

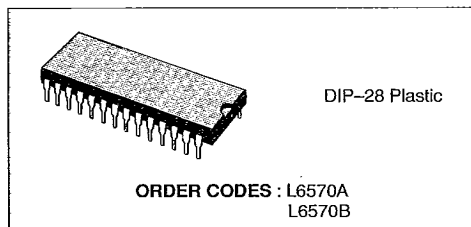
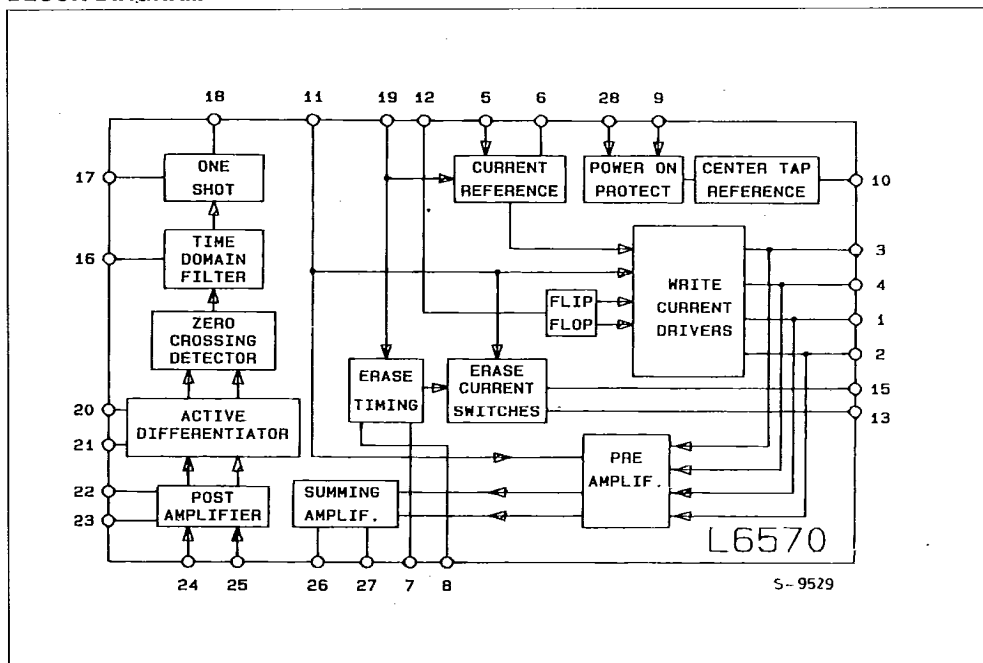
S G S-THOMSON
2-CHANNEL FLOPPY DISK READ/ WRITE CIRCUITS

- TWO GAIN VERSIONS (A AND B)
- COMPATIBLE WITH 8", 5.25" AND 3.5" DRIVES.
- INTERNAL WRITE AND ERASE CURRENT SOURCES, EXTERNALLY SET
- INTERNAL CENTER TAP VOLTAGE SOURCE
- CONTROL SIGNALS ARE TTL COMPATIBLE
- TTL SELECTABLE WRITE CURRENT BOOST
- OPERATES ON +12 V AND +5 V POWER SUPPLIES

tures a gain of 85 min and the L6570B of 300 min. All logic inputs and outputs are TTL compatible and all timing is externally programmable for maximum design flexibility.

