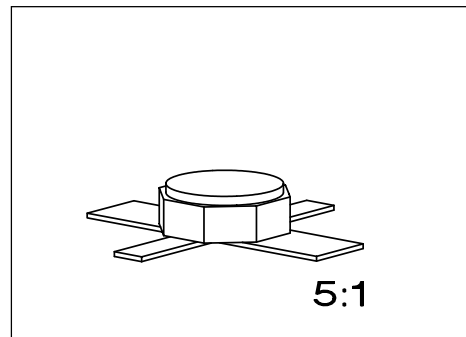


GaAs FET

CFY 25

- Low noise
- High gain
- For front-end amplifiers
- Ion-implanted planar structure
- All gold metallization



ESD: Electrostatic discharge sensitive device, observe handling precautions!

| Type | Marking | Ordering Code (tape and reel) | Pin Configuration | | | | Package ¹⁾ |
|-----------|---------|----------------------------------|-------------------|---|---|---|-----------------------|
| | | | 1 | 2 | 3 | 4 | |
| CFY 25-17 | C 5 | Q62703-F106 | D | S | G | S | Micro-X |
| CFY 25-20 | C 6 | Q62703-F107 | | | | | |
| CFY 25-23 | C 7 | Q62703-F108 | | | | | |

Maximum Ratings

| Parameter | Symbol | Values | Unit |
|--|-----------|----------------|------------------|
| Drain-source voltage | V_{DS} | 5 | V |
| Drain-gate voltage | V_{DG} | 7 | |
| Gate-source voltage | V_{GS} | - 5 ... + 0 | |
| Drain current | I_D | 80 | mA |
| Total power dissipation, $T_S \leq 56 \text{ }^\circ\text{C}^2)$ | P_{tot} | 250 | mW |
| Channel temperature | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage temperature range | T_{stg} | - 65 ... + 150 | |

Thermal Resistance

| | | | |
|---|---------------|-----|-----|
| Channel - soldering point ²⁾ | $R_{th\ chS}$ | 375 | K/W |
|---|---------------|-----|-----|

1) For detailed information see chapter Package Outlines.

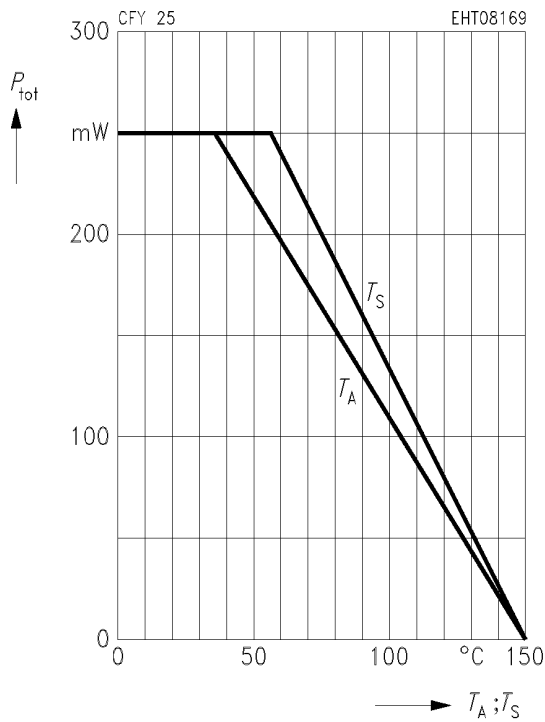
2) T_S is measured on the source lead at the soldering point to the pcb.

Electrical Characteristics

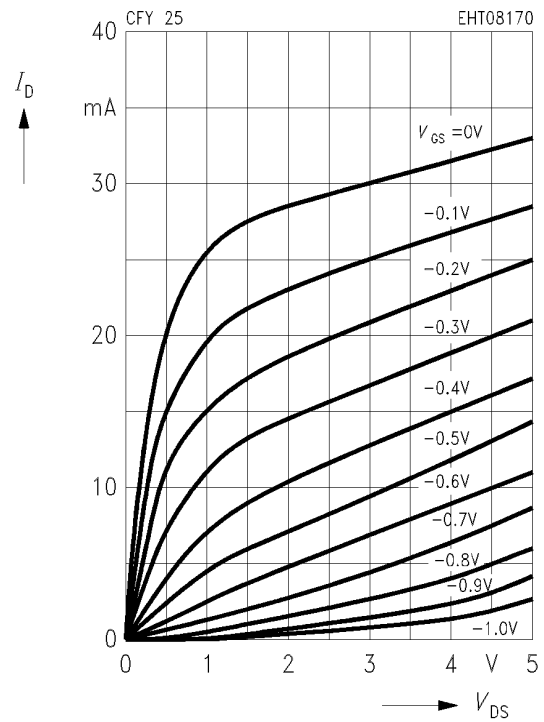
at $T_A = 25\text{ }^\circ\text{C}$, unless otherwise specified.

