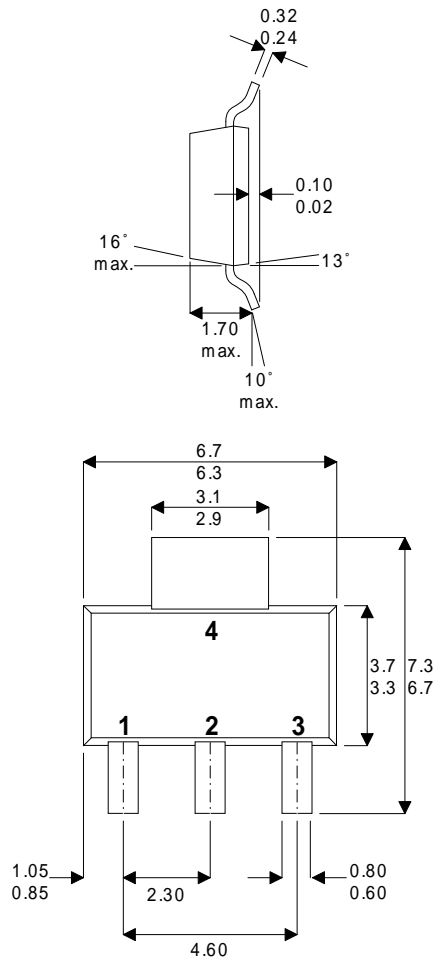


MECHANICAL DATA
Dimensions in mm.



SOT-223

PIN 1 GATE PIN 2 DRAIN
PIN 3 SOURCE PIN 4 DRAIN

**GOLD METALLISED
MULTI-PURPOSE SILICON
DMOS RF FET
750mW – 12V – 1GHz
SINGLE ENDED**

FEATURES

- SIMPLIFIED AMPLIFIER DESIGN
- SUITABLE FOR BROAD BAND APPLICATIONS
- LOW C_{rss}
- SIMPLE BIAS CIRCUITS
- LOW NOISE (Typical < 2dB NF)
- HIGH GAIN – 11dB MINIMUM
- SURFACE MOUNT

APPLICATIONS

- VHF/UHF COMMUNICATIONS
from DC to 2.5 GHz

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

| | | |
|--------------|--|-------------------------|
| P_D | Power Dissipation | 2W |
| BV_{DSS} | Drain – Source Breakdown Voltage | 65V |
| BV_{GSS} | Gate – Source Breakdown Voltage | $\pm 20V$ |
| $I_{D(sat)}$ | Drain Current | 200mA |
| T_{stg} | Storage Temperature | -65 to $125^{\circ}C$ |
| T_j | Maximum Operating Junction Temperature | $150^{\circ}C$ |

ELECTRICAL CHARACTERISTICS (T_{case} = 25°C unless otherwise stated)

| Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|--|---|------|------|------|------|
| B _V DSS Drain-Source Breakdown Voltage | V _{GS} = 0 I _D = 10mA | 65 | | | V |
| I _{DSS} Zero Gate Voltage Drain Current | V _{DS} = 28V V _{GS} = 0 | | | 1 | mA |
| I _{GSS} Gate Leakage Current | V _{GS} = 20V V _{DS} = 0 | | | 1 | μA |
| V _{GS(th)} Gate Threshold Voltage* | I _D = 10mA V _{DS} = V _{GS} | 1 | | 7 | V |
| g _{fs} Forward Transconductance* | V _{DS} = 10V I _D = 0.2A | 0.18 | | | mhos |
| G _{PS} Common Source Power Gain | P _O = 750mW | 11 | | | dB |
| η Drain Efficiency | V _{DS} = 12V I _{DQ} = 75mA | 40 | | | % |
| VSWR Load Mismatch Tolerance | f = 1GHz | 10:1 | | | — |
| C _{iss} Input Capacitance | V _{DS} = 0V V _{GS} = -5V f = 1MHz | | | 12 | pF |
| C _{oss} Output Capacitance | V _{DS} = 28V V _{GS} = 0 f = 1MHz | | | 6 | |
| C _{rss} Reverse Transfer Capacitance | V _{DS} = 28V V _{GS} = 0 f = 1MHz | | | 0.5 | |

