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## *8-Bit Latched, DMOS Power Driver*

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### **Discontinued Product**

These parts are no longer in production. The device should not be purchased for new design applications. Samples are no longer available.

Date of status change: April 28, 2007

#### **Recommended Substitutions:**

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NOTE: For detailed information on purchasing options, contact your local Allegro field applications engineer or sales representative.

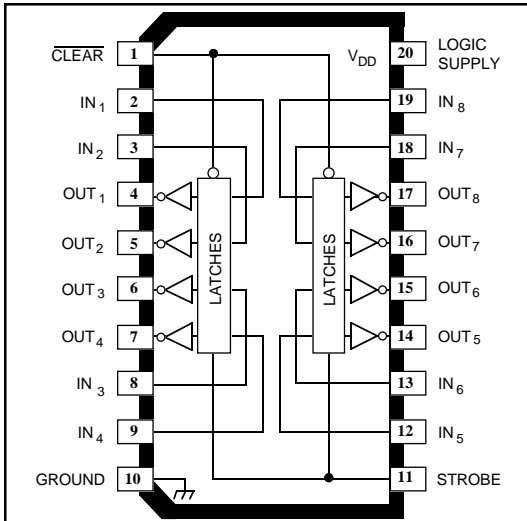
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# 6273

## 8-BIT LATCHED DMOS POWER DRIVER



Dwg. PP-015-2A

Note that the A6273KA (DIP) and the A6273KLW (SOIC) are electrically identical and share a common terminal number assignment.

### ABSOLUTE MAXIMUM RATINGS at $T_A = 25^\circ\text{C}$

|                                      |                  |
|--------------------------------------|------------------|
| Output Voltage, $V_O$ .....          | 50 V             |
| Output Drain Current,                |                  |
| Continuous, $I_O$ .....              | 250 mA*          |
| Peak, $I_{OM}$ .....                 | 750 mA*†         |
| Peak, $I_{OM}$ .....                 | 2.0 A†           |
| Single-Pulse Avalanche Energy,       |                  |
| $E_{AS}$ .....                       | 75 mJ            |
| Logic Supply Voltage, $V_{DD}$ ..... | 7.0 V            |
| Input Voltage Range,                 |                  |
| $V_I$ .....                          | -0.3 V to +7.0 V |
| Package Power Dissipation,           |                  |
| $P_D$ .....                          | See Graph        |
| Operating Temperature Range,         |                  |
| $T_A$ .....                          | -40°C to +125°C  |
| Storage Temperature Range,           |                  |
| $T_S$ .....                          | -55°C to +150°C  |

\* Each output, all outputs on.

† Pulse duration  $\leq 100 \mu\text{s}$ , duty cycle  $\leq 2\%$ .

Caution: These CMOS devices have input static protection (Class 3) but are still susceptible to damage if exposed to extremely high static electrical charges.

The A6273KA and A6273KLW combine eight (positive-edge-triggered D-type) data latches and DMOS outputs for systems requiring relatively high load power. Driver applications include relays, solenoids, and other medium-current or high-voltage peripheral power loads. The CMOS inputs and latches allow direct interfacing with microprocessor-based systems. Use with TTL may require appropriate pull-up resistors to ensure an input logic high.

The DMOS output inverts the DATA input. All of the output drivers are disabled (the DMOS sink drivers turned OFF) with the CLEAR input low. The A6273KA/KLW DMOS open-drain outputs are capable of sinking up to 750 mA.

The A6273KA is furnished in a 20-pin dual in-line plastic package. The A6273KLW is furnished in a 20-lead wide-body, small-outline plastic package (SOIC) with gull-wing leads for surface-mount applications. Copper lead frames, reduced supply current requirements, and low on-state resistance allow both devices to sink 150 mA from all outputs continuously, to ambient temperatures over 85°C.

