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TacTouch™, Low-Power, Ultra-Small, Resistive Touch-Screen Controller with Haptic Driver

General Description

The MAX11811 low-power touch-screen controller operates from a 1.7V to 3.6V single supply targeting power-sensitive applications such as handheld equipment. The device contains a 12-bit SAR ADC and a multiplexer to interface with a resistive touch-screen panel. A digital serial interface provides communications.

The MAX11811 includes digital preprocessing of the touch-screen measurements, reducing bus loading and application processor (AP) resource requirements. The included smart interrupt function generator greatly reduces the frequency of interrupt servicing to the devices. The MAX11811 enters low-power mode automatically between conversions to save power, making the device ideal for portable applications.

The MAX11811 offers two modes of operation: direct and autonomous. Direct mode allows the application processor to control all touch-screen controller activity. Autonomous mode allows the MAX11811 to control touch-screen activity, thereby freeing the application processor to perform other functions. In autonomous mode, the device periodically scans the touch screen for a touch event without requiring host processor intervention. This can be used to reduce system power consumption. An on-chip FIFO is used during autonomous mode to store results and increase effective data throughput and lower system power.

The MAX11811 supports data-tagging, which records the type of measurement performed; X, Y, Z1, or Z2, and the type of touch event; initial touch, continuing touch, or touch release.

The MAX11811 features a haptic driver to either drive a vibration motor directly or to interface with an external piezo actuator driver. The device generates PWM signals that can drive the MAX11835 haptic piezo controller. The device includes a general-purpose current DAC output and a general-purpose input that can be used to drive IR and visible LEDs, as well as IR photo-detectors in applications such as proximity detectors.

The MAX11811 supports the I²C serial bus. The MAX11811ETP+ is available in a 20-pin TQFN package and is specified over the extended industrial temperature range of -40°C to +85°C. The MAX11811GTP/V+ is specified over the -40°C to +105°C automotive temperature range.

Ordering Information and Typical Operating Circuits nnm, nappear at end of data sheet.

TacTouch is a trademark of Maxim Integrated Products, Inc.

Features

- **4-Wire Touch-Screen Interface**
- **X/Y Coordinate Measurement and Touch Pressure Measurement**
- **Ratiometric Measurement**
- **12-Bit SAR ADC**
- **Single 1.7V to 3.6V Supply**
- **Two Operating Modes—Direct and Autonomous**
- **Data Tagging Provides Measurement and Touch Event Information**
- **Data Filtering Provides Noise Reduction**
- **Aperture Mode Provides Spatial Filtering**
- **Digital Processing Reduces Bus Activity and Interrupt Generation**
- **Programmable Touch-Detect Pullup Resistors**
- **Auto Power-Down Control for Low-Power Operation**
- **General-Purpose Current DAC Output**
- **General-Purpose Input**
- **Integrated Proximity Sensing System**
- **Integrated Motor Haptic Driver***
- **PWM Output for MAX11835 Haptic Piezo Controller† (HPC)**
- **400kHz I²C Interface**
- **20-Pin, 4mm x 4mm TQFN**
- **Low-Power Operation**
  250µW at V_{DD} = 1.7V, 34.4ksps
- **ESD Protection**
  ±8kV HBM (X+, X-, Y+, Y-)

Applications

Mobile Communication Devices

PDA, GPS Receivers, Personal Navigation Devices, Media Players

Digital Still Camera

Digital Video Camera

Digital Photo Frame

POS Terminals and Financial Terminals

Handheld Games

Automotive Center Consoles

**Use of Haptic technologies in an end product may require third-party licensing.*

†Quickview available.