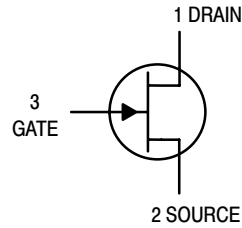


# JFET Switching

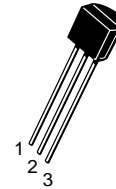
## N-Channel — Depletion



**2N5555**

### 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
Forward Gate Current	$I_{GF}$	10	mAdc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	350 2.8	mW mW/ $^\circ\text{C}$
Junction Temperature Range	$T_J$	-65 to +150	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-65 to +150	$^\circ\text{C}$



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

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

Characteristic	Symbol	Min	Max	Unit
----------------	--------	-----	-----	------

### OFF CHARACTERISTICS

Gate-Source Breakdown Voltage ( $I_G = 10 \mu\text{Adc}$ , $V_{DS} = 0$ )	$V_{(BR)GSS}$	25	—	Vdc
Gate Reverse Current ( $V_{GS} = 15 \text{Vdc}$ , $V_{DS} = 0$ )	$I_{GSS}$	—	1.0	nAdc
Drain Cutoff Current ( $V_{DS} = 12 \text{Vdc}$ , $V_{GS} = -10 \text{V}$ ) ( $V_{DS} = 12 \text{Vdc}$ , $V_{GS} = -10 \text{V}$ , $T_A = 100^\circ\text{C}$ )	$I_{D(off)}$	—	10 2.0	nAdc $\mu\text{Adc}$

### ON CHARACTERISTICS

Zero-Gate-Voltage Drain Current <sup>(1)</sup> ( $V_{DS} = 15 \text{Vdc}$ , $V_{GS} = 0$ )	$I_{DSS}$	15	—	mAdc
Gate-Source Forward Voltage ( $I_{G(f)} = 1.0 \text{mAdc}$ , $V_{DS} = 0$ )	$V_{GS(f)}$	—	1.0	Vdc
Drain-Source On-Voltage ( $I_D = 7.0 \text{mAdc}$ , $V_{GS} = 0$ )	$V_{DS(on)}$	—	1.5	Vdc
Static Drain-Source On Resistance ( $I_D = 0.1 \text{mAdc}$ , $V_{GS} = 0$ )	$r_{DS(on)}$	—	150	Ohms

1. Pulse Test: Pulse Width < 300  $\mu\text{s}$ , Duty Cycle < 3.0%.

### SMALL-SIGNAL CHARACTERISTICS

Small-Signal Drain-Source "ON" Resistance ( $V_{GS} = 0$ , $I_D = 0$ , $f = 1.0 \text{kHz}$ )	$r_{ds(on)}$	—	150	Ohms
Input Capacitance ( $V_{DS} = 15 \text{Vdc}$ , $V_{GS} = 0$ , $f = 1.0 \text{MHz}$ )	$C_{iss}$	—	5.0	pF
Reverse Transfer Capacitance ( $V_{DS} = 0$ , $V_{GS} = 10 \text{Vdc}$ , $f = 1.0 \text{MHz}$ )	$C_{rss}$	—	1.2	pF

### SWITCHING CHARACTERISTICS

Turn-On Delay Time	( $V_{DD} = 10 \text{Vdc}$ , $I_{D(on)} = 7.0 \text{mAdc}$ , $V_{GS(on)} = 0$ , $V_{GS(off)} = -10 \text{Vdc}$ ) (See Figure 1)	$t_{d(on)}$	—	5.0	ns
Rise Time		$t_r$	—	5.0	ns
Turn-Off Delay Time	( $V_{DD} = 10 \text{Vdc}$ , $I_{D(on)} = 7.0 \text{mAdc}$ , $V_{GS(on)} = 0$ , $V_{GS(off)} = -10 \text{Vdc}$ ) (See Figure 1)	$t_{d(off)}$	—	15	ns
Fall Time		$t_f$	—	10	ns

