

# DATA SHEET

## **74F30244**

Octal 30Ω line driver with enable,  
non-inverting (open collector)

Product specification  
Supersedes data of 1999 Jan 08  
IC15 Data Handbook

2000 Jun 30

# Octal 30Ω line driver with enable, non-inverting (open collector)

74F30244

## FEATURES

- Ideal for driving transmission lines or backplanes. 160mA I<sub>OL</sub> ideal for applications with impedance as low as 30Ω
- Guaranteed threshold voltages on the incident wave while driving line as low as 30Ω
- High impedance NPN base inputs for reduced loading (20μA in High and Low states)
- Ideal for applications which require high output drive and minimal bus loading
- Octal interface
- Non-inverting
- Open-Collector outputs sink 160mA
- Multiple side pins are used for V<sub>CC</sub> and GND to reduce lead inductance (improves speed and noise immunity)
- Available in 24-pin standard slim DIP (300mil) plastic or SOL

## DESCRIPTION

The 74F30244 is a high current open collector octal buffer composed of eight inverters. The 74F30244 has non-inverting paths. The device has eight inverters with two Output Enables ( $\overline{OE}0$ ,  $\overline{OE}1$ ), each controlling four outputs. The driver is designed to deal with the low-impedance transmission line effects found on printed circuit boards when fast edge rates are used. The 160mA I<sub>OL</sub> provides ample power to achieve TTL switching voltages on the incident wave.

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F30244	10.5ns	69mA

## ORDERING INFORMATION

DESCRIPTION	COMMERCIAL RANGE V <sub>CC</sub> = 5V ±10%, T <sub>amb</sub> = 0°C to +70°C	PACKAGE DRAWING NUMBER
24-pin Plastic Slim DIP (300mil)	N74F30244N	SOT222-1
24-pin Plastic SOL <sup>1</sup>	N74F30244D	SOT137-1

### NOTE:

1. Because of the high current sinking capability of these parts, the SOL package should only be used under the following conditions:
  - a. 50% duty cycle,
 AND
  - b. 3/5 of remaining 50% driving ≤ 100mA (leaving the remaining 2/5 of the drive ≤ 160mA)
 OR
  - c. use ≤ 450 linear feet per minute forced air or other thermal mounting techniques.

## INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

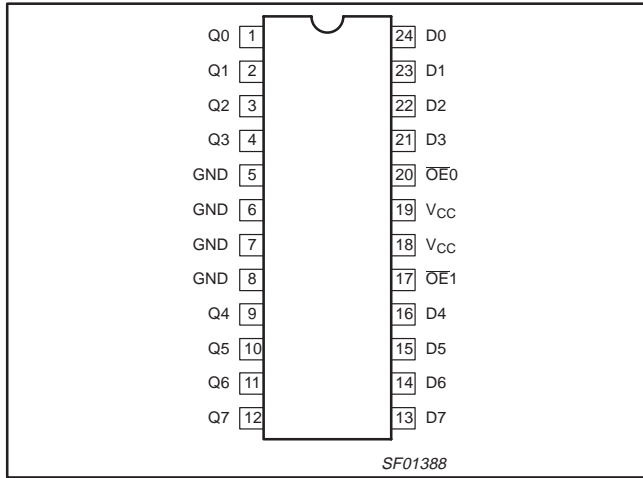
PINS	DESCRIPTION	74F(U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
D0–D7	Data inputs	1.0/0.033	20μA/20μA
$\overline{OE}0$ – $\overline{OE}1$	Output Enable inputs (Active Low)	1.0/0.033	20μA/20μA
Q0–Q7	Data outputs (OC)	OC/266.7	OC/160mA

NOTE: One (1.0) FAST unit load is defined as: 20μA in the High state and 0.6mA in the Low state. OC = Open Collector.

