PLESSEY
SEMICONDUCTORS

SP 8000 SERIES
HIGH SPEED DIVIDERS

SP 8750 B,M 1.0 GHz SP 8751 B,M 1.1 GHz SP 8752 B 1.2 GHz

UHF ÷ 64 PRESCALERS

The SP8750 range of devices are ECL divide-by-sixtyfours which will operate at frequencies up to 1.2GHz.

The device has a typical power dissipation of 470mW at the nominal supply voltage of +6.8V.

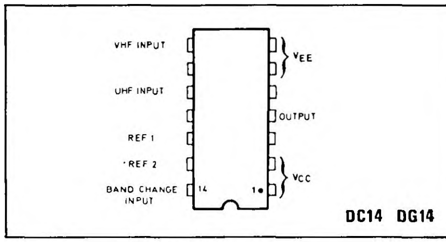


Fig. 1 Pin connections

FEATURES

- Input Ports for VHF and UHF
- Self-Biasing Clock Inputs
- Variable Input Hysteries Capability for Wide Band Operation
- TTL/MOS Compatible Band Change Input
- Push Pull TTL. O/P

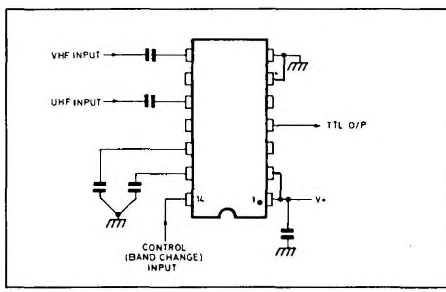


Fig. 2 Typical application

ABSOLUTE MAXIMUM RATINGS

Power supply voltage $V_{CC} - V_{EE}$	0V to +10V
Input voltage, clock inputs	2.5V p-p
Band change input	+7.2 to −0.5V or −10mA
Output current	+30 mA to −30 mA
Operating junction temperature	+150°C
Storage Temperature	−55°C to +150°C

OPERATING NOTES

Two input ports are available on this device. Switching between these inputs is accomplished by operation of the band change input. A logic '1' activates the UHF input, logic '0' the VHF input. When an input is not in use the input signal must be removed to prevent cross-modulation occuring on the other input at high frequencies. Both inputs are terminated by a nominal 400 and should be AC coupled to their respective signal sources. Input power to the device is terminated to ground by the two decoupling capacitors on the reference pins. Input coupling and reference decoupling capacitors should be of a type suitable for use at a frequency of 1.2Hz.

When the device is switched to the VHF input, an input hysteresis of 50mV is set by the internal band change circuit. This improves the low frequency sinewave operation of the device. The hysteresis level may be measured as $V_{REF1} - V_{REF2}$.

If the UHF input only is used and the device is required to operate with a sinewave input below 100 MHv, then the required hysteresis may be applied externally as shown in Fig. 5. Large values of hysteresis should be avoided as this will degrade the input sensitivity of the device at the maximum frequency. The divide by 64 output is designed to interface with TTL which has a common V_{EE} (ground). The specified fan-out of 3 standard TTL inputs may be increased to 6 standard or 5 high power/Schottky inputs at a logic zero level of 0.5V. At low frequency the output will change when one of the clock inputs changes from a low to a high level.

The devices may be operated down to very low frequencies if a square wave input is applied with an edge speed of greater than 200V/µs.

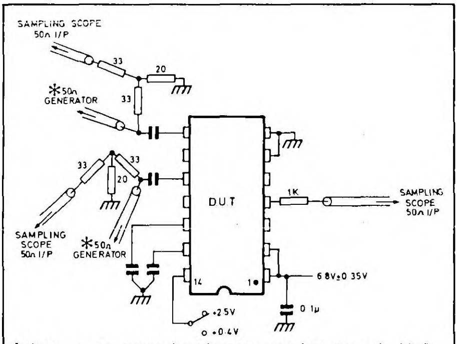
The divider is clocked on low to high transitions of either clock input.

ELECTRICAL CHARACTERISTICS

Supply voltage: 6.8V ± 0.35V
Supply current: 68 mA typ., 90 mA max.
Temperature range: 'B' grade 0°C to +70°C, 'M' grade −40°C to +85°C
Clock inputs: AC coupled, self-biasing via 400Ω
Band change input: TTL type including negative input voltage clamp, 0.8 mA max. sink current

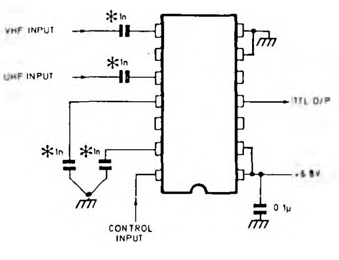
Test conditions (unless otherwise stated):
Supply voltage: V_{EE} = 0V, V_{CC} = +6.45V to +7.15V
Clock input voltage: 400mV to 1.0Vp-p
T_{amb} = 0°C to +70°C ('B' grade), −40°C to +85°C ('M' grade)

Characteristic	Type	Value			Units	Conditions
		Min.	Typ.	Max.		
UHF clock input						
Max. input frequency	SP8752	1.2			GHz	600mV p-p input
	SP8751	1.1			GHz	600mV p-p input
	SP8750	1.0			GHz	400mV p-p input
Min. input frequency	All			100	MHz	600mV p-p sinewave input
Min. slew rate for square wave input	All			200	v/µs	
VHF clock input						
Max. input frequency	All		1.0		GHz	
Min. input frequency			30	50	MHz	600mV p-p sinewave input
Band change input						
High level	All	2.5			V	
Low level				0.4	V	
Low level input current	All			0.8	mA	at 0.4V
Max. clamp current	All	−3			mA	at approx. −0.7V
Output						
High level	All	2.5	3.5	4.5	V	
Low level				0.4	V	5mA current sink
Supply current	All		68	90	mA	V_{CC} = 6.8V



* Only one generator should be connected to either the VHF or UHF inputs. The input not in use may be left open circuit. All capacitors are 1nF unless otherwise stated.

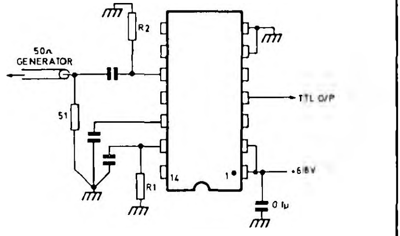
Fig. 3 AC test circuit



*Connections to these pins should be made to have the minimum series inductance. Capacitors should be of a type suitable for use at 1GHz.

For single input operation leave pins 8 and 14 open circuit.

Fig. 4 Application circuit



Capacitors are 1 nf unless otherwise stated. Values should be increased if operation below 10 MHz is desired.
For 50 mV hysteresis R1 = 36kΩ R2 = ∞
For 100 mV hysteresis R1 = 18kΩ R2 = 18kΩ

Fig. 5 Wideband operation