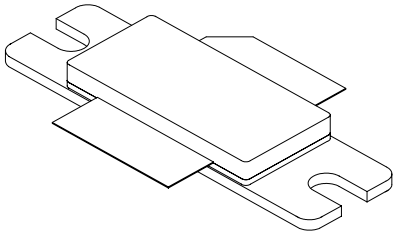
PRELIMINARY DATA SHEET

UGF09085

90W, 865-880 MHz, 26V Broadband RF Power N-Channel Enhancement-Mode Lateral MOSFET

Designed for broadband Commercial and Industrial applications in the frequency band 865 to 890 MHz. Rated with a minimum output power of 90W, it is ideal for large signal common source Power Amplifier in class AB operated at 26V.

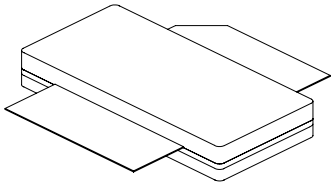
- ALL GOLD metal system for highest reliability
- Industry standard package
- Suggested alternative to the MRF9085
- Internally matched for repeatable manufacturing
- High gain, high efficiency and high linearity



Package Type 440171

PN: UGF09085F

- **Typical CDMA Performance** (IS-97)
  Average Load Power – 20 W
  PE – 26%
  Power Gain – 16 dB
  ACPR -40dBc @ 750kHz (30 kHz BW)
  -55dBc @ 1.98MHz (30 kHz BW)



Package Type 440133

PN: UGF09085P

UGF09085

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}	-	°C/W

Electrical DC Characteristics (T_C =25°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}=26 V, I_D=900mA)	$V_{GS(Q)}$	3.0	4.0	6.0	Volts
Drain to Source On Voltage (V_{GS}=10V, I_D=2A)	$V_{DS(on)}$	-	0.1	-	Volts
Forward Transconductance (V_{DS}=10V, I_D=5A)	Gm	-	-	-	S

AC Characteristics (T_C =25°C unless otherwise specified)

Rating	Symbol	Min	Typ	Max	Unit
Input Capacitance (V_{DS}=26V, V_{GS}=0V, f = 1MHz)	C_{ISS}	-	-	-	pF
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.