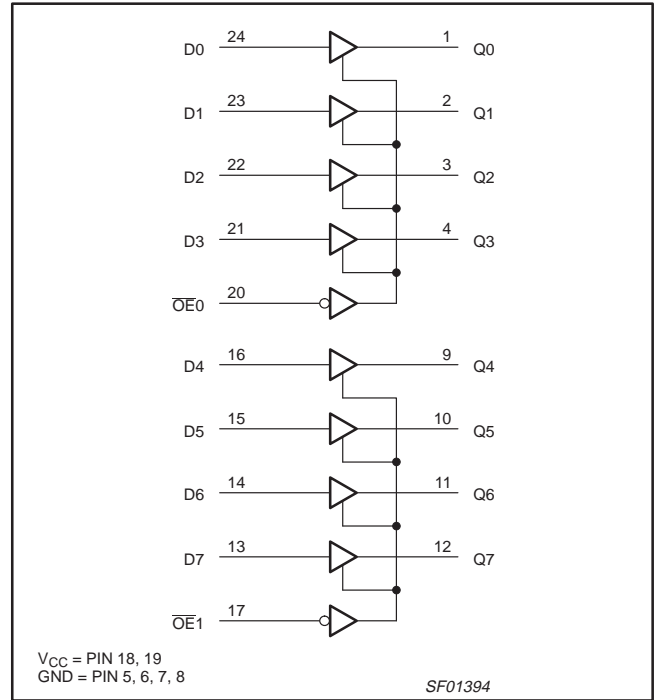
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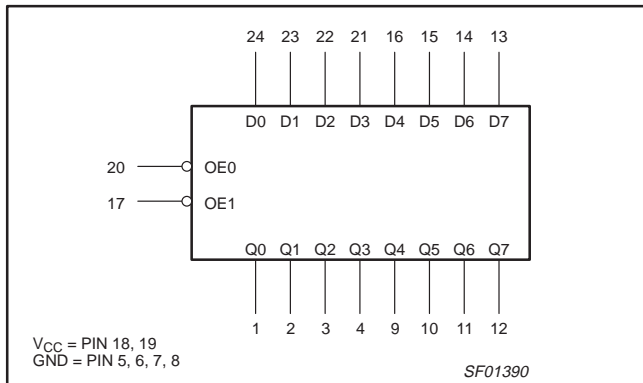
## PIN CONFIGURATION



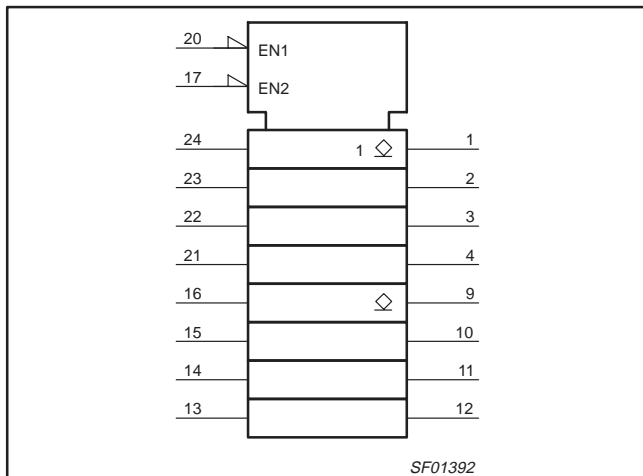
## LOGIC DIAGRAM



## LOGIC SYMBOL



## IEC/IEEE SYMBOL



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## FUNCTION TABLE

INPUTS		OUTPUTS
$\overline{OEn}$	Dn	Qn
L	L	L
L	H	H
H	X	OFF

H = High voltage level

L = Low voltage level

X = Don't care

OFF = Pulled up through resistor (Open Collector)

## ABSOLUTE MAXIMUM RATINGS

(Operation beyond the limits 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	320	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			UNIT
		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
$V_{OH}$	High-level output voltage			4.5	V
$I_{OL}$	Low-level output current			160	mA
$T_{amb}$	Operating free-air temperature range	0		+70	°C

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## 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	
I <sub>OH</sub>	High-level output current		V <sub>CC</sub> = MIN, V <sub>IL</sub> = MAX, V <sub>IH</sub> = MIN, V <sub>OH</sub> = MAX				250	μA
V <sub>OL</sub>	Low-level output current		V <sub>CC</sub> = MIN, V <sub>IL</sub> = MAX, V <sub>IH</sub> = MIN	I <sub>OL</sub> = 100mA	±10% V <sub>CC</sub>	0.42	0.55	V
				I <sub>OL</sub> = 160mA <sup>3</sup>	±5% V <sub>CC</sub>		0.80	V
V <sub>IK</sub>	Input clamp voltage		V <sub>CC</sub> = MIN, I <sub>I</sub> = I <sub>IK</sub>			-0.73	-1.2	V
I <sub>I</sub>	Input current at maximum input voltage		V <sub>CC</sub> = 0.0V, V <sub>I</sub> = 7.0V				100	μA
I <sub>IH</sub>	High-level input current		V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.7V				20	μA
I <sub>IL</sub>	Low-level input current		V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.5V				-20	μA
I <sub>CC</sub>	Supply current (total)	74F30244	V <sub>CC</sub> = MAX		I <sub>CCH</sub>	19	27	mA
					I <sub>CCL</sub>	70	100	mA