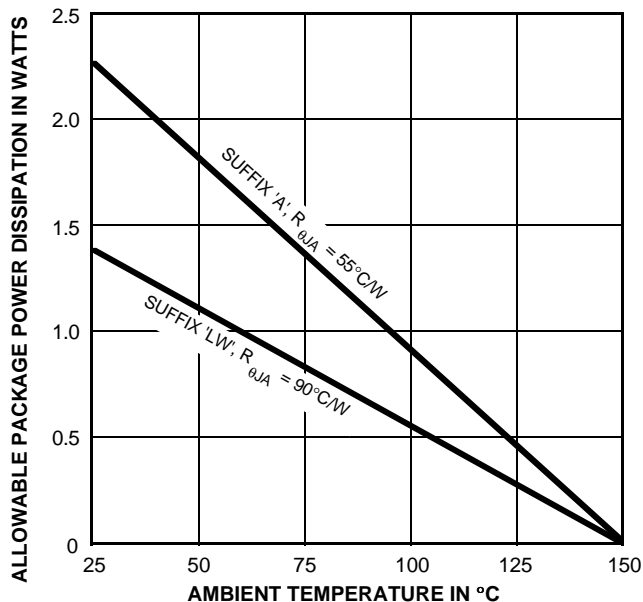
### FEATURES

- 50 V Minimum Output Clamp Voltage
- 250 mA Output Current (all outputs simultaneously)
- 1.3  $\Omega$  Typical  $r_{DS(on)}$
- Low Power Consumption
- Replacements for TPIC6273N and TPIC6273DW

Always order by complete part number:

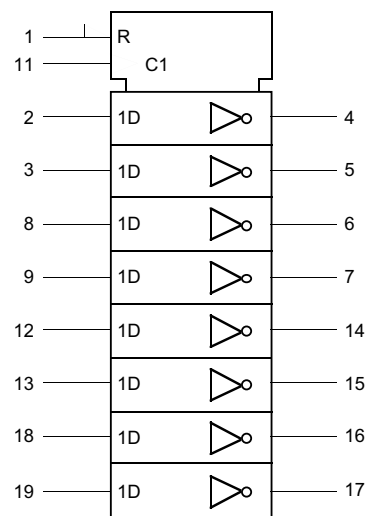
| Part Number | Package      | $R_{\theta JA}$ | $R_{\theta JC}$ |
|-------------|--------------|-----------------|-----------------|
| A6273KA     | 20-pin DIP   | 55°C/W          | 25°C/W          |
| A6273KLW    | 20-lead SOIC | 70°C/W          | 17°C/W          |

