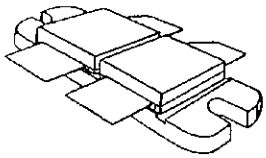
SGS-THOMSON MICROELECTRONICS

# SD2920-02

## RF MOS FIELD EFFECT TRANSISTORS HF/VHF APPLICATIONS

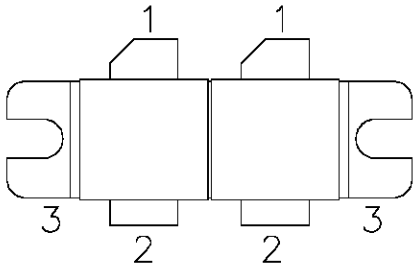
- 2 - 200 MHz
- 50 VOLTS
- IMD – 30dB
- CLASS AB
- GOLD METALLIZATION FOR HIGH RELIABILITY
- DESIGNED FOR LINEAR OPERATION
- WIDEBAND TUNING
- SIMPLE BIAS CIRCUITRY
- COMMON SOURCE CONFIGURATION
- $P_{OUT}$ = 300 W MIN. WITH 8.0 dB GAIN



**2 x .437 x .450 2LFL (M176)**
epoxy sealed

| ORDER CODE | BRANDING |
|---|---|
| SD2920-02 | 2920-2 |

**PIN CONNECTION**




1. Drain
2. Gate
3. Source

### DESCRIPTION

The SD1920-02 is a gold metallized N-Channel MOS field-effect RF power transistor. The SD1920-02 is intended for used in 50 V dc large signal applications up to 200 MHz.

### ABSOLUTE MAXIMUM RATINGS ($T_{case}$ = 25°C)

| Symbol | Parameter | Value (per side) | Unit |
|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-Source Voltage | 125 | V |
| $V_{DGR}$ | Drain-Gate Voltage | 125 | V |
| $V_{GS}$ | Gate-Source Voltage | ± 30 | V |
| $I_D$ | Drain Current | 27.8 | A |
| $P_{DISS}$ | Power Dissipation | 430 | W |
| $T_J$ | Junction Temperature | +200 | °C |
| $T_{STG}$ | Storage Temperature | – 65 to +150 | °C |

### THERMAL DATA

| | | | |
|---|---|---|---|
| $R_{TH(j-c)}$ | Junction-Case Thermal Resistance | 0.35 | °C/W |

## ELECTRICAL SPECIFICATIONS ($T_{case}$ = 25°C)

STATIC

| Symbol | Parameter | | | Value | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| $V_{(BR)DSS}$ | $V_{GS}$ = 0V | $I_D$ = 100mA | | 125 | — | — | V |
| $I_{DSS}$ | $V_{DS}$ = 50V | $V_{GS}$ = 0V | | — | — | 5 | mA |
| $I_{GSS}$ | $V_{GS}$ = 20V | $V_{DS}$ = 0V | | — | — | 1 | μA |
| $V_{DS(on)}$ | $V_{GS}$ = 10V | $I_D$ = 10A | | — | — | 5 | V |
| $G_{FS}$ | $V_{DS}$ = 10V | $I_D$ = 5A | | 3 | — | — | mhos |
| $C_{ISS}$ | $V_{DS}$ = 50V | $V_{GS}$ = 0V | F = 1MHz | — | — | 500 | pF |
| $C_{OSS}$ | $V_{DS}$ = 50V | $V_{GS}$ = 0V | F = 1MHz | — | — | 250 | pF |
| $C_{RSS}$ | $V_{DS}$ = 50V | $V_{GS}$ = 0V | F = 1MHz | — | — | 50 | pF |
| $V_{GS(TH)}$ | $V_{GS}$ = 10V | $I_D$ = 100mA | | 1 | — | 5 | V |

