

# 8-Bit Addressable Latch MC74AC259, MC74ACT259

The MC74AC259/74ACT259 is a high-speed 8-bit addressable latch designed for general purpose storage applications in digital systems. It is a multifunctional device capable of storing single line data in eight addressable latches, and also a 1-of-8 decoder and demultiplexer with active HIGH outputs. The device also incorporates an active LOW Common Clear for resetting all latches, as well as an active LOW Enable. It is functionally identical to the ALS259 8-bit addressable latch.

- Serial-to-Parallel Conversion
- Eight Bits of Storage with Output of Each Bit Available
- Random (Addressable) Data Entry
- Active High Demultiplexing or Decoding Capability
- Easily Expandable
- Common Clear
- These are Pb-Free Devices

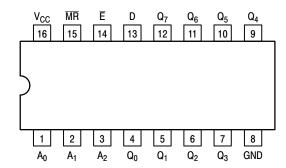


Figure 1. Pinout: 16-Lead Packages Conductors (Top View)

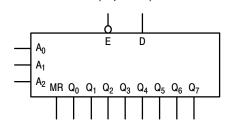


Figure 2. Logic Symbol

#### **MODE SELECT TABLE**

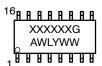
Ē	MR	Mode
L	Н	Addressable Latch
Н	Н	Memory
L	L	Active HIGH 8-Channel Demultiplexer
Н	L	Clear

H = HIGH Voltage Level L = LOW Voltage Level

#### MARKING DIAGRAM



SOIC-16 D SUFFIX CASE 751B



XXX = Specific Device Code A = Assembly Location

WL = Wafer Lot
 Y = Year
 WW = Work Week
 G = Pb-Free Package

#### **ORDERING INFORMATION**

See detailed ordering and shipping information in the package dimensions section on page 8 of this data sheet.

#### MODE SELECT-FUNCTION TABLE

Operating			Inp	uts						Out	puts			
Mode	MR	Ē	D	A <sub>0</sub>	A <sub>1</sub>	A <sub>2</sub>	$Q_0$	Q <sub>1</sub>	$Q_2$	$Q_3$	$Q_4$	$Q_5$	$Q_6$	Q <sub>7</sub>
Master Reset	L	Н	Χ	Χ	Χ	Χ	L	L	L	L	L	L	L	L
	L	L	d	L	L	L	Q = d	L	L	L	L	L	L	L
	L	L	d	Н	L	L	L	Q = d	L	L	L	L	L	L
Demultiplex	L	L	d	L	Н	L	L	L	Q = d	L	L	L	L	L
(Active HIGH Decoder when	•	•	•	•	•	•	•	•	•	•	•	•	•	•
D = H)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
D = 11)	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	L	L	d	Н	Н	Н	L	L	L	L	L	L	L	Q = d
Store (Do Nothing)	Н	Н	Х	Х	Х	Х	qo	q <sub>1</sub>	$q_2$	q <sub>3</sub>	q <sub>4</sub>	<b>q</b> 5	q <sub>6</sub>	q <sub>7</sub>
	Н	L	d	L	L	L	Q = d	q <sub>1</sub>	$q_2$	$q_3$	$q_4$	$q_5$	q <sub>6</sub>	<b>q</b> <sub>7</sub>
	Н	L	d	Н	L	L	$q_0$	Q = d	$q_2$	$q_3$	$q_4$	$q_5$	$q_6$	q <sub>7</sub>
A alalua a a a la la	Н	L	d	L	Н	L	$q_0$	$q_1$	Q = d	$q_3$	$q_4$	$q_5$	$q_6$	q <sub>7</sub>
Addressable Latch	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Laten	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	Н	L	d	Н	Н	Н	$q_0$	$q_1$	$q_2$	$q_3$	$q_4$	$q_5$	$q_6$	Q = d

H = HIGH Voltage Level

#### **FUNCTIONAL DESCRIPTION**

The MC74AC259/74ACT259 has four modes of operation as shown in the Mode Selection Table. In the addressable latch mode, data on the Data line (D) is written into the addressed latch. The addressed latch will follow the data input with all non-addressed latches remaining in their previous states in the memory mode. All latches remain in their previous state and are unaffected by the Data or Address inputs.

