

# DATA SHEET

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## **74F808, 74F1808** Hex 2-input AND drivers

Product specification

1991 Jan 02

IC15 Data Handbook

# Hex 2-input AND drivers

# 74F808/74F1808

## FEATURES

- High capacitive drive capability
- Choice of configuration  
Corner  $V_{CC}$  and GND – 74F808  
Center  $V_{CC}$  and GND – 74F1808
- Typical propagation delay of 4.0ns
- Superior ground noise characteristics (implemented using output edge rate control)
- Increased source and sink current (64mA)

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F808	4.0ns	24mA
74F1808	4.0ns	24mA

## ORDERING INFORMATION

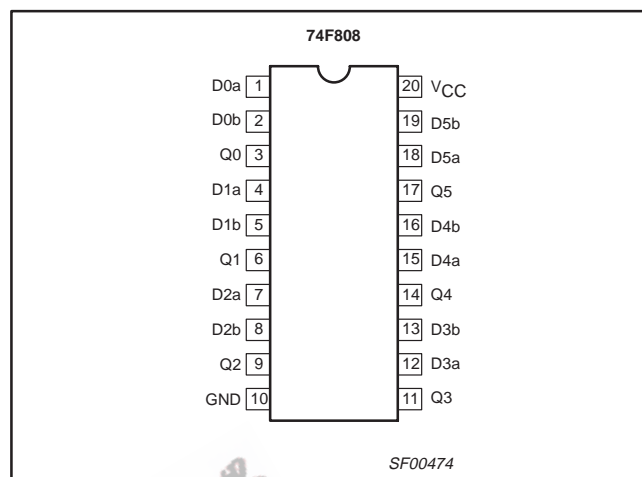
DESCRIPTION	ORDER CODE	PKG DWG #
	COMMERCIAL RANGE $V_{CC} = 5V \pm 10\%$ , $T_{amb} = 0^{\circ}C$ to $+70^{\circ}C$	
20-pin plastic DIP	N74F808N, N74F1808N	SOT 146-1
20-pin plastic SOL	N74F808D, N74F1808D	SOT163-1

## INPUT AND OUTPUT LOADING AND FAN OUT TABLE

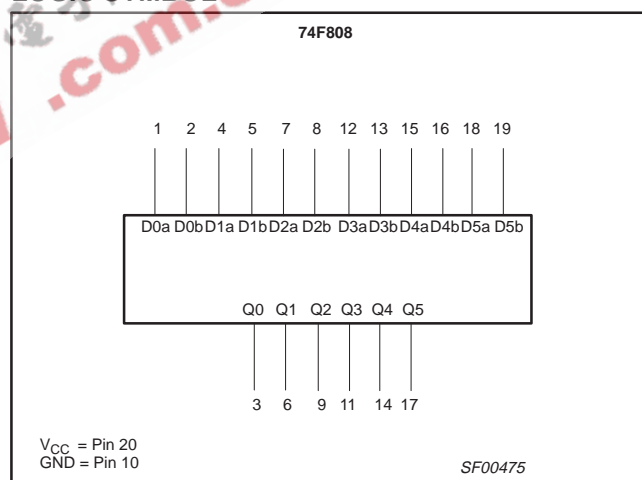
PINS	DESCRIPTION	74F (U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
Dna – Dnb	Data inputs	1.0/0.033	20 $\mu$ A/20 $\mu$ A
Q0 – Q5	Data outputs	3200/106.	64mA/64mA

