



Characteristic:

- GP8403 via I2C interface Linear conversion to dual-channel analog voltage outputs of 0-5V or 0-10V.
- A single I2C interface supports the parallel connection of eight GP8403 devices, selectable via the three-bit hardware address pins A2, A1, and A0.
- Input signal range: 12-bit, 0x000-0xFFFF
- 0-5V/0-10V output voltage is controlled via internal data.
- I2C input signal high level: 2.7V-5.5V
- Output voltage error: 0.2% typ
- Output voltage linearity error: 0.1% typ
- Output short-circuit protection: The chip enters protection mode and stops outputting when the output pin is shorted to ground.
- Power supply voltage: 9V-36V
- Power consumption: 2mA typ.
- Startup time: <2ms
- Operating temperature: -40°C to 85°C

Description:

The GP8403 is an I2C-to-analog signal converter (DAC) capable of linearly converting a 12-bit digital value (0x000-0xFFFF) into two independent analog voltage outputs—either 0-5V or 0-10V—with an output voltage error of 0.2%

Application:

- Universal Signal Conversion
- Motor speed control, LED dimming
- Inverters, power supplies
- Industrial Analog Signal Isolation

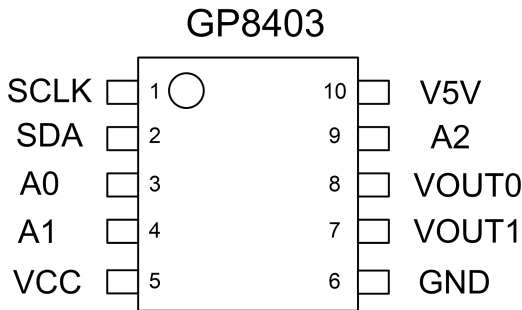




1. Pin Definitions

Pin Name	Pin Functions
SCLK	I2C Protocol clock signal
SDA	I2C protocol data signal
VCC	power supply
GND	land
V5V	Internal LDO, 5V output; an external capacitor greater than 1μF is required
A0	Hardware address at index 0
A1	First hardware address
A2	2nd hardware address
VOUT0	For the first analog voltage output channel, an external 1μF capacitor must be connected.
VOUT1	For the second analog voltage output, an external 1μF capacitor must be connected.

Table A - Pinout



2. Absolute Maximum Ratings

Industrial operating temperature	-40°C to 85°C
Storage temperature	-50°C to 125°C
Input voltage	-0.3 vVCC + 0.3 v
Maximum voltage	36 v
ESD Protection	> 2000 v

Exceeding the parameter values listed under "Absolute Maximum Ratings" may cause permanent damage to the device.
Operation of the device under conditions beyond those specified is not guaranteed. Prolonged exposure to extreme conditions may affect device reliability or functionality.

