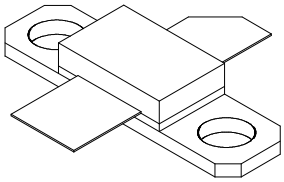
UGF27025

25W, 2.7 GHz, 28V Broadband RF Power N-Channel Enhancement-Mode Lateral MOSFET

Designed for base station applications in the frequency band 2.5 to 2.7 GHz. Rated with a minimum output power of 25W, it is ideal for CW and Multi-Tone Amplifiers in Class AB operation.

- ALL GOLD metal system for highest reliability
- Industry standard package
- Internally matched for repeatable manufacturing
- High gain, high efficiency and high linearity
- Integrated ESD Protection.
- Maximum gain and insertion phase flatness.
- Output load VSWR tolerance 10:1 all phase angles at $28V_{DC}$, 2500MHz, 25W (CW) output power.
- Common source.



Package Type 440159

PN: UGF27025F

- **Application Specific Performance, 2.7 GHz**

  - **Typical 2-Tone Performance**

  Average Load Power – 12.5 W
  η_D – 30%
  Power Gain – 11.5 dB
  IMD3: -30dBc @ -100kHz/ +100KHz
  VDD – 28V
  IDQ – 330mA

  - **Typical CW Performance**

  Average Load Power – 25 W
  η_D – 38%
  Power Gain – 11.0 dB
  VDD – 28V
  IDQ – 330mA

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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 -0.5	Volts
Total Device Dissipation @ Tcase = 70°C Derate above 70°C	P_D	83.5 0.48	Watts W/°C
Storage Temperature Range	T_{stg}	-65 to +150	°C
Maximum Operating Junction Temperature	T_J	200	°C

Thermal Characteristics

Characteristic	Symbol	Typical	Unit
Thermal Resistance, Junction to Case	Θ_{JC}	2.1	°C/W

Electrical DC Characteristics (Tc=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}=28V, 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}=28 V, I_D=330mA)	$V_{GS(Q)}$	3.0	4.0	5.0	Volts
Drain to Source On Voltage (V_{GS}=10V, I_D=1A)	$V_{DS(on)}$	-	-	0.33	Volts
Forward Transconductance (V_{DS}=10V, I_D=1A)	Gm	1.0	-	-	S