**NOTE:** One (1.0) FAST unit load is defined as: 20 $\mu$ A in the high state and 0.6mA in the low state.

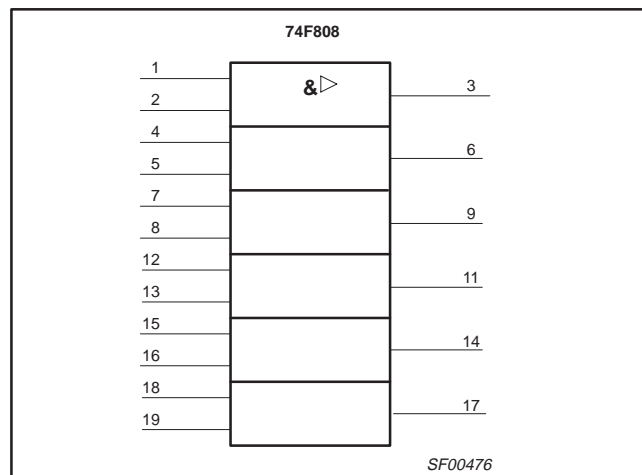
## PIN CONFIGURATION



## LOGIC SYMBOL



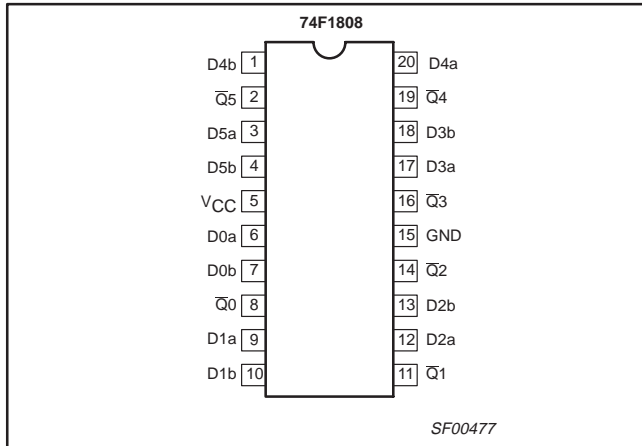
## IEC/IEEE SYMBOL



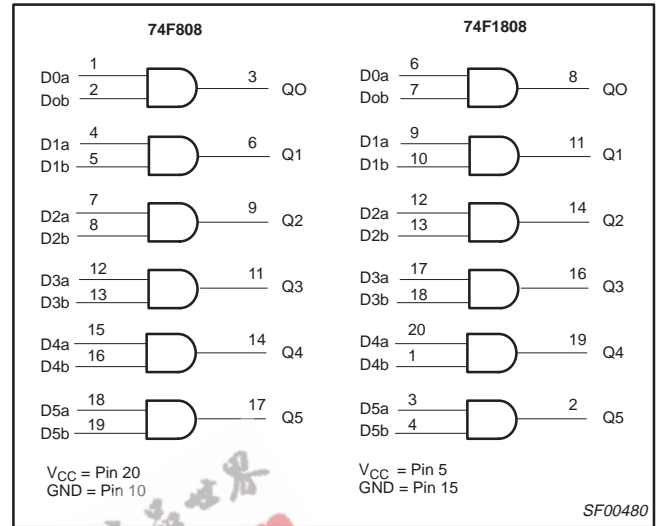
# Hex 2-input AND drivers

## 74F808/74F1808

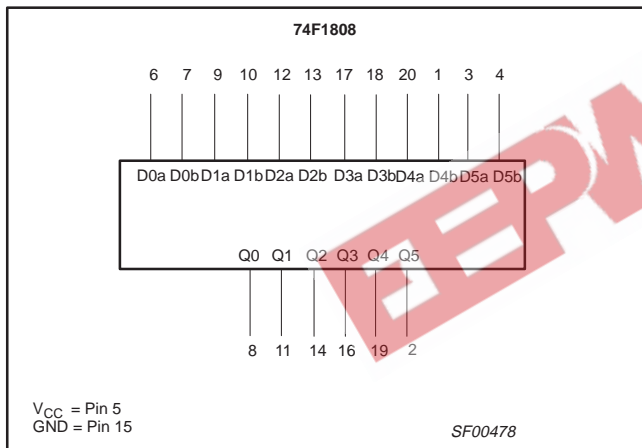
### PIN CONFIGURATION



### LOGIC DIAGRAM



### LOGIC SYMBOL



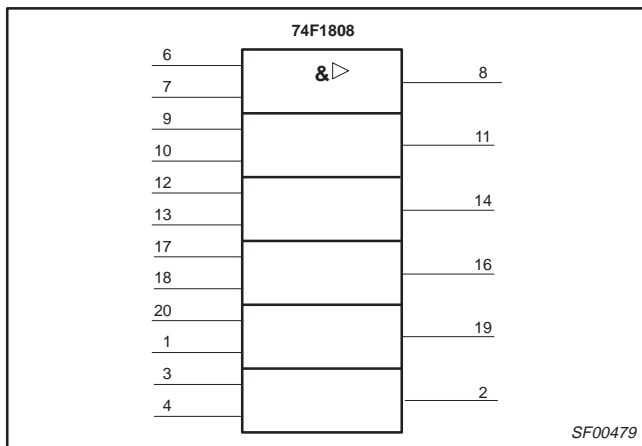
### FUNCTION TABLE

INPUTS		OUTPUT
Da	Db	Q
H	H	H
L	X	L
X	L	L

#### NOTES:

- H = High voltage level
- L = Low voltage level
- X = Don't care

### IEC/IEEE SYMBOL



## Hex 2-input AND drivers

74F808/74F1808

**ABSOLUTE MAXIMUM RATINGS**

(Operation beyond the limit set forth in this table may impair the useful life of the device. Unless otherwise noted these limits are over the operating free air temperature range.)

