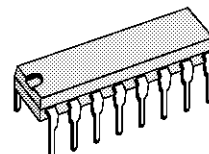


TV VERTICAL DEFLECTION OUTPUT CIRCUIT

- DRIVES VERTICAL DEFLECTION WINDINGS DIRECTLY
- HIGH EFFICIENCY
- INTERNAL FLYBACK GENERATOR
- THERMAL PROTECTION
- ON-CHIP VOLTAGE REFERENCE
- HIGH OUTPUT CURRENT (2.2 A peak)
- 16-LEAD POWERDIP PLASTIC PACKAGE



DIP16
(Plastic package)

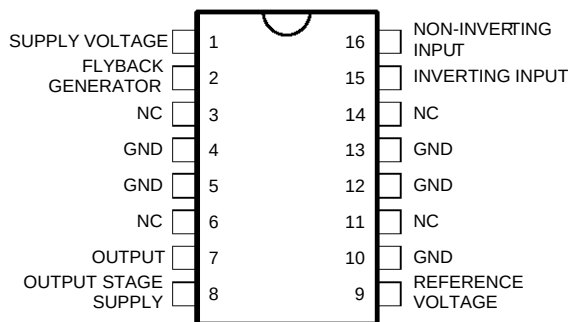
ORDER CODE : TDA2270

DESCRIPTION

The TDA2270 is a high efficiency monolithic output stage for vertical deflection circuits in TVs and monitors. Driving the vertical windings directly, the device contains a power amplifier, flyback generator, voltage reference and thermal protection circuit.

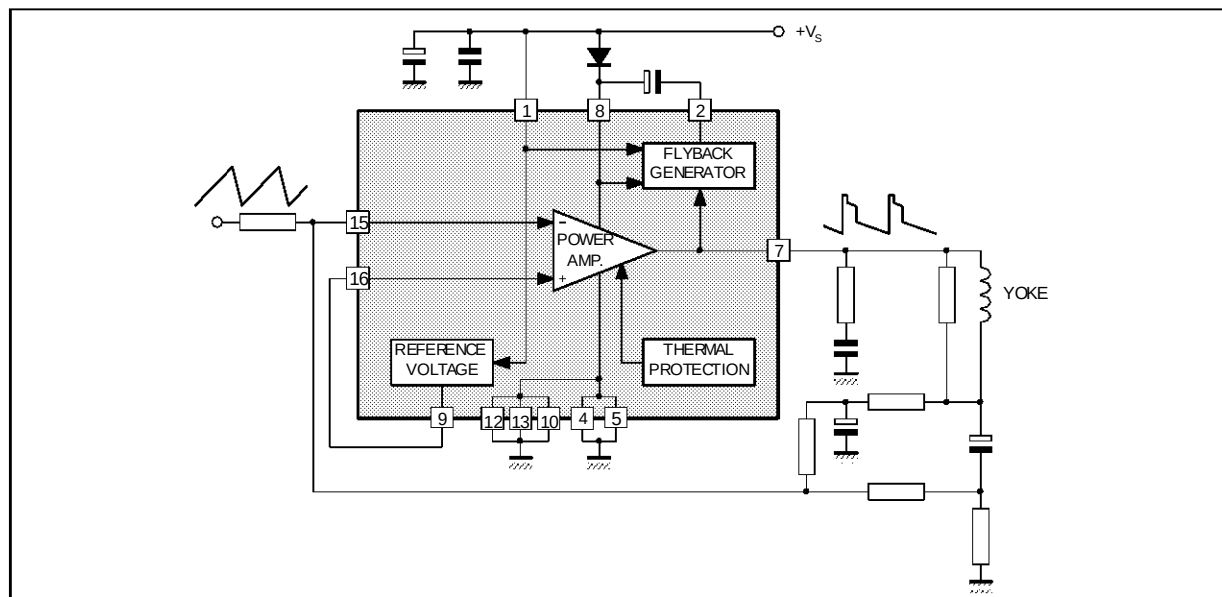
The TDA2270 is supplied in a 16-pin DIP with the four center pins connected together and used for heatsinking.

