

Square 0.134" 4-Character 5x5 Dot Matrix Serial Input Dot Addressable Intelligent Display® Devices

Lead (Pb) Free Product - RoHS Compliant



Yellow SCDQ5541P/Q/R

Super-red SCDQ5542P/Q/R

Green SCDQ5543P/Q/R

High Efficiency Green SCDQ5544P/Q/R

DESCRIPTION

The SCDQ5541X (Yellow), SCDQ5542X (Super-red), SCDQ5543X (Green), and SCDQ5544X (High Efficiency Green) are four digit, dot addressable 5 x 5 dot matrix, serial input, alphanumeric Intelligent Display devices in a square format. The four digits are packaged in a rugged, high quality, optically transparent, plastic package several mounting options. The SIP Pin for standard display mounting and 90° Bend SIP for side mounting. Additionally, a connector/header configuration is also available for display side mounting.

The on-board CMOS has a 100 bit RAM, one bit associated with one LED, each to generate User Defined Characters. In Power Down Mode, quiescent current is <50 µA.

The SCDQ554XX is designed to work with the serial port of most common microprocessors. Data is transferred into the display through the Serial Data Input (DATA), clocked by the Serial Data Clock (SDCLK), and enabled by the Load Input (LOAD).

FEATURES

- Four 3.40 mm (0.134") 5 x 5 Dot Matrix Characters in Red, Yellow, Super-red, Green, or High Efficiency Green
- Optimum Display Surface Efficiency (display area to package ratio)
- Square Character Format to Display Data in a Vertical or Horizontal Format
- High Speed Data Input Rate: 5.0 MHz
- ROMless Serial Input, Dot Addressable Display—Ideal for User Defined Characters
- Built-in Decoders, Multiplexers and LED Drivers
- Readable from 1.8 meters (6 Feet)
- Wide Viewing Angle, ± 55° in X-Axis and Y-Axis
- Attributes:
 - 100 Bit RAM for User Defined Characters
 - Eight Dimming Levels
 - Power Down Model (<20 µW)
 - Software Clear Function
 - Lamp Test
 - 3.3 V Capability

Ordering Information

Type	Color of Emission	Character Height mm (inch)	Ordering Code
SCDQ5541P	yellow	3.2 (0.134)	Q68100A1472P
SCDQ5542P	super-red		Q68100A1078P
SCDQ5543P	green		Q68100A1473P
SCDQ5544P	high efficiency green		Q68100A1474P
SCDQ5541Q	yellow	3.2 (0.134)	Q68100A1472Q
SCDQ5542Q	super-red		Q68100A1078Q
SCDQ5543Q	green		Q68100A1473Q
SCDQ5544Q	high efficiency green		Q68100A1474Q
SCDQ5541R	yellow	3.2 (0.134)	Q68100A1472R
SCDQ5542R	super-red		Q68100A1078R
SCDQ5543R	green		Q68100A1473R
SCDQ5544R	high efficiency green		Q68100A1474R

SCDQ5541P/Q/R, SCDQ5542P/Q/R, SCDQ5543P/Q/R, SCDQ5544P/Q/R

Maximum Ratings

Operation in excess of any of these conditions may result in permanent damage to this device ($T_A = 25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Operating temperature range	T_{op}	$-40 \dots +85$	$^\circ\text{C}$
Storage temperature range	T_{stg}	$-40 \dots +100$	$^\circ\text{C}$
Supply Voltage V_{CC} to GND (non-operating)	V_{CC}	-0.5 to $+7.0$	V
Input Voltage, any Pin to GND		-0.5 to V_{CC} to 5.5	V
Solder Temperature, Connector only 1.59 mm (0.063") below seating plane, $t < 5.0$ s	T_S	260	$^\circ\text{C}$
Relative Humidity (non-condensing)		85	%
ESD (100 pF, 1.5 k Ω)	V_Z	2.0	kV
Input Current		± 100	mA
Power Dissipation at 85°C		0.65	W

Optical Characteristics at 25°C

($V_{CC}=5.0$ V at 100% brightness level, viewing angle: X axis $\pm 55^\circ$, Y axis $\pm 65^\circ$)

Description	Symbol	Values				Unit
		Yellow SCDQ5541	Super-red SCDQ5542	Green SCDQ5543	High Efficiency Green SCDQ5544	
Luminous Intensity (min.)	I_{Vpeak}	1.8	1.8	1.8	2.1	mcd
Character Average (#displayed all digits) (typ.)		5.4	5.4	5.4	6.4	mcd
Peak Wavelength (typ.)	λ_{peak}	583	630	565	568	nm
Dominant Wavelength (typ.)	λ_{dom}	585	620	570	574	nm

Notes:

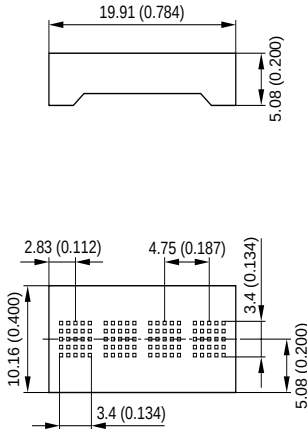
1. Dot to dot intensity matching at 100% brightness is 1.8:1.
2. Displays are binned for hue at 2.0 nm intervals.
3. Displays within a given intensity category have an intensity matching of 1.5:1 (max.).

SCDQ5541P/Q/R, SCDQ5542P/Q/R, SCDQ5543P/Q/R, SCDQ5544P/Q/R

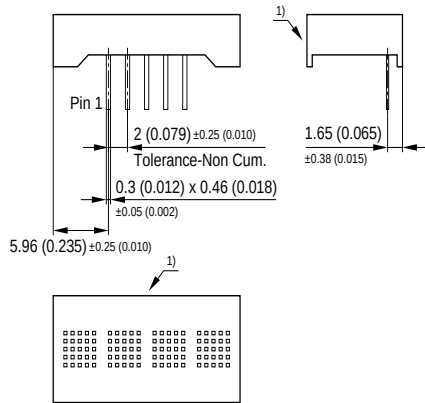
Package Outlines

Dimensions in mm (inch)

