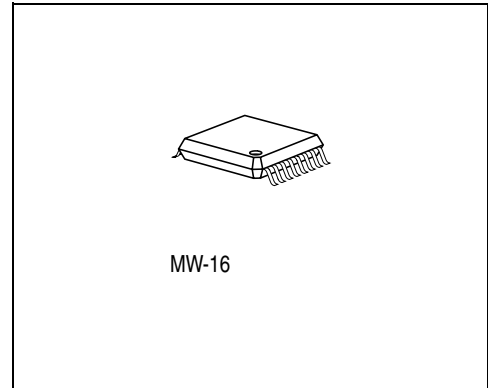


# GaAs MMIC

## Data Sheet

# CGY 353

- 3-stage power amplifier for 3.5 GHz applications
- Linear Output power 31.0 dBm
- Gain of 21.0 dB typ.
- Operating voltage 7.0 V typ.
- Unconditionally stable



**ESD:** Electrostatic discharge sensitive device, observe handling precautions!

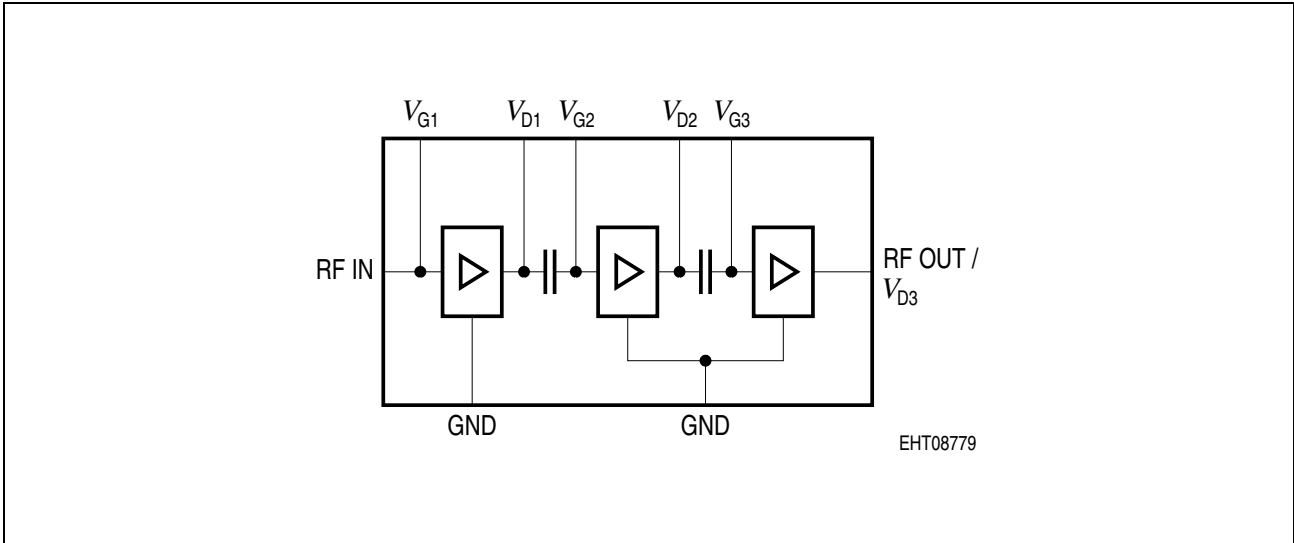
Type	Marking	Ordering Code (taped)	Package
CGY 353	CGY 353	Q62702-G82	MW-16

### Maximum Ratings

Parameter	Symbol	Value	Unit
Positive supply voltage	$V_D$	8.0	V
Supply current	$I_D$	2.0	A
Maximum input power	$P_{IN\_max}$	17.0	dBm
Channel temperature	$T_{Ch}$	150	°C
Storage temperature	$T_{stg}$	- 55 ... + 150	°C
Total power dissipation ( $T_S \leq 81$ °C) $T_S$ : Temperature at soldering point	$P_{tot}$	7.0	W
Pulse peak power dissipation duty cycle 30%, $t_{ON} = 0.5$ ms	$P_{Pulse}$	11.0	W

