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	D2980S 5V Surface mount D2980S-3 3.3V Surface mount Through hole (Dip) package is available for prototype only
Symbologies	Code39, interleaved 2 of 5, Codabar, Code93, Code128, UPC A, UPC E0 & E1, EAN 8 & 13 with 2 or 5-digit supplements
Maximum Scanning Speed	375 inches per second @ narrow element width of 0.0075 inch.
Operating Temperature.	-40° to 85°C

General Specifications.

- Operating voltage range (VDD) part no. D2980S: 4.2V to 5.5V
- Operating voltage range (VDD) part no. D2980S-3: 2.0V to 3.6V

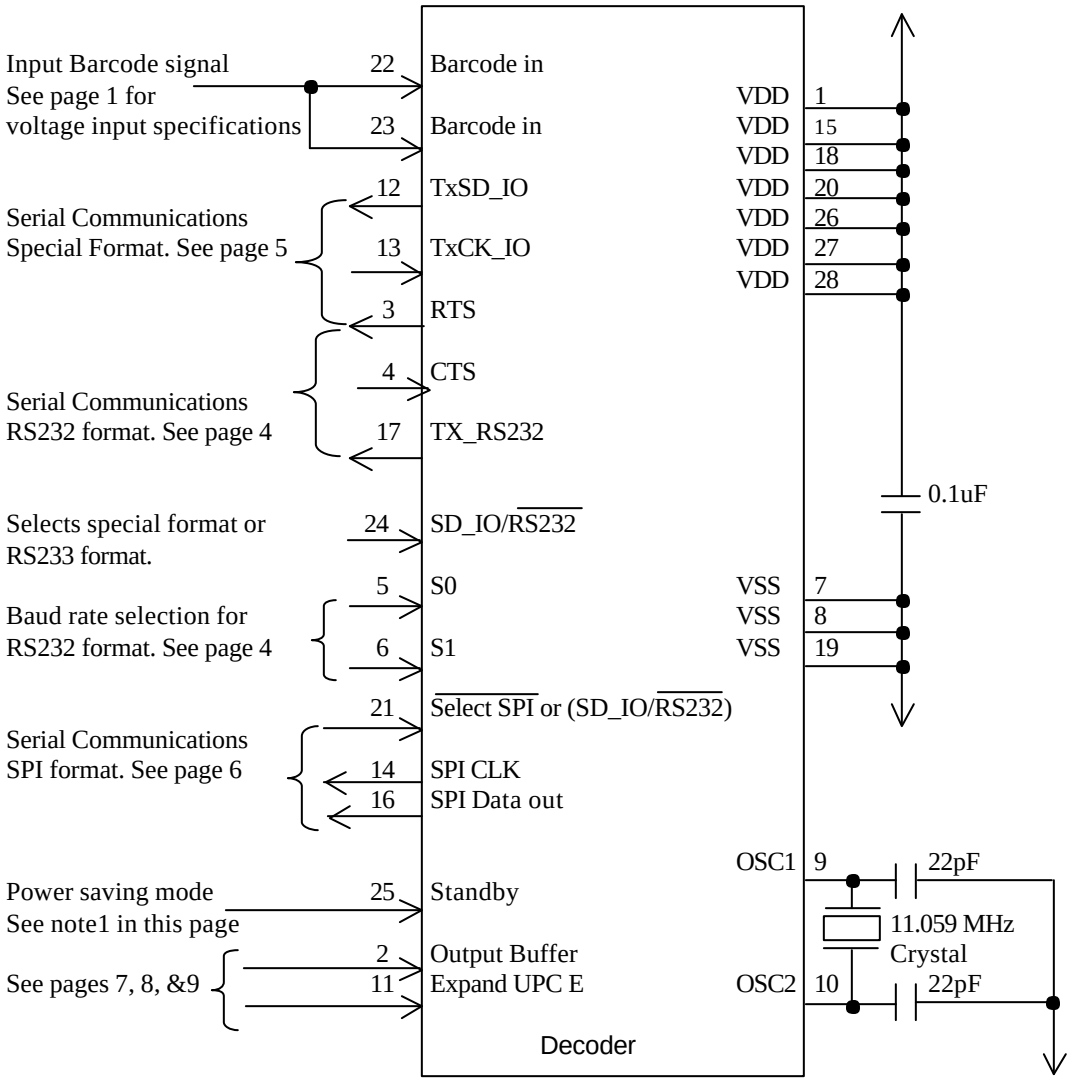
- Supply current @ VDD: 5mA
- Input low voltage Min: Vss, Max: 0.15VDD
- Input high voltage Min: 0.8VDD, Max: VDD
- Output low voltage Max: 0.6V
- Output high voltage Min: VDD – 0.7
- Operating Speed: 11.059 MHz.

