

# 2N3819

## JFET VHF/UHF Amplifier

### N-Channel – Depletion

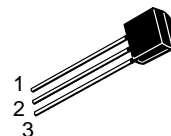
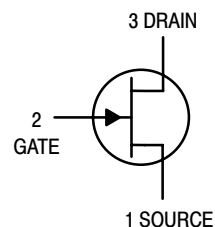
#### MAXIMUM RATINGS

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
Drain Current	$I_D$	100	mA <sub>dc</sub>
Forward Gate Current	$I_{G(f)}$	10	mA <sub>dc</sub>
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	350 2.8	mW mW/ $^\circ\text{C}$
Storage Channel Temperature Range	$T_{stg}$	-65 to +150	$^\circ\text{C}$



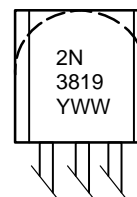
ON Semiconductor®

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TO-92  
CASE 29  
STYLE 22

#### MARKING DIAGRAM



2N3819 = Device Code  
Y = Year  
WW = Work Week

#### ORDERING INFORMATION

Device	Package	Shipping
2N3819	TO-92	5000 Units/Box

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

Characteristic	Symbol	Min	Typ	Max	Unit
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**OFF CHARACTERISTICS**

Gate–Source Breakdown Voltage ( $I_G = 1.0\ \mu\text{Adc}$ , $V_{DS} = 0$ )	$V_{(BR)GSS}$	25	–	–	Vdc
Gate–Source ( $V_{DS} = 15\ \text{Vdc}$ , $I_D = 200\ \mu\text{Adc}$ )	$V_{GS}$	0.5	–	7.5	Vdc
Gate–Source Cutoff Voltage ( $V_{DS} = 15\ \text{Vdc}$ , $I_D = 10\ \text{nAdc}$ )	$V_{GS(off)}$	–	–	–8.0	Vdc
Gate Reverse Current ( $V_{GS} = 15\ \text{Vdc}$ , $V_{DS} = 0$ )	$I_{GSS}$	–	–	210	nAdc

**ON CHARACTERISTICS**

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

Forward Transfer Admittance ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0$ , $f = 1.0\ \text{kHz}$ )	$ Y_{fs} $	3.0	–	6.5	mmhos
Output Admittance ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0$ , $f = 1.0\ \text{kHz}$ )	$ Y_{os} $	–	40	–	$\mu\text{mhos}$
Forward Transfer Admittance ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0$ , $f = 200\ \text{MHz}$ )	$ Y_{fs} $	–	5.6	–	mmhos
Reverse Transfer Admittance ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0$ , $f = 200\ \text{MHz}$ )	$ Y_{rs} $	–	1.0	–	mmhos
Input Capacitance ( $V_{DS} = 20\ \text{Vdc}$ , $-V_{GS} = 1.0\ \text{Vdc}$ )	$C_{iss}$	–	3.0	–	pF
Reverse Transfer Capacitance ( $V_{DS} = 20\ \text{Vdc}$ , $-V_{GS} = 1.0\ \text{Vdc}$ , $f = 1.0\ \text{MHz}$ )	$C_{rss}$	–	0.7	–	pF
Output Capacitance ( $V_{DS} = 20\ \text{Vdc}$ , $-V_{GS} = 1.0\ \text{Vdc}$ , $f = 1.0\ \text{MHz}$ )	$C_{oss}$	–	0.9	–	pF
Cut–off Frequency (Note 1) ( $V_{DS} = 15\ \text{Vdc}$ , $V_{GS} = 0$ )	$F_{(Yfs)}$	–	700	–	MHz