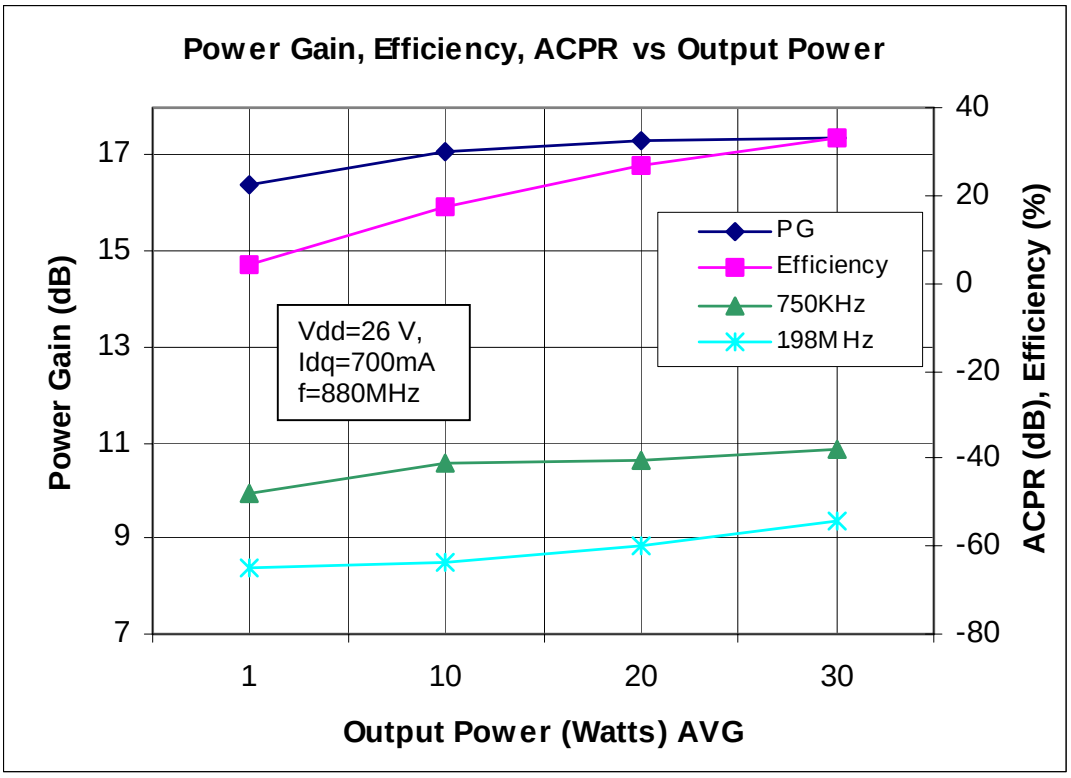
UGF09085

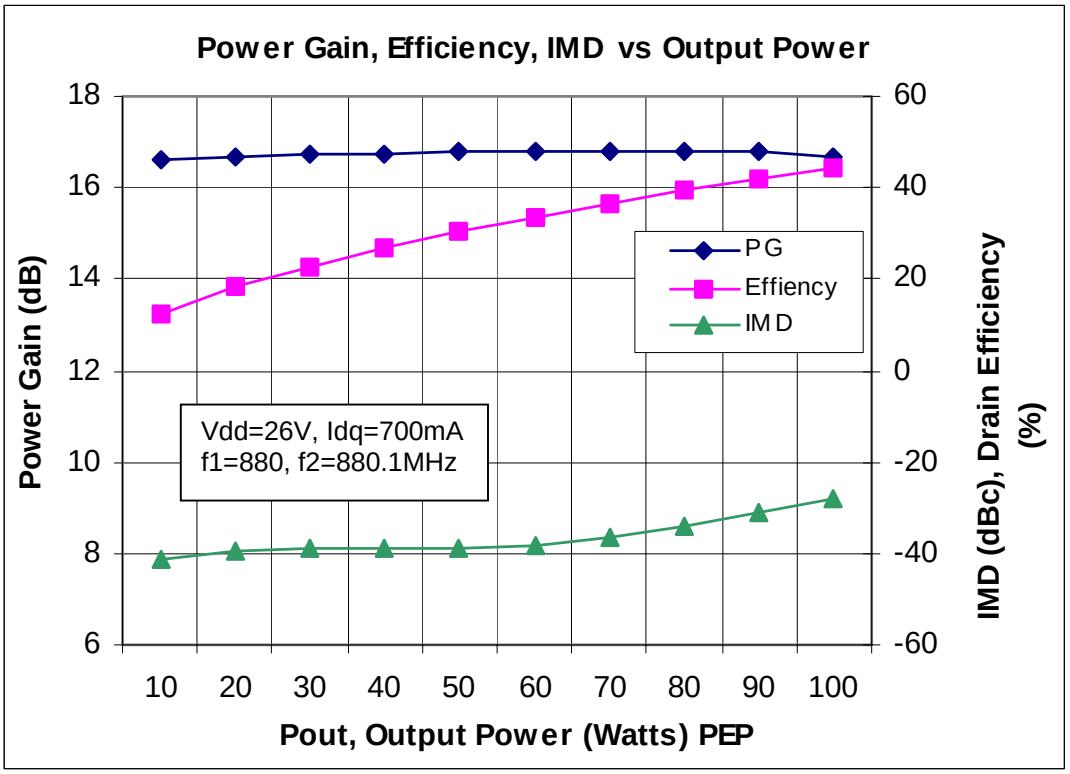
RF and Functional Tests (Tc=25°C unless otherwise specified, Cree Microwave Broadband Fixture)