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

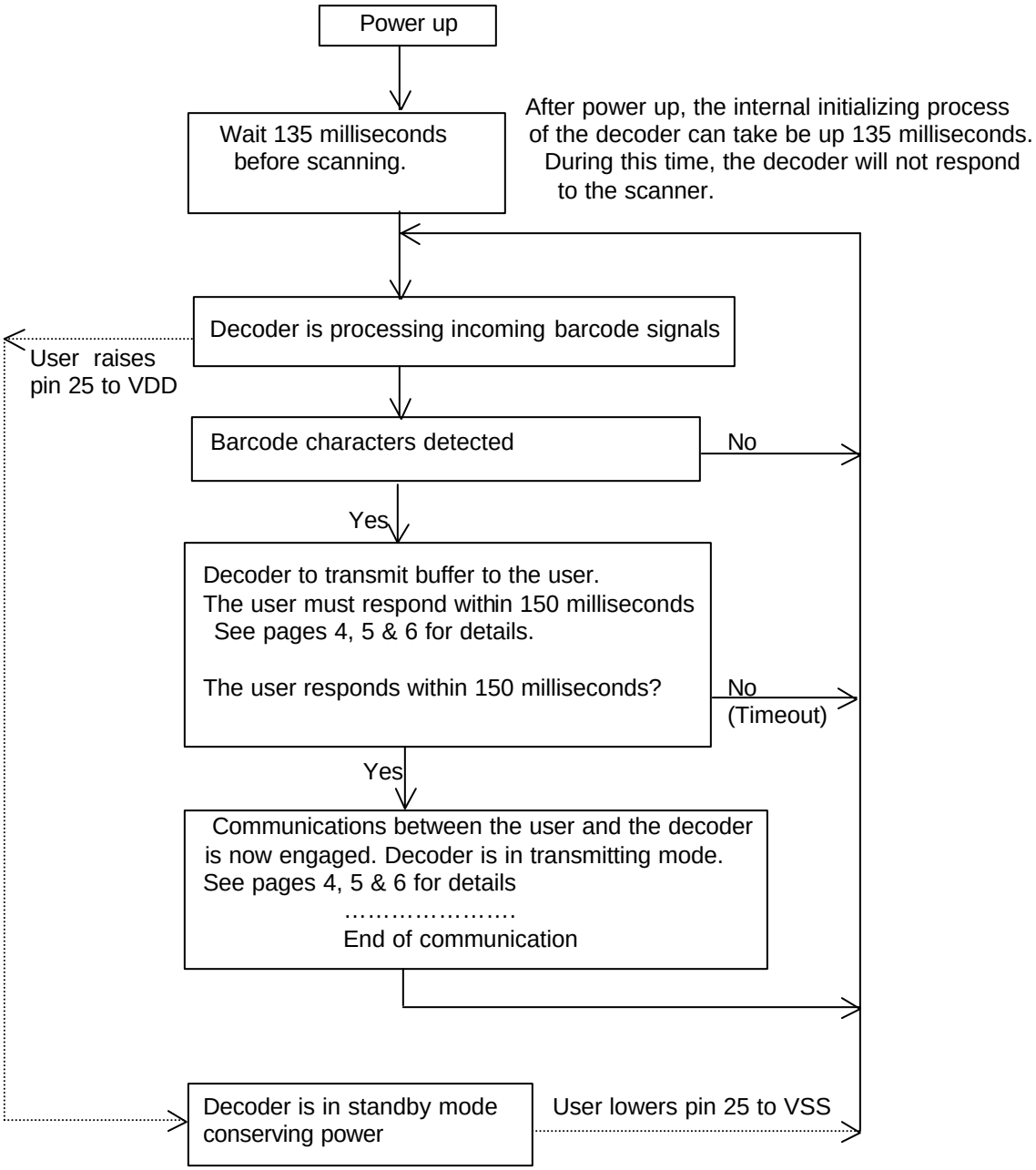
For sales/Tech support or other decoders, please call (714) 906-1865 or visit Memrock Technologies

