

# MPF102

Preferred Devices

## JFET VHF Amplifier

### N-Channel – Depletion

#### Features

- Pb-Free Package is Available\*

#### MAXIMUM RATINGS

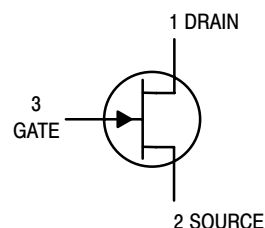
Rating	Symbol	Value	Unit
Drain–Source Voltage	$V_{DS}$	25	Vdc
Drain–Gate Voltage	$V_{DG}$	25	Vdc
Gate–Source Voltage	$V_{GS}$	–25	Vdc
Gate Current	$I_G$	10	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	350 2.8	mW mW/ $^\circ\text{C}$
Junction Temperature Range	$T_J$	125	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	–65 to +150	$^\circ\text{C}$

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.



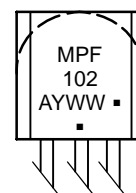
**ON Semiconductor®**

<http://onsemi.com>



TO-92 (TO-226AA)  
CASE 29-11  
STYLE 5

#### MARKING DIAGRAM



MPF102 = Device Code  
A = Assembly Location  
Y = Year  
WW = Work Week  
■ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping
MPF102	TO-92	1000 Units/Bulk
MPF102G	TO-92 (Pb-Free)	1000 Units/Bulk

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

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

# MPF102

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

Characteristic	Symbol	Min	Max	Unit
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### OFF CHARACTERISTICS

Gate–Source Breakdown Voltage ( $I_G = -10\ \mu\text{Adc}$ , $V_{DS} = 0$ )	$V_{(BR)GSS}$	-25	–	Vdc
Gate Reverse Current ( $V_{GS} = -15\ \text{Vdc}$ , $V_{DS} = 0$ ) ( $V_{GS} = -15\ \text{Vdc}$ , $V_{DS} = 0$ , $T_A = 100^\circ\text{C}$ )	$I_{GSS}$	– –	-2.0 -2.0	nAdc $\mu\text{Adc}$
Gate–Source Cutoff Voltage ( $V_{DS} = 15\ \text{Vdc}$ , $I_D = 2.0\ \text{nAdc}$ )	$V_{GS(off)}$	–	-8.0	Vdc
Gate–Source Voltage ( $V_{DS} = 15\ \text{Vdc}$ , $I_D = 0.2\ \text{mAdc}$ )	$V_{GS}$	-0.5	-7.5	Vdc

### ON CHARACTERISTICS

Zero–Gate–Voltage Drain Current (Note 1) ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0\ \text{Vdc}$ )	$I_{DSS}$	2.0	20	mAdc
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### SMALL–SIGNAL CHARACTERISTICS

Forward Transfer Admittance (Note 1) ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0$ , $f = 1.0\ \text{kHz}$ ) ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0$ , $f = 100\ \text{MHz}$ )	$ y_{fs} $	2000 1600	7500 –	$\mu\text{mhos}$
Input Admittance ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0$ , $f = 100\ \text{MHz}$ )	$\text{Re}(y_{is})$	–	800	$\mu\text{mhos}$
Output Conductance ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0$ , $f = 100\ \text{MHz}$ )	$\text{Re}(y_{os})$	–	200	$\mu\text{mhos}$
Input Capacitance ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0$ , $f = 1.0\ \text{MHz}$ )	$C_{iss}$	–	7.0	pF
Reverse Transfer Capacitance ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0$ , $f = 1.0\ \text{MHz}$ )	$C_{rss}$	–	3.0	pF

1. Pulse Test; Pulse Width  $\leq 630\ \text{ms}$ , Duty Cycle  $\leq 10\%$ .

# COMMON SOURCE CHARACTERISTICS

## ADMITTANCE PARAMETERS

( $V_{DS} = 15 \text{ Vdc}$ ,  $T_{\text{channel}} = 25^\circ\text{C}$ )