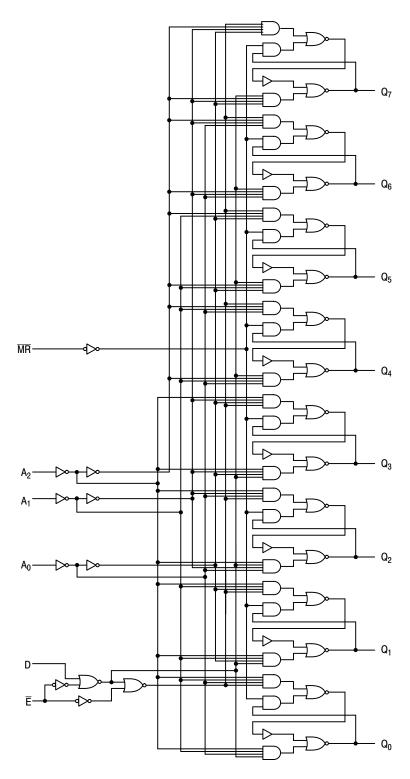
In the one-of-eight decoding or demultiplexing mode, the addressed output will follow the state of the D input with all other outputs in the LOW state. In the clear mode all outputs are LOW and unaffected by the address and data inputs. When operating the MC74AC/ACT259 as an addressable latch, changing more than one bit of the address could impose a transient wrong address. Therefore, this should only be done while in the memory mode. The Mode Select Function Table summarizes the operations of the MC74AC/ACT259.

L = LOW Voltage Level

X = Immaterial

d = HIGH or LOW Data one setup time prior to the LOW-to-HIGH Enable transition

q = Lower case letters indicate the state of the referenced output established during the last cycle in which it was addressed or cleared.



NOTE: This diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

Figure 3. Logic Diagram

#### **MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	DC Supply Voltage	-0.5 to +6.5	V
VI	DC Input Voltage	$-0.5 \le V_{CC} + 0.5$	V
Vo	DC Output Voltage (Note 1)	$-0.5 \le V_{CC} + 0.5$	V
I <sub>IK</sub>	DC Input Diode Current	±20	mA
I <sub>OK</sub>	DC Output Diode Current	±50	mA
I <sub>O</sub>	DC Output Sink/Source Current	±50	mA
I <sub>CC</sub>	DC Supply Current per Output Pin	±50	mA
I <sub>GND</sub>	DC Ground Current per Output Pin	±50	mA
T <sub>STG</sub>	Storage Temperature Range	-65 to +150	°C
TL	Lead temperature, 1 mm from Case for 10 Seconds	260	°C
TJ	Junction temperature under Bias	+150	°C
$\theta_{\sf JA}$	Thermal Resistance (Note 2)	126	°C/W
$P_{D}$	Power Dissipation in Still Air at 25°C (Note 3)	995	mW
MSL	Moisture Sensitivity	Level 1	
F <sub>R</sub>	Flammability Rating Oxygen Index: 30% – 35%	UL 94 V-0 @ 0.125 in	
V <sub>ESD</sub>	ESD Withstand Voltage Human Body Model (Note 4) Charged Device Model (Note 5)	> 2000 > 1000	V
I <sub>Latch-Up</sub>	Latch-Up Performance Above V <sub>CC</sub> and Below GND at 85°C (Note 6)	±100	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

- 1. I<sub>O</sub> absolute maximum rating must be observed.
- 2. The package thermal impedance is calculated in accordance with JESD51-7.
- 3. 500 mW at 65°C; derate to 300 mW by 10 mW/ from 65°C to 85°C.
- 4. Tested to EIA/JESD22-A114-A.
- 5. Tested to JESD22-C101-A.
- 6. Tested to EIA/JESD78.

#### RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter		Min	Тур	Max	Unit	
V	Consulta Valta and	'AC	2.0	5.0	6.0	V	
V <sub>CC</sub>	Supply Voltage	'ACT	4.5	5.0	5.5		
V <sub>IN</sub> , V <sub>OUT</sub>	DC Input Voltage, Output Voltage (Ref. to GND)	0	-	V <sub>CC</sub>	V		
t <sub>r</sub> , t <sub>f</sub>		V <sub>CC</sub> @ 3.0 V	-	150	-		
	Input Rise and Fall Time (Note 1)  'AC Devices except Schmitt Inputs	V <sub>CC</sub> @ 4.5 V	-	40	-	ns/V	
	// C Devices except commit impate	V <sub>CC</sub> @ 5.5 V	-	25	-		
	Input Rise and Fall Time (Note 2)	V <sub>CC</sub> @ 4.5 V	-	10	-	ns/V	
t <sub>r</sub> , t <sub>f</sub>	'ACT Devices except Schmitt Inputs	V <sub>CC</sub> @ 5.5 V	-	8.0	_		
T <sub>A</sub>	Operating Ambient Temperature Range	-40	25	85	°C		
I <sub>OH</sub>	Output Current - High	-	-	-24	mA		
I <sub>OL</sub>	Output Current – Low			-	24	mA	

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

- V<sub>IN</sub> from 30% to 70% V<sub>CC</sub>; see individual Data Sheets for devices that differ from the typical input rise and fall times.
   V<sub>IN</sub> from 0.8 V to 2.0 V; see individual Data Sheets for devices that differ from the typical input rise and fall times.

# **DC CHARACTERISTICS**

			74	AC	74AC		
Symbol	Parameter	V <sub>CC</sub> (V)	T <sub>A</sub> = +25°C		T <sub>A</sub> =-40°C to +85°C	Unit	Conditions
		(*)	Тур	G	uaranteed Limits		
V <sub>IH</sub>	Minimum High Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	2.1 3.15 3.85	2.1 3.15 3.85	٧	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V
V <sub>IL</sub>	Maximum Low Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	0.9 1.35 1.65	0.9 1.35 1.65	٧	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> - 0.1 V
V <sub>OH</sub>	Minimum High Level Output Voltage	3.0 4.5 5.5	2.99 4.49 5.49	2.9 4.4 5.4	2.9 4.4 5.4	٧	I <sub>OUT</sub> = -50 μA
		3.0 4.5 5.5	- - -	2.56 3.86 4.86	2.46 3.76 4.76	V	$*V_{IN} = V_{IL} \text{ or } V_{IH}$ $-12 \text{ mA}$ $I_{OH}$ $-24 \text{ mA}$ $-24 \text{ mA}$
V <sub>OL</sub>	Maximum Low Level Output Voltage	3.0 4.5 5.5	0.002 0.001 0.001	0.1 0.1 0.1	0.1 0.1 0.1	٧	I <sub>OUT</sub> = 50 μA
		3.0 4.5 5.5	- - -	0.36 0.36 0.36	0.44 0.44 0.44	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> 12 mA I <sub>OL</sub> 24 mA 24 mA
I <sub>IN</sub>	Maximum Input Leakage Current	5.5	-	±0.1	±1.0	μА	V <sub>I</sub> = V <sub>CC</sub> , GND
I <sub>OLD</sub>	†Minimum Dynamic	5.5	-	_	75	mA	V <sub>OLD</sub> = 1.65 V Max
I <sub>OHD</sub>	Output Current	5.5	-	_	-75	mA	V <sub>OHD</sub> = 3.85 V Min
I <sub>CC</sub>	Maximum Quiescent Supply Current	5.5	-	8.0	80	μА	V <sub>IN</sub> = V <sub>CC</sub> or GND

<sup>\*</sup>All outputs loaded; thresholds on input associated with output under test.  $\dagger$ Maximum test duration 2.0 ms, one output loaded at a time.

