

Microcontroladores

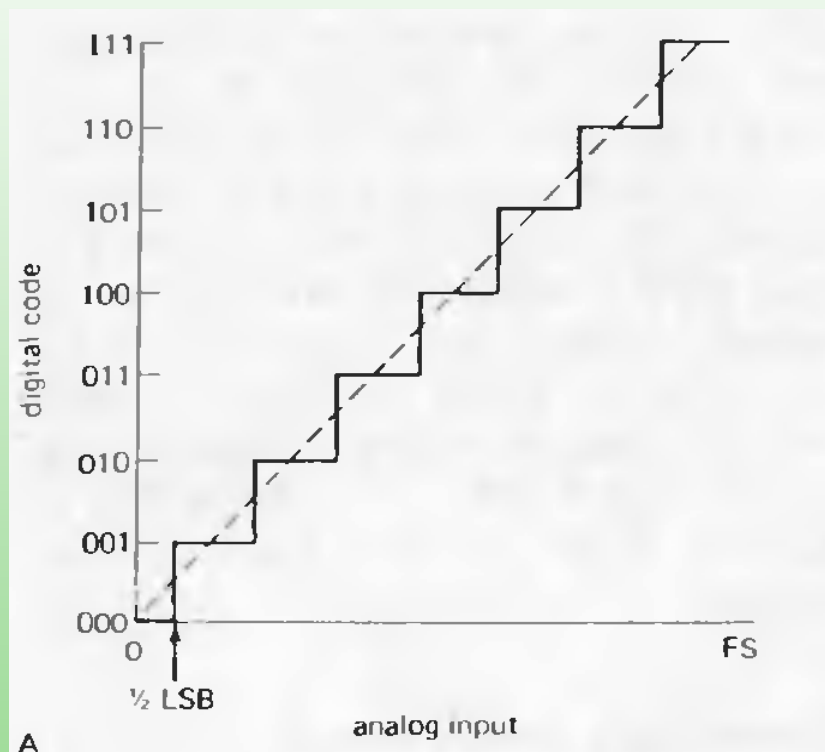
Facultad de Ciencias Exactas
Universidad Nacional del Centro de la Provincia de Buenos Aires



