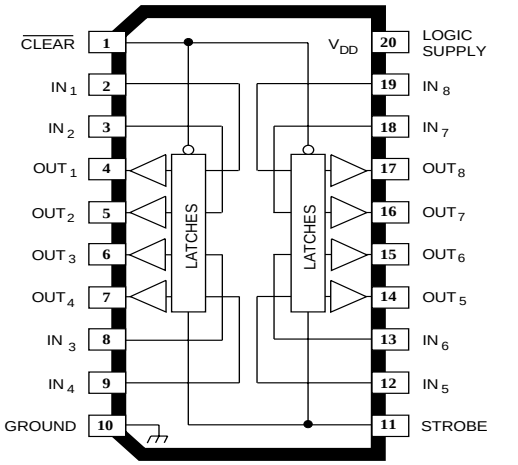
6B273

Data Sheet
26180.122

ADVANCE INFORMATION
(Subject to change without notice)
January 24, 2000

8-BIT LATCHED DMOS POWER DRIVER



Dwg. PP-015-2

Note that the A6B273KA (DIP) and the A6B273KLW (SOIC) are electrically identical and share a common terminal number assignment.

ABSOLUTE MAXIMUM RATINGS at T_A = 25°C

Output Voltage, V_O ..... **50 V**
Output Drain Current,
Continuous, I_O ..... **150 mA***
Peak, I_{OM} ..... **500 mA†**
Single-Pulse Avalanche Energy,
E_{AS} ..... **30 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 ≤ 100 µs, duty cycle ≤ 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 A6B273KA and A6B273KLW 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 A6B273KA/KLW DMOS open-drain outputs are capable of sinking up to 500 mA. Similar devices with reduced $r_{DS(on)}$ are available as the A6273KA/KLW.

The A6B273KA is furnished in a 20-pin dual in-line plastic package. The A6B273KLW 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.

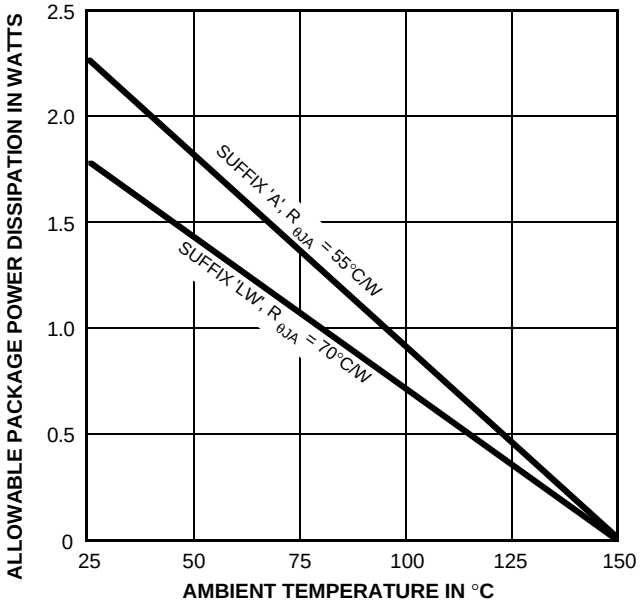
FEATURES

- 50 V Minimum Output Clamp Voltage
- 150 mA Output Current (all outputs simultaneously)
- 5 Ω Typical $r_{DS(on)}$
- Low Power Consumption
- Replacements for TPIC6B273N and TPIC6B273DW

Always order by complete part number:

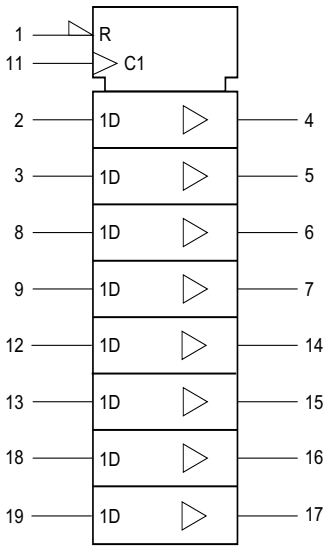
Part Number	Package	$R_{\theta JA}$	$R_{\theta JC}$
A6B273KA	20-pin DIP	55°C/W	25°C/W
A6B273KLW	20-lead SOIC	70°C/W	17°C/W