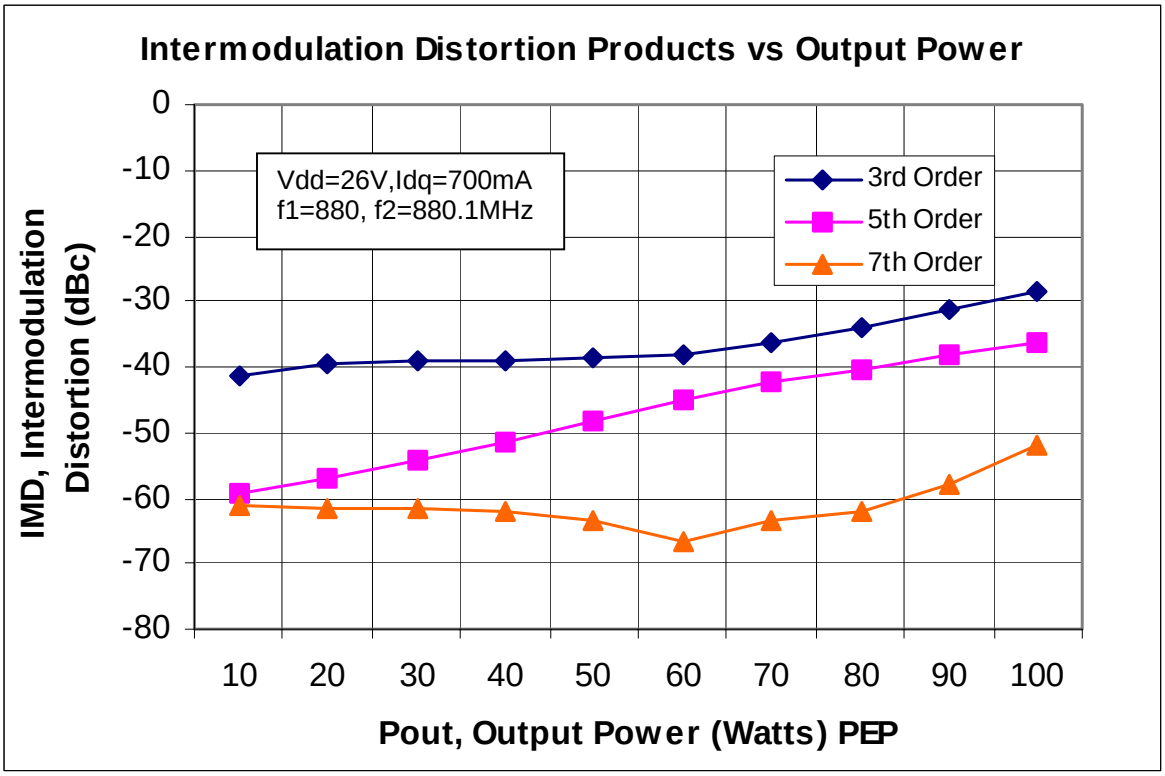
Rating	Symbol	Min	Typ	Max	Unit
CW. Power Gain, P_{out} =90W V_{DD}=26V, I_{DQ}=700mA f= 865-880 MHz	Gp	-	16	-	dB
CW. Output power @ 1dB compression point V_{DD}=26V, I_{DQ}=700mA f=880 MHz	P1dB	90	105	-	W
CW. Drain Efficiency, P_{out} = 90 W, f=880 MHz, V_{DD}=26V, I_{DQ}=700mA	η_D	-	45	-	%
Two-Tone Common-Source Amplifier Power Gain V_{DD}=26V, I_{DQ}=700mA, P_{out} = 90 W PEP f_1 =880 MHz and f_2=880.1 MHz	G_{TT}	-	16.2	-	dB
Two-Tone Intermodulation Distortion V_{DD}=26V, I_{DQ}=700mA, P_{out} = 90 W PEP f_1 =880 MHz and f_2=880.1 MHz	I_{MD}	-28.5	-30	-	dBc
Two-Tone Drain Efficiency V_{DD}=26V, I_{DQ}=700mA, P_{out} = 90 W PEP f_1 =880 MHz and f_2=880.1 MHz	η_{D2T}	35	38	-	%
Input Return Loss V_{DD} =26V, P_{out} = 90 W PEP, I_{DQ}=700mA f =865 - 880 MHz, Tone Spacing =100kHz	IRL	-	12	-	dB
Load Mismatch Tolerance V_{DS}=26V, I_{DQ}= 700 mA, Pout=90W, f=880 MHz	VSWR	10:1	-	-	Ψ