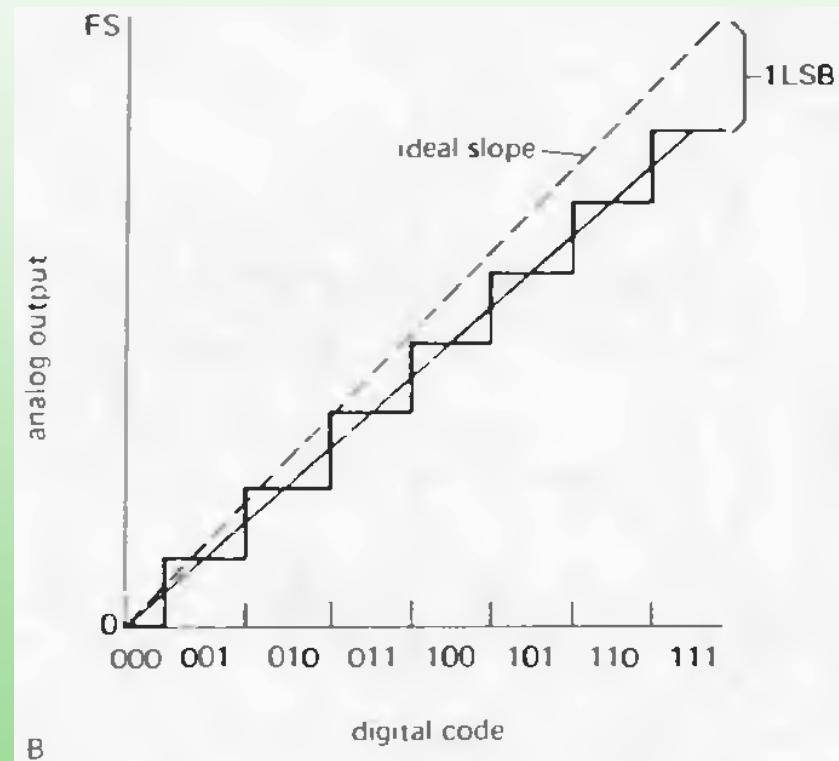
Tema: Conversores A/D
y D/A

Dr. Mario Barbaglia

Errores en la conversión

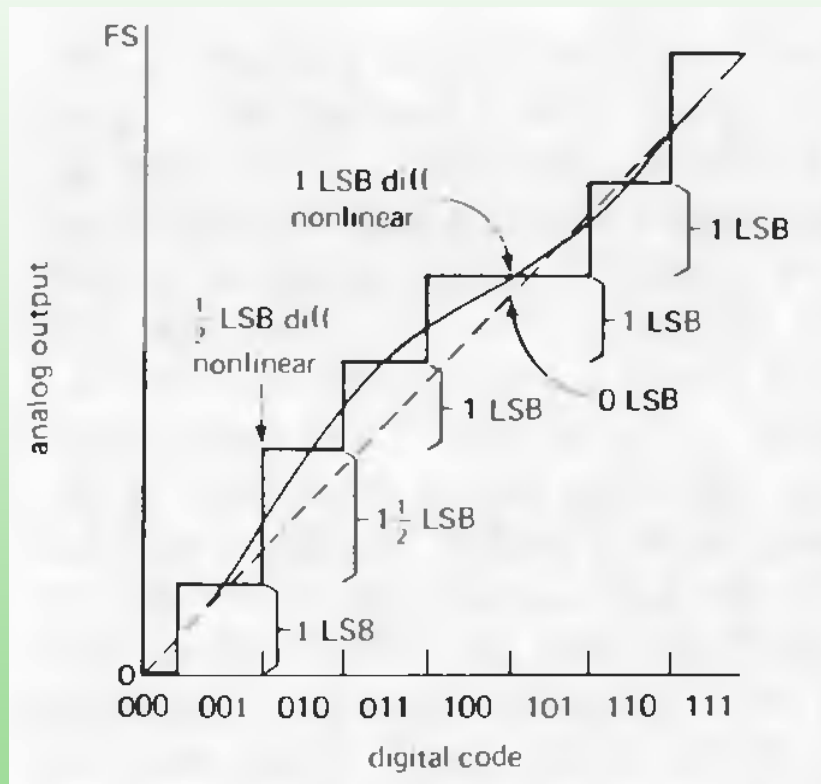