6B273
8-BIT LATCHED DMOS POWER DRIVER

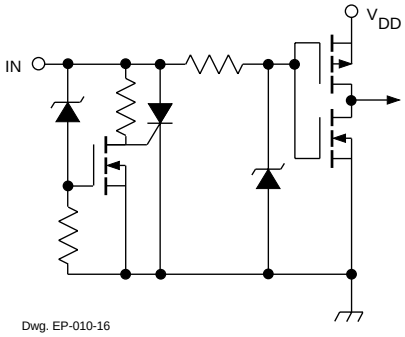


Dwg. GS-004A

LOGIC SYMBOL

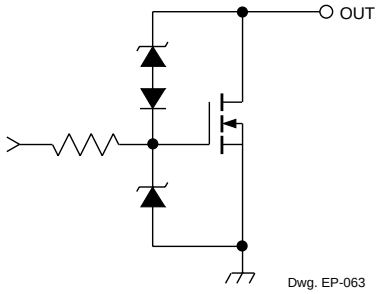


Dwg. FP-046-1



Dwg. EP-010-16

LOGIC INPUTS



Dwg. EP-063

DMOS POWER DRIVER OUTPUT

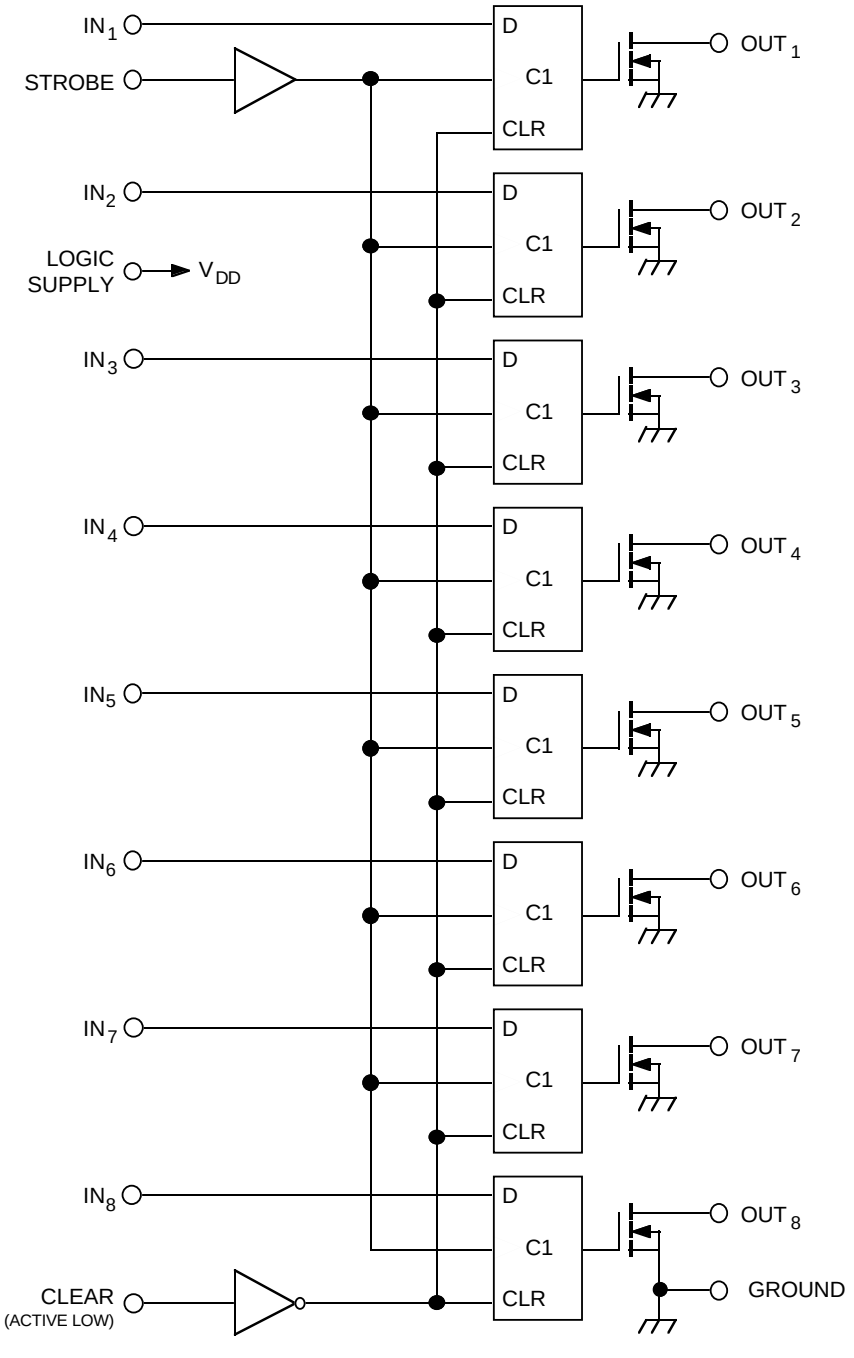
FUNCTION TABLE

Inputs			
$\overline{\text{CLEAR}}$	STROBE	IN_X	OUT_X
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

Allegro® MicroSystems, Inc.
115 Northeast Cutoff, Box 15036
Worcester, Massachusetts 01615-0036 (508) 853-5000

FUNCTIONAL BLOCK DIAGRAM



Dwg. FP-016-2

6B273
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°C, V_{DD} = 5 V, $t_{ir} = t_{if} \leq$ 10 ns (unless otherwise specified).

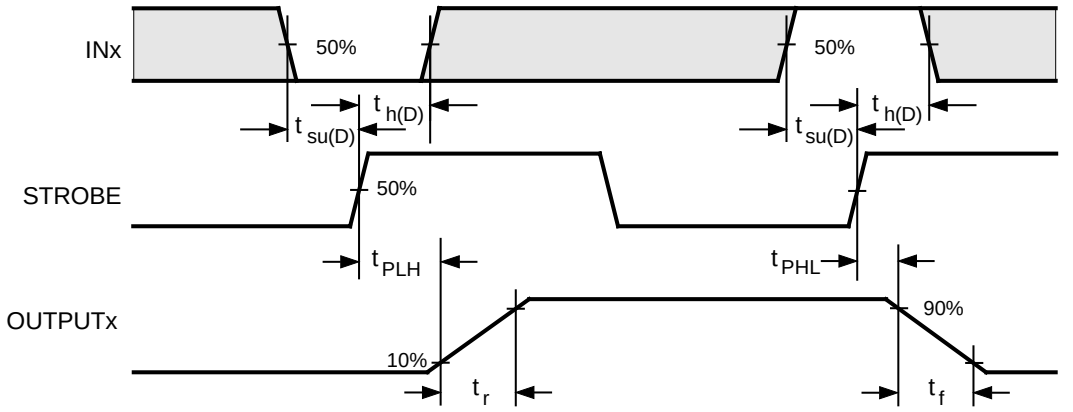
Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
Logic Supply Voltage	V_{DD}	Operating	4.5	5.0	5.5	V
Output Breakdown Voltage	$V_{(BR)DSX}$	I_O = 1 mA	50	—	—	V
