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NTE1670 Integrated Circuit Air Core Meter Driver

Description:

The NTE1670 is a function generator/driver for air-core (moving-magnet) meter movements in a 14-Lead DIP type package. A Norton amplifier and an NPN transistor are included on chip for signal conditioning as required. Driver outputs are self-centering and develop $\pm 4.5V$ swing at 20mA. Better than 2% linearity is guaranteed over a full 305-degree operating range.

Features:

- Self-Centering 20mA Outputs
- 12V Operation
- Norton Amplifier
- Function Generator

Applications:

- Air-Core Meter Driver
- Tachometers
- Ruggedized Instruments

Absolute Maximum Ratings:

Supply Voltage (Pin13), V_{CC} 20V
 Power Dissipation (Note 1), P_D 1300mW
 Collector-Emitter Breakdown Voltage, $V_{(BR)CEO}$ $20V_{MIN}$
 Operating Temperature Range, T_{opr} $-40^{\circ}C$ to $+85^{\circ}C$
 Storage Temperature Range, T_{stg} $-65^{\circ}C$ to $-150^{\circ}C$
 Lead Temperature (During soldering, 10sec Max), T_L $+260^{\circ}C$

Note 1 For operation above $+25^{\circ}C$, the NTE1670 must be derated based upon a $+125^{\circ}C$ maximum junction temperature and a thermal resistance of $+76^{\circ}C/W$ which applies for the device soldered in a printed circuit board and operating in a still-air ambient.

Electrical Characteristics: ($V_{CC} = 13.1V$ $T_A = +25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Current (Pin13)	I_S	Zero Input Frequency	–	–	65	mA
Regulator Voltage (Pin11)	V_{REG}	$I_{REG} = 0mA$	8.1	8.5	8.9	V
Regulator Output Resistance (Pin11)		$I_{REG} = 0mA$ to $3mA$	–	13.5	–	Ω

Electrical Characteristics (Cont'd): ($V_{CC} = 13.1V$ $T_A = +25^\circ C$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Reference Voltage (Pin4)	V_{REF}	$I_{REF} = 0mA$	1.9	2.1	2.3	V
Reference Output Resistance (Pin4)		$I_{REF} = 0\mu A$ to $50\mu A$	–	5.3	–	$k\Omega$
Norton Amplifier Mirror Gain(Pin5, Pin6)		$I_{BIAS} \cong 20\mu A$	0.9	1.0	1.1	
NPN Transistor DC Gain (Pin9, Pin10)	h_{FE}		–	125	–	
Function Generator Feedback Bias Current (Pin1)		$V_1 = 5.1V$	–	1.0	–	mA
Drive Voltage Extremes, Sine and Cosine (Pin2, Pin12)		$I_{LOAD} = 20mA$	± 4.0	± 4.5	–	V
Sine Output Voltage with Zero Input (Pin2)		$V_8 = V_{REF}$	–350	0	+350	mV
Function Generator Linearity		FSD = 305°	–	–	± 1.7	%FSD
Function Generator Gain	k	Meter Deflection/ ΔV_8	50.75	53.75	56.75	$^\circ/V$

Pin Connection Diagram