Error de cero

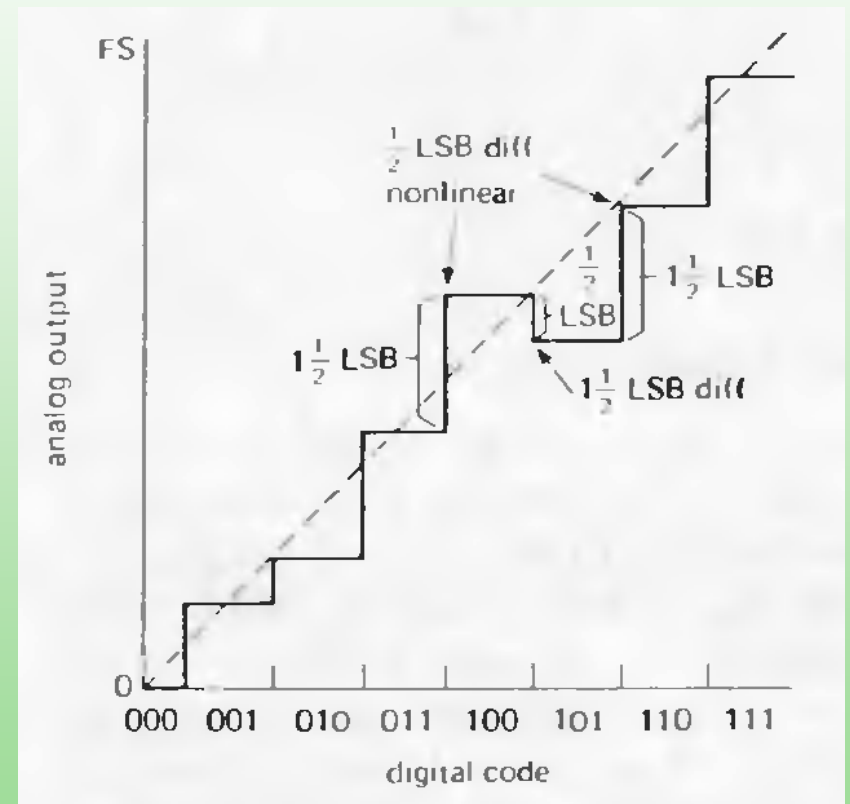


Error de escala

Errores en la conversión

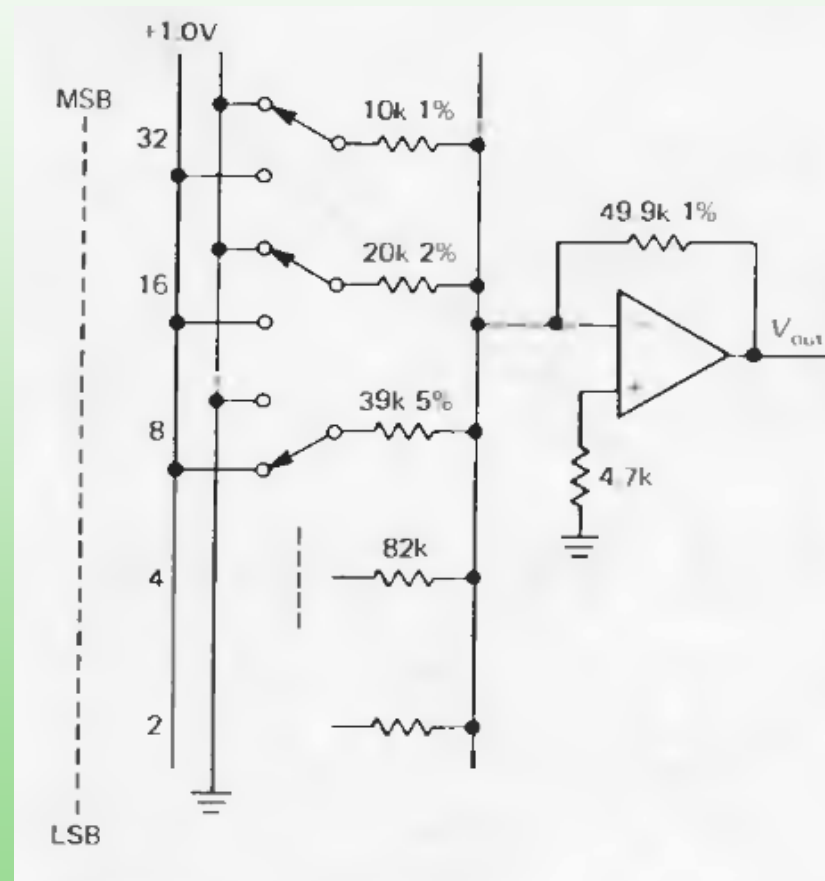


