MEMROCK TECHNOLOGIES BARCODE DECODER IC CHIP

This barcode decoder IC chip is designed to meet the needs for low cost, small space, and most importantly strong decoding algorithm to increase the performance of the product especially in the environment where the barcodes are printed with poor quality. This decoder also meets all decoding standards.

Part Number	D2991 5V Surface mount D2991-3 3.3V Surface mount Through hole (Dip) package is available for prototype only
Symbologies	Code39, interleaved 2 of 5, Codabar, Code93, and Code128. UPC A, UPC E0 & E1, EAN 8 & 13 with 2 or 5-digit supplements
Scanner Interface	This decoder is designed to interface with laser scanner. Max. Speed: 200 Scans/Sec. Higher speed available upon request.
Operating Temperature.	-40° to 85°C

General Specifications

- Operating voltage range (VDD) part no. D2991-3: 1.8V to 3.6V, Supply current: 5mA Typical.
- Operating voltage range (VDD) part no. D2991: 4.2V to 5.5V, Supply current: 20mA Typical.

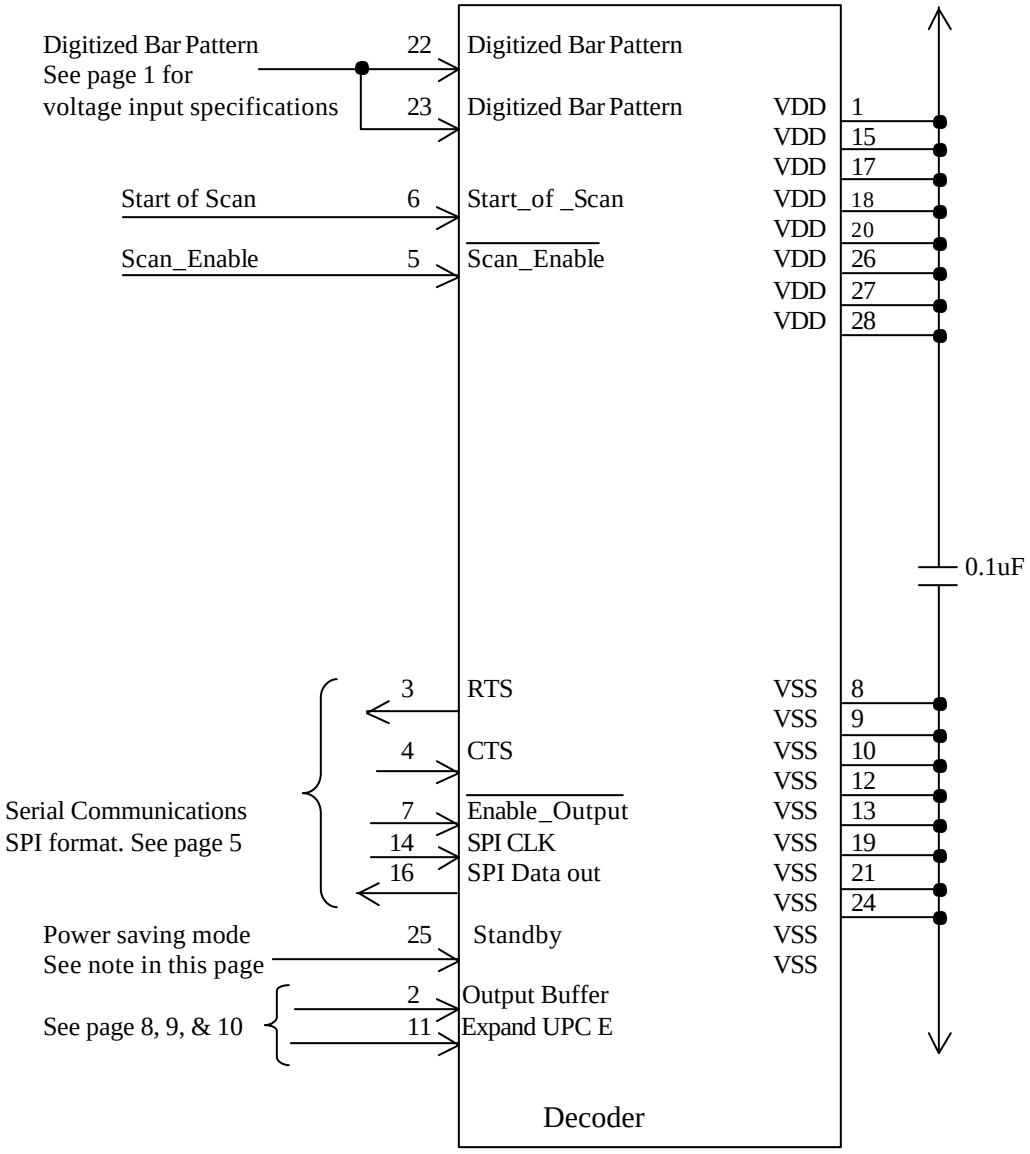
- Input low voltage Min: Vss, Max: 0.15VDD
- Input high voltage Min: 0.8VDD, Max: VDD
- Output low voltage Max: 0.6V
- Output high voltage Min: VDD – 0.7
- No external XTAL is required.