# 6273 8-BIT LATCHED DMOS POWER DRIVER

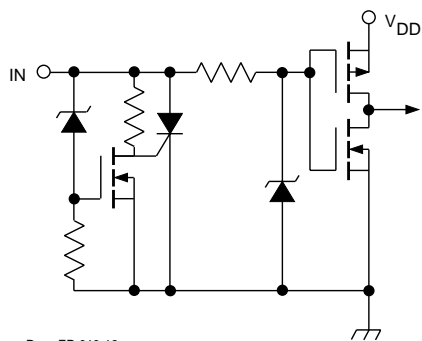


Dwg. GS-004B

## LOGIC SYMBOL

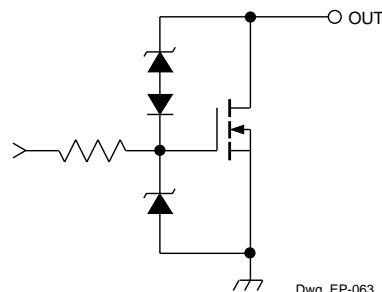


Dwg. FP-046-1A



Dwg. EP-010-16

## LOGIC INPUTS



Dwg. EP-063

## DMOS POWER DRIVER OUTPUT

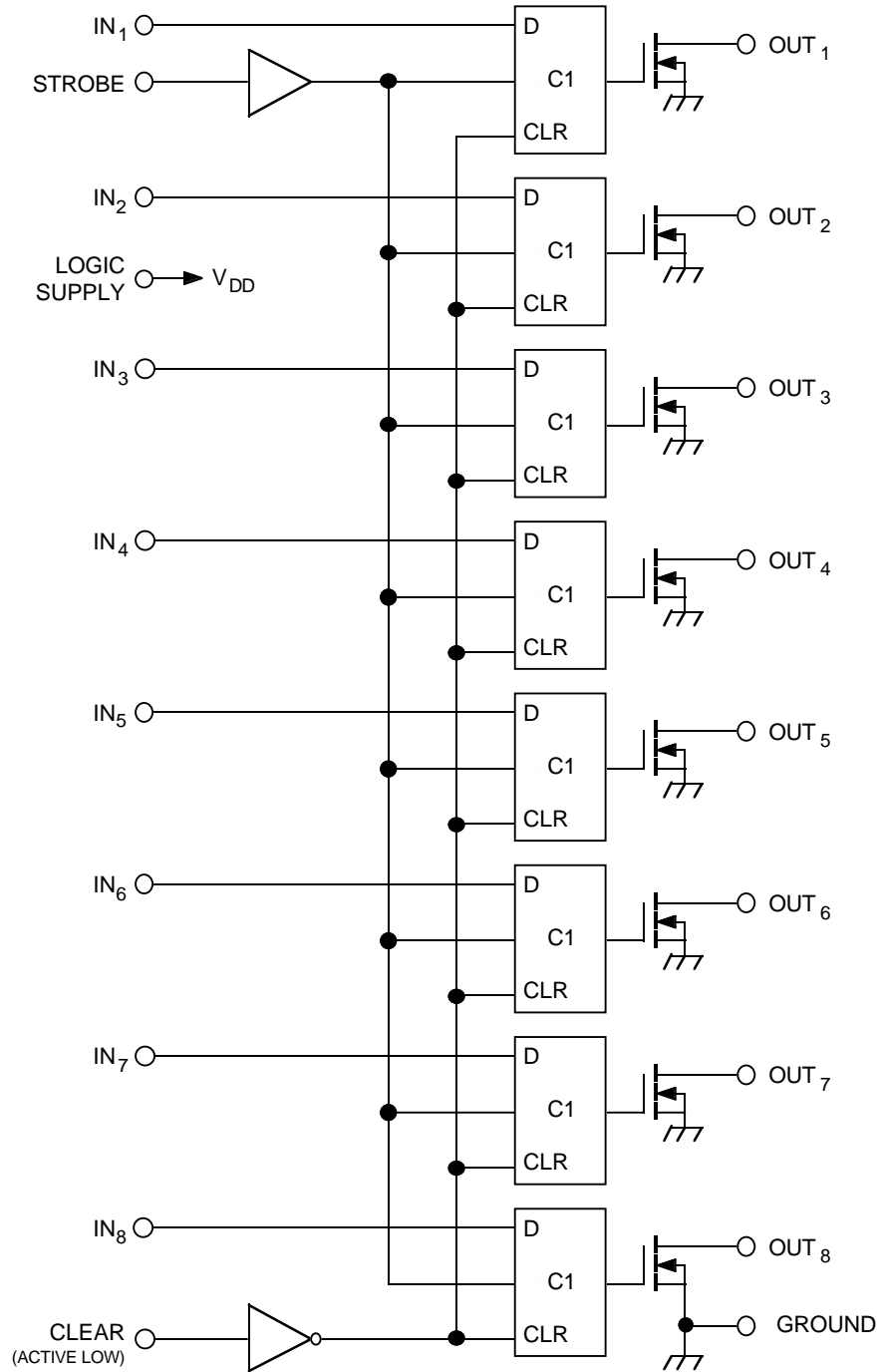
## FUNCTION TABLE

| $\overline{\text{CLEAR}}$ | Inputs |                 | OUT <sub>x</sub> |
|---------------------------|--------|-----------------|------------------|
|                           | STROBE | IN <sub>x</sub> |                  |
| L                         | X      | X               | H                |
| H                         |        | H               | L                |
| H                         |        | L               | H                |
| H                         | L      | X               | R                |

