



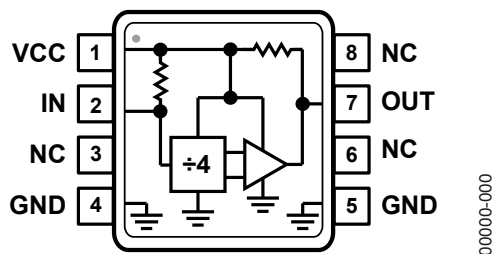
## SMT GaAs HBT MMIC Divide-by-4, 0.05 - 4 GHz

### Typical Applications

Prescaler for DC to C Band PLL Applications:

- UNII, Point-to-Point & VSAT Radios
- 802.11a & HiperLAN WLAN
- Fiber Optic
- Wireless infrastructure (W-CDMA, TD-SCDMA, WiMax, GSM, PCS, DCS, DECT)
- Cellular Infrastructure
- Satellites / VSATs
- Test Equipment/Instrumentation

### Functional Diagram



### Features

- Ultra Low SSB Phase Noise: -150 dBc/Hz
- Single-Ended I/O's
- Output Power: -2 dBm
- Single DC Supply: +3V @ 53 mA

### General Description

The ADMV2101 is a low noise Divide-by-4 Static Divider utilizing InGaP GaAs HBT technology in ultra small surface mount MSOP8 plastic package. This device operates from DC (with a square wave input) to 4 GHz input frequency with a single +3V DC supply. Single-ended inputs and outputs reduce component count and cost. The low additive SSB phase noise of -150 dBc/Hz at 100 kHz offset helps the user maintain good system noise performance.

### Electrical Specifications, $T_A = +25^\circ\text{C}$ , 50 Ohm System, $V_{cc} = +3V_{dc} \pm 5\%$

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Frequency <sup>[1], [2]</sup>	Sinewave	0.05		4	GHz
Input Power Range	$F_{in} = 1\text{GHz} - 4\text{GHz}$	-10		10	dBm
Output Power	$F_{in} = 4\text{GHz}$	-5.0	-2.8		
Reverse Leakage	RF Output Terminated, $F_{in} = 2\text{GHz}$ , $P_{in} = 0\text{dBm}$		-20		dBm
SSB Phase Noise (100 kHz offset)	$P_{in} = 0\text{dBm}$ , $F_{in} = 4\text{GHz}$		-150		dBc/Hz
Output Transition Time	$P_{in} = 0\text{dBm}$ , $F_{out} = 882\text{MHz}$		120		ps
Supply Current ( $I_{cc}$ )	$V_{cc} = +3.0V$		55	71	mA

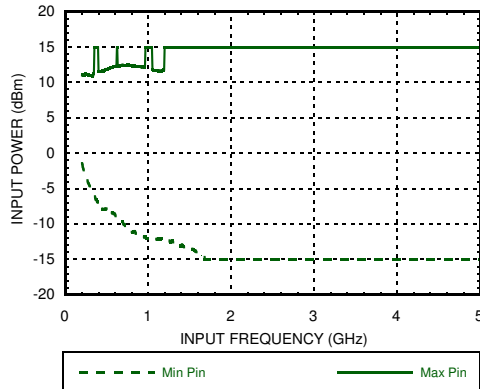
<sup>1</sup> Divider will operate down to DC levels. Square-wave input required below 200MHz.

<sup>2</sup> For stable operation without an input signal, refer to Analog Devices Application Note, "Frequency Divider Operation & Compensation with No Input Signal."

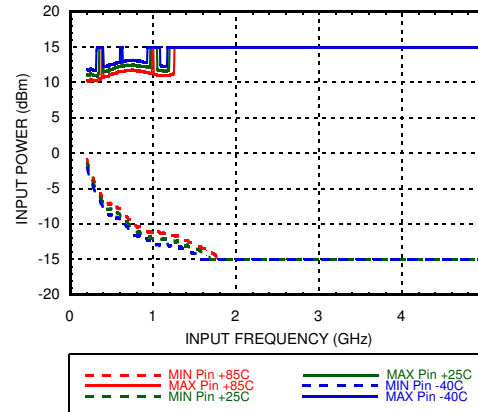


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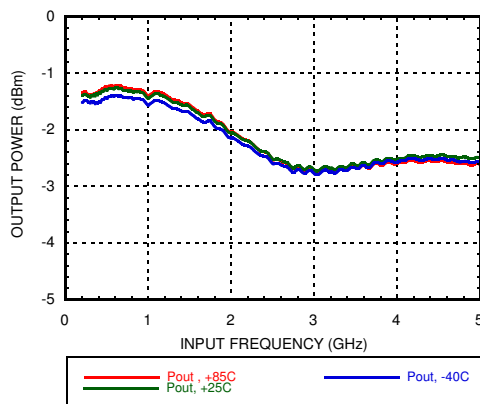
**Input Sensitivity Window,  $T = 25\text{ }^{\circ}\text{C}$**