SYMBOL	PARAMETER	RATING	UNIT
$V_{CC}$	Supply voltage	-0.5 to +7.0	V
$V_{IN}$	Input voltage	-0.5 to +7.0	V
$I_{IN}$	Input current	-30 to +5	mA
$V_{OUT}$	Voltage applied to output in high output state	-0.5 to $V_{CC}$	V
$I_{OUT}$	Current applied to output in low output state	96	mA
$T_{amb}$	Operating free air temperature range	0 to +70	°C
$T_{stg}$	Storage temperature range	-65 to +150	°C

**RECOMMENDED OPERATING CONDITIONS**

SYMBOL	PARAMETER	LIMITS			$T_A = -40$ to +85°C
		MIN	NOM	MAX	
$V_{CC}$	Supply voltage	4.5	5.0	5.5	V
$V_{IH}$	High-level input voltage	2.0			V
$V_{IL}$	Low-level input voltage			0.8	V
$I_{IK}$	Input clamp current			-18	mA
$I_{OH}$	High-level output current			-64	mA
$I_{OL}$	Low-level output current			64	mA
$T_{amb}$	Operating free air temperature range	0		+70	°C

**DC ELECTRICAL CHARACTERISTICS**

(Over recommended operating free-air temperature range unless otherwise noted.)

SYMBOL	PARAMETER	TEST CONDITIONS <sup>1</sup>	LIMITS			UNIT		
			MIN	TYP <sup>2</sup>	MAX			
$V_{OH}$	High-level output voltage	$V_{CC} = \text{MIN}, V_{IL} = \text{MAX}$	$\pm 10\%V_{CC}$	2.0		V		
		$V_{IH} = \text{MIN}, I_{OH} = \text{MAX}$	$\pm 5\%V_{CC}$	2.0		V		
$V_{OL}$	Low-level output voltage	$V_{CC} = \text{MIN}, V_{IL} = \text{MAX}$	$\pm 10\%V_{CC}$		0.38	0.55	V	
		$V_{IH} = \text{MIN}, I_{OL} = \text{MAX}$	$\pm 5\%V_{CC}$		0.38	0.55	V	
$V_{IK}$	Input clamp voltage	$V_{CC} = \text{MIN}, I_I = I_{IK}$			-0.73	-1.2	V	
$I_I$	Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 7.0V$				100	μA	
$I_{IH}$	High-level input current	$V_{CC} = \text{MAX}, V_I = 2.7V$				20	μA	
$I_{IL}$	Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.5V$				-20	μA	
$I_O$	Output current <sup>3</sup>	$V_{CC} = \text{MAX}$		-60		-180	mA	
$I_{CC}$	Supply current (total)	$I_{CCH}$ $I_{CCL}$	$V_{CC} = \text{MAX}$	$V_{IN} = \text{GND}$		19	27	mA
				$V_{IN} = 4.5V$		30	42	mA

**NOTES:**

- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
- All typical values are at  $V_{CC} = 5V, T_{amb} = 25^\circ\text{C}$ .
- The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current,  $I_{OS}$ .

# Hex 2-input AND drivers

74F808/74F1808

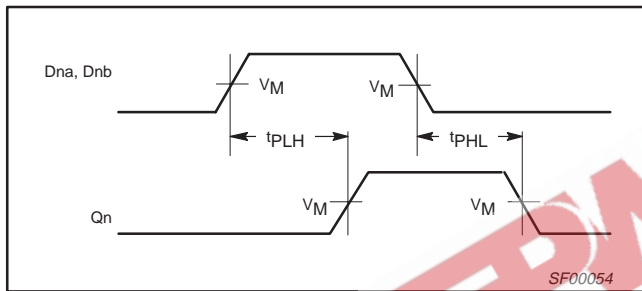
## AC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	LIMITS					UNIT
			T <sub>amb</sub> = +25°C V <sub>CC</sub> = +5.0V C <sub>L</sub> = 50pF, R <sub>L</sub> = 500Ω			T <sub>amb</sub> = 0°C to +70°C V <sub>CC</sub> = +5.0V ± 10% C <sub>L</sub> = 50pF, R <sub>L</sub> = 500Ω		
			MIN	TYP	MAX	MIN	MAX	
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation delay Dna, Dnb to Qn	Waveform 1	2.0 2.0	4.5 3.5	6.3 6.0	2.0 1.5	6.8 6.5	ns
t <sub>sk(o)</sub>	Output skew <sup>1,2</sup>	Waveform 2			2.5		3.0	ns