L = Low Logic Level  
H = High Logic Level  
X = Irrelevant  
R = Previous State

**6273**  
**8-BIT LATCHED**  
**DMOS POWER DRIVER**

**FUNCTIONAL BLOCK DIAGRAM**



Dwg. FP-016-2

# 6273

## 8-BIT LATCHED

### DMOS POWER DRIVER

#### RECOMMENDED OPERATING CONDITIONS

over operating temperature range

Logic Supply Voltage Range,  $V_{DD}$  ..... 4.5 V to 5.5 V

High-Level Input Voltage,  $V_{IH}$  .....  $\geq 0.85V_{DD}$

Low-level input voltage,  $V_{IL}$  .....  $\leq 0.15V_{DD}$

#### ELECTRICAL CHARACTERISTICS at $T_A = +25^\circ\text{C}$ , $V_{DD} = 5\text{ V}$ , $t_{ir} = t_{if} \leq 10\text{ ns}$ (unless otherwise specified).

| Characteristic                          | Symbol        | Test Conditions   | Limits |      |      | Units         |
|---|---------------|---|--------|------|------|---------------|
|   |               |   | Min.   | Typ. | Max. |               |
| Logic Supply Voltage                    | $V_{DD}$      | Operating   | 4.5    | 5.0  | 5.5  | V             |
| Output Breakdown Voltage                | $V_{(BR)DSX}$ | $I_O = 1\text{ mA}$   | 50     | —    | —    | V             |
| Off-State Output Current                | $I_{DSX}$     | $V_O = 40\text{ V}$   | —      | 0.05 | 1.0  | $\mu\text{A}$ |
|   |               | $V_O = 40\text{ V}$ , $T_A = 125^\circ\text{C}$                             | —      | 0.15 | 5.0  | $\mu\text{A}$ |
| Static Drain-Source On-State Resistance | $r_{DS(on)}$  | $I_O = 250\text{ mA}$ , $V_{DD} = 4.5\text{ V}$                             | —      | 1.3  | 2.0  | $\Omega$      |
|   |               | $I_O = 250\text{ mA}$ , $V_{DD} = 4.5\text{ V}$ , $T_A = 125^\circ\text{C}$ | —      | 2.0  | 3.2  | $\Omega$      |
|   |               | $I_O = 500\text{ mA}$ , $V_{DD} = 4.5\text{ V}$ (see note)                  | —      | 1.3  | 2.0  | $\Omega$      |
| Nominal Output Current                  | $I_{O(nom)}$  | $V_{DS(on)} = 0.5\text{ V}$ , $T_A = 85^\circ\text{C}$                      | —      | 250  | —    | mA            |
| Logic Input Current                     | $I_{IH}$      | $V_I = V_{DD} = 5.5\text{ V}$   | —      | —    | 1.0  | $\mu\text{A}$ |
|   | $I_{IL}$      | $V_I = 0$ , $V_{DD} = 5.5\text{ V}$   | —      | —    | -1.0 | $\mu\text{A}$ |
| Prop. Delay Time                        | $t_{PLH}$     | $I_O = 250\text{ mA}$ , $C_L = 30\text{ pF}$                                | —      | 625  | —    | ns            |
|   | $t_{PHL}$     | $I_O = 250\text{ mA}$ , $C_L = 30\text{ pF}$                                | —      | 150  | —    | ns            |
| Output Rise Time                        | $t_r$         | $I_O = 250\text{ mA}$ , $C_L = 30\text{ pF}$                                | —      | 675  | —    | ns            |
| Output Fall Time                        | $t_f$         | $I_O = 250\text{ mA}$ , $C_L = 30\text{ pF}$                                | —      | 400  | —    | ns            |
| Supply Current                          | $I_{DD(off)}$ | $V_{DD} = 5.5\text{ V}$ , Outputs OFF                                       | —      | 15   | 100  | $\mu\text{A}$ |
|   | $I_{DD(on)}$  | $V_{DD} = 5.5\text{ V}$ , Outputs ON  | —      | 150  | 300  | $\mu\text{A}$ |