1. The frequency at which  $g_{fs}$  is 0.7 of its value at 1 kHz.

# COMMON SOURCE CHARACTERISTICS

## ADMITTANCE PARAMETERS

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

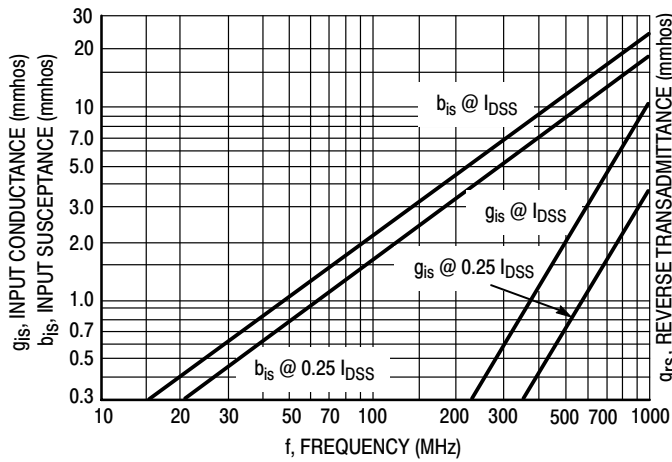


Figure 1. Input Admittance ( $y_{is}$ )

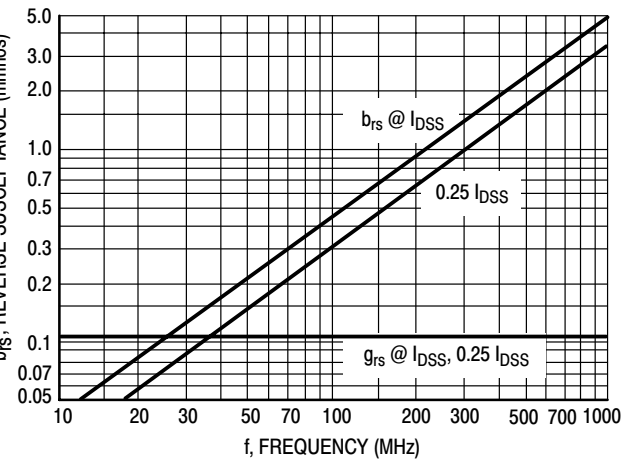


Figure 2. Reverse Transfer Admittance ( $y_{rs}$ )

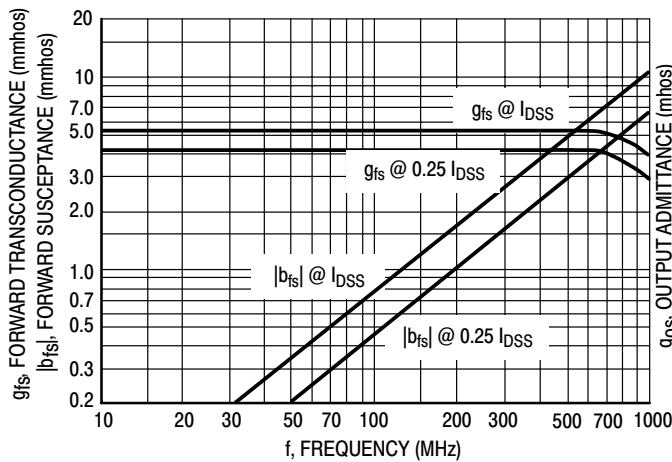


Figure 3. Forward Transadmittance ( $y_{fs}$ )

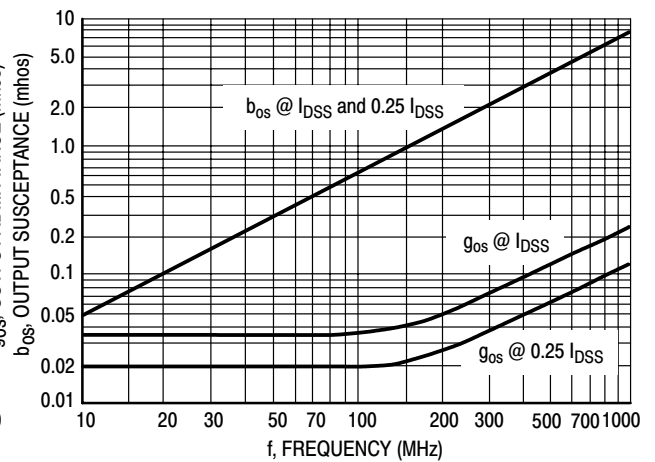


Figure 4. Output Admittance ( $y_{os}$ )