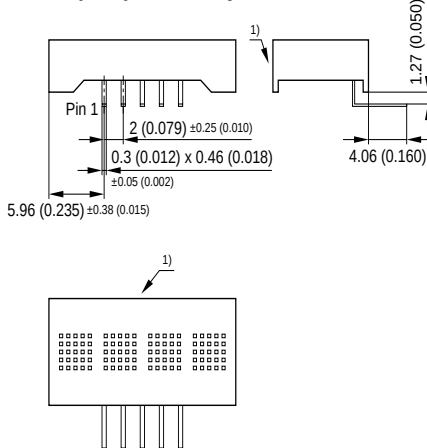
Typical Package Outline & Matrix



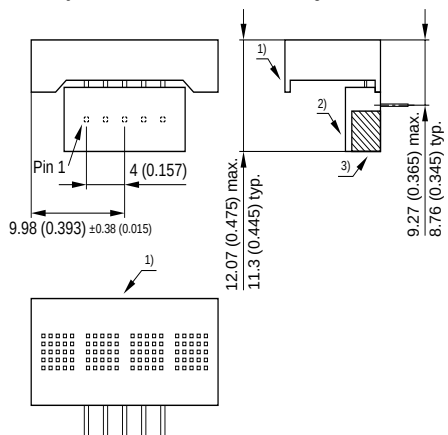
SCDQ554XP SIP Package



SCDQ554XQ 90° SIP Package



SCDQ554XR 90° Connector/Header Package



- 1) Part marking is on this side of the display.
RoHS Compliant (lead-free) have a "Z" marked to the right of the date code.
- 2) Molex header, 53290-0510 mounted on the display.
- 3) Molex receptacle, 52418-0510 mounted on the customer's PCB. Supplied by the customer.
- Use Pin 1 designation on this drawing, not the Molex connector specification.
- 4) Unless otherwise specified all tolerances are ± 0.25 (0.010).

ID05D001

Electrical characteristics (over operating temperature, unless otherwise specified, $T_A = 25^\circ\text{C}$)

Parameter	Min.	Typ.	Max.	Units	Conditions
V_{CC}	4.5	—	5.5	V	—
I_{CC} (Power Down Mode)	—	—	5.0	μA	$V_{CC}=5.0\text{ V}$, all inputs=0 V or V_{CC}
I_{CC} (16 dots on per digit) ¹⁾	—	100	145	mA	$V_{CC}=5.0\text{ V}$, “#” displayed in all 4 digits at 100% brightness at 25°C
V_{IH}	3.5	—	—	V	$V_{CC}=4.5\text{ V}$ to 5.5 V
V_{IL}	—	—	1.5	V	$V_{CC}=4.5\text{ V}$ to 5.5 V
I_{IH}	—	—	10	μA	$V_{CC}=V_{IN}=5.0\text{ V}$ (all inputs)
I_{IL}	—	—	-10	μA	$V_{CC}=5.0\text{ V}$, $V_{IN}=0\text{ V}$ (all inputs)
Internal Mux Frequency	375	768	1086	Hz	—
θ_{ja}	—	65	—	$^\circ\text{C/W}$	—

Notes:

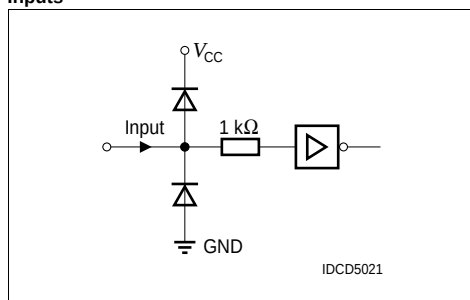
¹⁾ I_{CC} is an average value, the Peak current is $\frac{5}{3} \times I_{CC}$.

²⁾ Contact manufacturer for 3.3 volt operation.

Input Circuit

The input resistor/diode network shown below is used for ESD protection and to eliminate substrate latch-up caused by input voltage over/under shoot.

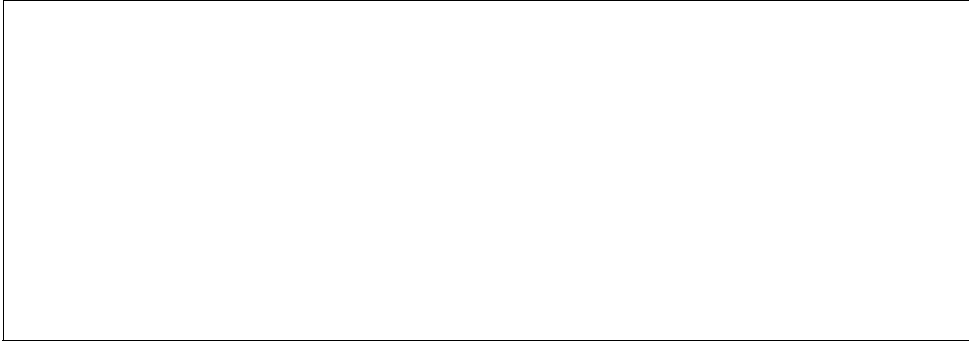
Inputs



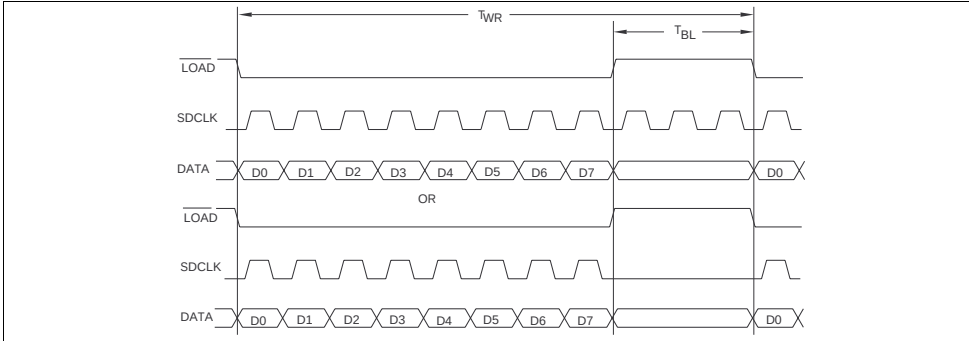
Pinout and Pin Definitions

Pin	Function	Definitions
1	LOAD	Low input enables data clocking into 8-bit serial shift register. When LOAD goes high, the contents of 8- bit serial Shift Register will be decoded.
2	SDATA	Serial data input
3	SDCLK	Loads data into the 8-bit serial data register on a low to high transition
4	V_{CC}	Power supply
5	GND	Power supply ground