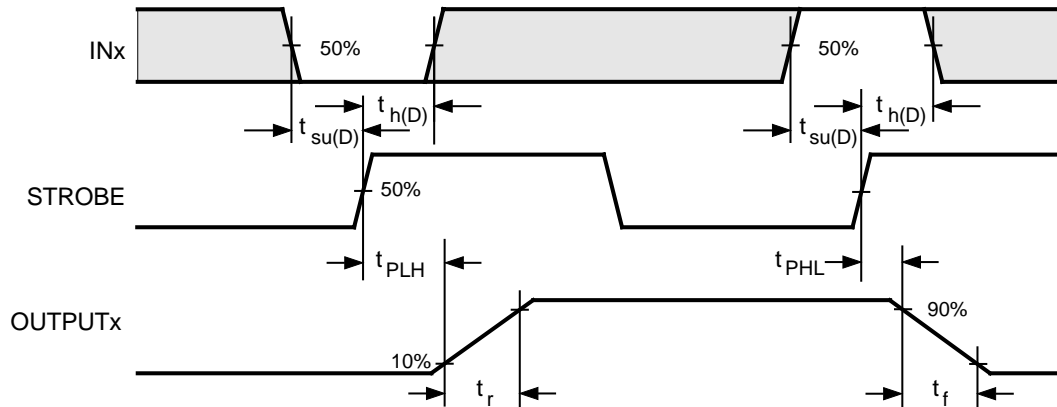
Typical Data is at  $V_{DD} = 5\text{ V}$  and is for design information only.

NOTE — Pulse test, duration  $\leq 100\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .



# 6273 8-BIT LATCHED DMOS POWER DRIVER

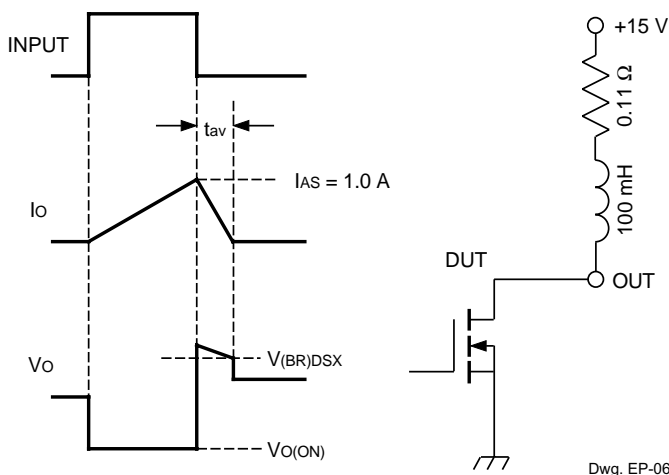
## TIMING REQUIREMENTS



Dwg. WP-036-1

|  |                                     |
|--|-------------------------------------|
| Input Active Time Before Strobe<br>(Data Set-Up Time), $t_{su(D)}$ ..... | <b>20 ns</b>                        |
| Input Active Time After Strobe<br>(Data Hold Time), $t_{h(D)}$ .....     | <b>20 ns</b>                        |
| Input Pulse Width, $t_w(D)$ .....  | <b>40 ns</b>                        |
| Input Logic High, $V_{IH}$ .....   | <b><math>\geq 0.85V_{DD}</math></b> |
| Input Logic Low, $V_{IL}$ .....  | <b><math>\leq 0.15V_{DD}</math></b> |