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

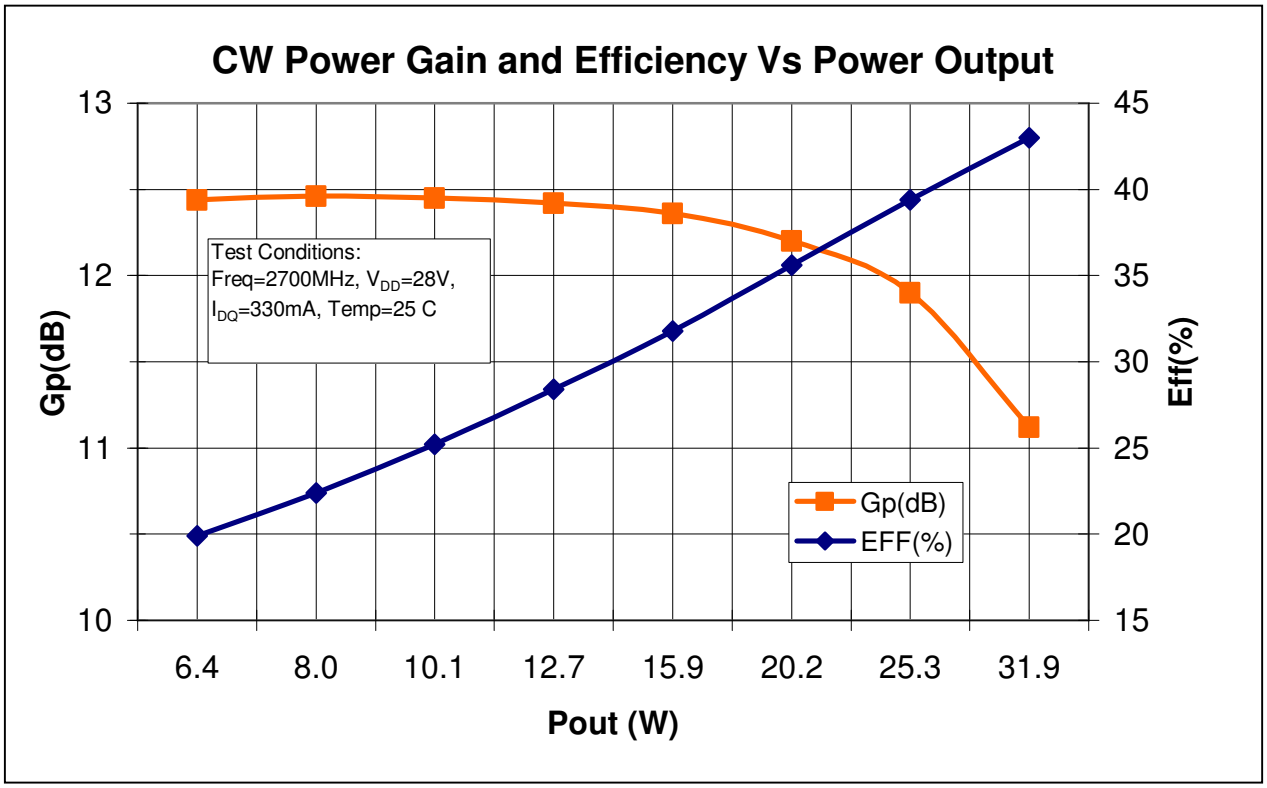
Rating	Symbol	Min	Typ	Max	Unit
Input capacitance * (including matching capacitor) (V_{DS}=28V, V_{GS}=0V, f = 1MHz)	C_{ISS}	-	74	-	pF
Output capacitance * (including matching capacitor) (V_{DS}= 28V, V_{GS}=0V, f = 1MHz)	C_{OSS}	-	352	-	pF
Feedback capacitance * (V_{DS}=28V, V_{GS}=0V, f = 1MHz)	C_{RSS}	-	1.6	-	pF

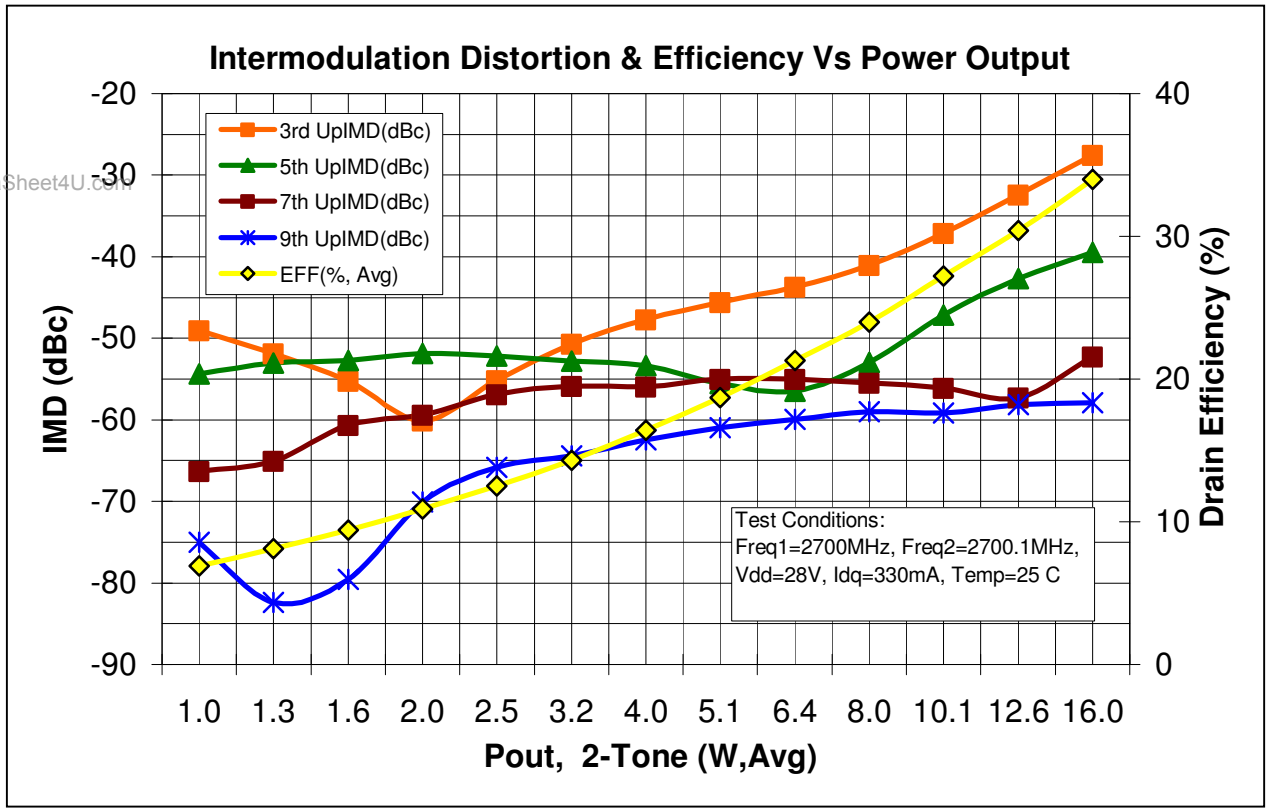
* Part is internally matched on input and output.