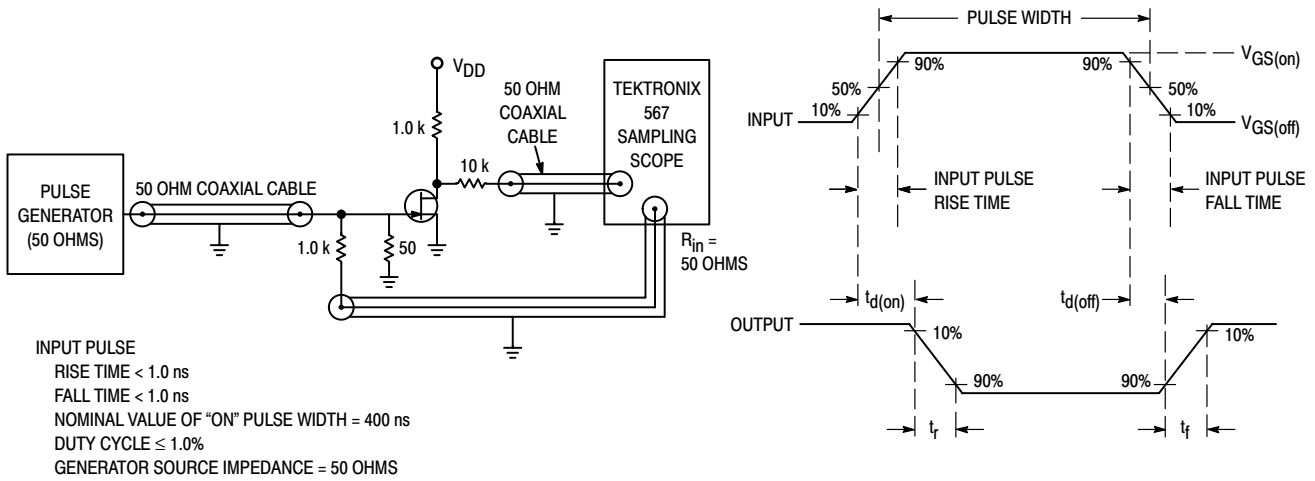


Figure 1. Switching Times Test Circuit

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

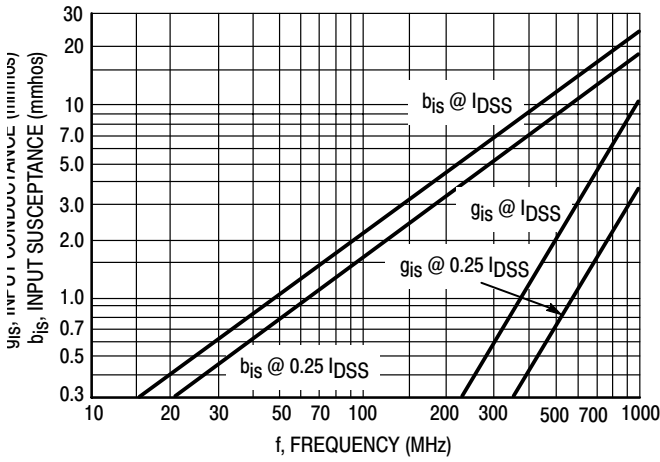


Figure 2. Input Admittance ( $y_{is}$ )

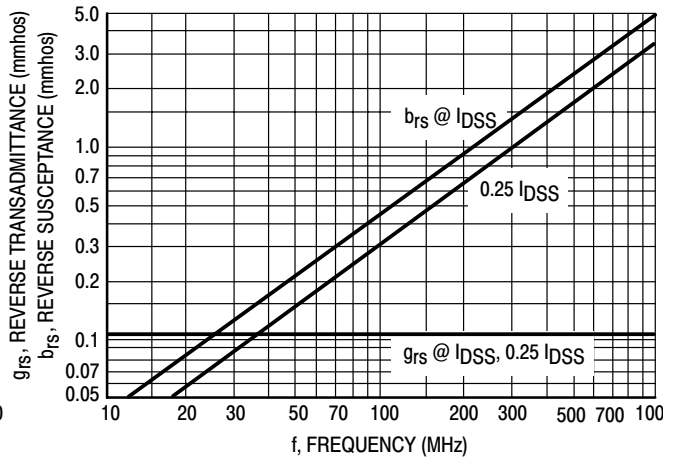


Figure 3. Reverse Transfer Admittance ( $y_{rs}$ )