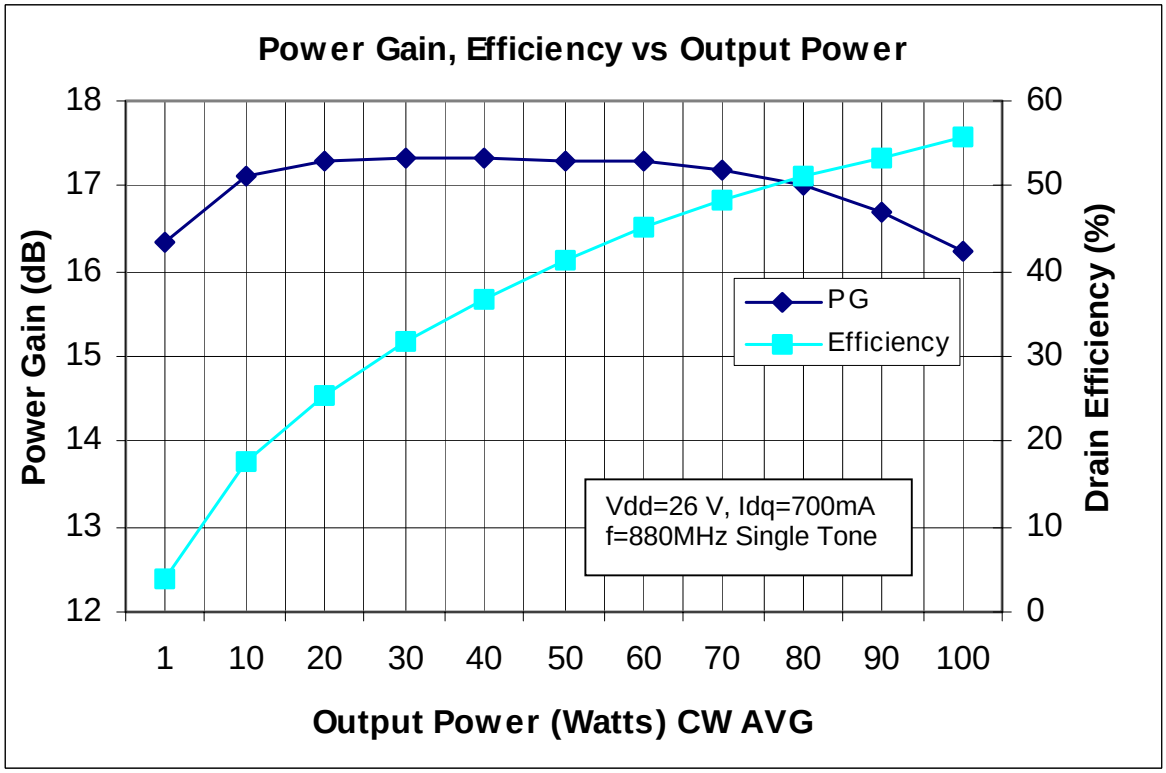
Note: This transistor has been designed to work in the Motorola MRF9085 test fixture. Performance has been verified within that fixture.

