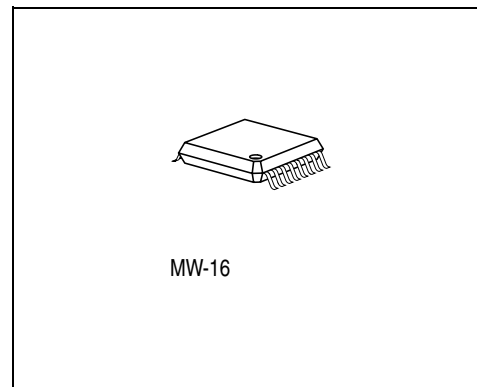


GaAs MMIC

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 ($T_S \leq 81\text{ °C}$) T_S : Temperature at soldering point	P_{tot}	7.0	W
Pulse peak power dissipation duty cycle 30%, $t_{ON} = 0.5\text{ ms}$	P_{Pulse}	11.0	W

Thermal Resistance

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

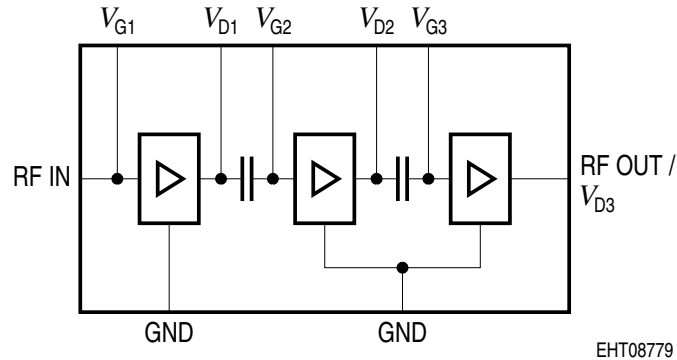


Figure 1 Functional Block Diagram

Pin Configuration

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

Pin Configuration (cont'd)

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

- ¹⁾ The gate voltage of the 1st 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: $V_D = 7.0 \text{ V}$, $T_A = 25 \text{ }^\circ\text{C}$, $f = 3425 - 3450 \text{ MHz}$, $Z_S = Z_L = 50 \text{ }\Omega$, 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	$P_{IN} = 12 \text{ dBm}$
Saturation Output Power	P_{SAT}	–	33	–	dBm	$P_{IN} = 14 \text{ dBm}$
Overall Power added Efficiency	PAE	–	15	–	%	$P_{IN} = 10 \text{ dBm}$
Adjacent channel power ¹⁾	ACP	–	–	– 30	dBc	$\pm 156 \text{ kHz}$ beside carrier
Input return loss ²⁾	S11	10	–	–	dB	$P_{IN} = 10 \text{ dBm}$
Output return loss	S22	8	–	–	dB	$P_{IN} = 10 \text{ dBm}$
Noise Figure	NF	–	5	–	dB	–

¹⁾ 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.

²⁾ Values of S11 and S22 with match as realized on application board.

