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. Other interesting features such as standby mode, and wide operating voltages and temperature.

Part Number	ADC2981 5V, SPI communication, Surface mount ADC2981-3 3.3V, SPI communication, 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	100 inches per second @ narrow element width of 0.0075 inch.
Operating Temperature.	-40° to 85°C

General Specifications.

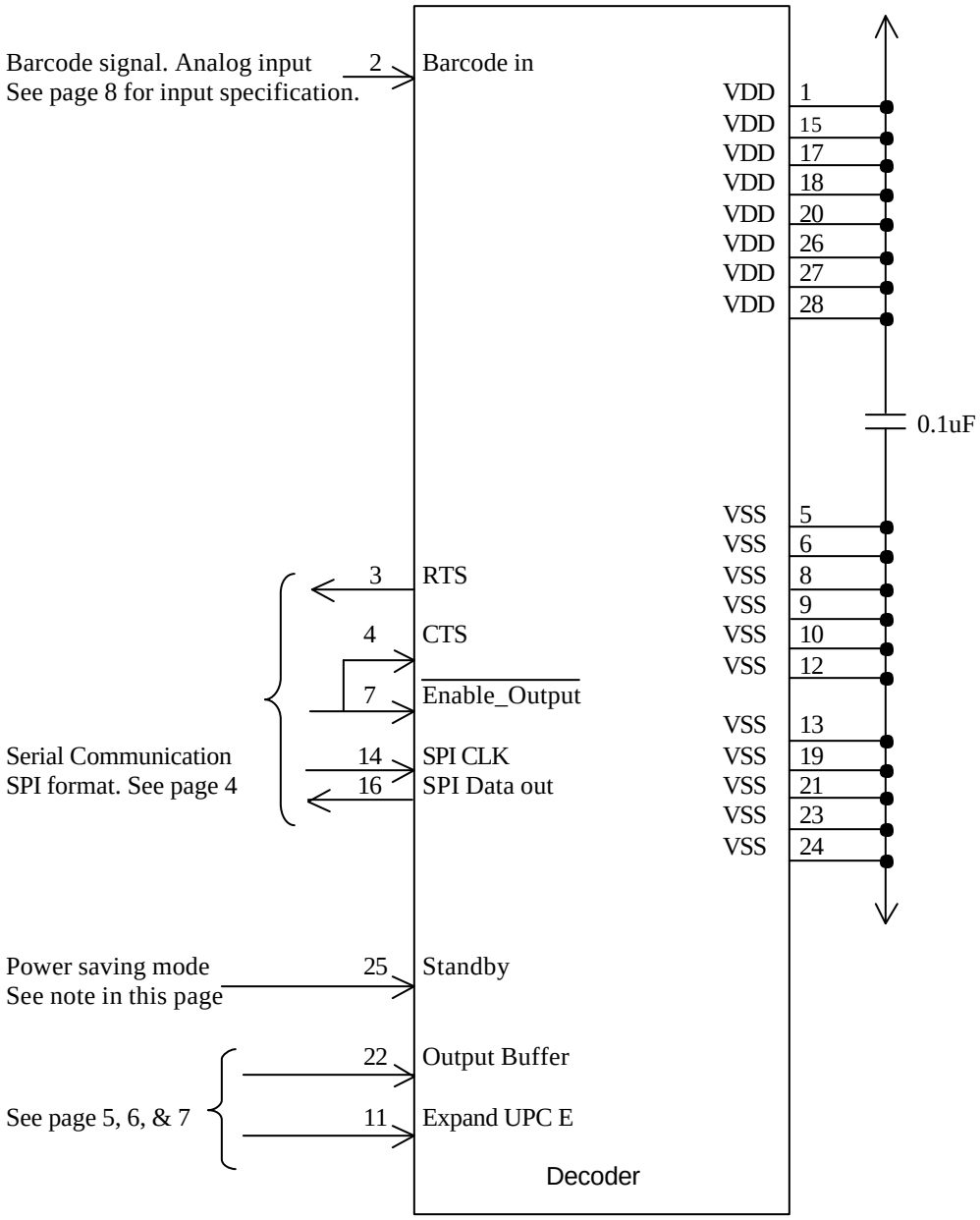
- Operating voltage range (VDD) part no. ADC2981: 4.2V to 5.5V
- Operating voltage range (VDD) part no. ADC2981-3: 2.0V to 3.6V

- 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
  Pin 2 is analog input. See page 8 for input specifications.
- 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 (V_{DD} + 0.3V)
Maximum output current sunk by any I/O pin	25mA
Maximum output current sourced by any I/O pin	25mA

Pin-outs Diagram.

