

Application Brief D-003

Introduction

The HCMS-29xx/HCMS-39xx alphanumeric displays have a single data line that accepts data inputs serially. Each character is formed out of a 5 x 7 pixel array by shifting bits into each pixel position (1 = on, 0 = off). The eighth row does not consist of LEDs, but is a pixel position and must be considered a data position when encoding a character to be displayed. Thus, each character's information content can be stored and accessed as five bytes (40 bits) of information, with each byte representing a column of data. To properly implement the character coding given here, input the most significant bit first (i.e. least significant bit last). The most significant bit of each byte is a "don't care" since there are no LEDs in the eighth row.

Codes

The symbol codes in Table 1 represent the ASCII characters shown there and in Table 3. The symbol codes in Table 2 represent the characters shown in Table 4, the Katakana character set. The column and row values for each symbol are shown in the appropriate character set (columns D4 - D7, rows D0 - D3). Ignore the user defined section of each character set (relates to Avago Technologies smart displays that have an internal ASCII decoder). Columns 0, 1, 6, and 7 of the Katakana character set are encoded in the ASCII character set.

Further applications information on the HCMS-29xx/HCMS-39xx alphanumeric displays is available. Please contact your local Avago Technologies sales office for copies of the literature.

Table 1. (continued)

CHARACTER	SYMBOL CODE	COLUMN CODE					
τ	10	10	08	78	08	04	
φ	11	18	24	7E	24	18	
Ω	12	5E	61	01	61	5E	
Å	13	78	14	15	14	78	
ä	14	38	44	45	3C	40	
Ä	15	78	15	14	15	78	
ä	16	38	45	44	3D	40	
Ö	17	3C	43	42	43	3C	
ö	18	38	45	44	45	38	
Ü	19	3C	41	40	41	3C	
ü	1A	38	42	40	42	38	
→	1B	08	08	2A	1C	08	
□	1C	20	7E	02	02	02	
2	1D	12	19	15	12	00	
£	1E	48	7E	49	41	42	
¥	1F	01	12	7C	12	01	
(space)	20	00	00	00	00	00	
!	21	00	5F	00	00	00	
"	22	00	03	00	03	00	
#	23	14	7F	14	7F	14	
\$	24	24	2A	7F	2A	12	
%	25	23	13	08	64	62	
&	26	36	49	56	20	50	
'	27	00	0B	07	00	00	
(	28	00	00	3E	41	00	
)	29	00	41	3E	00	00	
*	2A	08	2A	1C	2A	08	
+	2B	08	08	3E	08	08	
,	2C	00	58	38	00	00	
-	2D	08	08	08	08	08	
.	2E	00	30	30	00	00	
/	2F	20	10	08	04	02	
0	30	3E	51	49	45	3E	
1	31	00	42	7F	40	00	
2	32	62	51	49	49	46	
3	33	22	41	49	49	36	
4	34	18	14	12	7F	10	
5	35	27	45	45	45	39	
6	36	3C	4A	49	49	30	

Table 1. Encoded Data for ASCII Symbols

CHARACTER	SYMBOL CODE	COLUMN CODE					
◀	00	08	1C	3E	7F	00	
¿	01	30	45	48	40	30	
ⓧ	02	45	29	11	29	45	
N	03	7D	09	11	21	7D	
n	04	7D	09	05	05	79	
a	05	38	44	44	38	44	
b	06	7E	01	29	2E	10	
d	07	30	4A	4D	49	30	
Δ	08	60	50	48	50	60	
h	09	1E	04	04	38	40	
θ	0A	3E	49	49	49	3E	
λ	0B	62	14	08	10	60	
m	0C	40	3C	20	20	1C	
π	0D	08	7C	04	7C	02	
σ	0E	38	44	44	3C	04	
Σ	0F	41	63	55	49	41	

Table 1. (continued)

CHARACTER	SYMBOL CODE	COLUMN CODE					
7	37	01	71	09	05	03	
8	38	36	49	49	49	36	
9	39	06	49	49	29	1E	
:	3A	00	36	36	00	00	
:	3B	00	5B	3B	00	00	
<	3C	00	08	14	22	41	
=	3D	14	14	14	14	14	
>	3E	41	22	14	08	00	
?	3F	02	01	51	09	06	
@	40	3E	41	5D	55	1E	
A	41	7E	09	09	09	7E	
B	42	7E	49	49	49	36	
C	43	3E	41	41	41	22	
D	44	7F	41	41	41	3E	
E	45	7F	49	49	49	41	
F	46	7F	09	09	09	01	
G	47	3E	41	41	51	32	
H	48	7F	08	08	08	7F	
I	49	00	41	7F	41	00	
J	4A	20	40	40	40	3F	
K	4B	7F	08	14	22	41	
L	4C	7F	40	40	40	40	
M	4D	7F	02	0C	02	7F	
N	4E	7F	04	08	10	7F	
O	4F	3E	41	41	41	3E	
P	50	7F	09	09	09	06	
Q	51	3E	41	51	21	5E	
R	52	7F	09	19	29	46	
S	53	26	49	49	49	32	
T	54	01	01	7F	01	01	
U	55	3F	40	40	40	3F	
V	56	07	18	60	18	07	
W	57	7F	20	18	20	7F	
X	58	63	14	08	14	63	
Y	59	03	04	78	04	03	
Z	5A	61	51	49	45	43	
[	5B	00	00	7F	41	41	
\	5C	02	04	08	10	20	
]	5D	41	41	7F	00	00	
-	5E	04	02	7F	02	04	
_	5F	40	40	40	40	40	
·	60	00	07	0B	00	00	
a	61	38	44	44	3C	40	
b	62	7F	48	44	44	38	
c	63	38	44	44	44	44	
d	64	38	44	44	48	7F	
e	65	38	54	54	54	08	
f	66	08	7E	09	02	00	
g	67	08	14	54	54	3C	
h	68	7F	08	04	04	78	
i	69	00	44	7D	40	00	
j	6A	20	40	44	3D	00	
k	6B	00	7F	10	28	44	
l	6C	00	41	7F	40	00	
m	6D	78	04	18	04	78	
n	6E	7C	08	04	04	78	
o	6F	38	44	44	44	38	
p	70	7C	14	24	24	18	
q	71	18	24	14	7C	40	