| Parameter | Symbol | Values | | | Unit |
|--|-----------|--------|-------|-------|---------------|
| | | min. | typ. | max. | |
| Drain-source saturation current $V_{DS} = 3\text{ V}, V_{GS} = 0$ | I_{DSS} | 15 | 30 | 60 | mA |
| Pinch-off voltage $I_D = 1\text{ mA}, V_{DS} = 3\text{ V}$ | V_p | - 0.3 | - 1.0 | - 3.0 | V |
| Gate leakage current $I_D = 15\text{ mA}, V_{DS} = 3\text{ V}$ | I_G | - | 0.1 | 2 | μA |
| Transconductance $I_D = 15\text{ mA}, V_{DS} = 3\text{ V}$ | g_m | 30 | 40 | - | mS |
| Noise figure $I_{DS} = 15\text{ mA}, V_{DS} = 3\text{ V}, f = 12\text{ GHz}$ | F | | | | dB |
| CFY 25-17 | - | 1.6 | 1.7 | | |
| CFY 25-20 | - | 1.9 | 2.0 | | |
| CFY 25-23 | - | 2.2 | 2.3 | | |
| Associated gain $I_{DS} = 15\text{ mA}, V_{DS} = 3\text{ V}, f = 12\text{ GHz}$ | G_a | | | | |
| CFY 25-17 | 9 | 9.5 | - | | |
| CFY 25-20 | 8.5 | 9 | - | | |
| CFY 25-23 | 8.5 | 9 | - | | |

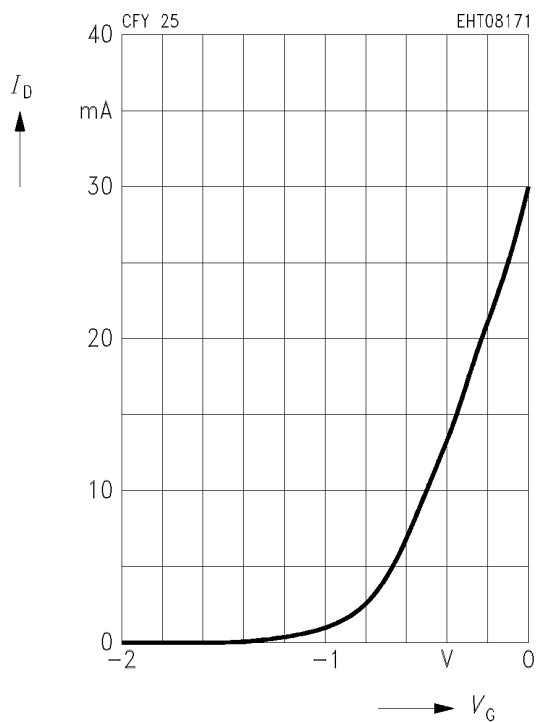
Total power dissipation $P_{tot} = f(T_S; T_A^*)$
 * Package mounted on alumina