Absolute Maximum Rating

Ambient temperature under bias	-40° to 125°C
Storage temperature	-65° to 150°C
Voltage on any pin with respect to VSS	-0.3V to (Vdd + 0.3V)
Maximum output current sunk by any I/O pin	25mA
Maximum output current sourced by any I/O pin	25mA

For sales/Tech support or other decoders, please call (714) 906-1865 or visit Memrock Technologies

Pin-outs diagram



Note: Decoder in Standby Mode.
In this mode, if the user raises pin 25 of the decoder to V_{DD}, then the decoder enters a standby mode to conserve power. If the user lowers pin 25 of the decoder to V_{SS}, then the decoder will exit the standby mode and starts in normal mode after 10 milliseconds.
In this standby mode, the decoder conserves power by reducing the supply current to less than 3.0uA.

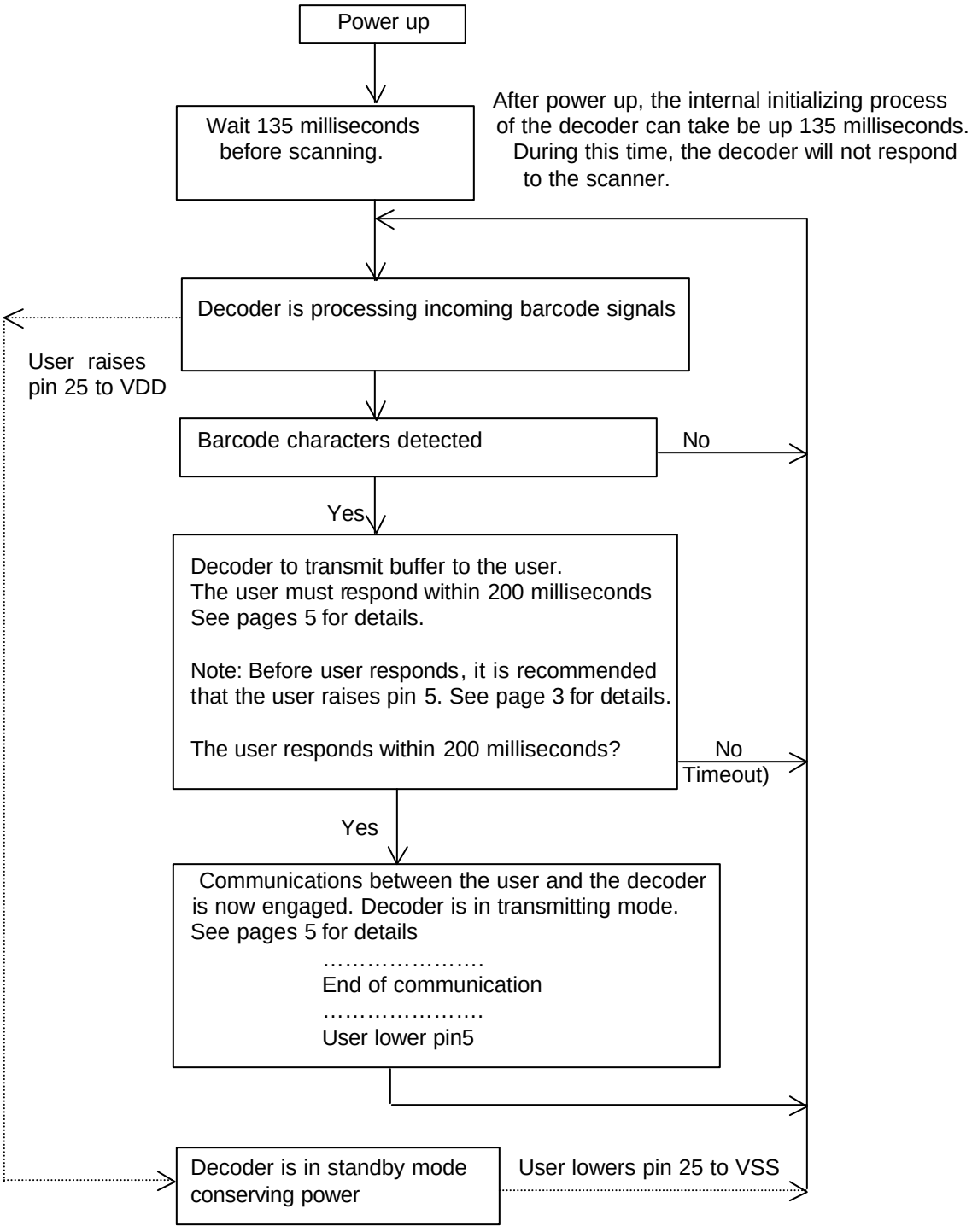
Interfacing Laser scanner to decoder

Digitized Bar Pattern (Pins 22, and 23): This is barcode signal from laser module send to decoder