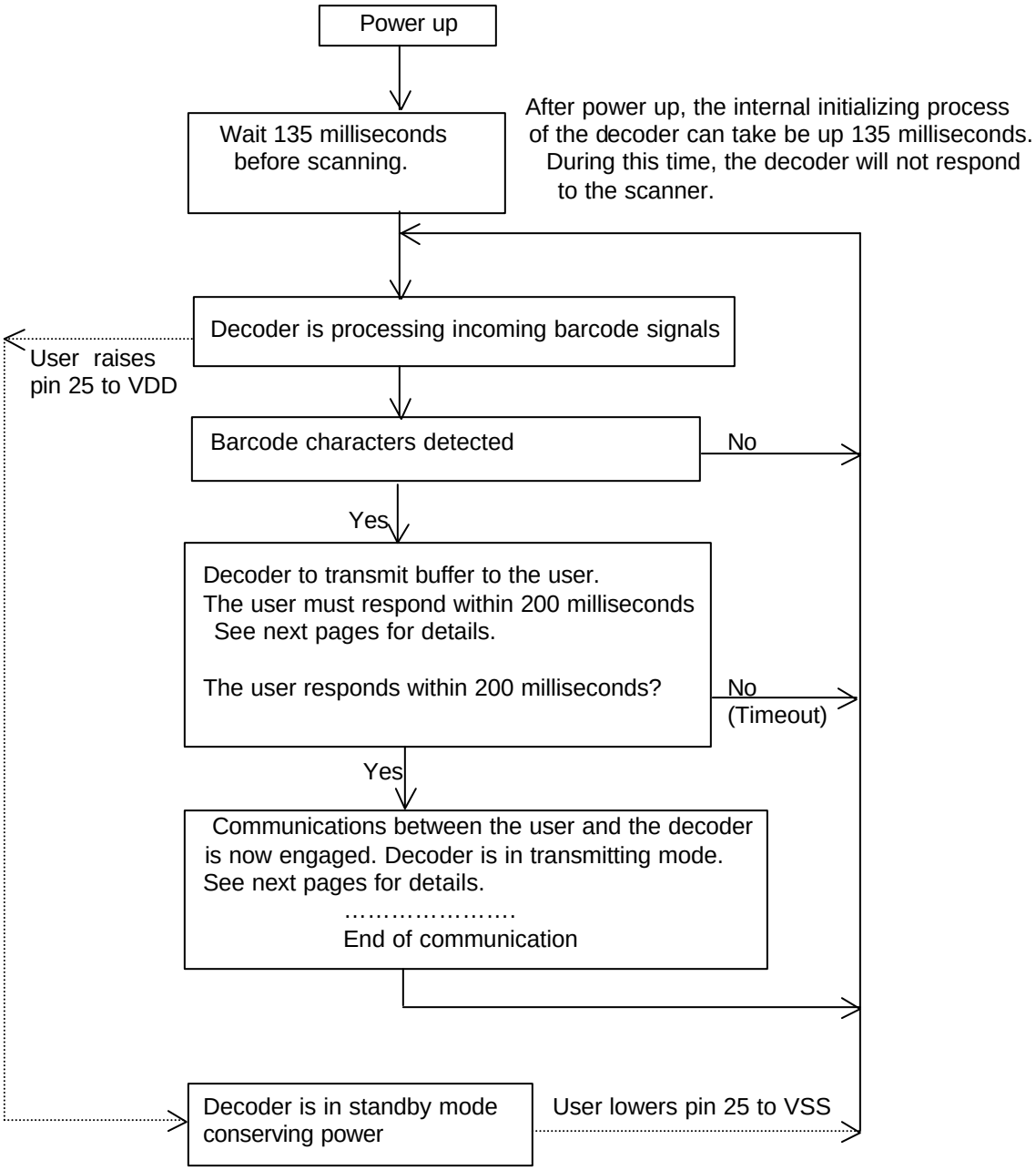


Note: Decoder in Standby Mode.

