

GW7120

Smart Ultrasonic Sensor SoC with LIN Interface

Description

The GW7120 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 ranging from 30kHz to 80kHz to be sent to a single ultrasonic transducer connected through a center-tapped transformer. With the use of supported transducers, this device enables distance measurement between 20cm and 7m, achieving a resolution of 1mm.

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 GW7120 offers various communication interfaces, including LIN, UART, and I2C, making it convenient to connect with a host device.

Features

- Analog Front End integrated stand-alone Ultrasonic Park Assist 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
- LIN 2.x interface
- 8bit CPU with 16MHz Clock
- 16KB Flash memory for application program
- 2KB SRAM
- Fast Calibration Data and Program Update via LIN interface

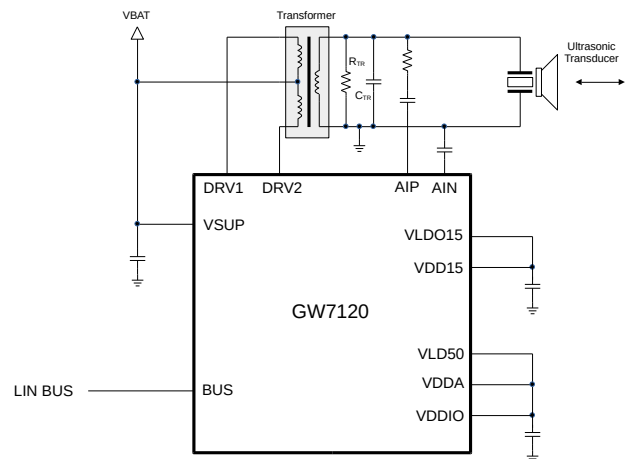
Physical Characteristics

- Operating voltages
 - External supply voltage: 8V ~ 18V
 - 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 park assist (USPA/PDS/UPA)
- Automatic parking (SPAS/APA)
- Advanced driver assistance systems (ADAS)
- Drone and Robotics
- Distance measurement systems

Basic Application Diagram



Ordering Information

Device name	Package	Remark
GW7120ARSBTQ	5.0mmx5.0mm, 0.4 mm pitch	QFN40, Automotive
GW7120IRSBT	5.0mmx5.0mm, 0.4 mm pitch	QFN40, Industrial

Block Diagram

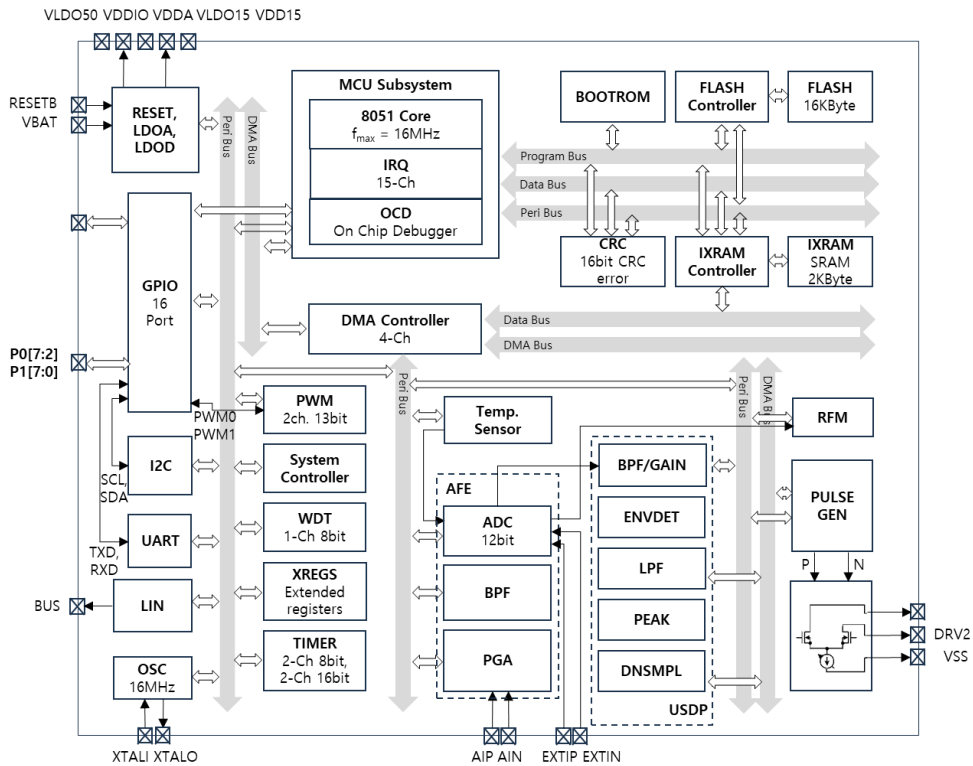
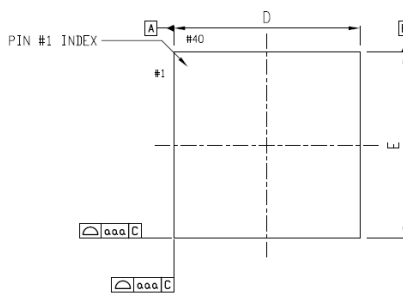
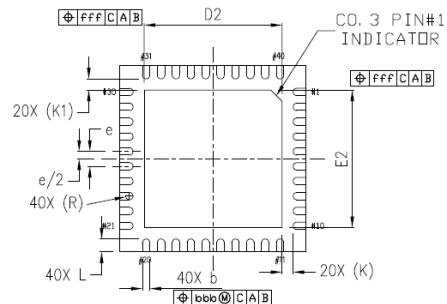


Figure 1 Functional Block Diagram

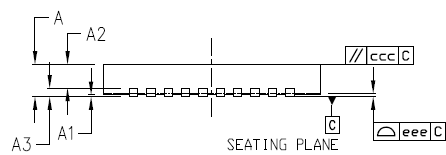
Package Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

	SYMBOL	MIN	NOM	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	D	4.90	5.00	5.10
	Y	E	4.90	5.00	5.10
LEAD PITCH	e	0.40 BSC			
EXPOSED PAD SIZE	X	D2	3.60	3.70	3.80
	Y	E2	3.60	3.70	3.80
LEAD LENGTH	L	0.30	0.35	0.40	
LEAD TJP TO EXPOSED PAD EDGE	K	0.30 REF			
	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	bbb	0.07			
EXPOSED PAD OFFSET	fff	0.10			

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