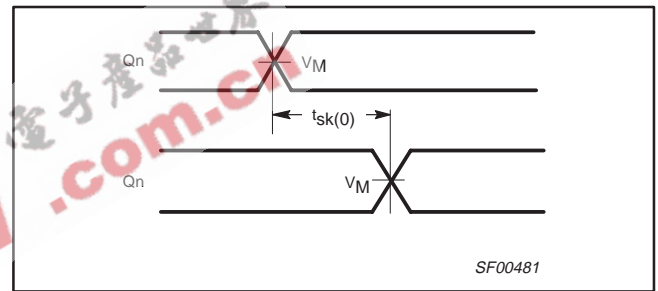
**NOTES:**

- [t<sub>PN</sub> actual – t<sub>PM</sub> actual] for any output compared to any other output where N and M are either LH or HL.
- Skew times are valid only under same test conditions (temperature, V<sub>CC</sub>, loading, etc.).

## AC WAVEFORMS



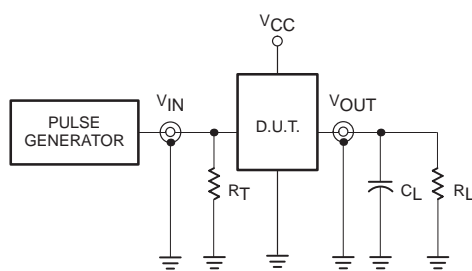
Waveform 1. Propagation delay for inverting outputs



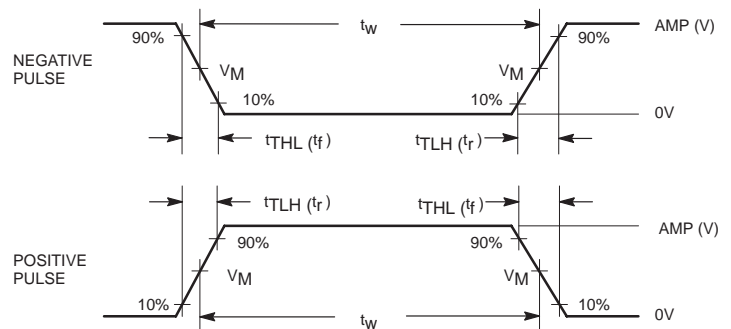
Waveform 2. Output skew

**NOTE:** For all waveforms, V<sub>M</sub> = 1.5V.

## TEST CIRCUIT AND WAVEFORMS



Test Circuit for Totem-Pole Outputs



Input Pulse Definition

family	INPUT PULSE REQUIREMENTS					
	amplitude	V <sub>M</sub>	rep. rate	t <sub>w</sub>	t <sub>TLH</sub>	t <sub>THL</sub>
74F	3.0V	1.5V	1MHz	500ns	2.5ns	2.5ns

**DEFINITIONS:**

- R<sub>L</sub> = Load resistor; see AC ELECTRICAL CHARACTERISTICS for value.
- C<sub>L</sub> = Load capacitance includes jig and probe capacitance; see AC ELECTRICAL CHARACTERISTICS for value.
- R<sub>T</sub> = Termination resistance should be equal to Z<sub>OUT</sub> of pulse generators.

