

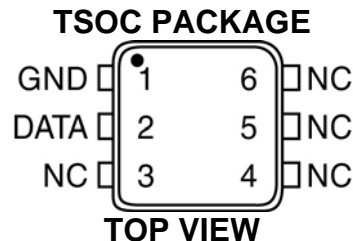
## FEATURES

- Factory programmed 48-bit node address chip with 768 bits user-programmable OTP-EPROM communicates with the economy of one signal plus ground
- Provides valid MAC-48/EUI-48 Ethernet address
- Unique, factory lasered and tested 64-bit registration number assures absolute traceability because no two parts are alike
- Built-in multidrop controller ensures compatibility with other 1-Wire® products
- Device is an “add-only” memory where additional data can be programmed into EPROM without disturbing existing data
- Reduces control, address, data, power and programming signals to a single pin
- Directly connects to a single port pin of a microprocessor and communicates at up to 16.3kbps
- Presence detector acknowledges when reader first applies voltage
- Low cost TO-92 or TSOC surface mount packages
- Reads over a wide voltage range of 2.8V to 6.0V from -40°C to +85°C; programs at 11.5V to 12.0V from -40°C to + 50°C

## PIN CONFIGURATION



**BOTTOM VIEW**



**TOP VIEW**

## ORDERING INFORMATION

DS2502-E48	TO-92 package
DS2502P-E48	TSOC package
DS2502P-E48/T&R	Tape-and-Reel version of DS2502P-E48

## GLOBAL IDENTIFIER DESCRIPTION

The DS2502-E48 is a variant of the DS2502 1024-bit add-only memory. It differs from the standard DS2502 in its custom ROM family code 89H, and the UniqueWare Identifier 5E7H in place of the upper 12 bits of the standard ROM serialization field. Otherwise, the electrical and logical behavior is identical to that of the DS2502. For technical details please refer to the DS2502 data sheet.

*1-Wire is a registered trademark of Dallas Semiconductor.*

**Note:** Some revisions of this device may incorporate deviations from published specifications known as errata. Multiple revisions of any device may be simultaneously available through various sales channels. For information about device errata, click here: [www.maxim-ic.com/errata](http://www.maxim-ic.com/errata).

The first 32 bytes of the DS2502-E48's EPROM memory contain a globally unique 48-bit node address and are write-protected. The data structure follows the conventions of UniqueWare devices using Default Data Structure (Figure 1).

### Figure 1. NODE ADDRESS CHIP DATA STRUCTURE

(unused)	CRC16		Company ID Value		Extension ID Value		Project ID		Length
	MSB	LSB	MSB	LSB	MSB	LSB	MSB	LSB	
19 bytes FFH	2 bytes		3 bytes constant 006035H		3 bytes serialization		4 bytes constant 00001129H		1 byte 0AH
high address									low address

The data record starts with a length byte (0AH) and the 4-byte UniqueWare Project ID 00001129H. The next 6 bytes contain the 48-bit node address which consists of an incrementing 24-bit extension identifier and the IEEE-assigned 24-bit company ID value 006035H. A 16-bit CRC ends the data record. The remaining bytes of the 32-byte memory page remain unprogrammed. Neither the 24-bit extension identifier nor the 24-bit company ID are related to the 64-bit ROM registration number. The ROM registration number is used to provide a unique address to access the DS2502-E48 when multidropped on a 1-Wire bus.

The company ID value 006035H has been assigned by the IEEE to Dallas Semiconductor. If a different company ID value is required, See App Note 99: *UniqueWare Project Setup Manual*.

[http://dbserv.maxim-ic.com/appnotes.cfm/appnote\\_number/518/ln/en](http://dbserv.maxim-ic.com/appnotes.cfm/appnote_number/518/ln/en)

### EXAMPLE

Assume that a manufacturer's company ID value is 006035H and the 24-bit extension identifier is 67ABCDH. The 48-bit node address value generated from these two numbers is 00603567ABCDH, whose byte and bit representations are illustrated in Figure 2.

### Figure 2. SAMPLE NODE ADDRESS VALUE

MOST SIGNIFICANT BYTE				LEAST SIGNIFICANT BYTE		HEX BINARY
00	60	35	67	AB	CD	
0000 0000	0110 0000	0011 0101	0110 0111	1010 1011	1100 1101	
MOST SIGNIFICANT BIT				LEAST SIGNIFICANT BIT		

This information is stored in the DS2502-E48 as 48-bit number with the least significant byte at the lower address. Including the length byte and the CRC, the complete set of data is shown in Figure 3.

### Figure 3. PHYSICAL ADDRESS AND DATA MAPPING INSIDE THE DEVICE

ADDRESS	0C	0B	0A	09	08	07	06	05	04	03	02	01	00
DATA	XX	XX	00	60	35	67	AB	CD	00	00	11	29	0A

XX XX = CRC16, value depends on actual data

The four bytes at memory addresses 01 to 04 contain the UniqueWare Project ID 00001129H. The two bytes at addresses 0BH and 0CH are the 16-bit CRC over the length byte, Project ID and node address value. The least significant byte of the CRC is stored at address 0B. This CRC is generated according to the standardized CRC16 polynomial function  $X^{16} + X^{15} + X^2 + 1$ . For more details on generating CRC values including examples in both hardware and software, see Application Note 27.

The contents of the memory address range 0DH to 1FH is FFH. These cells cannot be altered since the whole memory page is write-protected. The memory range from 20H to 7FH, however, is user-programmable. It can be write-protected by programming the corresponding write-protect bit in the status memory of the DS2502-E48.