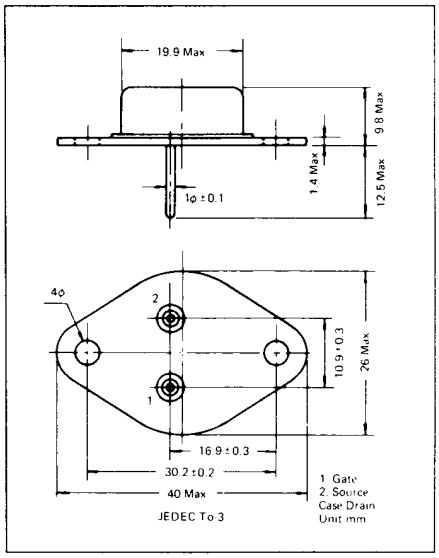
# 2SJ18

## Silicon P-Channel Junction V-FET

- オーディオパワーアンプ
- HiFi: Power Amplifiers
- Complementary to 2SK60




### 絶対最大定格 Absolute Maximum Ratings $T_a = 25°C$

| Characteristics | Symbol | 2SJ18 |
|---|---|---|
| Drain-to-Gate Voltage | $V_{DGO}$ | -170V |
| Source-to-Gate Voltage | $V_{SGO}$ | *1 |
| Drain Current | $I_D$ | 5A |
| Gate Current | $I_G$ | -0.5A |
| Total Power Dissipation | $P_T$ | 63W ($T_c = 25°C$) |
| Junction Temperature | $T_j$ | 120°C |
| Storage Temperature | $T_{stg}$ | -50—+150°C |

*1 Source-to-Gate Voltage $V_{SGO}$

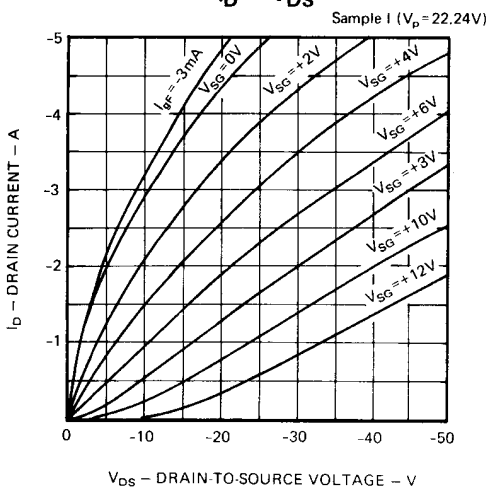
| | |
|---|---|
| 2SJ18-2, -3, -4 | -30V |
| -5 | -35V |
| -6 | -40V |
| -7 | -45V |

### 電気的特性 Electrical Characteristics $T_a = 25°C$

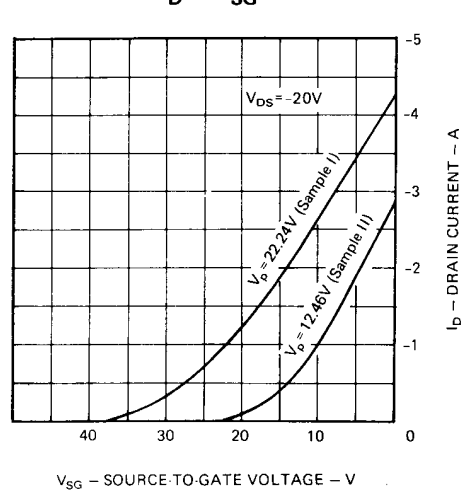
| Characteristics | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain Cutoff Current | $I_{DGO}$ | $V_{DG} = -100V$, $I_S = 0$ | | -0.1 | -100 | μA |
| Source Cutoff Current | $I_{SGO}$ | $V_{GS} = -30V$, $V_{DS} = 0V$ | | -0.1 | -100 | μA |
| Drain-to-Source On-State Voltage | $V_{on}$ | $I_G = -0.2A$, $I_D = -3A$, $t = 100$ ms | | | -10 | V |
| Pinch-off Voltage | $V_p$ | $V_{DS} = -60V$, $I_D = -100$ mA | 7.5 | 18 | 25 | V |
| Input Capacitance | $C_{iss}$ | $V_{GS} = 15V$, $V_{DS} = 0V$, $f = 1$ MHz | | 190 | | pF |
| Gain Bandwidth Product | $f_T$ | $V_{DS} = -20V$, $I_D = -0.5A$ | | 20 | | MHz |
| Voltage Amplification Ratio | $\mu$ | $V_{DS} = -20V$, $I_D = -1A$, $f = 1$ kHz | | 4 | | |
| Output Resistance | $r_D$ | $V_{DS} = -20V$, $I_D = -1A$, $f = 1$ kHz | | 16 | | Ω |
| Area of Safe Operation | ASO | $V_{DS} = -50V$, $t = 100$ ms, $T_c = 25°C$ | 2.5 | | | A |
| Junction-to-Case Thermal Resistance | $\theta_{j-c}$ | | | | 1.5 | °C/W |