**NOTES:**

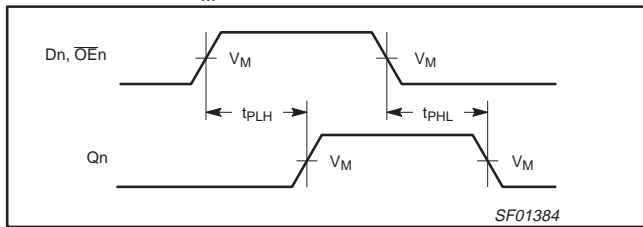
- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
- All typical values are at V<sub>CC</sub> = 5V, T<sub>amb</sub> = 25°C.
- I<sub>OL1</sub> is the current necessary to guarantee the High-to-Low transition in a 30Ω transmission line on the incident wave.

## AC ELECTRICAL CHARACTERISTICS

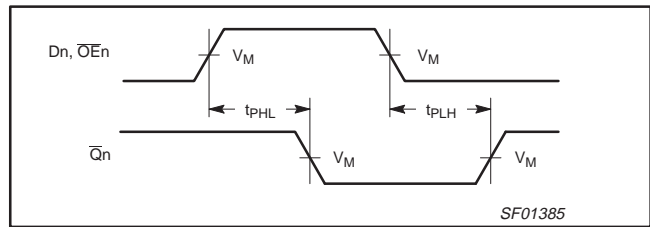
SYMBOL	PARAMETER	TEST CONDITION	LIMITS					UNIT
			T <sub>amb</sub> = +25°C V <sub>CC</sub> = +5.0V C <sub>L</sub> = 50pF, R <sub>L</sub> = 500Ω			T <sub>amb</sub> = 0°C to +70°C V <sub>CC</sub> = +5.0V ± 10% C <sub>L</sub> = 50pF, R <sub>L</sub> = 500Ω		
			MIN	TYP	MAX	MIN	MAX	
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation delay Dn to Qn	Waveform 1	4.0 3.0	10.5 5.5	14.5 9.0	4.0 3.0	15.0 9.5	ns
t <sub>PLH</sub> t <sub>PHL</sub>	Propagation delay OE <sub>n</sub> to Qn	Waveform 1, 2	4.0 3.5	9.5 6.0	14.0 9.0	4.0 3.5	14.5 10.5	ns

## AC WAVEFORMS

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



Waveform 1. Propagation Delay for Data to Output

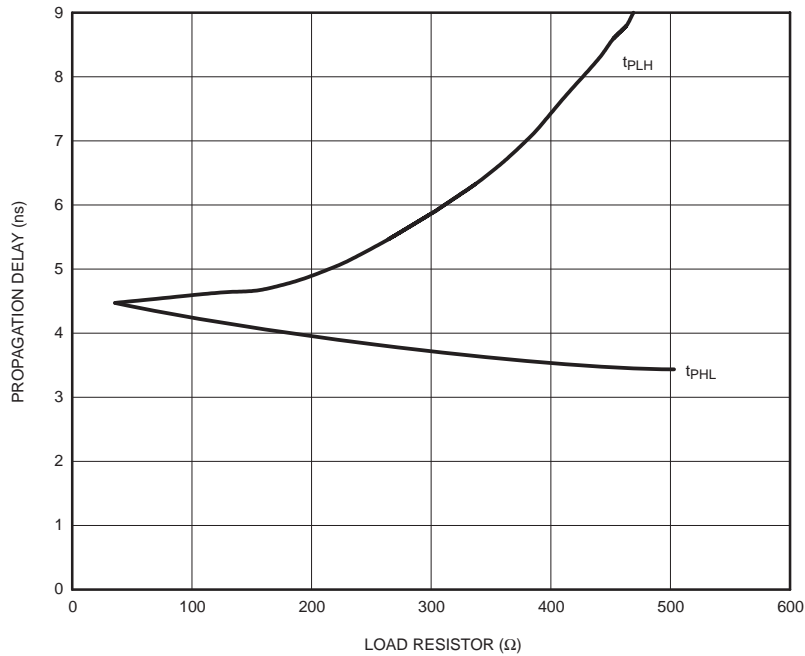


Waveform 2. Propagation Delay for Data to Output

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## TYPICAL PROPAGATION DELAYS VERSUS LOAD FOR OPEN COLLECTOR OUTPUTS