NOTE:  $I_{IN}$  and  $I_{CC}$  @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V  $V_{CC}$ .

# **AC CHARACTERISTICS**

				74AC		74.		
Symbol	Parameter		T <sub>A</sub> = +25°C C <sub>L</sub> = 50 pF			T <sub>A</sub> = -40°C to +85°C C <sub>L</sub> = 50 pF		Unit
			Min	Тур	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to Q <sub>n</sub>	3.3 5.0	2.0 2.0	9.0 6.5	14.5 10.0	1.5 1.5	17.0 11.5	ns
t <sub>PHL</sub>	Propagation Delay D <sub>n</sub> to Q <sub>n</sub>	3.3 5.0	2.0 2.0	9.0 6.0	13.5 9.5	1.5 1.5	16.0 11.0	ns
t <sub>PLH</sub>	Propagation Delay E to Q <sub>n</sub>	3.3 5.0	2.0 2.0	10.5 7.0	15.0 10.5	1.5 1.5	17.5 12.5	ns
t <sub>PHL</sub>	Propagation Delay E to Q <sub>n</sub>	3.3 5.0	2.0 2.0	8.0 7.5	12.5 9.0	1.5 1.5	15.0 11.0	ns
t <sub>PLH</sub>	Propagation Delay Address to Q <sub>n</sub>	3.3 5.0	2.0 2.0	12.0 8.0	19.0 13.0	1.5 1.5	22.5 15.5	ns
t <sub>PHL</sub>	Propagation Delay Address to Q <sub>n</sub>	3.3 5.0	2.0 2.0	10.0 7.0	16.0 11.0	1.5 1.5	19.0 13.0	ns
t <sub>PHL</sub>	Propagation Delay MR to Q	3.3 5.0	2.0 2.0	8.0 6.0	12.0 9.0	1.5 1.5	13.5 10.0	ns

<sup>\*</sup>Voltage Range 3.3 V is 3.3 V  $\pm 0.3$  V. \*Voltage Range 5.0 V is 5.0 V  $\pm 0.5$  V.

# **AC OPERATING REQUIREMENTS**

				74AC	74AC	
Symbol	Parameter			<sub>A</sub> = +25°C <sub>L</sub> = 50 pF	T <sub>A</sub> = -40°C to +85°C C <sub>L</sub> = 50 pF	Unit
			Тур	Guaran	teed Minimum	
t <sub>s</sub>	Setup Time, HIGH or LOW D <sub>n</sub> to E	3.3 5.0	- -	3.5 2.5	4.5 3.5	ns
t <sub>h</sub>	Hold Time, HIGH or LOW D <sub>n</sub> to E	3.3 5.0	- -	2.5 2.0	2.5 2.0	ns
t <sub>s</sub>	Setup Time Address to E	3.3 5.0	-	7.0 4.0	9.0 6.0	ns
t <sub>h</sub>	Hold Time Address to E	3.3 5.0	- -	2.0 2.0	2.0 2.0	ns
t <sub>w</sub>	Minimum Pulse Width MR	3.3 5.0	- -	6.0 5.5	6.5 6.0	ns
t <sub>w</sub>	Minimum Pulse Width E	3.3 5.0	- -	6.5 5.5	7.0 6.0	ns

<sup>\*</sup>Voltage Range 3.3 V is 3.3 V  $\pm 0.3$  V. \*Voltage Range 5.0 V is 5.0 V  $\pm 0.5$  V.