Start of Scan (Pin 6): When laser is scanning from left to right or from right to left, the Start of Scan (pin 6) will see input that is changing from low to high or high to low, or vise versa.

Scan_Enable (Pin 5): When this pin is high, the decoder is not decoding. When this pin is low the decoder will immediately start processing barcode signals.
When decoder has good data to send to the user, then it is suggested that the user raises this pin and start to collect data, and when transaction is completed, the user can then lower this pin. Otherwise, when decoder finishes sending data to the user, the decoder will immediately start to decode and will have same data of the same label presented to the user again in less than a second or so.
The user might use similar method such as disabling the scanner when decoder has data.

Decoder Process.



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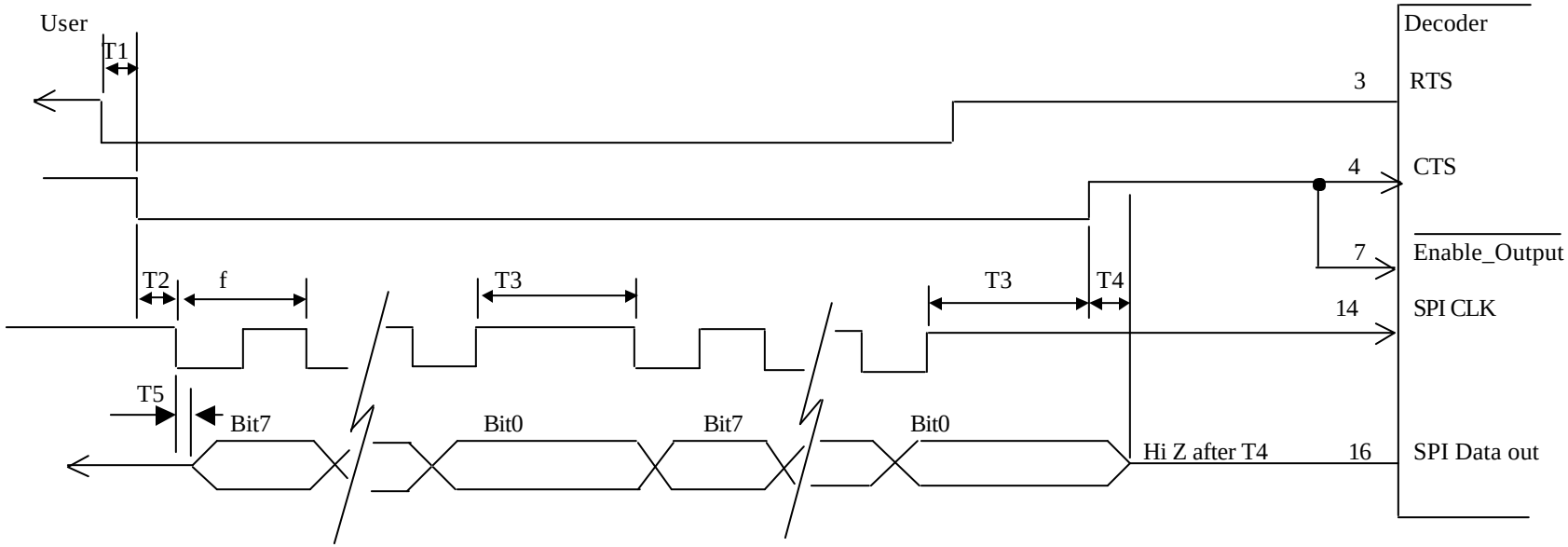
Decoder in data transmitting mode
SPI Communications, decoder in Slave Mode