Error de linealidad
Error de linealidad diferencial

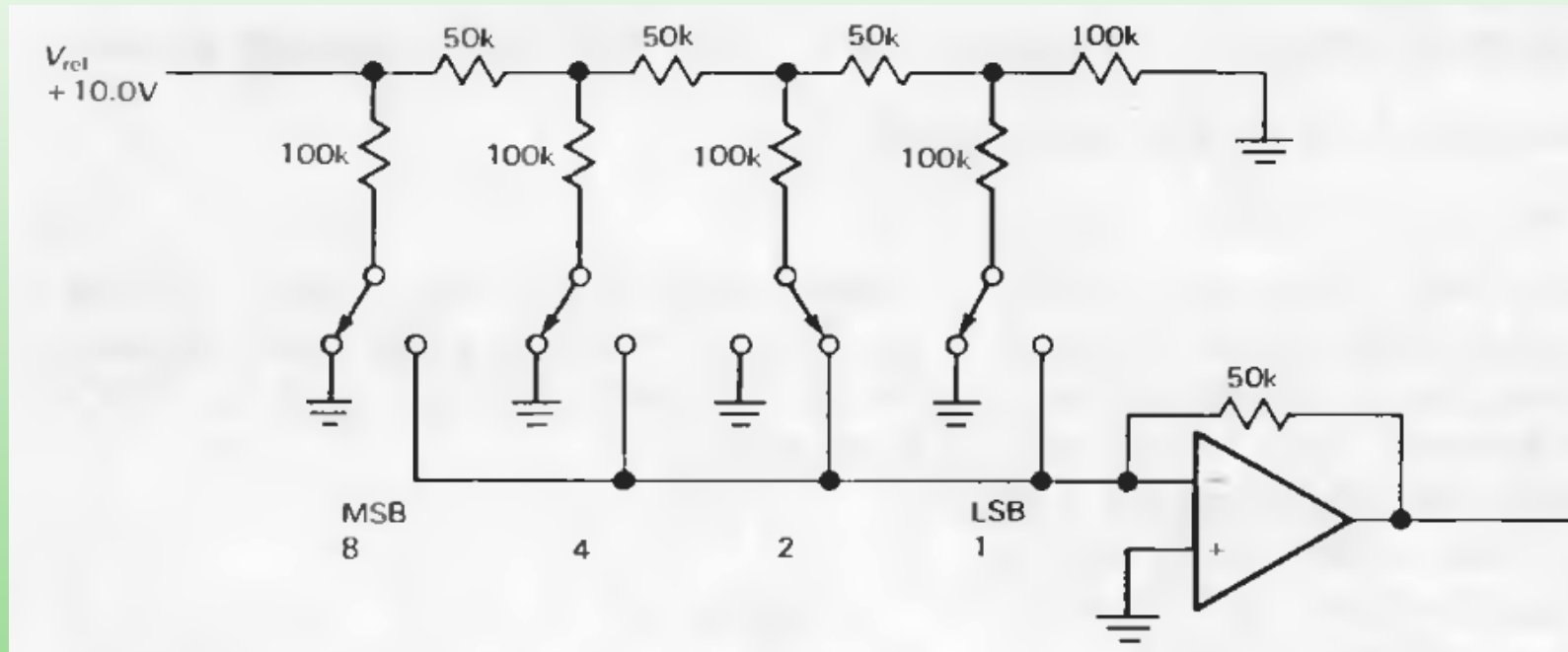


Monotonicidad $> \pm 1/2 \text{ LSB}$