# **DC CHARACTERISTICS**

			74	ACT	74ACT		
Symbol	Parameter	V <sub>CC</sub> (V)	T <sub>A</sub> = -	+25°C	T <sub>A</sub> = -40°C to +85°C	Unit	Conditions
		(-)	Тур	G	uaranteed Limits		
V <sub>IH</sub>	Minimum High Level Input Voltage	4.5 5.5	1.5 1.5	2.0 2.0	2.0 2.0	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> – 0.1 V
V <sub>IL</sub>	Maximum Low Level Input Voltage	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8	V	V <sub>OUT</sub> = 0.1 V or V <sub>CC</sub> – 0.1 V
V <sub>OH</sub>	Minimum High Level Output Voltage	4.5 5.5	4.49 5.49	4.4 5.4	4.4 5.4	V	I <sub>OUT</sub> = -50 μA
		4.5 5.5	_ _	3.86 4.86	3.76 4.76	V	$*V_{IN} = V_{IL} \text{ or } V_{IH}$ $-24 \text{ mA}$ $I_{OH}$ $-24 \text{ mA}$
V <sub>OL</sub>	Maximum Low Level Output Voltage	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1	V	I <sub>OUT</sub> = 50 μA
		4.5 5.5	- -	0.36 0.36	0.44 0.44	V	*V <sub>IN</sub> = V <sub>IL</sub> or V <sub>IH</sub> 24 mA I <sub>OL</sub> 24 mA
I <sub>IN</sub>	Maximum Input Leakage Current	5.5	-	±0.1	±1.0	μА	V <sub>I</sub> = V <sub>CC</sub> , GND
$\Delta I_{CCT}$	Additional Max. I <sub>CC</sub> /Input	5.5	0.6	-	1.5	mA	V <sub>I</sub> = V <sub>CC</sub> - 2.1 V
I <sub>OLD</sub>	†Minimum Dynamic	5.5	-	-	75	mA	V <sub>OLD</sub> = 1.65 V Max
I <sub>OHD</sub>	Output Current	5.5	-	-	-75	mA	V <sub>OHD</sub> = 3.85 V Min
I <sub>CC</sub>	Maximum Quiescent Supply Current	5.5	-	8.0	80	μΑ	V <sub>IN</sub> = V <sub>CC</sub> or GND

<sup>\*</sup>All outputs loaded; thresholds on input associated with output under test. †Maximum test duration 2.0 ms, one output loaded at a time.

# **AC CHARACTERISTICS**

	Parameter	V <sub>CC</sub> * (V)		74ACT		74		
Symbol			T <sub>A</sub> = +25°C C <sub>L</sub> = 50 pF			T <sub>A</sub> = -40°C C <sub>L</sub> =	Unit	
			Min	Тур	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay D <sub>n</sub> to Q <sub>n</sub>	5.0	2.0	6.5	11.0	1.5	12.5	ns
t <sub>PHL</sub>	Propagation Delay D <sub>n</sub> or Q <sub>n</sub>	5.0	2.0	7.0	10.5	1.5	12.0	ns
t <sub>PLH</sub>	Propagation Delay $\overline{E}$ to $Q_n$	5.0	2.0	10.5	14.0	1.5	16.5	ns
t <sub>PHL</sub>	Propagation Delay $\overline{E}$ or $Q_n$	5.0	2.0	9.0	12.0	1.5	14.0	ns
t <sub>PLH</sub>	Propagation Delay Address to Q <sub>n</sub>	5.0	2.0	8.0	11.5	1.5	13.5	ns
t <sub>PHL</sub>	Propagation Delay Address to Q <sub>n</sub>	5.0	2.0	6.0	10.0	1.5	12.0	ns
t <sub>PHL</sub>	Propagation Delay MR to Q	5.0	2.0		10.0	1.5	11.0	ns

<sup>\*</sup>Voltage Range 5.0 V is 5.0 V  $\pm$ 0.5 V.

