

# TM5058

## 0.1 - 22 GHz 2 Watt Power Amplifier



### Product Features

High P1dB Output Power: +31 dBm  
High Psat Output Power: +33 dBm  
Gain: 13.5 dB  
DC Supply: +15 V @ 500 mA  
50 Ohm Matched Input/Output  
Die size: 3.0 x 1.88 x 0.1 mm

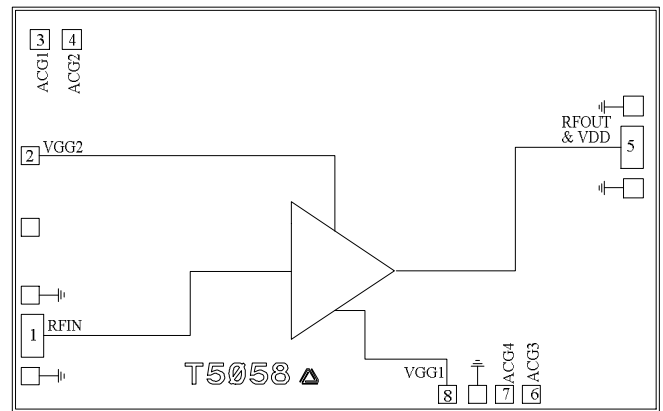
### General Description

The TM5058 is a wideband distributed power amplifier die which operates from 0.1 to 22 GHz. The amplifier delivers 13.5 dB of gain with a corresponding output 1dB compression point of +31 dBm. The TM5058 is a 50 ohm matched design which eliminates the need for RF port matching. The die is 4 mil thick and the backside is plated for simultaneous RF and DC ground.

### Applications

- Test Instrumentation
- Microwave Radio
- Driver Amplifier
- Fiber Optics
- Compatible with Both Epoxy and Eutectic Die Attachment

### Functional Diagram



### Electrical Specifications, VDD = 15 V, VGG2 = 9.5 V, IDD = 500 mA, TA = 25 °C

Parameter	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range		0.1 - 10			10 - 22		GHz
Gain		12.5			13.5		dB
Input Return Loss		-17			-17		dB
Output Return Loss		-15			-20		dB
Output P1dB		31.5			31		dBm
Saturated Output Power		33.5			33		dBm
Output Third Order Intercept (OIP 3)		41			39		dBm
Noise Figure (NF)		5.5			6		dB
Supply Current		500			500		mA

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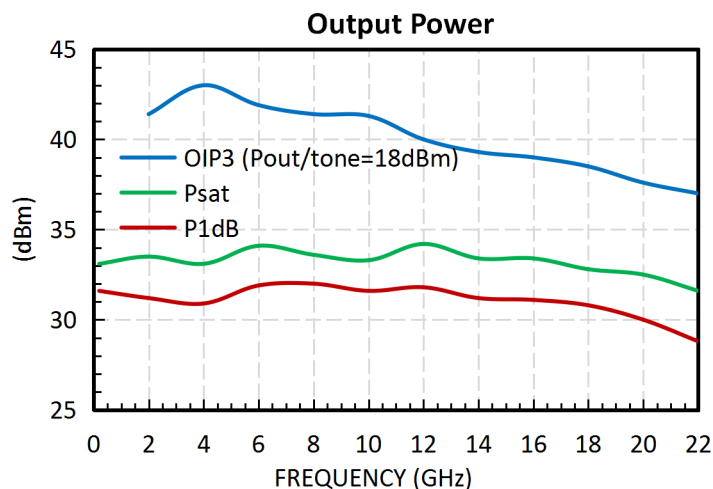
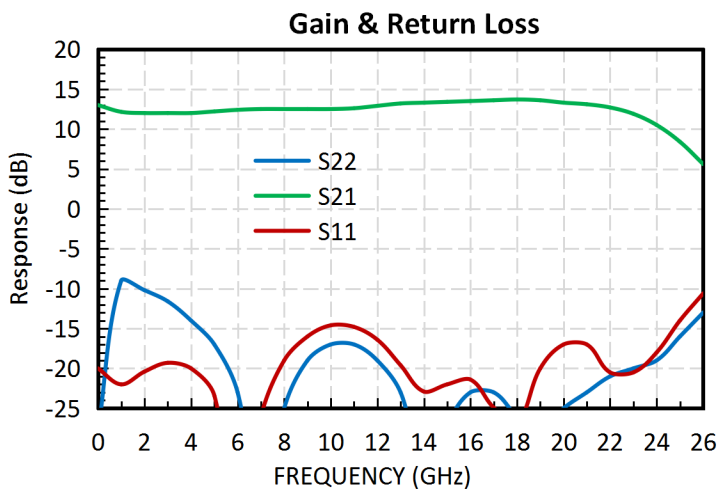


