

## FEATURES

- 104-114 GHz
- P1dB/PSAT: 20/22 dBm
- Gain: 30 dB
- OIP3: 26 dBm
- Size: 16 x 23 x 4 mm
- Evaluation board available

## DESCRIPTION

gMTX0046 is a surface-mount GaAs transmitter for the 104-114 GHz frequency band. The transmitter offers a wide IF bandwidth from DC to 10 GHz suitable for direct conversion or IF modulation/demodulation. The package output has a WR-10 aperture for low-loss connection to a rectangular waveguide.

## TYPICAL APPLICATIONS

- Point-to-point communication
- Instrumentation
- Active imaging
- General purpose

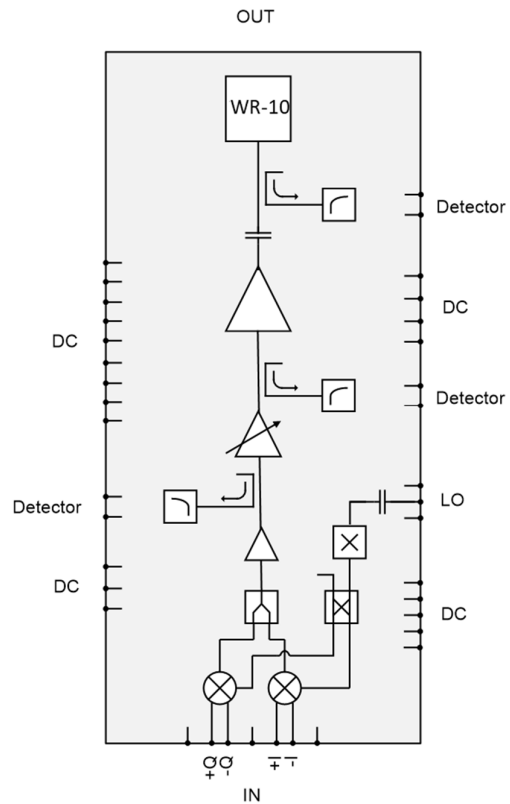


Figure 1. Block diagram

## ELECTRICAL PERFORMANCE

**Table 1. Electrical performance  $T_A=25^\circ\text{C}$**

Parameter	Min	Typ	Max	Unit
RF frequency	92		100	GHz
IF frequency	DC		10	GHz
LO input frequency	11.5		12.5	GHz
LO input power		2		dBm
LO multiplication factor		8		
Max conversion gain		30		dB
Gain control range		25		dB
P1dB		20		dBm
PSAT		22		dBm
OIP3		26		dBm
RF return loss		10		dB
IF return loss		10		dB
LO return loss		10		dB
Power consumption		6.3		W

## ABSOLUTE MAXIMUM RATINGS

**Table 2. Absolute Maximum Ratings**

Parameter	
Gate-source voltage	-2 to +0.7 V
Drain-source voltage	4.5 V
Gate-drain breakdown voltage	8 V
Operating temperature	-40 to + 85°C
Storage temperature	-65 to +150°C

## PIN CONFIGURATION AND BIAS

Always apply the gate supplies first followed by the drain supplies. It is recommended to initially set all gates to -1.6 V and adjust the gate supplies to obtain the specified drain currents. The typical gate voltage can vary by up to 0.2 V from what is noted. The drain currents are listed with all RF input signals off.

*Note:* Not connected (NC) pins are floating and must not be grounded.

**Table 3. Pin functions and electrical settings**

Pad No.	Reference	Supply (V)	Current (mA)	Function
1	NC			
2	NC			
3	VD_PA**	4	650**	Bias
4				
5				
6	NC			
7	VG_PA	-0.5 (typ)		Bias
8	NC			
9	VTEMP			Temperature output
10	NC			
11	NC			
12	VD2_VGA	3.3	75	Bias
13	VG2_VGA	-0.5 (typ)		Bias
14	VG1_VGA	-0.5 (typ)		Bias
15	VD1_VGA	3.3	115	Bias
16	NC			
17	VDET_1			Detector output
18	VREF_1			Detector reference
19	NC			
20	VD_BUF	3.3	50	Bias
21	VG_BUF	-0.5 (typ)		Bias
22	VG_MIX	-0.8 (typ)		Bias
23	Q+	Z0 = 100Ω differential impedance, DC-coupled		Input
24	Q-			Input
25	I+	Z0 = 100Ω differential impedance, DC-coupled		Input
26	I-			Input
27	NC			
28	VG_AMP_X2	-0.5 (typ)	(78)	Bias
29	VD_AMP_X2	3.3	80 (78+2)	Bias
30	VG_X2	-0.9 (typ)	(2)	Bias
31	NC			
32	NC			

33	LO	Z0 = 50Ω, AC-coupled	LO
34	VREF_2		Detector reference
35	VDET_2		Detector output
36	NC		
37	NC		
38	NC		
39	NC		
40	VD_PA**	650**	Bias
41			
42			
43	VREF_3		Detector reference
44	VDET_3		Detector output
45-58	NC		
59	RF OUT	WR-10	Output
60-72	GND		GND

\*\* VD\_PA, bias supply to pin 3-5 and 40-42, total current is 650+650=1300 mA.