Off-State Output Current	I_{DSX}	V_O = 40 V, V_{DD} = 5.5 V	—	0.1	5.0	µA
		V_O = 40 V, V_{DD} = 5.5 V, T_A = 125°C	—	0.15	8.0	µA
Static Drain-Source On-State Resistance	$r_{DS(on)}$	I_O = 100 mA, V_{DD} = 4.5 V	—	4.2	5.7	Ω
		I_O = 100 mA, V_{DD} = 4.5 V, T_A = 125°C	—	6.8	9.5	Ω
		I_O = 350 mA, V_{DD} = 4.5 V (see note)	—	5.5	8.0	Ω
Nominal Output Current	I_{ON}	$V_{DS(on)}$ = 0.5 V, T_A = 85°C	—	90	—	mA
Logic Input Current	I_{IH}	$V_I = V_{DD}$ = 5.5 V	—	—	1.0	µA
	I_{IL}	V_I = 0, V_{DD} = 5.5 V	—	—	-1.0	µA
Prop. Delay Time	t_{PLH}	I_O = 100 mA, C_L = 30 pF	—	150	—	ns
	t_{PHL}	I_O = 100 mA, C_L = 30 pF	—	90	—	ns
Output Rise Time	t_r	I_O = 100 mA, C_L = 30 pF	—	200	—	ns
Output Fall Time	t_f	I_O = 100 mA, C_L = 30 pF	—	200	—	ns
Supply Current	$I_{DD(OFF)}$	V_{DD} = 5.5 V, Outputs off	—	20	100	µA
	$I_{DD(ON)}$	V_{DD} = 5.5 V, Outputs on	—	150	300	µA

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

NOTE — Pulse test, duration ≤100 µs, duty cycle ≤2%.