# 2SJ18

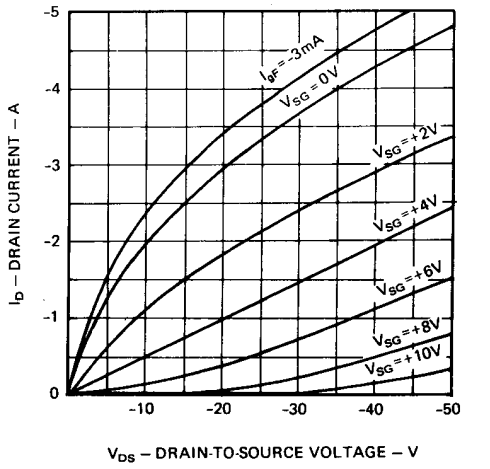
## $I_D - V_{DS}$



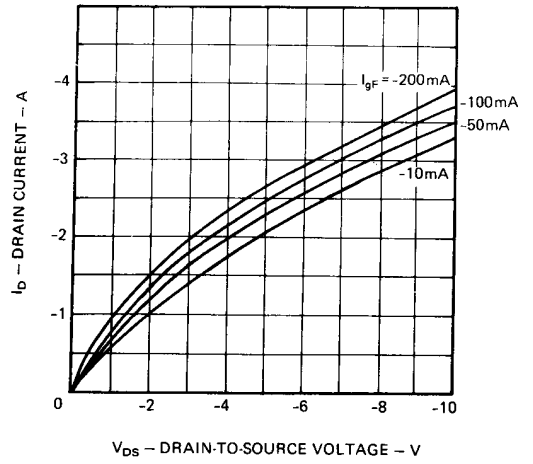

## $I_D - V_{SG}$



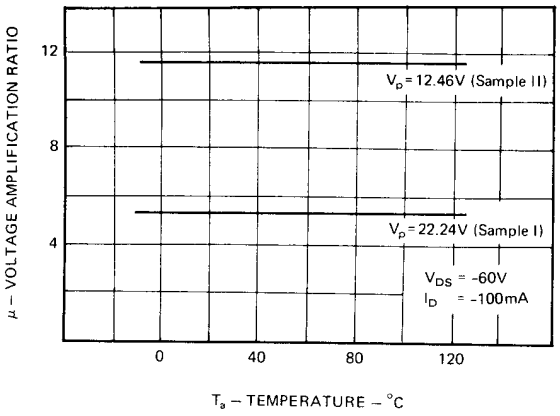

## $I_D - V_{DS}$ Sample II ($V_p$ = 12.46V)



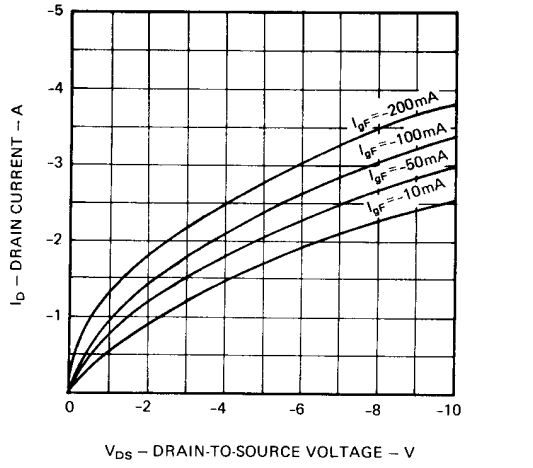

## $I_D - V_{DS}$



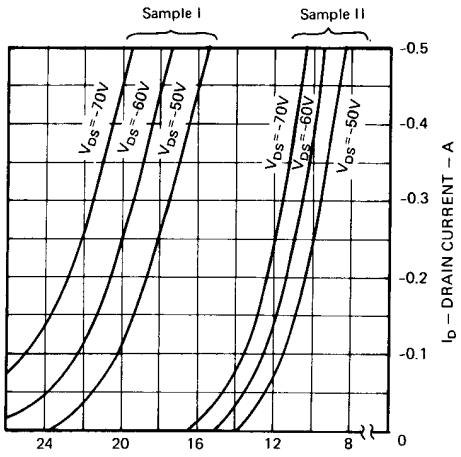

## $\mu - T_a$



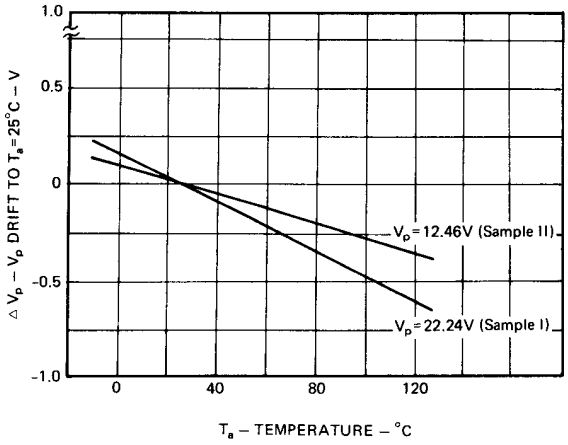

## $I_D - V_{DS}$



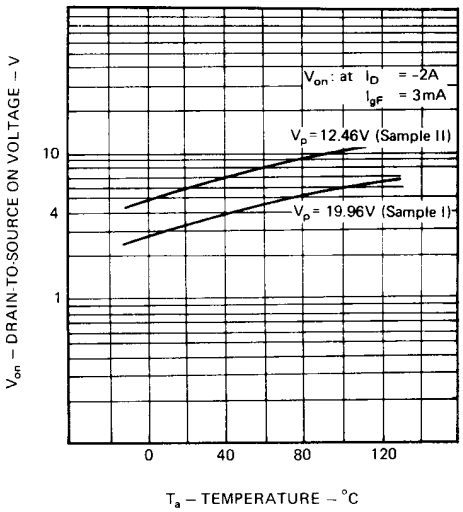
## $I_D - V_{SG}$



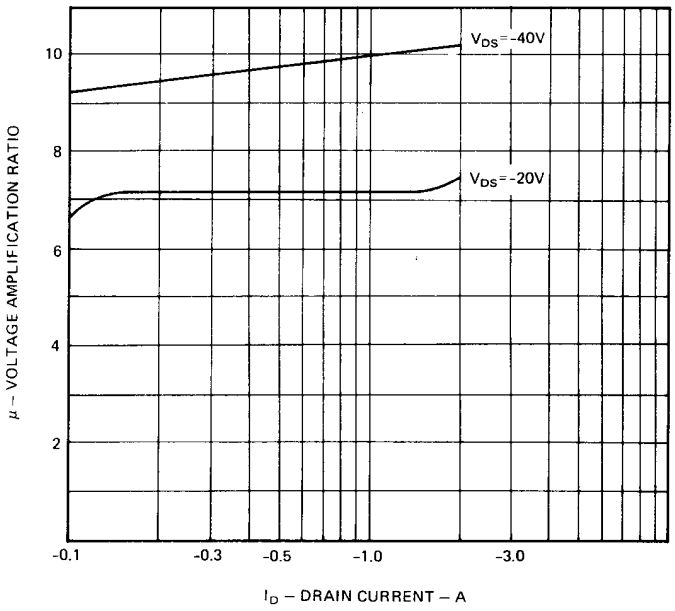

## $V_p - T_a$



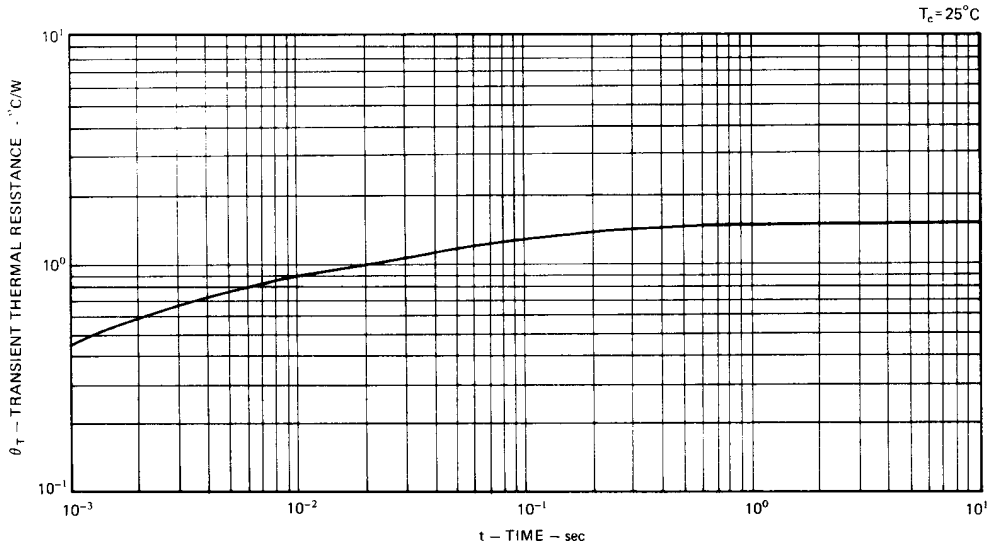

## $V_{on} - T_a$



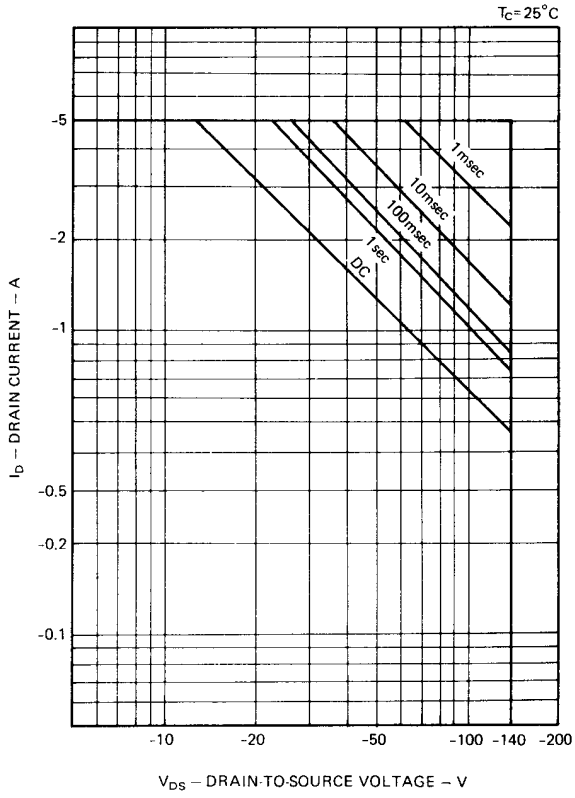

## $\mu - I_D$



## $\theta_T - t$


$T_c$=25°C
$10^1$
$10^0$
$10^{-1}$
$\theta_T$ – TRANSIENT THERMAL RESISTANCE – °C/W
$10^{-3}$
$10^{-2}$
$10^{-1}$
$10^0$
$10^1$
t – TIME – sec

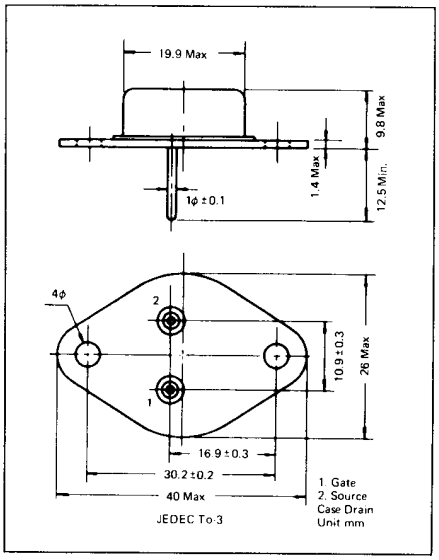
## ASO


$T_C$=25°C
-5
-2
-1
-0.5
-0.2
-0.1
$I_D$ – DRAIN CURRENT – A
1msec
10msec
100msec
1sec
DC
-10
-20
-50
-100
-140
-200
$V_{DS}$ – DRAIN-TO-SOURCE VOLTAGE – V