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

Rating	Symbol	Min	Typ	Max	Unit
CW Low Power Gain, Pout=8W V_{DD}=28V, I_{DQ}=330mA, f=2700 MHz	G_L	11	12	-	dB
CW Power Gain, P_{out} = 25 W V_{DD}=28V, I_{DQ}=330mA, f=2700 MHz	G_P	10	11	-	dB
CW Drain Efficiency, P_{out} = 25 W, f=2700 MHz, V_{DD}=28V, I_{DQ}=330mA	η_D	34	38	-	%
Two-Tone Common-Source Amplifier Power Gain V_{DD}=28V, I_{DQ}=330mA, P_{out} = 25 W PEP f_1 =2700 MHz and f_2=2700.1 MHz	G_{TT}	10.5	11.5	-	dB
Two-Tone Intermodulation Distortion V_{DD}=28V, I_{DQ}=330mA, P_{out} = 25 W PEP f_1 =2700 MHz and f_2=2700.1 MHz	I_{MD}	-	-30	-28	dBc
Two-Tone Drain Efficiency V_{DD}=28V, I_{DQ}=330mA, P_{out} = 25 W PEP f_1 =2700 MHz and f_2=2700.1 MHz	η_{D2T}	26	30	-	%
Input Return Loss V_{DD} =28V, P_{out} = 25 W PEP, I_{DQ}=330mA f_1 =2500 MHz and 2700 MHz, Tone Spacing = 100kHz	IRL	-	-	-9	dB
Load Mismatch Tolerance V_{DS}=28V, I_{DQ}= 330 mA, Pout=25W, f=2500 MHz	VSWR	10:1	-	-	Ψ

