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PLESSEY Semiconductors

SP1658BC

T-50-15

VOLTAGE-CONTROLLED MULTIVIBRATOR
(CONFORMS TO MIL-STD-883C CLASS B)

The SP1658 is a voltage-controlled multivibrator which provides appropriate level shifting to produce an output compatible with ECL III and ECL 10,000 logic levels. Frequency control is accomplished through the use of voltage-variable current sources which control the slew rate of a single external capacitor.

The bias filter may be used to help eliminate ripple on the output voltage levels at high frequencies and the input filter may be used to decouple noise from the analog input signal.

The SP1658 is useful in frequency modulation, phase-locked loops, frequency synthesiser and clock signal generation applications for instrumenation, communication and computer systems.

FEATURES

- MIL-M-38510 Change Notification Observed
- Full Quality Conformance Inspection
- Operating temeprature range: -30°C to +85°C
- Supply Voltages -5.2V, 0V
- Oscillator Frequency Range 0.1 - 100MHz
- Voltage Controlled

CHANGE NOTIFICATION

The change notification requirements of MIL-M-38510 will be implemented on this device type. Known customers will be notified of any changes since last buy when ordering further parts if significant changes have been made.

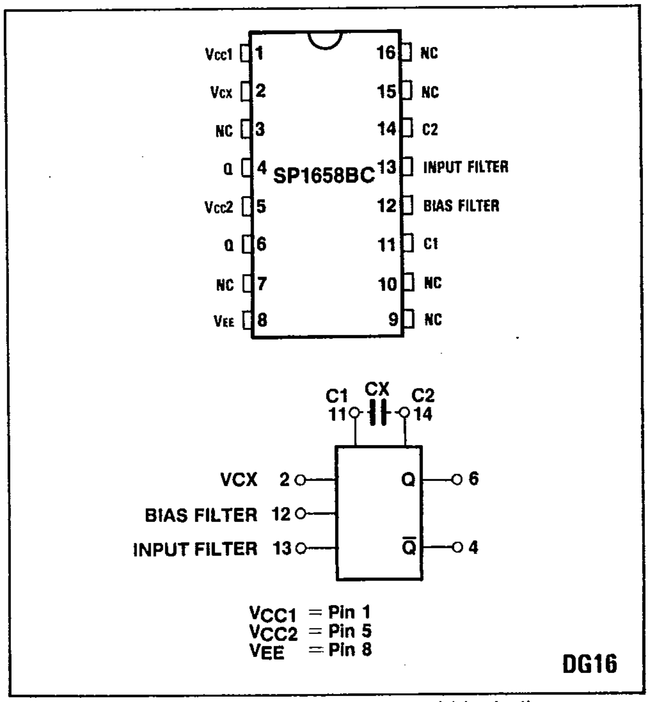

Fig.1 Pin connections (top view) and block diagram

ORDERING INFORMATION

SP1658BC DG (Commercial - ceramic package)