# 2SK60

## Silicon N-Channel Junction V-FET

- オーディオパワーアンプ
- HiFi: Power Amplifiers
- Complementary to 2SJ18




### 絶対最大定格 Absolute Maximum Ratings $T_a = 25°C$

| Characteristics | Symbol | 2SK60 |
|---|---|---|
| Drain-to-Gate Voltage | $V_{DGO}$ | 170V |
| Source-to-Gate Voltage | $V_{SGO}$ | *1 |
| Drain Current | $I_D$ | 5A |
| Gate Current | $I_G$ | 0.5A |
| Total Power Dissipation | $P_T$ | 63W ($T_c = 25°C$) |
| Junction Temperature | $T_j$ | 120°C |
| Storage Temperature | $T_{stg}$ | -50–+150°C |

*1 Source-to-Gate Voltage $V_{SGO}$

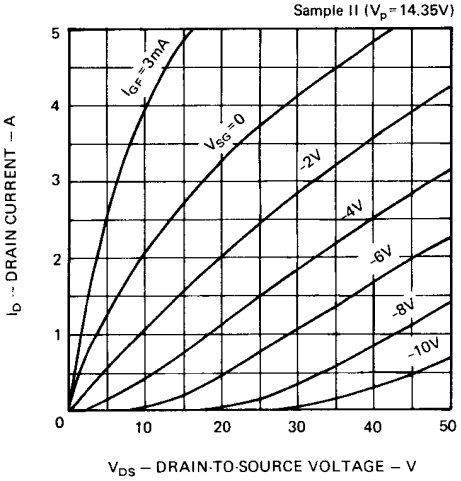
| | |
|---|---|
| 2SK60-2, -3, -4 | -30V |
| -5 | -35V |
| -6 | -40V |
| -7 | -45V |
| -8 | -50V |

### 電気的特性 Electrical Characteristics $T_a = 25°C$

| Characteristics | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain Cutoff Current | $I_{DGO}$ | $V_{DG} = 100V$, $I_S = 0$ | | 0.1 | 100 | μA |
| Source Cutoff Current | $I_{SGO}$ | $V_{GS} = 30V$, $I_D = 0$ | | 0.1 | 100 | μA |
| Drain-to-Source On-State Voltage | $V_{on}$ | $I_G = 0.2A$, $I_D = 3A$, $t = 100ms$ | | | 10 | V |
| Pinch-off Voltage | $V_p$ | $V_{DS} = 60V$, $I_D = 100mA$ | -7.5 | -18 | -25 | V |
| Input Capacitance | $C_{iss}$ | $V_{DS} = -15V$, $V_{DS} = 0V$, $f = 1MHz$ | | 190 | | pF |
| Gain Bandwidth Product | $f_T$ | $V_{DS} = 20V$, $I_D = 0.5A$ | | 20 | | MHz |
| Voltage Amplification Ratio | $\mu$ | $V_{DS} = 20V$, $I_D = 1A$, $f = 1kHz$ | | 4 | | |
| Output Resistance | $r_D$ | $V_{DS} = 20V$, $I_D = 1A$, $f = 1kHz$ | | 16 | | Ω |
| Area of Safe Operation | ASO | $V_{DS} = 50V$, $t = 100ms$, $T_c = 25°C$ | 2.5 | | | A |
| Junction-to-Case Thermal Resistance | $\theta_{j-c}$ | | | | 1.5 | °C/W |

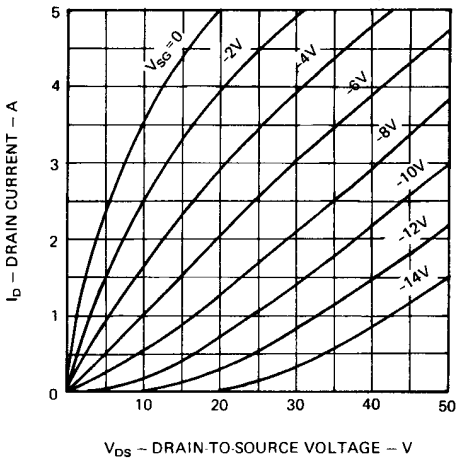
## $I_D - V_{DS}$

Sample II ($V_p$=14.35V)



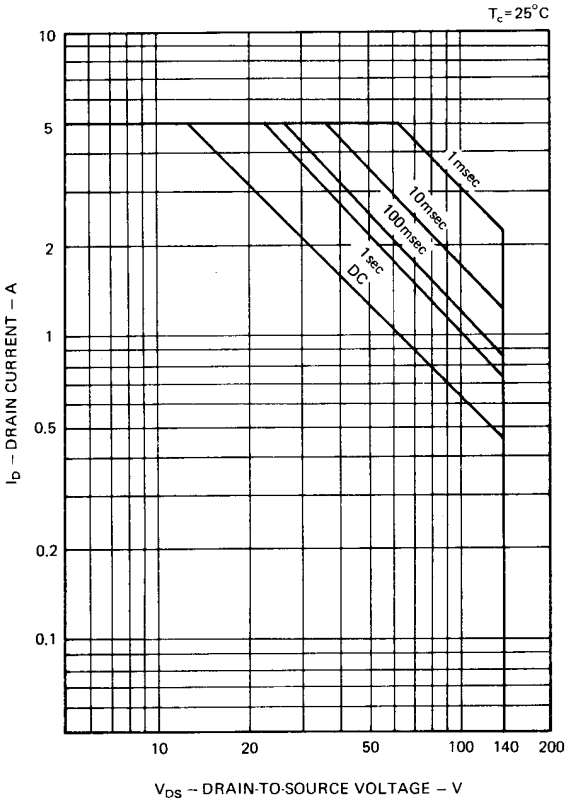

## $I_D - V_{DS}$

Sample I ($V_p$=22.80V)



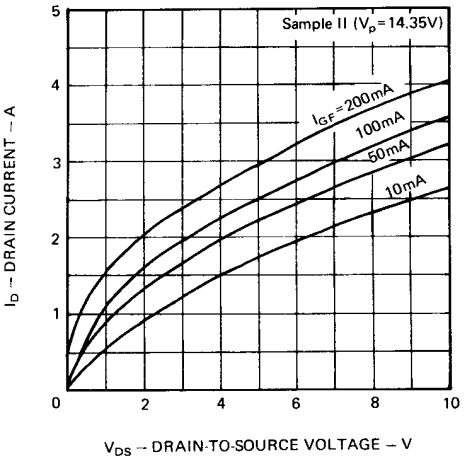

## ASO

$T_c$=25°C



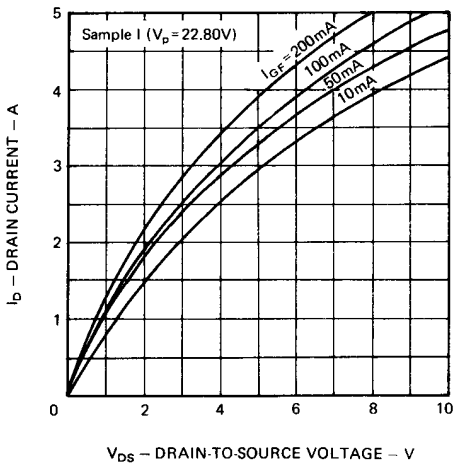

## $I_D - V_{DS}$

Sample II ($V_p$=14.35V)

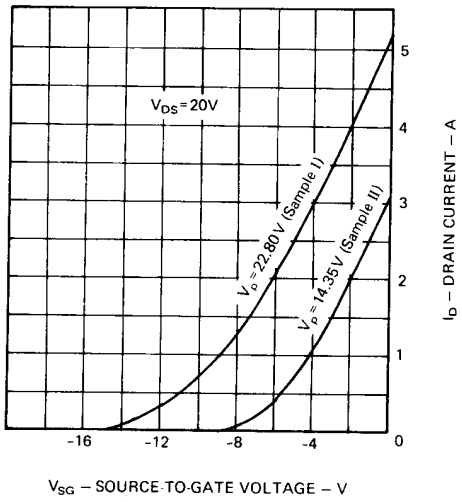



## $I_D - V_{DS}$

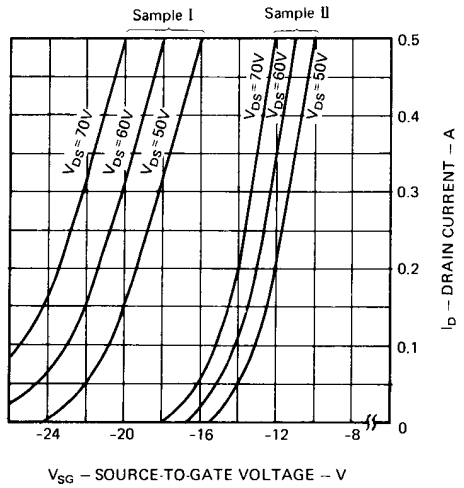
Sample I ($V_p$=22.80V)