DESCRIPTION

The L6570A/B are integrated circuits which perform the functions of generating write signals and amplifying and processing read signals required for a double sided floppy disk drive. The L6570A fea-


BLOCK DIAGRAM


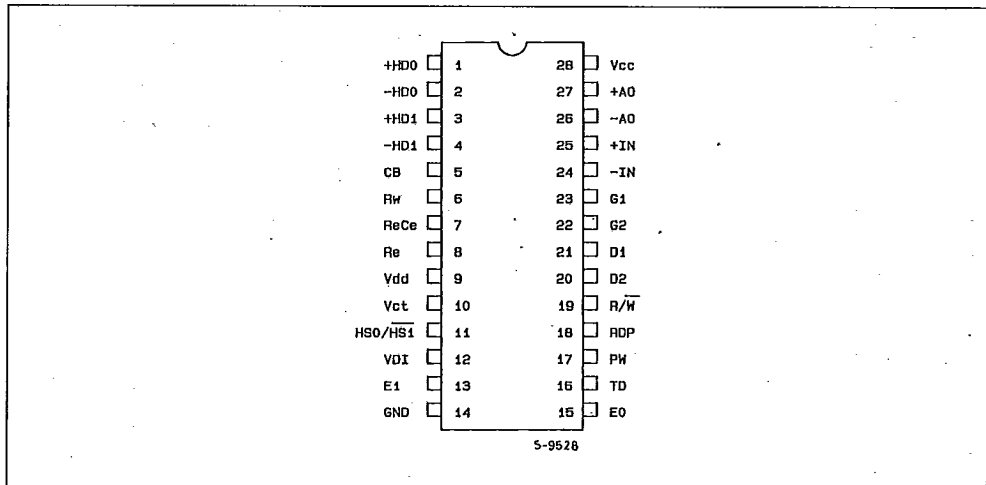
ABSOLUTE MAXIMUM RATINGS

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T-52-38

Symbol	Parameter	Test Conditions	Unit
V _{CC}	5V Supply Voltage	7	V
V _{DD}	12V Supply Voltage	14	V
T _{stg}	Storage Temperature	- 65 to 150	°C
T _{amb}	Ambient Operating Temperature	0 to + 70	°C
T _j	Junction Operating Temperature	0 to + 130	°C
V _I	Logic Input Voltage	- 0.5 to 7.0	V
P _{tot}	Power Dissipation	500	mW

CONNECTION DIAGRAM (top view)



THERMAL DATA

R _{th j-amb}	Thermal Resistance Junction-ambient	Max	100	°C/W

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ELECTRICAL CHARACTERISTICS (unless otherwise specified, $4.75\text{V} \leq V_{CC} \leq 5.25\text{V}$; $11.4\text{V} \leq V_{DD} \leq 12.6\text{V}$; $0^\circ\text{C} \leq T_{amb} \leq 70^\circ\text{C}$; $R_W = 430\ \Omega$; $R_{ED} = 62\ \text{K}\Omega$; $C_E = 0.012\ \mu\text{F}$; $R_{EH} = 62\ \text{K}\Omega$; $R_{EC} = 220\ \Omega$)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
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POWER SUPPLY CURRENTS

I_{CC}	5V Supply Current	Read Mode			35	mA
		Write Mode			38	mA
I_{DD}	12V Supply Current	Read Mode	L6570A		26	mA
			L6570B		35	mA
		Write Mode (exclude Write and Erase currents)	L6570A		24	mA
			L6570B		35	mA

LOGIC SIGNALS-READ/WRITE ($\overline{R/W}$), CURRENT BOOST (CB)

V_{IL}	Input Low Voltage				0.8	V
I_{IL}	Input Low Current	$V_{IL} = 0.4\text{V}$			-0.4	mA
V_{IH}	Input High Voltage		2.0			V
I_{IH}	Input High Current	$V_{IH} = 2.4\text{V}$			20	μA

LOGIC SIGNALS-WRITE DATA INPUT (WDI), HEAD SELECT (HS0/HS1)

V_{T+}	Threshold Voltage, Positive-going		1.4		1.9	V
V_{T-}	Threshold Voltage, Negative-going		0.6		1.1	V
V_{T+}, V_{T-}	Hysteresis		0.4			V
I_{IH}	Input High Current	$V_{IH} = 2.4\text{V}$			20	μA
I_{IL}	Input Low Current	$V_{IL} = 0.4\text{V}$			-0.4	mA