In this SPI mode, the decoders lowers RTS pin, and waits for CTS to be lowered.
T1 is 0 second min. 200 milliseconds Max. If max is exceeded without lowering CTS pin, then communications is terminated.
After lowering CTS, the user must wait T2 = 20 microseconds or more before clocking out data at f = 2MHz or less.
In all cases, the data will appear after T5 = 50 nanoseconds on the falling edge of the clock.
After the last bit = Bit0, the user will need to wait T3 = 20 microseconds or more before clocking out next byte.
After waiting T3, the user needs to check if RTS still low. If high, then this indicate that all data has been send to the user,
And in this case the user will need raise CTS. The “SPI Data out” will float (Hi Z) after T4 = 50 nanoseconds.

Note that Pins 4 and 7 must be tied together.

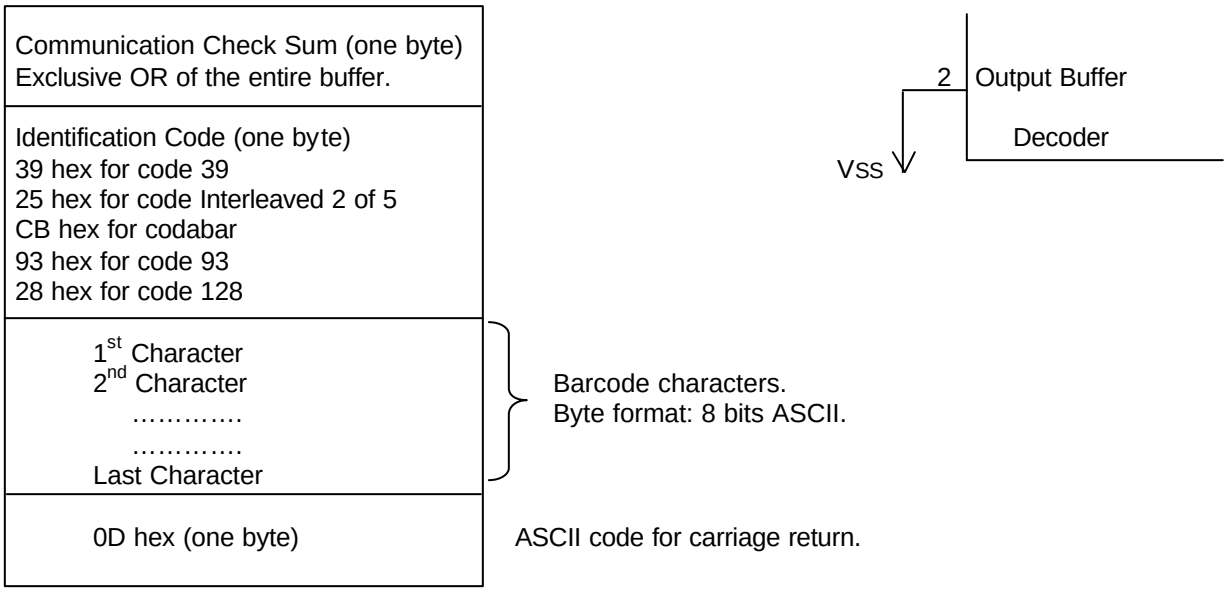


Figure 1: Structure of transmitted buffer from decoder to the user for Code 39, I25, Codabar, Code93, and Code128.
For this type of output buffer, connect Pin2 of decoder to VSS.
See page 8 & 9 for UPC/EAN.

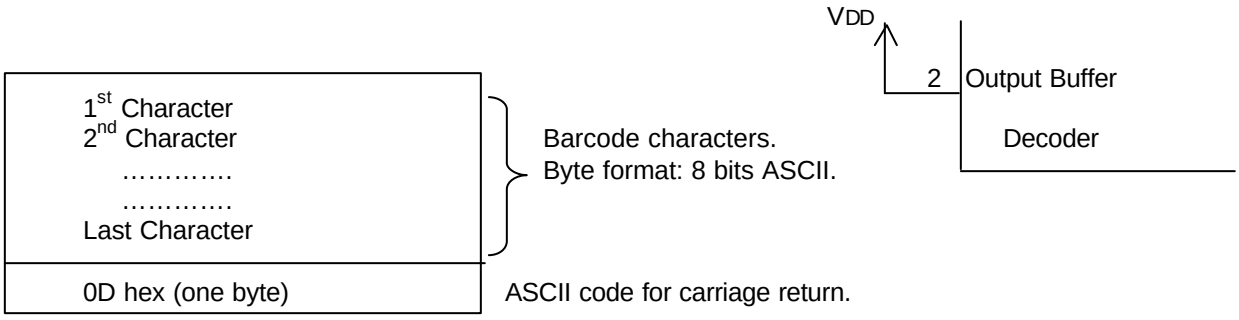
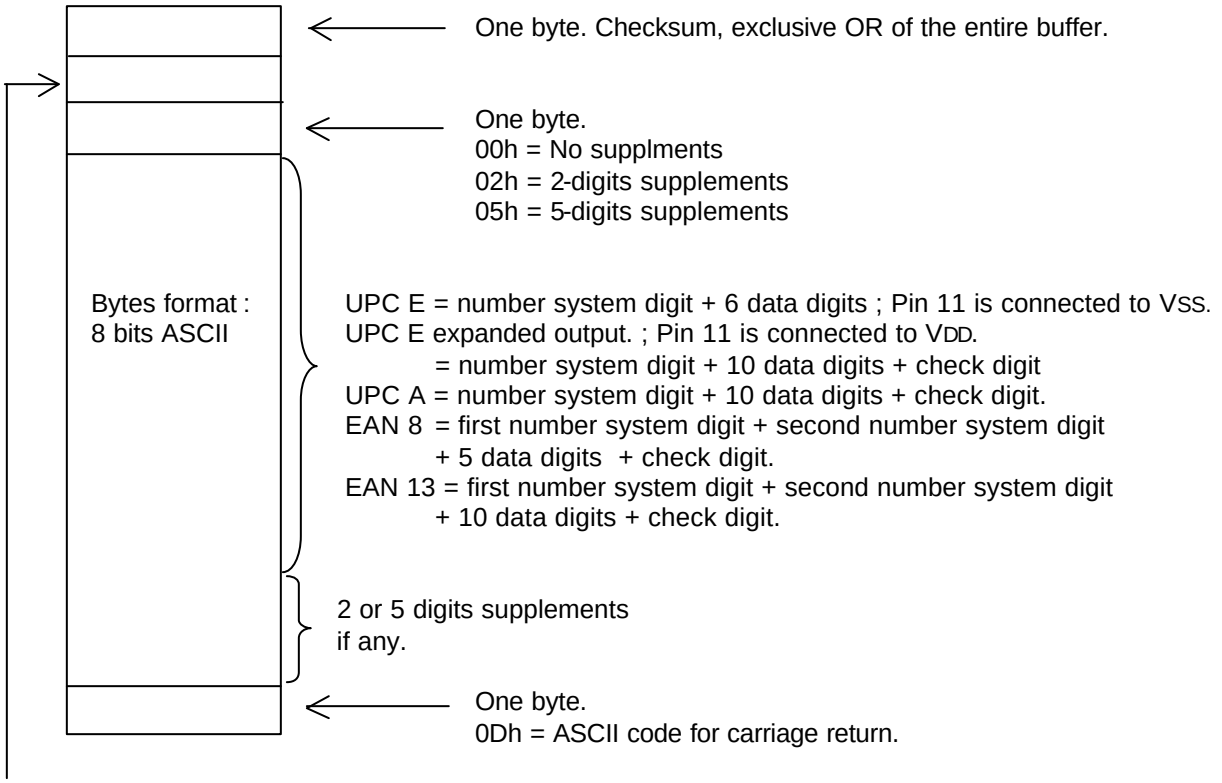