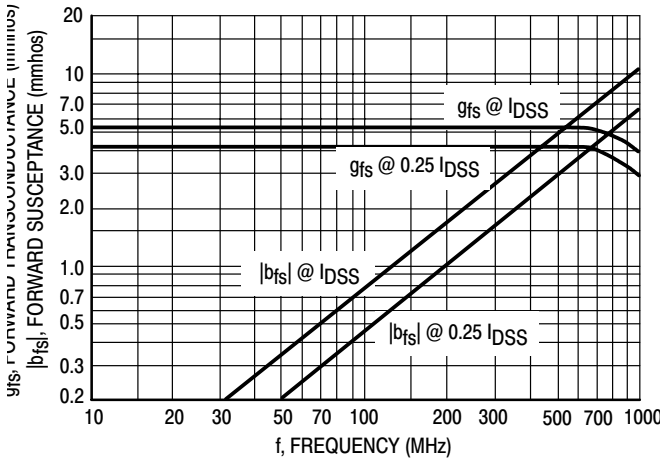


Figure 4. Forward Transadmittance ( $y_{fs}$ )

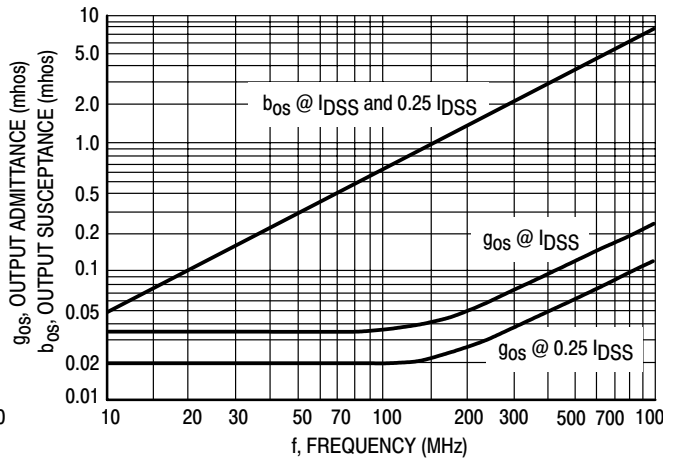
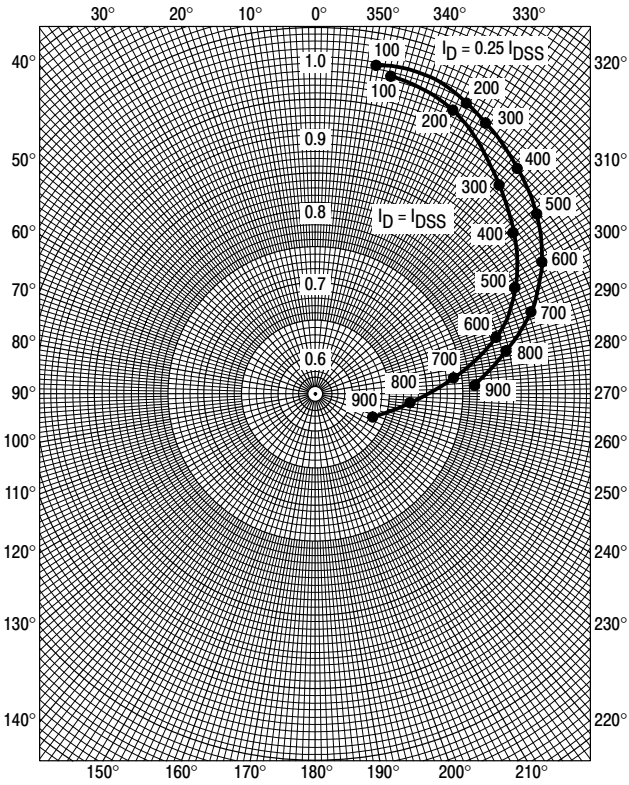