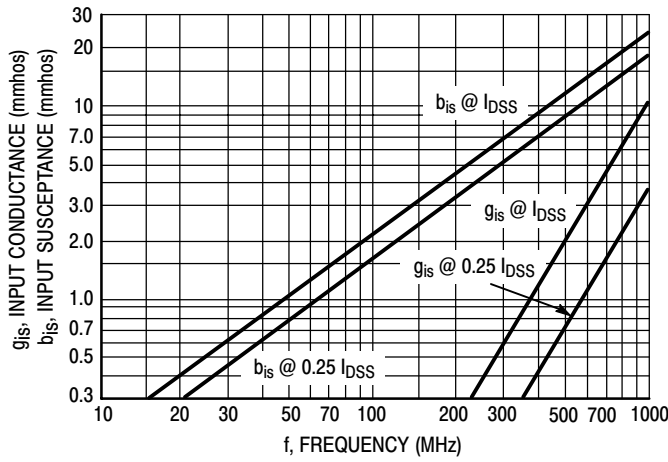


Figure 1. Input Admittance ( $y_{is}$ )

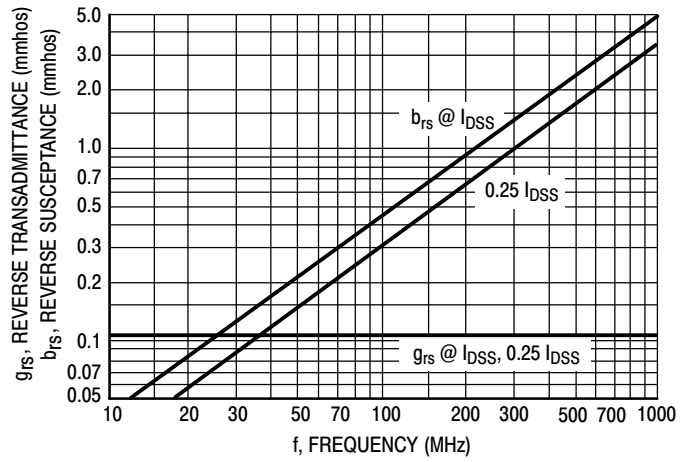


Figure 2. Reverse Transfer Admittance ( $y_{rs}$ )

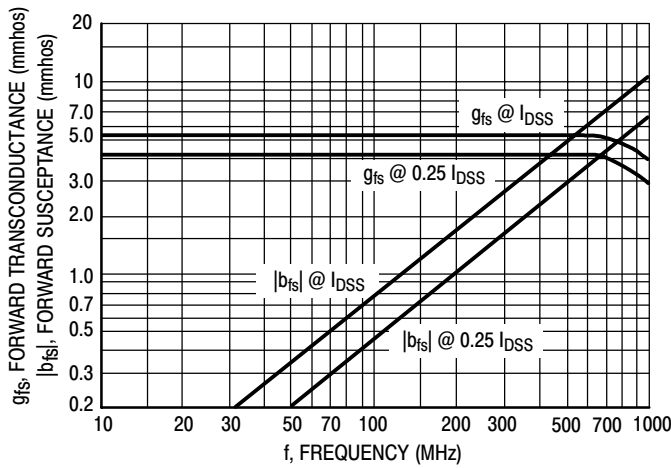


Figure 3. Forward Transfer Admittance ( $y_{fs}$ )

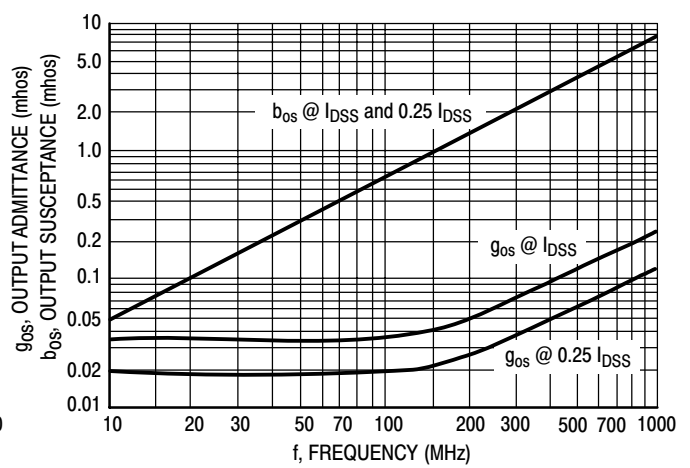


Figure 4. Output Admittance ( $y_{os}$ )