PIN CONNECTIONS



2270-01.EPS

BLOCK DIAGRAM



2270-02.EPS

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_s	Supply Voltage (pin 1)	35	V
V_7, V_8	Flyback Peak Voltage	60	V
V_2	Voltage at Pin 2	+ V_s	
V_{15}, V_{16}	Amplifier Input Voltage	+ $V_s, - 0.5$	V
I_o	Output Peak Current (non repetitive, $t = 2$ ms)	2	A
I_o	Output Peak Current at $f = 50$ Hz, $t \leq 10$ μ s	2.2	A
I_o	Output Peak Current at $f = 50$ Hz, $t > 10$ μ s	1.2	A
I_2	Pin 2 DC Current at $V_7 < V_1$	50	mA
I_2	Pin 2 Peak to Peak Flyback Current at $f = 50$ Hz, $t_{fly} \leq 1.5$ ms	2	A
P_{tot}	Total Power Dissipation at $T_{pins} \leq 90$ °C $T_{amb} = 70$ °C	4.3 1	W W
T_{stg}, T_j	Storage and Junction Temperature	- 40 to 150	°C

2270-01.TBL

THERMAL DATA

Symbol	Parameter	Value	Unit
$R_{th\ j-case}$	Thermal Resistance Junction-case Max	14	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient Max	80	°C/W

2270-02.TBL

* Obtained with the GND pins soldered to printed circuit with minimized copper area.

ELECTRICAL CHARACTERISTICS

(refer to the test circuits, $V_s = 35$ V, $T_{amb} = 25$ °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit	Fig.
I_1	Pin 1 Quiescent Current	$I_2 = 0, I_7 = 0, V_{16} = 3$ V		8	16	mA	1a
I_8	Pin 8 Quiescent Current	$I_2 = 0, I_7 = 0, V_{16} = 3$ V		16	36	mA	1a
I_{15}	Amplifier Input Bias Current	$V_{15} = 1$ V		- 0.1	- 1	μ A	1a
I_{16}	Amplifier Input Bias Current	$V_{16} = 1$ V		- 0.1	- 1	μ A	1a
V_{2L}	Pin 2 Saturation Voltage to GND	$I_2 = 20$ mA		1		V	1c
V_7	Quiescent Output Voltage	$V_s = 35$ V, $R_a = 39$ k Ω $V_s = 15$ V, $R_a = 13$ k Ω		18 7.5		V V	1d 1d
V_{7L}	Output Saturation Voltage to GND	$I_7 = 0.7$ A		0.7	1	V	1c
V_{7H}	Output Saturation Voltage to Supply	- $I_7 = 0.7$ A		1.3	1.8	V	1b
V_9	Reference Voltage	$I_9 = 0$		2.2		V	1a
$\frac{\Delta V_9}{\Delta V_s}$	Reference Voltage Drift versus Supply Voltage	$V_s = 15$ to 30 V		1	2	mV/V	1a
R_9	Reference Voltage Output Resistance			2.1		k Ω	
T_j	Junction Temperature for Thermal Shut Down			140		°C	