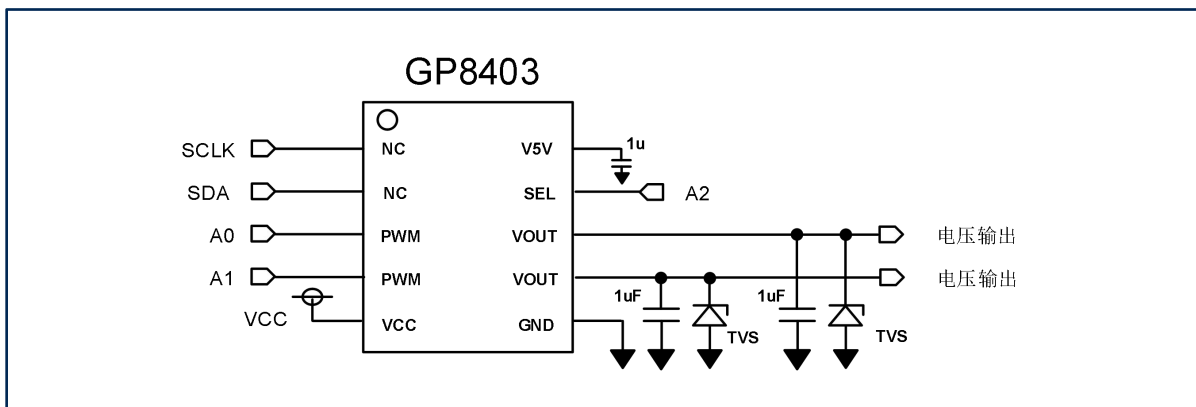




3. Typical Applications

3.1 Basic Functions (Typical Circuit)

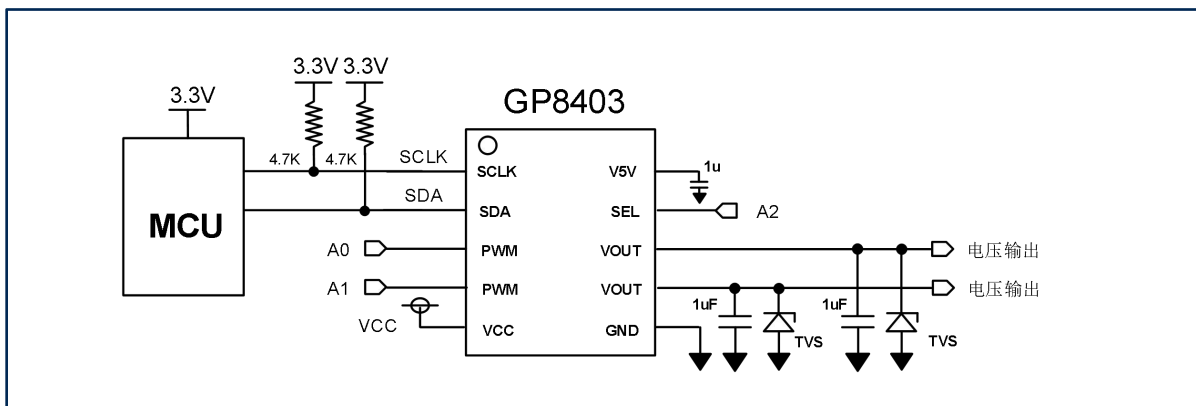
When the chip is used in an on-board circuit, capacitors and TVS diodes can be added to stabilize and protect the circuit.



Notice:

1. A capacitor larger than $1\mu\text{F}$ is required on the V5V line.
2. When VOUT is used as a board-level interface, add a 12V unidirectional TVS for reverse-polarity and surge protection.

3.2 Interfacing with 3.3V MCUs

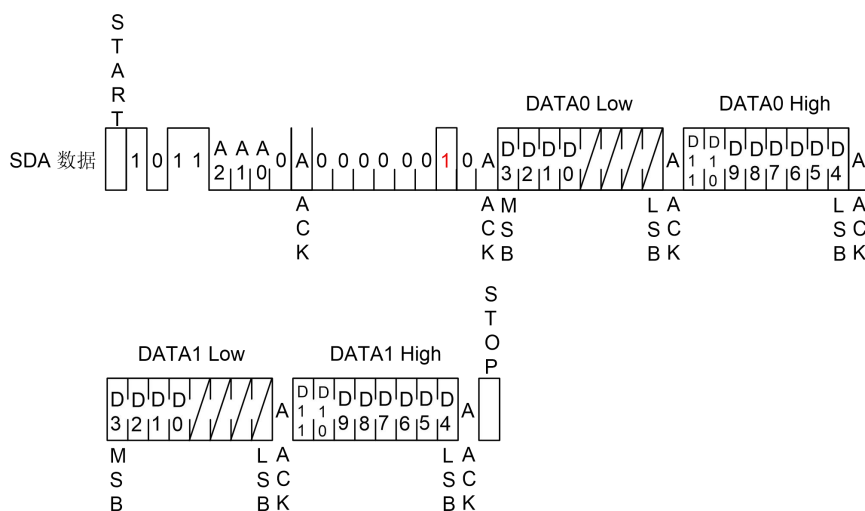
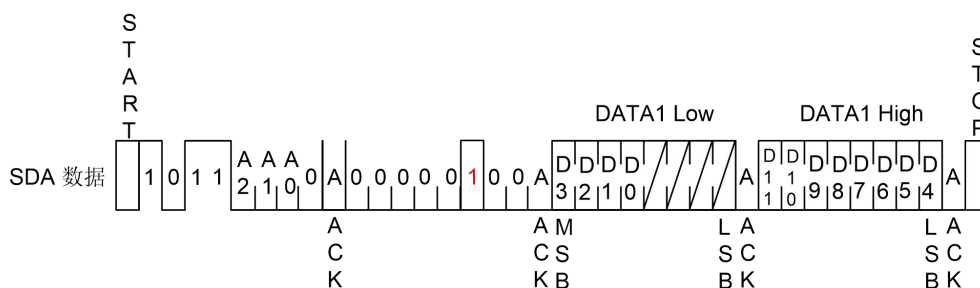