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.

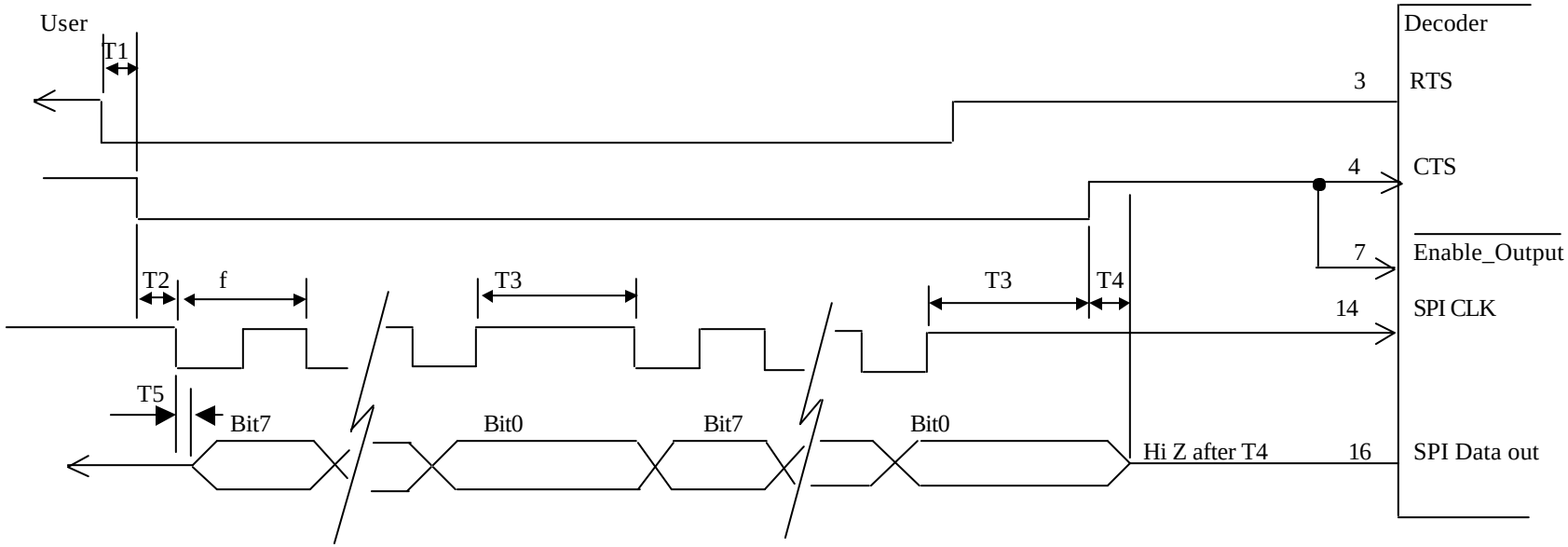
In this standby mode, the decoder conserves power by reducing the supply current to less than 3.0uA.

Decoder Process.



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

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.

