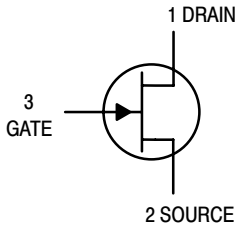
# ON Semiconductor

# Is Now

**To learn more about onsemi™, please visit our website at**
**www.onsemi.com**

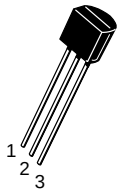
# JFET Switching
## N–Channel — Depletion




**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°C<br>Derate above 25°C | $P_D$ | 350<br>2.8 | mW<br>mW/°C |
| Junction Temperature Range | $T_J$ | –65 to +150 | °C |
| Storage Temperature Range | $T_{stg}$ | –65 to +150 | °C |




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

**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | |
| Gate–Source Breakdown Voltage ($I_G$ = 10 μAdc, $V_{DS}$ = 0) | $V_{(BR)GSS}$ | 25 | — | Vdc |
| Gate Reverse Current ($V_{GS}$ = 15 Vdc, $V_{DS}$ = 0) | $I_{GSS}$ | — | 1.0 | nAdc |
| Drain Cutoff Current ($V_{DS}$ = 12 Vdc, $V_{GS}$ = –10 V)<br>($V_{DS}$ = 12 Vdc, $V_{GS}$ = –10 V, $T_A$ = 100°C) | $I_{D(off)}$ | —<br>— | 10<br>2.0 | nAdc<br>μAdc |
| **ON CHARACTERISTICS** | | | | |
| Zero–Gate–Voltage Drain Current(1)<br>($V_{DS}$ = 15 Vdc, $V_{GS}$ = 0) | $I_{DSS}$ | 15 | — | mAdc |
| Gate–Source Forward Voltage<br>($I_{G(f)}$ = 1.0 mAdc, $V_{DS}$ = 0) | $V_{GS(f)}$ | — | 1.0 | Vdc |
| Drain–Source On–Voltage<br>($I_D$ = 7.0 mAdc, $V_{GS}$ = 0) | $V_{DS(on)}$ | — | 1.5 | Vdc |
| Static Drain–Source On Resistance<br>($I_D$ = 0.1 mAdc, $V_{GS}$ = 0) | $r_{DS(on)}$ | — | 150 | Ohms |