Pin-outs diagram

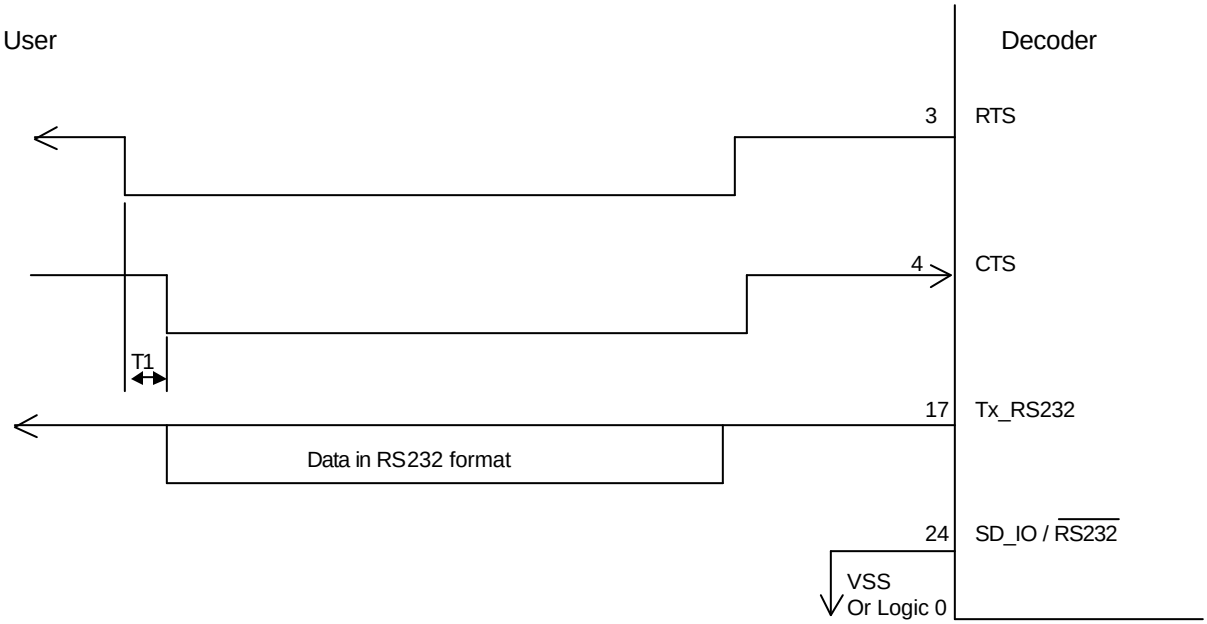


Note1: Decoder in Standby Mode.
In this mode, if the user raises pin 25 of the decoder to V_{DD}, then the decoder enters a standby mode to conserve power. If the user lowers pin 25 of the decoder to V_{SS}, then the decoder will exit the standby mode and starts in normal mode after 10 milliseconds.
In this standby mode, the decoder conserves power by reducing the supply current to less than 3.0uA.

Decoder Process.



Decoder in data transmitting mode
RS232 Format



Decoders lowers RTS pin, and waits for CTS to be lowered.
After CTS is being lowered, the decoder will start to transmit. The decoder will raise RTS pin after transmission of data is completed.
T1 is 0 second min. 150 milliseconds Max. If max is exceeded without lowering CTS pin, then communications is terminated. RTS and CTS can be tied together.

