TELETRONICS INTERNATIONAL, INC.

TC3151

Nov. 2001

2.4 GHz 2W MMIC

FEATURES

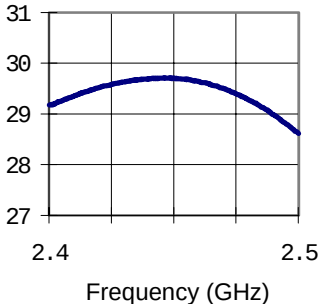
- P_{-1} dB: 33 dBm
- Small Signal Gain: 28 dB
- Power Added Efficiency: 36 %
- IP3: 42 dBm
- DC Power: 5.6 W

PHOTO ENLARGEMENT

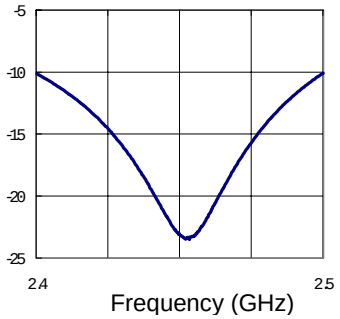
DESCRIPTION

The TC3151 is a 2 stage PHEMT MMIC power amplifier. It is designed for use in low cost, high volume, 2.4-2.5 GHz ISM band applications. The MMIC provides a typical gain of 28 dB and saturation power of more than 34 dBm. Typical bias condition is 7V at 800 mA. The MMIC is a packaged in a standard SO-8 power package. The copper based carrier of the package allows direct soldering of the device to the PCB for proper heat sinking. The input and output matching of the MMIC require minimum external components.

Typical Small Signal Gain (dB)



Typical Input Return Loss (dB)



ELECTRICAL SPECIFICATIONS (Ta = 25 °C)

SYMBOL	DESCRIPTION	MIN	TYP	MAX	UNITS
FREQ	Frequency Range	2.4		2.5	GHz
SSG	Small Signal Gain	27	28		dB
P_{-1} dB	Output Power at 1 dB Gain Compression	32	33		dBm
P3 dB	Output Power at 3 dB Gain Compression	33	34		dBm
PAE	Power Added Efficiency		36		%
IP3	Third Order Intercept Point	41	42		dBm
RL, IN	Input Return Loss	9	12		dB
VDD	Supply Voltage		7		Volt
Vg	Gate Voltage	-0.6	-1.2	-2	Volt
IDD	Current Supply Without RF		800		mA
ID_P_{-1} dB	Current Supply @ Pout = P_{-1} dB		920		mA

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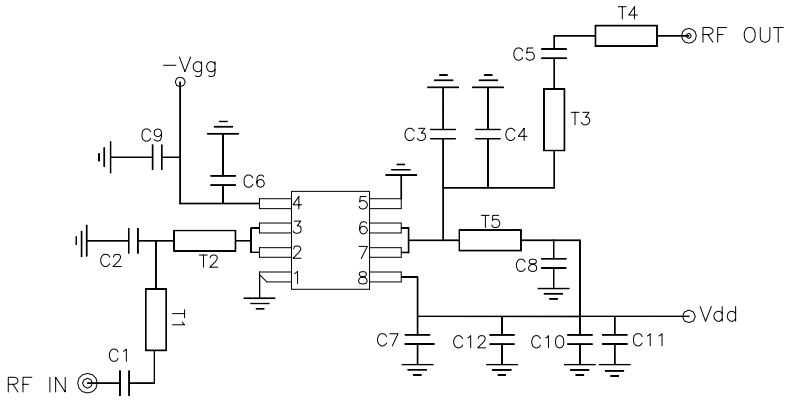
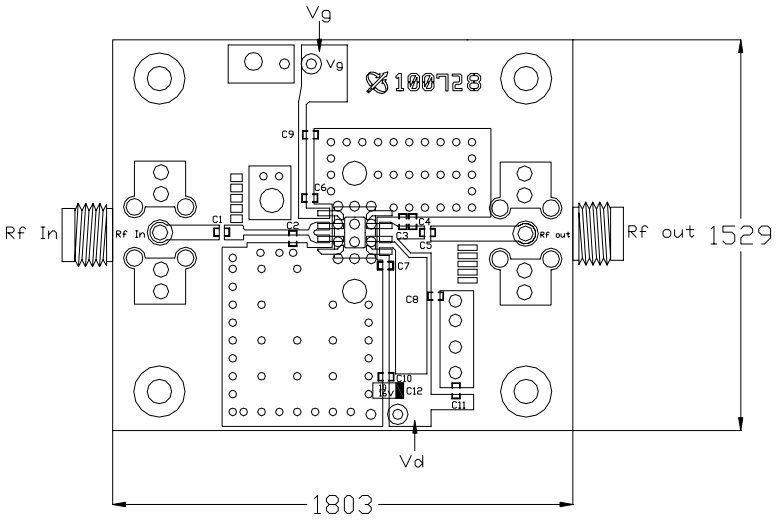
TEST CIRCUITS