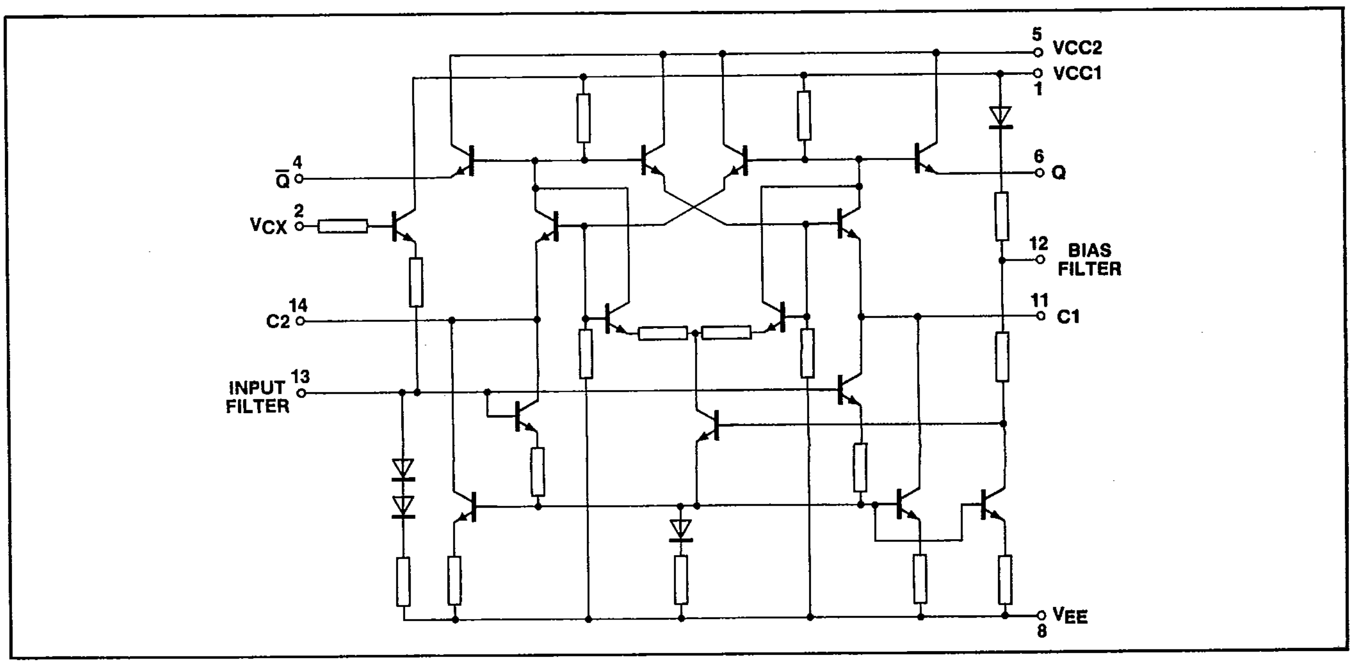

Fig.2 Circuit diagram

Rev.	A		
Date	1 Feb 87		

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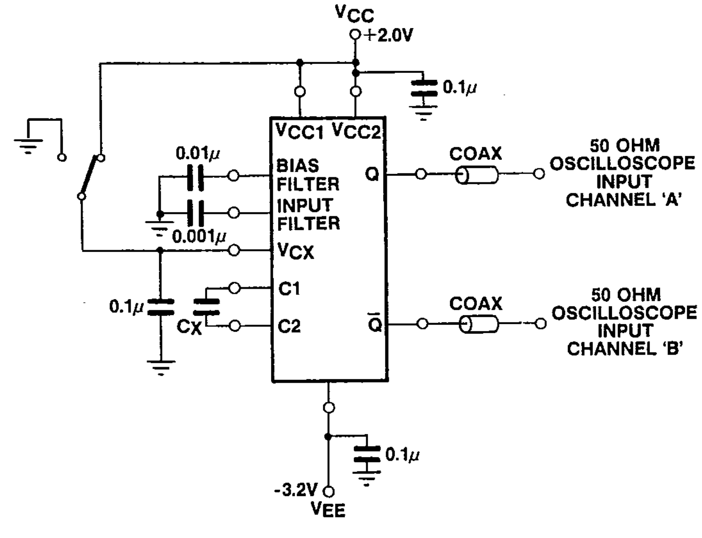
ELECTRICAL CHARACTERISTICS

Test conditions (unless otherwise stated):

$V_{CC1} = V_{CC2} = 0V$; $V_{EE} = -5.2V \pm 0.01V$

Parameter	Symbol	Value Min.	Value Max.	Sub group	Notes	Method/Conditions/Temp.
Supply current	I_{EE}		32mA	1,2,3	1	
Control input current	I_{CX}		350μA		1	$V_{CX} = 0V$
		-0.5μA			1	$V_{CX} = -2V$
Logic high output voltage	V_{OH}	-0.960V	-0.810V	1	1	$T_{amb} = +25°C$
		-0.890V	-0.700V	2	1	$T_{amb} = +85°C$
		-1.045V	-0.875V	3	1	$T_{amb} = -30°C$
Logic low output voltage	V_{OL}	-1.850V	-1.620V	1	1	$T_{amb} = +25°C$
		-1.830V	-1.575V	2	1	$T_{amb} = +80°C$
		-1.890V	-1.650V	3	1	$T_{amb} = -30°C$
Oscillator frequency	f_{osc}	78MHz	120MHz	4	2	$C_X = 10pF$ $T_{amb} = +25°C$ $V_{CX} = V_{CC}$
				5,6	2	$C_X = 10pF$ $T_{amb} = -30°C$ to $+85°C$ $V_{CX} = V_{CC}$
Timing ratio test	TR	3.1	-	4,5,6	2,3	$C_X = 10pF$ $T_{amb} = -30°C$ to $+85°C$
Function test		-	-	7,8	4	

