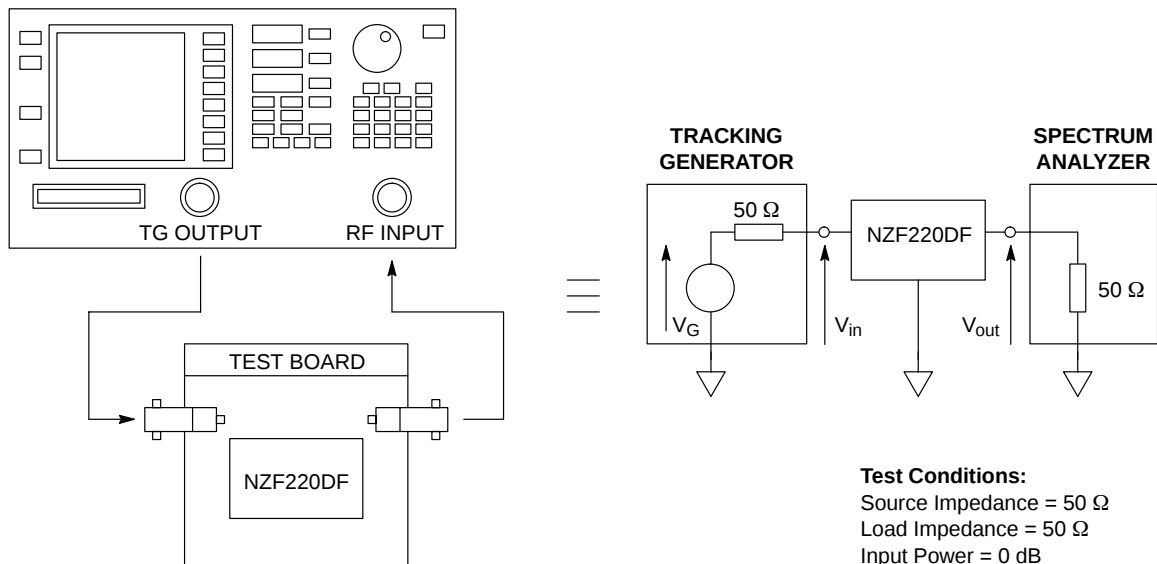
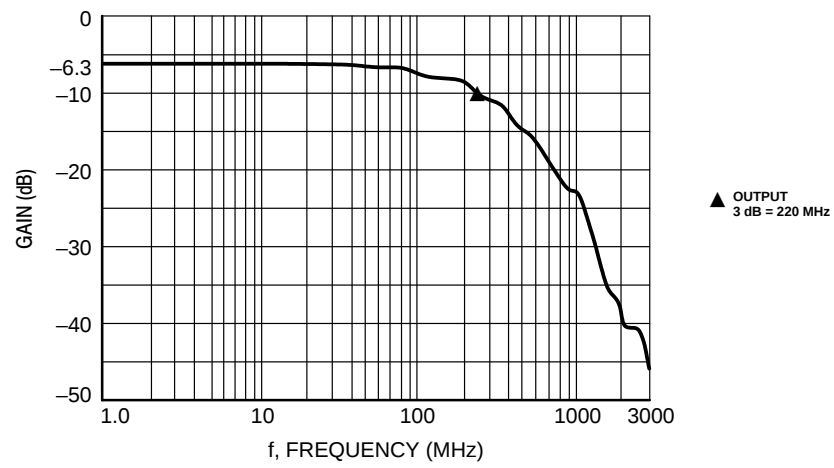


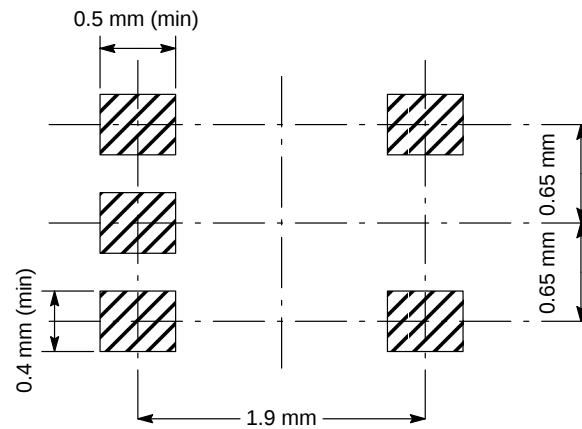
Figure 1. Measurement Conditions

NZF220DFT1



**Figure 2. Typical EMI Filter Response
(50 Ω Source and 50 Ω Load Termination)**

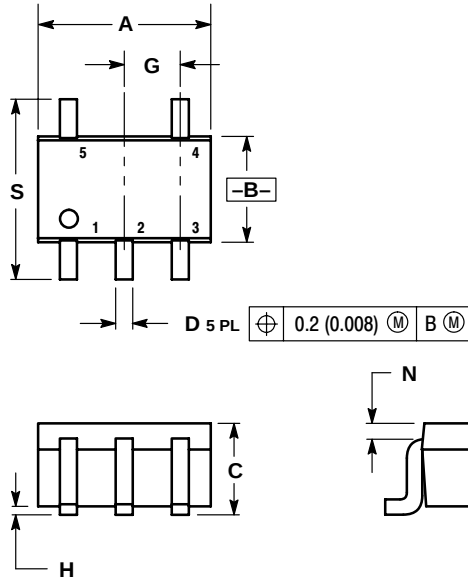
Footprint



OUTLINE DIMENSIONS

EMI Filter with ESD Protection

SC-88A/SOT-323
CASE 419A-02
ISSUE F



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 419A-01 OBSOLETE. NEW STANDARD 419A-02.

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	0.031	0.043	0.80	1.10
D	0.004	0.012	0.10	0.30
G	0.026 BSC		0.65 BSC	
H	---	0.004	---	0.10
J	0.004	0.010	0.10	0.25
K	0.004	0.012	0.10	0.30
N	0.008 REF		0.20 REF	
S	0.079	0.087	2.00	2.20

STYLE 1: PIN 1. BASE 2. EMITTER 3. BASE 4. COLLECTOR 5. COLLECTOR	STYLE 2: PIN 1. ANODE 2. EMITTER 3. BASE 4. COLLECTOR 5. CATHODE	STYLE 3: PIN 1. ANODE 1 2. N/C 3. ANODE 2 4. CATHODE 2 5. CATHODE 1	STYLE 4: PIN 1. SOURCE 1 2. DRAIN 1/2 3. SOURCE 1 4. GATE 1 5. GATE 2	STYLE 5: PIN 1. CATHODE 2. COMMON ANODE 3. CATHODE 2 4. CATHODE 3 5. CATHODE 4	STYLE 6: PIN 1. EMITTER 2. BASE 3. EMITTER 4. COLLECTOR 5. COLLECTOR	STYLE 7: PIN 1. BASE 2. EMITTER 3. BASE 4. COLLECTOR 5. COLLECTOR
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