AMCC®

33 x 32 1.5 GBIT/S DIFFERENTIAL CROSSPOINT SWITCH S2028

FEATURES

- 33 x 32 differential crosspoint switch
- Full broadcast switching capability
- Differential 10K PECL data path
- Configurable differential output driver controls
- Up to 1.5 Gbit/s NRZ data rate
- TTL configuration controls
- Reconfigurable without disturbing operation
- Single cycle broadcast configuration
- High-speed multicast and fast unicast configuration (100 MHz)
- "Break" feature to disable previous multicast configuration
- 224-pin LDCC package

APPLICATIONS

- Internet Switches
- Datacom or telecom switching
- Digital demultiplexing
- Microwave or fiber-optic data distribution
- High-speed automatic test equipment
- Digital video

GENERAL DESCRIPTION

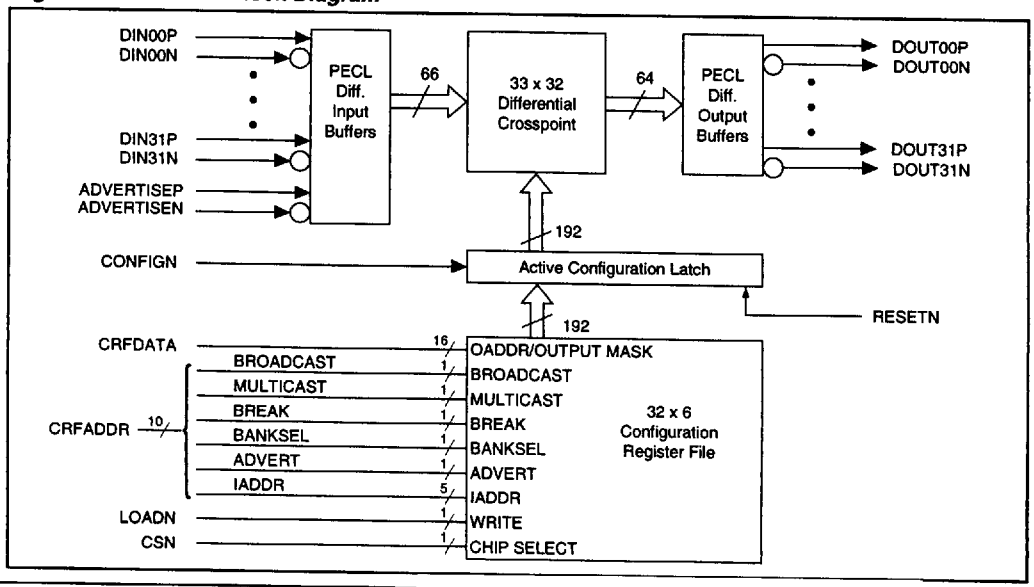
The S2028 is a very high-speed 33 x 32 differential crosspoint switch with fast multicast and broadcast capabilities. It consists of 32 differential PECL input signal pairs that can be connected to any or all of its 32 differential PECL output signal pairs. In addition, the differential output drivers can be individually configured to gate in an additional broadcast channel. This channel can be used as a default advertise channel, or to supply a signal such as a clock to simplify interface design.

Along with a single cycle reconfiguration of the entire 33x32 crosspoint switch, the S2028 features single cycle broadcast and fast two cycle multicast configuration. A "break" feature allows fast multicast disable of the previous multicast configuration.

The S2028 contains a unique memory map, which provides full support of the broadcast, multicast, and unicast modes.

The differential 10K PECL logic data path makes the part ideal for high-speed applications. The differential nature of the data path is retained throughout the crosspoint structure, to minimize data distortion and to handle NRZ data rates up to 1.5 gigabits per second.

Figure 1. Functional Block Diagram



TTL configuration controls simplify interfacing to slower speed circuitry. Once a new configuration has been entered into the configuration register file, the S2028 can be completely reconfigured in only 10 ns without disturbing switch operations.

The configuration register can also be put into transparent mode, reconfiguring all addressed outputs within 10ns after the LOADN signal goes low.