1. Pulse Test: Pulse Width < 300 μs, Duty Cycle < 3.0%.

**SMALL–SIGNAL CHARACTERISTICS**

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

**SWITCHING CHARACTERISTICS**

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



November, 2001 – Rev. 3
Publication Order Number:
2N5555/D

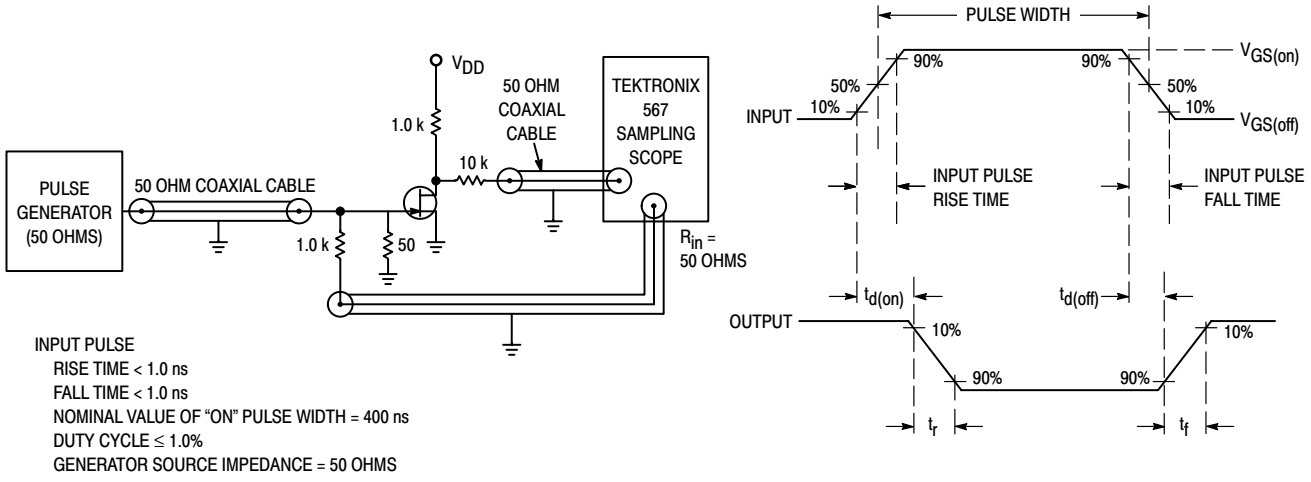



**Figure 1. Switching Times Test Circuit**

## COMMON SOURCE CHARACTERISTICS

### ADMITTANCE PARAMETERS

($V_{DS}$ = 15 Vdc, $T_{channel}$ = 25°C)