CENTER TAP VOLTAGE REFERENCE

V_{CT}	Output Voltage	$I_{WC} + I_E = 3\ \text{mA}$ to 60 mA	$V_{DD}-1.5$		$V_{DD}-0.5$	V
V_{CC}	Turn-Off Threshold		4.0			V
V_{DD}	Turn-Off Threshold		9.6			V
V_{CT}	Disabled Voltage				1.0	V

ERASE OUTPUTS (E_1, E_0)

	Unselected Head Leakage	$V_{E0}, V_{E1} = 12.6\text{V}$			100	μA
V_{E1}, V_{E0}	Output on Voltage	$I_E = 50\ \text{mA}$			0.5	V

ELECTRICAL CHARACTERISTICS (Continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
	Unselected Head Leakage	$V_{E1}, V_{E0} = 12.6V$			25	μA
	Write Current Range	$R_W = 820 \Omega$ to 180Ω	3		10	mA
	Current Reference Accuracy	$I_{WC} = 2.3/R_W$ V_{CB} (current boost) = $0.5V$	-5		+5	%
	Write Current Unbalanced	$I_{WC} = 3$ mA to 10 mA			1.0	%
	Differential Head Voltage Swing	$\Delta I_{WC} \leq 5 \%$	12.8			V_{pk}
	Current Boost	$V_{CB} = 2.4V$	$1.25 I_{WC}$		$1.35 I_{WC}$	

WRITE CURRENT

ERASE TIMING

	Erase Delay Range	$R_{ED} = 39 K\Omega$ to $82 K\Omega$ $C_E = 0.0015 \mu F$ to $0.043 \mu F$	0.1		1.0	ms
	Erase Delay Accuracy $\frac{\Delta T_{ED}}{T_{ED}} \times 100 \%$	$T_{ED} = 0.69 R_{ED} C_E$ $R_{ED} = 39 K\Omega$ to $82 K\Omega$ $C_E = 0.0015 \mu F$ to $0.043 \mu F$	-15		+15	%
	Erase Hold Range	$R_{EH} + R_{ED} = 78 K\Omega$ to $164 K\Omega$ $C_E = 0.0015 \mu F$ to $0.043 \mu F$	0.2		2.0	ms
	Erase Hold Accuracy $\frac{\Delta T_{ED}}{T_{ED}} \times 100 \%$	$T_{EH} = 0.69 (R_{ED} + R_{EH}) C_E$ $R_{EH} + R_{ED} = 78 K\Omega$ to $164 K\Omega$ $C_E = 0.0015 \mu F$ to $0.043 \mu F$	-15		+15	%

ELECTRICAL CHARACTERISTICS (Unless otherwise specified : V_{IN} (Preamplifier) = $10mV_{pp}$ sine wave, DC coupled to center tap. Summing amplifier load = $2 K\Omega$ line-line, AC coupled. V_{IN} (Postamplifier) = $0.2 V_{pp}$ sine wave, AC coupled ; R_G = open ; Data pulse load = $1 K\Omega$ to V_{CC} ; $C_D = 240 pF$; $C_{TD} = 100 pF$; $R_{TD} = 7.5 K\Omega$; $C_{PW} = 47 pF$; $R_{PW} = 7.5 K\Omega$).

READ MODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
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PREAMPLIFIER-SUMMING AMPLIFIER

	Diff Voltage Gain	Freq. = 250 KHz L6570A L6570B	85 300		115 400	V/V
	Bandwidth (-3 dB)		3			MHz
	Gain Flatness	Freq. = DC to 1.5 MHz			± 1.0	dB
	Diff. Input Impedance	Freq. = 250 KHz	20			$K\Omega$
	Max. Diff. Output Voltage Swing	$V_{IN} = 250$ KHz Sine Wave THD $\leq 5 \%$ L6570A L6570B	2.5 4.0			V_{pp}
	Small Signal Difference Output Resistance	$I_O \leq 1.0$ mA $_{pp}$			75	Ω
	Common Mode Rejection Ratio	$V_{IN} = 300$ mV $_{pp}$ @ 500 KHz Inputs Shorted L6570A L6570B	50 40			dB