Conversores D/A



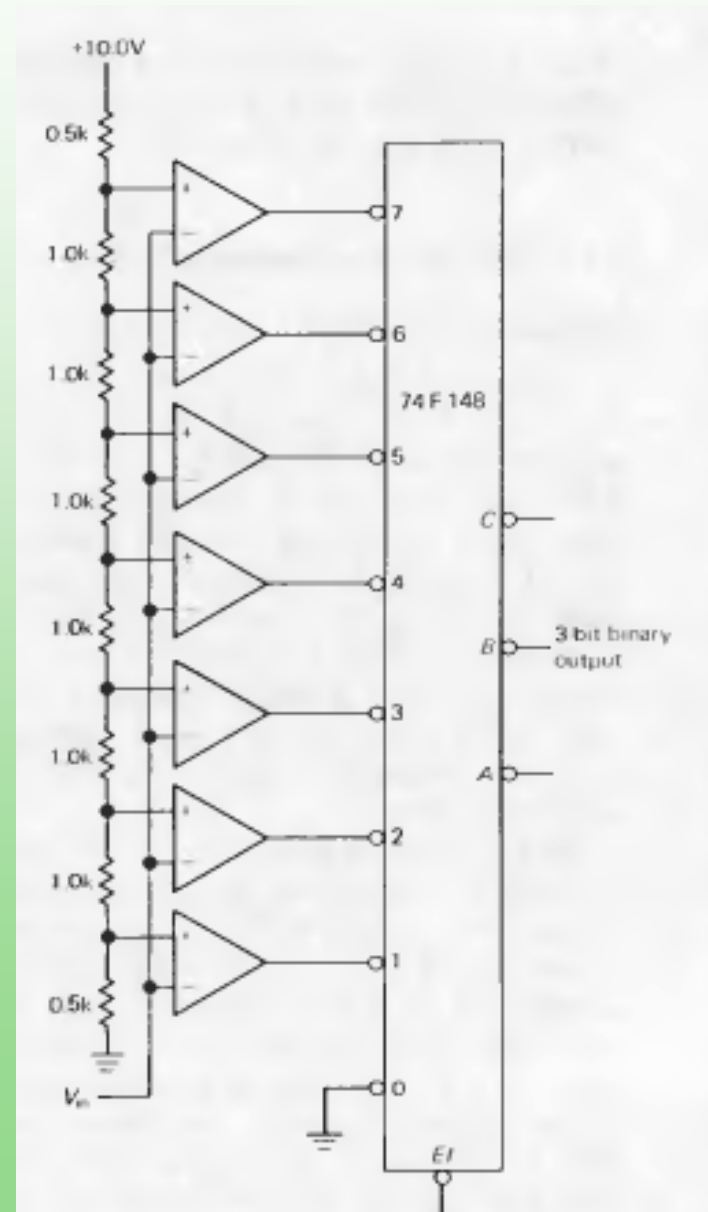
Conversores D/A



R2R

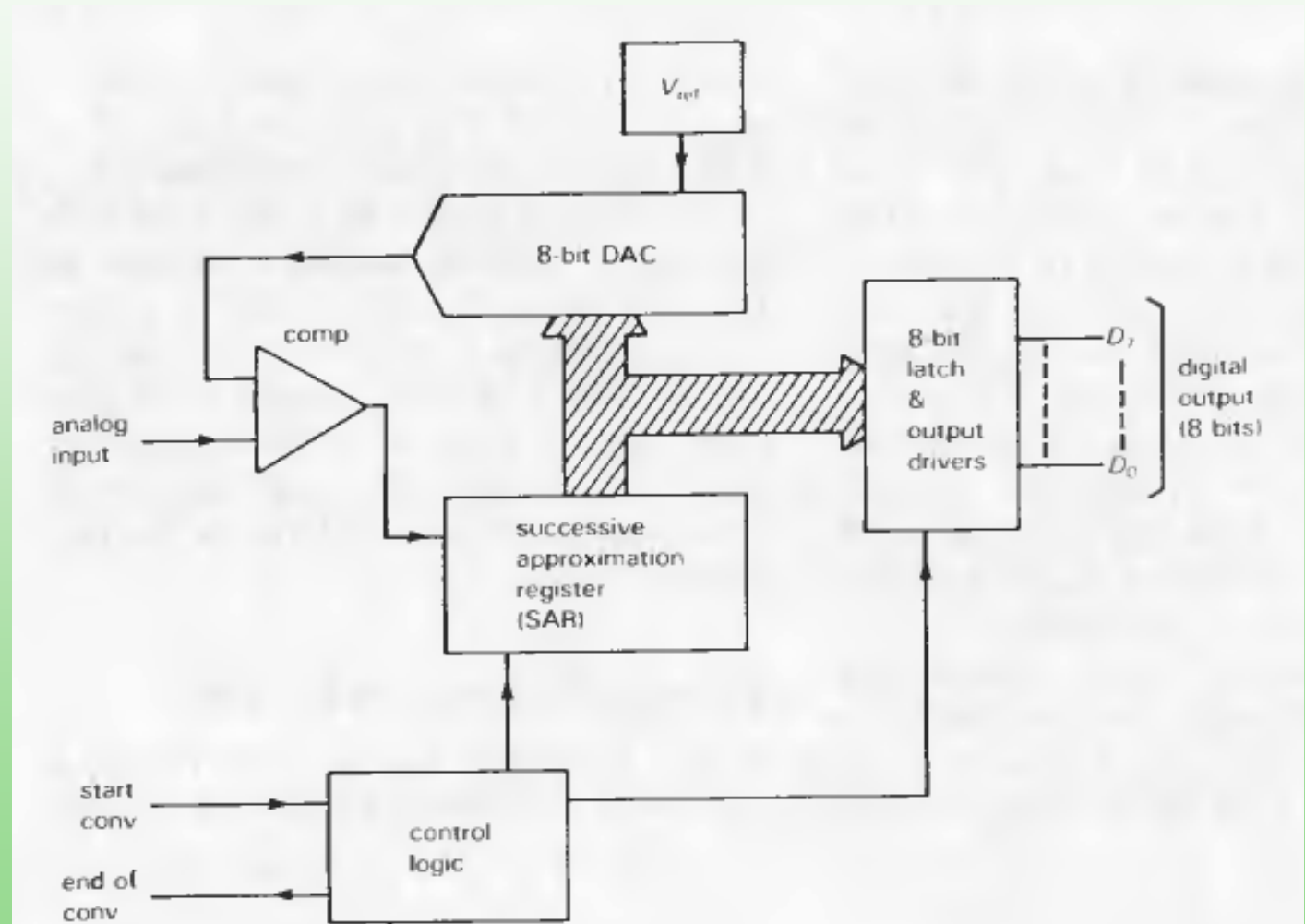
Conversores A/D