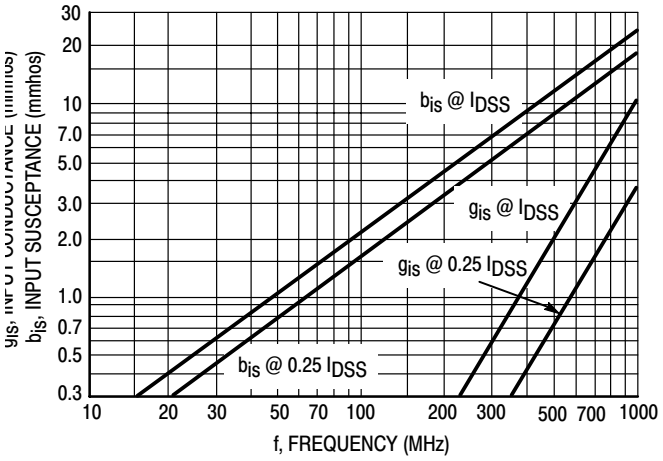



**Figure 2. Input Admittance ($y_{is}$)**

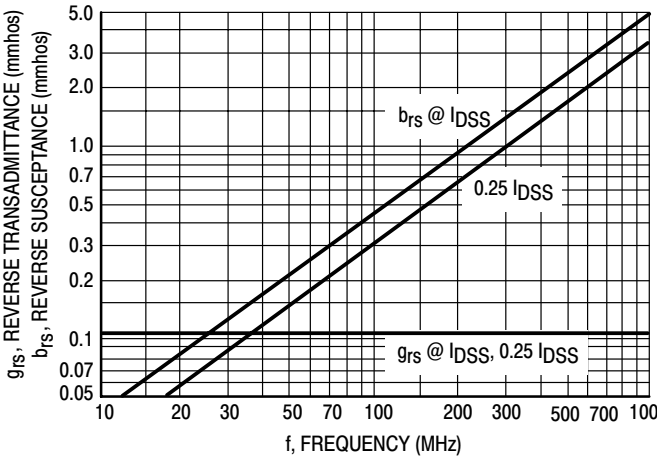



**Figure 3. Reverse Transfer Admittance ($y_{rs}$)**

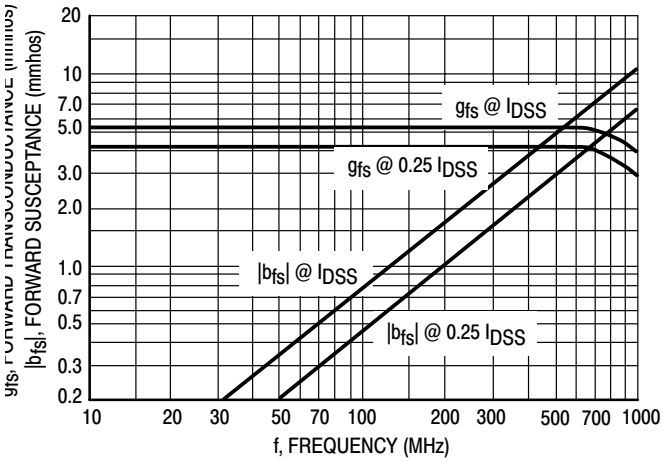



**Figure 4. Forward Transadmittance ($y_{fs}$)**

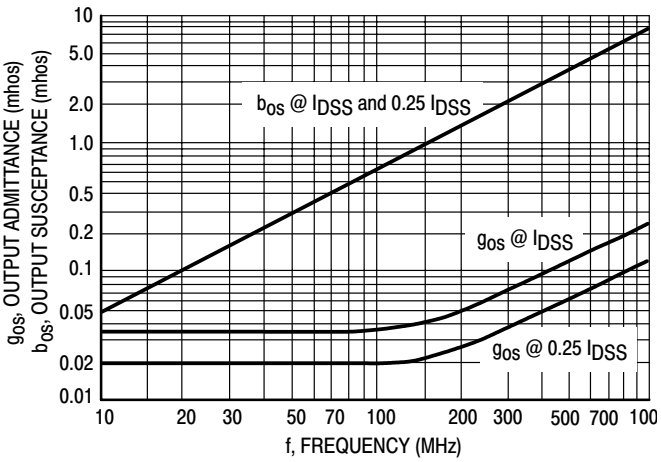



**Figure 5. Output Admittance ($y_{os}$)**

## COMMON SOURCE CHARACTERISTICS

### S–PARAMETERS

($V_{DS}$ = 15 Vdc, $T_{channel}$ = 25°C, Data Points in MHz)