Close Up of Data “Write” Cycle



Device Timing

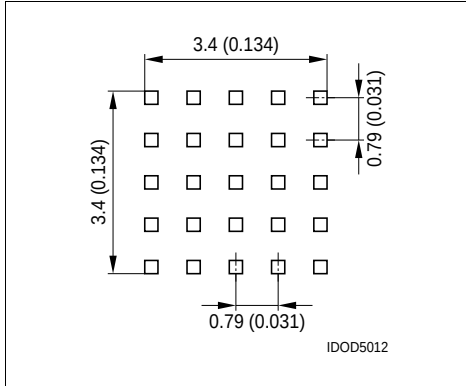


Write Cycle Timing
(over operating temperature range, $V_{CC}=V_{LL}=4.5\text{ V to }5.5\text{ V}$)

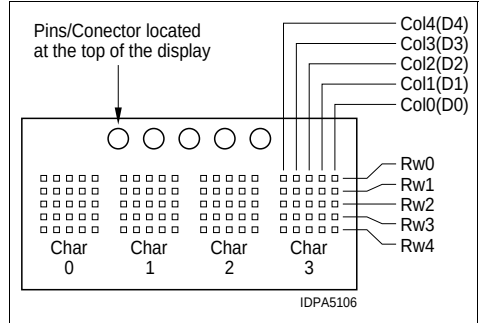
Symbol	Description	Min.	Max.	Units
T_{LDS}	Load Setup Time	50	—	ns
T_{DS}	Data Setup Time	50	—	ns
T_{SDCLK}	Clock Period	200	—	ns
T_{SDCW} (HI or LOW)	Clock Width	70	—	ns
T_{LDH}	Load Hold Time	0	—	ns
T_{DH}	Data Hold Time	25	—	ns
T_{WR}	Total Write Time	2.25	—	μ s
T_{BL}	Time Between Writes	600	—	ns
T_{RST}	Reset Active Time	600	—	ns

- Notes:
- T_{WR} =Setup Time + 8 Clock Times + Hold Times + Time Between Writes.
 - Data is shifted into the display's 8 bit shift register on the positive going edge of the SDCLK.
 - Shift register data is evaluated when Load goes high.

Dot Matrix Format

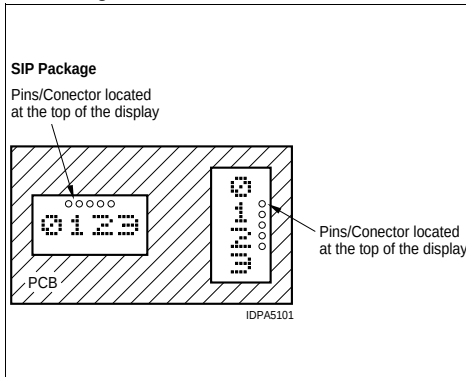


Character Address, Row, & Column Data Map

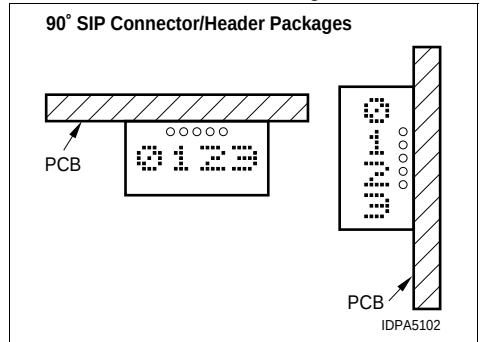


1. Viewed from the LED side of the display with the display in a horizontal position.
2. The row address and column data are typical for all character positions. The LED is on when the data bit = 1 and off when the data bit = 0.

Suggested Display Mounting SIP Package



Suggested Display Mounting 90° SIP Connector / Header Packages



Operation of the SCDQ554XX

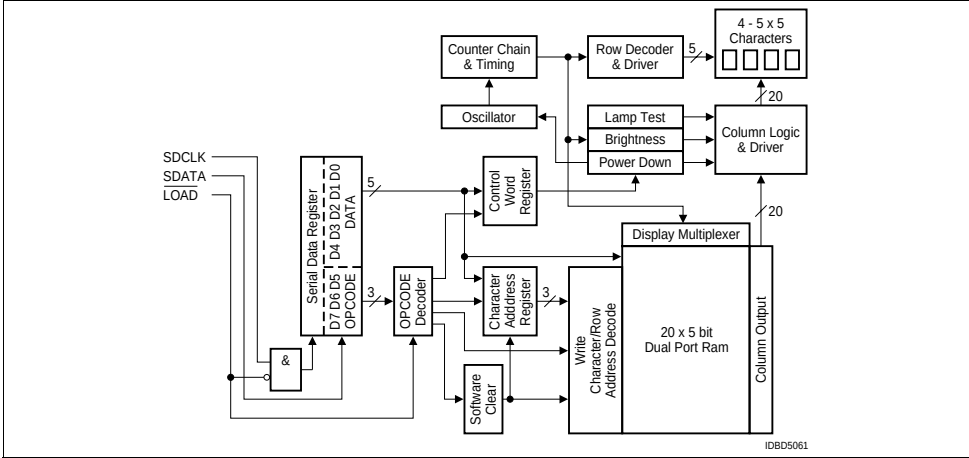
The SCDQ554XX display consists of a CMOS IC containing control logic and drivers for four 5 x 5 characters. These components are assembled in a compact plastic package.

Individual LED dot addressability allows the user great freedom in creating special characters or mini-icons. The User Definable Character Set examples illustrate 200 different character and symbol possibilities. Each example has the hexadecimal code required to display characters in a horizontal or vertical format. See Figures above, Suggested Display Mounting, for the display positioning. Generally, the contacts should be on the right side of the display for the vertical format and on the top of the display for the horizontal format.

The serial data interface provides a highly efficient interconnection between the display and the mother board. The SCDQ554XX requires only three input lines as compared to 15 for an equivalent four character parallel input part.

The on-board CMOS IC is the electronic heart of the display. The IC accepts decoded serial data, which is stored in the internal RAM. Asynchronously the RAM is read by the character multiplexer at a strobe rate that results in a flicker free display. shows the three functional areas of the IC. These include: the input serial data register and control logic, a 100 bits two port RAM, and an internal multiplexer/display driver.