The 3.3V I2C interface output from the MCU is connected to the GP8403.





DAC (Digital to Analog ConF1601)

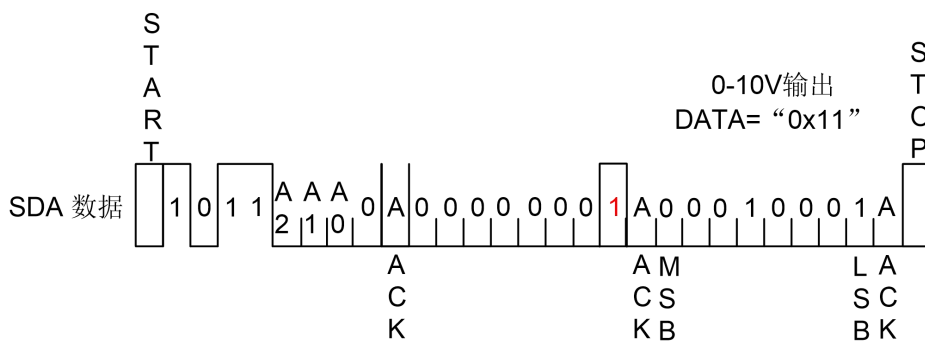
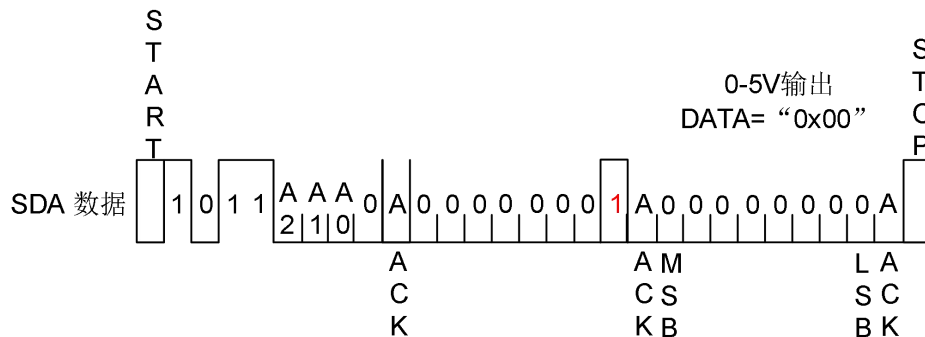




3. Typical Applications

3.3 Operating Procedures

3.3.6 Configure the settings highlighted in red in the figure below: set the address to 01. If data 0x00 is written, the chip's output voltage range is set to 0-5V; if data 0x11 is written, the output voltage range is set to 0-10V.