# **AC OPERATING REQUIREMENTS**

	Parameter			74ACT	74ACT	Unit
Symbol			T,	գ = +25°C L = 50 pF	T <sub>A</sub> = -40°C to +85°C C <sub>L</sub> = 50 pF	
			Тур	Guarar	nteed Minimum	
t <sub>s</sub>	Setup Time, HIGH or LOW $D_n$ to $\overline{E}$	5.0	-	3.0	4.0	ns
t <sub>h</sub>	Hold Time, HIGH or LOW $D_n$ to $\overline{E}$	5.0	1	2.5	2.5	ns
t <sub>s</sub>	Setup Time Address to $\overline{\mathbb{E}}$	5.0	1	4.5	6.5	ns
t <sub>h</sub>	Hold Time Address to $\overline{\mathbb{E}}$	5.0	1	2.5	2.5	ns
t <sub>w</sub>	Minimum Pulse Width MR	5.0	ı	7.0	7.5	ns
t <sub>w</sub>	Minimum Pulse Width E	5.0	-	7.0	7.5	ns

<sup>\*</sup>Voltage Range 5.0 V is 5.0 V  $\pm$ 0.5 V.

# **CAPACITANCE**

Symbol	Parameter	Value Typ	Unit	Test Conditions
C <sub>IN</sub>	Input Capacitance	4.5	pF	V <sub>CC</sub> = 5.0 V
C <sub>PD</sub>	Power Dissipation Capacitance	50.0	pF	V <sub>CC</sub> = 5.0 V

# **ORDERING INFORMATION**

Part Number	Marking	Package	Shipping <sup>†</sup>
MC74AC259DG	AC259	SOIC-16 (Pb-Free)	48 Units / Rail
MC74AC259DR2G	AC259	SOIC-16 (Pb-Free)	2500 / Tape & Reel
MC74ACT259DR2G	ACT259	SOIC-16 (Pb-Free)	2500 / Tape & Reel

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.



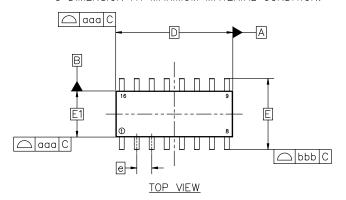


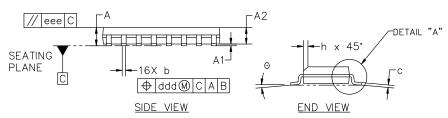
#### SOIC-16 9.90x3.90x1.37 1.27P CASE 751B ISSUE M

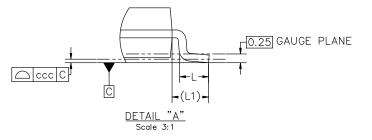
**DATE 18 OCT 2024** 

#### NOTES:

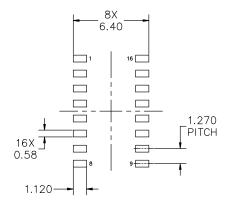
- 1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
- 2. DIMENSION IN MILLIMETERS. ANGLE IN DEGREES.
- 3. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD PROTRUSION.
- 4. MAXIMUM MOLD PROTRUSION 0.15mm PER SIDE.
- 5. DIMENSION 6 DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127mm TOTAL IN EXCESS OF THE 6 DIMENSION AT MAXIMUM MATERIAL CONDITION.







MILLIMETERS					
DIM	MIN	NOM	MAX		
А	1.35	1.55	1.75		
A1	0.10	0.18	0.25		
A2	1.25	1.37	1.50		
b	0.35	0.42	0.49		
С	0.19	0.22	0.25		
D	9.90 BSC				
E	6.00 BSC				
E1	3.90 BSC				
е	1.27 BSC				
h	0.25		0.50		
L	0.40	0.83	1.25		
L1	1.05 REF				
Θ	0.		7.		
TOLERANCE OF FORM AND POSITION					
aaa	0.10				
bbb	0.20				
ccc	0.10				
ddd	0.25				
eee	0.10				



#### RECOMMENDED MOUNTING FOOTPRINT

\*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE onsemi SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D

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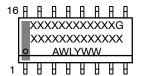
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# **SOIC-16 9.90x3.90x1.37 1.27P** CASE 751B