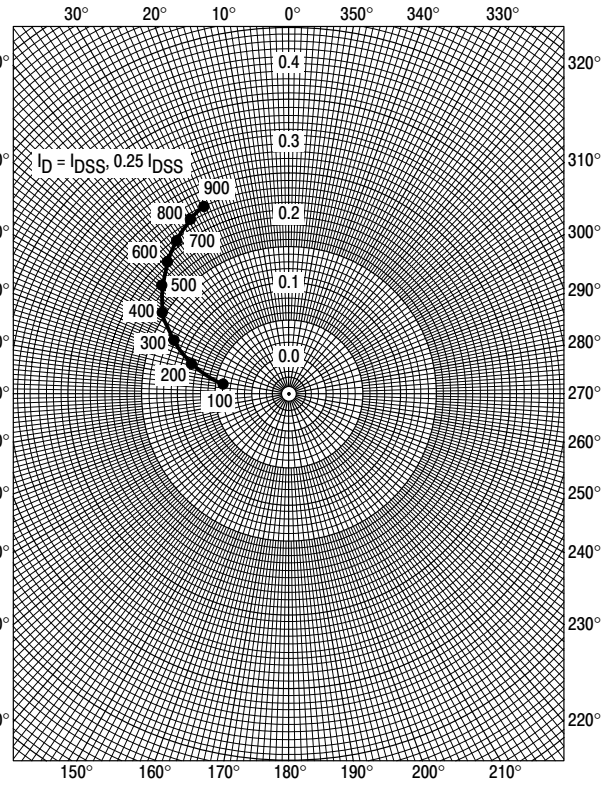
Figure 5. Output Admittance ( $y_{os}$ )

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

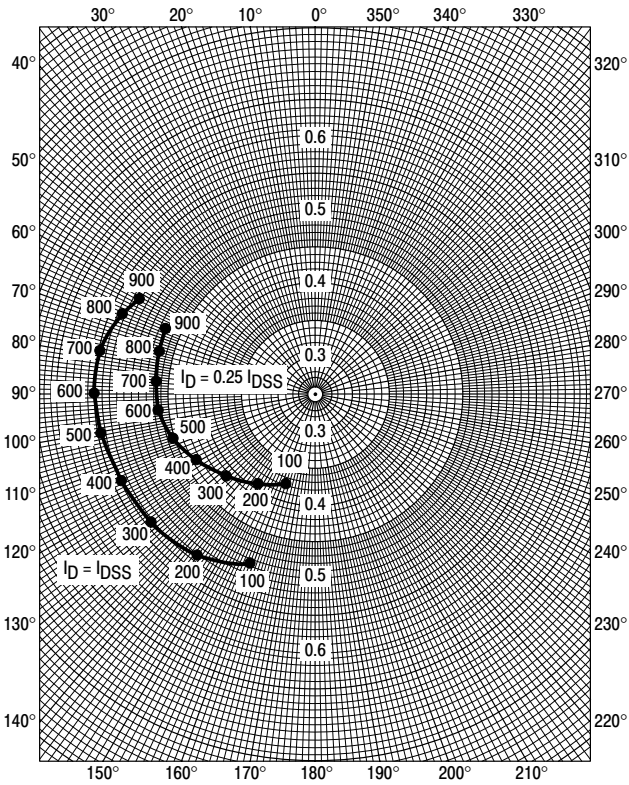
( $V_{DS} = 15 \text{ Vdc}$ ,  $T_{\text{channel}} = 25^\circ\text{C}$ , Data Points in MHz)