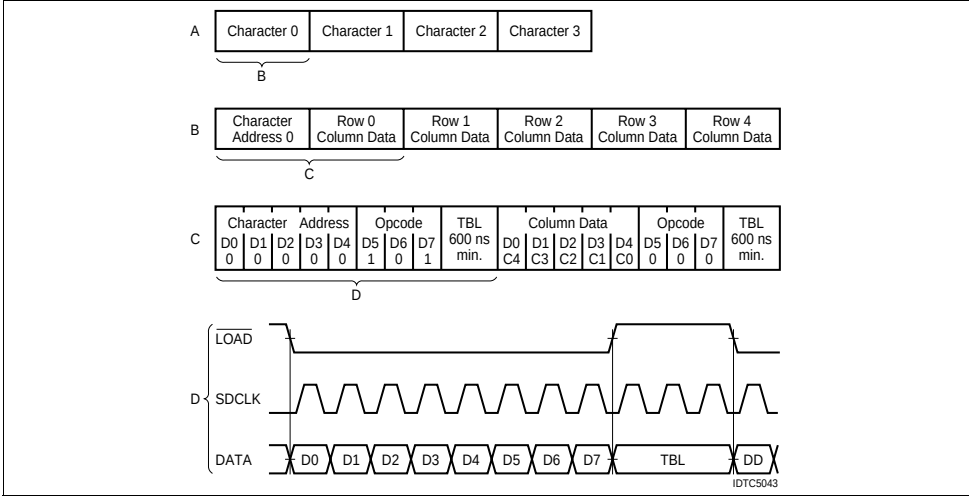
SCDQ Block Diagram



The following explains how to format the serial data to be loaded into the display. The user supplies a string of bit mapped decoded characters. The contents of this string is shown in Figure „Loading Serial Character Data A“ (**page 8**). Figure „Loading Serial Character Data B“ (**page 8**) shows that each character consists of six 8 bit words. The first word encodes the display character location and the succeeding five bytes are row data. The row data represents the status (On, Off) of individual column LEDs. Figure „Loading Serial Character Data C“ (**page 8**) shows that each 8 bit word is formatted to include a three bit Operational Code (OPCODE) defined by bits D7–D5 and five bits (D4–D0) representing Column Data, Character Address, or Control Word Data.

Figure „Loading Serial Character Data D“ (**page 8**) shows the sequence for loading the bytes of data. Bringing the LOAD line low enables the serial register to accept data. The shift action occurs on the low to high transition of the serial data clock (SDCLK). The least significant bit (D0) is loaded first. After eight clock pulses the LOAD line is brought high. With this transition the OPCODE is decoded. The decoded OPCODE directs D4–D0 to be latched in the Character Address register, stored in the RAM as Column data, or latched in the Control Word register. The control IC requires a minimum 600 ns delay between successive byte loads.

Loading Serial Character Data



SCDQ5541P/Q/R, SCDQ5542P/Q/R, SCDQ5543P/Q/R, SCDQ5544P/Q/R

The Character Address bits, D4–D0 stored in the Character Address Register and the Column Data Instruction's Row Address bits, D7–D5, direct the Column Data bits, D4–D0 to specific RAM location. See the Instruction Set Table for address and data format. Figure „Writing Character 'D' Example" (page 9) shows the Row Address for the example character "D". See Figure „Character Address, Row, & Column Data Map" (page 7) for the dot positioning (Display contacts are at the top of the display).

Column data is written and read asynchronously from the 200 bit RAM. Once loaded the internal oscillator and character multiplexer reads the data from the RAM. These characters are row strobed with column data as shown in Figure „Row Strobe Example" (page 10). The character strobe rate is determined by the internal IC's=320 counter.

Instruction Set

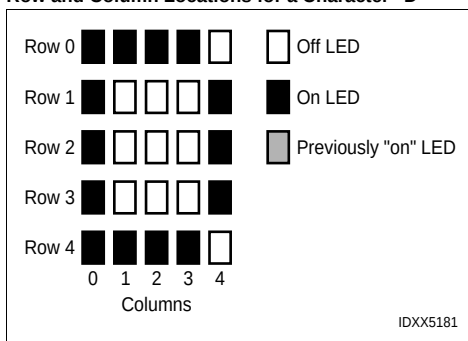
OPERATION	D 7	D 6	D 5	D 4	D 3	D 2	D 1	D 0	HEX	DESCRIPTION
CONTROL WORD	1	1	1	1	L T	B r	B r	B r	F0+X	Select Control Word plus operand See Control Word Format
Power Down Mode	1	1	1	1	1	1	1	1	FF	Power Down Mode–0% Brightness
SFT CLEAR	1	1	0	0	0	0	0	0	C0	Software Clear
ADDRESS REGISTER	1	0	1	0	0	0	0	0	A0	Select Digit Address 0
CHR ADRS	1	0	1	0	0	0	1	0	A2	Select Digit Address 2
0–3	1	0	1	0	0	0	1	1	A3	Select Digit Address 3
COLUMN DATA	0	0	0	D 4	D 3	D 2	D 1	D 0	00+X	Row 0 D4–D0=Column Data
	0	0	1	D 4	D 3	D 2	D 1	D 0	20+X	Row 1 D4–D0=Column Data
	0	1	0	D 4	D 3	D 2	D 1	D 0	40+X	Row 2 D4–D0=Column Data
	0	1	1	D 4	D 3	D 2	D 1	D 0	60+X	Row 3 D4–D0=Column Data
	1	0	0	D 4	D 3	D 2	D 1	D 0	80+X	Row 4 D4–D0=Column Data

Row data is written to the character address contained in the Character Address Register.

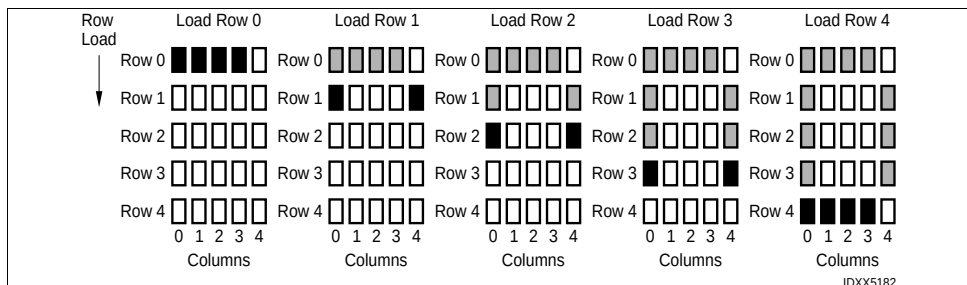
Writing Character "D" Example

	Op code D7 D6 D5			Column Data D4 D3 D2 D1 D0 C0 C1 C2 C3 C4					Hex
Row 0	0	0	0	1	1	1	1	0	1E
Row 1	0	0	1	1	0	0	0	1	31
Row 2	0	1	0	1	0	0	0	1	51
Row 3	0	1	1	1	0	0	0	1	71
Row 4	1	0	0	1	1	1	1	0	9E

Row and Column Locations for a Character "D"



Row Strobe Example



The user can activate four Control functions. These include: LED Brightness Level, Lamp Test, IC Power Down, or Display Clear. OPCODEs and five bit words are used to initiate these functions. The OPCODEs and Control Words for the Character Address and Loading Column Data are shown in Instruction Set Table.