ISSUE M

**DATE 18 OCT 2024** 

# GENERIC MARKING DIAGRAM\*



XXXXX = Specific Device Code A = Assembly Location

WL = Wafer Lot
 Y = Year
 WW = Work Week
 G = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

STYLE 1:		STYLE 2:		STYLE 3:	S	TYLE 4:	
	COLLECTOR	PIN 1.	CATHODE	PIN 1.	COLLECTOR, DYE #1	PIN 1.	COLLECTOR, DYE #1
	BASE	2.	ANODE	2.	BASE. #1	2.	
3.	EMITTER	3.	NO CONNECTION	3.	EMITTER. #1	3.	
4.	NO CONNECTION	4.	CATHODE	4.	COLLECTOR, #1	4.	COLLECTOR, #2
5.	EMITTER	5.	CATHODE	5.	COLLECTOR, #2	5.	COLLECTOR, #3
6.	BASE	6.	NO CONNECTION	6.	BASE, #2	6.	COLLECTOR, #3
7.	COLLECTOR	7.	ANODE	7.	EMITTER, #2	7.	COLLECTOR, #4
8.	COLLECTOR	8.	CATHODE	8.	COLLECTOR, #2	8.	COLLECTOR, #4
9.	BASE	9.	CATHODE	9.	COLLECTOR, #3	9.	BASE, #4
10.	EMITTER	10.	ANODE	10.	BASE, #3	10.	EMITTER, #4
11.	NO CONNECTION	11.	NO CONNECTION	11.	EMITTER, #3	11.	
	EMITTER	12.	CATHODE	12.		12.	
13.	BASE	13.		13.	COLLECTOR, #4	13.	BASE, #2
14.	COLLECTOR	14.	NO CONNECTION	14.	BASE, #4	14.	
15.	EMITTER	15.	ANODE	15.	EMITTER, #4	15.	
16.	COLLECTOR	16.	CATHODE	16.	COLLECTOR, #4	16.	EMITTER, #1
STYLE 5:		STYLE 6:		STYLE 7:			
PIN 1.	DRAIN, DYE #1	PIN 1.	CATHODE	PIN 1.	SOURCE N-CH		
2.	DRAIN, #1	2.	CATHODE	2.	COMMON DRAIN (OUTPUT)		
3.	DRAIN. #2				COMMON DOMINI (OLITOLIT)		
	שוויאווי, דב	3.	CATHODE	3.	COMMON DRAIN (OUTPUT)		
4.		3. 4.	CATHODE	3. 4.			
4. 5.	DRAIN, #2 DRAIN, #3		CATHODE CATHODE		GATE P-CH COMMON DRAIN (OUTPUT)		
5. 6.	DRAIN, #2 DRAIN, #3 DRAIN, #3	4. 5. 6.	CATHODE CATHODE CATHODE	4. 5. 6.	GATE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT)		
5.	DRAIN, #2 DRAIN, #3 DRAIN, #3 DRAIN, #4	4. 5. 6. 7.	CATHODE CATHODE CATHODE CATHODE	4. 5. 6. 7.	GATE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT)		
5. 6. 7. 8.	DRAIN, #2 DRAIN, #3 DRAIN, #3 DRAIN, #4 DRAIN, #4	4. 5. 6. 7.	CATHODE CATHODE CATHODE CATHODE CATHODE	4. 5. 6. 7. 8.	GATE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) SOURCE P-CH		
5. 6. 7. 8.	DRAIN, #2 DRAIN, #3 DRAIN, #3 DRAIN, #4 DRAIN, #4 GATE, #4	4. 5. 6. 7. 8.	CATHODE CATHODE CATHODE CATHODE CATHODE ANODE	4. 5. 6. 7. 8. 9.	GATE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) SOURCE P-CH SOURCE P-CH		
5. 6. 7. 8. 9.	DRAIN, #2 DRAIN, #3 DRAIN, #3 DRAIN, #4 DRAIN, #4 GATE, #4 SOURCE, #4	4. 5. 6. 7. 8. 9.	CATHODE CATHODE CATHODE CATHODE CATHODE ANODE ANODE	4. 5. 6. 7. 8. 9.	GATE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) SOURCE P-CH SOURCE P-CH COMMON DRAIN (OUTPUT)		