DATA TRANSFER

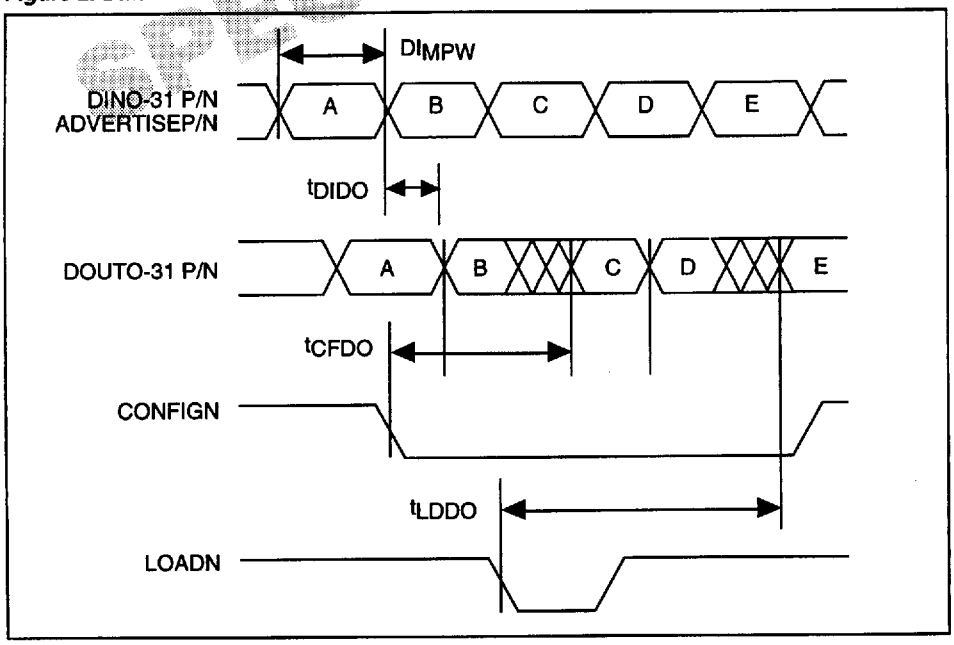
For each configured connection between a differential input pair and an enabled output pair, any data appearing at the input pair and switching at up to 1.5 Gb/s will be passed immediately through to the output pair.

CONFIGURATION

The S2028 can be selectively reconfigured one output channel at a time in unicast mode, 16 output channels at a time in multicast mode, and all 32 output channels simultaneously in broadcast mode. Any number of output channels can be reconfigured simultaneously using the CONFIGN control. Configuration data is stored in all 32 registers, one register for each output channel. As shown in Figure 1, the configuration data is passed in parallel from all 32 registers to a bank of latches which hold the active switch configuration. This two-state arrangement allows any number of output channels to be reconfigured simultaneously.

Each output configuration register holds 6 bits. Five bits are used to select which input channel will be connected to the output channel, and one bit is used to override the input address and instead channel the ADVERTISEP/N input to that output.