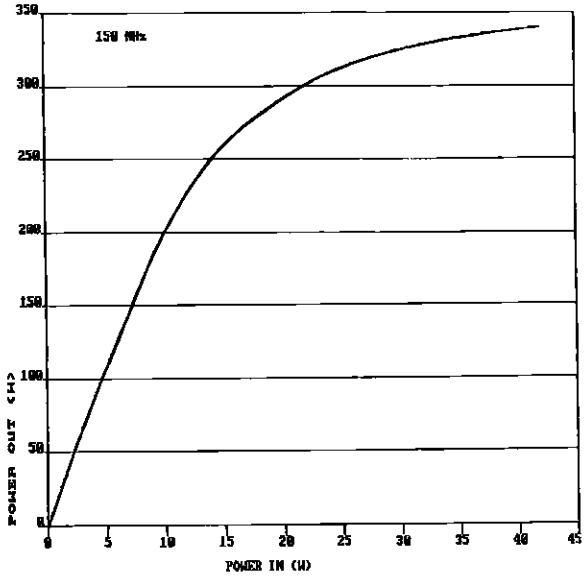
All DC Static Parameters Tested Per Side.

DYNAMIC

| Symbol | Parameter | | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| $P_{OUT}$ | $V_{DS}$ = 50 V | $I_{DQ}$ = 2 x 250 mA f = 150 MHz | 300 | — | — | W |
| $\eta_D$ | $V_{DS}$ = 50 V | $I_{DQ}$ = 2 x 250 mA f = 150 MHz | 45 | — | — | % |
| $G_{PS}$ | $V_{DS}$ = 50 V | $I_{DQ}$ = 2 x 250 mA f = 150 MHz | 8.0 | — | — | dB |

