

# NZF220TT1

## EMI Filter with ESD Protection

### Features:

- 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  $\mu$ A Maximum
- Zener Breakdown Voltage; 6 – 8 Volts

### Benefits:

- Designed to suppress EMI/RFI Noise in Systems Subjected to Electromagnetic Interference
- 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) $8 \times 20 \mu$ s Pulse	$P_{PK}$	14	Watts
Maximum Junction Temperature	$T_J$	150	$^{\circ}$ C

1. All diodes under power



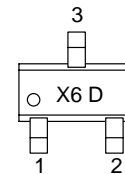
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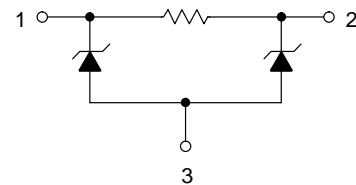
SC-75  
CASE 463  
STYLE 4

### MARKING DIAGRAM



X6 = Specific Device Code  
D = Date Code

### CIRCUIT DESCRIPTION



### ORDERING INFORMATION

Device	Package	Shipping
NZF220TT1	SC-75	3000/Tape & Reel

# NZF220TT1

## ELECTRICAL CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Unit
$V_Z$	Zener Breakdown Voltage, @ $I_{ZT} = 1 \text{ mA}$	6.0	–	8.0	V
$I_F$	Zener Leakage Current, @ $V_R = 3 \text{ V}$	N/A	–	1.0	$\mu\text{A}$
$V_F$	Zener Forward Voltage, @ $I_F = 50 \text{ mA}$	N/A	–	1.25	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	$\Omega$
$F_C$ (Note 2)	Cutoff Frequency	–	220	–	MHz

2. 50  $\Omega$  Source and 50  $\Omega$  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

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## Frequency Response Specification

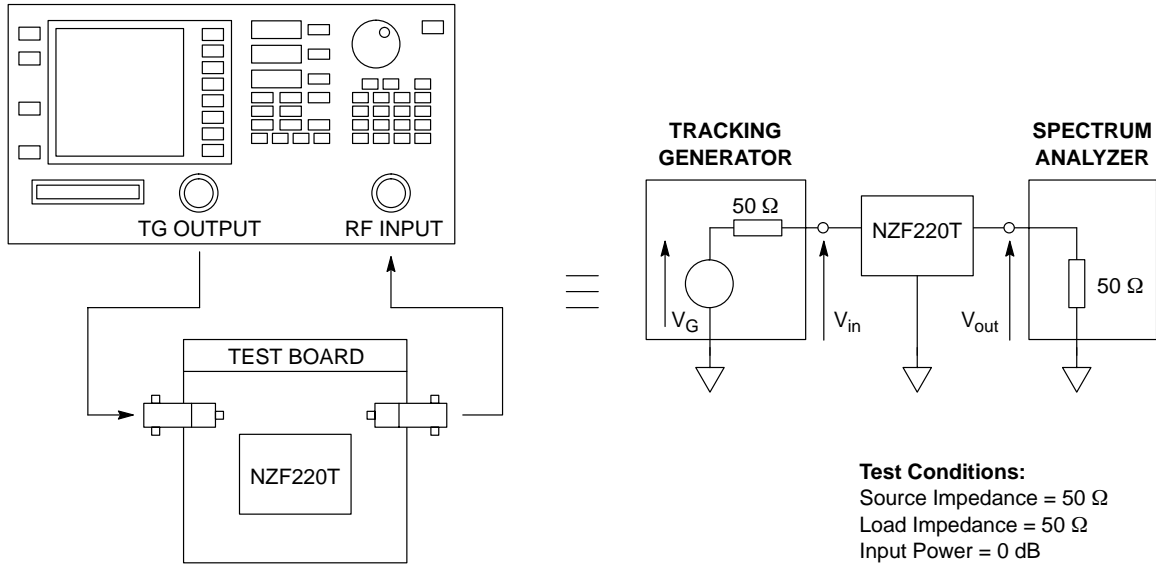


Figure 1. Measurement Conditions

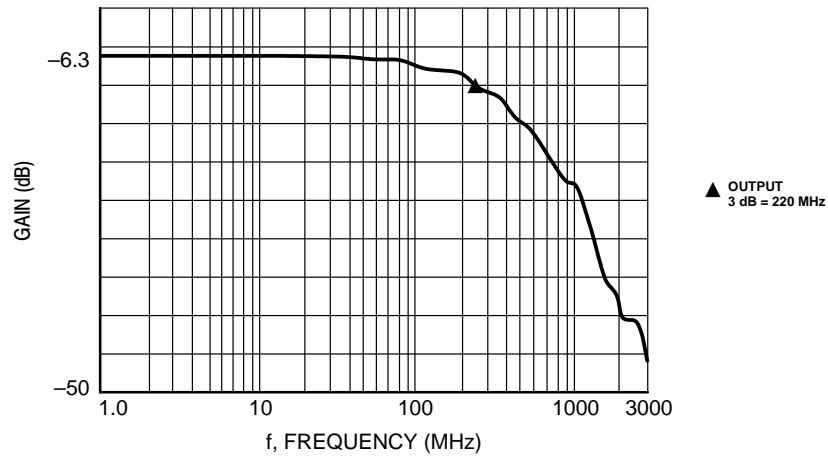


Figure 2. Typical EMI Filter Response  
(50  $\Omega$  Source and 50  $\Omega$  Load Termination)

# NZF220TT1

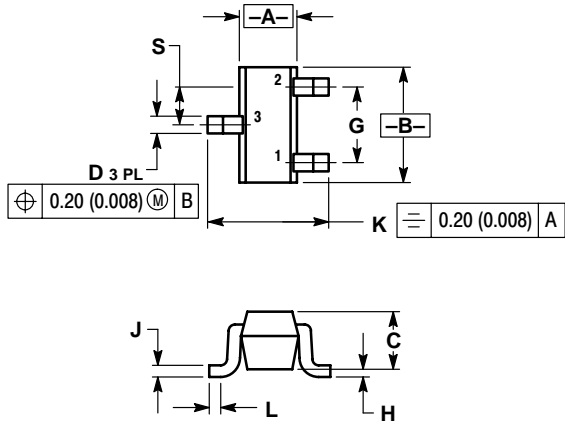
## OUTLINE DIMENSIONS

# EMI Filter with ESD Protection

SC-75/SOT-416

CASE 463-01

ISSUE B




NOTES:

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

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.70	0.80	0.028	0.031
B	1.40	1.80	0.055	0.071
C	0.60	0.90	0.024	0.035
D	0.15	0.30	0.006	0.012
G	1.00 BSC		0.039 BSC	
H	---	0.10	---	0.004
J	0.10	0.25	0.004	0.010
K	1.45	1.75	0.057	0.069
L	0.10	0.20	0.004	0.008
S	0.50 BSC		0.020 BSC	

STYLE 4:

1. CATHODE
2. CATHODE
3. ANODE

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