**COMMON SOURCE CHARACTERISTICS**  
**S-PARAMETERS**

( $V_{DS} = 15$  Vdc,  $T_{channel} = 25^{\circ}\text{C}$ , Data Points in MHz)

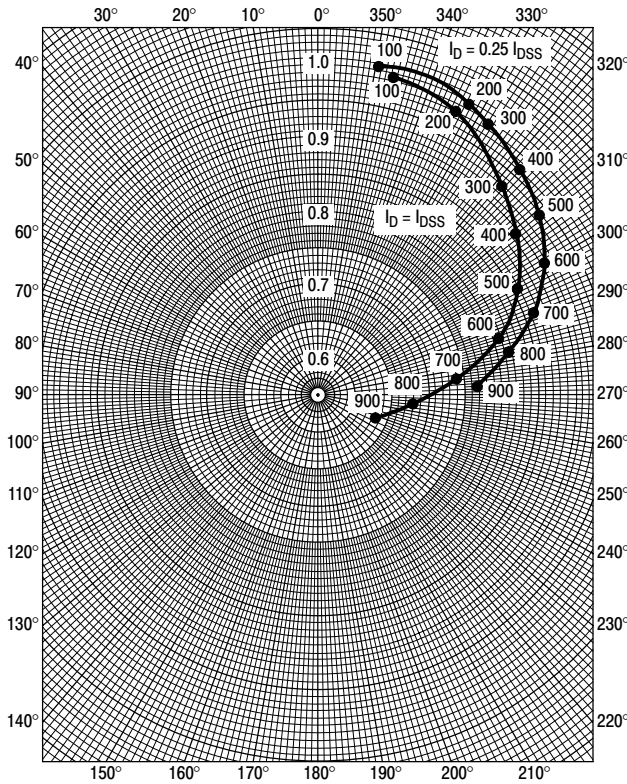


