



# PRELIMINARY DATA-SHEET

**UGF19060**

## **60W, 1.9 GHz, 26V Broadband RF Power N-Channel Enhancement-Mode Lateral MOSFET**

Designed for PCS base station applications in the frequency band 1.93 to 1.99 GHz. Rated with a minimum output power of 60W, it is ideal for CDMA, TDMA, WCDMA, GSM, and Multi-Carrier Power Amplifiers in Class AB operation.

- ALL GOLD metal system for highest reliability
- Industry standard package
- Suggested alternative to the MRF19060
- Internally matched for repeatable manufacturing
- High gain, high efficiency and high linearity

Package Type 440117

- **Application Specific Performance, 1.99 GHz**

|                   |                  |              |
|-------------------|------------------|--------------|
| <b>GSM:</b>       | <b>55 Watts</b>  | <b>12 dB</b> |
| <b>EDGE:</b>      | <b>25 Watts</b>  | <b>12 dB</b> |
| <b>IS95 CDMA:</b> | <b>7.5 Watts</b> | <b>12 dB</b> |
| <b>CDMA2000:</b>  | <b>TBD Watts</b> | <b>12 dB</b> |

Package Type 44 0133

- **Typical CDMA Performance (IS-97)**  
Average Load Power – 7.5 W  
PAE – 18%  
Power Gain – 12 dB  
ACPR     -45dBc @ 885kHz (30kHz BW)  
             -55dBc @ 1.25MHz (12.5kHz BW)  
             -53dBc @ 2.25MHz (1MHz BW)



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## Maximum Ratings

| Rating                                                       | Symbol    | Value       | Unit          |
|--------------------------------------------------------------|-----------|-------------|---------------|
| Drain to Source Voltage, Gate connected to Source            | $V_{DSS}$ | 65          | Volts         |
| Gate to Source Voltage                                       | $V_{GSS}$ | +15 to -5   | Volts         |
| Total Device Dissipation @ Tcase = 70°C<br>Derate above 70°C | $P_D$     |             | Watts<br>W/°C |
| Storage Temperature Range                                    | $T_{stg}$ | -65 to +150 | °C            |
| Operating Junction Temperature                               | $T_J$     | 200         | °C            |

## Thermal Characteristics

| Characteristic                       | Symbol        | Typical | Unit |
|--------------------------------------|---------------|---------|------|
| Thermal Resistance, Junction to Case | $\Theta_{JC}$ | 1.2     | °C/W |

## Electrical DC Characteristics (Tc=25°C unless otherwise specified)

| Rating                                                           | Symbol       | Min | Typ | Max | Unit  |
|------------------------------------------------------------------|--------------|-----|-----|-----|-------|
| Drain to Source Breakdown Voltage<br>( $V_{GS}=0$ , $I_D=1mA$ )  | $BV_{DSS}$   | 65  | -   | -   | Volts |
| Drain to Source Leakage current<br>( $V_{DS}=26V$ , $V_{GS}=0$ ) | $I_{DSS}$    | -   | -   | 1.0 | mA    |
| Gate to Source Leakage current<br>( $V_{GS}=15V$ , $V_{DS}=0$ )  | $I_{GSS}$    | -   | -   | 1.0 | μA    |
| Threshold Voltage<br>( $V_{DS}=10V$ , $I_D=1mA$ )                | $V_{GS(th)}$ | -   | 3.5 | -   | Volts |
| Gate Quiescent Voltage<br>( $V_{DS}=26V$ , $I_D=600mA$ )         | $V_{GS(Q)}$  | 3.0 | 4.0 | 6.0 | Volts |
| Drain to Source On Voltage<br>( $V_{GS}=10V$ , $I_D=1A$ )        | $V_{DS(on)}$ | -   | .15 | -   | Volts |
| Forward Transconductance<br>( $V_{DS}=10V$ , $I_D=5A$ )          | $G_m$        |     |     | -   | S     |

## AC Characteristics (Tc=25°C unless otherwise specified)

| Rating                                                              | Symbol    | Min | Typ | Max | Unit |
|---------------------------------------------------------------------|-----------|-----|-----|-----|------|
| Output capacitance *<br>( $V_{DS}=26V$ , $V_{GS}=0V$ , $f=1MHz$ )   | $C_{oss}$ | -   |     | -   | pF   |
| Feedback capacitance *<br>( $V_{DS}=26V$ , $V_{GS}=0V$ , $f=1MHz$ ) | $C_{rss}$ | -   |     | -   | pF   |

\* Part is internally matched on input.



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## RF and Functional Tests *(In UltraRF Broadband Fixture, Tc=25°C unless otherwise specified)*

| Rating                                                                                                                                                                              | Symbol           | Min  | Typ | Max | Unit |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------|-----|-----|------|
| CW Small Signal Gain, P <sub>out</sub> =10W<br>V <sub>DD</sub> =26V, I <sub>DQ</sub> =600mA                                                                                         | G <sub>L</sub>   |      | 12  |     | dB   |
| CW Power Gain, P <sub>out</sub> = 60 W<br>V <sub>DD</sub> =26V, I <sub>DQ</sub> =600mA                                                                                              | G <sub>P</sub>   |      | 11  | -   | dB   |
| CW Drain Efficiency, P <sub>out</sub> = 60 W,<br>f=1960 MHz, V <sub>DD</sub> =26V, I <sub>DQ</sub> =600mA,                                                                          | η <sub>D</sub>   |      | 44  |     | %    |
| Two-Tone Common-Source Amplifier Power Gain<br>V <sub>DD</sub> =26V, I <sub>DQ</sub> =600mA, P <sub>out</sub> = 60 W PEP<br>f <sub>1</sub> =1960 MHz and f <sub>2</sub> =1960.1 MHz | G <sub>TT</sub>  |      | 12  | –   | dB   |
| Two-Tone Intermodulation Distortion<br>V <sub>DD</sub> =26V, I <sub>DQ</sub> =600mA, P <sub>out</sub> = 60 W PEP<br>f <sub>1</sub> =1960 MHz and f <sub>2</sub> =1960.1 MHz         | I <sub>MD</sub>  |      | -27 |     | dBc  |
| Two-Tone Drain Efficiency<br>V <sub>DD</sub> =26V, I <sub>DQ</sub> =600mA, P <sub>out</sub> = 60 W PEP<br>f <sub>1</sub> =1960 MHz and f <sub>2</sub> =1960.1 MHz                   | η <sub>D2T</sub> |      | 35  | –   | %    |
| Input Return Loss<br>V <sub>DD</sub> =26V, P <sub>out</sub> = 60 W PEP, I <sub>DQ</sub> =600mA<br>f <sub>1</sub> =1930 MHz and 1990 MHz, Tone Spacing =<br>100kHz                   | IRL              | –    | 10  |     | dB   |
| Load Mismatch Tolerance<br>V <sub>DS</sub> =26V, I <sub>DQ</sub> = 600 mA, P <sub>out</sub> =60W, f=1990 MHz                                                                        | VSWR             | 10:1 | –   | –   |      |

Note: This transistor has been designed to work in the Motorola MRF19060 test fixture. Performance has been verified within that fixture.

**CAUTION** - MOS Devices are susceptible to damage from ElectroStatic Discharge (ESD). Appropriate precautions in handling, packaging and testing MOS devices must be observed.