The user can select seven specific LED brightness levels. These brightness levels (in percentages of full brightness of the display) include: 100% (F0HEX), 53% (F1HEX), 40% (F2HEX), 27% (F3HEX), 20% (F4HEX), 13% (F5HEX), and 6.6% (F6HEX). The brightness levels are controlled by changing the duty factor of the row strobe pulse.

Display Brightness

Op code D7 D6 D5	Control Word D4 D3 D2 D1 D0	Hex	Operation Level
1 1 1	1 0 0 0 0	F0	100%
1 1 1	1 0 0 0 1	F1	53%
1 1 1	1 0 0 1 0	F2	40%
1 1 1	1 0 0 1 1	F3	27%
1 1 1	1 0 1 0 0	F4	20%
1 1 1	1 0 1 0 1	F5	13%
1 1 1	1 0 1 1 0	F6	6.6%

The SCDQ554X offers a unique Display Power Down feature which reduces I_{CC} to less than 50 μ A. When FFHEX is loaded the display is set to 0% brightness and the internal multiplex clock is stopped. When in the Power Down mode data may still be written into the RAM. The display is reactivated by loading a new rightness Level Control Word into the display.

Power Down

Op code D7 D6 D5	Control Word D4 D3 D2 D1 D0	Hex	Operation Level
1 1 1	1 1 1 1 1	FF	0% brightness

The Lamp Test is enabled by loading F8HEX into the serial shift register. This Control Word sets all of the LEDs to a 53% brightness level. Operation of the Lamp Test has no affect on the RAM and is cleared by loading a Brightness Control Word.

Lamp Test

Op code D7 D6 D5	Control Word D4 D3 D2 D1 D0	Hex	Operation Level
1 1 1	1 0 B B B		Lamp Test (OFF)
1 1 1	1 1 0 0 0	F8	Lamp Test (ON)

The Software Clear (C0HEX) clears the Address Register and the RAM. The display is blanked and the Character Address Register will be set to Character 0. The internal counter and the Control Word Register are unaffected. The Software Clear will remain active until the next data input cycle is initiated.

Software Clear

Op code D7 D6 D5	Control Word D4 D3 D2 D1 D0	Hex	Operation Level
1 1 0	0 0 0 0 0	C0	CLEAR

Electrical & Mechanical Considerations

Interconnect Considerations

Optimum product performance can be had when the following electrical and mechanical recommendations are adopted. The SCDQ554XX's IC is constructed in a high speed CMOS process, consequently high speed noise on the SERIAL DATA, SERIAL DATA CLOCK, and LOAD lines may cause incorrect data to be written into the serial shift register. Adhere to transmission line termination procedures when using fast line drivers and long cables (>10 cm).

Good digital grounds (pin 1) and power supply decoupling (pin 2) will insure that I_{CC} (<350 mA peak) switching currents do not generate localized ground bounce. Therefore it is recommended that each display package use a 0.1 μ F and 20 μ F capacitor between V_{CC} and ground.

ESD Protection

The input protection structure of the SCDQ554XX provides significant protection against ESD damage. It is capable of withstanding discharges greater than 2.0 kV. Take all the standard precautions, normal for CMOS components. These include properly grounding personnel, tools, tables, and transport carriers that come in contact with unshielded parts. If these conditions are not, or cannot be met, keep the leads of the device shorted together or the parts in anti-static packaging.

Soldering Considerations

The SCDQ554XX can be hand soldered with SN63 solder using a grounded iron set to 260°C.

Wave soldering is also possible following these conditions: Pre-heat that does not exceed 93°C on the solder side of the PC board or a package surface temperature of 85°C. Water soluble organic acid flux (except carboxylic acid) or resin-based RMA flux without alcohol can be used.

Wave temperature of 245°C ± 5°C with a dwell between 1.5 s to 3.0 s. Exposure to the wave should not exceed temperatures above 260°C for five seconds at 1.59 mm (0.063") below the seating plane. The packages should not be immersed in the wave.

The SCDQ554XR connects to an external connector receptacle which may be soldered before inserting the SCDQ554XR Display. In this way, only the connector is subject to the user's soldering process. The Molex 52418-0510 receptacle called out in the product drawing can be used in solder reflow processes. See Molex for specifications.

Post Solder Cleaning Procedures

The least offensive cleaning solution is hot D.I. water (60°C) for less than 15 minutes. Addition of mild saponifiers is acceptable. Do not use commercial dishwasher detergents.

For faster cleaning, solvents may be used. Exercise care in choosing solvents as some may chemically attack the nylon package. For further information refer to Appnotes 18 and 19 at www.osram-os.com or in the current Short Form Catalogue. See Appnote 19, Table 2, "Displays—Group 2".

Optical Considerations

The 3.12 mm (0.123") high character of the SCDQ554XX gives readability up to five feet. Proper filter selection enhances readability over this distance.

Using filters emphasizes the contrast ratio between a lit LED and the character background. This will increase the discrimination of different characters. The only limitation is cost. Take into consideration the ambient lighting environment for the best cost/benefit ratio for filters.

Incandescent (with almost no green) or fluorescent (with almost no red) lights do not have the flat spectral response of sunlight. Plastic band-pass filters are an inexpensive and effective way to strengthen contrast ratios. The SCDQ5542X is a super-red display and should be matched with long wavelength pass filter in the 570 nm to 590 nm range. The SCDQ5541X/3X/4X should be matched with a yellow-green band-pass filter that peaks at 565 nm. For displays of multiple colors, neutral density grey filters offer the best compromise.

Additional contrast enhancement is gained by shading the displays. Plastic band-pass filters with built-in louvers offer the next step up in contrast improvement. Plastic filters can be improved further with anti-reflective coatings to reduce glare. The trade-off is fuzzy characters. Mounting the filters close to the display reduces

this effect. Take care not to overheat the plastic filter by allowing for proper air flow.