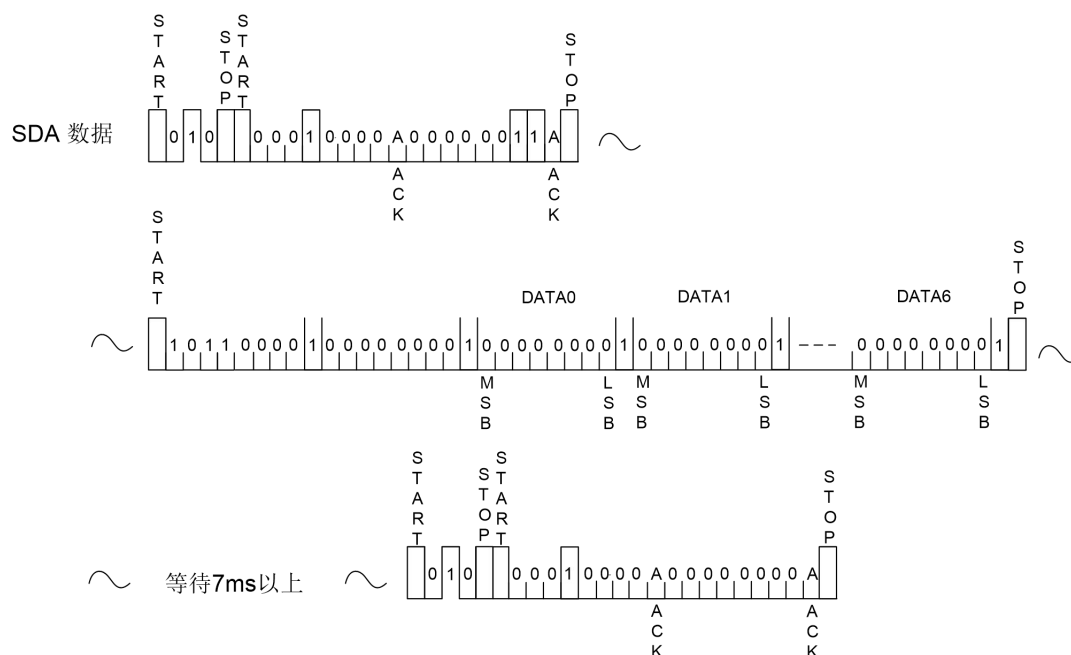




3. Typical Applications

3.3 Operating Procedures

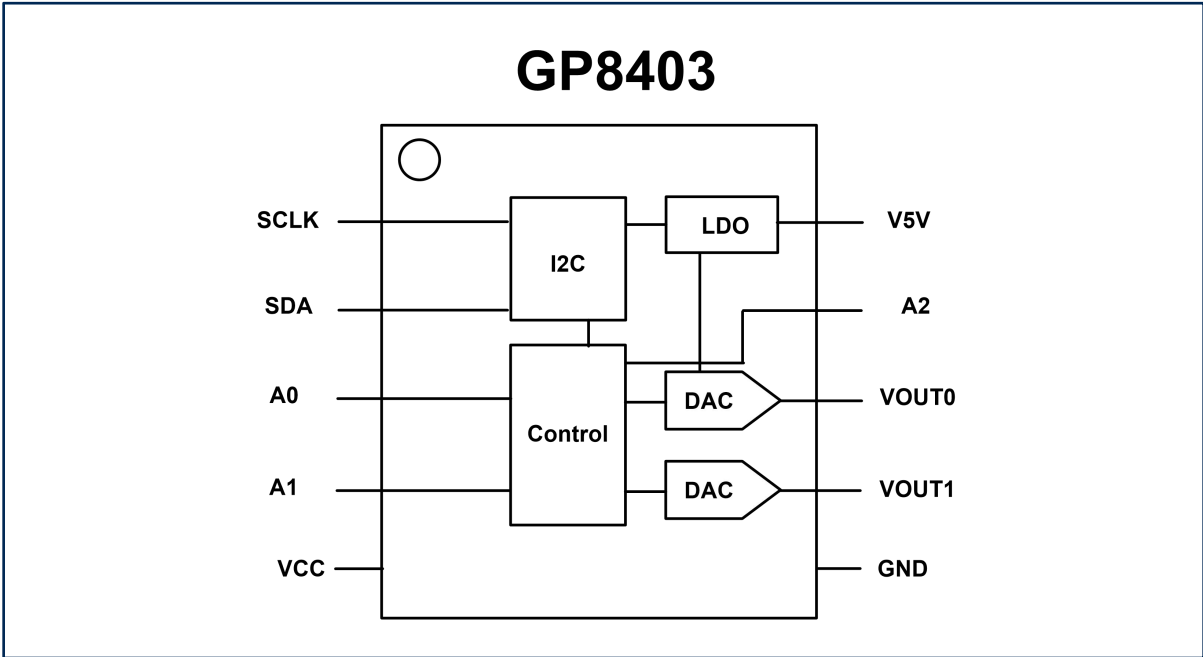
3.3.7 The GP8403 supports saving voltage data internally, ensuring that the corresponding voltage output state is maintained after a power-cycle. By sending the data shown in the figure below, the written data can be permanently stored within the chip.