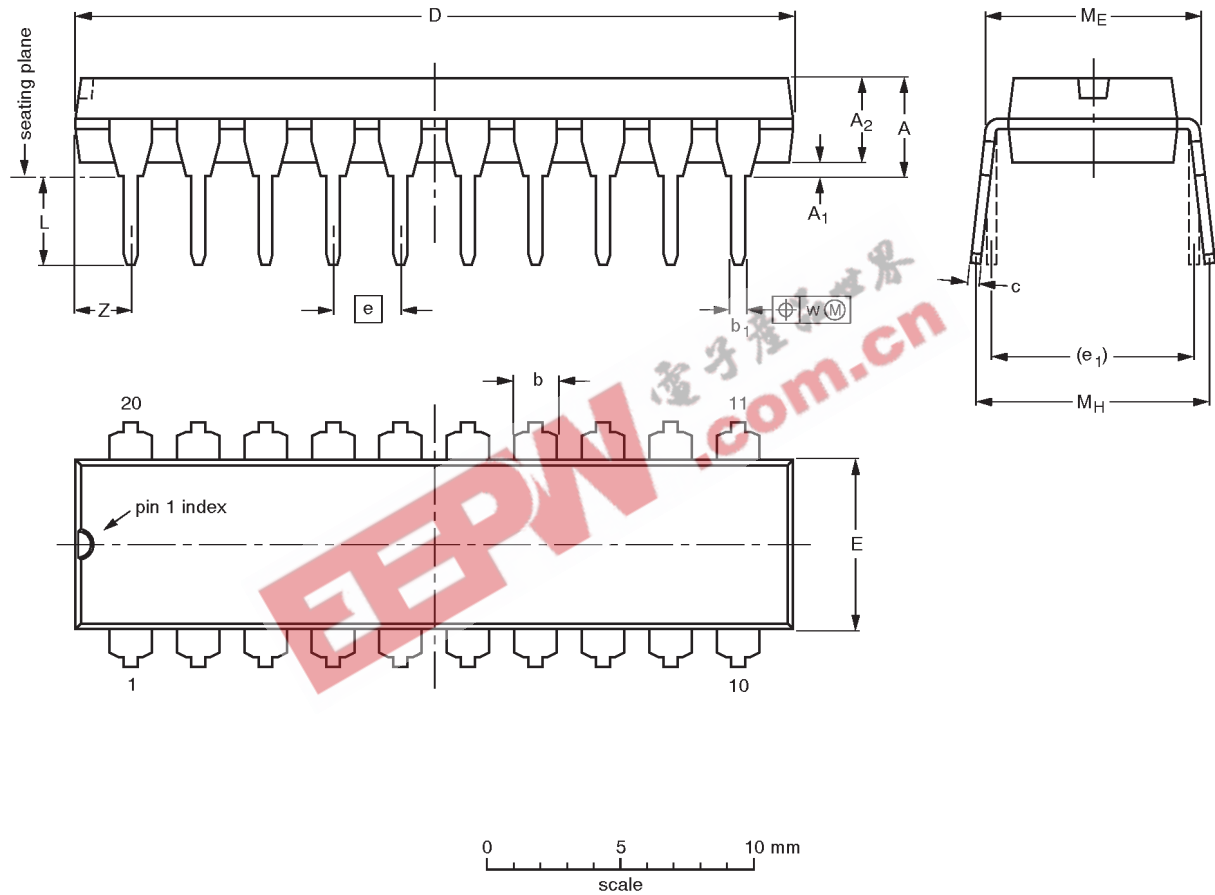
SF00006

Hex 2-input AND drivers

74F808, 74F1808

DIP20: plastic dual in-line package; 20 leads (300 mil)

SOT146-1



DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A <sub>1</sub> min.	A <sub>2</sub> max.	b	b <sub>1</sub>	c	D <sup>(1)</sup>	E <sup>(1)</sup>	e	e <sub>1</sub>	L	M <sub>E</sub>	M <sub>H</sub>	w	Z <sup>(1)</sup> max.
mm	4.2	0.51	3.2	1.73 1.30	0.53 0.38	0.36 0.23	26.92 26.54	6.40 6.22	2.54	7.62	3.60 3.05	8.25 7.80	10.0 8.3	0.254	2.0
inches	0.17	0.020	0.13	0.068 0.051	0.021 0.015	0.014 0.009	1.060 1.045	0.25 0.24	0.10	0.30	0.14 0.12	0.32 0.31	0.39 0.33	0.01	0.078