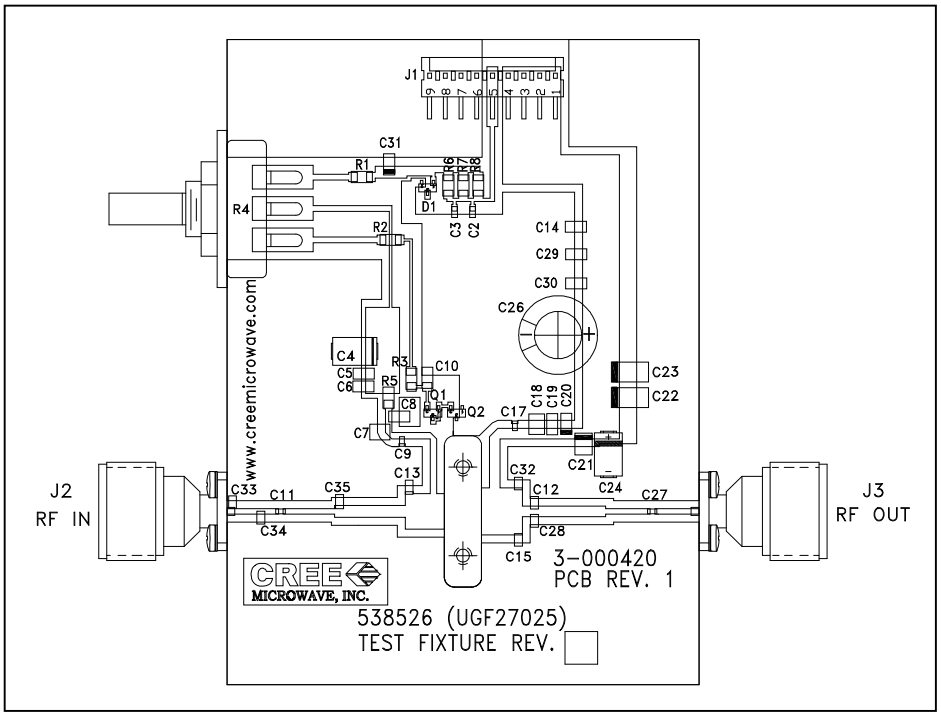
CAUTION - MOS Devices are susceptible to damage from Electrostatic Discharge (ESD). Appropriate precautions in handling, packaging and testing MOS devices must be observed.