Figure 2. Data Transfer Waveforms



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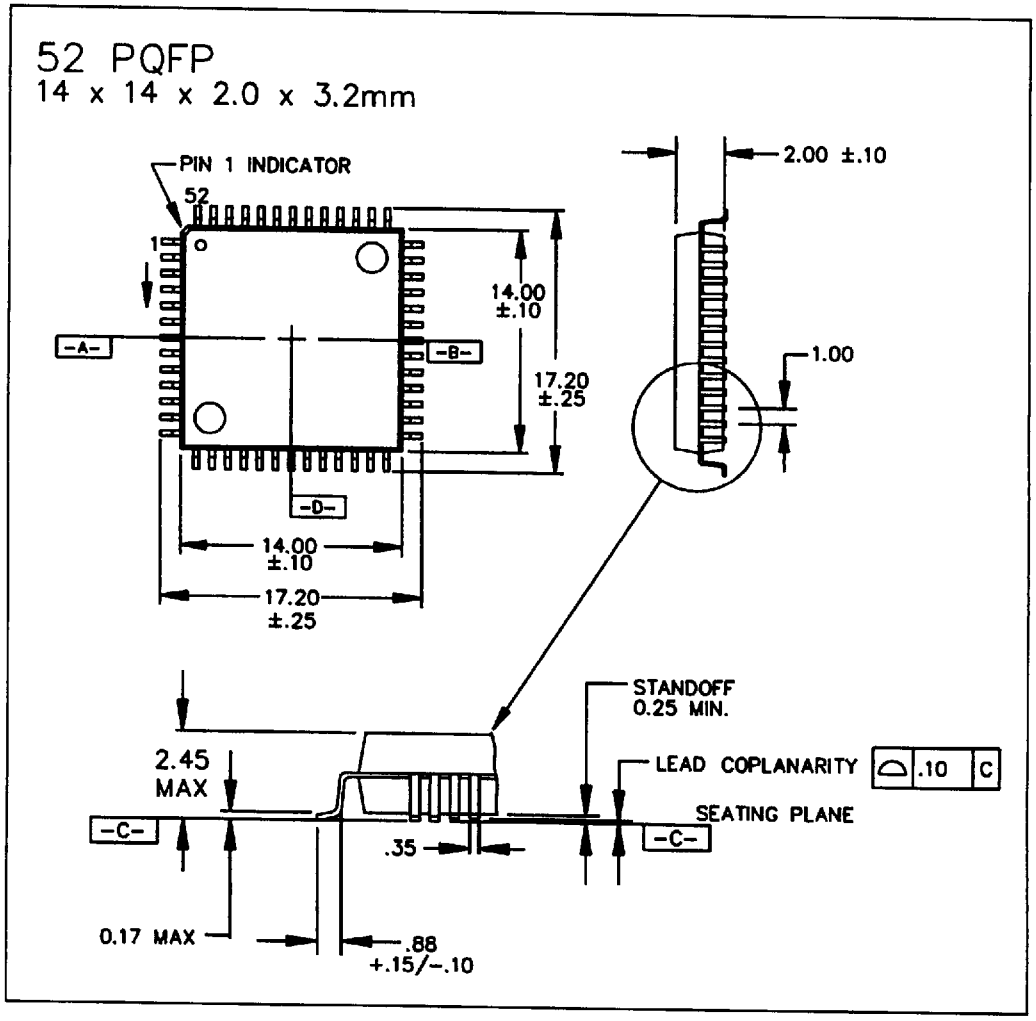
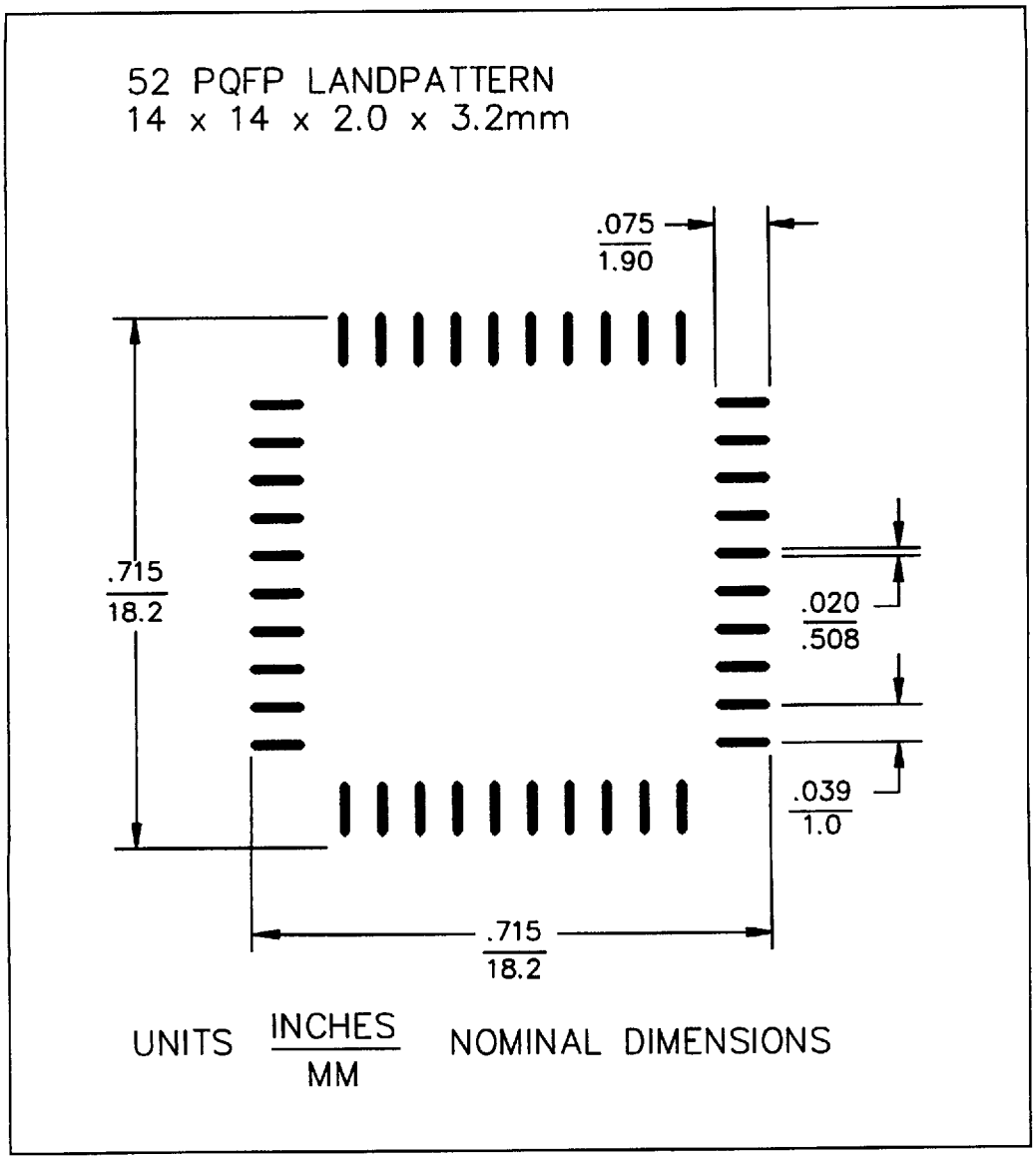