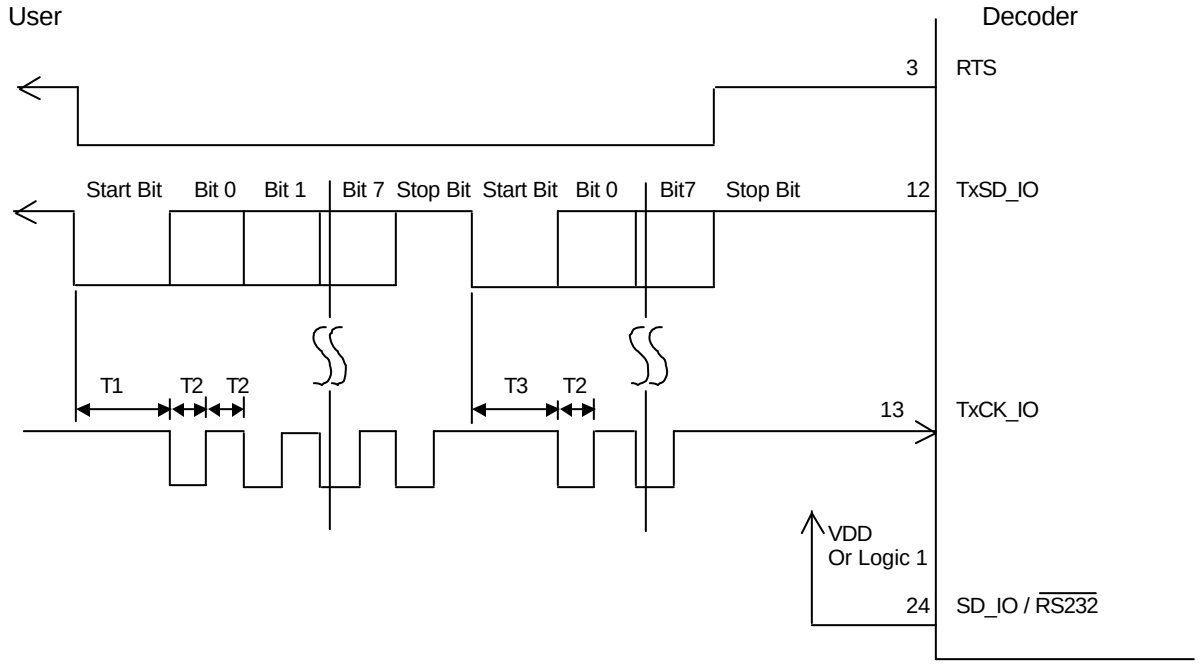
Communication settings

S0	S1	Baud rate (bits per second)
0	0	9600
0	1	19200
-	-	-
1	0	1200
1	1	2400
8 bit data, 1 stop bit.		

S0=pin5, S1=pin6, logic 0=V_{SS}, Logic 1=V_{DD}.

Note: If the output of the decoder is to be connected to external device (PC for example), then a voltage level converter (RS232 or RS485 transceiver) will be required.

Decoder in data transmitting mode
Special Format



Decoder in Transmitting Mode, User in Receiving Mode

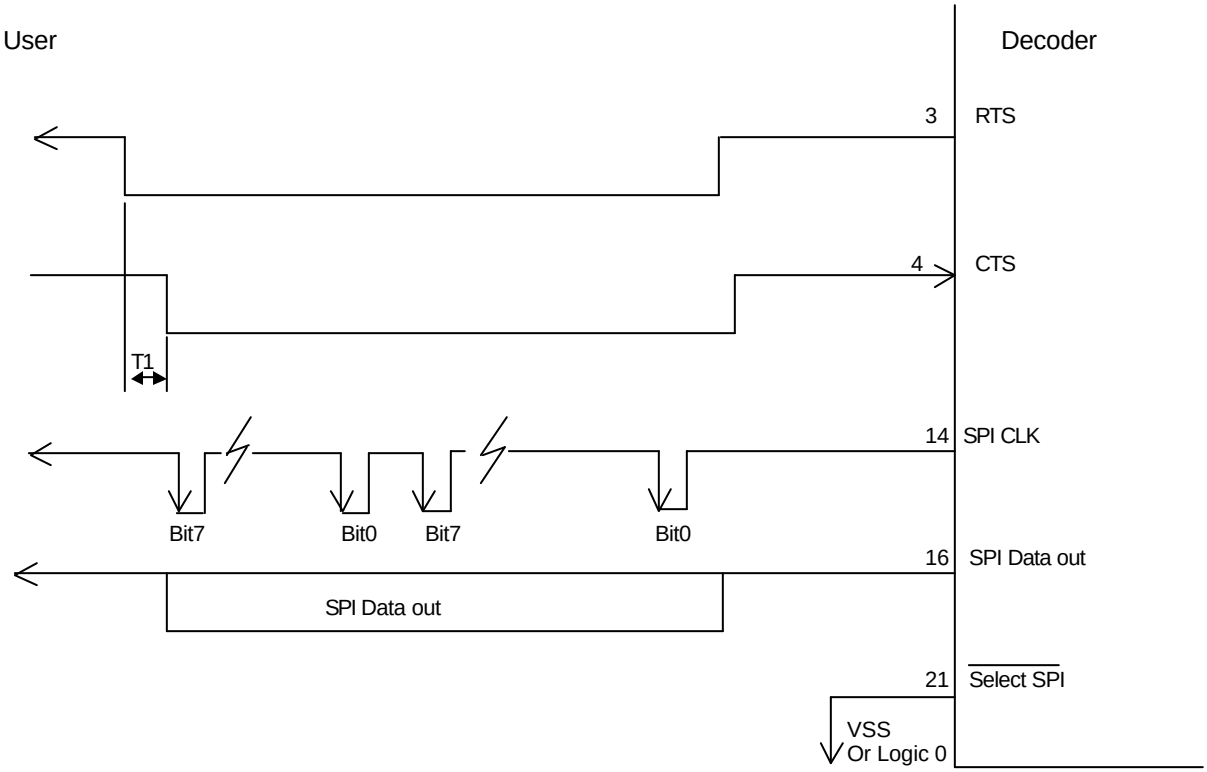
If the decoder has valid buffer/barcode characters to transmit then the decoder will enter this mode. In this mode, the decoder lowers pin 3 and pin 12 to initiate start bit. The decoder then waits for pin 13 to be lowered by the user.