### Thermal Resistance

Parameter	Symbol	Value	Unit
Channel-soldering point	$R_{thChS}$	t.b.d.	K/W



**Figure 1 Functional Block Diagram**

**Pin Configuration**

Pin No.	Name	Configuration	Bias Voltage
1	RF IN	RF input <sup>1)</sup>	–
2	GND	GND	0 V
3	GND	GND	0 V
4	GND	GND	0 V
5	GND	GND	0 V
6	GND	GND	0 V
7	$V_{D1}$	1 <sup>st</sup> RF Amp Drain Bias	pos. voltage <sup>2)</sup>
8	$V_{G2}$	2 <sup>nd</sup> RF Amp Gate Bias	neg. voltage <sup>3)</sup>
9	$V_{G1}$	1 <sup>st</sup> RF Amp Gate Bias	neg. voltage <sup>3)</sup>
10	GND	GND	0 V
11	GND	GND	0 V
12	RF OUT/ $V_{D3}$	RF output/3 <sup>rd</sup> RF Amp Drain Bias	pos. voltage <sup>2)</sup>
13	RF OUT/ $V_{D3}$	RF output/3 <sup>rd</sup> RF Amp Drain Bias	pos. voltage <sup>2)</sup>
14	RF OUT/ $V_{D3}$	RF output/3 <sup>rd</sup> RF Amp Drain Bias	pos. voltage <sup>2)</sup>
15	$V_{G3}$	3 <sup>rd</sup> RF Amp Gate Bias	neg. voltage <sup>3)</sup>

**Pin Configuration (cont'd)**

Pin No.	Name	Configuration	Bias Voltage
16	$V_{D2}$	2 <sup>nd</sup> RF Amp Drain Bias	pos. voltage <sup>2)</sup>
MW-16 Heatsink Slug	GND	OWP Ground	0 V

1) The gate voltage of the 1<sup>st</sup> RF Amp is not blocked internally (see also **Figure 1**). Therefore  $V_{G1}$  must be blocked externally at RF IN.

2) The positive DC voltages of  $V_{D1}$ ,  $V_{D2}$  and  $V_{D3}$  are typically equal. The voltage range is typically between + 5.0 V and + 7.0 V.

3) The negative DC voltages of  $V_{G1}$ ,  $V_{G2}$  and  $V_{G3}$  are typically equal. The voltage range depends on the wanted drain current. A gate voltage of - 2.1 V will set  $I_D$  typically to 1.2 A at  $V_D = 7.0$  V. In that case  $I_{D1}$  will have about 70 mA,  $I_{D2}$  about 270 mA and  $I_{D3}$  about 900 mA.

**Electrical Characteristics**

Conditions:  $V_D = 7.0$  V,  $T_A = 25$  °C,  $f = 3425 - 3450$  MHz,  $Z_S = Z_L = 50$  Ω, pulsed operation mode, duty cycle = 30%, unless otherwise specified.

Parameters	Symbol	Limit Values			Unit	Test Conditions
		min.	typ.	max.		
Supply current	$I_{DD}$	–	1.2	–	A	–
Power down current	$I_{Pdown}$	–	10	–	mA	–
Supply current neg. voltage	$I_G$	–	1	–	mA	–
Gain at nominal linear output power	$G$	–	21	–	dB	–
Linear Output Power	$P_{OUT}$	–	31	–	dBm	$P_{IN} = 12$ dBm
Saturation Output Power	$P_{SAT}$	–	33	–	dBm	$P_{IN} = 14$ dBm
Overall Power added Efficiency	PAE	–	15	–	%	$P_{IN} = 10$ dBm
Adjacent channel power <sup>1)</sup>	ACP	–	–	– 30	dBc	± 156 kHz beside carrier
Input return loss <sup>2)</sup>	S11	10	–	–	dB	$P_{IN} = 10$ dBm
Output return loss	S22	8	–	–	dB	$P_{IN} = 10$ dBm
Noise Figure	$NF$	–	5	–	dB	–