Figure 5.  $S_{11s}$

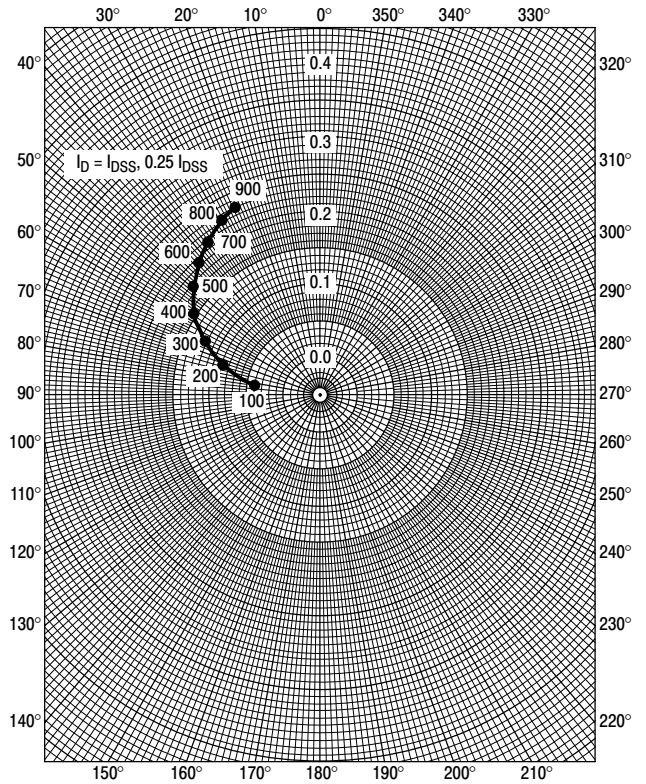


Figure 6.  $S_{12s}$

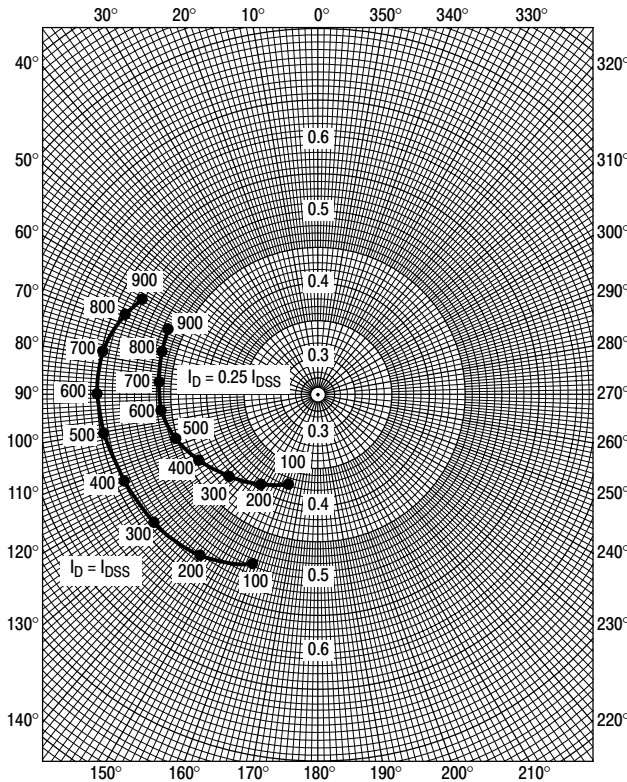


Figure 7.  $S_{21s}$

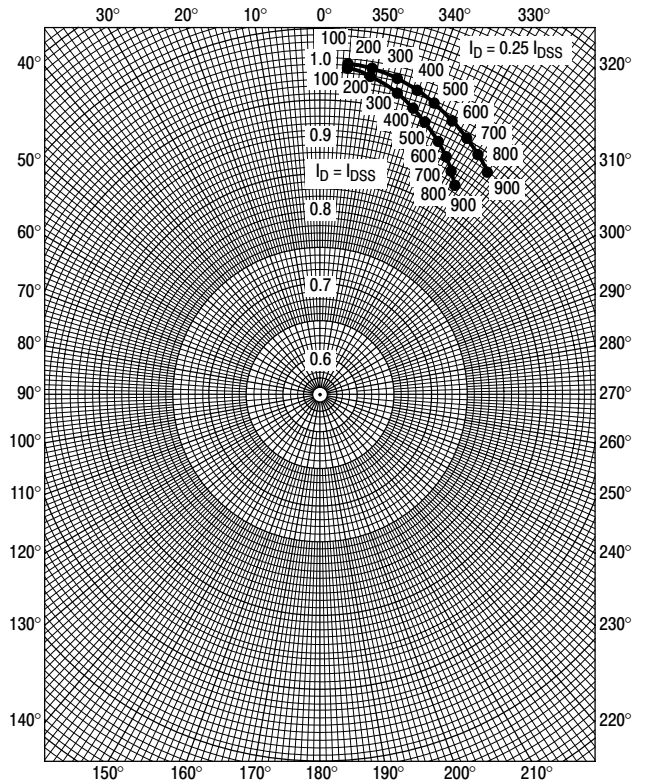