Allegro® MicroSystems, Inc.
115 Northeast Cutoff, Box 15036
Worcester, Massachusetts 01615-0036 (508) 853-5000

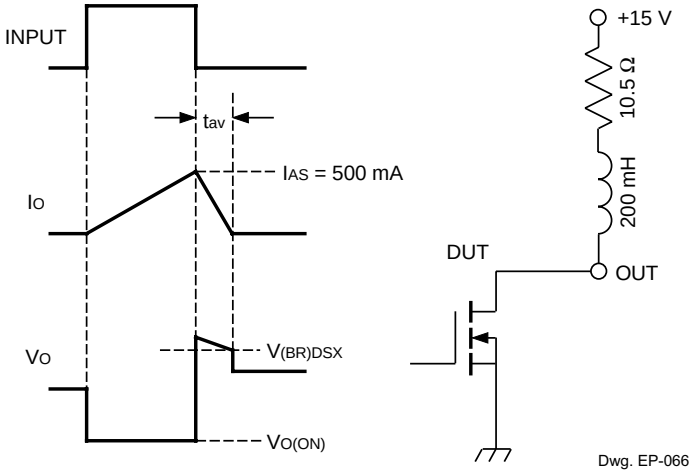
TIMING REQUIREMENTS



Dwg. WP-036-1

Input Active Time Before Strobe
(Data Set-Up Time), $t_{su(D)}$ ..... **20 ns**
Input Active Time After Strobe
(Data Hold Time), $t_{h(D)}$ ..... **20 ns**
Input Pulse Width, $t_{w(D)}$ ..... **40 ns**
Input Logic High, V_{IH} ..... $\geq$ **0.85V_{CC}**
Input Logic Low, V_{IL} ..... $\leq$ **0.15V_{CC}**

TEST CIRCUITS

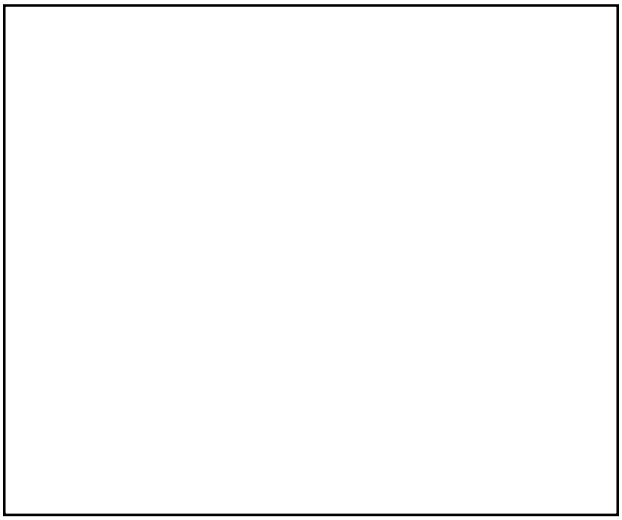


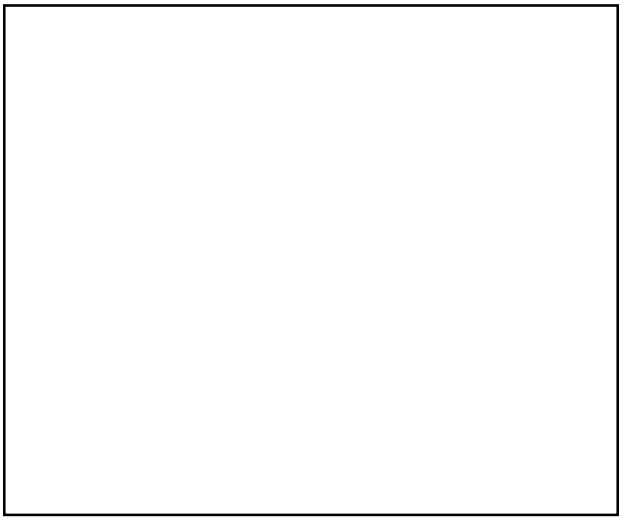
$$E_{AS} = I_{AS} \times V_{(BR)DSX} \times t_{AV}/2$$