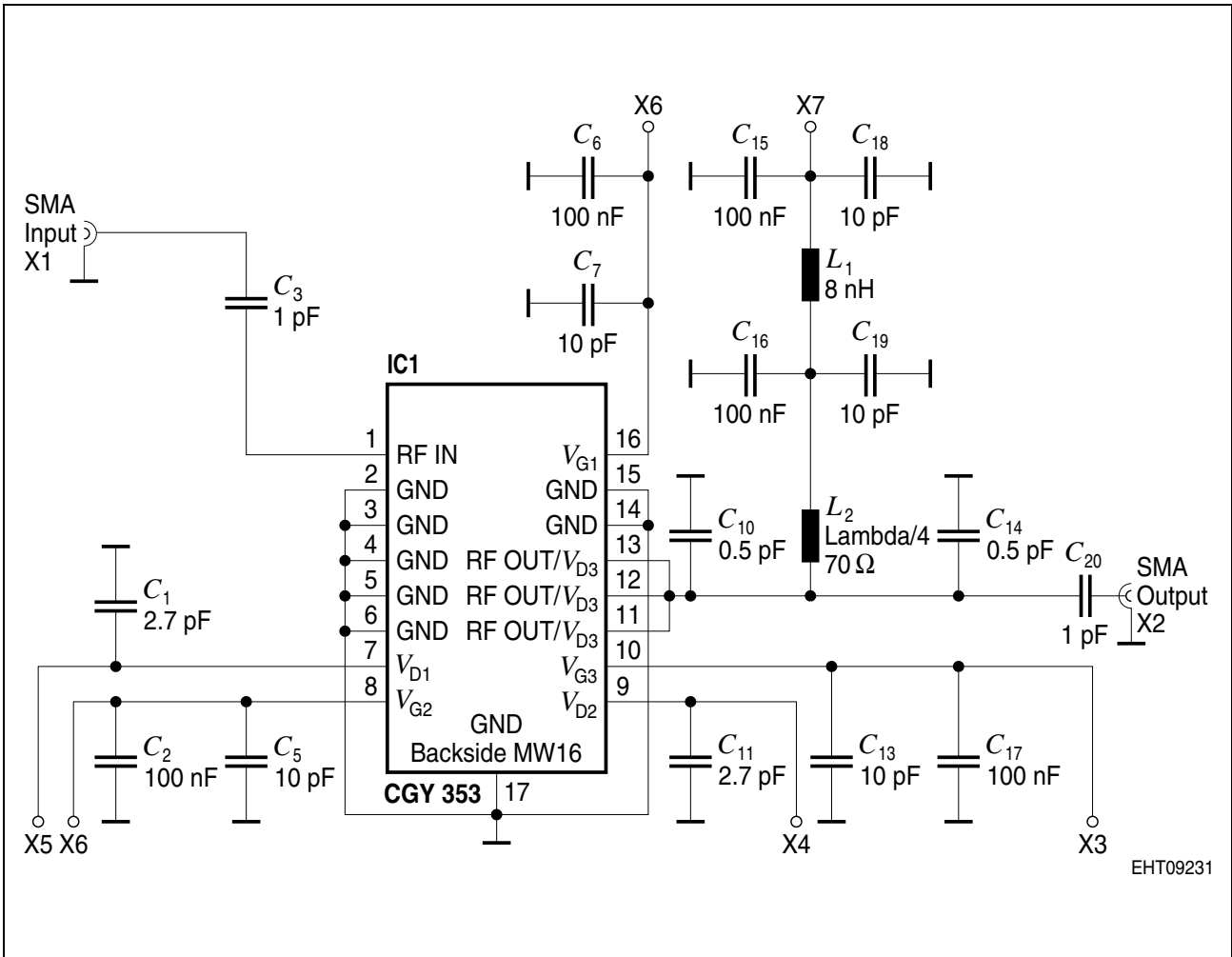
<sup>1)</sup> Modulation:  $\pi/4$  DQPSK with an alpha = 0.4 root raised cosine filtered  
Symbol rate: 256 ksymbols/s.