2270-03.TBL

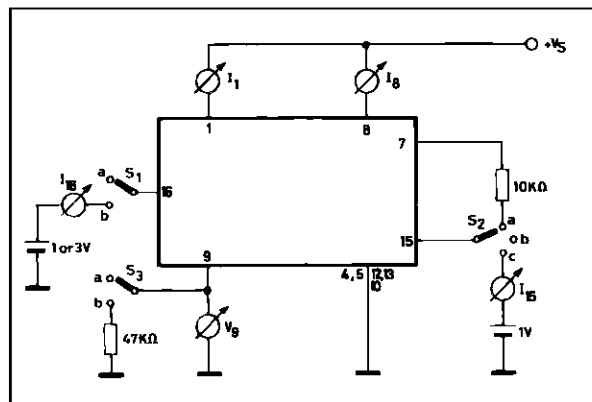
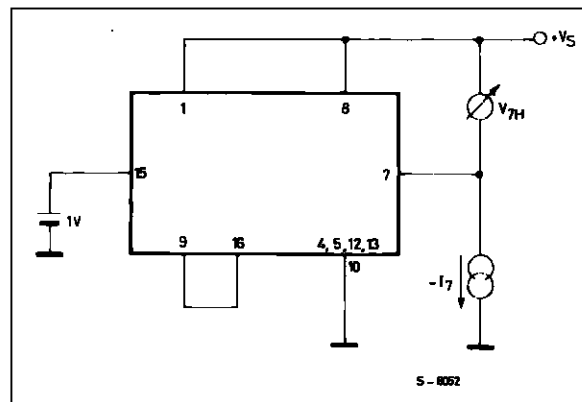
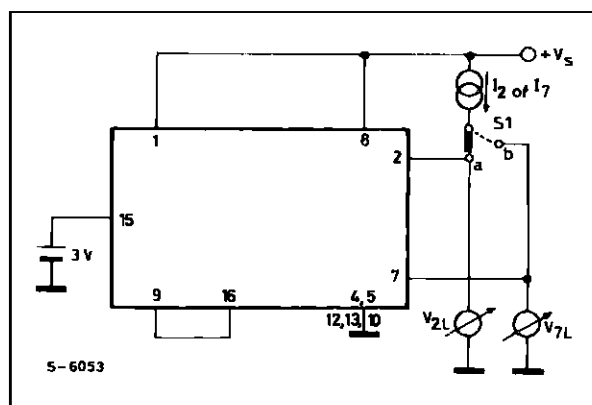
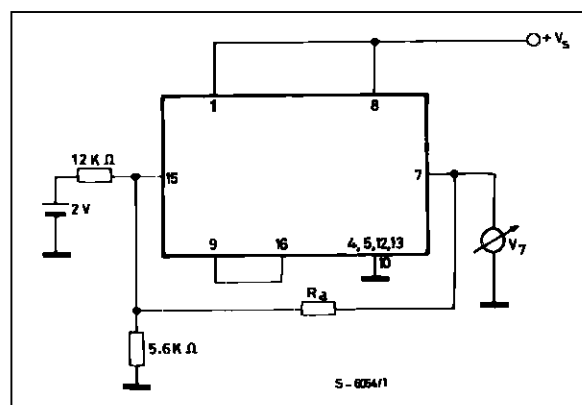
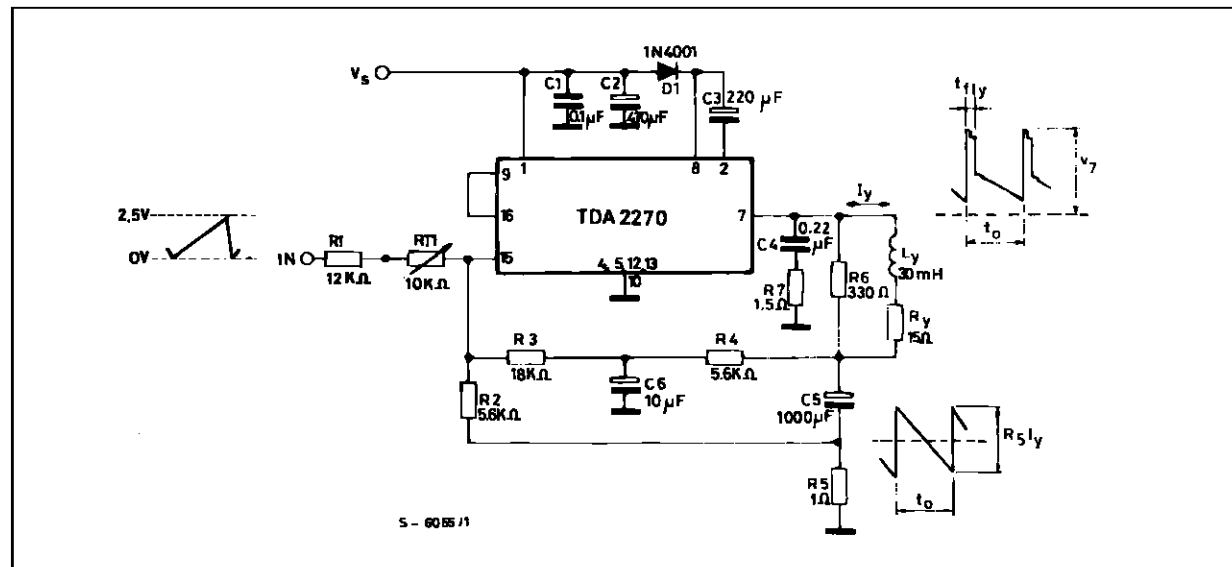
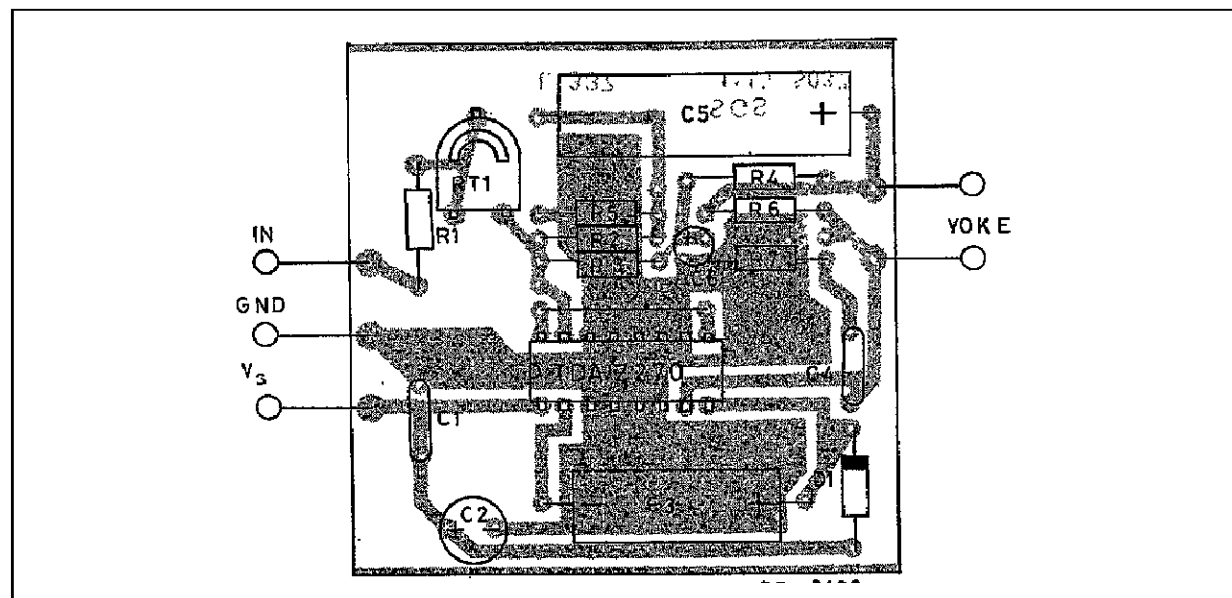
Figure 1 : DC Test Circuits**Figure 1a :** Measurement of I_1 ; I_8 ; I_{15} ; I_{16} ; V_9 ; $\Delta V_9/\Delta V_S$; R_9 S1 : (a) I_{15} ; (b) I_{16} , I_7 and I_8 .S2 : (a) I_7 and I_8 ; (b) I_{16} , (c) I_{15} .S3 : (a) I_{15} , I_{16} , I_7 , I_8 and V_9 ; (b) R_9 **Figure 1b :** Measurement of V_{7H} **Figure 1c :** Measurement of V_{2L} ; V_{7L} S1 : (a) V_{2L} ; (b) V_{7L} **Figure 1d :** Measurement of V_7 