**Input Sensitivity Window vs. Temperature**

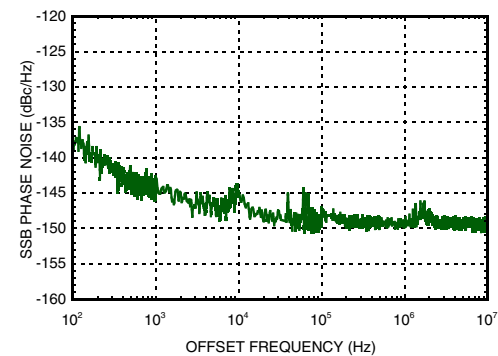


**Output Power vs. Temperature,  $P_{in} = 0\text{ dBm}$**

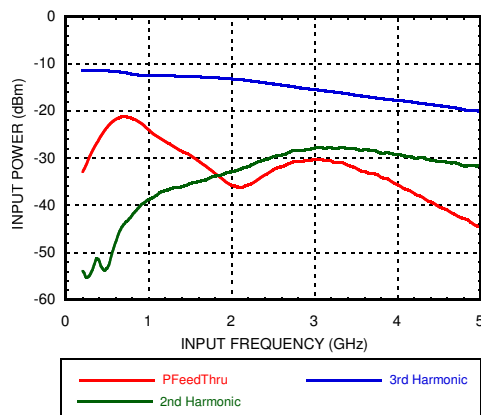


**SSB Phase Noise**

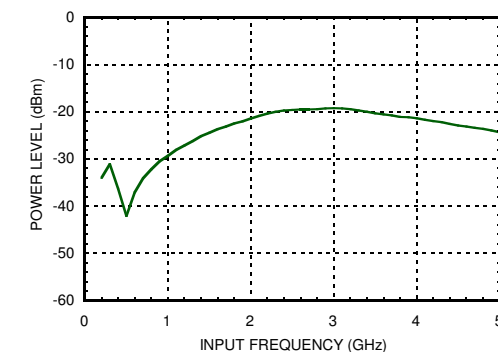
**Performance,  $P_{in} = 0\text{ dBm}$ ,  $F_{in} = 4\text{ GHz}$**

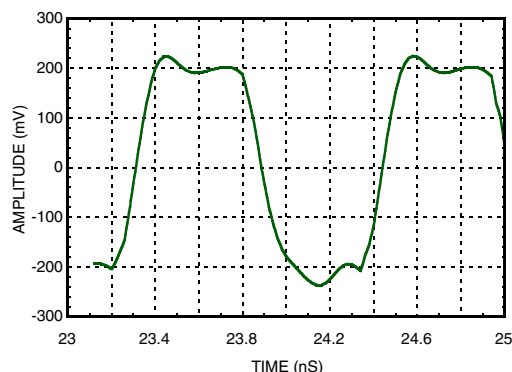


**Output Harmonic Content,  $P_{in} = 0\text{ dBm}$ ,  $T = 25\text{ }^{\circ}\text{C}$**



**Reverse Leakage,  $P_{in} = 0\text{ dBm}$ ,  $T = 25\text{ }^{\circ}\text{C}$**




**SMT GaAs HBT MMIC  
Divide-by-4, 0.05 - 4 GHz**
**Output Voltage Waveform,  
Pin= 0 dBm, Fout= 882 MHz, T= 25 °C**

**Absolute Maximum Ratings**

RF Input Power (Vcc = +3V)	15 dBm
Nominal +3V Supply to GND	-0.3V to +3.5V
Max Peak Flow Temperature	260 °C
Storage Temperature	-65 to +125 °C
ESD Rating	FICDM - Class IV, HBM - Class 0

**Reliability Information**

Junction Temperature to Maintain 1 Million Hour MTTF	135 °C
Nominal Junction Temperature (T = 85 °C)	99 °C
Thermal Resistance (Junction to GND Paddle, 3V Supply)	83 °C/W
Operating Temperature	-40 to +85 °C

DC blocking capacitors are required at RF input and RF output ports.  
Choose value for lowest frequency of operation.



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

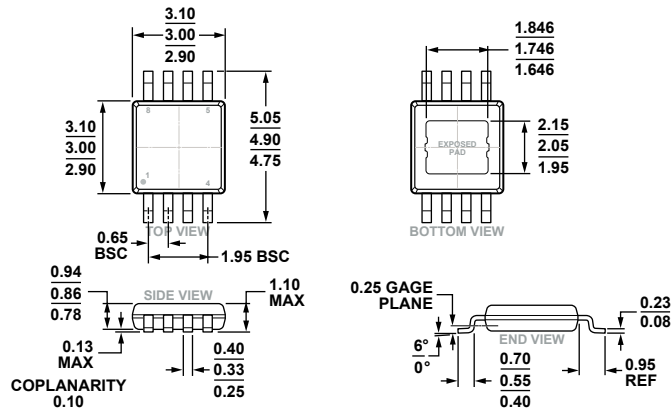
**Typical Supply Current vs. Vcc**

Vcc (V)	Icc (mA)
2.70	45
3.0	55
3.30	66

Note: Divider will operate over full voltage range shown above

**Outline Drawing**

8-Lead Mini Small Outline Package with Exposed Pad [MINI\_SO\_EP]  
(RH-8-2)  
Dimensions shown in millimeters



COMPLIANT TO JEDEC STANDARDS MO-187-AA-T

**Package Information**

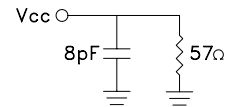
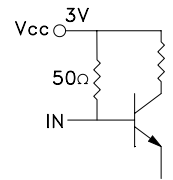

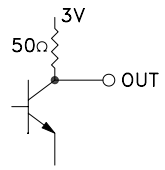
Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking
ADMV2101	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL3 <sup>[1]</sup>	#V 1B

[1] Max peak reflow temperature of 260 °C



**SMT GaAs HBT MMIC**  
**Divide-by-4, 0.05 - 4 GHz**

**Pin Description**

Pin Number	Function	Description	Interface Schematic
1	VCC	Main supply voltage, 3.0Vdc $\pm$ 0.3V	
2	IN	RF input; must use external DC block	
3, 6, 8	NC	No connection or ground. No internal bond.	
4, 5	GND	Ground. Must be connected to RF and DC ground.	
7	OUT	RF output; must use external DC block	
Exposed Paddle	GND	Ground. Must be connected to RF and DC ground.	

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