Evaluation Board Schematic



EVALUATION BOARD

PCB Material: FR4
ER = 4.6
Thickness = 31 mil
Unit: mil



Evaluation Board Parts List

Part Type	Reference Designator	Description	Manufacturer	Part Number
Capacitor	C1	3.3 pF 0603	Murata	GRM39C0G3R3C50V
Capacitor	C2	2.5 pF 0603	Murata	GRM39C0G2R5C50V
Capacitor	C3	1 pF 0603	Murata	GRM39C0G010C50V
Capacitor	C4	0.75 pF	Murata	GRM39C0GR75C50V
Capacitor	C5	1.5 pF 0603	Murata	GRM39C0G1R5C50V
Capacitor	C6~8	1000 pF 0603	Murata	GRM39C0G102J50V
Capacitor	C9~11	0.1 uF 0603	Murata	GRM39Y5V104Z25V
Capacitor	C12	4.7uF 1206		Tan Cap

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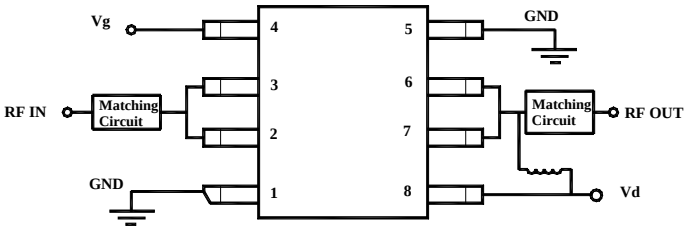
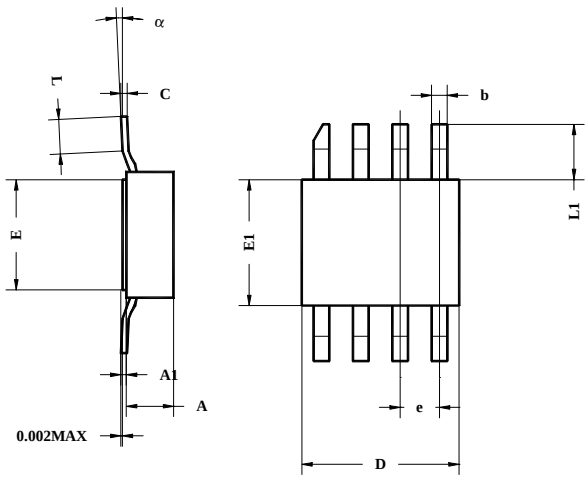
CONNECTION DIAGRAM AND PIN DESCRIPTIONS



Pin #	Name	Description
1	GND	Ground
2, 3	RF IN	RF input (internally DC blocked)
4	Vg	FET gate bias
5	GND	Ground
6, 7	RF OUT	RF output and V_{d2} External matching circuit required
8	Vd	Input stage drain bias

PHYSICAL DEMENSIONS



DIMENSION	MINIMUM	NOMINAL	MAXIMUM
A	0.083	0.086	0.089
A1	0.007	0.008	0.009
b	0.017	0.020	0.023
c	0.007	0.008	0.009
D	0.195	0.200	0.205
E	0.135	0.140	0.145
E1	0.155	0.160	0.165
e		0.050	
L	0.020		0.040
L1	0.055	0.065	0.075
α	0°		7°

Dimensions in inches

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