52 PQFP
14 x 14 x 2.0 x 3.2mm
PIN 1 INDICATOR
52
1
-A-
-B-
-D-
14.00 ±.10
17.20 ±.25
14.00 ±.10
17.20 ±.25
2.00 ±.10
1.00
STANDOFF 0.25 MIN.
LEAD COPLANARITY .10 C
SEATING PLANE
2.45 MAX
-C-
.35
0.17 MAX
.88 +.15/-.10

52-PIN PQFP MECHANICAL DIMENSIONS



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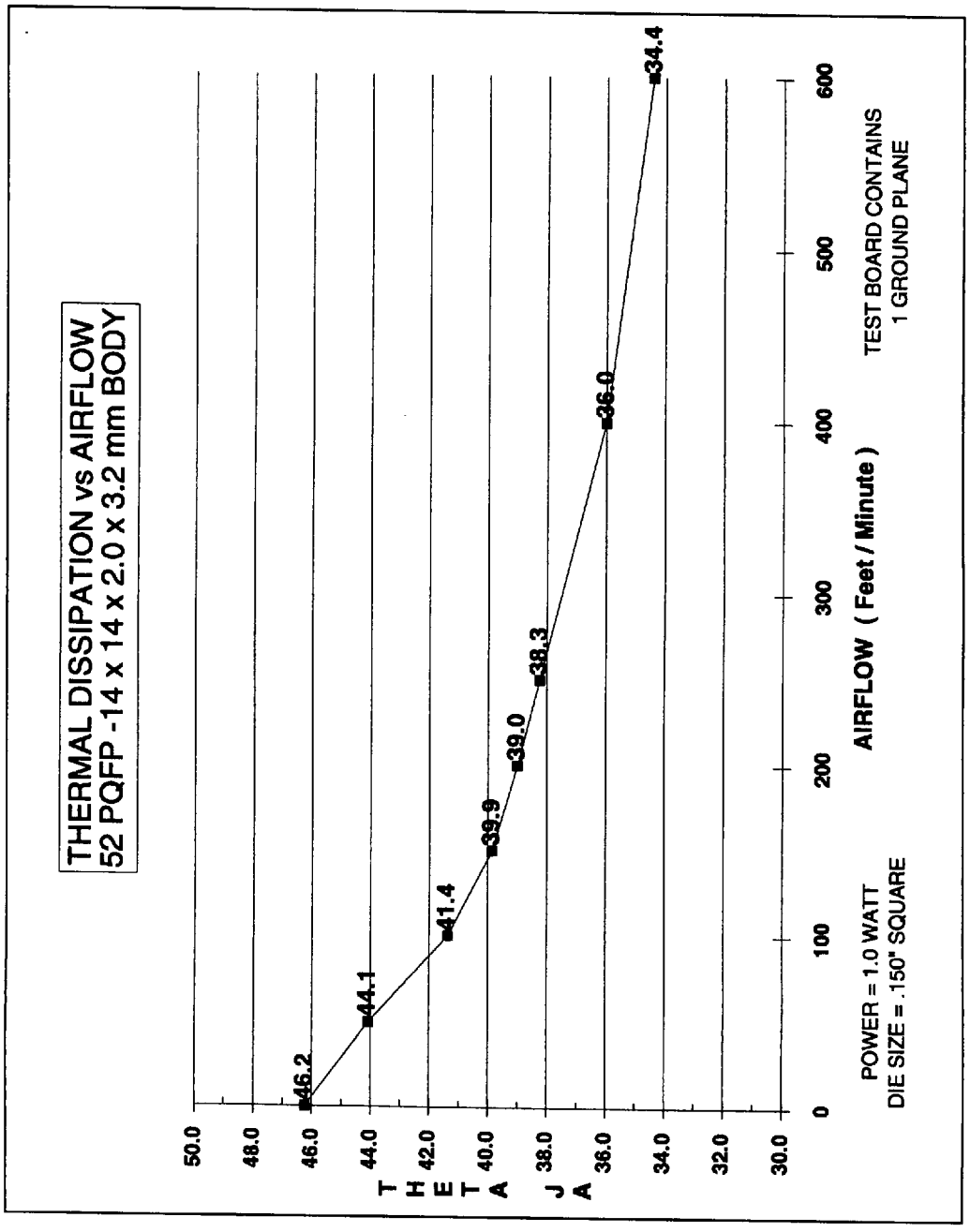