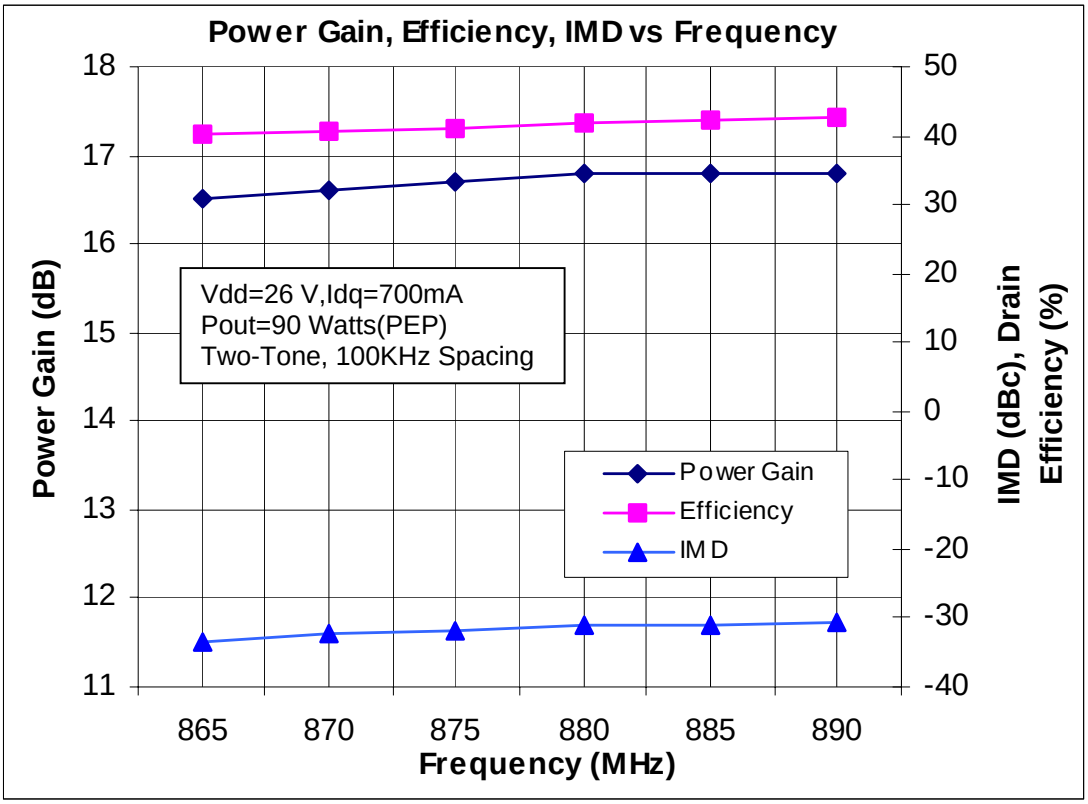
CAUTION - MOS Devices are susceptible to damage from Electrostatic Discharge (ESD). Appropriate precautions in handling, packaging and testing MOS devices must be observed.


Power Gain, Efficiency, ACPR vs Output Power
Power Gain (dB)
ACPR (dB), Efficiency (%)
Output Power (Watts) AVG
17
15
13
11
9
7
40
20
0
-20
-40
-60
-80
1
10
20
30
PG
Efficiency
750KHz
198MHz
Vdd=26 V,
Idq=700mA
f=880MHz


Power Gain, Efficiency, IMD vs Output Power
Power Gain (dB)
IMD (dBc), Drain Efficiency (%)
Pout, Output Power (Watts) PEP
18
16
14
12
10
8
6
60
40
20
0
-20
-40
-60
10
20
30
40
50
60
70
80
90
100
PG
Effiency
IMD
Vdd=26V, Idq=700mA
f1=880, f2=880.1MHz


Intermodulation Distortion Products vs Output Power
IMD, Intermodulation Distortion (dBc)
0
-10
-20
-30
-40
-50
-60
-70
-80
Vdd=26V,Idq=700mA
f1=880, f2=880.1MHz
3rd Order
5th Order
7th Order
10
20
30
40
50
60
70
80
90
100
Pout, Output Power (Watts) PEP


Power Gain, Efficiency vs Output Power
Power Gain (dB)
18
17
16
15
14
13
12
Drain Efficiency (%)
60
50
40
30
20
10
0
PG
Efficiency
Vdd=26 V, Idq=700mA
f=880MHz Single Tone
1
10
20
30
40
50
60
70
80
90
100
Output Power (Watts) CW AVG



Note: Class AB broadband circuit performance.