# COMMON SOURCE CHARACTERISTICS

## S-PARAMETERS

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

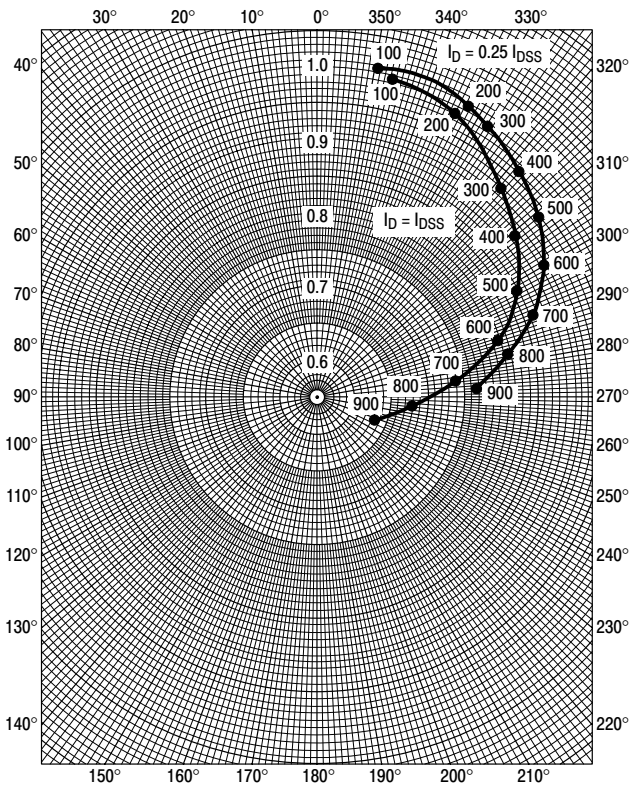


Figure 5.  $S_{11s}$