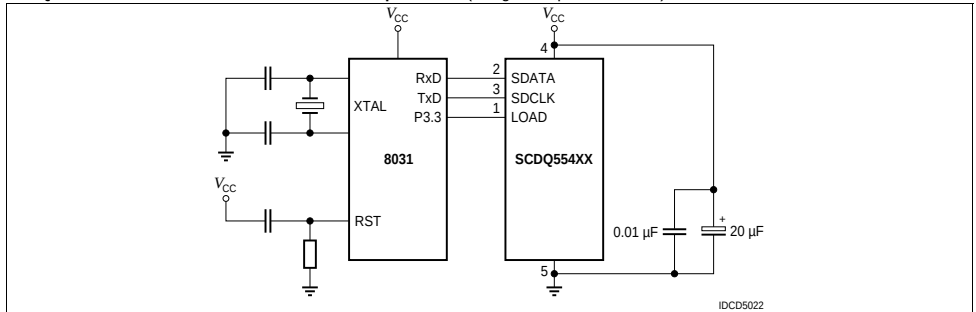
Optimal filter enhancements are gained by using circular polarized, anti-reflective, band-pass filters. The circular polarizing further enhances contrast by reducing the light that travels through the filter and reflects back off the display to less than 1%.

Several filter manufacturers supply quality filter materials. Some of them are: Panelgraphic Corporation, W. Caldwell, NJ; SGL Homalite, Wilmington, DE; 3M Company, Visual Products Division, St. Paul, MN; Polaroid Corporation, Polarizer Division, Cambridge, MA; Marks Polarized Corporation, Deer Park, NY; Hoya Optics, Inc., Fremont, CA.

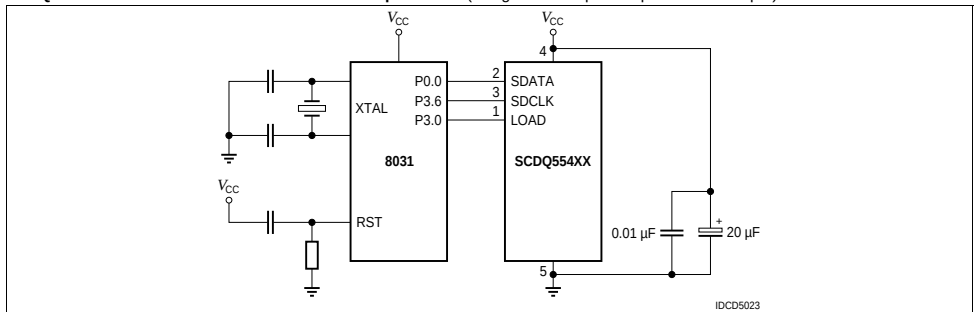
One last note on mounting filters: recessing displays and bezel assemblies is an inexpensive way to provide a shading effect in overhead lighting situations. Several Bezel manufacturers are: R.M.F. Products, Batavia, IL; Nobex Components, Griffith Plastic Corp., Burlingame, CA; Photo Chemical Products of California, Santa Monica, CA; I.E.E.-Atlas, Van Nuys, CA.

SCDQ5541P/Q/R, SCDQ5542P/Q/R, SCDQ5543P/Q/R, SCDQ5544P/Q/R

SCDQ554XX Interface to Siemens/Intel 8031 Microprocessor (using serial port in mode 0)



SCDQ554XX Interface to Siemens/Intel 8031 Microprocessor (using one bit of parallel port as serial input)



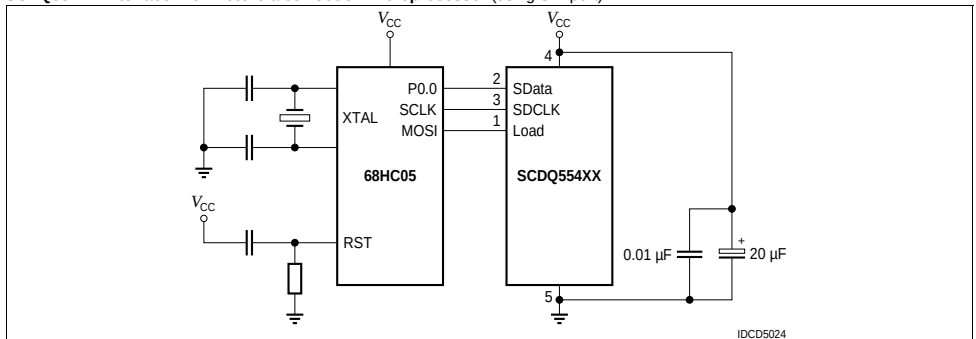
Microprocessor Interface

The microprocessor interface is through the serial port, SPI port or one out of eight data bits on the eight bit parallel port and also control lines SDCLK and LOAD.

Power Up Sequence

Upon power up display will come on at random. Thus the display should be reset at power-up. The reset will set the Address Register to Digit 0, User RAM is set to 0 (display blank) the Control Word is set to 0 (100% brightness with Lamp Test off) and the internal counters are reset.

SCDQ554XX Interface with Motorola 68HC05C4 Microprocessor (using SPI port)



SCDQ5541P/Q/R, SCDQ5542P/Q/R, SCDQ5543P/Q/R, SCDQ5544P/Q/R

Loading Data into the Display

Use following procedure to load data into the display:

1. Power up the display.
2. Step A: software clear the display.
3. Step B: Load the Control Word with the desired brightness level.
4. Load the Digit Address into the display.
5. Load display row and column data for the selected digit.
6. Repeat steps 4 and 5 for all digits.