NOTES
1. The static tests are carried out with a Germanium diode connected between pins 11 and 14; anode to 11 gives Q high, cathode to 11 gives Q low.
2. The test configuration for dynamic testing is shown in Fig.3.
3. The Tuning Ratio is defined as (output frequency at $V_{CX} = V_{CC}$)/(output frequency at $V_{CX} = V_{CC} - 2V$).
4. The Function Test is performed in conjunction with the Oscillator Frequency tests (sub group 4,5 or 6).
5. Sub groups 9.10,11 are not required.



The +2 and -3.2V supplies enable the output load to be connected to ground.

50-ohm termination to ground located in each scope channel input.

All input and output cables to the scope are equal lengths of 50-ohm coaxial cable. Wire length should be <1 inch from TP_{in} to input pin and TP_{out} to output pin.

Chip capacitors are advised for the input bias filters and supply decoupling.

Fig.3 Dynamic test circuit

ABSOLUTE MAXIMUM RATINGS

Power supply	$\lvert V_{CC} - V_{CC} \rvert$ 8V
Output source current	<15mA
V_{CX} input	-2.5V to 0V w.r.t. V_{CC}
Storage temperature range	-55°C to +150°C
Operating junction temperature	<175°C
Thermal characteristics DG16	$\theta_{JA} = 120°C/W$
	$\theta_{JC} = 40°C/W$

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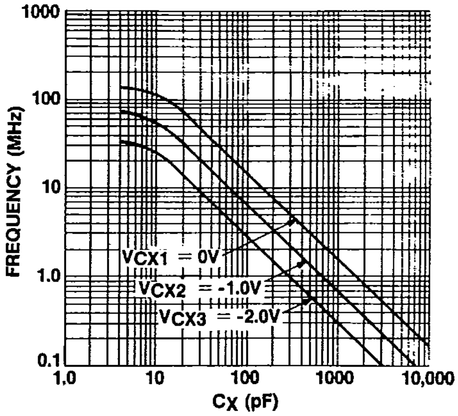