4. Device Functions

The GP8403 is a high-performance, dual-channel DAC chip (I2C-to-analog voltage converter) that converts 12-bit data received via I2C into an analog voltage. The output voltage range—either 0–5V or 0–10V—is selectable via internal configuration (see Section 3.3.6 for details). The chip features hardware address pins (A0, A1, A2), allowing a single I2C bus to control up to eight GP8403 devices. The GP8403 has a default output voltage accuracy of 0.5%. When used as a system interface chip, a 0.1μF capacitor and a 12V unidirectional TVS diode should be connected from the VOUT pin to ground to ensure protection against hot-plugging, electrostatic discharge (ESD), and reverse polarity.





5. AC Characteristics

Symbol	Describe	Minimum	Default	Maximum	Unit
f_{sclk}	I2C clock frequency			400K	Hz

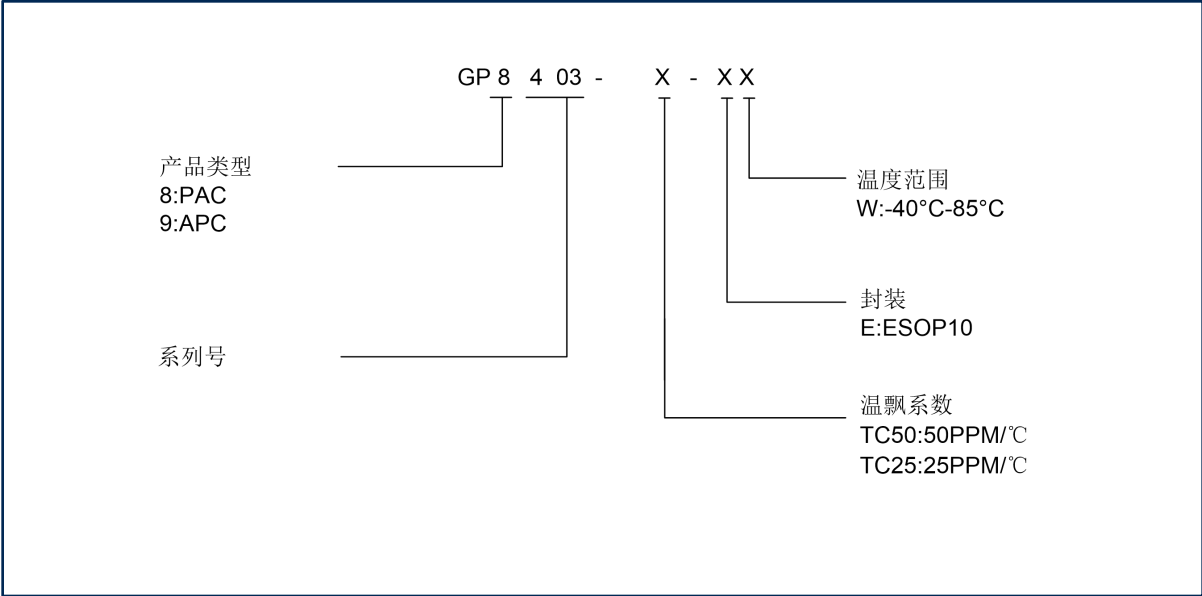
6. DC Characteristics

Symbol	Describe	Test Conditions	Minimum	Typical	Maximum	Unit
VCC	Power supply voltage*1		9	12	36	V
ICC	Power supply power consumption	VCC @ 12V, No Load		2	5	mA
VOUT	Output Voltage	SEL Grounding	0		5	V
		Connect SEL to V5V	0		10	V