Figure 2: Structure of transmitted buffer from decoder to the user for Code 39, I25, Codabar, Code93, and Code128.
For this type of output buffer, connect Pin2 of decoder to VDD.
See page 8 & 9 for UPC/EAN.



One byte symbology identifier	Symbology
10h	UPC E
20h	EAN 8
30h	UPC A
40h	EAN 13

Figure 3: Structure of transmitted buffer for UPC/EAN
from decoder to the user.
For this type of output buffer, connect Pin2 of decoder to VSS.

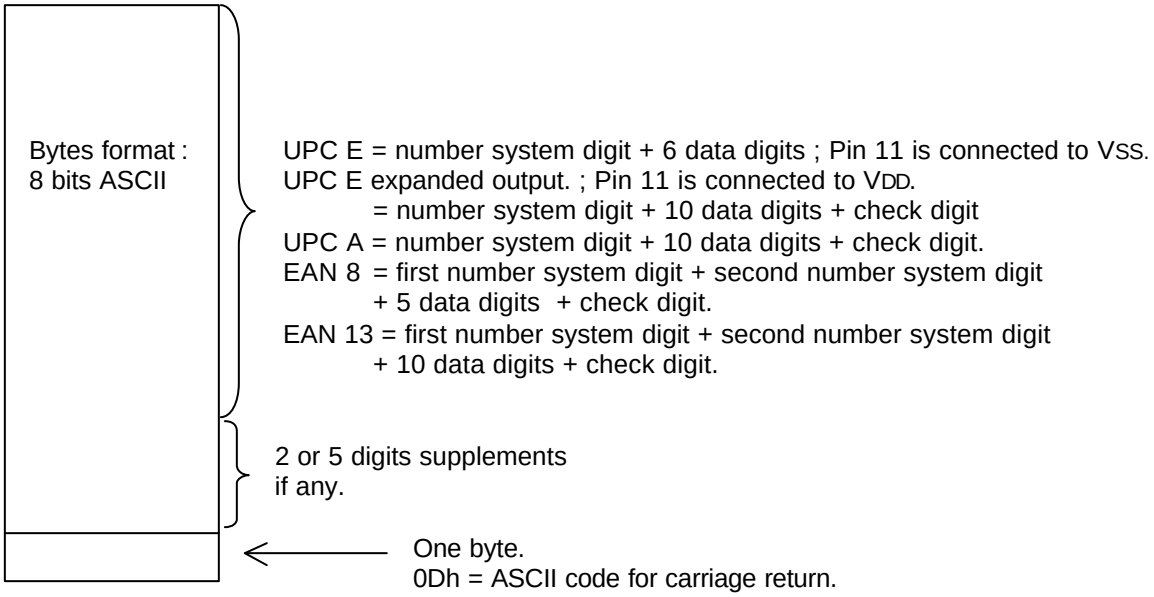
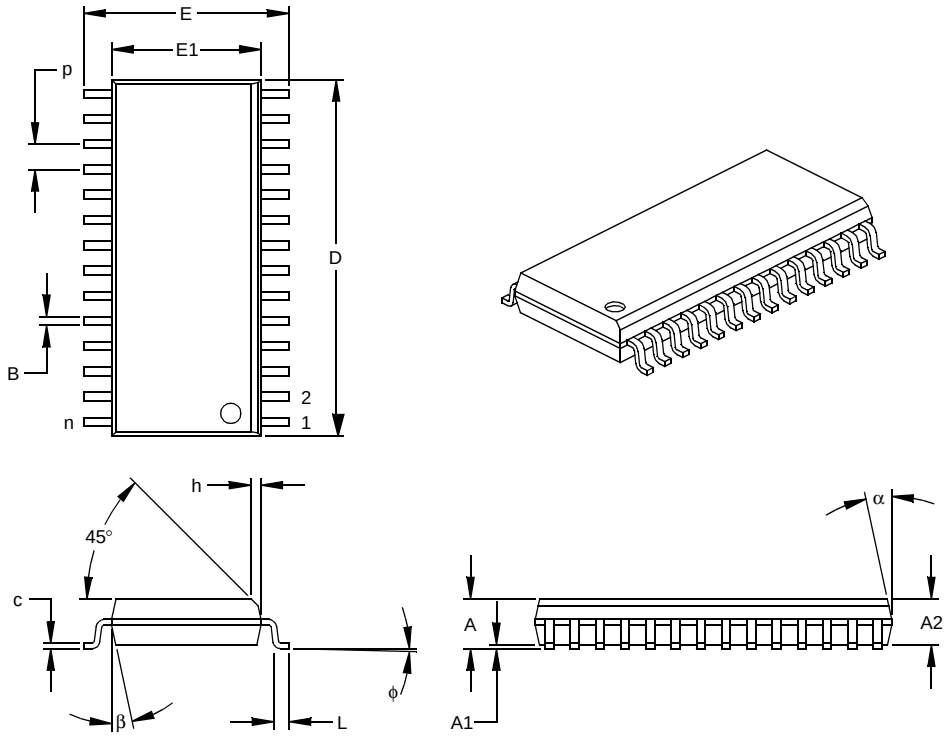