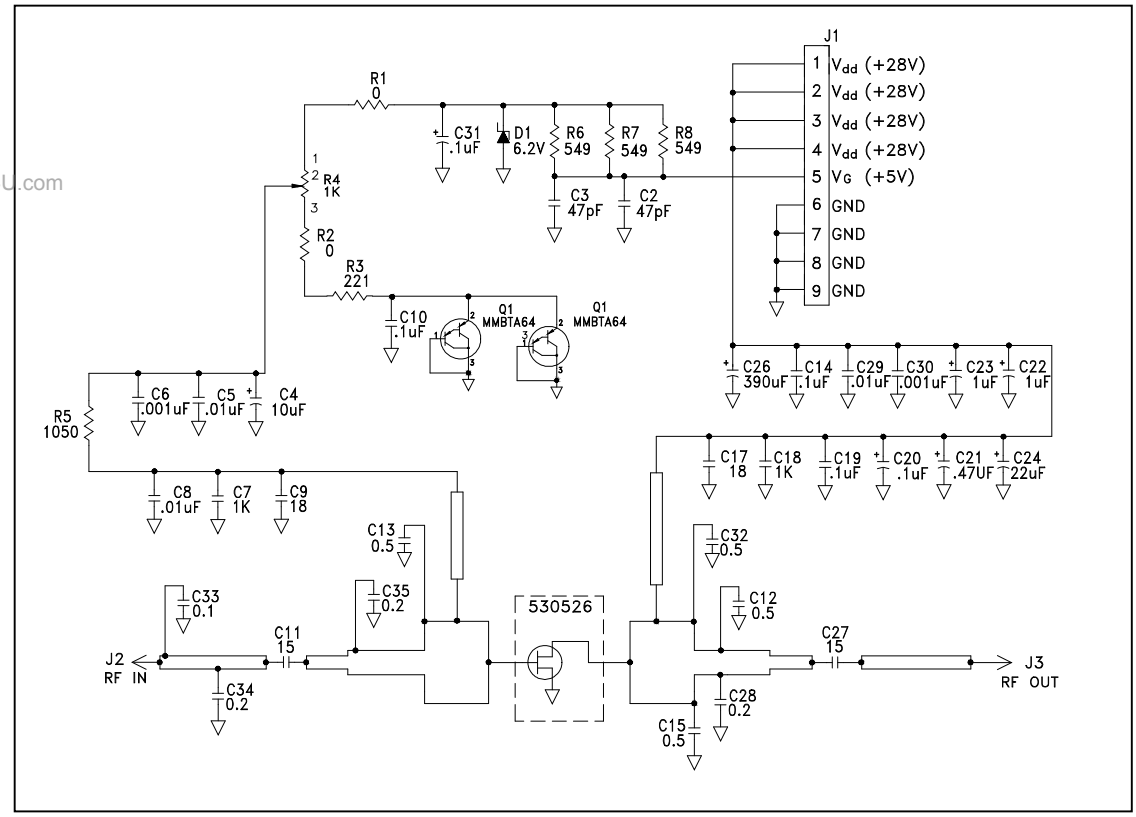


Test Fixture

Test Fixture Layout for 2.5-2.7GHz

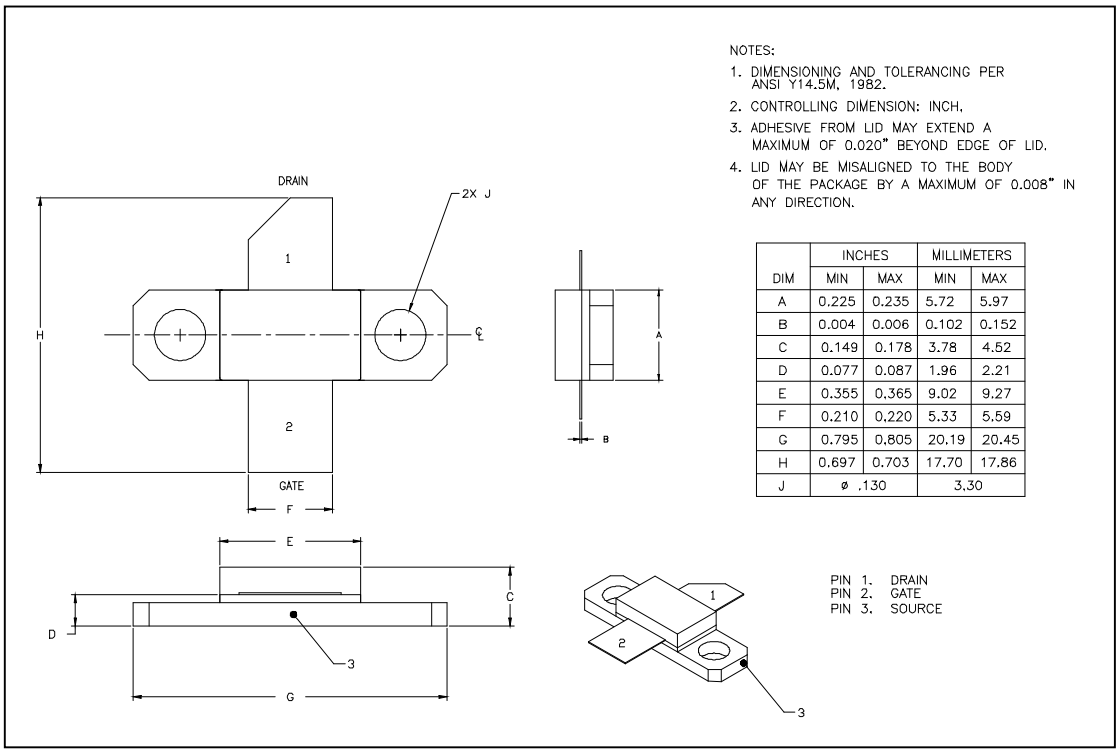


Test Fixture Schematic



Product Dimensions

UGF27025F -Package Number 440159



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.225	0.235	5.72	5.97
B	0.004	0.006	0.102	0.152
C	0.149	0.178	3.78	4.52
D	0.077	0.087	1.96	2.21
E	0.355	0.365	9.02	9.27
F	0.210	0.220	5.33	5.59
G	0.795	0.805	20.19	20.45
H	0.697	0.703	17.70	17.86
J	ø .130		3.30	

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