### Absolute Maximum Ratings

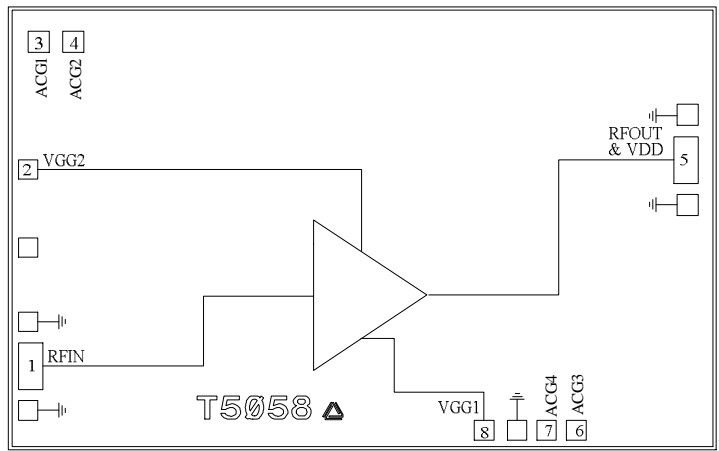
Parameter	Rating
Storage Temperature	-65 to 150 °C
Operating Temperature	-55 to 85 °C
Drain Voltage	+17 V
Gate Voltage VGG1	-3 to 0 V
Gate Voltage VGG2	VDD-7 to VDD-4
Channel Temperature	175 °C
Thermal Resistance (Channel to die bottom)	8 °C/W

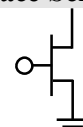
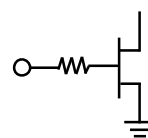
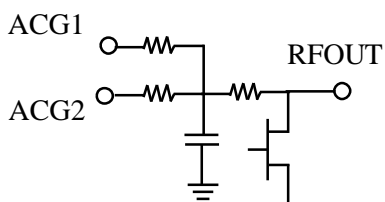
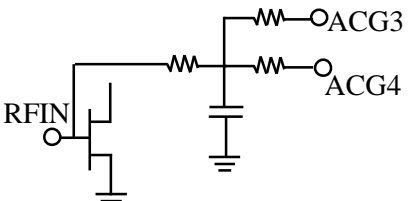
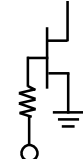
### Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
VDD		15		V
IDD		500		mA
VGG2		9.5		V

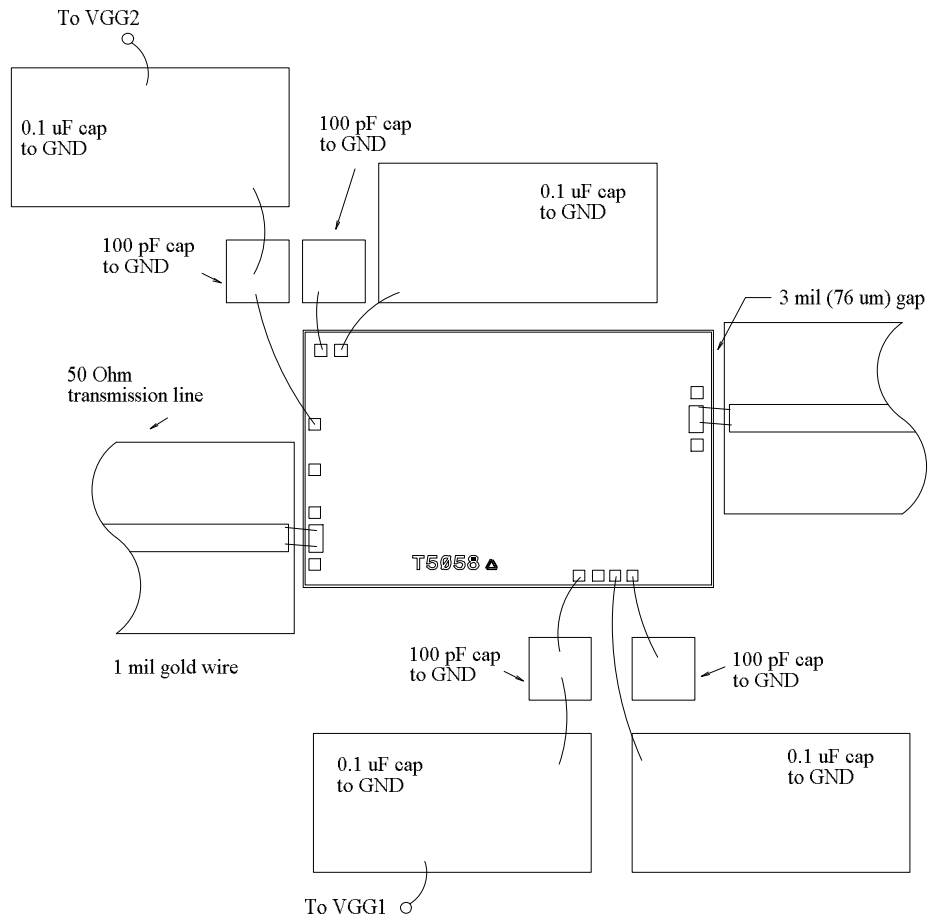


### Pin Description



Pad	Function	Description	Interface Schematic
1	RFIN	50 Ohm matched and DC coupled input	
2	VGG2	Gate control 2 for amplifier. Recommended voltage is 9.5V. Equivalent resistance to ground is 680 Ohm.	
3, 4	ACG1, ACG2	Low frequency AC ground termination. Attach bypass capacitor per application circuit.	
5	RFOUT & VDD	50 Ohm matched output and supply voltage. External bias-T required per application circuit.	
6, 7	ACG3, ACG4	Low frequency AC ground termination. Attach bypass capacitor per application circuit.	
8	VGG1	Gate control 1 for amplifier. Adjust this voltage for the desired IDD.	

### Assembly Diagram



### Application Circuit