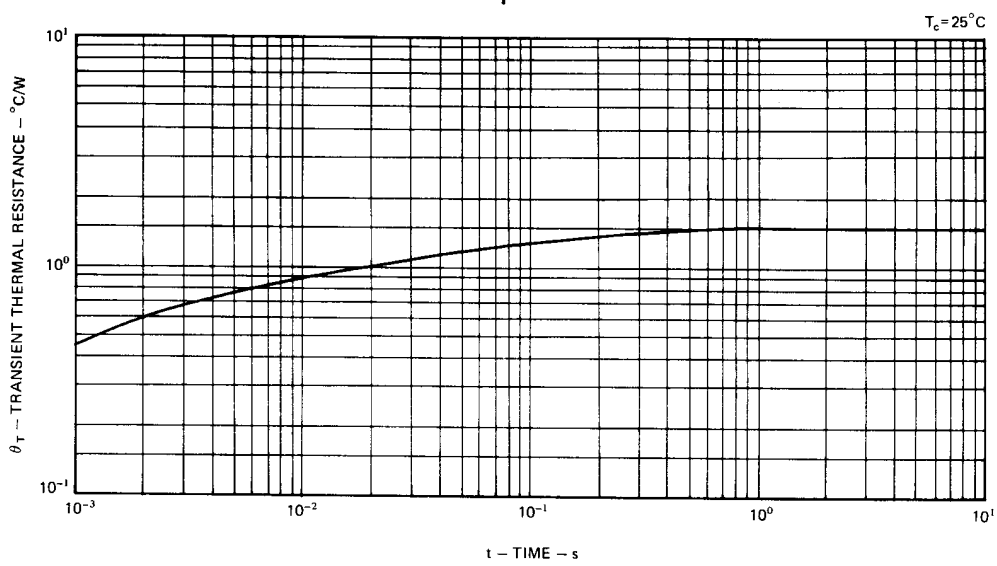
$I_D - V_{SG}$




$I_D - V_{SG}$

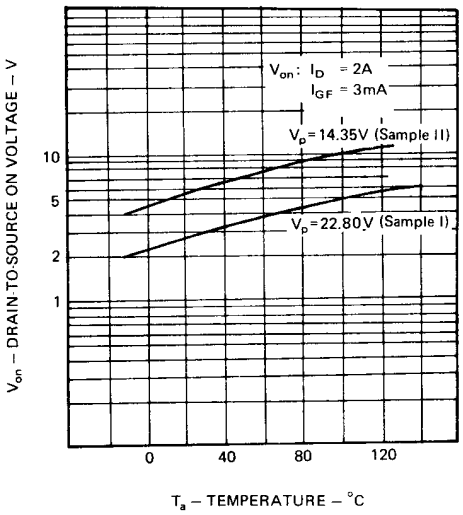



$\theta_T - t$

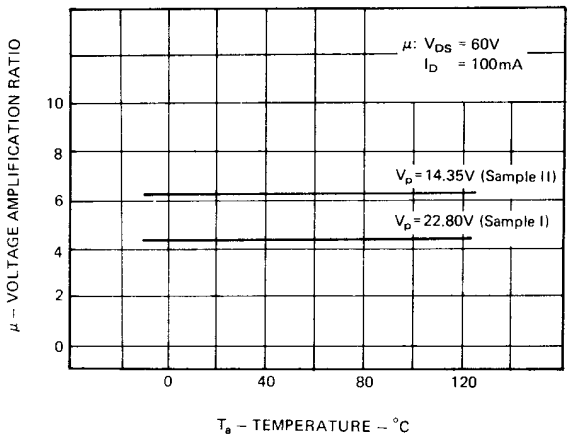



4

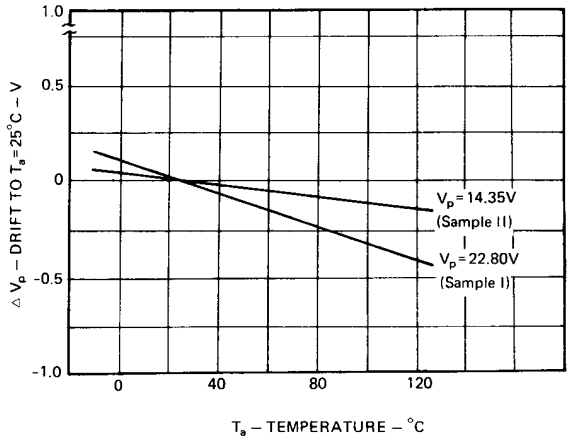
## $V_{on} - T_a$



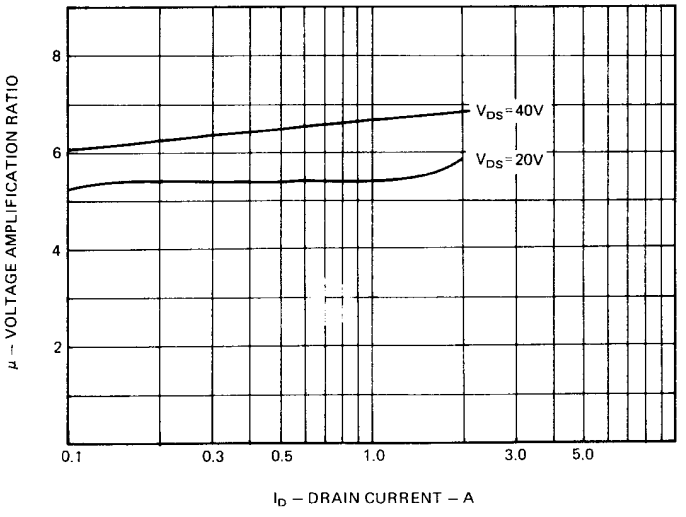

## $\mu - T_a$




## $\triangle V_p - T_a$



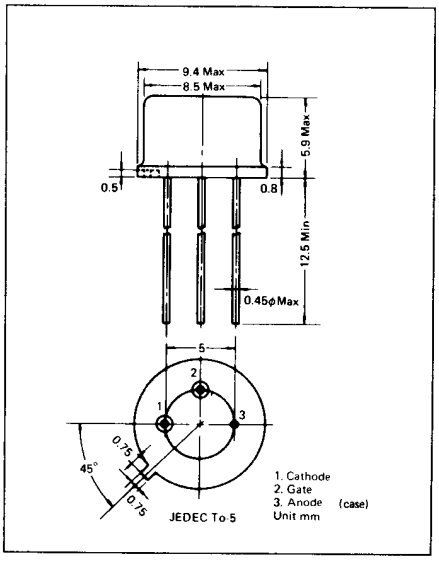

## $\mu - I_D$



# 2SK63

## Silicon N-Channel Junction V-FET

- 小信号電圧増幅
- High Voltage
- Mold Type: 2SK79




### 絶対最大定格 Absolute Maximum Ratings $T_a = 25°C$

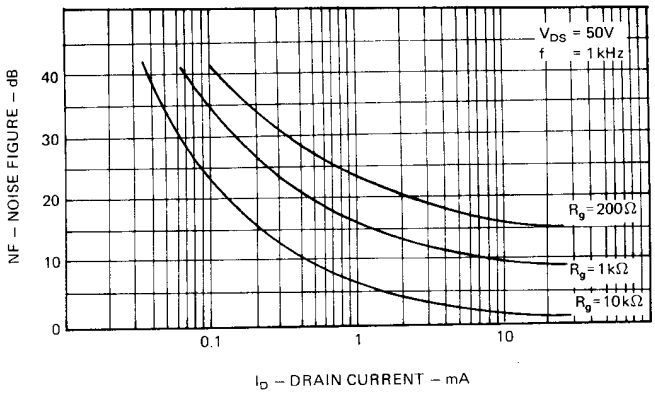
| Characteristics | Symbol | 2SK63 |
|---|---|---|
| Drain-to-Gate Voltage | $V_{DGO}$ | 120 V |
| Source-to-Gate Voltage | $V_{SGO}$ | 10 V |
| Drain Current | $I_D$ | 200 mA |
| Gate Current | $I_G$ | 20 mA |
| Total Power Dissipation | $P_T$ | 470 mW |
| Junction Temperature | $T_j$ | 120°C |
| Storage Temperature | $T_{stg}$ | -50—+150°C |