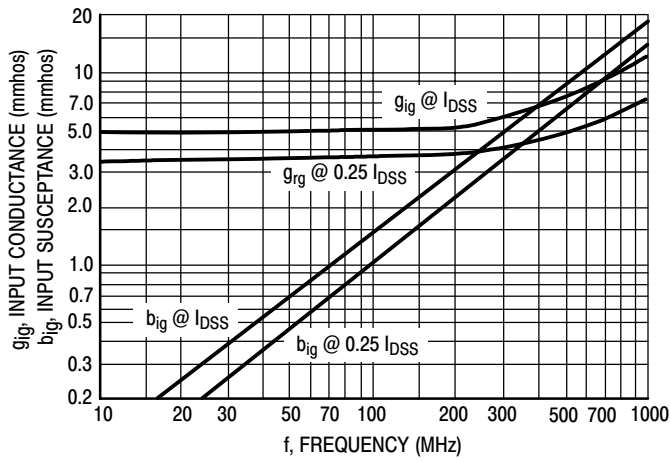
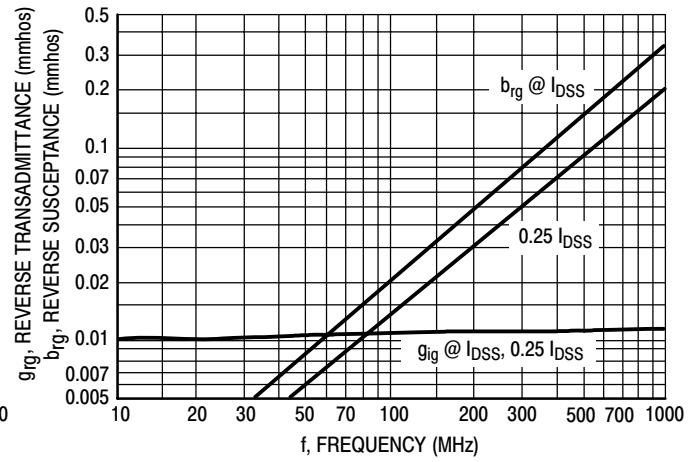
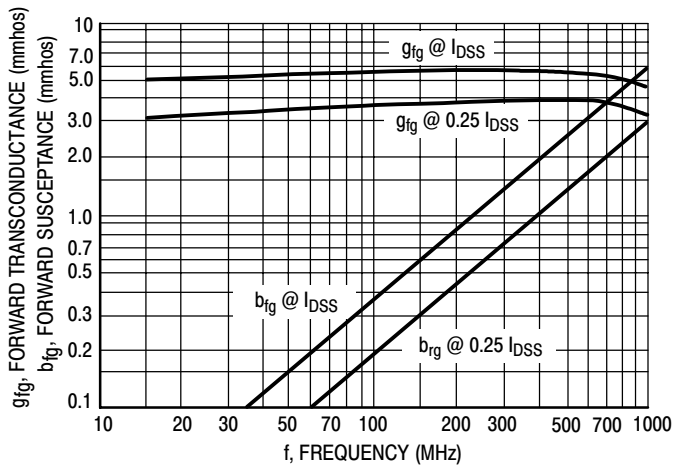
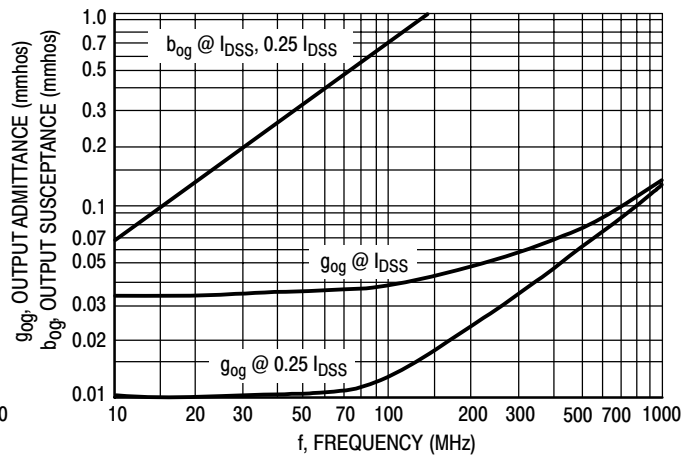