Figure 4: Structure of transmitted buffer for UPC/EAN
from decoder to the user.
For this type of output buffer, connect Pin2 of decoder to VDD.

28-Lead Plastic Small Outline (SO) – Wide, 300 mil (SOIC)



Units		INCHES*			MILLIMETERS		
Dimension Limits		MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		28			28	
Pitch	p		.050			1.27	
Overall Height	A	.093	.099	.104	2.36	2.50	2.64
Molded Package Thickness	A2	.088	.091	.094	2.24	2.31	2.39
Standoff §	A1	.004	.008	.012	0.10	0.20	0.30
Overall Width	E	.394	.407	.420	10.01	10.34	10.67
Molded Package Width	E1	.288	.295	.299	7.32	7.49	7.59
Overall Length	D	.695	.704	.712	17.65	17.87	18.08
Chamfer Distance	h	.010	.020	.029	0.25	0.50	0.74
Foot Length	L	.016	.033	.050	0.41	0.84	1.27
Foot Angle Top	ϕ	0	4	8	0	4	8
Lead Thickness	c	.009	.011	.013	0.23	0.28	0.33
Lead Width	B	.014	.017	.020	0.36	0.42	0.51
Mold Draft Angle Top	α	0	12	15	0	12	15
Mold Draft Angle Bottom	β	0	12	15	0	12	15