* Pulse Test: Pulse Duration = 300 μs , Duty Cycle ≤ 2%

THERMAL DATA

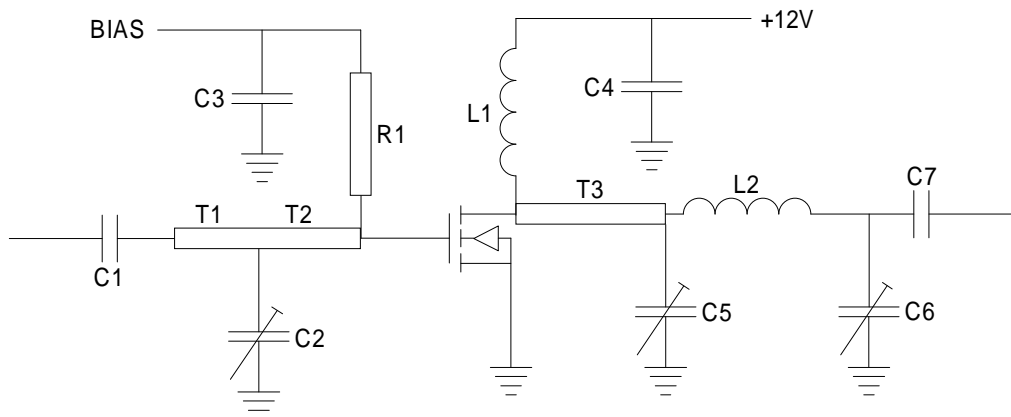
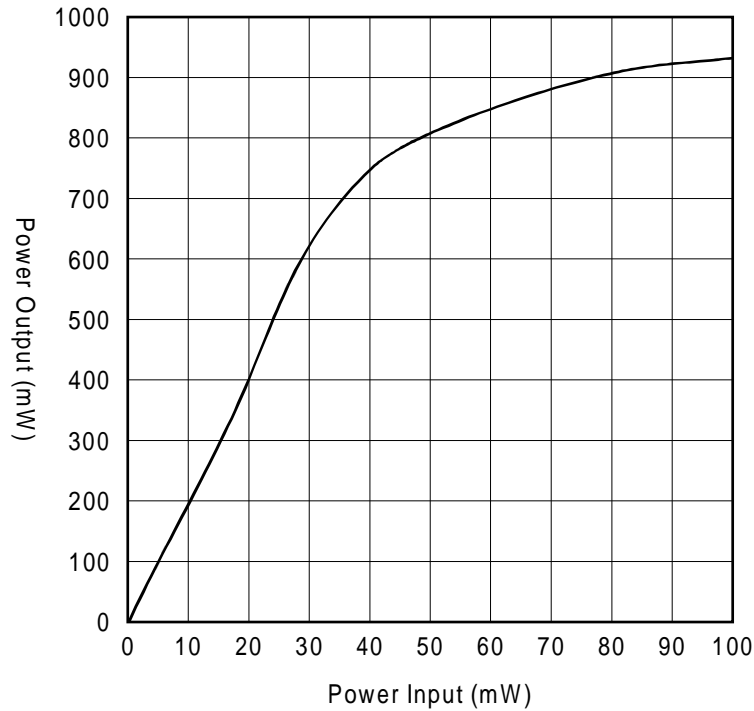
| | | |
|-----------------------|------------------------------------|---------------|
| R _{THj-case} | Thermal Resistance Junction – Case | Max. 70°C / W |
|-----------------------|------------------------------------|---------------|

S Parameters at V_d = 12V, I_d = 75mA

| Freq MHz | S11 | | S12 | | S21 | | S22 | |
|-------------|------|------|------|-----|------|-----|------|------|
| | mag | ang | mag | ang | mag | ang | mag | ang |
| 300 | 0.47 | -95 | 0.04 | 50 | 5.20 | 90 | 0.32 | -90 |
| 400 | 0.46 | -120 | 0.05 | 80 | 4.40 | 76 | 0.35 | -91 |
| 500 | 0.47 | -131 | 0.07 | 100 | 3.50 | 68 | 0.38 | -94 |
| 600 | 0.49 | -146 | 0.10 | 110 | 3.00 | 59 | 0.43 | -98 |
| 700 | 0.51 | -156 | 0.15 | 110 | 2.60 | 51 | 0.48 | -103 |
| 800 | 0.53 | -163 | 0.20 | 104 | 2.30 | 45 | 0.54 | -108 |
| 900 | 0.54 | -180 | 0.25 | 100 | 2.10 | 40 | 0.58 | -112 |
| 1000 | 0.55 | 178 | 0.29 | 96 | 1.80 | 36 | 0.60 | -116 |
| 1100 | 0.56 | 175 | 0.34 | 91 | 1.60 | 33 | 0.63 | -120 |
| 1200 | 0.57 | 163 | 0.40 | 85 | 1.40 | 28 | 0.65 | -126 |
| 1300 | 0.58 | 150 | 0.45 | 80 | 1.30 | 26 | 0.66 | -129 |
| 1400 | 0.60 | 144 | 0.48 | 75 | 1.20 | 24 | 0.66 | -133 |
| 1500 | 0.60 | 140 | 0.52 | 70 | 1.10 | 22 | 0.66 | -135 |
| 1600 | 0.59 | 130 | 0.55 | 66 | 1.00 | 21 | 0.65 | -138 |
| 1700 | 0.58 | 123 | 0.58 | 63 | 0.95 | 20 | 0.65 | -140 |
| 1800 | 0.56 | 115 | 0.60 | 58 | 0.90 | 19 | 0.64 | -142 |
| 1900 | 0.54 | 110 | 0.62 | 54 | 0.90 | 20 | 0.64 | -144 |
| 2000 | 0.51 | 108 | 0.62 | 50 | 0.90 | 20 | 0.63 | -145 |

TYPICAL PERFORMANCE BFM21 at 1GHz

Bias Conditions $V_d = 12V$, $I_{dq} = 75mA$



BFM21UK 1GHz Test Circuit

- | | | | |
|------------|-------------------------------|----|---------------------------|
| C1, C7 | 33pF ATC100B | T1 | 50Ω microstrip, 11mm long |
| C2, C5, C6 | 1–8pF | T2 | 50Ω microstrip, 15mm long |
| C3, C4 | 1000pF NPO | T3 | 50Ω microstrip, 5mm long |
| L1 | 0.1μH | | |
| L2 | 10mm of 1.6mm tcw (half turn) | | |