Figure 8.  $S_{22s}$

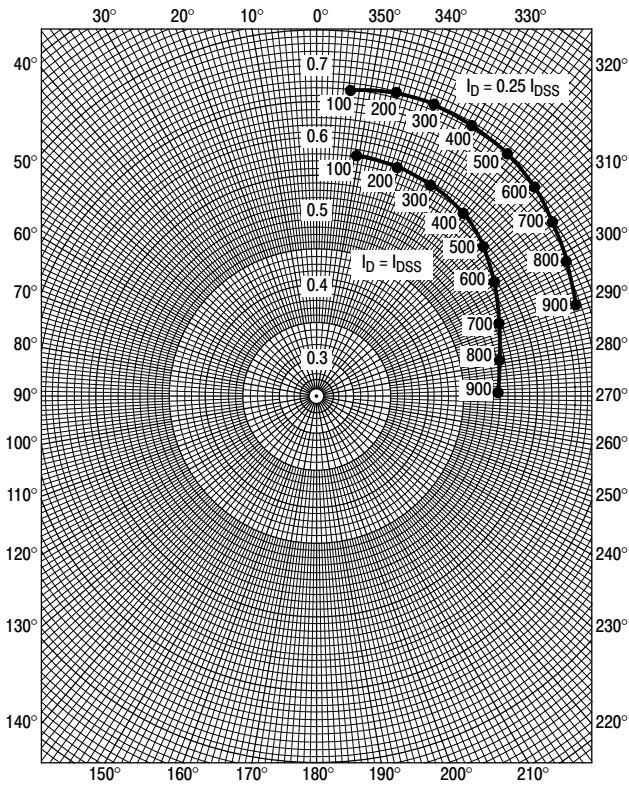
## COMMON GATE CHARACTERISTICS

## ADMITTANCE PARAMETERS

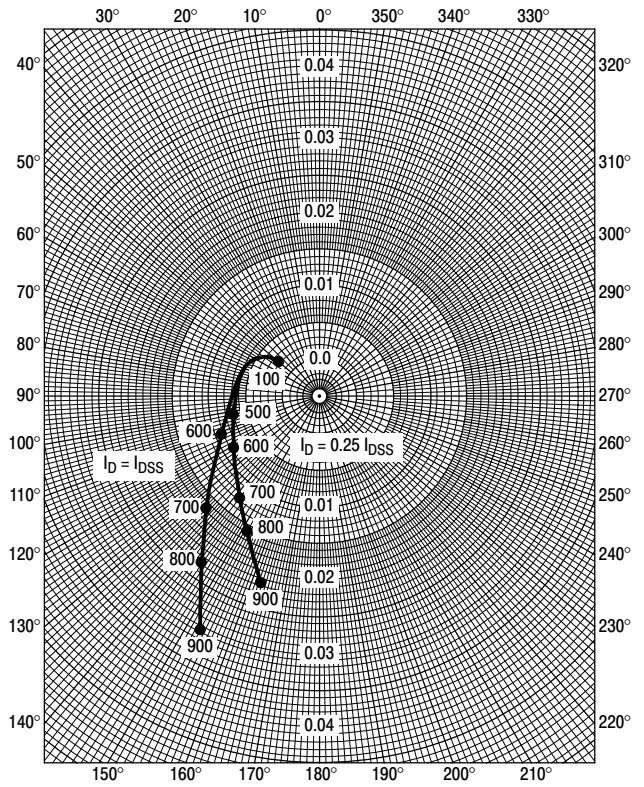
(V<sub>DG</sub> = 15 Vdc, T<sub>channel</sub> = 25°C)Figure 9. Input Admittance ( $y_{ig}$ )Figure 10. Reverse Transfer Admittance ( $y_{rg}$ )Figure 11. Forward Transfer Admittance ( $y_{fg}$ )Figure 12. Output Admittance ( $y_{og}$ )