Output characteristics $I_D = f(V_{DS})$



Transfer characteristics $I_D = f(V_G)$
 $V_{DS} = 3 V$



Common Source Noise Parameters

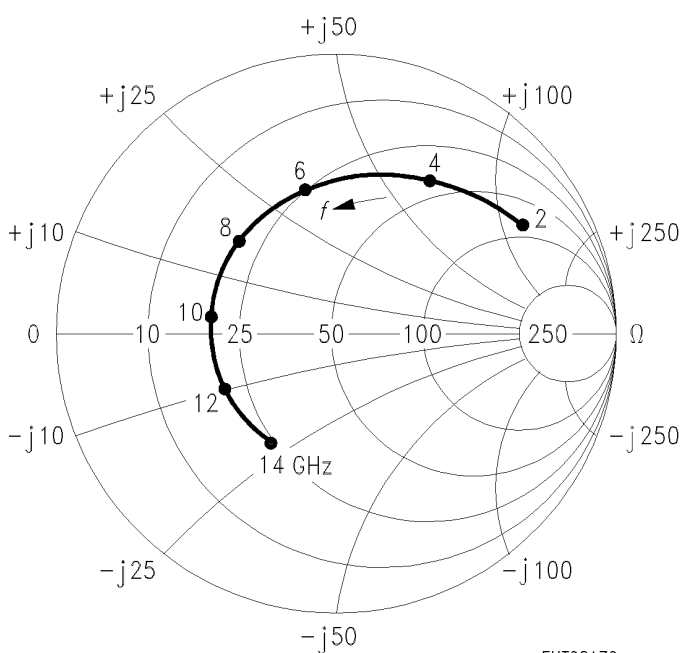
| f | F_{min} | G_a | Γ_{opt} | | R_N | r_N | N | $F_{50 \Omega}$ | $G(F_{50 \Omega})$ |
|-----|-----------|-------|----------------|-----|----------|-------|-----|-----------------|--------------------|
| GHz | dB | dB | MAG | ANG | Ω | — | — | dB | dB |

$I_D = 15 \text{ mA}, V_{DS} = 3.0 \text{ V}, Z_0 = 50 \Omega$

| | | | | | | | | | |
|----|------|------|------|------|-----|-------|------|-----|------|
| 2 | 0.60 | 18.5 | 0.70 | 31 | 29 | 0.580 | 0.10 | 2.0 | 11.4 |
| 4 | 0.77 | 14.6 | 0.59 | 63 | 21 | 0.420 | 0.14 | 1.8 | 10.5 |
| 6 | 1.00 | 12.4 | 0.50 | 103 | 13 | 0.260 | 0.19 | 1.8 | 9.3 |
| 8 | 1.25 | 11.0 | 0.47 | 140 | 7.3 | 0.146 | 0.23 | 2.0 | 8.2 |
| 10 | 1.55 | 9.8 | 0.45 | 174 | 5.6 | 0.112 | 0.28 | 2.4 | 7.3 |
| 12 | 1.77 | 9.0 | 0.43 | -156 | 7.1 | 0.142 | 0.29 | 2.5 | 6.4 |
| 14 | 2.15 | 8.1 | 0.41 | -130 | 18 | 0.360 | 0.46 | 3.0 | 5.8 |

Source impedance for min. noise figure

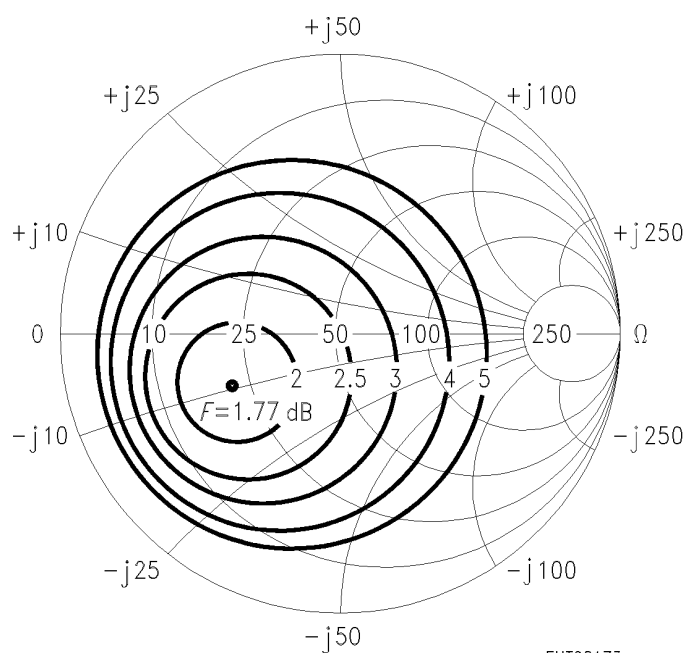
$I_D = 15 \text{ mA}, V_{DS} = 3 \text{ V}$