After the user lowers pin 13 of the decoder, the decoder will then output a valid bit. The user can read this valid bit after waiting T2 seconds and put pin 13 of the decoder to high state (logic 1) for T2 seconds. This process repeats until the stop bit. T2 can range from 12 microseconds to 26 milliseconds.

If no response from the user within 26 milliseconds, then the decoder will not wait further, and the communications will terminate.

T1 cannot be greater than 150 milliseconds; T3 cannot be greater than 26 milliseconds

Decoder in data transmitting mode
SPI Communications, decoder in Master Mode.



If pin 21 is connected to Vss, then only SPI Communications is enabled. The RS232 or Special format will be disabled regardless of PIN 24 status.
In the SPI mode, the idle state of the clock is high, and the valid output bit is on falling edge of clock.
The clock frequency is 172.8 KHz.
The decoder is configured for transmitting/master mode. Therefore, the neighboring processor must be in receiving/slave mode.

In this SPI mode, the decoders lowers RTS pin, and waits for CTS to be lowered.
After CTS is being lowered, the decoder will start to transmit. The decoder will raise
RTS pin after transmission of data is completed.
T1 is 0 second min. 150 milliseconds Max. If max is exceeded without lowering CTS pin, then communications is terminated. RTS and CTS can be tied together.

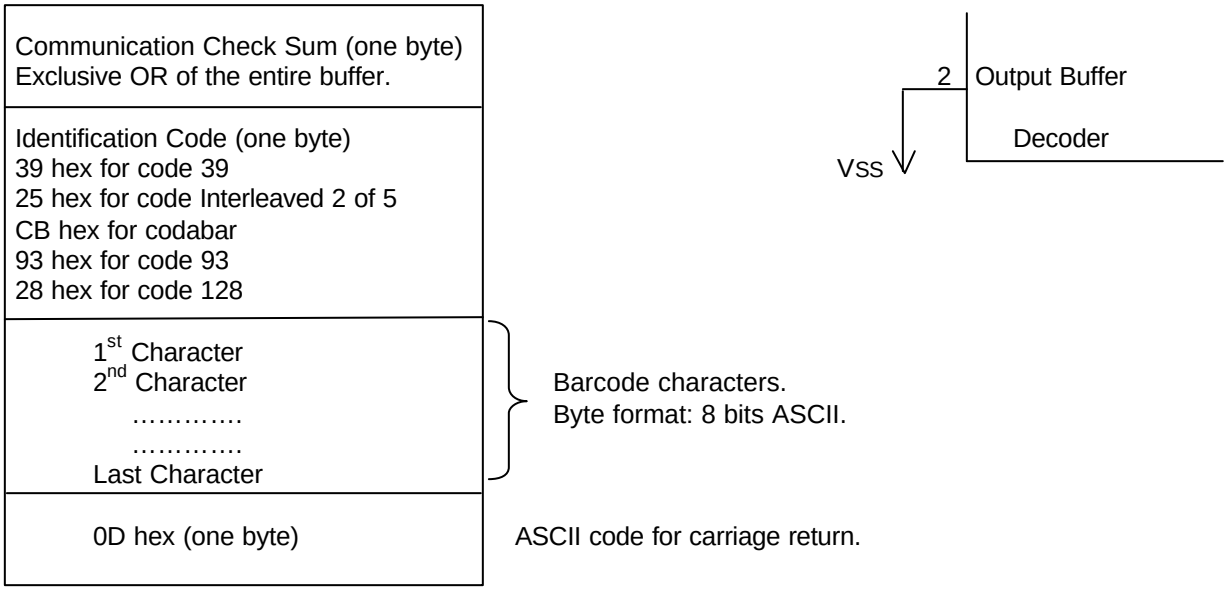


Figure 1: Structure of transmitted buffer from decoder to the user for Code 39, I25, Codabar, Code93, and Code128.
For this type of output buffer, connect Pin2 of decoder to VSS.
See page 8 & 9 for UPC/EAN.

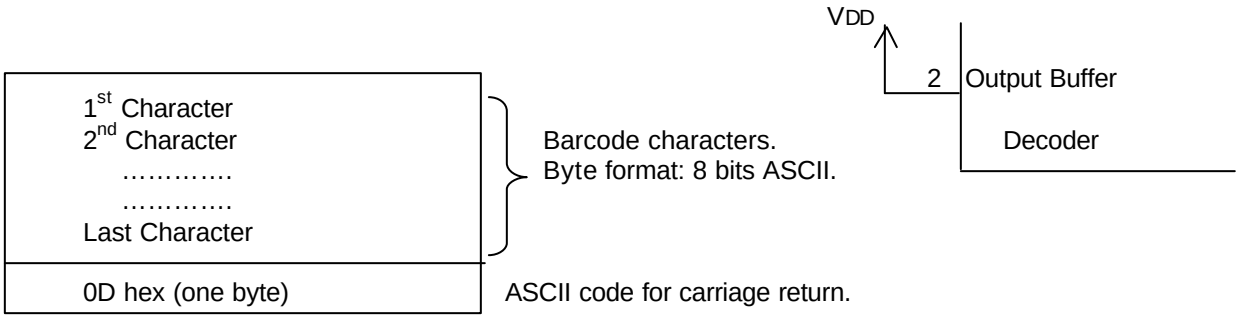
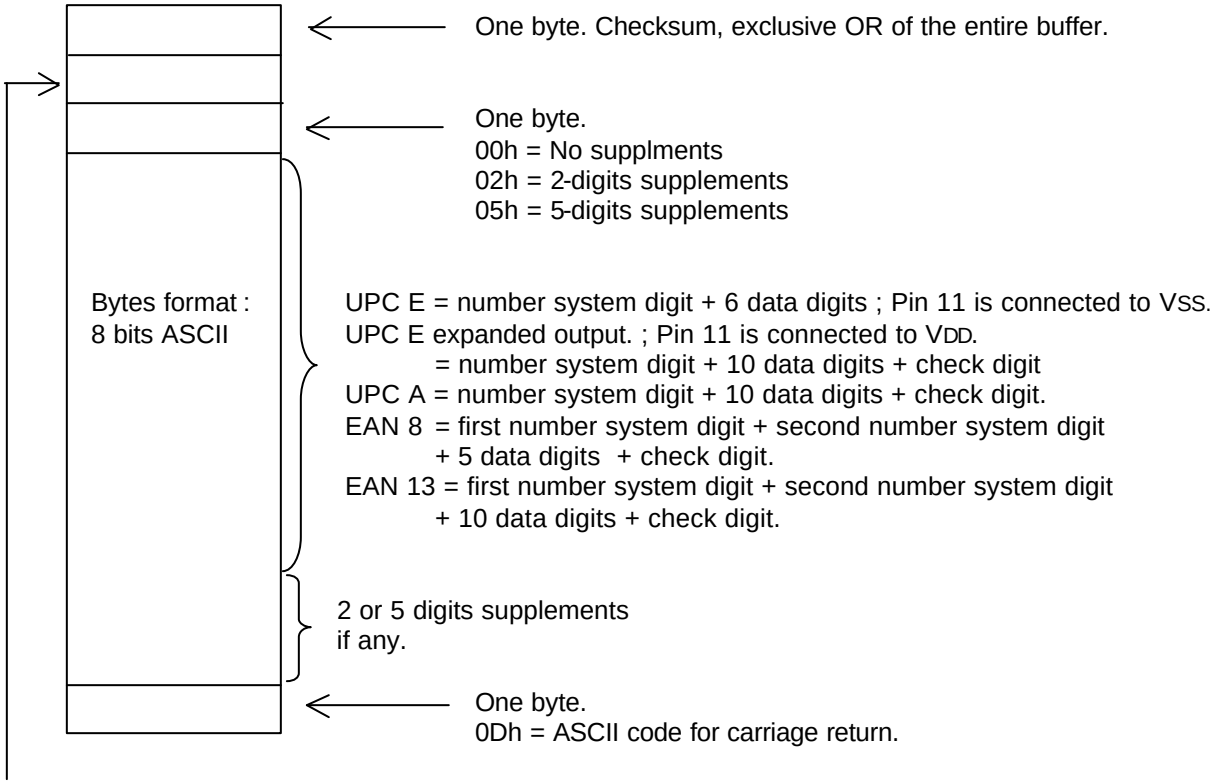