Transmission burst: Each burst has a 500 s nominal duration with 20 dB of raised cosine shaping of 8 s duration at the beginning and the end of the burst. A maximum of three bursts occur in each 5 ms period, but consecutive bursts are separated by a minimum interval of 1 ms.

Duty cycle: 30%, 3 bursts per 5 ms frame with a minimum interval of 1 ms between bursts.

The modulation signal has a peak to mean envelope ratio of 3.1 dB.

<sup>2)</sup> Values of S11 and S22 with match as realized on application board.



EHT09231

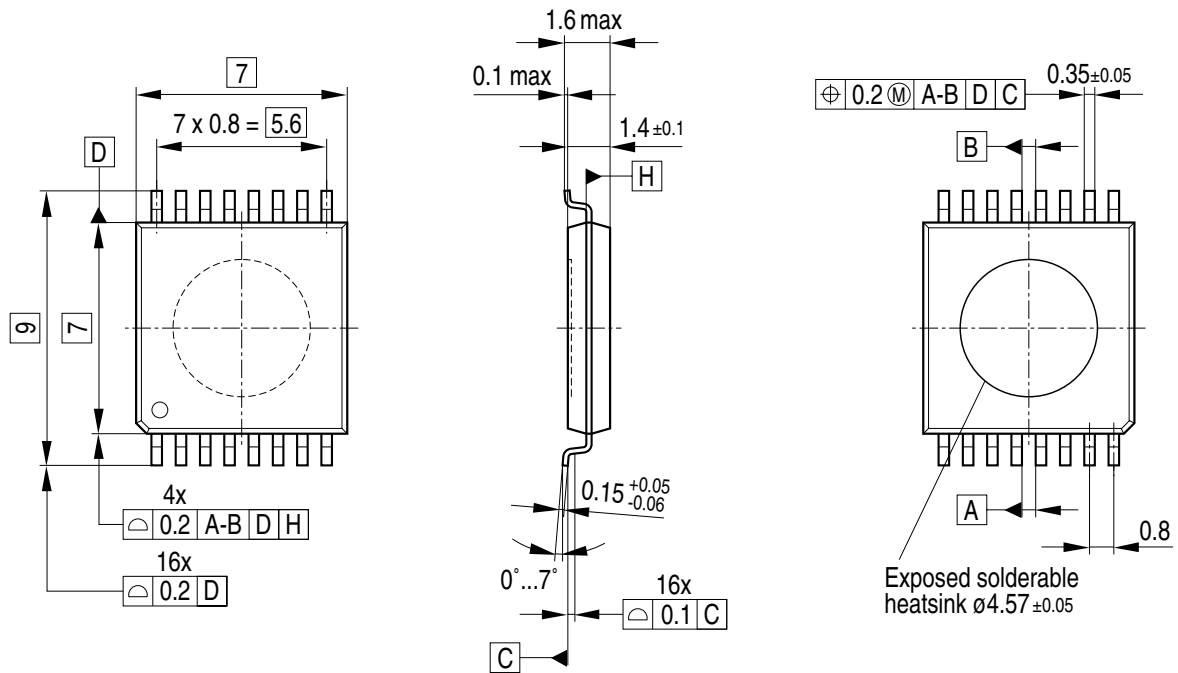
**Figure 2 Application Circuit**

**Notes:**

- Input and output line: 50  $\Omega$
- $C_{10}$  and  $C_{14}$ : 0402 capacitors
- All other capacitors: 0603
- $C_{20}$ : AVX 06035J1R0BBT
- $L_1$ : Coilcraft Air Core Inductor A03T
- Suggested Heat Sink: about 7 K/W
- $V_{D3}$  additionally blocked with 4.7  $\mu$ F/16 V at connection X7

Package Outlines

**MW-16**  
(Special Package)



GPW05969

**Sorts of Packing**

Package outlines for tubes, trays etc. are contained in our Data Book "Package Information".

**SMD = Surface Mounted Device**

Dimensions in mm