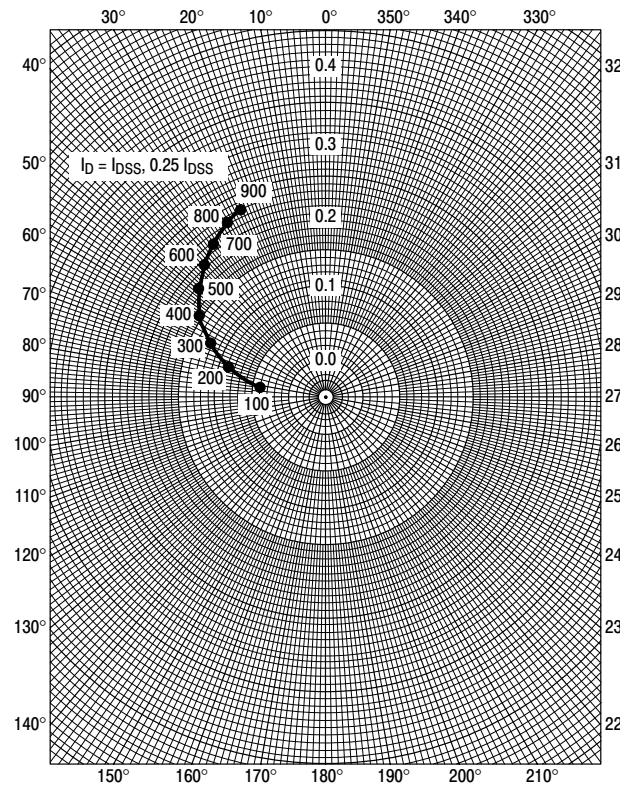


Figure 6.  $S_{12s}$

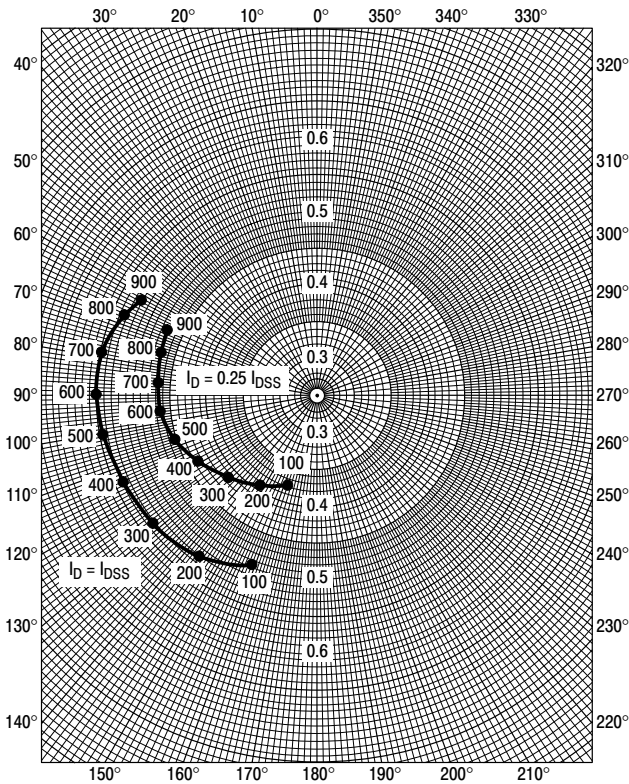


Figure 7.  $S_{21s}$

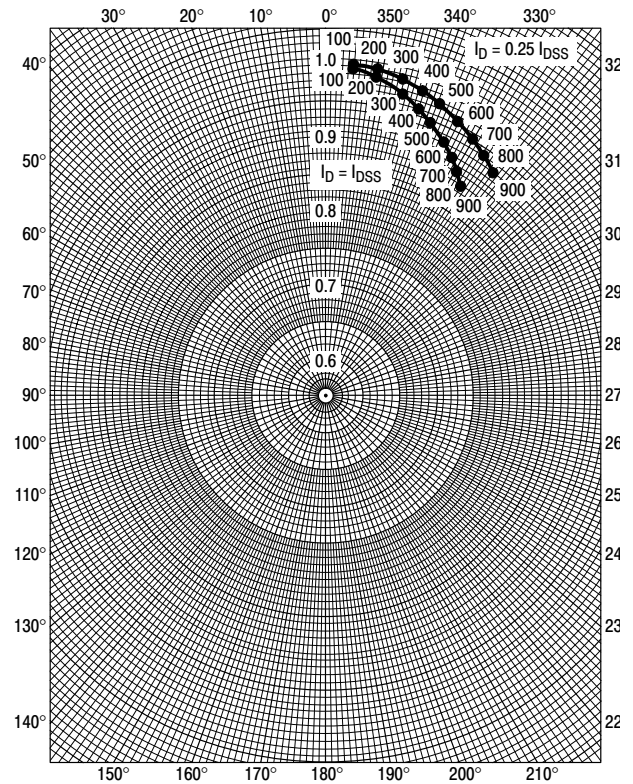