## TYPICAL PERFORMANCE

**POWER OUTPUT vs POWER INPUT**

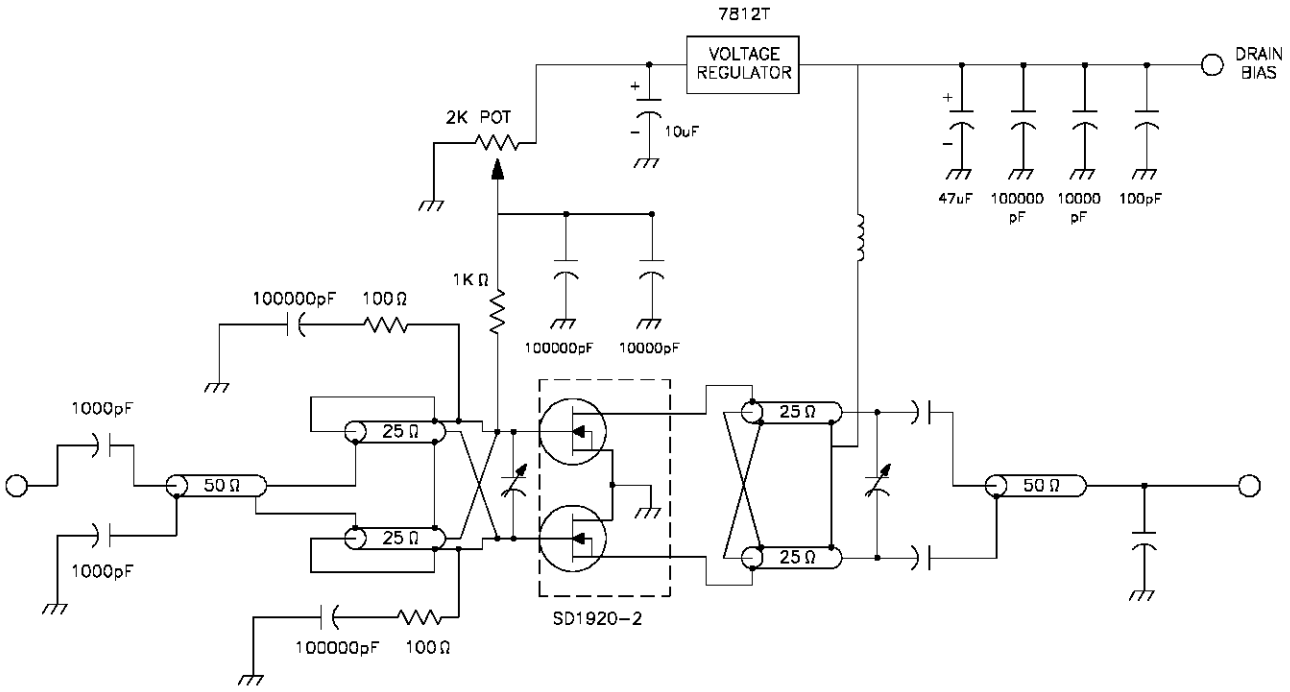


## IMPEDANCE DATA

| FREQ. | $Z_{IN}$ (Ω)* | $Z_{CL}$ (Ω)** |
|---|---|---|
| 150 MHz | 1.2 – j 0.1 | 3.3 + j 4.7 |

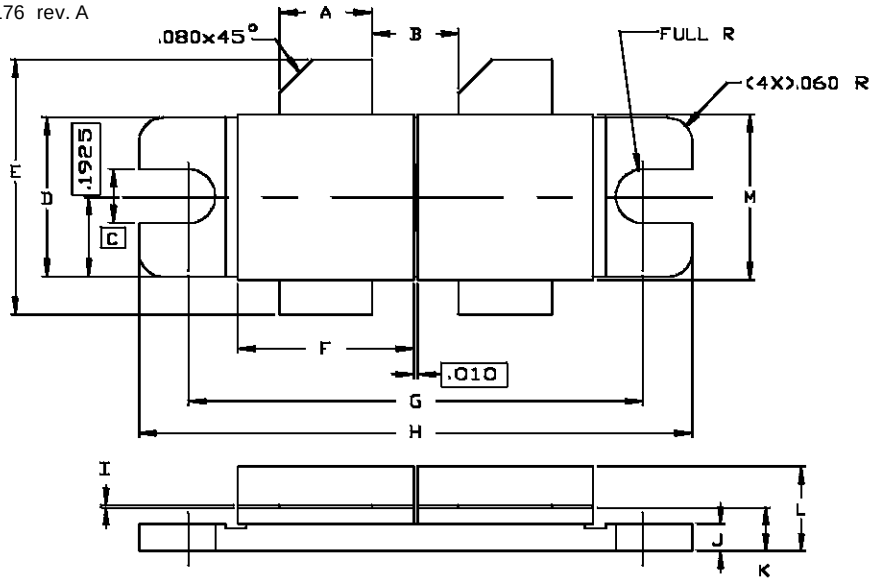
* Gate to Gate
** Drain to Drain

## TEST CIRCUIT



## PACKAGE MECHANICAL DATA

Ref.: Dwg. No. 12-0176 rev. A




| SGS-THOMSON MICROELECTRONICS | | | CONT'D | | |
|---|---|---|---|---|---|
| | MINIMUM Inches/mm | MAXIMUM Inches/mm | | MINIMUM Inches/mm | MAXIMUM Inches/mm |
| A | .220/5,59 | .230/5,84 | K | .100/2,54 | .115/2,92 |
| B | .210/5,33 | | L | | .230/5,84 |
| C | .125/3,18 | | M | .395/10,03 | .405/10,29 |
| D | .380/9,65 | .390/9,91 | | | |
| E | .580/14,73 | .620/15,75 | | | |
| F | .420/10,67 | .430/10,93 | | | |
| G | 1.090/27,69 | 1.105/28,07 | | | |
| H | 1.335/33,91 | 1.345/34,16 | | | |
| I | .003/0,08 | .007/0,18 | | | |
| J | .060/1,52 | .070/1,78 | | | |