



MAX11810/MAX11811

Advanced Touch Interface Solution with Haptic Controller plus Driver and Proximity Sensing

General Description

The MAX11810/MAX11811 low-power touch interface solutions operate from a single supply of 1.7V to 3.6V, targeting power-sensitive applications such as handheld equipment. The MAX11810/MAX11811 include a 4-wire resistive touch-screen controller, a haptic motor controller plus driver, and IR proximity-sensing system.

The devices contain a 12-bit SAR ADC and a multiplexer to interface with a 4-wire resistive touch-screen panel. A digital serial interface provides communications.

The MAX11810/MAX11811 contain an advanced state machine, which performs digital preprocessing of the touch-screen measurements, reducing bus loading and application-processor resource requirements. The MAX11810/MAX11811 enter low-power modes automatically between conversions to save power, making them ideal for portable applications. Also included is a smart interrupt generation engine, which enables servicing the part only when needed. The register map is compatible with that of the MAX11800/MAX11801.

In addition, the MAX11810/MAX11811 have a built-in haptic controller plus driver to either drive a vibration motor directly, or to interface with an external piezo driver. The built-in haptic waveform generator generates > 50,000 haptic patterns, which are configured through the serial interface. This eliminates the need for a dedicated interface on the applications processor/microcontroller end.

They also contain a general-purpose current DAC output and voltage input. The DAC output can drive IR and visible LEDs; the input can connect to either a photo-detector for proximity sensing, or an ambient light sensor.

Applications

- Mobile Communication Devices
- PDA, GPS, Media Players, Portable Navigation Devices
- POS Terminals and Financial Terminals
- Automotive Center Consoles
- Handheld Games

SPI is a trademark of Motorola, Inc.

Features

- ◆ 4-Wire Resistive Touch-Screen Interface
- ◆ X and Y Coordinate and Touch Pressure Measurement
- ◆ Ratiometric Measurement
- ◆ 12-Bit SAR ADC
- ◆ Single 1.7V to 3.6V Supply
- ◆ Integrated Haptic Controller Driver for ERM and LRA Motors
- ◆ Integrated Proximity Sensing System
- ◆ General-Purpose Current DAC Output and General-Purpose Input
- ◆ PWM Output for Piezo Drivers
- ◆ Data Tagging Provides Measurement and Touch Event Information
- ◆ Data Filtering Provides Noise Reduction
- ◆ Aperture Mode Provides Spatial Filtering
- ◆ Digital Preprocessing Reduces Serial Bus Activity and Interrupt Generation
- ◆ Programmable Touch Detect Pullup Resistor
- ◆ Auto Power-Down Control for Ultra-Low-Power Operation
- ◆ 25MHz SPI Interface (MAX11810)
- ◆ 400kHz I²C Interface (MAX11811)
- ◆ 2.1mm x 2.1mm, 16-Pin WLP and 4mm x 4mm, 20-Pin TQFN Packages
- ◆ Low-Power Operation
 - 246µW at V_{DD} = 1.8V, 34.4ksps
 - 698µW at V_{DD} = 3.6V, 34.4ksps

Ordering Information

PART	PIN-PACKAGE	SERIAL INTERFACE
MAX11810ETP+*	20 TQFN-EP**	SPI
MAX11810EWE+*	16 WLP	SPI
MAX11811ETP+*	20 TQFN-EP**	I ² C
MAX11811EWE+*	16 WLP	I ² C

Note: All devices are specified over the -40°C to +85°C operating temperature range.

+Denotes a lead(Pb)-free/RoHs-compliant package.