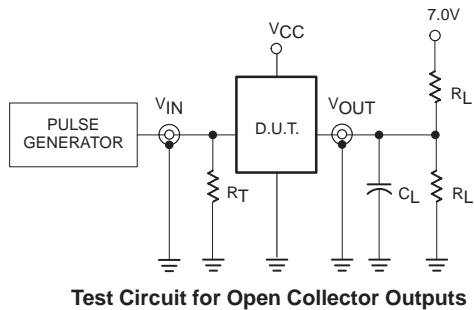


**NOTE:**

When using Open-Collector parts, the value of the pull-up resistor greatly affects the value of the t<sub>PLH</sub>. For example, changing the specified pull-up resistor value from 500Ω to 100Ω will improve the t<sub>PLH</sub> up to 50% with only a slight increase in the t<sub>PHL</sub>. However, if the value of the pull-up resistor is changed, the user must make certain that the total I<sub>OL</sub> current through the resistor and the total I<sub>IL</sub>s of the receivers does not exceed the I<sub>OL</sub> maximum specification.

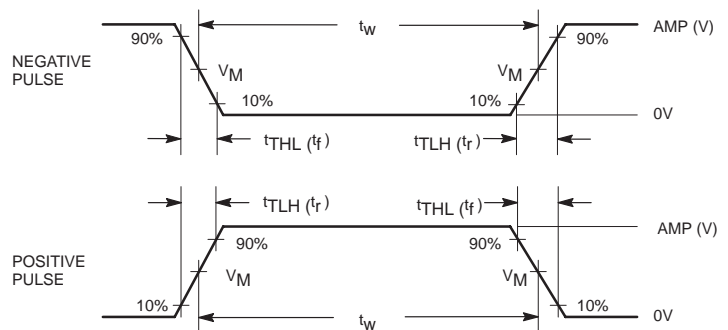
SF01386

## TEST CIRCUIT AND WAVEFORMS



**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.



**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

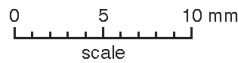
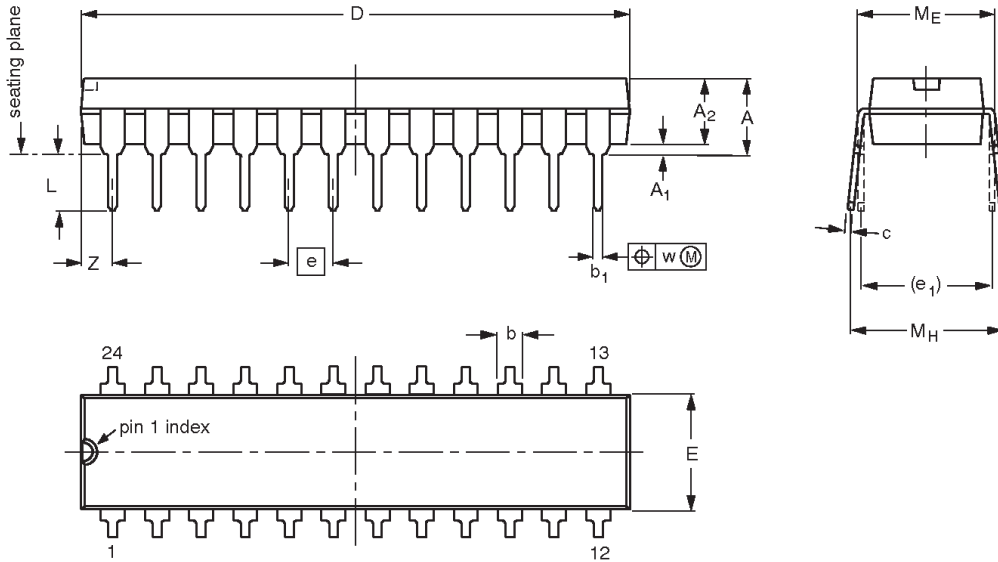
SF00027

Octal 30Ω line driver with enable, non-inverting  
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DIP24: plastic dual in-line package; 24 leads (300 mil)

