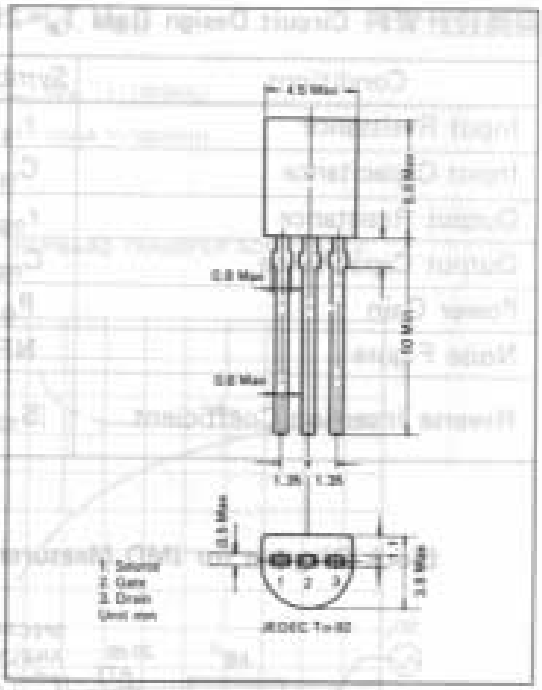
# 2SK125



## Silicon N-Channel Junction FET

- UHF Amplifiers, Mixers (Common Gate)
- $P_G$: 12.5 dB Typ. (f = 100 MHz, Common Gate)
- NF: 1.5 dB Typ. (f = 100 MHz, Common Gate)
- 3rd Harmonic Distortion -52 dB Typ.
- Analogue Switchings ($R_{ON}$: 40Ω Typ.)




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

| Characteristics | Symbol | 2SK125 |
|---|---|---|
| Drain-to-Gate Voltage | $V_{DGO}$ | 25 V |
| Source-to-Gate Voltage | $V_{SGO}$ | 25 V |
| Drain Current | $I_D$ | 100 mA |
| Gate Current | $I_G$ | 10 mA |
| Channel Power Dissipation | $P_{ch}$ | 500 mW |
| Channel Temperature | $T_{ch}$ | 120°C |
| Storage Temperature | $T_{stg}$ | -50–+120°C |

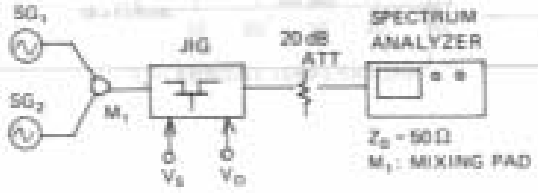
### 電気的特性 Electrical Characteristics $T_a$ = 25°C

| Characteristics | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Gate Cutoff Current | $I_{GSS}$ | $V_{GS}$ = -15 V, $V_{DS}$ = 0 | | | -10 | nA |
| Gate-to-Source Voltage | $V_{GSS}$ | $I_G$ = -10 μA, $V_{DS}$ = 0 | -25 | | | V |
| Drain Saturation Current | $I_{DSS}$ | $V_{DS}$ = 10 V, $V_{GS}$ = 0, PW = 300 μS | 30 | | 75 | mA |
| Pinch-off Voltage | $V_p$ | $V_{DS}$ = 10 V, $I_D$ = 100 μA | -2 | | -6 | V |
| Forward Transfer Conductance | $g_m$ | $V_{DS}$ = 10 V, $I_D$ = 10 mA, f = 1 kHz | 10 | 14 | | m℧ |
| Reverse Transfer Capacitance | $C_{rss}$ | $V_{DG}$ = 10 V, $I_S$ = 0, f = 1 MHz | | 2.6 | 3 | pF |
| Power Gain | $P_G$ | $V_{DG}$ = 10 V, $I_D$ = 10 mA, f = 100 MHz, BW = 2.8 MHz | 10 | 12.5 | | dB |
| Noise Figure | NF | $V_{DG}$ = 10 V, $I_D$ = 10 mA, f = 100 MHz, BW = 2.8 MHz 2nd Stage NF = 4.2 dB | | 1.8 | 2.5 | dB |
| Intermodulation Distortion | IMD | $V_{DG}$ = 10 V, $I_D$ = 10 mA, $f_1$ = 100 MHz, $f_2$ = 100.1 MHz, $e_i$ = 100 dBμ | -45 | -52 | | dB |
| Junction-to-Ambient Thermal Resistance | $\theta_{j\text{-}a}$ | | | | 190 | °C/W |

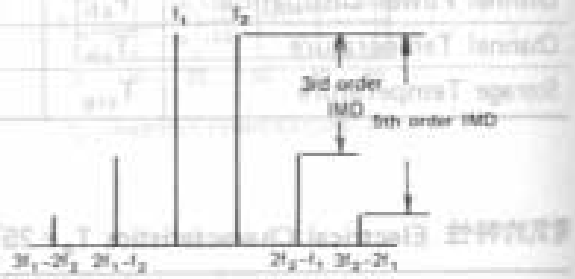
## 回路設計資料 Circuit Design Data $T_a = 25^\circ C$

| Conditions | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Input Resistance | $r_{ig}$ | $V_{DG} = 10V$, $I_D = 10mA$, f = 100 MHz | | 70 | | Ω |
| Input Capacitance | $C_{ig}$ | | | 3.0 | | pF |
| Output Resistance | $r_{og}$ | | | 5 | | kΩ |
| Output Capacitance | $C_{og}$ | | | 3.0 | | pF |
| Power Gain | $P_G$ | $V_{DG} = 10V$, $I_D = 10mA$, f = 500 MHz, BW = 12 MHz | | 7.0 | | dB |
| Noise Figure | NF | | | 4.0 | | dB |
| Reverse Insertion Coefficient | $\|S_{12}\|$ | $V_{DG} = 10V$, $I_D = 10mA$, f = 500 MHz | | 0.035 | | |

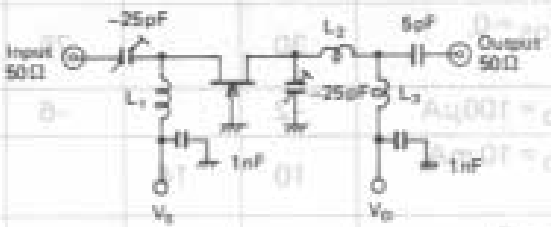
### Block Diagram for IMD Measurement




### Frequency Spectrum

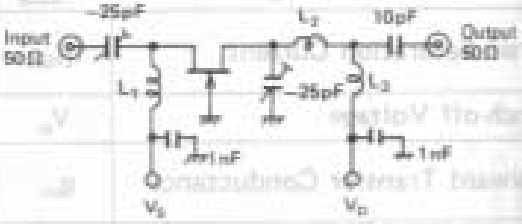



### $P_G$ & NF Test Circuit (f = 100 MHz)




L1 : 0.45φ 3φ-10.5T
L2, L3: 0.45φ 3φ-5.5T

### IMD Test Circuit (f = 100 MHz)




L1 : 0.45φ 3φ-10.5T
L2, L3: 0.45φ 3φ-5.5T

### $P_G$, NF – $I_D$