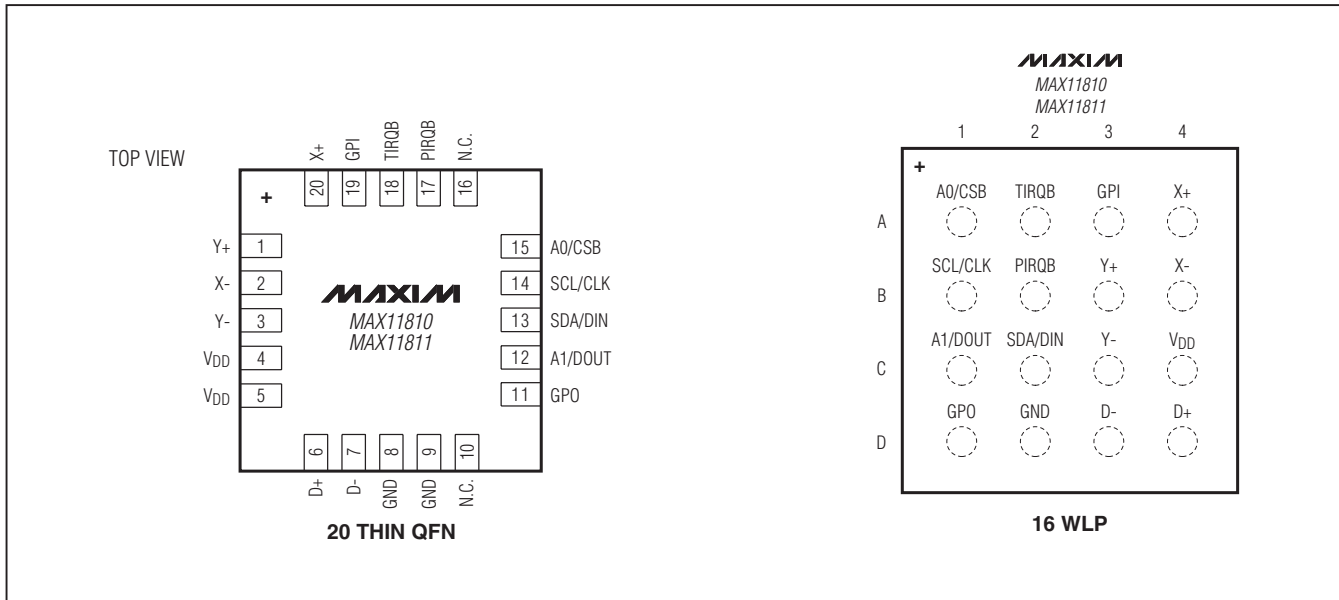
*Future product—contact factory for availability.