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ELECTRICAL CHARACTERISTICS (Continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
	Power Supply Rejection Ratio	$\Delta V_{DD} = 300 \text{ mV}_{pp}$ @ 500 KHz Inputs Shorted to V_{CT}	50			dB
	Channel Isolation	Unselected Channel $V_{IN} = 100 \text{ mV}_{pp}$ @ 500 KHz. Selected Channel Input Connected to V_{CT}	40			dB
	Equivalent Input Noise	Power BW = 10 kHz to 1 MHz Inputs Shorted to V_{CT}			10	μV_{rms}
V_{CT}	Center Tap Voltage			1.5		V

PREAMPLIFIER-SUMMING AMPLIFIER

	Power Supply Rejection Ratio	$\Delta V_{DD} = 300 \text{ mV}_{pp}$ @ 500 KHz Inputs Shorted to V_{CT}	50			dB
	Channel Isolation	Unselected Channel $V_{IN} = 100 \text{ mV}_{pp}$ @ 500 KHz. Selected Channel Input Connected to V_{CT}	40			dB
	Equivalent Input Noise	Power BW = 10 kHz to 1 MHz Inputs Shorted to V_{CT}			10	μV_{rms}
V_{CT}	Center Tap Voltage			1.5		V

POSTAMPLIFIER-ACTIVE DIFFERENTIATOR

	AO, Diff. Voltage Gain + IN, - IN to D1, D2	Freq. = 250 KHz	8.5		11.5	V/V
	Bandwidth (-3dB) + IN, - IN to D1, D2	$C_D = 0.1 \mu\text{F}$, $R_D = 2.5 \text{ K}\Omega$	3			MHz
	Gain Flatness + IN, - IN to D1, D2	Freq. = DC to 1.5 MHz $C_D = 0.1 \mu\text{F}$, $R_D = 2.5 \text{ K}\Omega$			± 1.0	dB
	Max. Diff. Output Voltage Swing	$V_{IN} = 250 \text{ KHz}$ Sine Wave, AC Coupled. $\leq 5\%$ THD in Voltage across C_D	5.0			V_{pp}
	Max. Diff. Input Voltage	$V_{IN} = 250 \text{ KHz}$ Sine Wave, AC Coupled. $\leq 5\%$ THD in Voltage across C_D , $R_G = 1.5 \text{ K}\Omega$	2.5			V_{pp}
	Diff. Input Impedance		10			$\text{K}\Omega$
	Gain Control Accuracy $\frac{\Delta A_R}{A_R} \times 100\%$	$A_R = A_0 R_G / (8 \times 10^3 + R_G)$ $R_G = 2 \text{ K}\Omega$	-25		+25	%
	Threshold Differential Input Voltage	Min. diff. input voltage at post amp. that results in a change of state at RDP $V_{IN} = 250 \text{ KHz}$ square wave, $C_D = 0.1 \mu\text{F}$ $R_D = 500 \Omega$, $T_R, T_F \leq 0.2 \mu\text{s}$. No overshoot ; Data pulse from each V_{IN} transition			3.7	mV_{pp}
	Peak Differential Network Current		1.0			mA

ELECTRICAL CHARACTERISTICS (Continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
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TIME DOMAIN FILTER