Tipo Flash



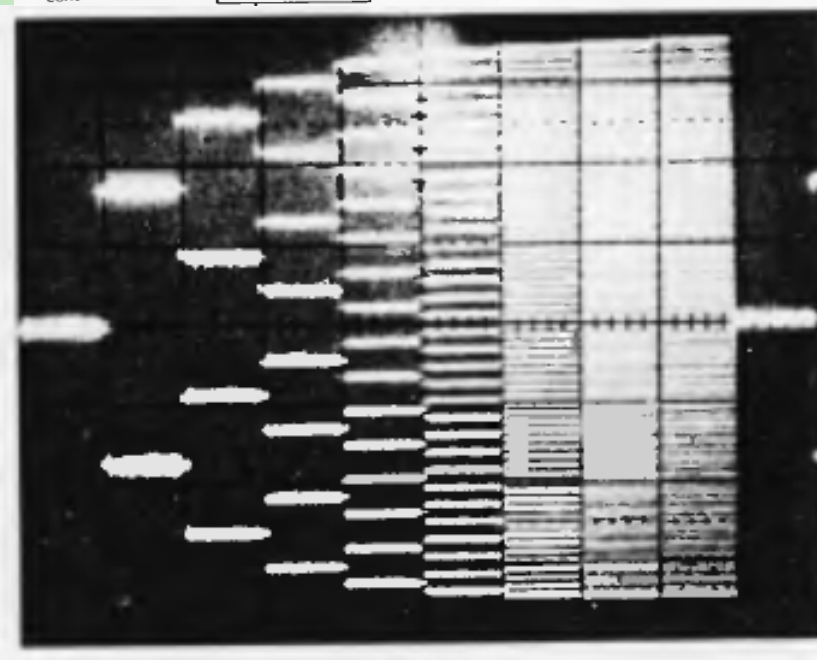
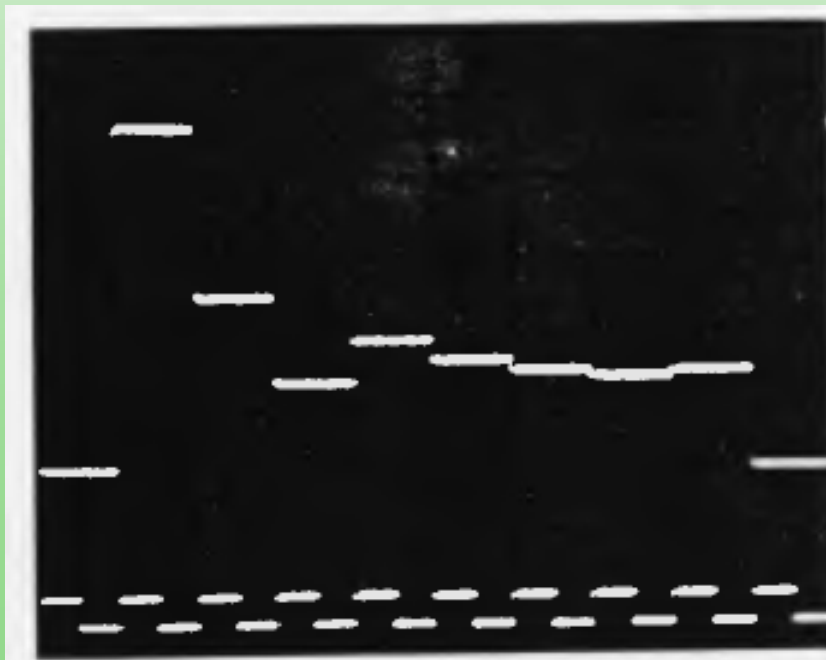
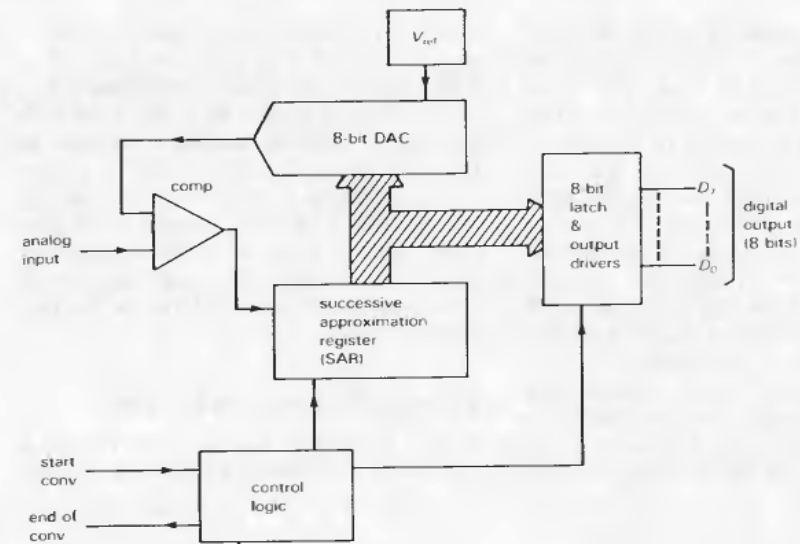
Conversores A/D