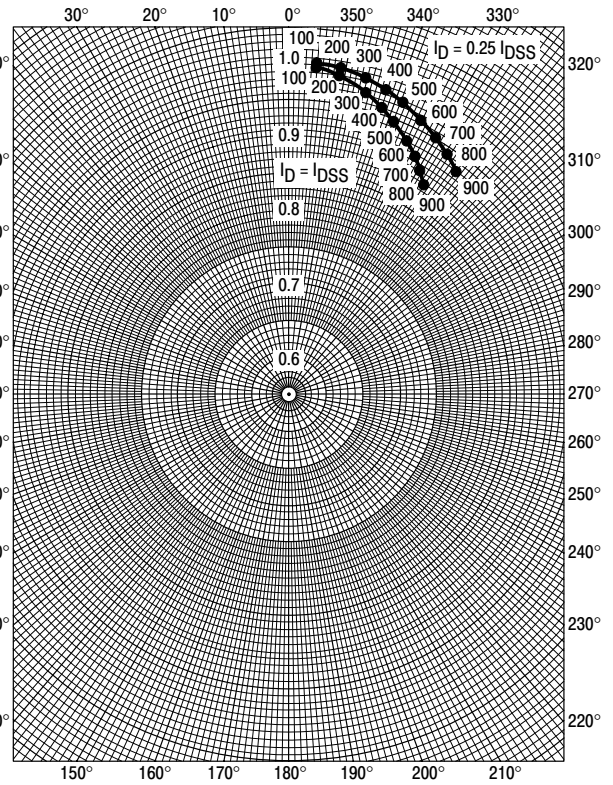
**Figure 6.  $S_{11s}$**



**Figure 7.  $S_{12s}$**



**Figure 8.  $S_{21s}$**



**Figure 9.  $S_{22s}$**

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

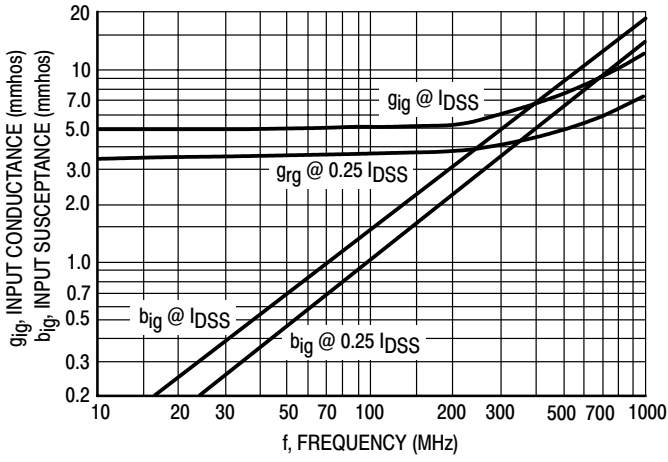


Figure 10. Input Admittance ( $y_{ig}$ )

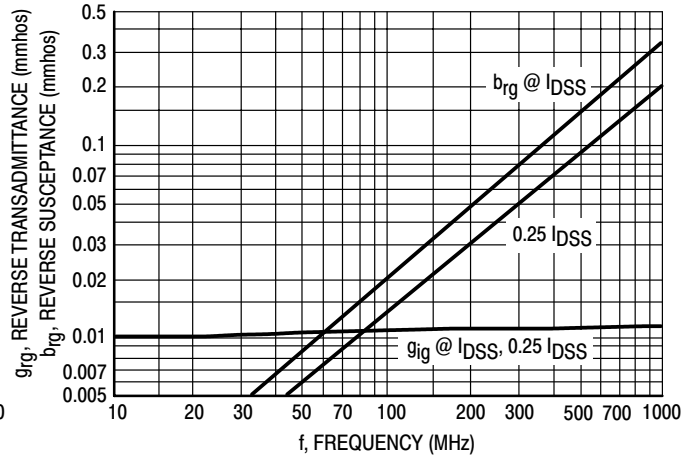


Figure 11. Reverse Transfer Admittance ( $y_{rg}$ )

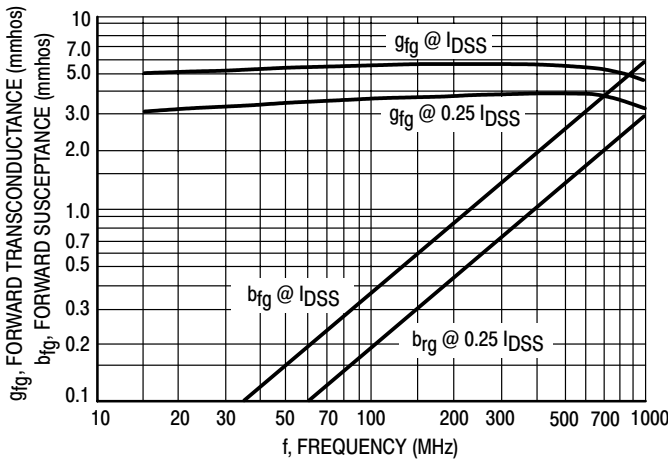


Figure 12. Forward Transfer Admittance ( $y_{fg}$ )