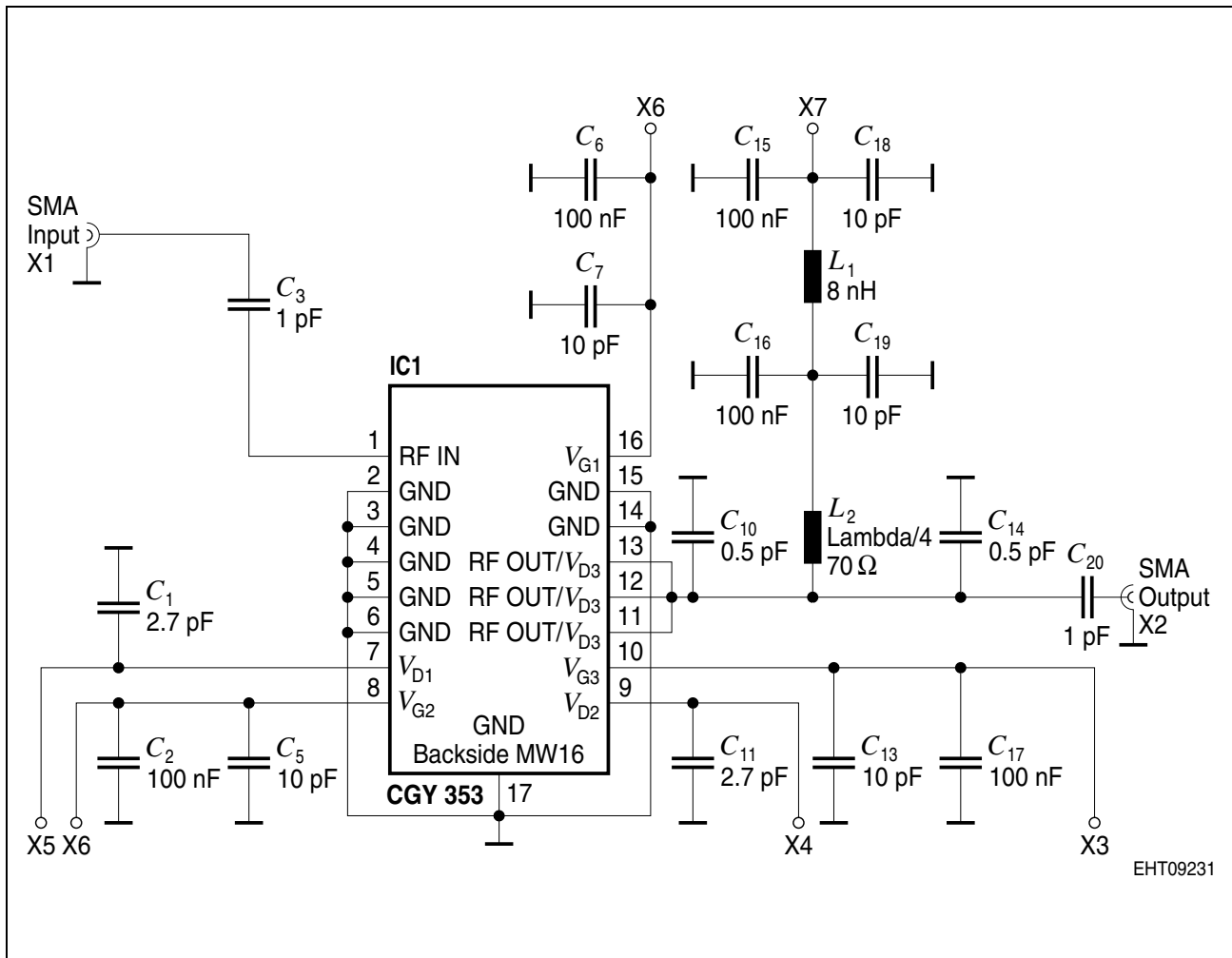


Figure 2 Application Circuit

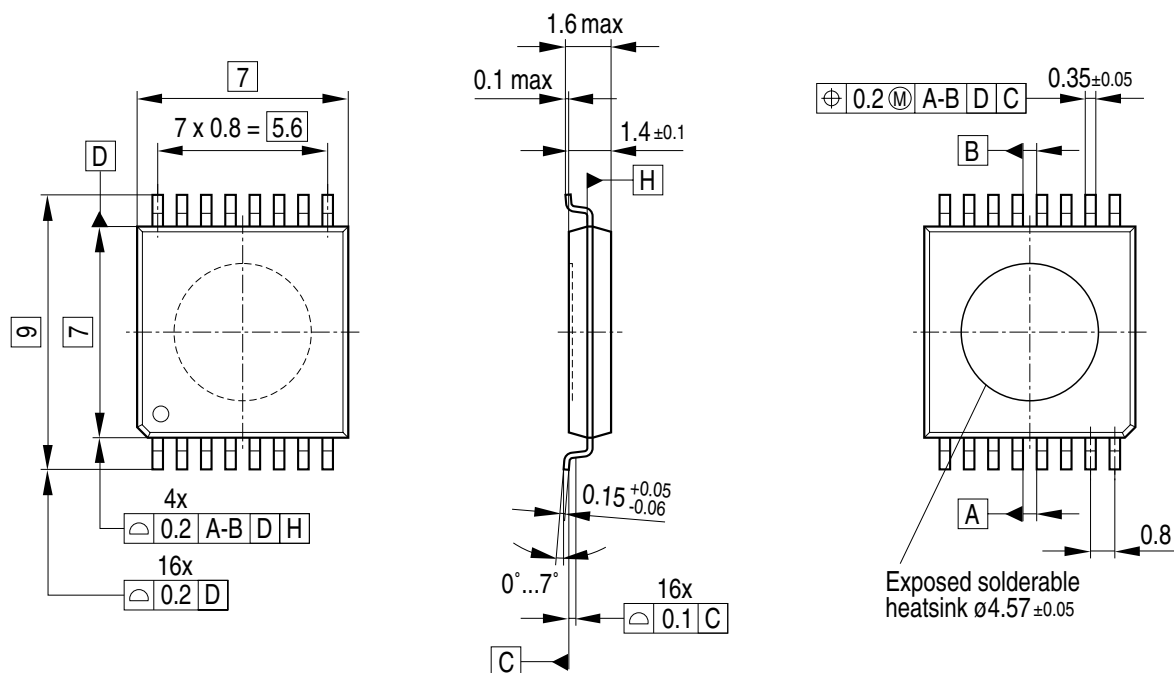
Notes:

Input and output line: 50 Ω
C₁₀ and C₁₄: 0402 capacitors
All other capacitors: 0603
C₂₀: AVX 06035J1R0BBT
L₁: Coilcraft Air Core Inductor A03T
Suggested Heat Sink: about 7 K/W
V_{D3} additionally blocked with 4.7 μF/16 V at connection X6

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