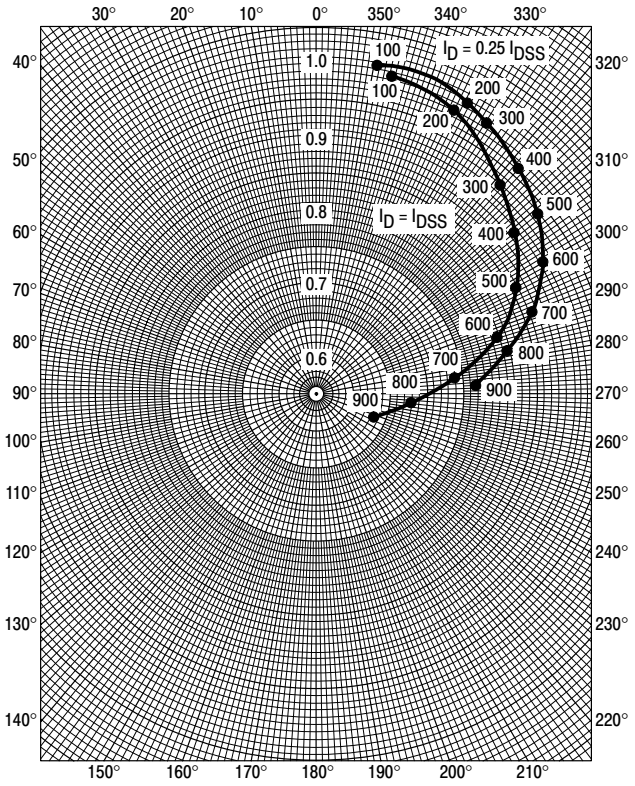



**Figure 6. $S_{11s}$**

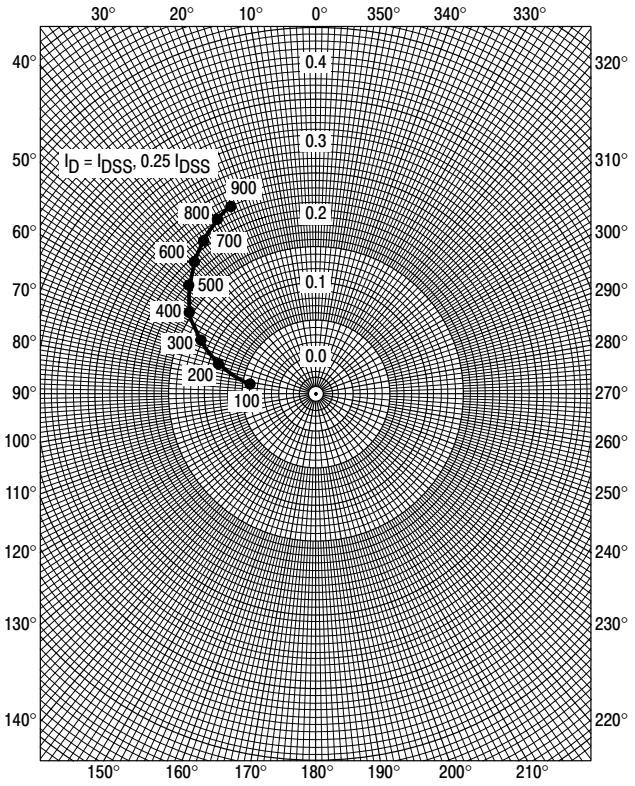



**Figure 7. $S_{12s}$**

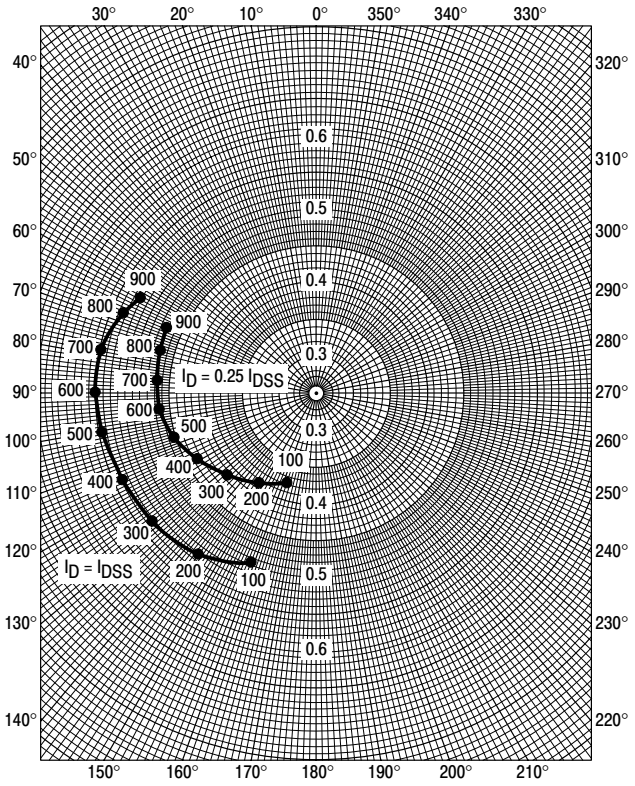



**Figure 8. $S_{21s}$**

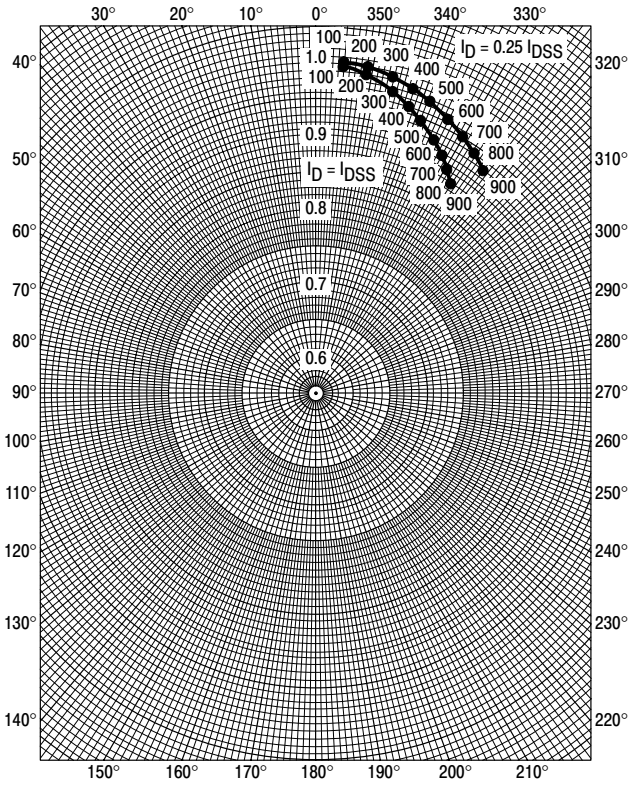



**Figure 9. $S_{22s}$**

## COMMON GATE CHARACTERISTICS

### ADMITTANCE PARAMETERS

($V_{DG}$ = 15 Vdc, $T_{channel}$ = 25°C)

