PROGRAMMABLE SEVEN CHANNEL RC ENCODER

NE5044

DESCRIPTION

The NE5044 is a programmable parallel input, serial output pulsewidth encoder. A multiplexed dual linear ramp technique is used to allow up to 7 inputs to be converted to a serial pulsewidth modulated signal with excellent linearity and minimal crosstalk. Fixed or variable frame rates can be used, externally controlled, for ease of demodulation. An onboard 5V regulator eliminates power supply sensitivities and provides up to 20mA current capability for driving external loads.

FEATURES

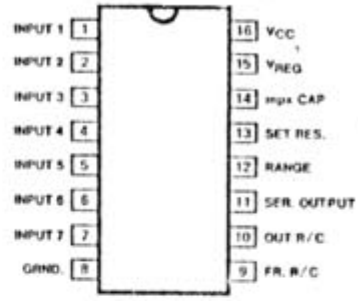
- 3 to 7 channels, externally selectable
- Constant current dual linear ramp for linearity better than .3%
- Internal voltage regulator for low drift
- Wide supply range 4.5 – 16V
- Fixed or variable frame rate set by external R-C
- External control for channel gain or range
- Versatile applications; exponential rates, mixing, dual rate, reversing etc.
- Compatible with all transmission mediums

APPLICATIONS

- Radio controlled aircraft, cars, boats, trains
- Industrial controllers
- Remote controlled entertainment systems
- Security systems
- Instrumentation recorders/controls
- Remote Analog/digital data transmission
- Automotive sensor systems

PIN CONFIGURATION

D,N PACKAGE



TOP VIEW

ORDER NUMBERS

NE5044D NE5044N

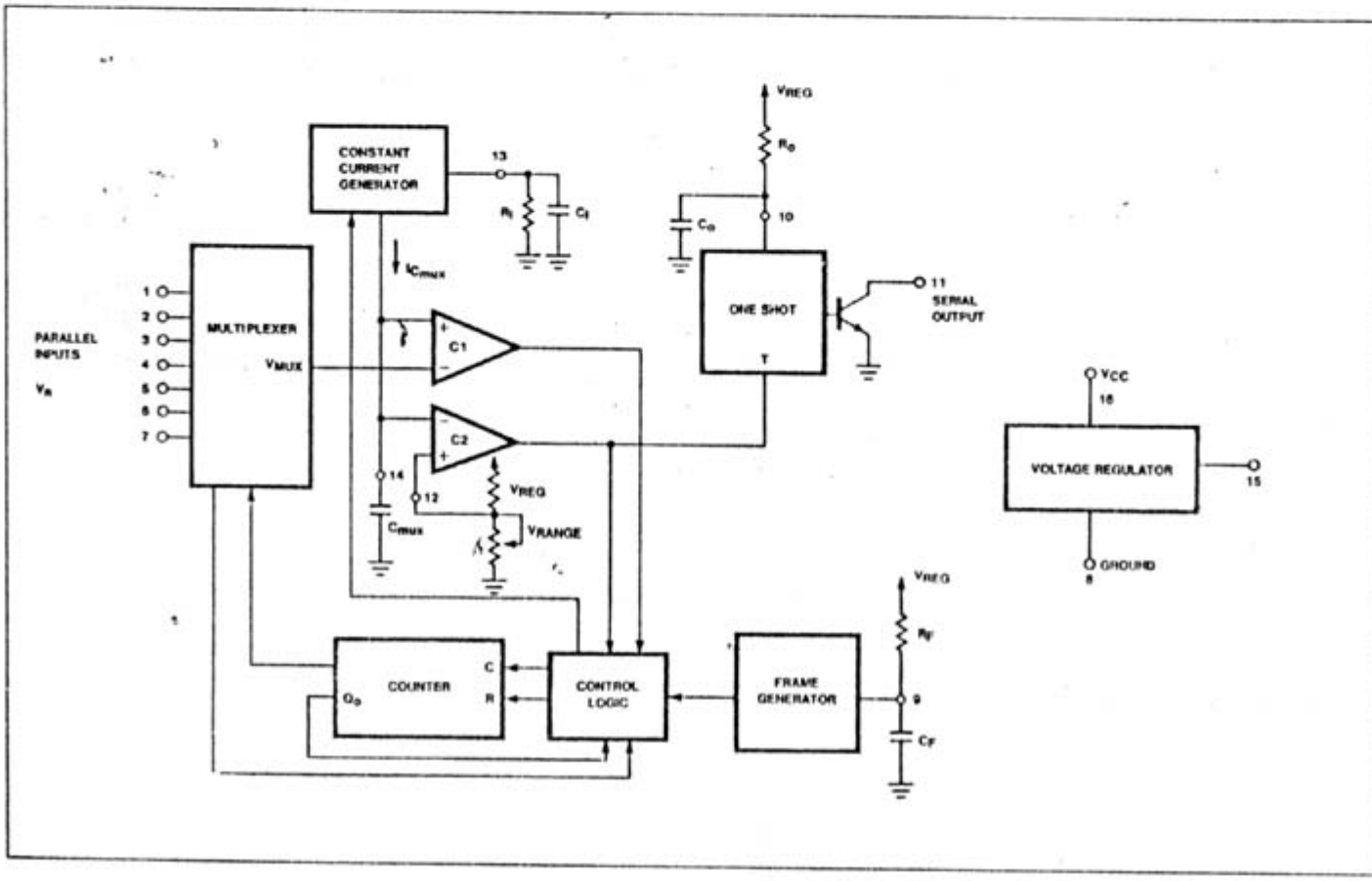
ABSOLUTE MAXIMUM RATINGS[1]