**COMMON GATE CHARACTERISTICS**  
**S-PARAMETERS**

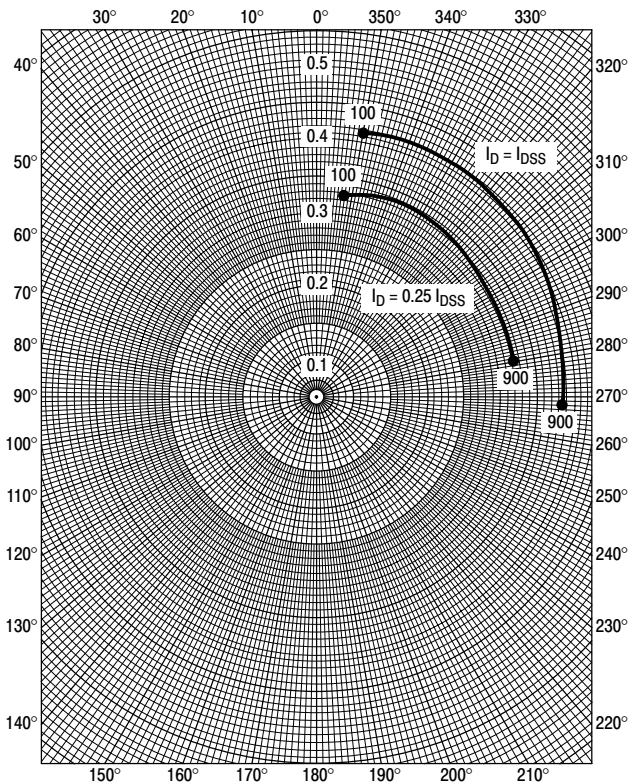
( $V_{DS} = 15$  Vdc,  $T_{channel} = 25^{\circ}\text{C}$ , Data Points in MHz)



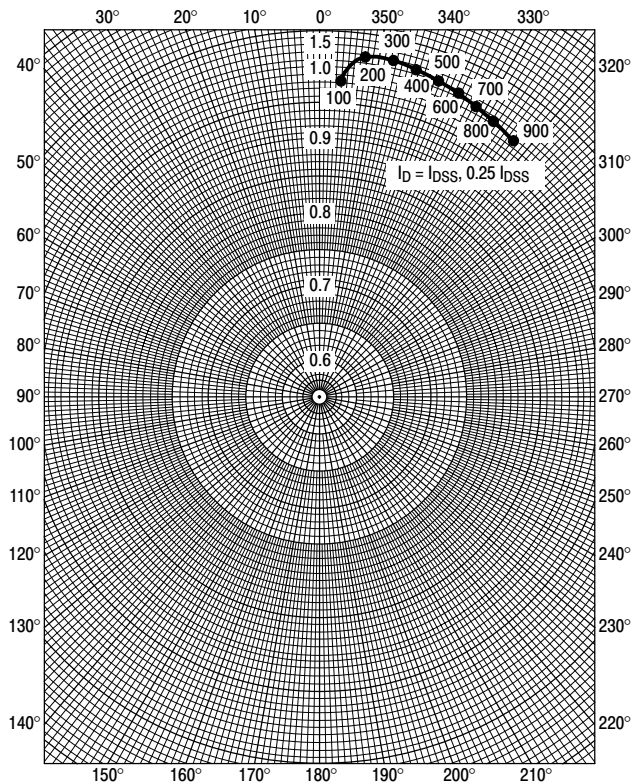
**Figure 13.  $S_{11g}$**



**Figure 14.  $S_{12g}$**



**Figure 15.  $S_{21a}$**

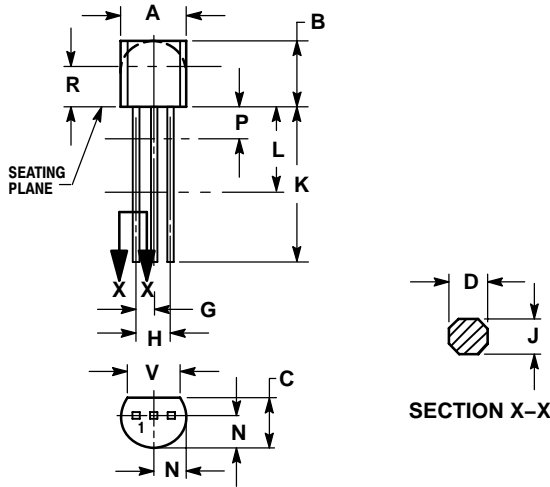


**Figure 16.  $S_{22a}$**

# MPF102

## PACKAGE DIMENSIONS

TO-92 (TO-226)  
CASE 29-11  
ISSUE AL




### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

### STYLE 5:

1. DRAIN
2. SOURCE
3. GATE

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