Figure 2 : Application Circuit



2270-07.EPS

Figure 3 : PC Board and Component Layout (1 : 1 scale)



2270-06.TIF

COMPONENTS LIST FOR TYPICAL APPLICATIONS (refer to the fig. 2)

Component	B/W TV 10 Ω / 20 mH / 1 App	90° TVC 15 Ω / 30 mH / 0.82 App	Unit
RT1	10	10	k Ω
R1	10	12	k Ω
R2	5.6	5.6	k Ω
R3	15	18	k Ω
R4	6.8	5.6	k Ω
R5	1	1	Ω
R6	330	330	Ω
R7	1.5	1.5	Ω
D1	1N 4001	1N 4001	–
C1	0.1	0.1	μ F
C2 el.	470/25 V	470/25 V	μ F
C3 el.	220/25 V	220/25 V	μ F
C4	0.22	0.22	μ F
C5 el.	1000/25 V	1000/16 V	μ F
C6 el.	10/16 V	10/16 V	μ F

2270-04.TBL

TYPICAL PERFORMANCE

Parameter	B/W TV 10 Ω / 20 mH / 1 App	90° TVC 15 Ω / 30 mH	Unit
V _s – Supply Voltage	20	25	V
I _s – Current	145	125	mA
t _{fly} – Flyback Time	0.75	0.7	ms
* P _{tot} – Power Dissipation	1.8	2.05	W
* R _{th c-a} – Heatsink	14	12	°C/W
T _{amb}	60	60	°C
T _{j max}	130	130	°C
t _o	20	20	ms
V _i	2.5	2.5	V _{pp}
V ₇ – Flyback Voltage	42	52	V _p

2270-05.TBL

MOUNTING INSTRUCTIONS

The $R_{th\ j-amb}$ of the TDA 2270 can be reduced by soldering the GND pins to a suitable copper area of the printed circuit board (fig. 4) or to an external heatsink (fig. 5).

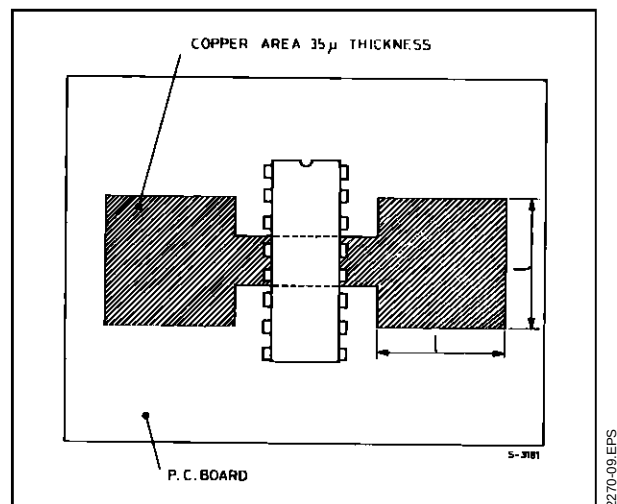
The diagram of figure 6 shows the maximum dissippable power P_{tot} and the $R_{th\ j-amb}$ as a function of the side "l" of two equal square copper areas having

a thickness of $35\ \mu$ (1.4 mils).

During soldering the pins temperature must not exceed $260\ ^\circ\text{C}$ and the soldering time must not be longer than 12 seconds.

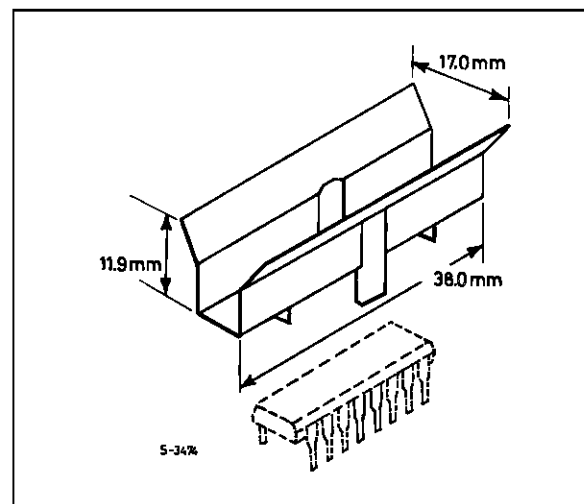
The external heatsink or printed circuit copper area must be connected to electrical ground.