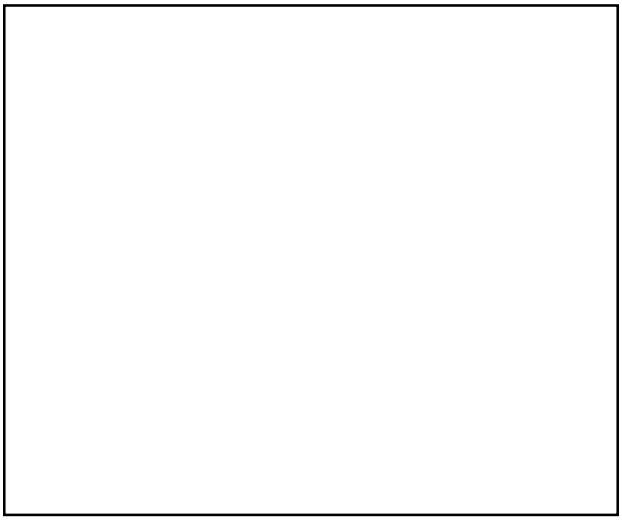
Single-Pulse Avalanche Energy Test Circuit and Waveforms

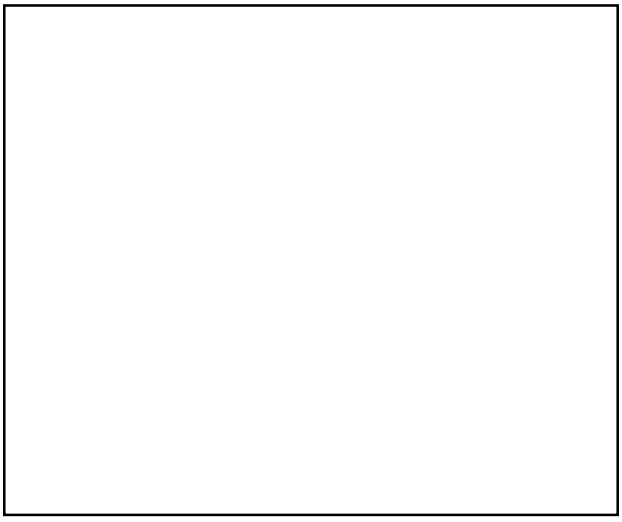
Allegro MicroSystems, Inc.
115 Northeast Cutoff, Box 15036
Worcester, Massachusetts 01615-0036 (508) 853-5000