## TEST CIRCUIT



**Single-Pulse Avalanche Energy Test Circuit and Waveforms**

Dwg. EP-066-1

$$E_{AS} = I_{AS} \times V_{(BR)DSX} \times t_{AV}/2$$

**6273**  
**8-BIT LATCHED**  
**DMOS POWER DRIVER**

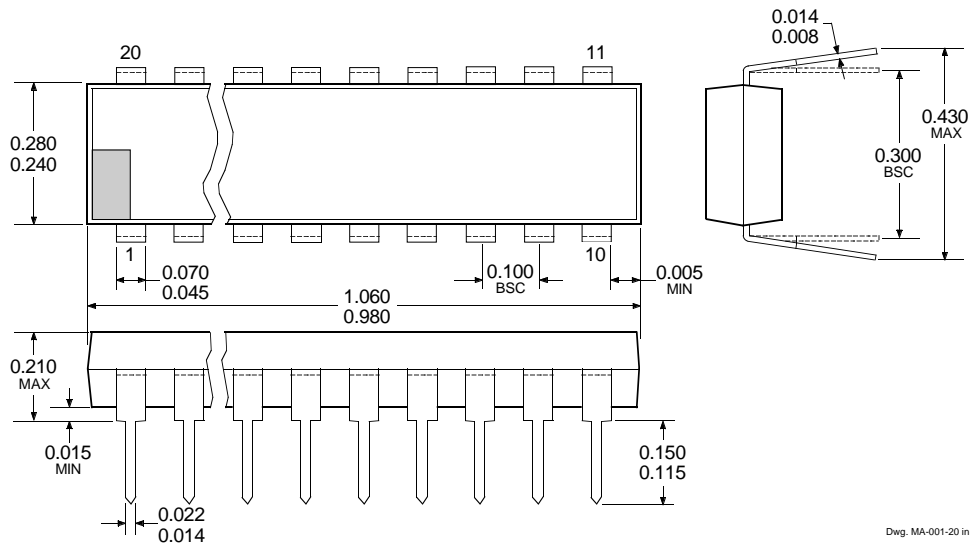
**TERMINAL DESCRIPTIONS**

| Terminal No. | Terminal Name    | Function   |
|--------------|------------------|--|
| 1            | CLEAR            | When (active) LOW, all latches are reset and all outputs go HIGH (turn OFF).   |
| 2            | IN <sub>1</sub>  | CMOS data input to a latch. When strobed, the output then inverts the data input (IN <sub>1</sub> = HIGH, OUT <sub>1</sub> = LOW).                 |
| 3            | IN <sub>2</sub>  | CMOS data input to a latch. When strobed, the output then inverts the data input (IN <sub>2</sub> = HIGH, OUT <sub>2</sub> = LOW).                 |
| 4            | OUT <sub>1</sub> | Current-sinking, open-drain DMOS output.   |
| 5            | OUT <sub>2</sub> | Current-sinking, open-drain DMOS output.   |
| 6            | OUT <sub>3</sub> | Current-sinking, open-drain DMOS output.   |
| 7            | OUT <sub>4</sub> | Current-sinking, open-drain DMOS output.   |
| 8            | IN <sub>3</sub>  | CMOS data input to a latch. When strobed, the output then inverts the data input (IN <sub>3</sub> = HIGH, OUT <sub>3</sub> = LOW).                 |
| 9            | IN <sub>4</sub>  | CMOS data input to a latch. When strobed, the output then inverts the data input (IN <sub>4</sub> = HIGH, OUT <sub>4</sub> = LOW).                 |
| 10           | GROUND           | Reference terminal for all voltage measurements.   |
| 11           | STROBE           | A CMOS dynamic input to all latches. Data on each IN <sub>x</sub> terminal is loaded into its associated latch on a low-to-high STROBE transition. |
| 12           | IN <sub>5</sub>  | CMOS data input to a latch. When strobed, the output then inverts the data input (IN <sub>5</sub> = HIGH, OUT <sub>5</sub> = LOW).                 |
| 13           | IN <sub>6</sub>  | CMOS data input to a latch. When strobed, the output then inverts the data input (IN <sub>6</sub> = HIGH, OUT <sub>6</sub> = LOW).                 |
| 14           | OUT <sub>5</sub> | Current-sinking, open-drain DMOS output.   |
| 15           | OUT <sub>6</sub> | Current-sinking, open-drain DMOS output.   |
| 16           | OUT <sub>7</sub> | Current-sinking, open-drain DMOS output.   |
| 17           | OUT <sub>8</sub> | Current-sinking, open-drain DMOS output.   |
| 18           | IN <sub>7</sub>  | CMOS data input to a latch. When strobed, the output then inverts the data input (IN <sub>7</sub> = HIGH, OUT <sub>7</sub> = LOW).                 |
| 19           | IN <sub>8</sub>  | CMOS data input to a latch. When strobed, the output then inverts the data input (IN <sub>8</sub> = HIGH, OUT <sub>8</sub> = LOW).                 |
| 20           | LOGIC SUPPLY     | (V <sub>DD</sub> ) The logic supply voltage (typically 5 V).   |