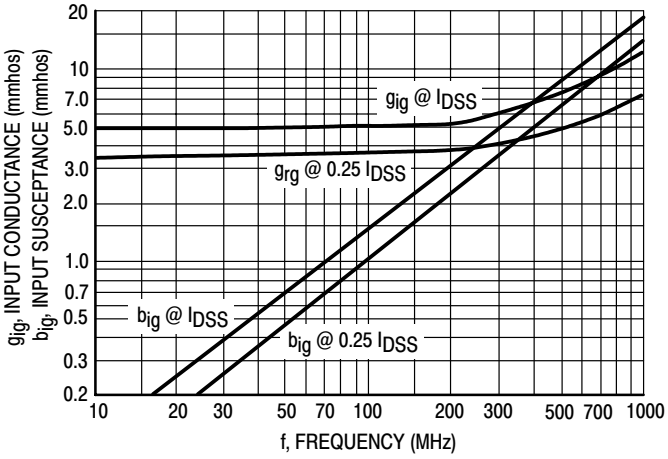



**Figure 10. Input Admittance ($y_{ig}$)**

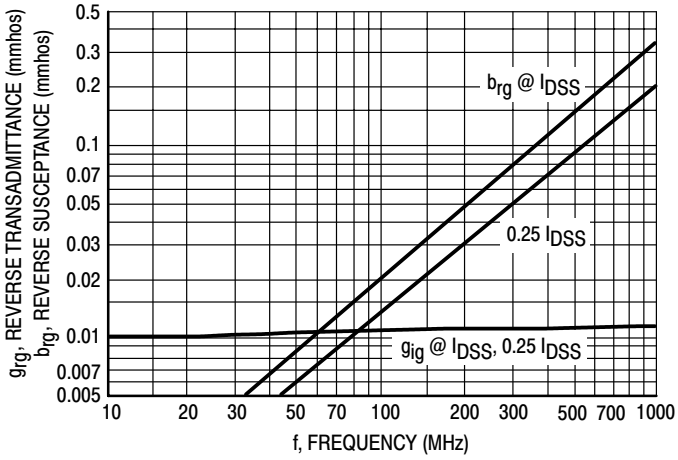



**Figure 11. Reverse Transfer Admittance ($y_{rg}$)**

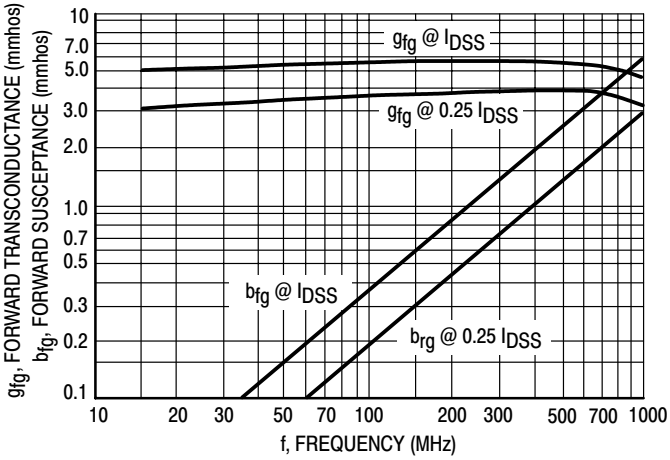



**Figure 12. Forward Transfer Admittance ($y_{fg}$)**

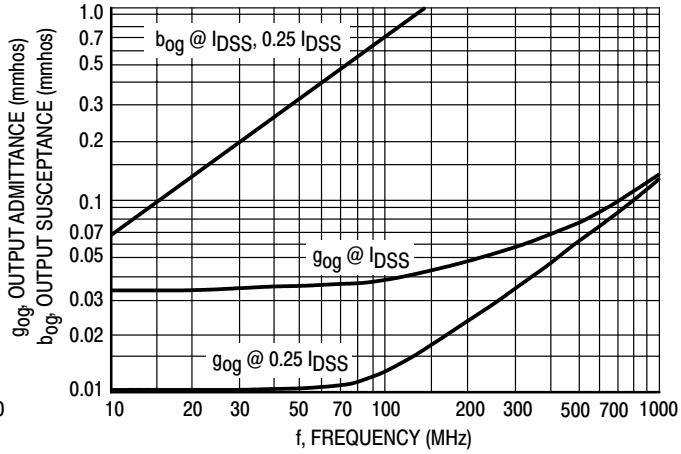



**Figure 13. Output Admittance ($y_{og}$)**

## COMMON GATE CHARACTERISTICS

### S–PARAMETERS

($V_{DS}$ = 15 Vdc, $T_{channel}$ = 25°C, Data Points in MHz)