	Delay Accuracy $\frac{\Delta T_{TD}}{T_{TD}} \times 100 \%$	$T_{TD} = 0.58 R_{TD} \cdot (C_{TD} + 10^{-11}) + 150 \text{ ns.}$ $R_{TD} = 5 \text{ K}\Omega \text{ to } 10 \text{ K}\Omega$ $C_{TD} = 56 \text{ pF}$ $V_{IN} = 50 \text{ mV}_{pp} @ 250 \text{ KHz sq. wave}$ $T_R, T_F \leq 20 \text{ ns, AC coupled.}$ Delay measured from 50 % input amplitude to 1.5 V data pulse	- 15		+ 15	%
	Delay Range	$T_{TD} = 0.58 R_{TD} \cdot (C_{TD} + 10^{-11}) + 150 \text{ ns.}$ $R_{TD} = 5 \text{ K}\Omega \text{ to } 10 \text{ K}\Omega$ $C_{TD} = 56 \text{ pF to } 240 \text{ pF}$ $R_D = 500 \Omega$ $C_D = 0.1 \mu\text{F.}$	240		2370	ns

DATA PULSE

	Width Accuracy $\frac{\Delta T_{PW}}{T_{PW}} \times 100 \%$	$T_{PW} = 0.58 R_{PW} \times (C_{PW} + 8 \times 10^{-12}) + 20 \text{ ns}$ $R_{PW} = 5 \text{ K}\Omega \text{ to } 10 \text{ K}\Omega$ $C_{PW} \geq 36 \text{ pF}$ with measured at 1.5V amplitudes	- 20		+ 20	%
	Active Level Output Voltage	$I_{OH} = 400 \mu\text{A}$	2.7			V
	Inactive Level Output Leakage	$I_{OL} = 4 \text{ mA}$			0.5	V
	Pulse Width	$T_{PW} = 0.58 R_{PW} \times (C_{PW} + 8 \times 10^{-12}) + 20 \text{ ns}$ $R_{PW} = 5 \text{ K}\Omega \text{ to } 10 \text{ K}\Omega$ $C_{PW} = 36 \text{ pF to } 200 \text{ pF}$	145		1225	ns

TEST SCHEMATICS

Figure 1 : Preamplifier Characteristics.

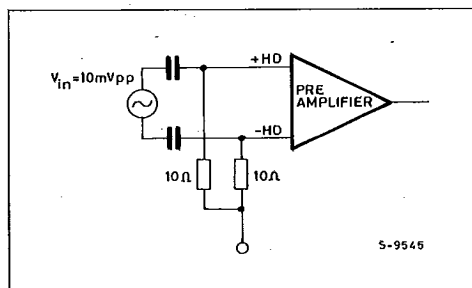
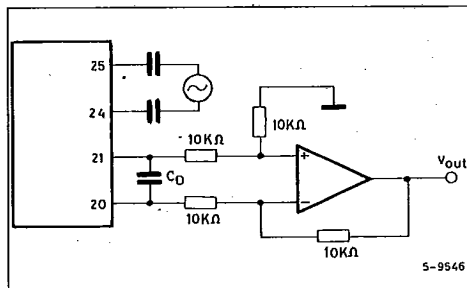


Figure 2 : Postamplifier Differential Output Voltage Swing and Voltage Gain.



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TEST SCHEMATICS (Continued)

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Figure 3 : Postamplifier Threshold Differential Input Voltage.

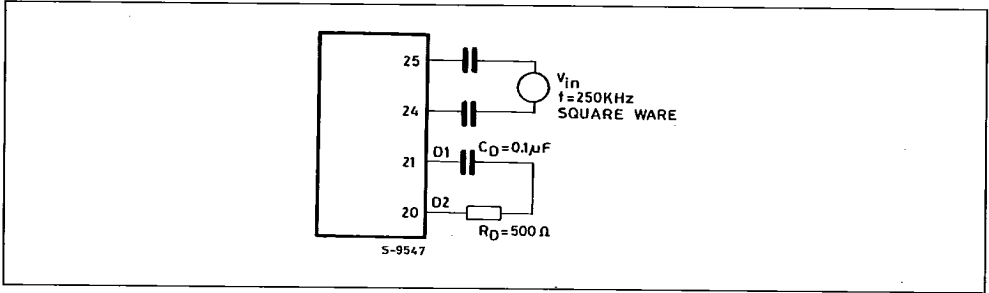


Figure 4 : Complete Test Circuit.

