

5W - 28V - 1GHz
GOLD METALLISED MULTI-PURPOSE
SILICON DMOS RF FET

FEATURES

- METAL GATE
- EXTRA LOW C_{rss}
- BROAD BAND
- SIMPLE BIAS CIRCUITS
- LOW NOISE
- HIGH GAIN

APPLICATIONS

- HF/VHF/UHF COMMUNICATIONS
from DC to 2 GHz

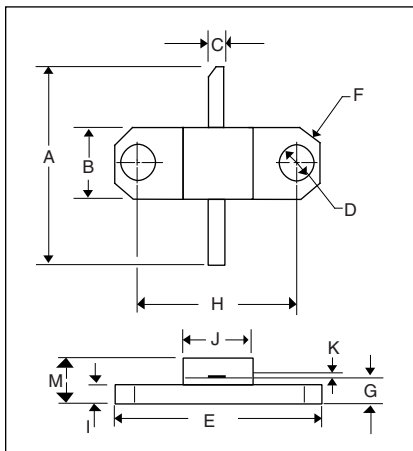
ABSOLUTE MAXIMUM RATINGS
($T_{CASE} = 25^{\circ}C$ unless otherwise stated)

| | | |
|----------------|--|--------------|
| P_D | Power Dissipation | 29W |
| BV_{DSS} | Drain-source breakdown voltage | 65V |
| V_{GS} | Gate-source voltage | $\pm 20V$ |
| I_D | Drain Current | 2A |
| T_{stg} | Storage temperature | -65 to 150°C |
| T_j | Maximum operating junction temperature | 200°C |
| $R_{THj-case}$ | Thermal resistance junction-case | Max. 6.0°C/W |

ELECTRICAL CHARACTERISTICS ($T_{CASE} = 25^{\circ}C$ unless otherwise stated)

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|--------------|--|------|------|------|-----------|
| BV_{DSS} | Breakdown voltage, drain source $V_{GS}=0$ $I_D=10mA$ | 65 | | | Vdc |
| I_{DSS} | Drain leakage current $V_{DS}=28V$ $V_{GS}=0$ | | | 0.4 | mAdc |
| I_{GSS} | Gate leakage current $V_{GS}=20V$ $V_{DS}=0$ | | | 1 | μ Adc |
| $V_{GS(th)}$ | Gate threshold voltage $I_D=10mA$ $V_{DS}=V_{GS}$ | 1 | | 7 | Vdc |
| gfs | Transconductance (300 μ s pulse) $V_{DS}=10V$ $D=0.4A$ | 0.4 | | | Mhos |
| G_{PS} | Common source power gain $P_O=5W$ | 13 | | | dB |
| η | Drain efficiency $V_{DS}=28V$ $I_{DQ}=0.4A$ | 40 | | | % |
| VSWR | Load mismatch tolerance $f=1GHz$ | 20:1 | | | |
| C_{iss} | Input capacitance $V_{DS}=0V$ $V_{GS}=-5V$ $f=1MHz$ | | | 24 | pF |
| C_{oss} | Output capacitance $V_{DS}=28V$ $V_{GS}=0$ $f=1MHz$ | | | 12 | pF |
| C_{rss} | Reverse transfer capacitance $V_{DS}=28V$ $V_{GS}=0$ $f=1MHz$ | | | 1 | pF |

DIMENSIONS



| DM | Millimeter | TOL | Inches | TOL |
|----|------------|-----|------------|------|
| A | 16.51 | .25 | .650 | .010 |
| B | 6.35 | .13 | .250 | .005 |
| C | 1.52 | .13 | .060 | .005 |
| D | 3.30 | .13 | .130 | .005 |
| E | 18.92 | .05 | .745 | .002 |
| F | 1.27 X 45° | .13 | .030 X 45° | .005 |
| G | 2.16 | .13 | .085 | .005 |
| H | 14.22 | .05 | .560 | .002 |
| I | 1.52 | .13 | .060 | .005 |
| J | 6.35 | .13 | .250 | .005 |
| K | 0.10 | .02 | .004 | .001 |
| M | 5.08 | MAX | .200 | MAX |

HAZARDOUS MATERIAL WARNING

The ceramic portion of the device between leads and metal flange is beryllium oxide. Beryllium oxide dust is highly toxic and care must be taken during handling and mounting to avoid damage to this area. THESE DEVICES MUST NEVER BE THROWN AWAY WITH GENERAL INDUSTRIAL OR DOMESTIC WASTE.

U.S. PATENTS 5,121,176 & 5,179,032
GLOBAL PATENTS PENDING

*D2002

*PSPICE MODEL FOR POINT NINE TECHNOLOGIES, Inc RF N-CHANNEL VERTICAL DMOS POWER FET
*PRELIMINARY DATA, JULY 1995

*TO GENERATE S PARAMETERS MATCHING DATA SHEET, SET VG??V FOR IDQ=0.4A

```
*      ____GATE
*      I      ____DRAIN
*      I      I      ____SOURCE
*      I      I      I
.SUBCKT D2002 10      20      30
LG      10      11      0.75N
RGATE   11      12      1.08
CG      10      30      0.49P
CRSS    12      17      1P
CISS    12      14      24P
LS      14      30      0.15N
CS      14      30      0.24P
LD      17      20      0.63N
CD      20      30      1.27P
R_RC    16      17      1079
C_RC    14      16      51.26P
MOS     13      12      14 15 D2002MOS L=0.71U W=0.021798 ;D G S B LEVEL1
JFET    17      14      13      D2002JF ;D G S
DBODY   14      17      D2002DB ;P N

.MODEL D2002MOS NMOS (VTO=2 KP=3.5E-5 LAMBDA=0.1 RD=1 RS=1.5)
.MODEL D2002JF NJF (VTO=-5.8 BETA=0.025 LAMBDA=1)
.MODEL D2002DB D (CJO=29P RS=0.25 VJ=0.7 M=0.33 BV=65)
.ENDS
```

D2002.s2p

```
!      Vds=28V, Idq=0.4A
#      MHz S MA R 50
```

| !Freq | S11 | | S21 | | S12 | | S22 | |
|-------|-------|------|--------|-----|---------|-----|-------|------|
| !MHz | mag | ang | mag | ang | mag | ang | mag | ang |
| 100 | 0.881 | -81 | 24.831 | 120 | 0.01549 | 32 | 0.804 | -53 |
| 200 | 0.841 | -118 | 14.791 | 90 | 0.01641 | 7 | 0.741 | -81 |
| 300 | 0.841 | -134 | 9.661 | 71 | 0.01349 | -3 | 0.759 | -98 |
| 400 | 0.841 | -146 | 6.761 | 56 | 0.00933 | -6 | 0.776 | -111 |
| 500 | 0.861 | -156 | 5.012 | 42 | 0.00569 | 8 | 0.804 | -125 |
| 600 | 0.881 | -160 | 3.589 | 35 | 0.00543 | 57 | 0.841 | -134 |
| 700 | 0.902 | -162 | 2.951 | 32 | 0.00933 | 86 | 0.871 | -137 |
| 800 | 0.912 | -166 | 2.427 | 23 | 0.01429 | 90 | 0.891 | -143 |
| 900 | 0.923 | -172 | 2.018 | 16 | 0.01972 | 89 | 0.902 | -150 |
| 1000 | 0.912 | -176 | 1.622 | 12 | 0.02371 | 89 | 0.891 | -154 |