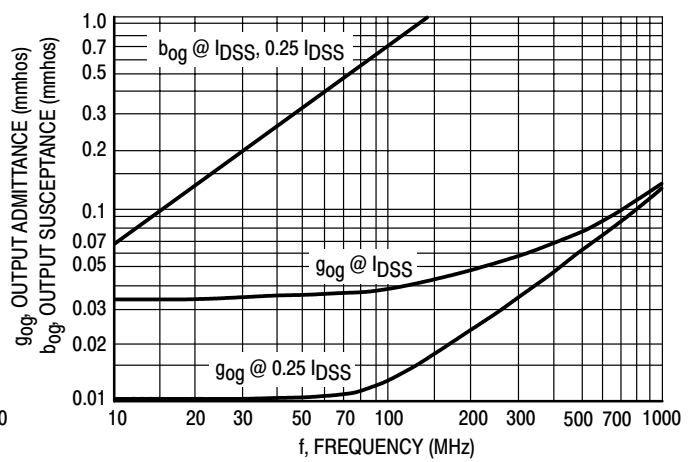


Figure 13. Output Admittance ( $y_{og}$ )

COMMON GATE CHARACTERISTICS  
S-PARAMETERS

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

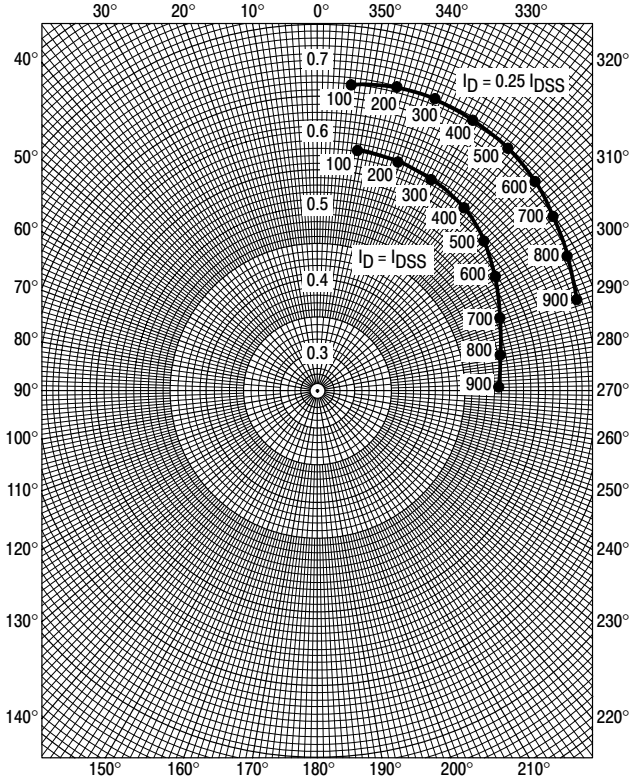


Figure 14.  $S_{11g}$

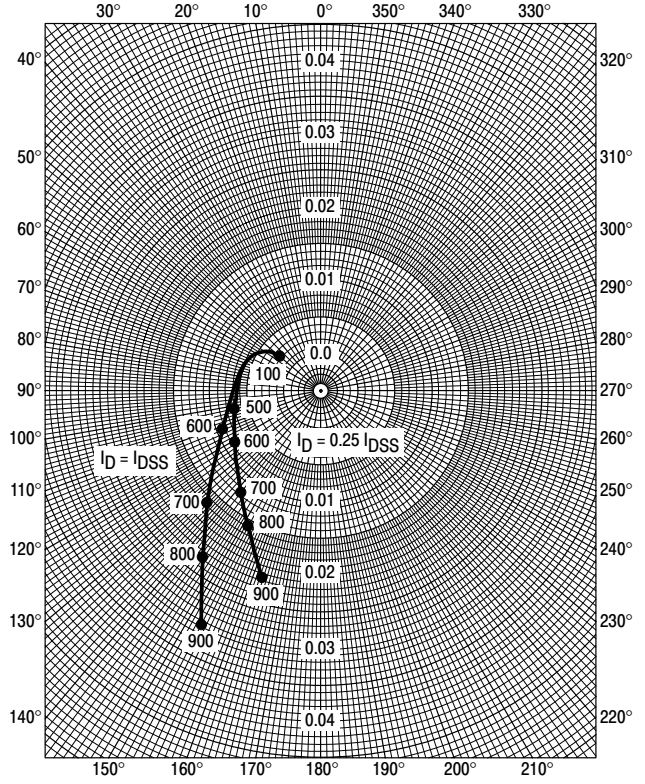


Figure 15.  $S_{12g}$

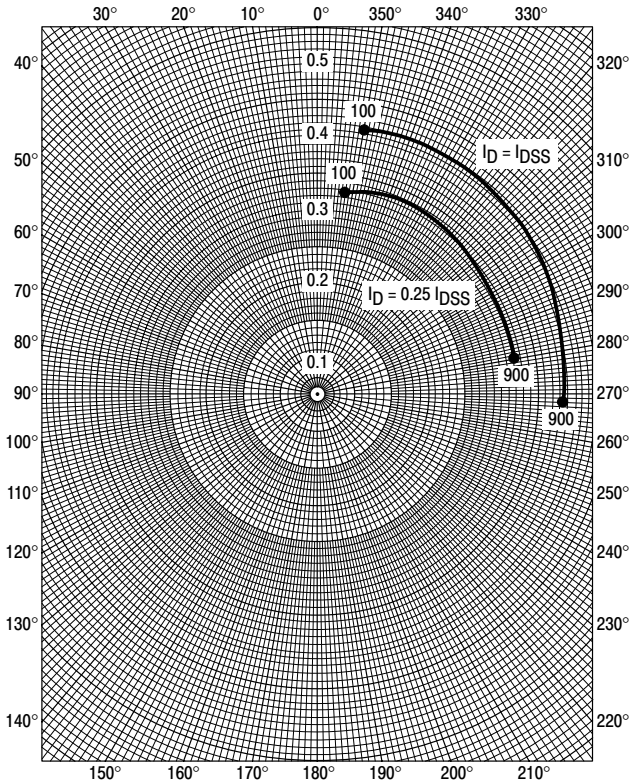


Figure 16.  $S_{21g}$