Data Contents for the Display in a Horizontal Format “↑AB↓”

Step	D7	D6	D5	D4	D3	D2	D1	D0	Function
A	1	1	0	0	0	0	0	0	CLEAR
B (optional)	1	1	1	1	0	B	B	B	BRIGHTNESS SELECT
1	1	0	1	0	0	0	0	0	DIGIT D0 SELECT
2	0	0	0	0	0	1	0	0	ROW 0 D0 (↑)
3	0	0	1	0	1	1	1	0	ROW 1 D0 (↑)
4	0	1	0	1	0	1	0	1	ROW 2 D0 (↑)
5	0	1	1	0	0	1	0	0	ROW 3 D0 (↑)
6	1	0	0	0	0	1	0	0	ROW 4 D0 (↑)
7	1	0	1	0	0	0	0	1	DIGIT D1 SELECT
8	0	0	0	0	0	1	0	0	ROW 0 D1 (A)
9	0	0	1	0	1	0	1	0	ROW 1 D1 (A)
10	0	1	0	1	1	1	1	1	ROW 2 D1 (A)
11	0	1	1	1	0	0	0	1	ROW 3 D1 (A)
12	1	0	0	1	0	0	0	1	ROW 4 D1 (A)
13	1	0	1	0	0	0	1	0	DIGIT D2 SELECT
14	0	0	0	1	1	1	1	0	ROW 0 D2 (B)
15	0	0	1	0	1	0	0	1	ROW 1 D2 (B)
16	0	1	0	0	1	1	1	0	ROW 2 D2 (B)
17	0	1	1	0	1	0	0	1	ROW 3 D2 (B)
18	1	0	0	1	1	1	1	0	ROW 4 D2 (B)
19	1	0	1	0	0	0	1	1	DIGIT D3 SELECT
20	0	0	0	0	0	1	0	0	ROW 0 D3 (↓)
21	0	0	1	0	0	1	0	0	ROW 1 D3 (↓)
22	0	1	0	1	0	1	0	1	ROW 2 D3 (↓)
23	0	1	1	0	1	1	1	0	ROW 3 D3 (↓)
24	1	0	0	0	0	1	0	0	ROW 4 D3 (↓)

SCDQ5541P/Q/R, SCDQ5542P/Q/R, SCDQ5543P/Q/R, SCDQ5544P/Q/R

User Definable Character Set Examples*

Upper and lower case alphabets

HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE	
HEX CODE	04 2A 5F 71 91	0E 29 4E 69 9E	0F 30 5D 70 9F	1E 29 49 69 9E	1F 30 5E 70 9F	2F 30 5F 70 9F	3F 30 5F 70 9F	4F 30 5F 70 9F	5F 30 5F 70 9F	6F 30 5F 70 9F	7F 30 5F 70 9F	8F 30 5F 70 9F	9F 30 5F 70 9F	AF 30 5F 70 9F	BF 30 5F 70 9F	CF 30 5F 70 9F	DF 30 5F 70 9F
HEX CODE	01 21 41 61 81	13 34 54 74 93	10 30 50 70 9F	11 31 51 71 91	12 32 52 72 92	13 33 53 73 93	14 34 54 74 94	15 35 55 75 95	16 36 56 76 96	17 37 57 77 97	18 38 58 78 98	19 39 59 79 99	1A 3A 5A 7A 9A	1B 3B 5B 7B 9B	1C 3C 5C 7C 9C	1D 3D 5D 7D 9D	1E 3E 5E 7E 9E
HEX CODE	0F 30 5E 70 9F	1F 30 5F 70 9F	2F 30 5F 70 9F	3F 30 5F 70 9F	4F 30 5F 70 9F	5F 30 5F 70 9F	6F 30 5F 70 9F	7F 30 5F 70 9F	8F 30 5F 70 9F	9F 30 5F 70 9F	AF 30 5F 70 9F	BF 30 5F 70 9F	CF 30 5F 70 9F	DF 30 5F 70 9F	EF 30 5F 70 9F	FF 30 5F 70 9F	00 30 5F 70 9F
HEX CODE	00 2E 52 72 9D	10 30 5E 70 9F	00 2F 53 73 9E	01 2F 54 74 9F	02 2F 55 75 9F	03 2F 56 76 9F	04 2F 57 77 9F	05 2F 58 78 9F	06 2F 59 79 9F	07 2F 5A 7A 9F	08 2F 5B 7B 9F	09 2F 5C 7C 9F	0A 2F 5D 7D 9F	0B 2F 5E 7E 9F	0C 2F 5F 7F 9F	0D 2F 5F 7F 9F	0E 2F 5F 7F 9F
HEX CODE	00 2E 52 72 9D	10 30 5E 70 9F	00 2F 53 73 9E	01 2F 54 74 9F	02 2F 55 75 9F	03 2F 56 76 9F	04 2F 57 77 9F	05 2F 58 78 9F	06 2F 59 79 9F	07 2F 5A 7A 9F	08 2F 5B 7B 9F	09 2F 5C 7C 9F	0A 2F 5D 7D 9F	0B 2F 5E 7E 9F	0C 2F 5F 7F 9F	0D 2F 5F 7F 9F	0E 2F 5F 7F 9F
HEX CODE	00 23 44 6A 8E	08 3C 52 72 9D	00 32 53 73 9E	00 31 52 72 9D	00 30 51 71 9C	00 2F 50 70 9B	00 2E 4F 6F 9A	00 2D 4E 6E 99	00 2C 4D 6D 98	00 2B 4C 6C 97	00 2A 4B 6B 96	00 29 4A 6A 95	00 28 49 69 94	00 27 48 68 93	00 26 47 67 92	00 25 46 66 91	00 24 45 65 90

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Numerals and punctuation

HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE	
HEX CODE	0E 33 79 8E	04 2C 44 64 8E	1E 21 4E 68 9F	1E 21 4E 61 9E	06 2A 5F 62 82	1F 30 5E 61 9E	06 28 5E 71 8E	1F 22 44 68 88	0E 31 4E 71 8E	0E 31 4E 71 8E	0E 31 4E 71 8E	0E 31 4E 71 8E	0E 31 4E 71 8E	0E 31 4E 71 8E	0E 31 4E 71 8E	0E 31 4E 71 8E	0E 31 4E 71 8E
HEX CODE	0E 31 4F 62 8C	0A 3F 4A 7F 8A	0F 34 4C 65 9E	06 29 5C 68 9F	19 3A 4A 6B 93	08 34 4D 72 8D	0C 2C 44 68 80	02 24 44 64 82	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88
HEX CODE	0C 2C 44 64 80	04 24 4F 64 84	00 2C 4C 64 88	00 2D 5F 60 80	00 2D 5F 60 80	01 22 44 68 90	04 24 44 60 84	0A 2A 40 60 80	07 24 44 64 87	07 24 44 64 87	07 24 44 64 87	07 24 44 64 87	07 24 44 64 87	07 24 44 64 87	07 24 44 64 87	07 24 44 64 87	07 24 44 64 87
HEX CODE	90 33 4F 7F 01	91 34 50 7F 00	92 35 51 7F 00	93 36 52 7F 00	94 37 53 7F 00	95 38 54 7F 00	96 39 55 7F 00	97 3A 56 7F 00	98 3B 57 7F 00	99 3C 58 7F 00	9A 3D 59 7F 00	9B 3E 5A 7F 00	9C 3F 5B 7F 00	9D 40 5C 7F 00	9E 41 5D 7F 00	9F 42 5E 7F 00	00 43 5F 7F 00
HEX CODE	10 28 44 62 81	1C 24 4A 64 9C	0E 35 47 70 8E	00 20 40 60 9F	0C 2C 40 6C 8C	0C 20 40 64 88	02 24 48 64 82	00 3F 40 7F 80	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88	08 24 44 64 88
HEX CODE	0E 31 42 64 88	06 24 4A 64 86	0C 24 42 64 8C	04 24 40 64 84	11 2A 40 6E 84	15 2E 40 6E 95	04 2A 50 60 80	08 35 40 60 80	08 35 40 60 80	08 35 40 60 80	08 35 40 60 80	08 35 40 60 80	08 35 40 60 80	08 35 40 60 80	08 35 40 60 80	08 35 40 60 80	08 35 40 60 80