Figure 4 : Example of P.C. Board Copper Area which is Used as Heatsink



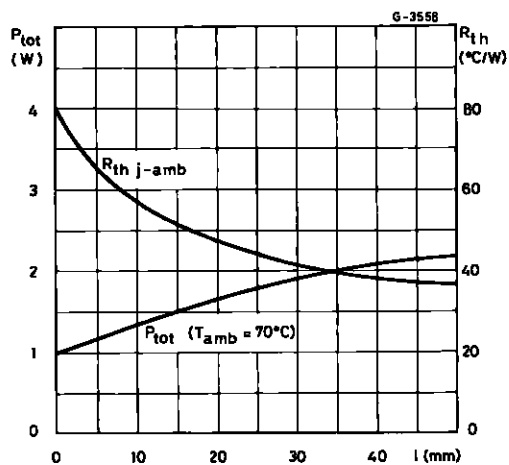
2270-09.EPS

Figure 5 : External Heatsink Mounting Example



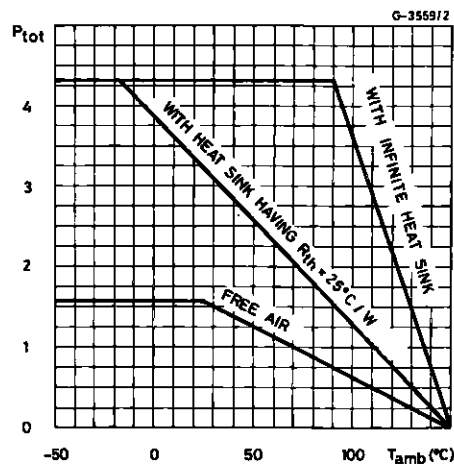
2270-10.EPS

Figure 6 : Maximum Dissippable Power and Junction to Ambient Thermal Resistance versus Side "l"



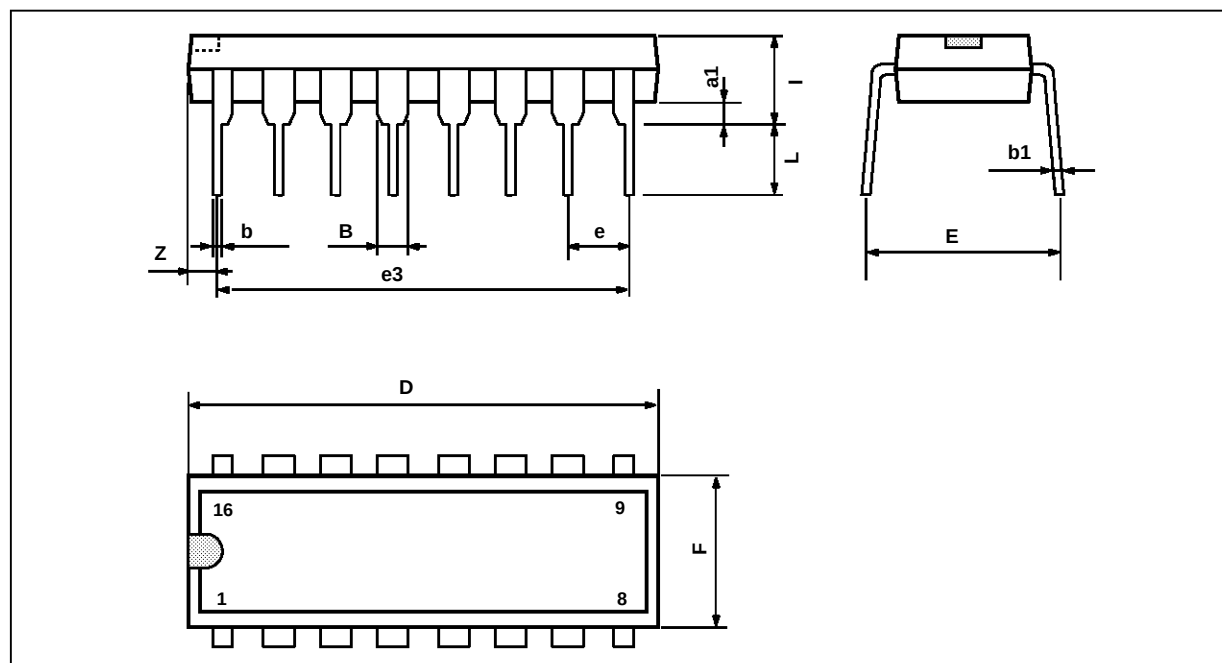
2270-11.EPS

Figure 7 : Maximum Allowable Power Dissipation versus Ambient Temperature



2270-12.EPS

PACKAGE MECHANICAL DATA **16 PINS - PLASTIC DIP**



PM-DIP16.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
i			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050

DIP16.TBL

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No licence is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

Purchase of I²C Components of SGS-THOMSON Microelectronics, conveys a license under the Philips I²C Patent. Rights to use these components in a I²C system, is granted provided that the system conforms to the I²C Standard Specifications as defined by Philips.

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - China - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco
The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.