Fig.4 Output frequency v. capacitance for three values of input voltage

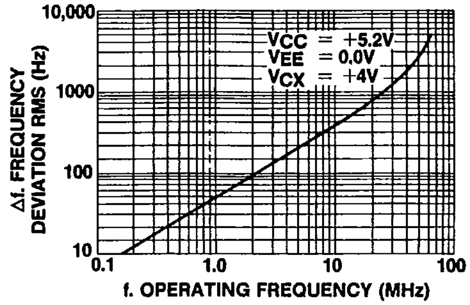

Fig.5 RMS noise deviation v. operating frequency

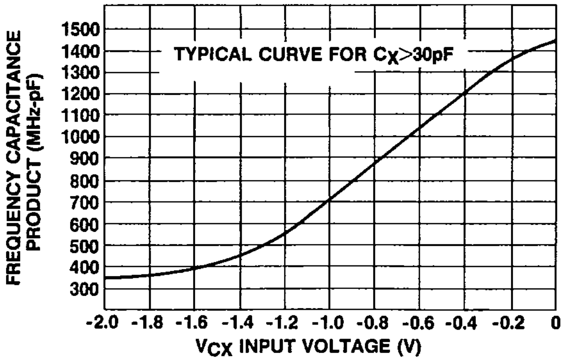

Fig.6 Frequency-capacitance product v. control voltage V_{CX}

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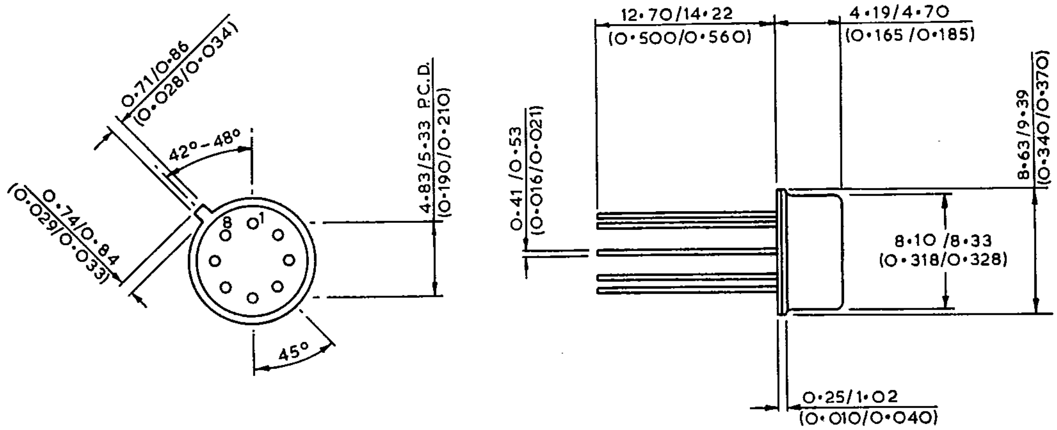
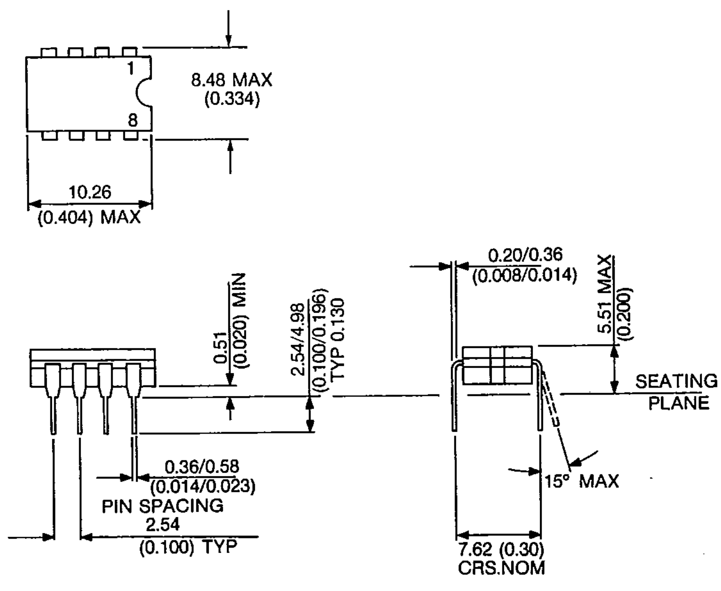


NOTE: This package does not have 'standoff' and therefore does not conform fully to MIL-M-38510F case outline A-1.