### 電気的特性 Electrical Characteristics $T_a = 25°C$

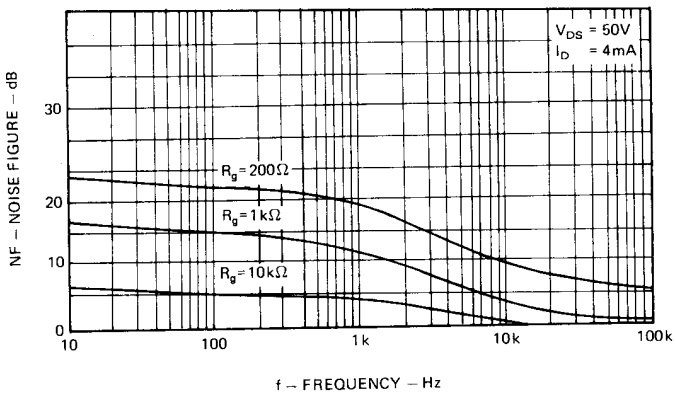
| Characteristics | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain-to-Gate Voltage | $V_{DGO}$ | $I_D = 0.1$ mA | 120 | | | V |
| Source-to-Gate Voltage | $V_{SGO}$ | $I_S = 0.1$ mA | 10 | | | V |
| Drain Cutoff Current | $I_{DGO}$ | $V_{DG} = 50$ V, $I_S = 0$ A | | | 200 | nA |
| Gate Cutoff Current | $I_{GSS}$ | $V_{GS} = 6$ V, $V_{DS} = 0$ V | | | 200 | nA |
| Drain-to-Source On-State Voltage | $V_{on}$ | $V_{GS} = 0.3$ V, $I_D = 7$ mA | | | 10 | V |
| Pinch-off Voltage | $V_p$ | $V_{DS} = 100$ V, $I_D = 300\mu$A | | -4.5 | -9.5 | V |
| Voltage Amplification Ratio | $\mu$ | $V_{DS} = 50$ V, $I_D = 4$ mA, f = 1 kHz | 15 | 30 | | |
| Forward Transfer Conductance | $g_m$ | $V_{DS} = 50$ V, $I_D = 4$ mA, f = 1 kHz | | 14 | | m℧ |
| Input Capacitance | $C_{ip}$ | $V_{DS} = 50$ V, $I_D = 4$ mA, f = 1 MHz | | 16 | | pF |
| Output Impedance | $r_p$ | $V_{DS} = 50$ V, $I_D = 4$ mA, f = 1 MHz | | 2 | | kΩ |
| | $C_p$ | | | 4 | | pF |
| Junction-to-Ambient Thermal Resistance | $\theta_{j\text{-}a}$ | | | | 200 | °C/W |
| Noise Figure | NF | $V_{DS} = 50$ V, $I_D = 4$ mA, $R_g = 500$ kΩ, f = 10 Hz | | | 30 | dB |