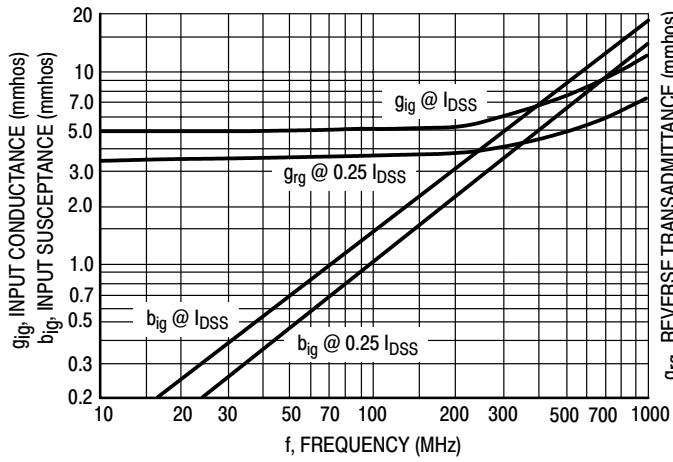
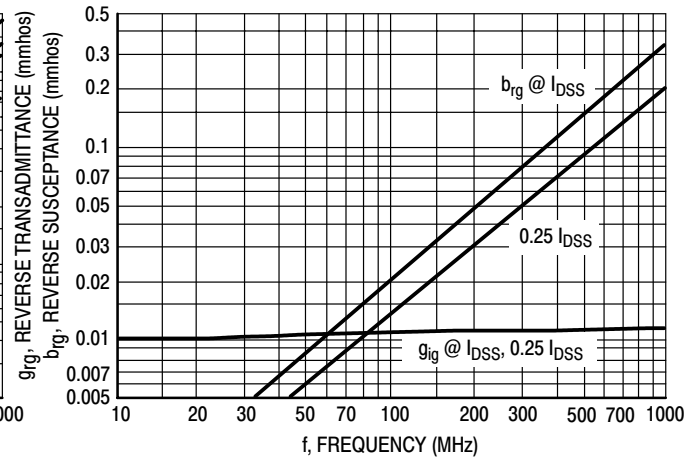
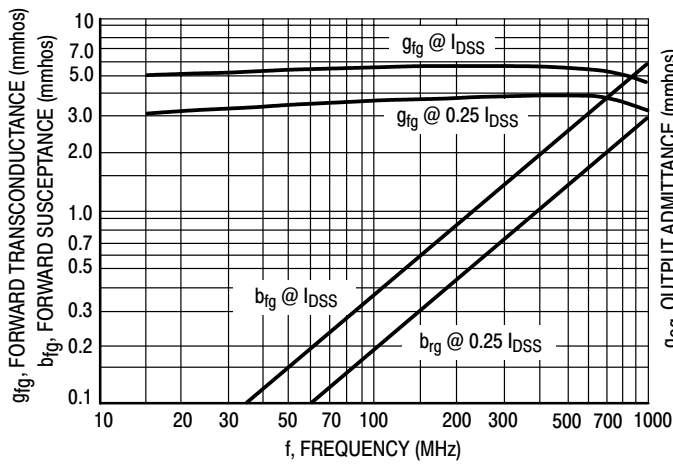
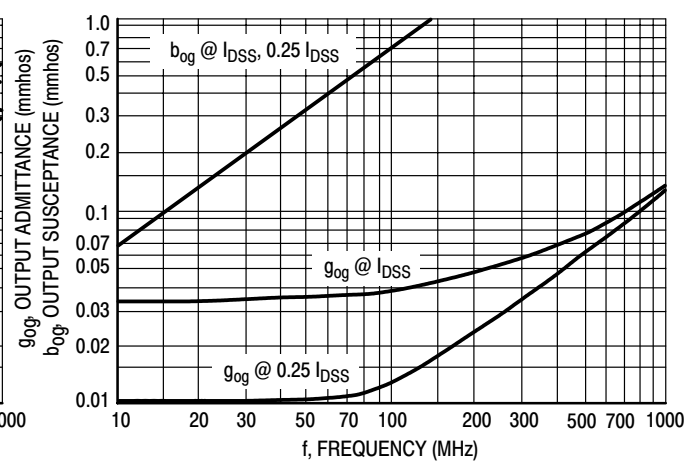