**EP = Exposed pad.



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Pin Configurations



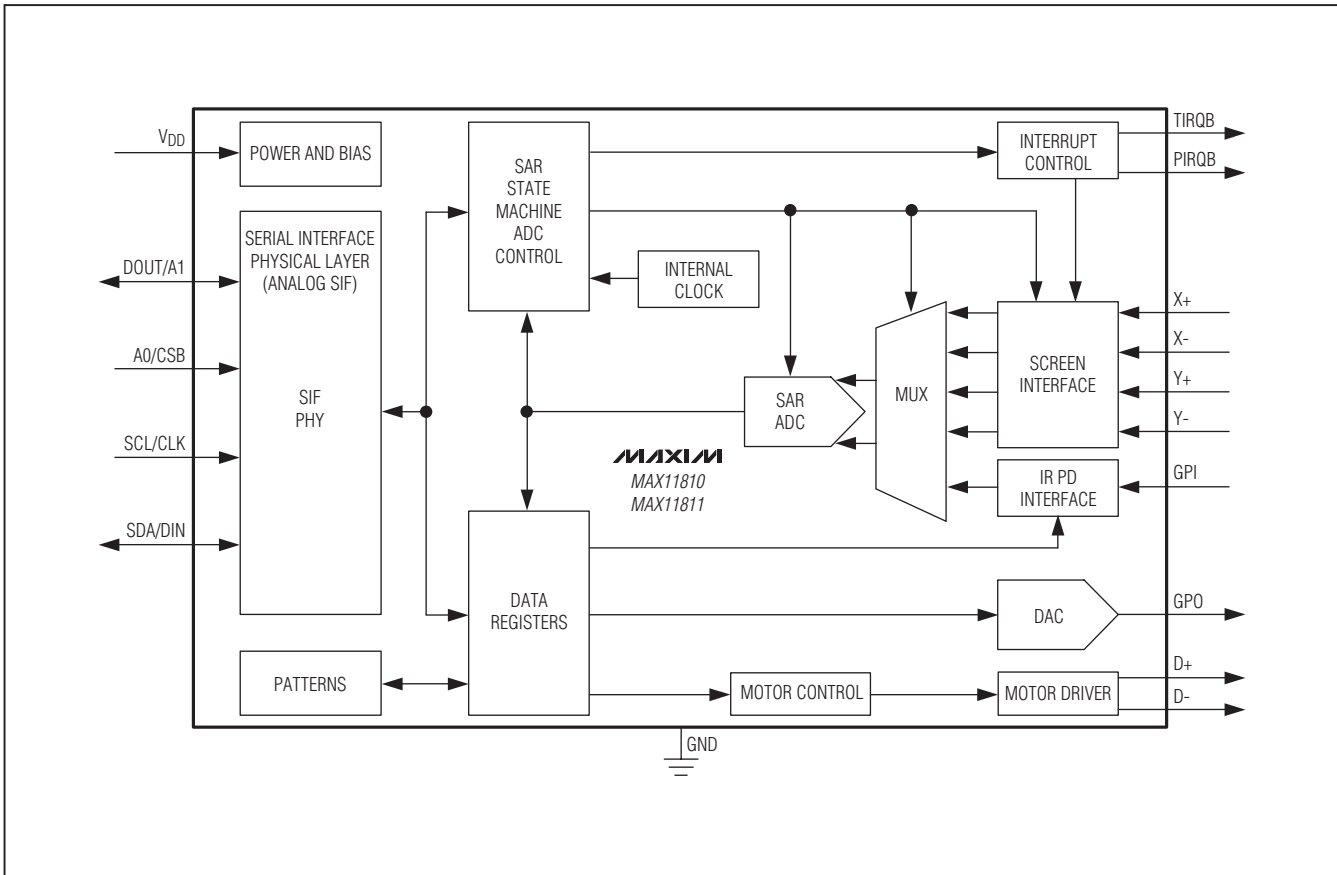
Pin Description

PIN		NAME	FUNCTION
TQFN	WLP		
1	B3	Y+	Y+ Channel Input from TS
2	B4	X-	X- Channel Input from TS
3	C3	Y-	Y- Channel Input from TS
4, 5	C4	VDD	Power Supply (Used as ADC reference)
6	D4	D+	Haptic Driver Positive Output
7	D3	D-	Haptic Driver Negative Output
8, 9	D2	GND	Ground
10, 16	—	N.C.	No Connection
11	D1	GPO	General-Purpose Output (IR LED Driver)
12	C1	A1/DOUT	I ² C Address Input Bit 1/SPI Data Output Bus
13	C2	SDA/DIN	I ² C Serial Data Bus/SPI Serial Data Input Bus
14	B1	SCL/CLK	I ² C Serial Data Clock/SPI Serial Data Clock
15	A1	A0/CSB	I ² C Address Input Bit 0/Chip-Select Bar for SPI
17	B2	PIRQB	Proximity Interrupt Output Bar
18	A2	TIRQB	Touch Interrupt Output Bar
19	A3	GPI	General-Purpose Input (IR Photo-Diode Input)
20	A4	X+	X+ Channel Input from TS
EP	—	EP	Exposed Pad

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Functional Diagram

MAX11810/MAX11811



Maxim cannot assume responsibility for use of any circuitry other than circuitry entirely embodied in a Maxim product. No circuit patent licenses are implied. Maxim reserves the right to change the circuitry and specifications without notice at any time.

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