4

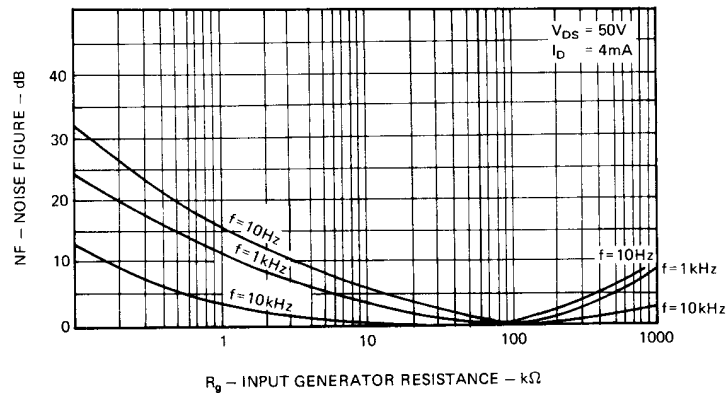
## NF – $I_D$



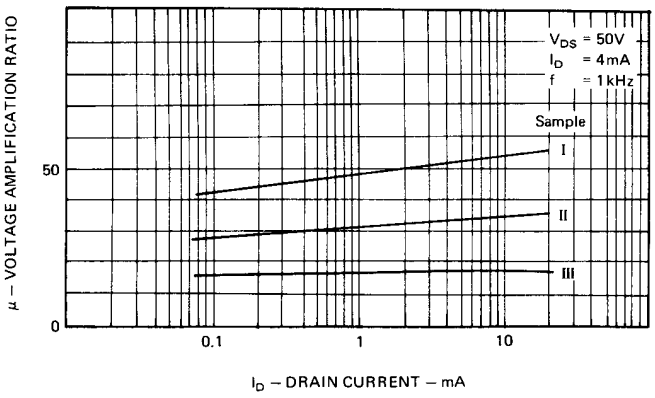

## NF – f



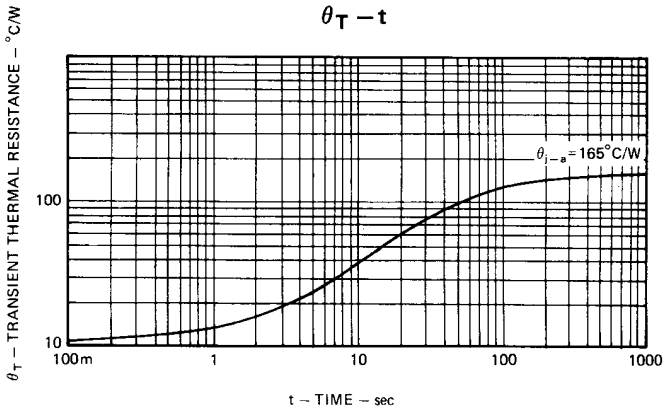

## NF – $R_g$



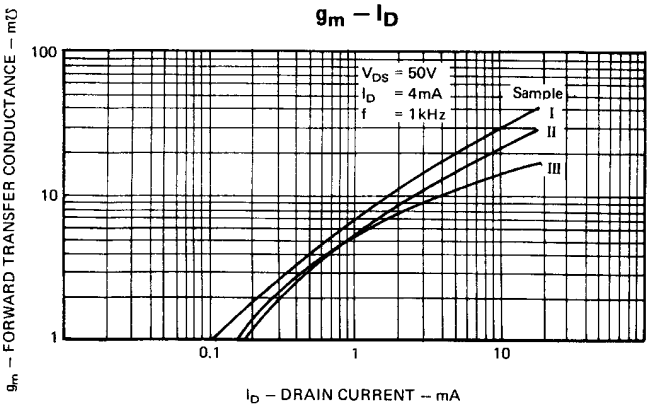
## $\mu - I_D$



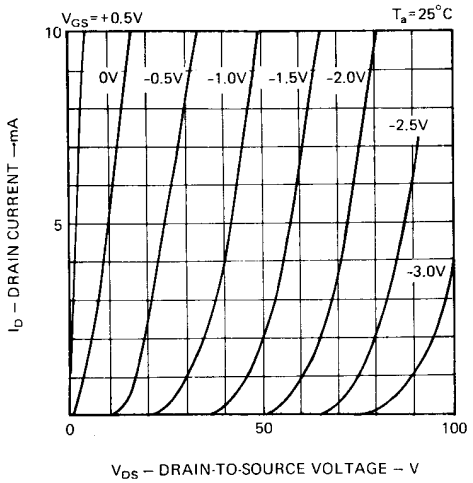

## $\theta_T - t$



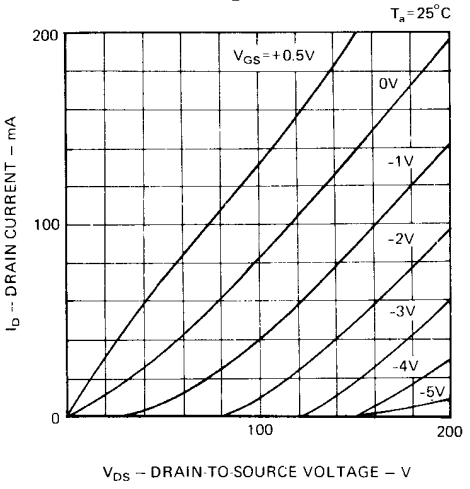

## $g_m - I_D$



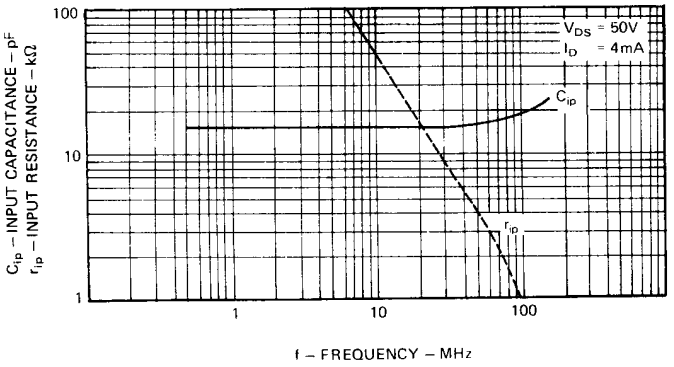
## $I_D - V_{DS}$



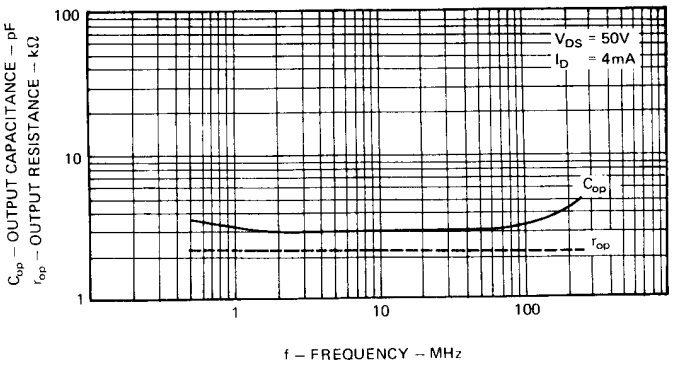

## $I_D - V_{DS}$



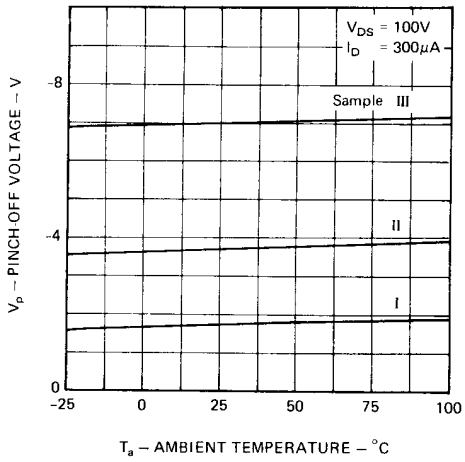

## $Y_{11S} - f$



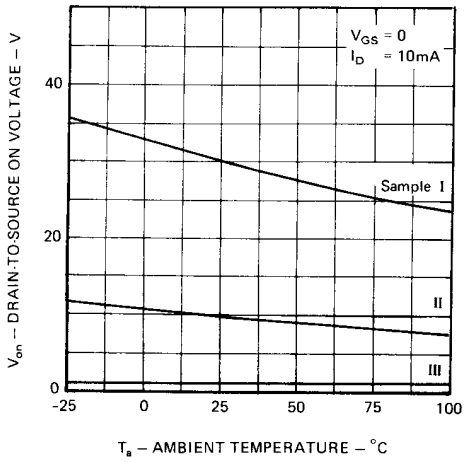

## $Y_{22S} - f$



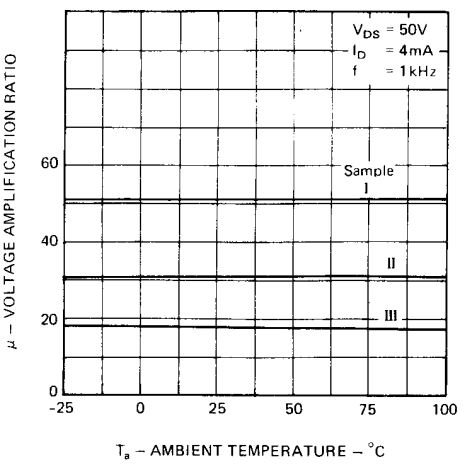
## $V_p - T_a$



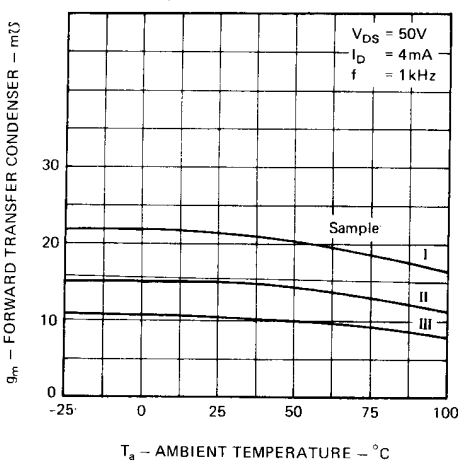

## $V_{ON} - T_a$




## $\mu - T_a$

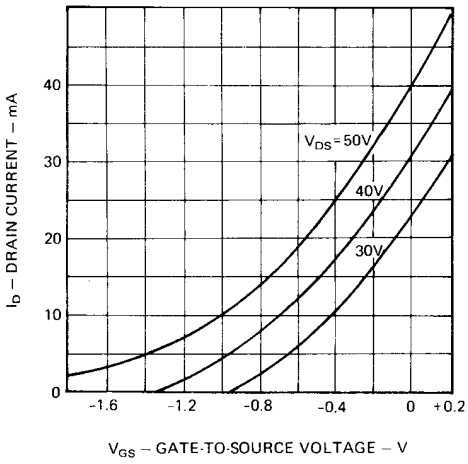



## $g_m - T_a$

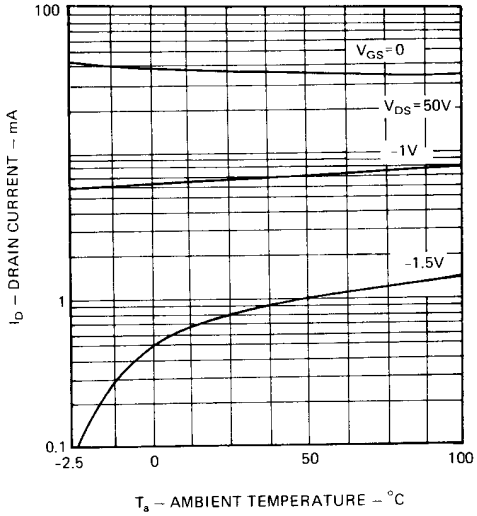



4

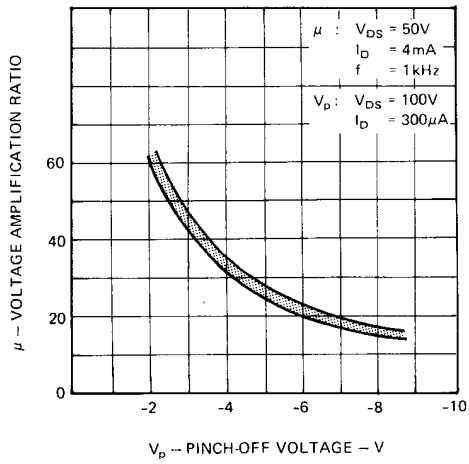
## $I_D - V_{GS}$



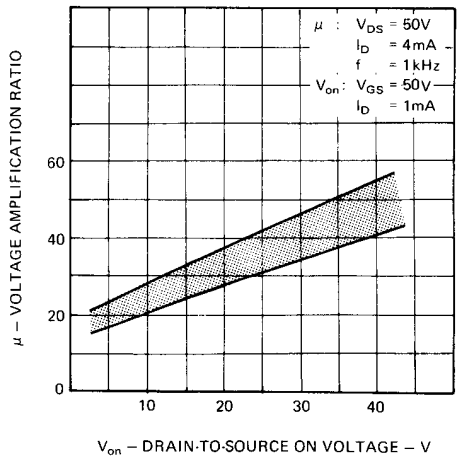

## $I_D - T_a$




## $\mu - V_p$



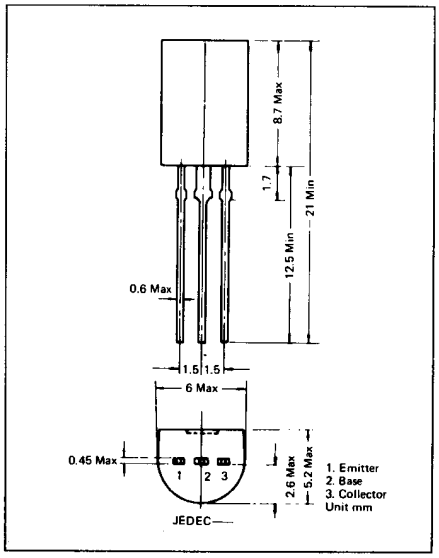

## $\mu - V_{on}$



# 2SK79

## Silicon N-Channel Junction V-FET

- 小信号電圧増幅
- High Voltage Amplifiers




### 絶対最大定格 Absolute Maximum Ratings $T_a = 25°C$

| Characteristics | Symbol | 2SK79 |
|---|---|---|
| Drain-to-Gate Voltage | $V_{DGO}$ | 120 V |
| Source-to-Gate Voltage | $V_{SGO}$ | 10 V |
| Drain Current | $I_D$ | 200 mA |
| Gate Current | $I_G$ | 20 mA |
| Total Power Dissipation | $P_T$ | 750 mW |
| Junction Temperature | $T_j$ | 120°C |
| Storage Temperature | $T_{stg}$ | -50–+150°C |