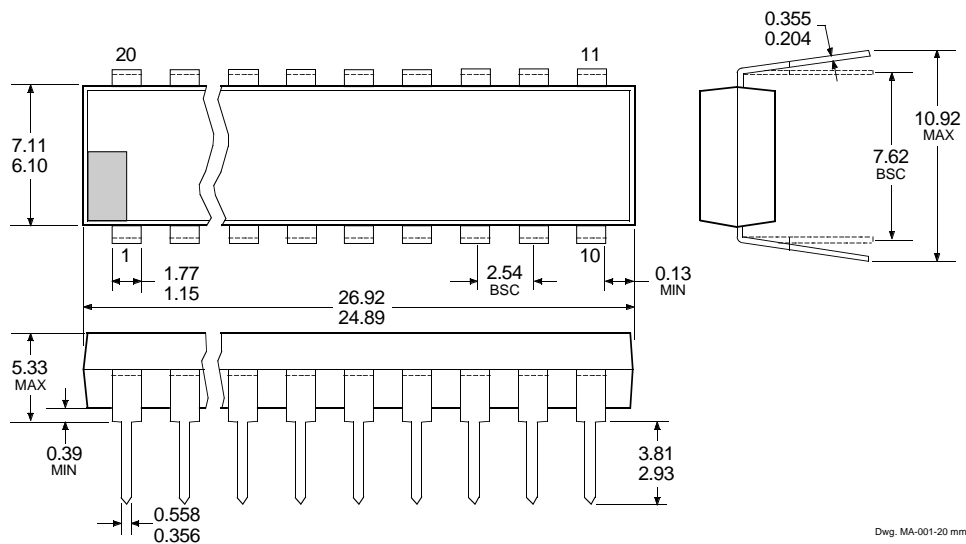


# 6273 8-BIT LATCHED DMOS POWER DRIVER

## A6273KA Dimensions in Inches (controlling dimensions)



## Dimensions in Millimeters (for reference only)

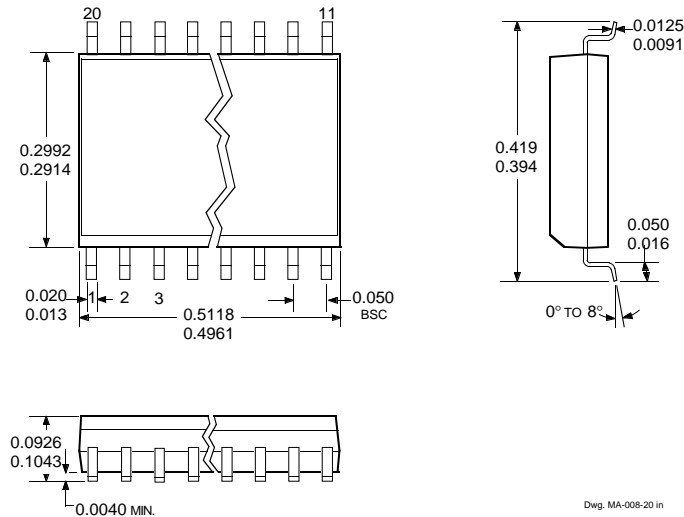


- NOTES: 1. Exact body and lead configuration at vendor's option within limits shown.  
 2. Lead spacing tolerance is non-cumulative.  
 3. Lead thickness is measured at seating plane or below.  
 4. Supplied in standard sticks/tubes of 18 devices.

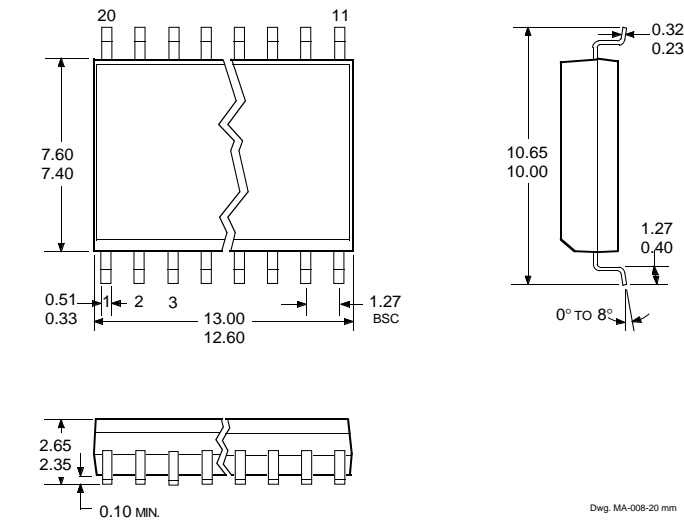


**6273**  
**8-BIT LATCHED**  
**DMOS POWER DRIVER**

**A6273KLW**  
 Dimensions in Inches  
 (for reference only)



Dimensions in Millimeters  
 (controlling dimensions)



- NOTES: 1. Exact body and lead configuration at vendor's option within limits shown.  
 2. Lead spacing tolerance is non-cumulative.  
 3. Supplied in standard sticks/tubes of 37 devices or add 'TR' to part number for tape and reel.