Note

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

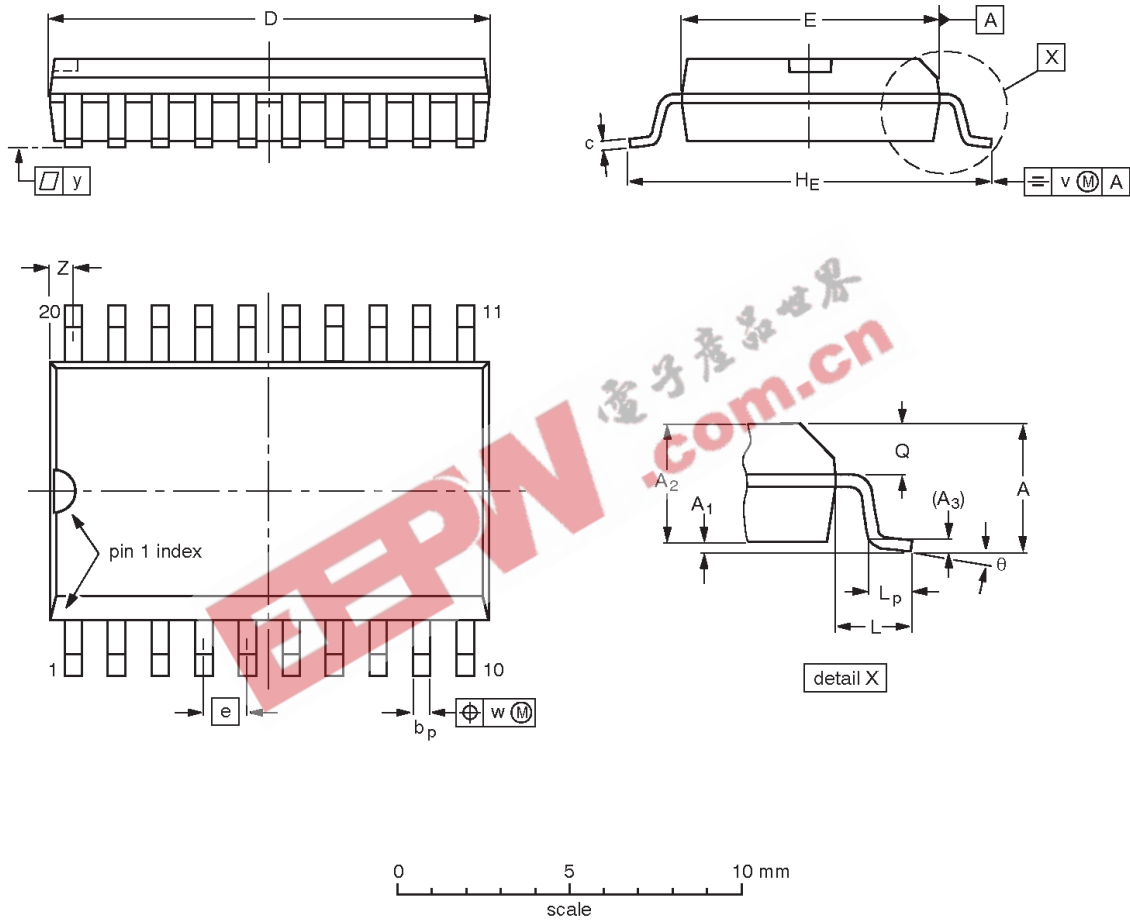
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT146-1			SC603			92-11-17 95-05-24

Hex 2-input AND drivers

74F808, 74F1808

SO20: plastic small outline package; 20 leads; body width 7.5 mm

SOT163-1



DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	b <sub>p</sub>	c	D <sup>(1)</sup>	E <sup>(1)</sup>	e	H <sub>E</sub>	L	L <sub>p</sub>	Q	v	w	y	Z <sup>(1)</sup>	θ
mm	2.65	0.30 0.10	2.45 2.25	0.25	0.49 0.36	0.32 0.23	13.0 12.6	7.6 7.4	1.27	10.65 10.00	1.4	1.1 0.4	1.1 1.0	0.25	0.25	0.1	0.9 0.4	8° 0°
inches	0.10	0.012 0.004	0.096 0.089	0.01	0.019 0.014	0.013 0.009	0.51 0.49	0.30 0.29	0.050	0.419 0.394	0.055	0.043 0.016	0.043 0.039	0.01	0.01	0.004	0.035 0.016	

Note

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT163-1	075E04	MS-013AC				95-01-24 97-05-22

## Hex 2-input AND drivers

74F808, 74F1808

## Data sheet status

Data sheet status	Product status	Definition [1]
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
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[1] Please consult the most recently issued datasheet before initiating or completing a design.

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Philips Semiconductors  
811 East Arques Avenue  
P.O. Box 3409  
Sunnyvale, California 94088-3409  
Telephone 800-234-7381

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