Figure 2: Structure of transmitted buffer from decoder to the user for Code 39, I25, Codabar, Code93, and Code128.
For this type of output buffer, connect Pin2 of decoder to VDD.
See page 8 & 9 for UPC/EAN.



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.

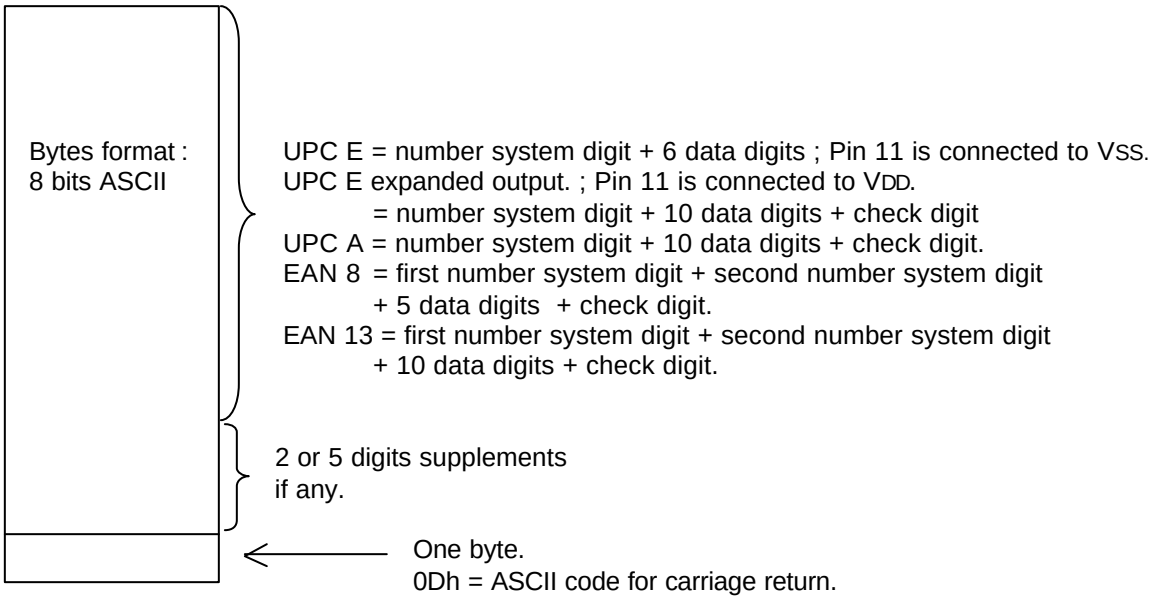
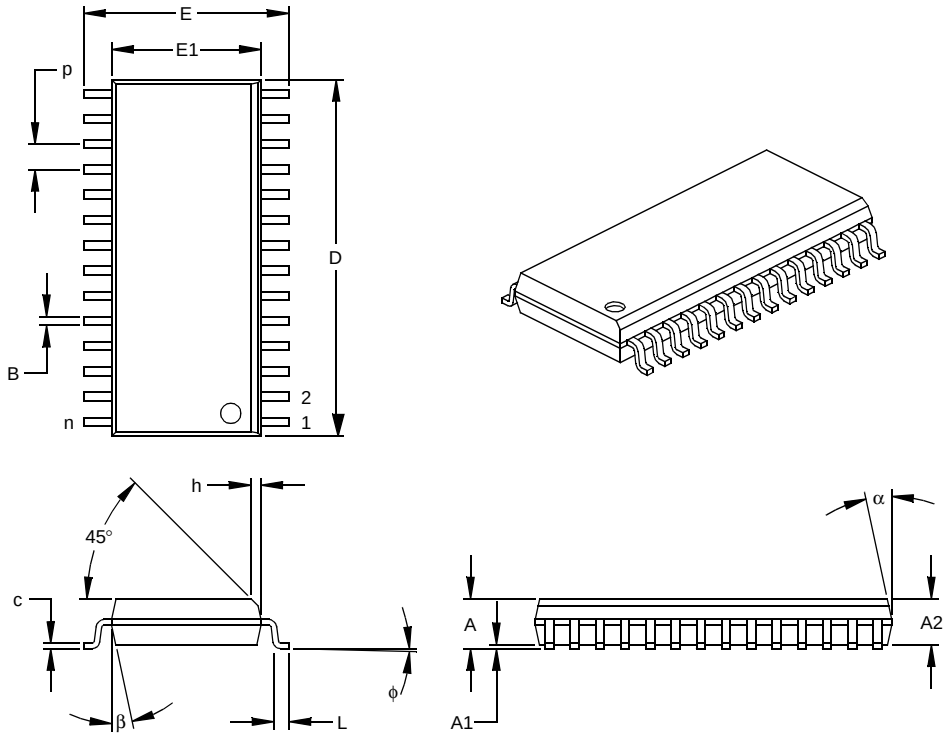