$\Delta VOUT$	Output Voltage Error	Proportional to the VOUT Output Range			0.5	%
Lout	Output Voltage linearity			0.1		%
TC	Temperature Coefficient				50	PPM/°C





7. Ordering Information

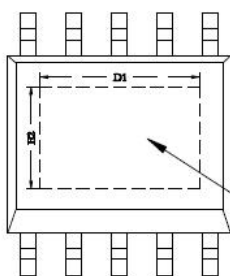
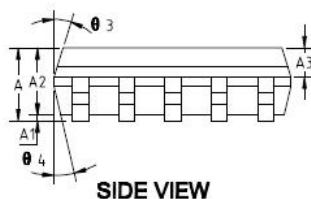
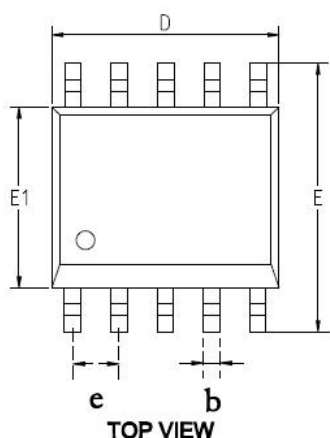


Temperature Coefficient	Precision	Encapsulation	Operating Temp	Order Code
50PPM/°C	0.5%	ESOP10	-40°C-85°C	GP8403-TC50-EW

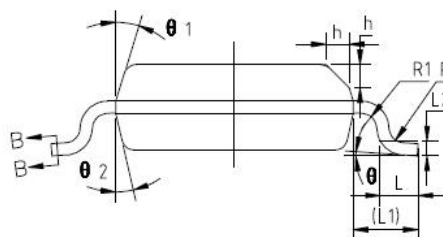




8. Packaging Information



HEAT SLUG



SYMBOL	MIN	NOM	MAX
A	1.35	1.50	1.65
A1	0.05	0.10	0.15
A2	1.35	1.40	1.50
A3	0.50	0.60	0.7
b	0.31	0.35	0.39
D	4.80	4.90	5.00
D1	3.20	3.30	3.40
e	1.0BSC		
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
E2	2.00	2.10	2.20
L	0.45	0.60	0.80
L1	1.04REF		
L2	0.25BSC		
R	0.07	—	—
R1	0.07	—	—
h	0.30	0.40	0.50
θ	0°	—	8°
θ1	6°	8°	10°
θ2	6°	8°	10°
θ3	5°	7°	9°
θ4	5°	7°	9°

NOTES:

1. ALL DIMENSIONS REFER TO JEDEC STANDARD MO-157E
2. DIMENSION D DOES NOT INCLUDE MOLD FLASH
3. DIMENSION E1 DOES NOT INCLUDE MOLD FLASH
4. FLASH OR PROTRUSION SHALL NOT EXCEED 0.25mm PER SIDE.