TYPICAL CHARACTERISTICS

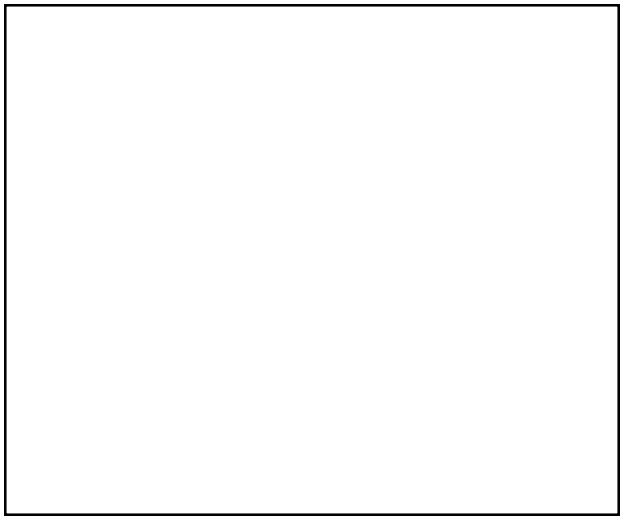


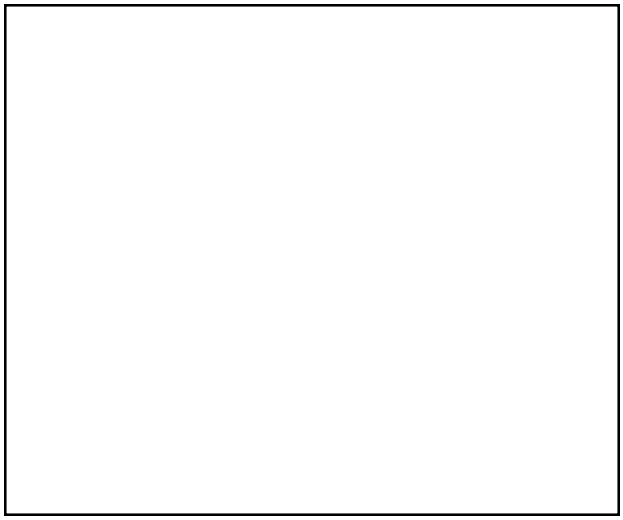


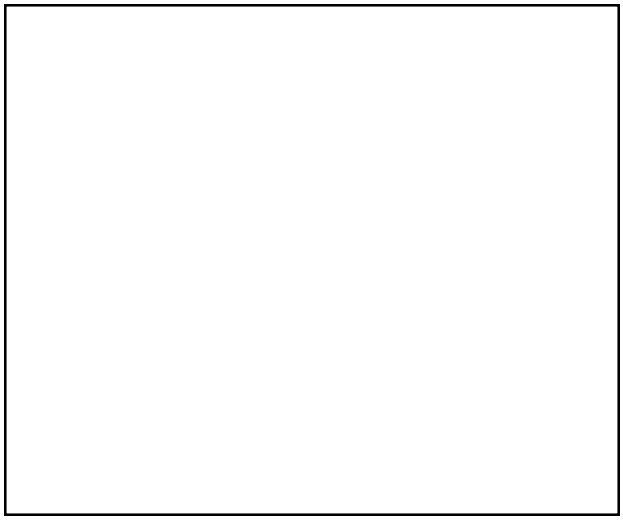


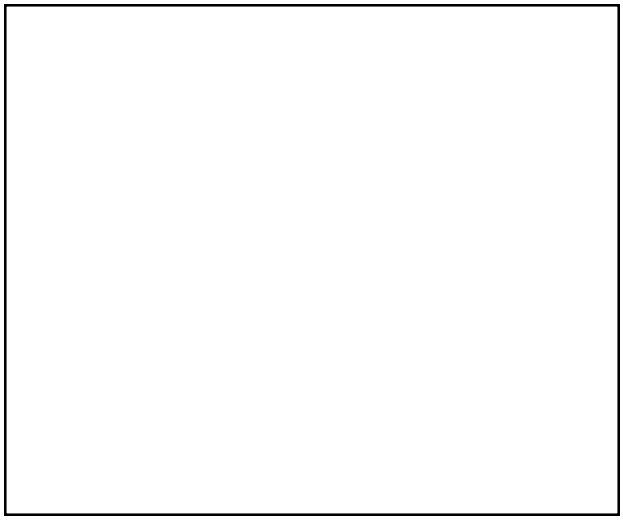


TYPICAL CHARACTERISTICS









Allegro® MicroSystems, Inc.