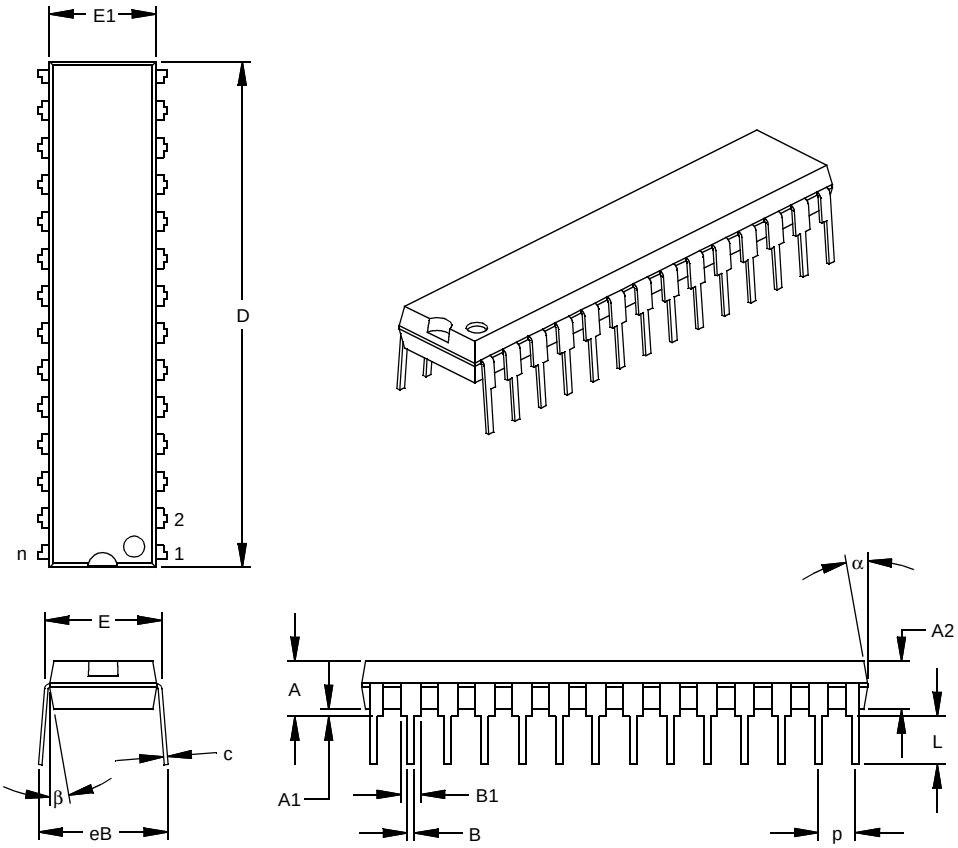
* Controlling Parameter
§ Significant Characteristic

Notes:
Dimensions D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010” (0.254mm) per side.
JEDEC Equivalent: MS-013
Drawing No. C04-052

23.2 Package Details

The following sections give the technical details of the packages.

28-Lead Skinny Plastic Dual In-line (SP) – 300 mil (PDIP)



Units		INCHES*			MILLIMETERS		
Dimension Limits		MIN	NOM	MAX	MIN	NOM	MAX
Number of Pins	n		28			28	
Pitch	p		.100			2.54	
Top to Seating Plane	A	.140	.150	.160	3.56	3.81	4.06
Molded Package Thickness	A2	.125	.130	.135	3.18	3.30	3.43
Base to Seating Plane	A1	.015			0.38		
Shoulder to Shoulder Width	E	.300	.310	.325	7.62	7.87	8.26
Molded Package Width	E1	.275	.285	.295	6.99	7.24	7.49
Overall Length	D	1.345	1.365	1.385	34.16	34.67	35.18
Tip to Seating Plane	L	.125	.130	.135	3.18	3.30	3.43
Lead Thickness	c	.008	.012	.015	0.20	0.29	0.38
Upper Lead Width	B1	.040	.053	.065	1.02	1.33	1.65
Lower Lead Width	B	.016	.019	.022	0.41	0.48	0.56
Overall Row Spacing §	eB	.320	.350	.430	8.13	8.89	10.92
Mold Draft Angle Top	α	5	10	15	5	10	15
Mold Draft Angle Bottom	β	5	10	15	5	10	15

* Controlling Parameter
§ Significant Characteristic
Notes:
Dimension D and E1 do not include mold flash or protrusions. Mold flash or protrusions shall not exceed .010” (0.254mm) per side.
JEDEC Equivalent: MO-095
Drawing No. C04-070