Figure 8.  $S_{22s}$

**COMMON GATE CHARACTERISTICS**  
**ADMITTANCE PARAMETERS**  
 $(V_{DG} = 15 \text{ Vdc}, T_{\text{channel}} = 25^\circ\text{C})$

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

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

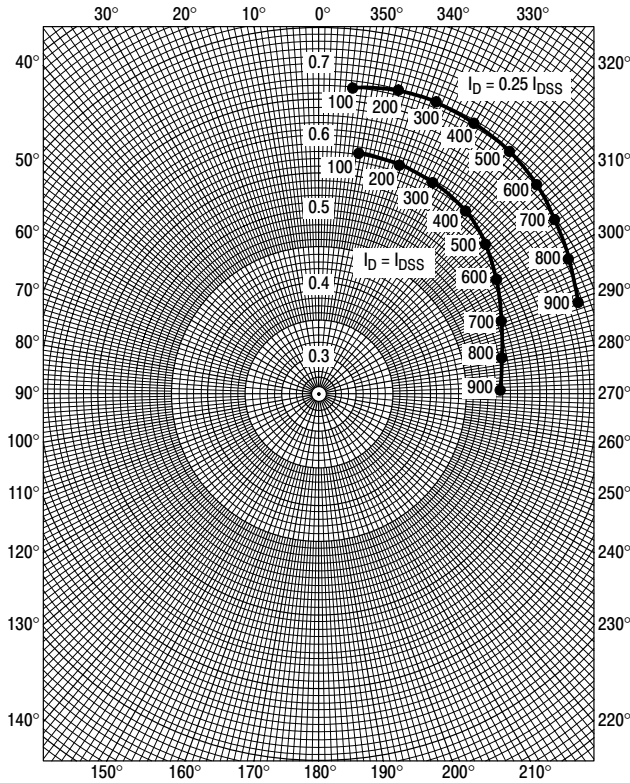


Figure 13.  $S_{11g}$

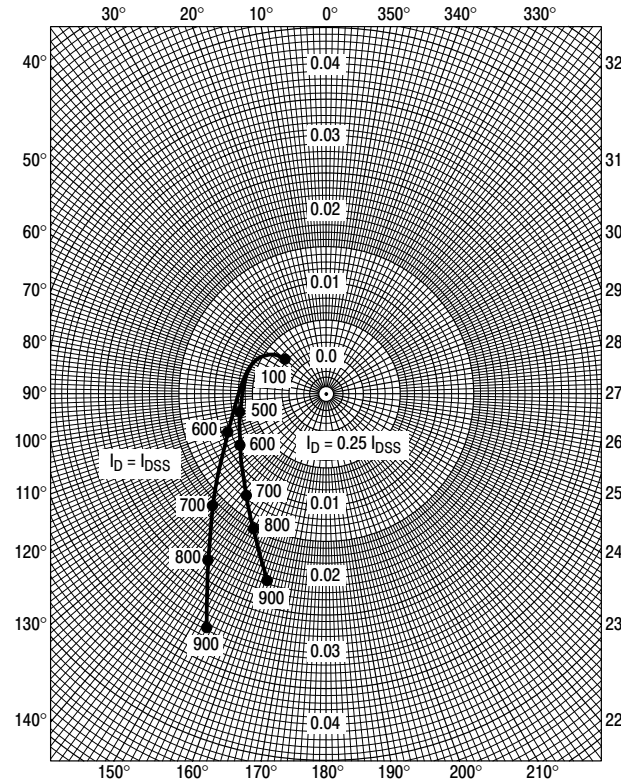