**6273**  
**8-BIT LATCHED**  
**DMOS POWER DRIVER**

*The products described here are manufactured under one or more U.S. patents or U.S. patents pending.*

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**6273**  
**8-BIT LATCHED**  
**DMOS POWER DRIVER**

**POWER**  
**INTERFACE DRIVERS**

| Function                                 | Output Ratings* |       | Part Number†    |
|--|-----------------|-------|-----------------|
| <b>SERIAL-INPUT LATCHED DRIVERS</b>      |                 |       |                 |
| 8-Bit (saturated drivers)                | -120 mA         | 50 V‡ | 5895            |
| 8-Bit                                    | 350 mA          | 50 V  | 5821            |
| 8-Bit                                    | 350 mA          | 80 V  | 5822            |
| 8-Bit                                    | 350 mA          | 50 V‡ | 5841            |
| 8-Bit                                    | 350 mA          | 80 V‡ | 5842            |
| 8-Bit (constant-current LED driver)      | 75 mA           | 17 V  | 6275            |
| 8-Bit (constant-current LED driver)      | 120 mA          | 24 V  | 6277            |
| 8-Bit (DMOS drivers)                     | 250 mA          | 50 V  | 6595            |
| 8-Bit (DMOS drivers)                     | 350 mA          | 50 V‡ | 6A595           |
| 8-Bit (DMOS drivers)                     | 100 mA          | 50 V  | 6B595           |
| 10-Bit (active pull-downs)               | -25 mA          | 60 V  | 5810-F and 6810 |
| 12-Bit (active pull-downs)               | -25 mA          | 60 V  | 5811            |
| 16-Bit (constant-current LED driver)     | 75 mA           | 17 V  | 6276            |
| 20-Bit (active pull-downs)               | -25 mA          | 60 V  | 5812-F and 6812 |
| 32-Bit (active pull-downs)               | -25 mA          | 60 V  | 5818-F and 6818 |
| 32-Bit                                   | 100 mA          | 30 V  | 5833            |
| 32-Bit (saturated drivers)               | 100 mA          | 40 V  | 5832            |
| <b>PARALLEL-INPUT LATCHED DRIVERS</b>    |                 |       |                 |
| 4-Bit                                    | 350 mA          | 50 V‡ | 5800            |
| 8-Bit                                    | -25 mA          | 60 V  | 5815            |
| 8-Bit                                    | 350 mA          | 50 V‡ | 5801            |
| 8-Bit (DMOS drivers)                     | 100 mA          | 50 V  | 6B273           |
| 8-Bit (DMOS drivers)                     | 250 mA          | 50 V  | 6273            |
| <b>SPECIAL-PURPOSE DEVICES</b>           |                 |       |                 |
| Unipolar Stepper Motor Translator/Driver | 1.25 A          | 50 V‡ | 5804            |
| Addressable 8-Bit Decoder/DMOS Driver    | 250 mA          | 50 V  | 6259            |
| Addressable 8-Bit Decoder/DMOS Driver    | 350 mA          | 50 V‡ | 6A259           |
| Addressable 8-Bit Decoder/DMOS Driver    | 100 mA          | 50 V  | 6B259           |
| Addressable 28-Line Decoder/Driver       | 450 mA          | 30 V  | 6817            |

\* Current is maximum specified test condition, voltage is maximum rating. See specification for sustaining voltage limits. Negative current is defined as coming out of (sourcing) the output.

† Complete part number includes additional characters to indicate operating temperature range and package style.

‡ Internal transient-suppression diodes included for inductive-load protection.