115 Northeast Cutoff, Box 15036
Worcester, Massachusetts 01615-0036 (508) 853-5000

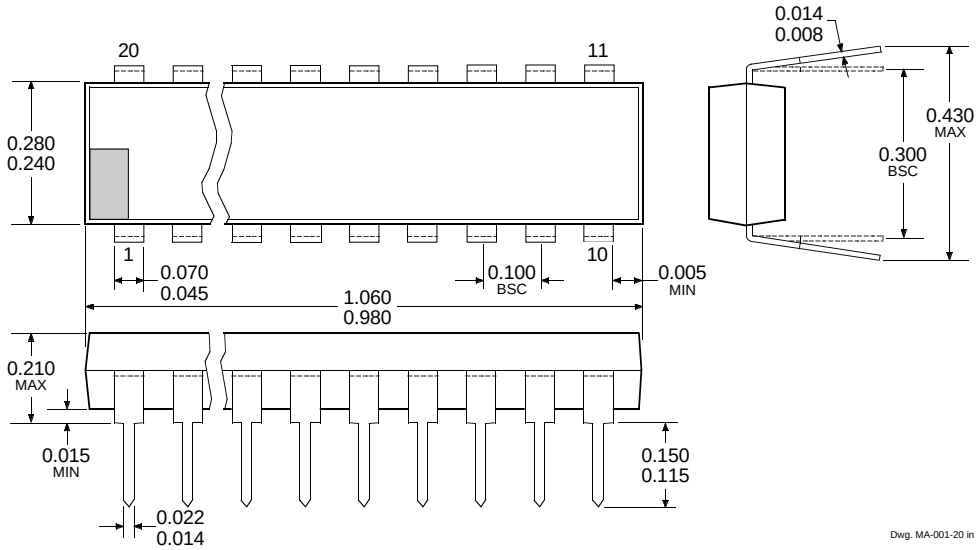
TERMINAL DESCRIPTIONS

Terminal No.	Terminal Name	Function
1	CLEAR	When (active) LOW, all latches are reset and all outputs go HIGH (turn OFF).
2	IN_1	CMOS data input to a latch. When strobed, the output then inverts the data input (IN_1 = HIGH, OUT_1 = LOW).
3	IN_2	CMOS data input to a latch. When strobed, the output then inverts the data input (IN_2 = HIGH, OUT_2 = LOW).
4	OUT_1	Current-sinking, open-drain DMOS output.
5	OUT_2	Current-sinking, open-drain DMOS output.
6	OUT_3	Current-sinking, open-drain DMOS output.
7	OUT_4	Current-sinking, open-drain DMOS output.
8	IN_3	CMOS data input to a latch. When strobed, the output then inverts the data input (IN_3 = HIGH, OUT_3 = LOW).
9	IN_4	CMOS data input to a latch. When strobed, the output then inverts the data input (IN_4 = HIGH, OUT_4 = LOW).
10	GROUND	Reference terminal for all voltage measurements.
11	STROBE	A CMOS dynamic input to all latches. Data on each IN_x terminal is loaded into its associated latch on a low-to-high STROBE transition.
12	IN_5	CMOS data input to a latch. When strobed, the output then inverts the data input (IN_5 = HIGH, OUT_5 = LOW).
13	IN_6	CMOS data input to a latch. When strobed, the output then inverts the data input (IN_6 = HIGH, OUT_6 = LOW).
14	OUT_5	Current-sinking, open-drain DMOS output.
15	OUT_6	Current-sinking, open-drain DMOS output.
16	OUT_7	Current-sinking, open-drain DMOS output.
17	OUT_8	Current-sinking, open-drain DMOS output.
18	IN_7	CMOS data input to a latch. When strobed, the output then inverts the data input (IN_7 = HIGH, OUT_7 = LOW).
19	IN_8	CMOS data input to a latch. When strobed, the output then inverts the data input (IN_8 = HIGH, OUT_8 = LOW).
20	LOGIC SUPPLY	(V_{DD}) The logic supply voltage (typically 5 V).

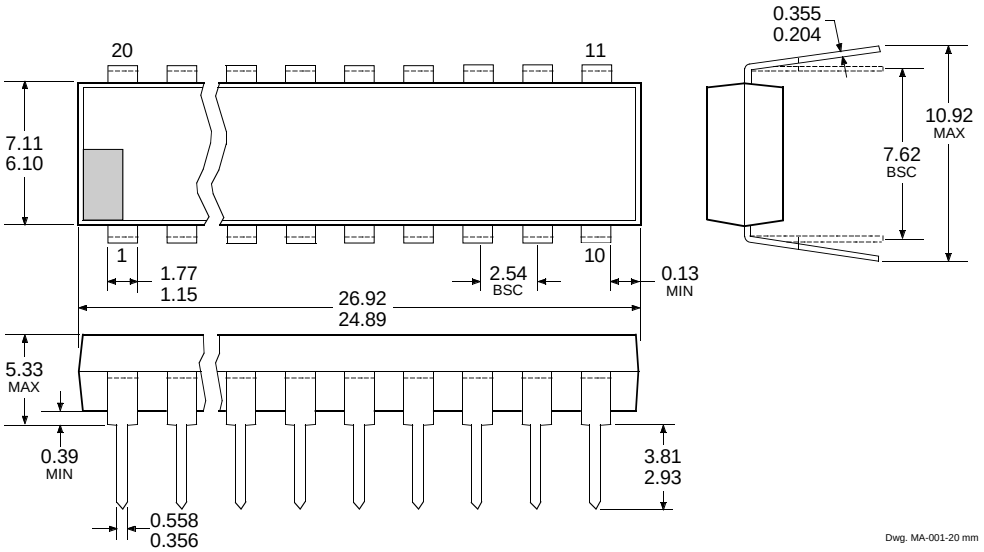
6B273
8-BIT LATCHED DMOS POWER DRIVER

A6B273KA

Dimensions in Inches
(controlling dimensions)