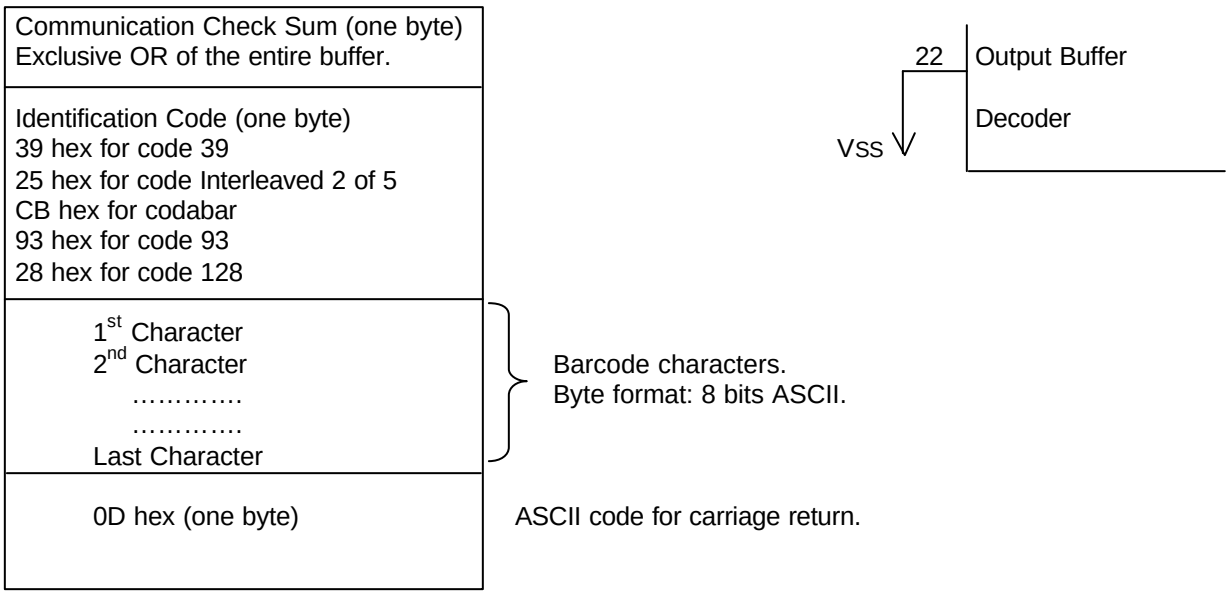


Figure 1: Structure of transmitted buffer from decoder to the user
for Code 39, I25, Codabar, Code93, and Code128. See page 8 & 9 for UPC/EAN.
