PRELIMINARY DATA-SHEET

UGF21090

90W, 2.17 GHz, 28V Broadband RF Power N-Channel Enhancement-Mode Lateral MOSFET

Designed for base station applications in the frequency band 2.11 to 2.17 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 MRF21090
- Internally matched for repeatable manufacturing
- High gain, high efficiency and high linearity

Package Type 440158

- **Application Specific Performance, 2.17 GHz**

GSM:	**90 Watts**	**11.5 dB**
EDGE:	**No Data**	**TBD**
IS95 CDMA:	**9 Watts**	**12 dB**
W-CDMA:	**11.5 Watts**	**12 dB**

Package Type 440164

- **Typical WCDMA Performance** (1CH, 16DCH, 3.84MHz BW)

  Average Load Power – 11.5 W
  PAE – 17%
  Power Gain – 12 dB
  ACPR (30 kHz BW offset ± 5 MHz normalized to total power in a 30 kHz BW): -44 dBc
  ACPR (30 kHz BW offset ± 10 MHz normalized to total power in a 30 kHz BW): -58 dBc

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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 Derate above 70°C	P_D		Watts 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	Θ_{JC}	0.65	°C/W

Electrical DC Characteristics *(Tc=25C 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}=28V, V_{GS}=0)	I_{DSS}	-	-	1.0	mA
Gate to Source Leakage current (V_{GS}=20V, 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}=28 V, I_D=750mA)	$V_{GS(Q)}$	3.0	4.0	6.0	Volts
Drain to Source On Voltage (V_{GS}=10V, I_D=1A)	$V_{DS(on)}$	-		-	Volts
Forward Transconductance (V_{DS}=10V, I_D=5A)	Gm			-	S

AC Characteristics *(Tc=25C unless otherwise specified)*

Rating	Symbol	Min	Typ	Max	Unit
Output capacitance * (V_{DS}= 28V, V_{GS}=0V, f = 1MHz)	C_{oss}	-		-	pF
Feedback capacitance * (V_{DS}=28V, V_{GS}=0V, f = 1MHz)	C_{rss}	-		-	pF

* Part is internally matched on input.

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

Rating	Symbol	Min	Typ	Max	Unit
CW Small Signal Gain, Pout=20W V_{DD}=28V, I_{DQ}=750mA	G_L	XX			dB
CW Power Gain, P_{out} = 75 W V_{DD}=28V, I_{DQ}=750mA	G_P		11.5	-	dB
CW Drain Efficiency, P_{out} = 75 W, f=2140 MHz, V_{DD}=28V, I_{DQ}=750mA,	η_D		42		%
Two-Tone Common-Source Amplifier Power Gain V_{DD}=28V, I_{DQ}=750mA, P_{out} = 90 W PEP f_1 =2140 MHz and f_2=2140.1 MHz	G_{TT}	10.0	12.0	_	dB
Two-Tone Intermodulation Distortion V_{DD}=28V, I_{DQ}=750mA, P_{out} = 90 W PEP f_1 =2140 MHz and f_2=2140.1 MHz	I_{MD}			-27.5	dBc
Two-Tone Drain Efficiency V_{DD}=28V, I_{DQ}=750mA, P_{out} = 90 W PEP f_1 =2140 MHz and f_2=2140.1 MHz	η_{D2T}	30	38	-	%
Input Return Loss V_{DD} =28V, P_{out} = 90 W PEP, I_{DQ}=750mA f_1 =2110 MHz and 2170 MHz, Tone Spacing = 100kHz	IRL	_	-12	-9	dB
Load Mismatch Tolerance V_{DS}=28V, I_{DQ}= 750 mA, Pout=90W, f=2170 MHz 10:1 All Phases	VSWR		_	_	

Suggested Matching Impedances

Source Impedance for Linear Operation (f=2140 MHz)	3 + j4
Load Impedance for Linear Operation (f=2140 MHz)	1 + j2

Note: These impedances have been derived from load pull data and by de-embedding the test fixture which was tuned for flat gain and near-optimum third-order IMD performance at rated output power (per appended test data). Designers are cautioned that measurement of optimum source and load impedances is sensitive to minor differences in test setups. Optimum source and load impedances also differ slightly depending on the application.

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

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