Dimensions in Millimeters
(for reference only)



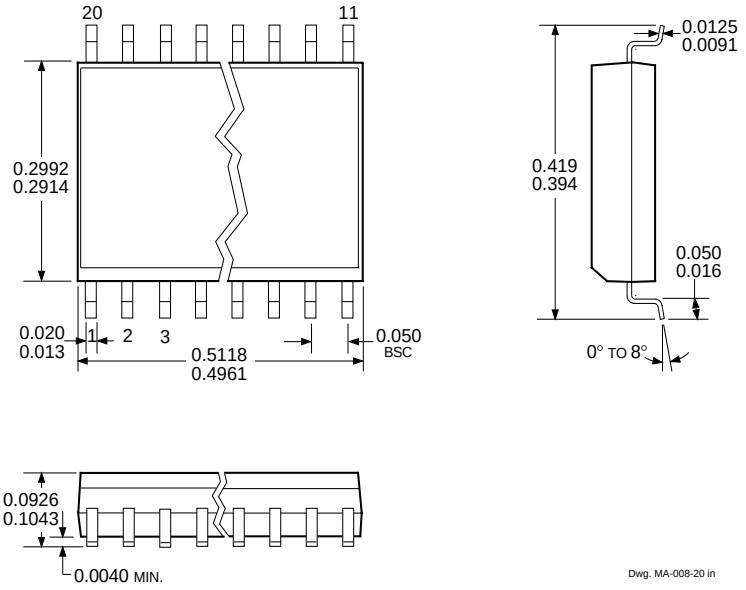
NOTES: 1. Exact body and lead configuration at vendor's option within limits shown.
2. Lead spacing tolerance is non-cumulative.
3. Lead thickness is measured at seating plane or below.

Allegro® MicroSystems, Inc.

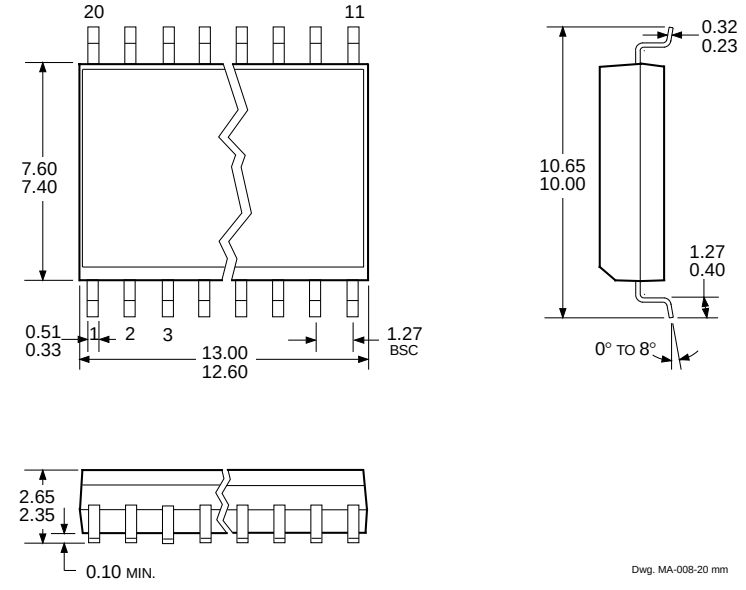
115 Northeast Cutoff, Box 15036
Worcester, Massachusetts 01615-0036 (508) 853-5000

A6B273KLW

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.

6B273
8-BIT LATCHED DMOS POWER DRIVER

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

Allegro MicroSystems, Inc. reserves the right to make, from time to time, such departures from the detail specifications as may be required to permit improvements in the performance, reliability, or manufacturability of its products. Before placing an order, the user is cautioned to verify that the information being relied upon is current.

Allegro products are not authorized for use as critical components in life-support devices or systems without express written approval.

The information included herein is believed to be accurate and reliable. However, Allegro MicroSystems, Inc. assumes no responsibility for its use; nor for any infringement of patents or other rights of third parties which may result from its use.

Allegro® MicroSystems, Inc.

115 Northeast Cutoff, Box 15036
Worcester, Massachusetts 01615-0036 (508) 853-5000