For this type of output buffer, connect Pin22 of decoder to V_{SS}.

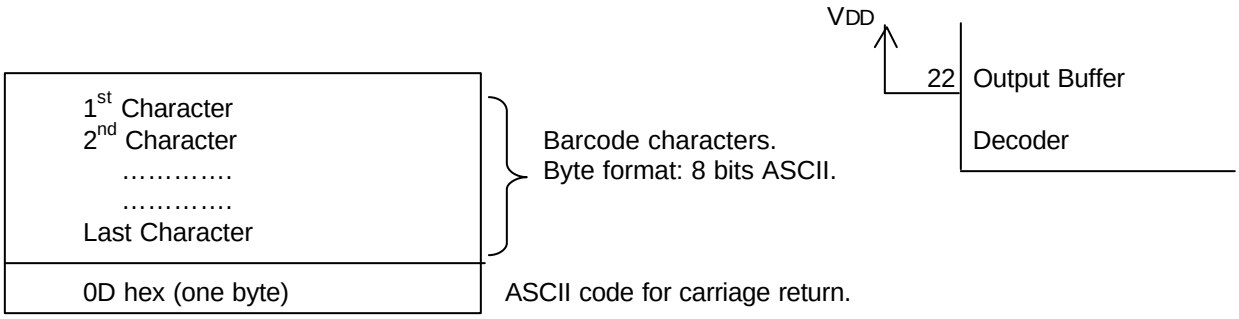
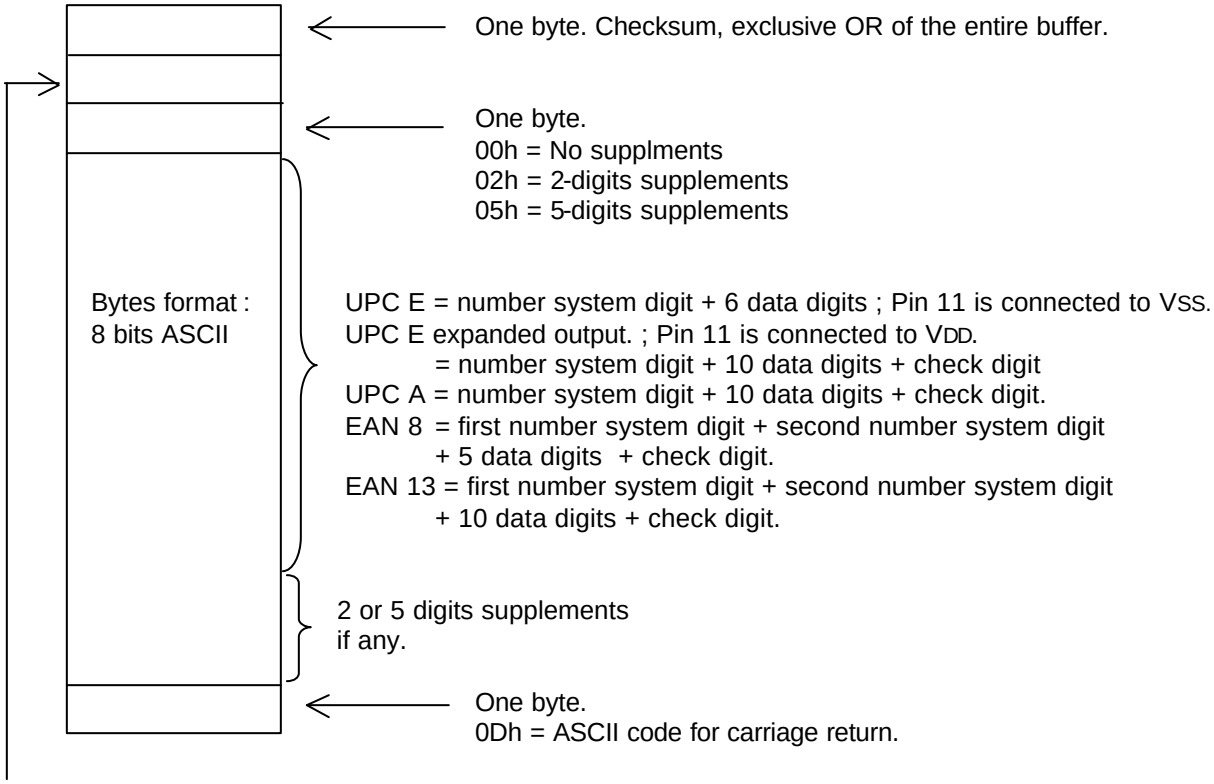