### 電気的特性 Electrical Characteristics $T_a = 25°C$

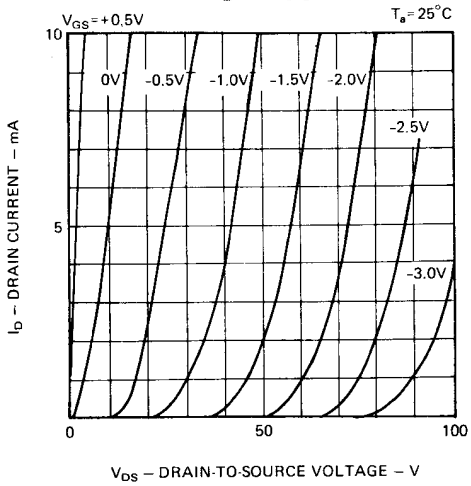
| Characteristics | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain-to-Gate Voltage | $V_{DGO}$ | $I_D = 0.1$ mA | 120 | | | V |
| Source-to-Gate Voltage | $V_{SGO}$ | $I_S = 0.1$ mA | 10 | | | V |
| Drain Cutoff Current | $I_{DGO}$ | $V_{DG} = 50$ V, $I_S = 0$ A | | | 200 | nA |
| Gate Cutoff Current | $I_{GSS}$ | $V_{GS} = 6$ V, $V_{DS} = 0$ V | | | 200 | nA |
| Drain-to-Source On-State Voltage | $V_{on}$ | $V_{GS} = 0.3$ V, $I_D = 7$ mA | | | 10 | V |
| Pinch-off Voltage | $V_p$ | $V_{DS} = 100$ V, $I_D = 300\mu$A | | -4.5 | -9.5 | V |
| Voltage Amplification Ratio | $\mu$ | $V_{DS} = 50$ V, $I_D = 4$ mA, f = 1 kHz | 15 | 30 | | |
| Forward Transfer Conductance | $g_m$ | $V_{DS} = 50$ V, $I_D = 4$ mA, f = 1 kHz | | 14 | | m℧ |
| Input Capacitance | $C_{ip}$ | $V_{DS} = 50$ V, $I_D = 4$ mA, f = 1 MHz | | 16 | | pF |
| Output Capacitance | $r_p$ | $V_{DS} = 50$ V, $I_D = 4$ mA, f = 1 MHz | | 2 | | kΩ |
| | $C_p$ | | | 4 | | pF |
| Junction-to-Ambient Thermal Resistance | $\theta_{j\text{-}a}$ | | | | 126 | °C/W |
| Noise Figure | NF | $V_{DS} = 50$ V, $I_D = 4$ mA, $R_g = 500$ kΩ, f = 10 Hz | | | 30 | dB |

4

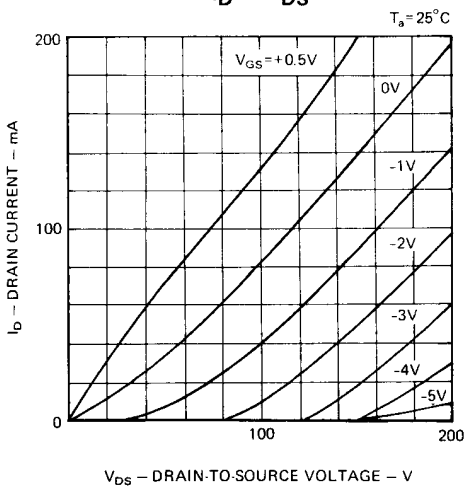
### 規格細分 Classifications

| Rank | $\mu$ ($V_{DS}$ = 50 V, $I_D$ = 4 mA) |
|---|---|
| 1 | 15–25 |
| 2 | 21–36 |
| 3 | 30–50 |
| 4 | 42–72 |
| 5 | 60– |