IDCS5082

*CAUTION: No more than 128 LEDs "on" at one time at 100% brightness.

2006-05-12

SCDQ5541P/Q/R, SCDQ5542P/Q/R, SCDQ5543P/Q/R, SCDQ5544P/Q/R

User Definable Character Set Examples* (continued)

Scientific notations, ect.

HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE	
0E 2E 5E 8E 80	상승상승상	04 24 48 74 8E	상승상승상	1F 20 59 75 93	상승상승상	1F 20 56 79 91	상승상승상	0E 20 4A 64 8A	상승상승상	00 32 52 72 80	상승상승상	0C 32 56 71 96	상승상승상	0E 24 4E 71 9E	상승상승상	00 24 4A 71 9F	상승상승상
10 3C 5F 72 81	상승상승상	0E 31 5F 71 8E	상승상승상	10 28 44 6A 91	상승상승상	09 29 49 6E 90	상승상승상	01 2E 54 64 84	상승상승상	04 2E 59 69 80	상승상승상	0E 31 51 6A 9B	상승상승상	01 2E 5A 6A 8A	상승상승상	0F 32 52 6A 8C	상승상승상
1F 28 44 68 9F	상승상승상	18 28 48 7C 80	상승상승상	1C 28 44 68 80	상승상승상	12 28 44 67 80	상승상승상	06 21 5A 67 80	상승상승상	07 22 59 66 80	상승상승상	1C 34 5C 60 80	상승상승상	0F 28 48 78 88	상승상승상	04 2E 5F 8E 80	상승상승상
00 24 4E 7F 8E	상승상승상	00 24 4E 6E 84	상승상승상	0E 24 4E 64 84	상승상승상	04 24 5F 7E 84	상승상승상	04 24 5F 6F 84	상승상승상	0E 24 5F 6E 8E	상승상승상	00 24 5F 7F 80	상승상승상	04 2E 55 64 84	상승상승상	04 2E 55 8E 84	상승상승상
04 22 5F 62 84	상승상승상	04 28 5F 68 84	상승상승상	1F 31 51 71 9E	상승상승상	08 2C 4A 78 98	상승상승상	0A 35 4A 75 8A	상승상승상	15 2A 59 6A 8A	상승상승상	1F 39 5F 75 9F	상승상승상	00 24 5F 7C 80	상승상승상	0E 3F 7F 8E	상승상승상
00 27 4E 78 9C	상승상승상	00 3C 5C 83 87	상승상승상	00 20 40 60 80	상승상승상	00 20 40 67 9F	상승상승상	00 23 4F 7F 9F	상승상승상	0C 3C 5C 7C 9C	상승상승상	15 2E 44 64 84	상승상승상				

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Foreign characters

HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE		HEX CODE	
1F 21 5F 82 84	상승상승상	1F 21 46 64 88	상승상승상	01 22 42 6A 82	상승상승상	04 3F 51 6A 86	상승상승상	06 3F 44 64 9F	상승상승상	02 3F 46 6A 92	상승상승상	08 3F 49 6A 8B	상승상승상	1F 21 45 6C 8C	상승상승상	02 3F 51 6C 8C	상승상승상
08 3F 49 89 92	상승상승상	04 3F 44 7F 8C	상승상승상	0F 28 51 62 8C	상승상승상	08 2F 52 62 82	상승상승상	0F 21 41 61 9F	상승상승상	0A 3F 4A 8C 9C	상승상승상	19 21 59 62 8C	상승상승상	0F 28 55 63 8C	상승상승상	01 2E 42 66 86	상승상승상
15 35 55 62 8C	상승상승상	0E 28 44 64 98	상승상승상	08 28 4C 6A 90	상승상승상	04 3F 44 64 98	상승상승상	0E 20 40 60 9F	상승상승상	1F 28 4A 64 9A	상승상승상	04 3E 44 6E 95	상승상승상	04 24 44 6E 90	상승상승상	04 22 44 61 91	상승상승상
10 3F 50 7D 8E	상승상승상	1F 21 42 61 8C	상승상승상	0E 20 4E 60 8F	상승상승상	04 25 51 7F 81	상승상승상	01 21 4A 64 8A	상승상승상	1F 28 42 62 8F	상승상승상	1E 22 42 62 8F	상승상승상	1F 21 5F 61 8F	상승상승상	0E 20 4F 61 8E	상승상승상
12 23 52 64 88	상승상승상	04 24 54 76 96	상승상승상	1E 24 4F 74 8F	상승상승상	0F 34 5F 74 8F	상승상승상	0F 36 4F 64 98	상승상승상	0F 35 55 79 8F	상승상승상	0F 34 57 74 8F	상승상승상	00 24 5F 74 8B	상승상승상	08 24 4E 72 8F	상승상승상
0A 26 51 7F 91	상승상승상	02 24 4C 64 8E	상승상승상	04 2A 4E 71 8E	상승상승상	0A 34 52 7A 90	상승상승상	08 24 51 71 8E	상승상승상	02 24 51 71 8E	상승상승상	0A 2A 51 71 8E	상승상승상				

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*CAUTION: No more than 128 LEDs "on" at one time at 100% brightness.

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Page	Subjects (major changes since last revision)	Date of change
all	Lead free device	2006-01-23

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