5. 6. 7. 8. 9. 10.	DRAIN, #2 DRAIN, #3 DRAIN, #3 DRAIN, #4 DRAIN, #4 GATE, #4 SOURCE, #4 GATE, #3	4. 5. 6. 7. 8. 9. 10.	CATHODE CATHODE CATHODE CATHODE CATHODE ANODE ANODE ANODE	4. 5. 6. 7. 8. 9. 10.	GATE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) SOURCE P-CH SOURCE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT)		
5. 6. 7. 8. 9. 10. 11.	DRAIN, #2 DRAIN, #3 DRAIN, #3 DRAIN, #4 DRAIN, #4 GATE, #4 SOURCE, #4 GATE, #3 SOURCE, #3	4. 5. 6. 7. 8. 9. 10. 11.	CATHODE CATHODE CATHODE CATHODE CATHODE ANODE ANODE ANODE ANODE ANODE ANODE	4. 5. 6. 7. 8. 9. 10. 11.	GATE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) SOURCE P-CH SOURCE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT)		
5. 6. 7. 8. 9. 10. 11. 12.	DRAIN, #2 DRAIN, #3 DRAIN, #3 DRAIN, #4 DRAIN, #4 GATE, #4 SOURCE, #4 GATE, #3 SOURCE, #3 GATE, #2	4. 5. 6. 7. 8. 9. 10. 11. 12.	CATHODE CATHODE CATHODE CATHODE CATHODE CATHODE ANODE ANODE ANODE ANODE ANODE ANODE ANODE ANODE	4. 5. 6. 7. 8. 9. 10. 11. 12.	GATE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) SOURCE P-CH SOURCE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) GATE N-CH		
5. 6. 7. 8. 9. 10. 11. 12. 13.	DRAIN, #2 DRAIN, #3 DRAIN, #3 DRAIN, #4 DRAIN, #4 GATE, #4 GATE, #4 GATE, #3 SOURCE, #3 GOURCE, #3 GOURCE, #2 SOURCE, #2	4. 5. 6. 7. 8. 9. 10. 11. 12. 13.	CATHODE CATHODE CATHODE CATHODE CATHODE CATHODE ANODE	4. 5. 6. 7. 8. 9. 10. 11. 12. 13.	GATE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) SOURCE P-CH SOURCE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) CATE N-CH COMMON DRAIN (OUTPUT)		
5. 6. 7. 8. 9. 10. 11. 12. 13. 14.	DRAIN, #2 DRAIN, #3 DRAIN, #3 DRAIN, #4 DRAIN, #4 SOURCE, #4 GATE, #3 SOURCE, #3 GATE, #2 SOURCE, #2 GATE, #1	4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14.	CATHODE CATHODE CATHODE CATHODE CATHODE ANODE	4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14.	GATE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) SOURCE P-CH SOURCE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) GATE N-CH COMMON DRAIN (OUTPUT) GATE N-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT)		
5. 6. 7. 8. 9. 10. 11. 12. 13.	DRAIN, #2 DRAIN, #3 DRAIN, #3 DRAIN, #4 DRAIN, #4 GATE, #4 GATE, #4 GATE, #3 SOURCE, #3 GOURCE, #3 GOURCE, #2 SOURCE, #2	4. 5. 6. 7. 8. 9. 10. 11. 12. 13.	CATHODE CATHODE CATHODE CATHODE CATHODE CATHODE ANODE	4. 5. 6. 7. 8. 9. 10. 11. 12. 13.	GATE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) SOURCE P-CH SOURCE P-CH COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) COMMON DRAIN (OUTPUT) CATE N-CH COMMON DRAIN (OUTPUT)		

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