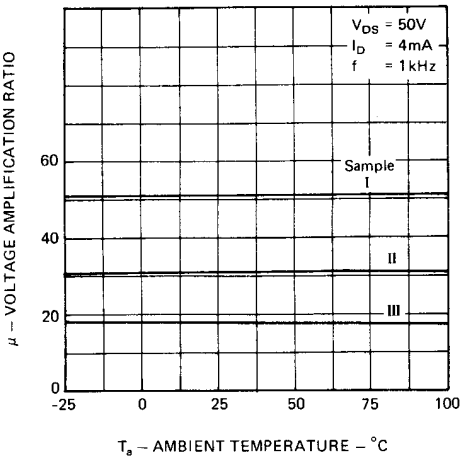
**$I_D - V_{DS}$**



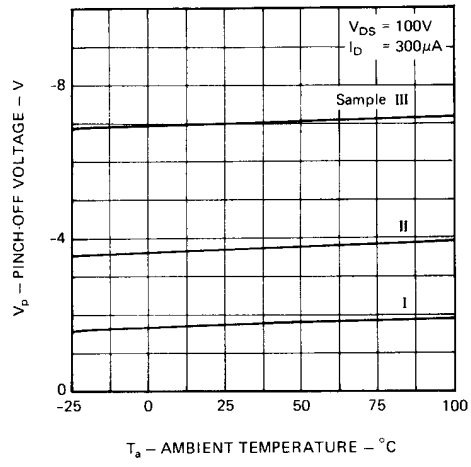

**$I_D - V_{DS}$**



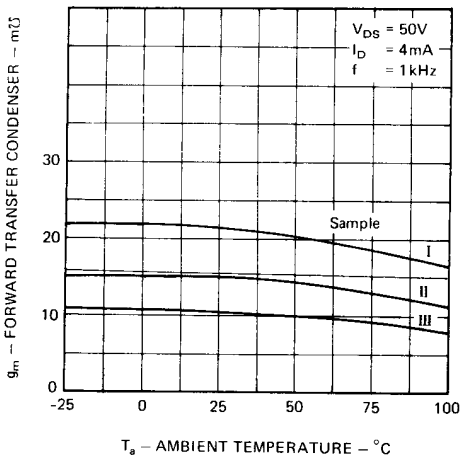

**$\mu - T_a$**



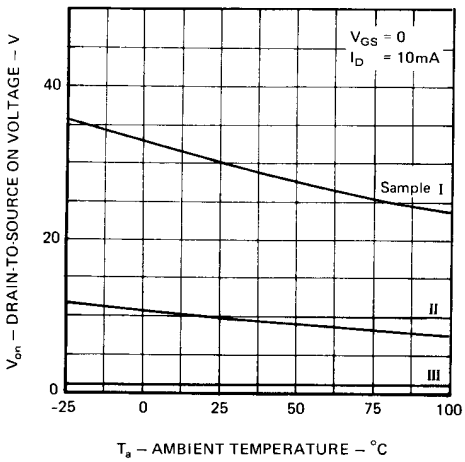

**$V_p - T_a$**



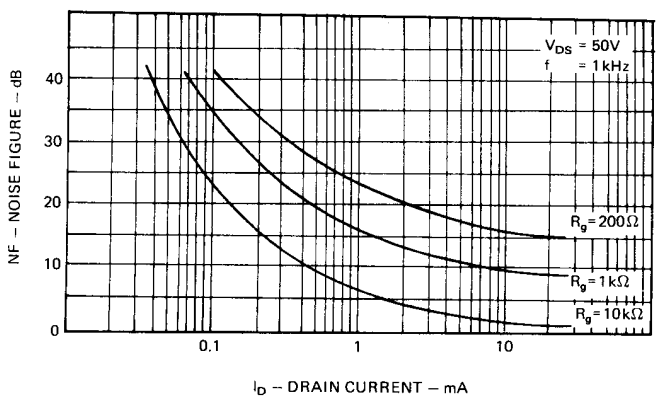
## $g_m - T_a$



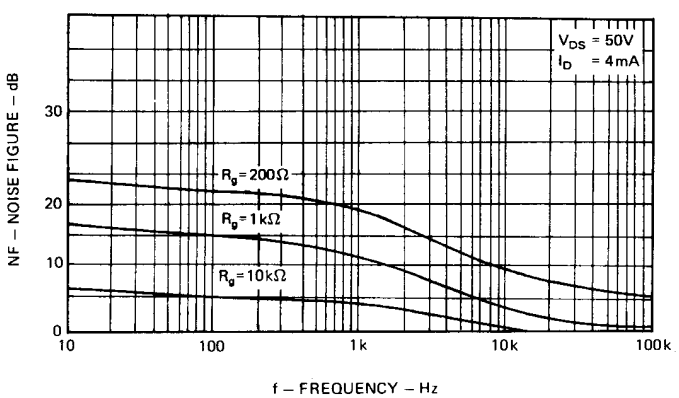

## $V_{on} - T_a$



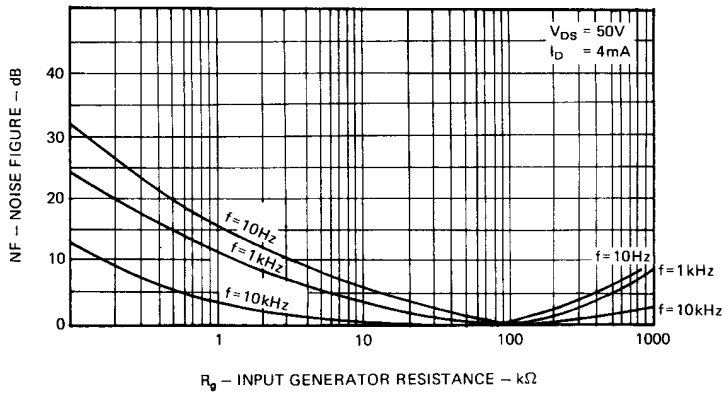

## $NF - I_D$



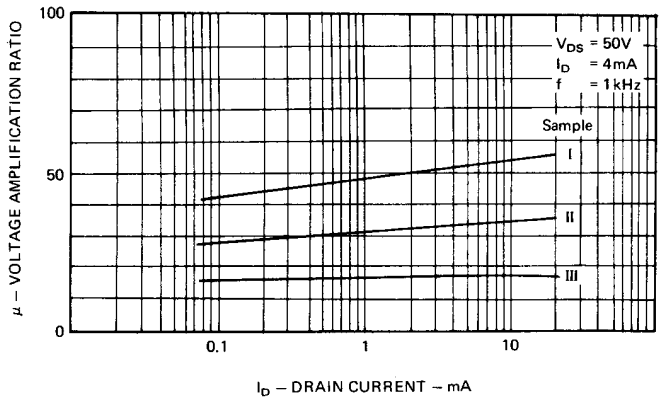

## $NF - f$



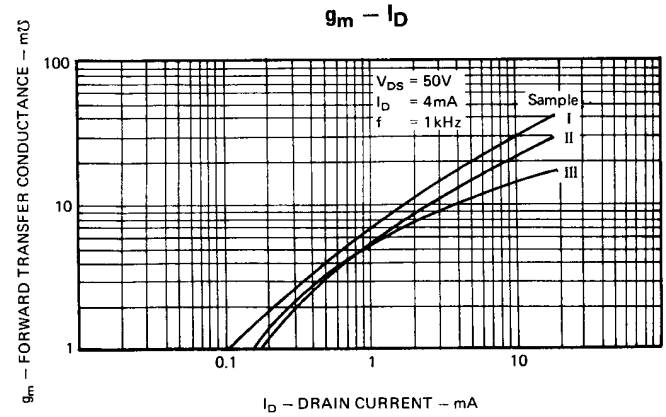
## NF – $R_g$



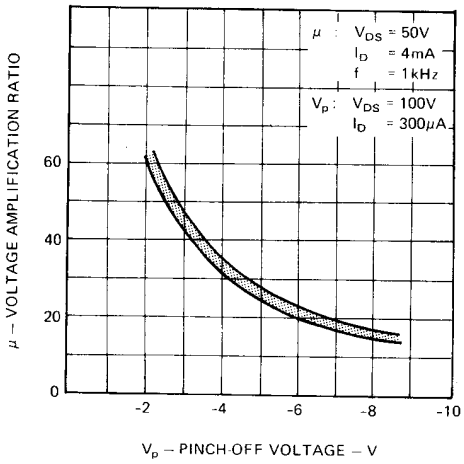

## $\mu$ – $I_D$



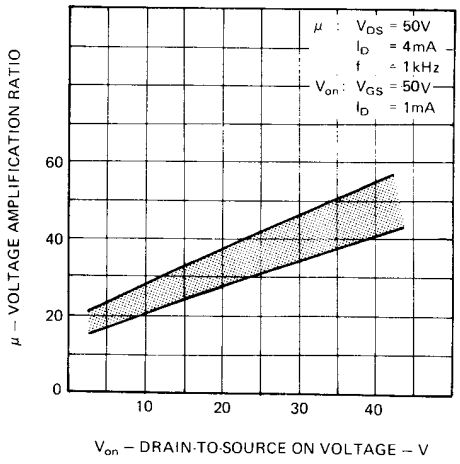

## $g_m$ – $I_D$



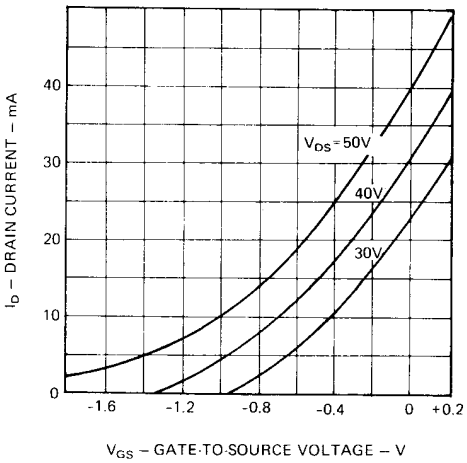
## $\mu - V_p$



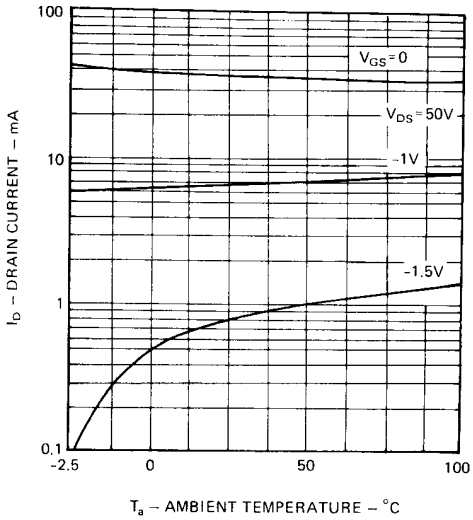

## $\mu - V_{on}$




## $I_D - V_{GS}$

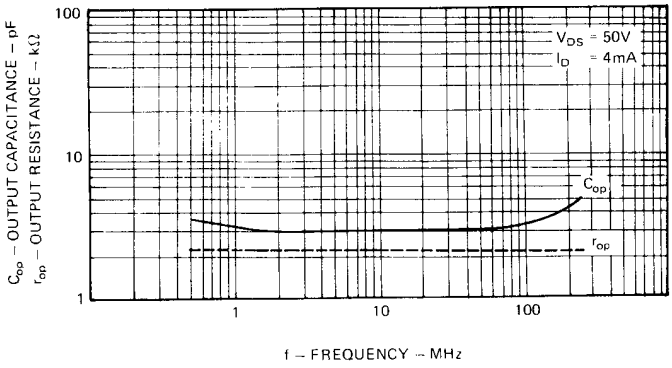



## $I_D - T_a$

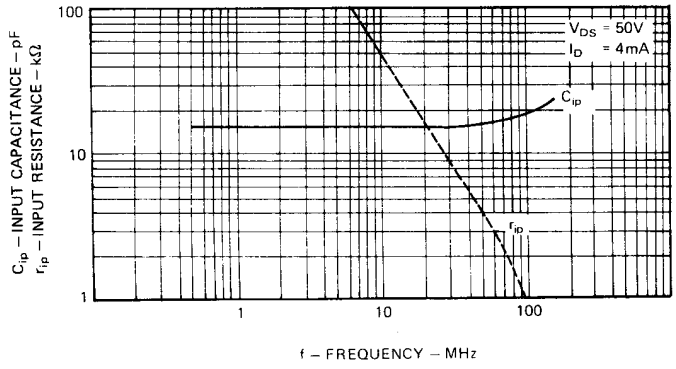



4

## $Y_{22S} - f$


100
10
1
1
10
100
$V_{DS}$ = 50V
$I_D$ = 4mA
$C_{op}$
$r_{op}$
$C_{op}$ – OUTPUT CAPACITANCE – pF
$r_{op}$ – OUTPUT RESISTANCE – kΩ
f – FREQUENCY – MHz

## $Y_{11S} - f$


100
10
1
1
10
100
$V_{DS}$ = 50V
$I_D$ = 4mA
$C_{ip}$
$r_{ip}$
$C_{ip}$ – INPUT CAPACITANCE – pF
$r_{ip}$ – INPUT RESISTANCE – kΩ
f – FREQUENCY – MHz