

GW7125

Smart Ultrasonic Sensor SoC

Description

The GW7125 is a device that combines an integrated microcontroller and an analog front end to provide ultrasonic range detection using a minimal number of components. Its pulse-width modulation (PWM) output allows for programmable bursts to be sent to a single ultrasonic transducer. With the support of compatible transducers, this device allows for distance measurement ranging from 10cm to 6m using an external Transformer, from 10cm to 4.5m using a Tri-State-buffer and can be utilized for presence detection within the range of 0cm to 10cm.

By utilizing internal components such as a programmable gain amplifier (PGA), a 12-bit analog-to-digital converter (ADC), digital filters, an envelope detector, and a peak detector, the desired measurement range and resolution can be achieved. Additionally, the device includes an internal temperature sensor and ADC for reading operating temperature information.

The device includes a 16KB embedded Flash memory for storing application-specific program and data, while a 2KB SRAM is available for storing data required for signal processing purposes.

The GW7125 offers various communication interfaces, including UART, I2C and I/O communication making it convenient to connect with a host device.

Features

- Analog Front End integrated stand-alone Ultrasonic Sensor Solution
- PWM output driver for Ultrasonic Transducer
- Programmable Transducer Power
- Programmable Receiver Sensitivity
- Digital Filtering and Signal Processing including Envelope Detection
- Adjustable Burst Length and Filter Bandwidth
- Internal Oscillator
- 8bit CPU with 16MHz Clock
- 16KB Flash memory for application program
- 2KB SRAM
- Fast Calibration Data and Program Update via Communication interface

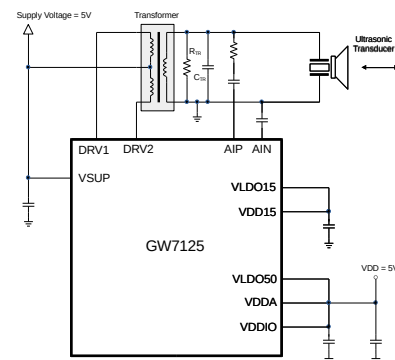
Physical Characteristics

- Operating voltages
 - External supply voltage: 5V
 - I/O supply voltage: 5V
 - Analog core voltage: 5.0V
 - Digital core voltage: 1.5V
- Operating temperature: -40°C ~ 105°C (AEC-Q100 Grade 2)
- Available in 5x5 0.4mm pitch 40-QFN package

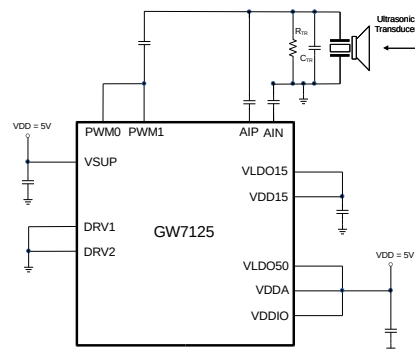
Typical Applications

- Ultrasonic Sensor Systems
- Blind Spot Detection
- Industrial Distance Measuring
- Robotics

Basic Application Diagram

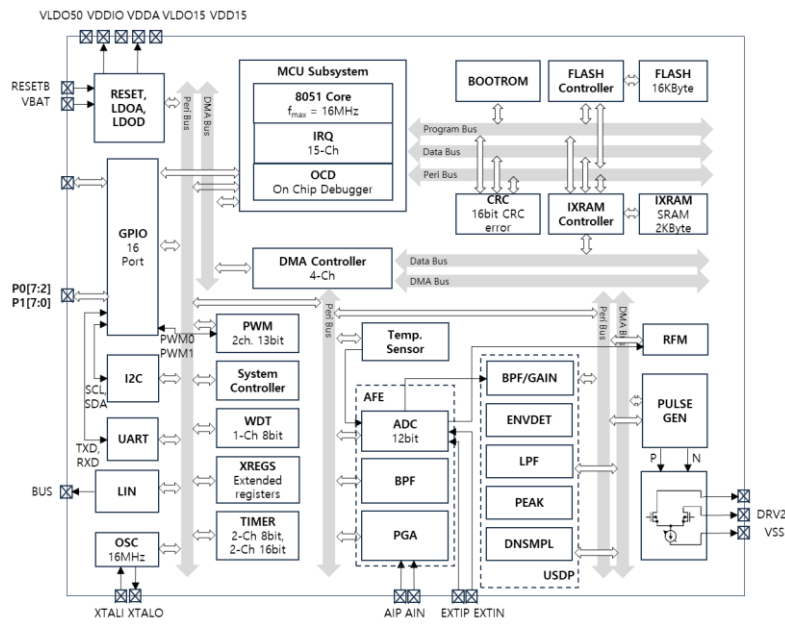


Long-Distance Measurement:
Need a transformer to drive the ultrasonic transducer



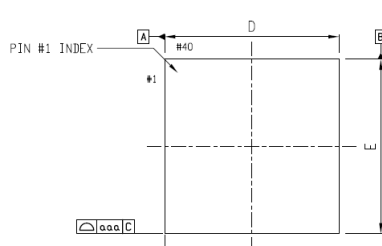
Direct Drive Mode
For Distance measurement and Presence detection

Block Diagram

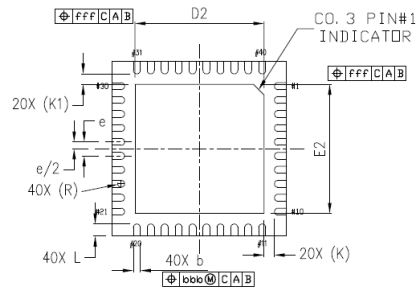


** LIN interface input/output, GW7120 exclusive

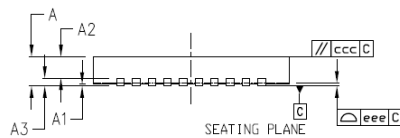
Package Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

	SYMBOL	MIN	NDM	MAX
TOTAL THICKNESS	A	0.70	0.75	0.80
STAND OFF	A1	0	0.02	0.05
MOLD THICKNESS	A2	---	0.55	---
L/F THICKNESS	A3	0.203	REF	
LEAD WIDTH	b	0.15	0.20	0.25
BODY SIZE	X	4.90	3.00	3.10
	Y	4.90	3.00	3.10
LEAD PITCH	e	0.40	BSC	
EXPOSED PAD SIZE	X	DE	3.60	3.70
	Y	E2	3.60	3.70
LEAD LENGTH	L	0.30	0.35	0.40
LEAD TJP TO EXPOSED PAD EDGE	K	0.30	REF	
LEAD TJP ROUND SIZE	K1	0.30	REF	
LEAD TJP ROUND SIZE	R	b MIN/2	---	---
PACKAGE EDGE TOLERANCE	aaa	0.10		
MOLD FLATNESS	ccc	0.10		
COPLANARITY	eee	0.08		
LEAD OFFSET	kkb	0.07		
EXPOSED PAD OFFSET	fff	0.10		

Ordering Information

Device name	Package	Remark
GW7120ARSBTQ	40QFN, 5x5, 0.4 mm pitch	QFN40, Automotive AEC-Q100
GW7125IRSBT	40QFN, 5x5, 0.4 mm pitch	QFN40, Industrial

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