



PRELIMINARY DATA-SHEET

UGF19090

90W, 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 90W, 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 MRF19090
- Internally matched for repeatable manufacturing
- High gain, high efficiency and high linearity

Package Type 440158

- **Application Specific Performance, 1.99 GHz**

GSM:	80 Watts	12 dB
EDGE:	35 Watts	12 dB
IS95 CDMA:	10 Watts	12 dB
CDMA2000:	TBD Watts	12 dB

Package Type 44 0164

- **Typical CDMA Performance (IS-97)**
Average Load Power – 9 W
PAE – 16%
Power Gain – 12 dB
ACPR -45dBc @ 885kHz (30kHz BW)
 -55dBc @ 1.25MHz (12.5kHz BW)
 -55dBc @ 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 @ $T_{case} = 70^{\circ}C$ Derate above $70^{\circ}C$	P_D		Watts $W/^{\circ}C$
Storage Temperature Range	T_{stg}	-65 to +150	$^{\circ}C$
Operating Junction Temperature	T_J	200	$^{\circ}C$

Thermal Characteristics

Characteristic	Symbol	Typical	Unit
Thermal Resistance, Junction to Case	Θ_{JC}		$^{\circ}C/W$

Electrical DC Characteristics ($T_c=25^{\circ}C$ unless otherwise specified)

Rating	Symbol	Min	Typ	Max	Unit
Drain to Source Breakdown Voltage ($V_{GS}=0$, $I_D=1mA$)	BV_{DSS}	65	-	-	Volts
Drain to Source Leakage current ($V_{DS}=26V$, $V_{GS}=0$)	I_{DSS}	-	-	1.0	mA
Gate to Source Leakage current ($V_{GS}=15V$, $V_{DS}=0$)	I_{GSS}	-	-	1.0	μA
Threshold Voltage ($V_{DS}=10V$, $I_D=1mA$)	$V_{GS(th)}$	-	3.5	-	Volts
Gate Quiescent Voltage ($V_{DS}=26V$, $I_D=900mA$)	$V_{GS(Q)}$	3.0	4.0	6.0	Volts
Drain to Source On Voltage ($V_{GS}=10V$, $I_D=2A$)	$V_{DS(on)}$	-	.1	-	Volts
Forward Transconductance ($V_{DS}=10V$, $I_D=5A$)	G_m			-	S

AC Characteristics ($T_c=25^{\circ}C$ unless otherwise specified)

Rating	Symbol	Min	Typ	Max	Unit
Output capacitance * ($V_{DS}=26V$, $V_{GS}=0V$, $f=1MHz$)	C_{oss}	-		-	pF
Feedback capacitance * ($V_{DS}=26V$, $V_{GS}=0V$, $f=1MHz$)	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 _{out} =15W V _{DD} =26V, I _{DQ} =900mA	G _L		12		dB
CW Power Gain, P _{out} = 90 W V _{DD} =26V, I _{DQ} =900mA	G _P		11	-	dB
CW Drain Efficiency, P _{out} = 90 W, f=1960 MHz, V _{DD} =26V, I _{DQ} =900mA,	η _D		44		%
Two-Tone Common-Source Amplifier Power Gain V _{DD} =26V, I _{DQ} =900mA, P _{out} = 90 W PEP f ₁ =1960 MHz and f ₂ =1960.1 MHz	G _{TT}		12	–	dB
Two-Tone Intermodulation Distortion V _{DD} =26V, I _{DQ} =900mA, P _{out} = 90 W PEP f ₁ =1960 MHz and f ₂ =1960.1 MHz	I _{MD}		-27		dBc
Two-Tone Drain Efficiency V _{DD} =26V, I _{DQ} =900mA, P _{out} = 90 W PEP f ₁ =1960 MHz and f ₂ =1960.1 MHz	η _{D2T}		38	–	%
Input Return Loss V _{DD} =26V, P _{out} = 90 W PEP, I _{DQ} =900mA f ₁ =1930 MHz and 1990 MHz, Tone Spacing = 100kHz	IRL	–	10		dB
Load Mismatch Tolerance V _{DS} =26V, I _{DQ} = 900 mA, P _{out} =90W, f=1990 MHz	VSWR	10:1	–	–	

Note: This transistor has been designed to work in the Motorola MRF19090 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.