PARAMETER	RATING	UNIT
V_{CC}, Supply voltage	17	V
Regulator ouput current	−25	mA
Serial output peak current	30	mA
Constant current generator	−1	mA
Parallel inputs, range input	0-V_{REG}	V
One shot input, frame generator input	0-V_{REG}	V
Operating temperature	−20 to +75	°C
Storage temperature	−65 to +150	°C

NOTE

1. T_A = 25° unless otherwise stated.

BLOCK DIAGRAM



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DC ELECTRICAL CHARACTERISTICS

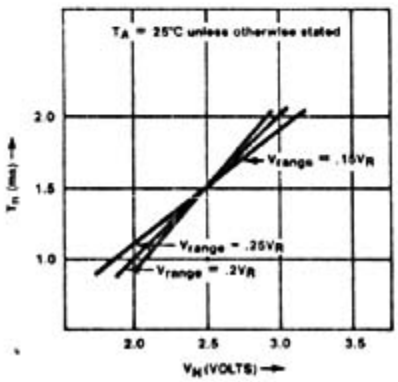
Test conditions T_A = 25°C, V_{CC} = 10V using Test Circuit A unless otherwise stated.

	PARAMETER	TEST CONDITIONS	NE 5044 Min	NE 5044 Typ	NE 5044 Max	UNIT
	POWER SUPPLY REQUIREMENTS[1]					
	Power supply voltage range		4.5		16	V
	Power supply current	Excluding control pots and serial output currents		11	15	mA
	VOLTAGE REGULATOR					
V_{REG}	Output voltage		4.5	5.0	5.5	V
	Output current	$V_R \geq 4.5V$			−20	mA
	Line regulation	$7 \leq V_{CC} \leq 16$		.005	0.2	V/V
	MULTIPLEXER					
	Input current	V_n = 2.5v		±30	±200	nA
	Input voltage range	$V_n - V_{Range} \geq .75V$	1.5		5	V
	Crosstalk			±1	±5	μs
	OUTPUT PULSE					
T_n	Position	$R_I \bullet C_{mux}$ = 1.25ms $V_n = .5V_{REG}$; $V_{RANGE} = .2V_{REG}$	1350	1500	1650	μs
	Position linearity error			5		μs
	Position tempco	0°C ≤ T_A ≤ 70°C.		.15		μs/°C
	Position PSR	6V ≤ V_{CC} ≤ 16V		.5	1	μs/V
T_O	Width	R_OC_O = 300μs	240	285	330	μs
	Saturation voltage	I_O = 25mA		.6	1	V
I_{11}	Leakage current			.05	50	μA
	Range input voltage	R_I = 50kΩ	.75			V
		R_I = 25kΩ	1.00			V
	Frame time (Fixed)	R_FC_F = 30ms	17	20	23	ms
	Inhibit threshold				.4	V

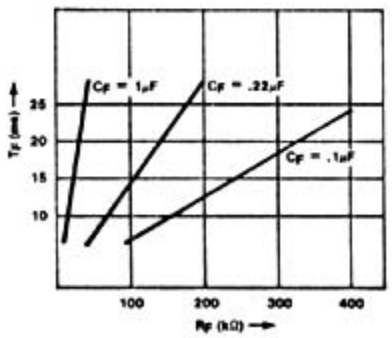
NOTE

1. At supply voltages exceeding 12 V, a current limiting resistor of 20 to 50Ω in series with V_{CC} is recommended.

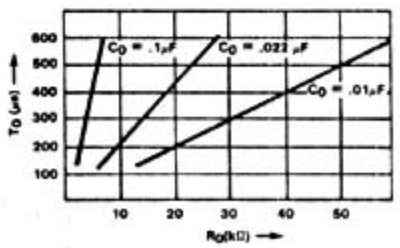
OUTPUT PULSE WIDTH (T_n) vs INPUT VOLTAGE (V_n)



FRAME TIME (T_F) vs R_F



OUTPUT ONESHOT TIME (T_O) vs R_O



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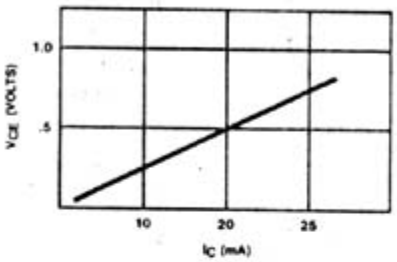
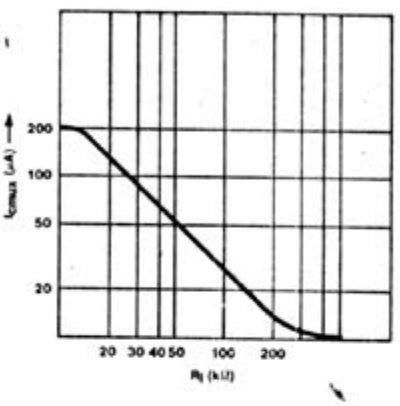
OUTPUT SATURATION VOLTAGE vs OUTPUT CURRENT



CONSTANT CURRENT vs R_I



TEST CIRCUIT A