SOT222-1



**DIMENSIONS (millimetre dimensions are derived from the original inch 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	4.70	0.38	3.94	1.63 1.14	0.56 0.43	0.36 0.25	31.9 31.5	6.73 6.48	2.54	7.62	3.51 3.05	8.13 7.62	10.03 7.62	0.25	2.05
inches	0.185	0.015	0.155	0.064 0.045	0.022 0.017	0.014 0.010	1.256 1.240	0.265 0.255	0.100	0.300	0.138 0.120	0.32 0.30	0.395 0.300	0.01	0.081

**Note**

1. Plastic or metal protrusions of 0.01 inches maximum per side are not included.

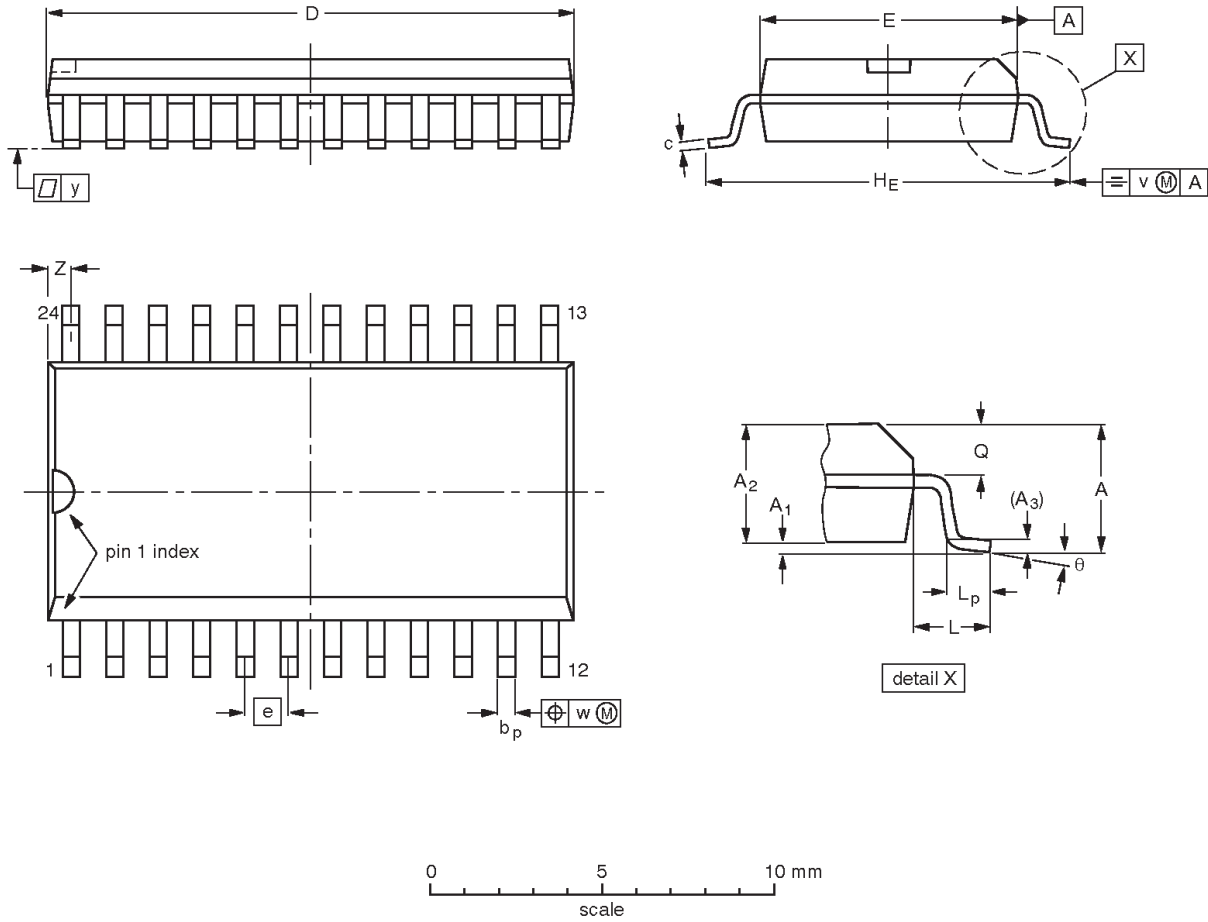
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT222-1		MS-001AF				95-03-11

Octal 30Ω line driver with enable, non-inverting  
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SO24: plastic small outline package; 24 leads; body width 7.5 mm

SOT137-1



**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	15.6 15.2	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	0.61 0.60	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			
SOT137-1	075E05	MS-013AD				95-01-24 97-05-22



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**NOTES**

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## 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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