Tipo Aproximaciones
Sucesivas



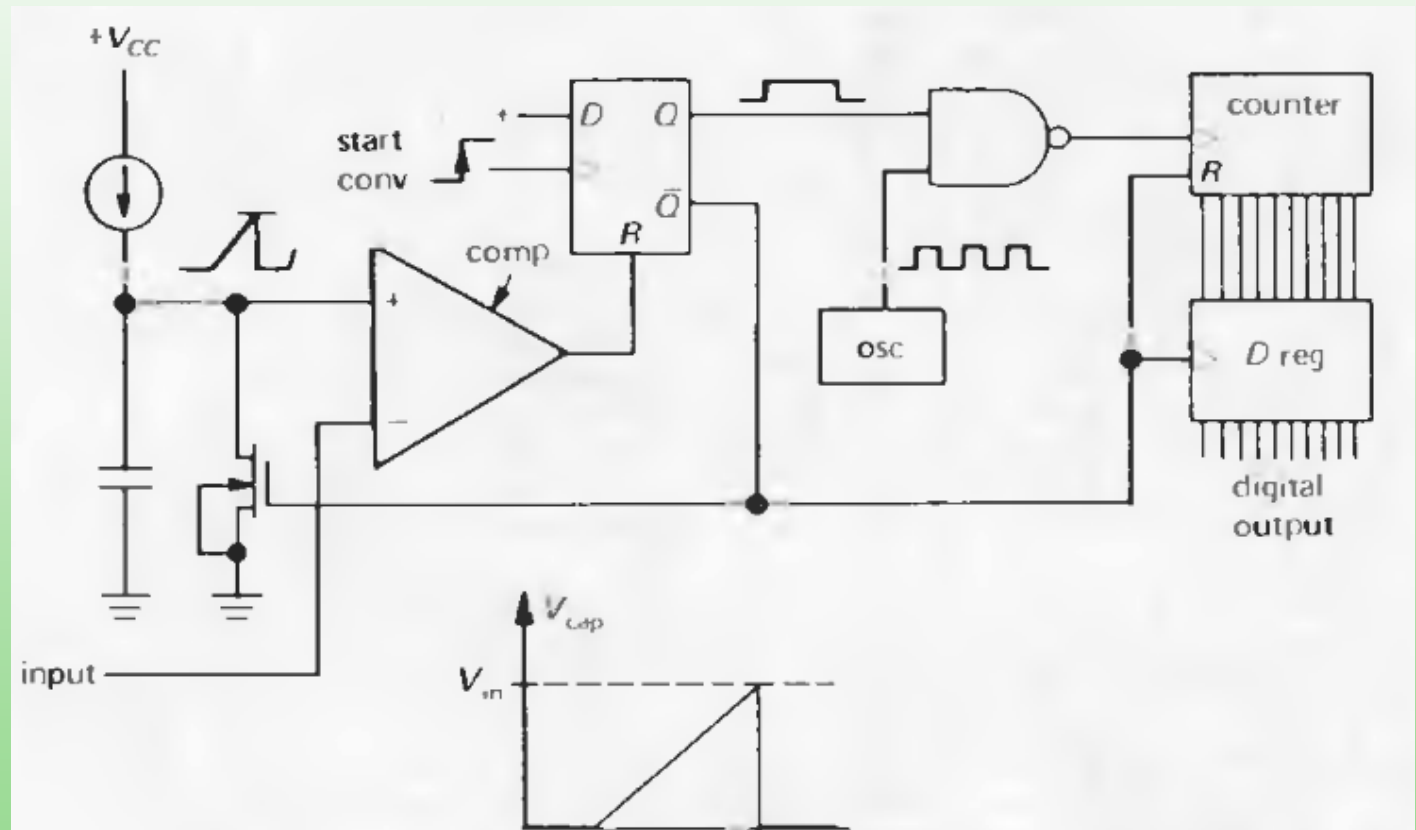
Conversores A/D

Tipo Aproximaciones
Sucesivas



Conversores A/D

Tipo
Voltaje a Frecuencia



Elección de un conversores

TABLE 9.4. DIGITAL-TO-ANALOG CONVERTERS

Type	Mfg ^a	# per pkg	Bits	Latch	V or I?	Speed to MSB/2 (ns)	Pol ^b	Input org	Pkg ^c	V _{supply} (V)	I _{supply} (mA)	Reference	Trim ^d	Multiplying?	Ext'd compl ^e	Low glitch?	Price	Comments
AD9702	AD	3	4	1	I	5	-	12	24	±6	1.8W	ext	-	-	4.2	*	\$45	color video; ECL or TTL
AD7225	AD	4	8	2	V	5000	+	4x8	24S	+15	10	ext	NT	-	-	-	\$18	double buffered; 7226 is single buff.
AD558	AD	1	8	1	V	1000	+	8	16	5 to 15	15	int	NT	-	-	-	\$6	complete, easy to use
DAC0830	NS	1	8	2	I	1000	M	8	20	5 to 15	2	0 to ±25	NT	*	N	-		same pinout as 12-bit DAC1230
AD7528	AD	2	8	1	I	350	M	8	20	5 to 15	0.1	0 to ±25	NT	*	N	-	\$6	dual, easy to use
DAC8408	PM	4	8	1	I	190	M	4x8	28	+5	0.05	ext	NT	*	N	-		can read back buffers
Bt-110	BT	8	8	1	I	100	+	8	40	+5	30	int	*	-	N	-		octal
AD7524	AD	1	8	1	I	100	M	8	16	5 to 15	0.1	0 to ±10	NT	*	N	-	\$5	indus std multiplying DAC
DAC-08	AD	1	8	-	I	85	-	8	16	±15	+2,-6	ext	-	-	28	-	\$1	obsolete; indus std
Bt-453	BT	3	8	1	I ^f	15	+	8	40	+5	160	ext	-	-	N	-	\$58	256x24 palette, for 256 of 16M colors
HDG0807	AD	1	8	-	V ^f	14	+	8	24	+5	185	int	NT	-	-	-	\$43	video, 75Ω output
TDC1018	TR	1	8	1	I	10	-	8	24	-5.2	100	ext	-	-	4	*		video