Figure 2: Structure of transmitted buffer from decoder to the user
for Code 39, I25, Codabar, Code93, and Code128. See page 8 & 9 for UPC/EAN.
For this type of output buffer, connect Pin22 of decoder to V_{DD}.



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 Pin22 of decoder to VSS.

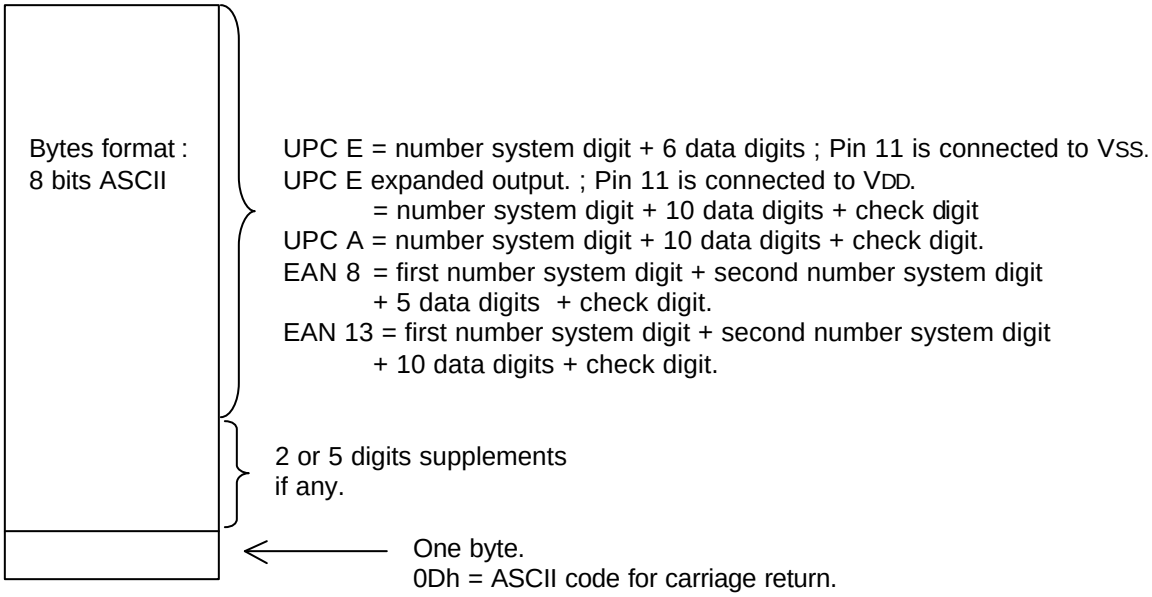


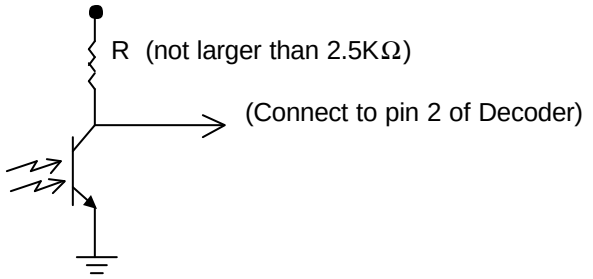
Figure 4: Structure of transmitted buffer for UPC/EAN
from decoder to the user.
For this type of output buffer, connect Pin22 of decoder to VDD.

Analog input specification and application examples.
Input Specification

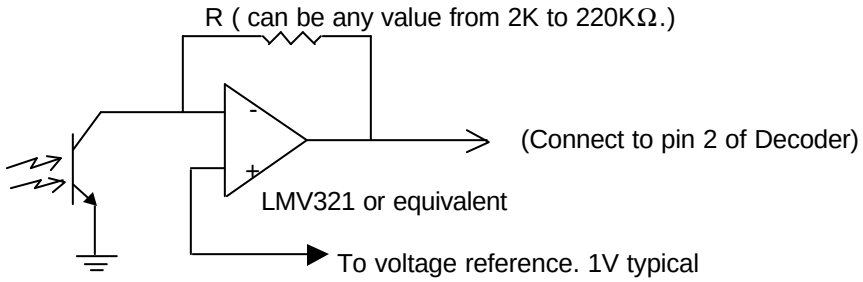
Minimum peak to peak: 0.5V.

The barcode signal can be shifted by DC level as long as the peak to peak is within device operating voltage (VSS to VDD)

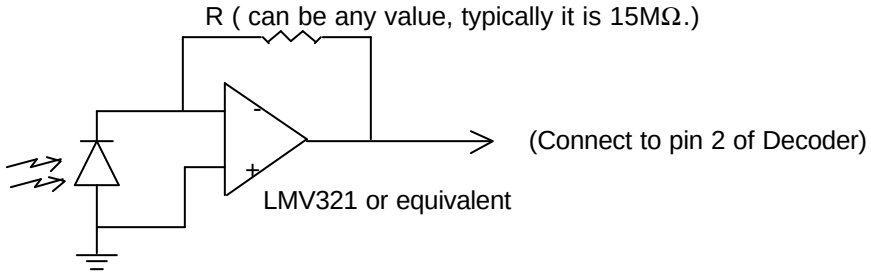
Analog source of type A (Phototransistor without amplifier).