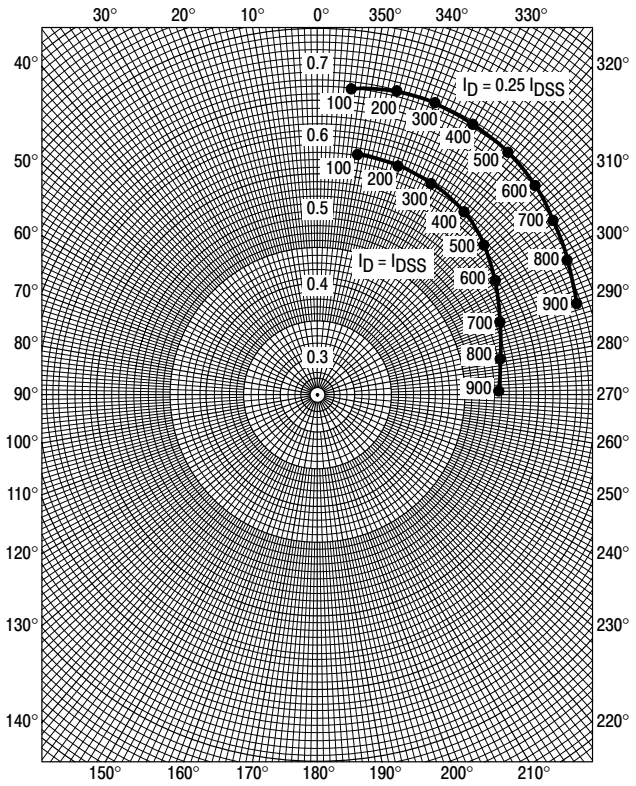



**Figure 14. $S_{11g}$**

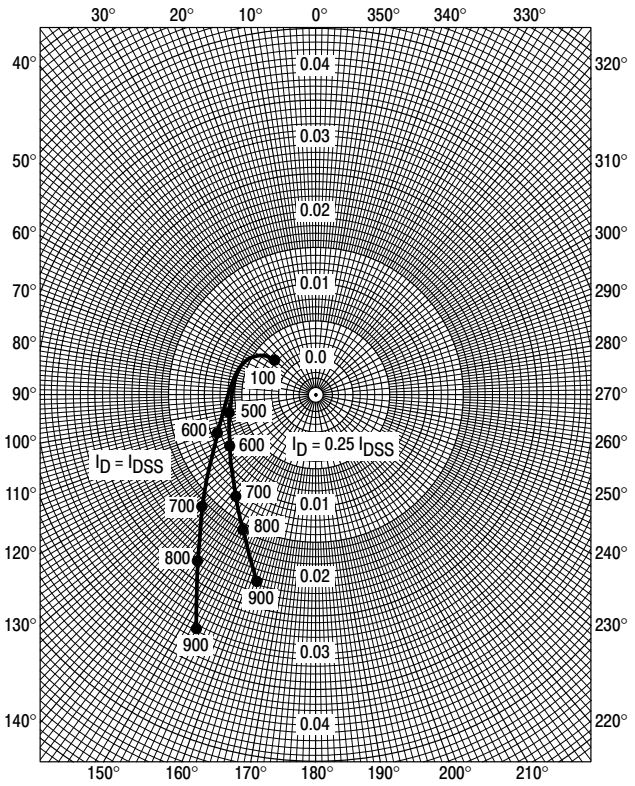



**Figure 15. $S_{12g}$**

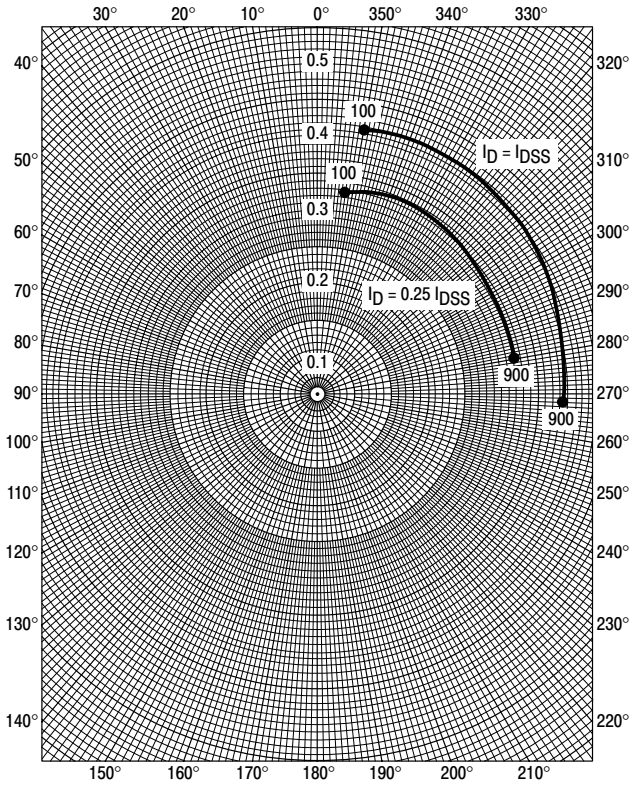



**Figure 16. $S_{21g}$**

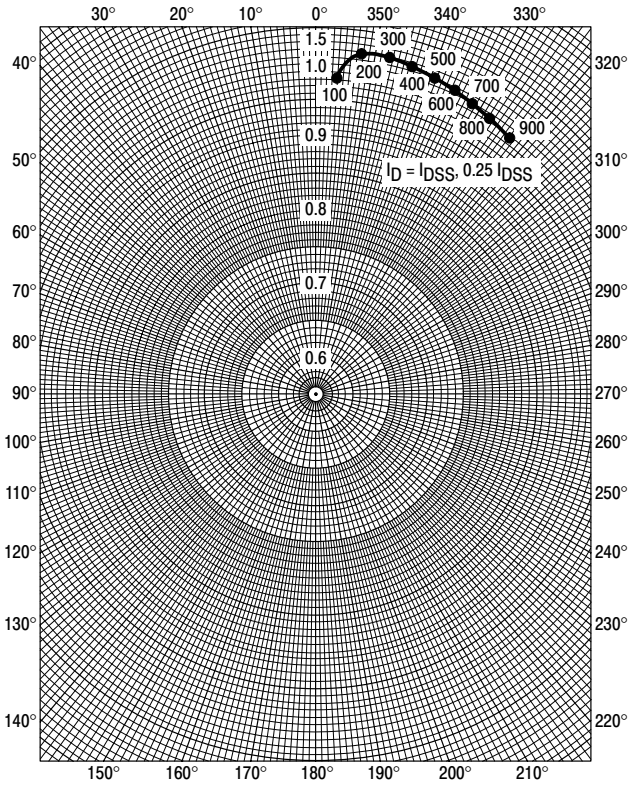
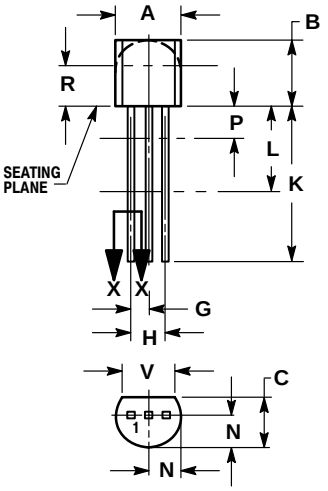
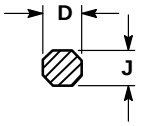



**Figure 17. $S_{22g}$**

## PACKAGE DIMENSIONS

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




SECTION X–X

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.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | 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:
PIN 1. DRAIN
2. SOURCE
3. GATE

# Notes

## PUBLICATION ORDERING INFORMATION

**Literature Fulfillment**:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
**Phone**: 303–675–2175 or 800–344–3860 Toll Free USA/Canada
**Fax**: 303–675–2176 or 800–344–3867 Toll Free USA/Canada
**Email**: ONlit@hibbertco.com

**N. American Technical Support**: 800–282–9855 Toll Free USA/Canada

**JAPAN**: ON Semiconductor, Japan Customer Focus Center
4–32–1 Nishi–Gotanda, Shinagawa–ku, Tokyo, Japan 141–0031
**Phone**: 81–3–5740–2700
**Email**: r14525@onsemi.com

**ON Semiconductor Website**: http://onsemi.com

For additional information, please contact your local
Sales Representative.