AD9768	AD	1	8	-	I	5	-	8	18?	±5	+15,-70	int	NT	-	N	-	\$40	ECL inputs
TDC1318	TR	3	8	1	I	5	-	3x8	40	-5.2	200	int	NT	-	N	-		high res'n color video; many 2nd sources
TQ6112	TQ	1	8	1	V	1	-	8	44	-3.5,-9	3.5W	ext	-	-	N	*		GaAs; ultra-fast
IDT75C29	ID	1	9	1	I	8	-	9	24	+5	80	ext	-	-	N	-		
DAC1000	NS	1	10	2	I	500	M	8+2	20	5 to 12	0.5	0 to ±25	NT	*	N	-		double buffered; cheap
AD7248	AD	1	12	2	V	5000	±	8+4	20	±15	5	int	NT	-	-	-	\$10	single supply possible; +5V ref out
AD7537	AD	2	12	2	I	1500	M	8+4	24S	+15	5	ext	NT	-	N	-	\$15	
AD7548	AD	1	12	2	I	1000	M	8+4	20	5 to 15	1	0 to ±25	NT	*	N	-	\$10	
DAC1230	NS	1	12	2	I	1000	M	8+4	20	+15	1.2	0 to ±25	NT	*	N	-		same pinout as DAC0830
AD568	AD	1	12	-	I	35	±	12	24S	±15	+30,-8	int	*	-	N	*	\$42	
AD7534	AD	1	14	2	I	1500	M	8+4	20	+15,-0.3	0.5	0 to ±25	*	*	N	-	\$17	7535,6,8 have 14-bit bus
AD569	AD	1	16	2	V	6000	M	8+8	28	±12	±6	±5	NT	*	-	-	\$28	
DAC71/72	all	1	16	-	I	1000	±	16	24	+5,±15	10,+10,-30	int	*	-	11	-	\$45	indus std; V _{out} also: 10μs
PCM54	BB	1	16	-	I	350	±	16	28	±5 to ±15	±13	int	NT	-	N	*	\$11	digital audio, cheap; V _{out} also: 3μs
DAC729	BB	1	18	-	I	300	-	18	40	+5,+15	18,+30,-40	int	*	-	6	-	\$141	V _{out} also: 4μs; 18 bits = 4ppm!

(a) see footnote to Table 4.1. (b) M - multiplying. (c) all are DIP; S - skinny-DIP. (d) NT - no trim required. (e) extended compliance, in volts. (f) to drive 75Ω.

Conversores A/D

Tipo
Delta-Sigma