Table 1. (continued)

CHARACTER	SYMBOL CODE	COLUMN CODE					
r	72	00	7C	08	04	04	
s	73	48	54	54	54	20	
t	74	04	3E	44	20	00	
u	75	3C	40	40	20	7C	
v	76	1C	20	40	20	1C	
w	77	3C	40	30	40	3C	
x	78	44	28	10	28	44	
y	79	04	48	30	08	04	
z	7A	44	64	54	4C	44	
{	7B	00	08	36	41	00	
	7C	00	00	77	00	00	
}	7D	00	41	36	08	00	
~	7E	08	04	08	10	08	
█	7F	2A	55	2A	55	2A	

Table 2. Encoded Data for Katakana Symbols

SYMBOL CODE	COLUMN CODE					
20	00	00	00	00	00	
21	70	50	70	00	00	
22	00	00	0F	01	01	
23	40	40	78	00	00	
24	10	20	40	00	00	
25	00	18	18	00	00	
26	0A	0A	4A	2A	1E	
27	04	44	34	14	0C	
28	20	10	78	04	00	
29	18	08	4B	48	38	
2A	48	48	78	48	48	
2B	48	28	18	7C	08	
2C	08	7C	08	28	18	
2D	40	48	48	78	40	
2E	54	54	54	7C	00	
2F	18	00	58	40	38	
30	08	08	08	08	08	
31	01	41	3D	09	07	
32	10	08	7C	02	01	
33	0E	02	43	22	1E	
34	42	42	7E	42	42	
35	22	12	0A	7F	02	
36	42	3F	02	42	3E	
37	0A	0A	7F	0A	0A	
38	08	46	42	22	1E	
39	04	03	42	3E	02	
3A	42	42	42	42	7E	
3B	02	4F	22	1F	02	
3C	4A	4A	40	20	1C	
3D	42	22	12	2C	46	
3E	02	3F	42	4C	46	
3F	06	48	40	20	1E	

Table 2. (continued)

SYMBOL CODE	COLUMN CODE					
40	08	46	4A	32	1E	
41	0A	4A	3E	09	08	
42	0E	00	4E	20	1E	
43	04	45	3D	05	04	
44	00	7F	08	10	00	
45	04	44	3F	04	04	
46	40	42	42	42	40	
47	42	2A	12	2A	06	
48	22	12	7B	16	22	
49	00	40	20	1F	00	
4A	78	00	02	04	78	
4B	3F	44	44	44	44	
4C	02	42	42	22	1E	
4D	04	02	04	08	30	
4E	3A	02	7F	02	3A	
4F	02	12	22	52	0E	
50	00	2A	2A	2A	40	
51	38	24	22	20	70	
52	40	28	10	28	06	
53	0A	3E	4A	4A	4A	
54	04	7F	04	14	0C	
55	40	42	42	7E	40	
56	4A	4A	4A	4A	7E	
57	04	05	45	25	1C	
58	0F	40	20	1F	00	
59	7C	00	7E	40	30	
5A	7E	40	20	10	08	
5B	7E	42	42	42	7E	
5C	0E	02	42	22	1E	
5D	42	42	40	20	18	
5E	01	02	01	02	00	
5F	02	05	05	02	00	

NOTE: # Columns 0, 1, 6 and 7 may be found in Table 1.

Table 3. ASCII Graphic Character Set

BITS					D7	D6	D5	D4	COLUMN		ROW																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
D3	D2	D1	D0		0	1	2	3	4	5	6	7	8-F	16 USER DEFINED CHARACTERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Table 4. Katakana Graphic Character Set

BITS															
D7 →					0	0	0	0	0	0	0	0	0	1	X
D6 →					0	0	0	0	0	1	1	1	1	1	X
D5 →					0	0	1	1	1	0	0	1	1	1	X
D4 →					0	1	0	1	0	1	0	1	1	X	
					COLUMN →										
					ROW ↓	0	1	2	3	4	5	6	7	8-F	
0000					0									ユーザ定義文字 16 文字	
0001					1										
0010					2										
0011					3										
0100					4										
0101					5										
0110					6										
0111					7										
1000					8										
1001					9										
1010					A										
1011					B										
1100					C										
1101					D										
1110					E										
1111					F										

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