EHT08172

Circles of constant noise figure

$I_D = 15 \text{ mA}, V_{DS} = 3 \text{ V}, f = 12 \text{ GHz}$

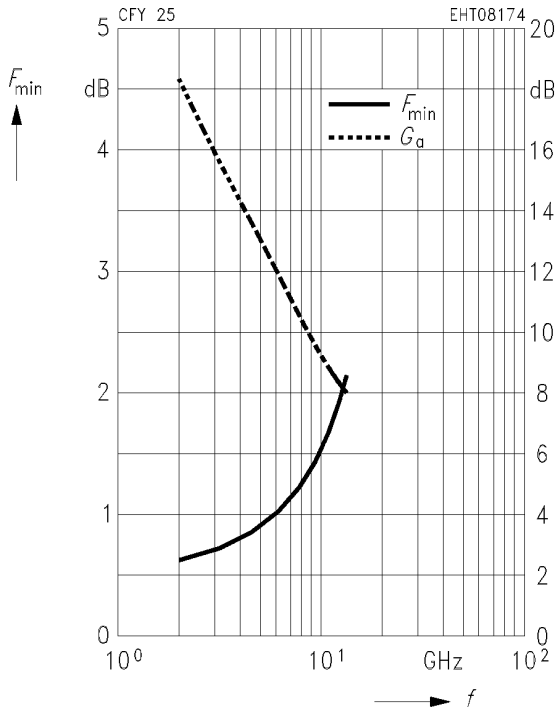


EHT08173

Minimum noise figure $F_{min} = f(f)$

Associated gain $G_a = f(f)$

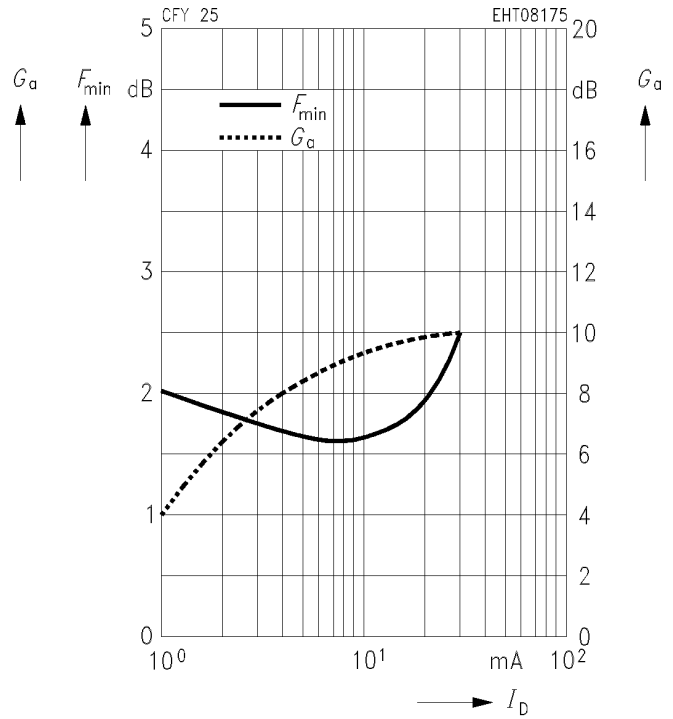
$I_D = 15 \text{ mA}$, $V_{DS} = 3 \text{ V}$, Z_{Sopt}