Figure 4: Structure of transmitted buffer for UPC/EAN
from decoder to the user.
For this type of output buffer, connect Pin2 of decoder to VDD.

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

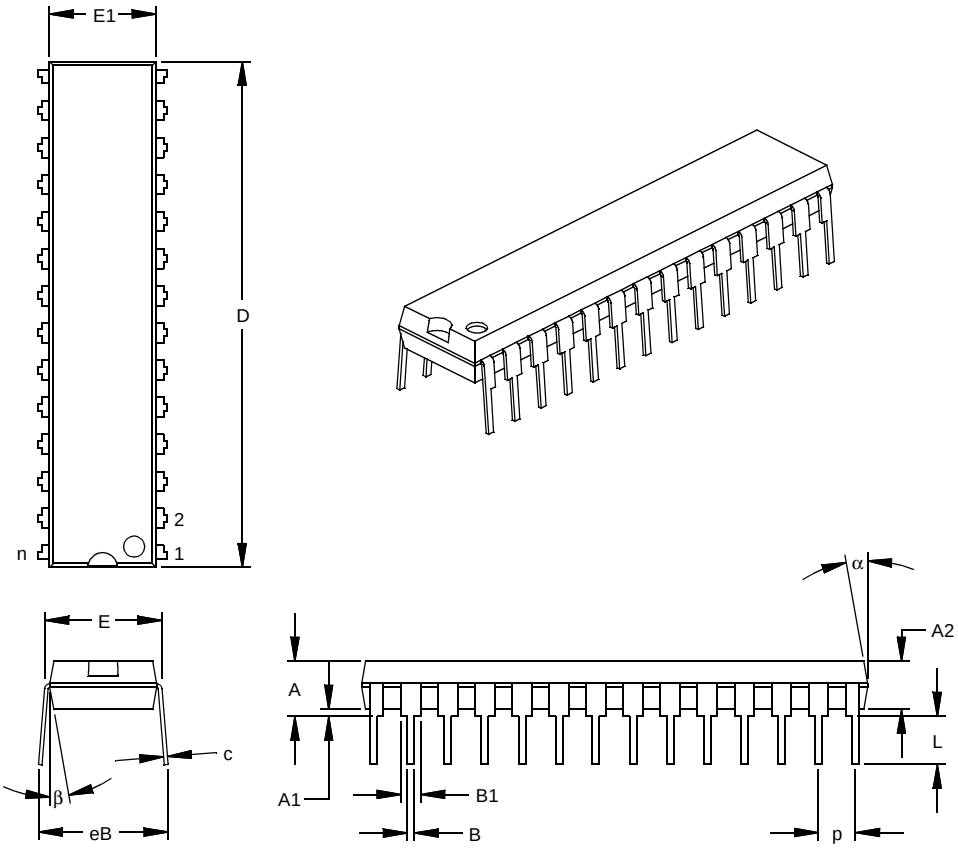
* Controlling Parameter
§ Significant Characteristic

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