

DALLAS

SEMICONDUCTOR

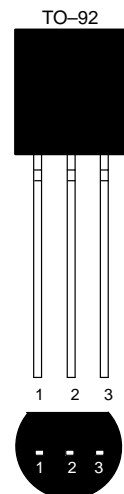
DS2406

Dual Addressable Switch Plus 1K-Bit Memory

FEATURES

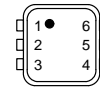
- Open drain PIO pins are controlled and their logic level can be determined over 1-Wire™ bus for closed-loop control
- Dual Channel operation (TSOC package)
- PIO pin channel A sink capability of 50 mA at 0.4V with soft turn-on; channel B 8 mA at 0.4V
- Maximum operating voltage of 13V at PIO-A, 6.5V at PIO-B
- 1024 bits user-programmable OTP EPROM
- 7 bytes of user-programmable status memory to control the device
- Multiple DS2406's can be identified on a common 1-Wire bus and be turned on or off independently of other devices on the bus
- Unique, factory-lasered and tested 64-bit registration number (8-bit family code + 48-bit serial number + 8-bit CRC tester) assures error-free selection and absolute identity because no two parts are alike
- On-chip CRC16 generator allows detection of data transfer errors
- Built-in multidrop controller ensures compatibility with other MicroLAN products
- Reduces control, address, data, programming and power to a single data pin
- Directly connects to a single port pin of a microprocessor and communicates at up to 16.3k bits/s
- Low cost TO-92 or 6-pin TSOC surface mount package
- 1-Wire communication operates over a wide voltage range of 2.8V to 6.0V from -40°C to +85°C
- Supports Conditional Search with user-selectable condition
- V_{CC} bondout for optional external supply to the device (TSOC package only)
- Fully compatible to DS2407 but no user-programmable power-on settings

PIN ASSIGNMENT



BOTTOM VIEW
See Mech. Drawings Section

TSOC PACKAGE



TOP VIEW
3.7 X 4.0 X 1.5 mm

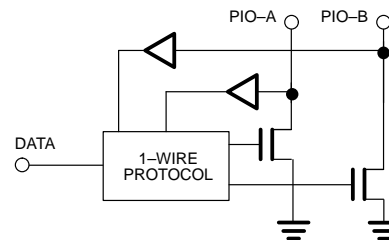


SIDE VIEW

See Mech. Drawings Section

PIN DESCRIPTION

	TO-92	TSOC
Pin 1	Ground	Ground
Pin 2	Data	Data
Pin 3	PIO-A	PIO-A
Pin 4	---	V _{CC}
Pin 5	---	NC
Pin 6	---	PIO-B



ORDERING INFORMATION

DS2406	TO-92 package
DS2406P	6-pin TSOC package
DS2406T	Tape & Reel version of DS2406
DS2406V	Tape & Reel version of DS2406P

ADDRESSABLE SWITCH™ DESCRIPTION

The DS2406 Dual Addressable Switch Plus Memory is a pair of open drain N-channel transistors that can be turned on or off via the 1-Wire bus. Alternatively, either open drain output can serve as a logic input that can be monitored via the same 1-Wire bus. In addition, the device has 1024 bits of EPROM to store relevant information such as switch function, physical location, etc. The device is addressed by matching its individual 64-bit factory-lasered registration number. The 64-bit number consists of an 8-bit family code, a unique 48-bit serial number, and an 8-bit cyclic redundancy check. Communication with the DS2406 follows the standard Dallas Semiconductor 1-Wire protocol and can be accomplished with a single port pin of a microcontroller. Multiple DS2406 devices can reside on a common 1-Wire bus creating a MicroLAN. The network controller circuitry is embedded within the chip including a search algorithm to determine the identity of each DS2406 on the network. The open drain outputs (PIO pins) for each DS2406 on the MicroLAN can be independently switched on or off whether there is one or many devices sharing the same 1-Wire bus. The logic level of the PIO pins for each device on the MicroLAN can also be individually sensed and reported to the bus master. The device also supports a Conditional Search command to identify and access devices that qualify for certain user-specified conditions. Qualification may be the status of a PIO-pin, the state of the output transistor or a latched activity flag.

OVERVIEW

The DS2406 Dual Addressable Switch Plus Memory provides a means for assigning an electronically readable identification to a particular node or location with additional control capability provided by two open-drain N-channel MOSFETs that can be remotely switched and sensed via communication over the 1-Wire bus. The DS2406 contains a factory-lasered registration number that includes a unique 48-bit serial number, an 8-bit CRC, and an 8-bit family code (12h). The 64-bit ROM portion of the DS2406 not only creates an abso-

lutely unique electronic identification for the device itself but also is a means to locate and obtain or change the state of the switches that are associated with the 64-bit ROM.

The DS2406 uses the standard Dallas Semiconductor 1-Wire protocol for data transfers, with all data being read and written least significant bit first. Communication to and from the DS2406 requires a single bi-directional line that is typically a port pin of a microcontroller. The 1-Wire bus master (microcontroller) must first issue one of the ROM function commands. These commands operate on the 64-bit lasered ROM portion of each device and can singulate a specific device if many are present on the 1-Wire bus as well as indicate to the bus master how many and what type of each device is present. After a ROM function command is successfully executed, the open-drain outputs can be switched or sensed, or the contents of the memory can be read or written via the 1-Wire bus. Writing the 1024 bits of data memory or writing to the EPROM sections of the status memory requires a 12V programming pulse. When programming the DS2406, only EPROM-based devices are allowed to be present on the 1-Wire bus.

DS2406 COMPARED TO DS2407

The DS2406 is a direct derivative of the DS2407. The essential difference is that with the DS2406 the state of status memory address 6 (power-on default settings) has no function when the device powers up and will always read 00h. This allows the application software to distinguish between the DS2406 and DS2407. The power-on status of all five Channel Select Bits will always be 1 and both PIOs will be off (high impedance). As a consequence the CSS and PIO-bits have to be preset under software control after every power-on cycle if the default settings do not match the requirements of the application. The Hidden Mode – if invoked – will end no later than with the next power-up cycle. In contrast to the DS2407, with the DS2406 the input load current will remain at 5 μ A typical after power is first applied. Both PIO-channels will always keep their output status as long as the 1-Wire bus is pulled high or V_{CC} is connected to an adequate supply. In all other respects the DS2406 behaves exactly the same way as the DS2407. Please refer to the DS2407 data sheet for the full functional description.