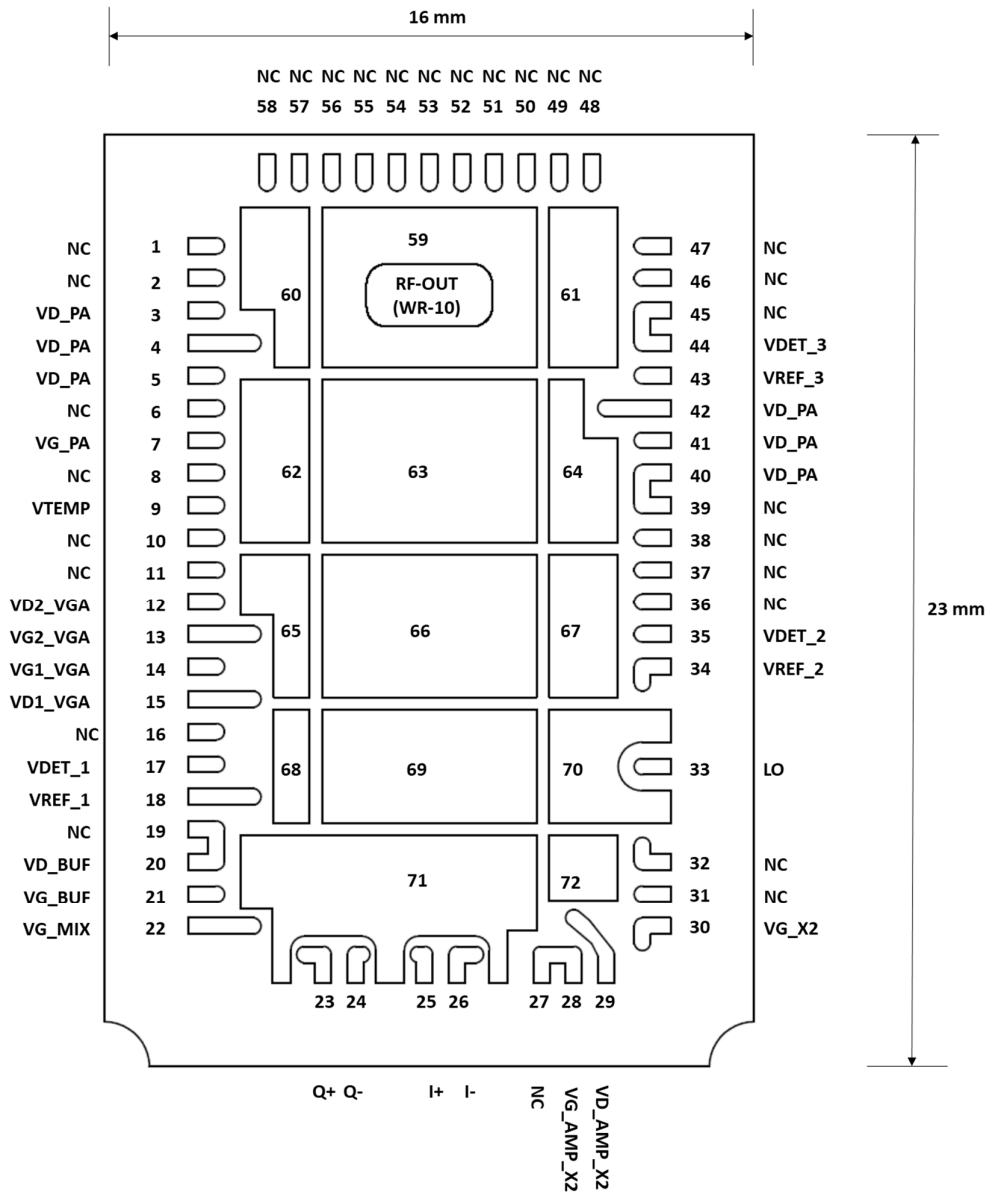


Figure 2. Pin configuration.