Minimum noise figure $F_{min} = f(I_D)$

Associated gain $G_a = f(I_D)$

$V_{DS} = 3 \text{ V}$, $f = 12 \text{ GHz}$, Z_{Sopt}

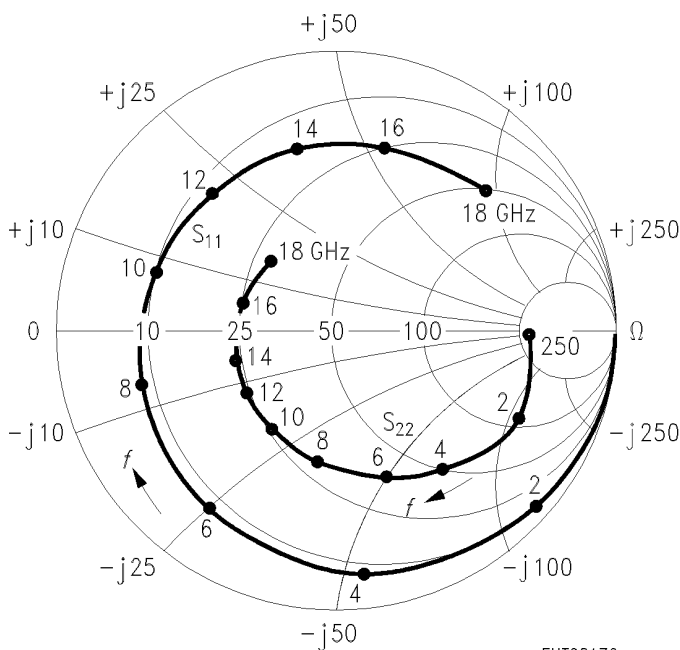


Common Source S Parameters

| <i>f</i> | <i>S</i> ₁₁ | | <i>S</i> ₂₁ | | <i>S</i> ₁₂ | | <i>S</i> ₂₂ | |
|--|------------------------|-------|------------------------|------|------------------------|------|------------------------|-------|
| GHz | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| <i>I_D</i> = 15 mA, <i>V_{DS}</i> = 3 V, <i>Z₀</i> = 50 Ω | | | | | | | | |
| 1.0 | 0.99 | - 21 | 3.83 | 161 | 0.026 | 75 | 0.68 | - 13 |
| 2.0 | 0.96 | - 42 | 3.73 | 141 | 0.049 | 61 | 0.66 | - 27 |
| 3.0 | 0.91 | - 67 | 3.55 | 121 | 0.069 | 45 | 0.63 | - 41 |
| 4.0 | 0.86 | - 87 | 3.34 | 103 | 0.083 | 33 | 0.59 | - 55 |
| 5.0 | 0.81 | - 107 | 3.10 | 86 | 0.093 | 21 | 0.56 | - 66 |
| 6.0 | 0.77 | - 125 | 2.92 | 70 | 0.100 | 11 | 0.52 | - 77 |
| 7.0 | 0.74 | - 145 | 2.74 | 54 | 0.105 | 1 | 0.48 | - 89 |
| 8.0 | 0.70 | - 165 | 2.57 | 37 | 0.107 | - 9 | 0.45 | - 102 |
| 9.0 | 0.68 | 178 | 2.42 | 23 | 0.108 | - 17 | 0.42 | - 112 |
| 10.0 | 0.67 | 161 | 2.31 | 9 | 0.109 | - 24 | 0.41 | - 124 |
| 11.0 | 0.67 | 146 | 2.20 | - 4 | 0.110 | - 30 | 0.39 | - 134 |
| 12.0 | 0.66 | 132 | 2.10 | - 17 | 0.110 | - 36 | 0.37 | - 145 |
| 13.0 | 0.66 | 117 | 2.02 | - 31 | 0.110 | - 42 | 0.36 | - 158 |
| 14.0 | 0.66 | 103 | 1.94 | - 44 | 0.112 | - 49 | 0.35 | - 169 |
| 15.0 | 0.66 | 90 | 1.90 | - 57 | 0.115 | - 55 | 0.34 | 180 |
| 16.0 | 0.66 | 77 | 1.84 | - 70 | 0.119 | - 63 | 0.33 | 165 |
| 17.0 | 0.66 | 63 | 1.80 | - 84 | 0.125 | - 72 | 0.32 | 151 |
| 18.0 | 0.66 | 47 | 1.78 | - 99 | 0.132 | - 83 | 0.31 | 136 |

*S*₁₁, *S*₂₂

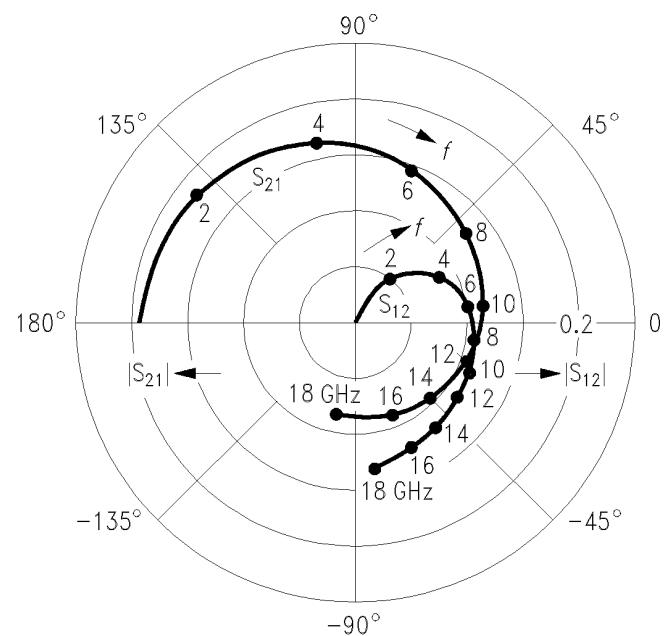
I_D = 15 mA, *V_{DS}* = 3 V, *Z₀* = 50 Ω



EHT08176

*S*₁₂, *S*₂₁

I_D = 15 mA, *V_{DS}* = 3 V, *Z₀* = 50 Ω



EHT08177