Figure 14.  $S_{12g}$

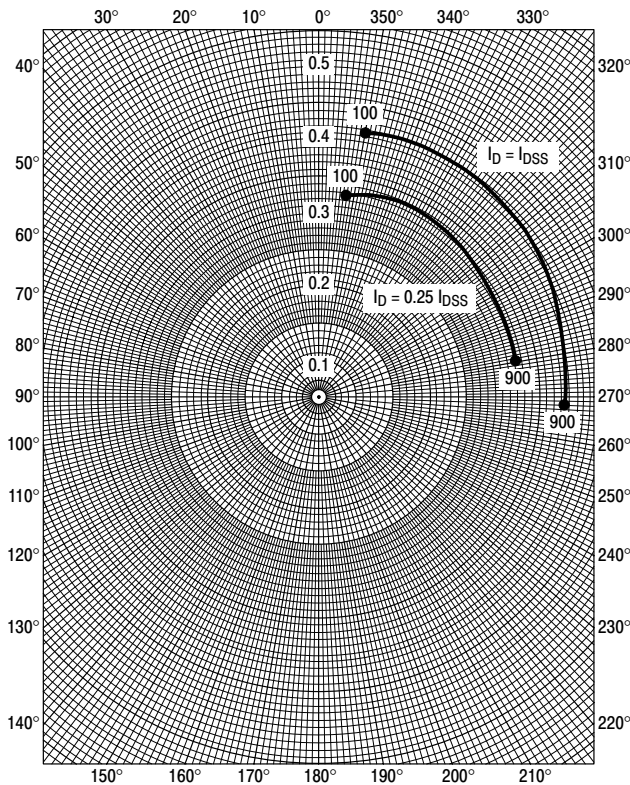


Figure 15.  $S_{21g}$

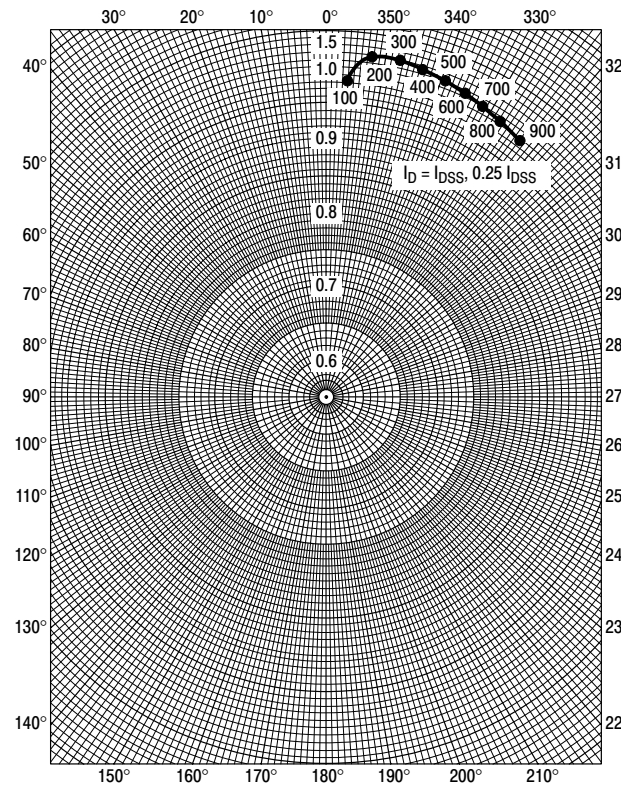
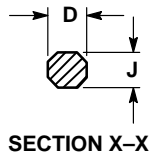
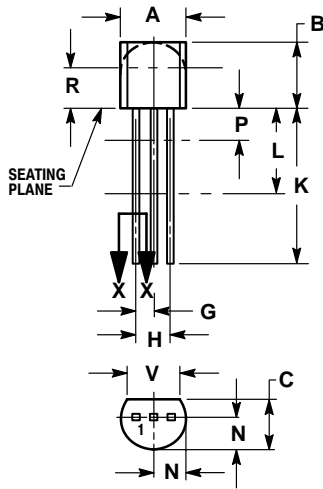


Figure 16.  $S_{22g}$

# 2N3819

## 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 22:

- PIN 1. SOURCE
- GATE
- DRAIN

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