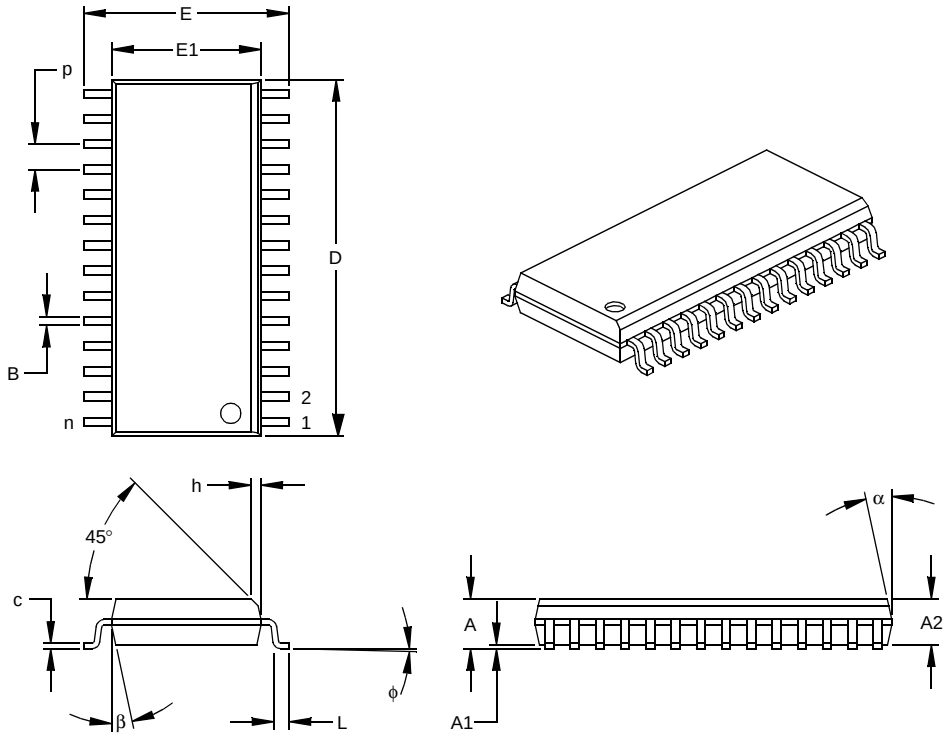
Analog source of type B (Phototransistor with amplifier).



Analog source of type C (Photodiode with amplifier).



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

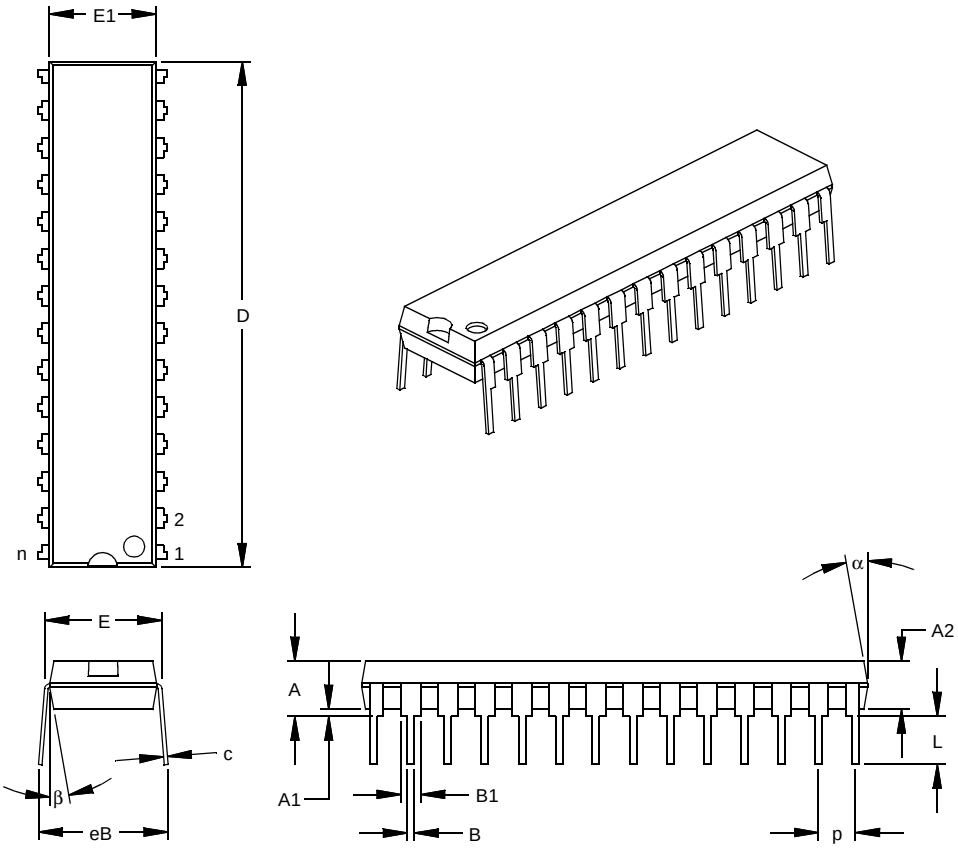
* Controlling Parameter
§ Significant Characteristic

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