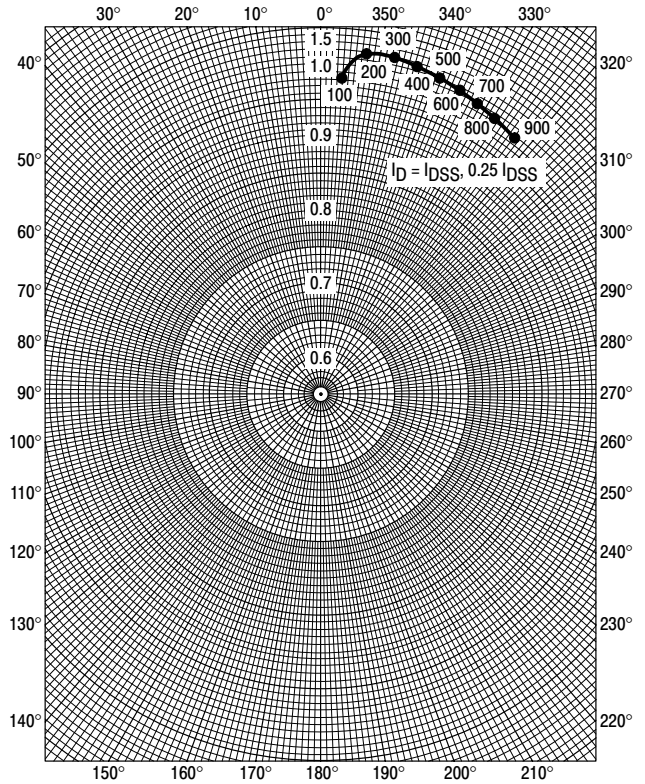
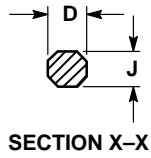
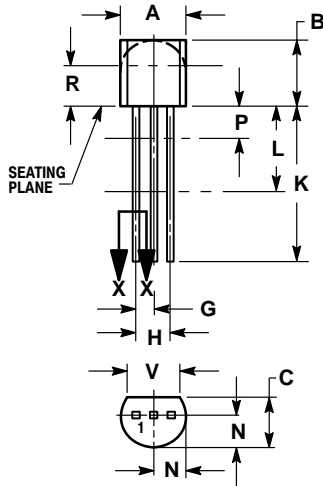


Figure 17.  $S_{22g}$

# 2N5555

## PACKAGE DIMENSIONS

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




STYLE 5:  
PIN 1. DRAIN  
2. SOURCE  
3. GATE

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	---

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