8-LEAD METAL CAN



8 LEAD CERAMIC DIL CERDIP - DG8

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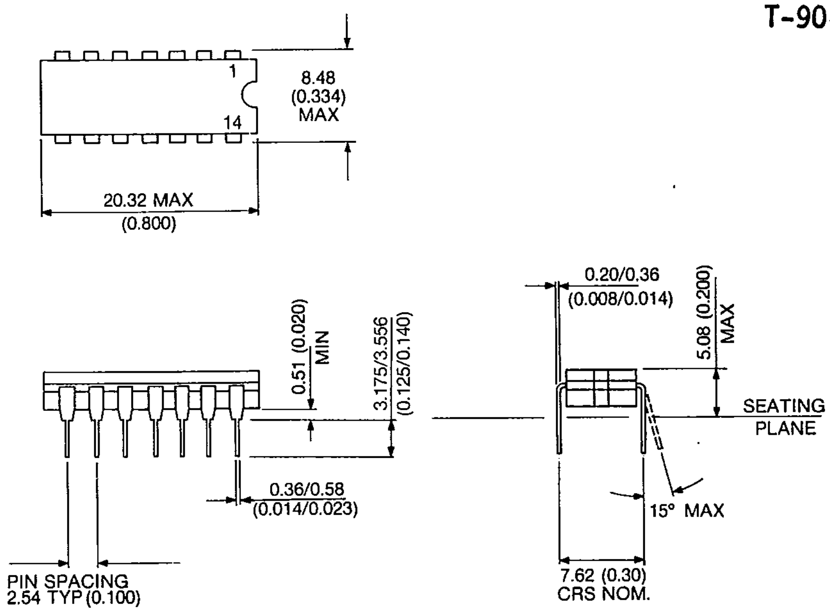
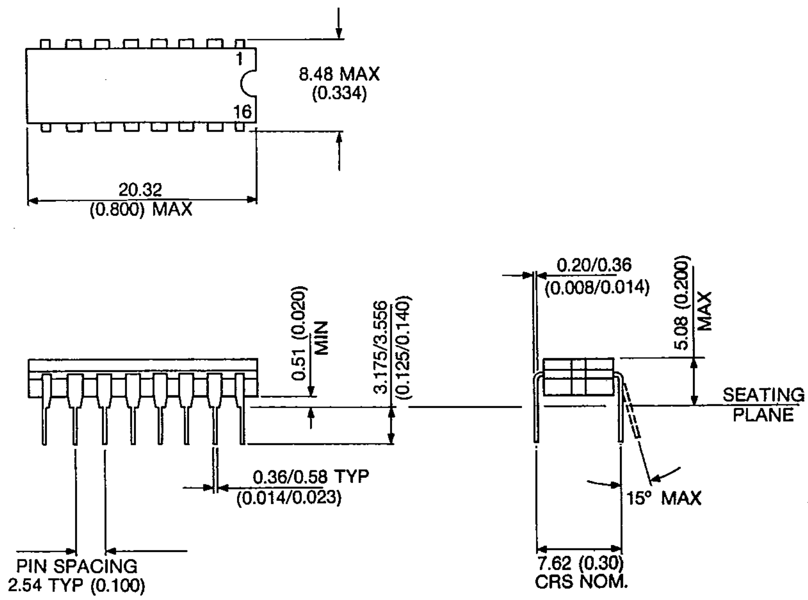
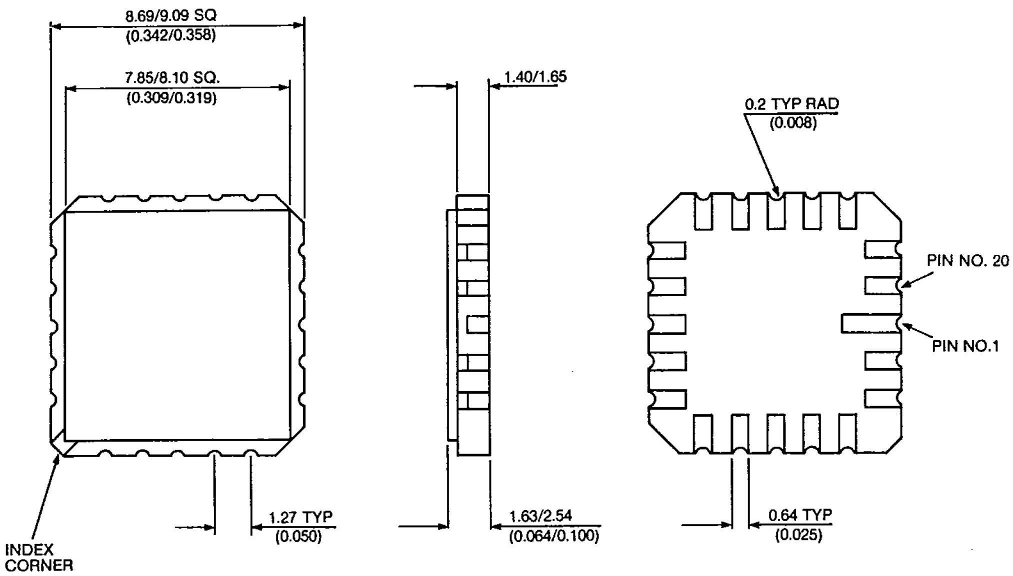


14 LEAD CERAMIC DIL CERDIP - DG14



16 LEAD CERAMIC DIL CERDIP - DG16



20-PIN LEADLESS CHIP CARRIER - LC20
(HERMETIC)