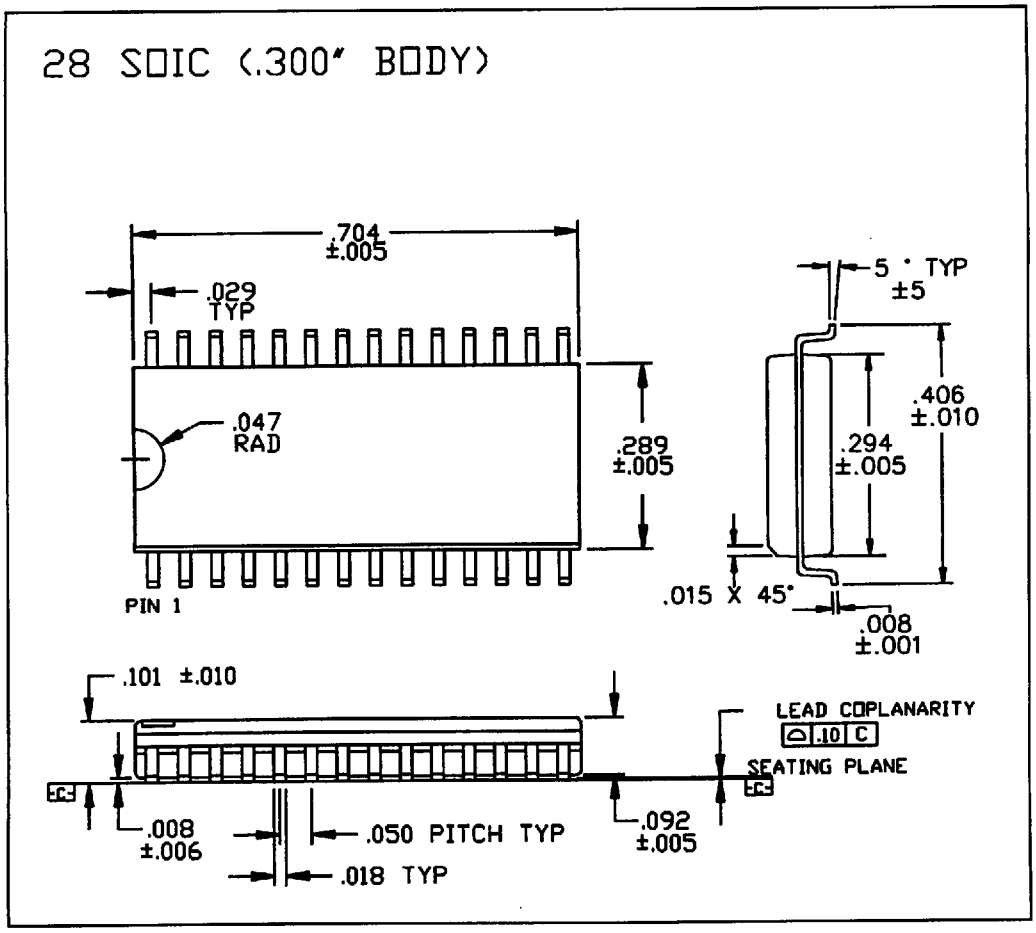

THERMAL DISSIPATION vs AIRFLOW
52 PQFP -14 x 14 x 2.0 x 3.2 mm BODY
THETA JA
50.0
48.0
46.0
44.0
42.0
40.0
38.0
36.0
34.0
32.0
30.0
46.2
44.1
41.4
39.9
39.0
38.3
36.0
34.4
0
100
200
300
400
500
600
AIRFLOW (Feet / Minute)
POWER = 1.0 WATT
DIE SIZE = .150" SQUARE
TEST BOARD CONTAINS
1 GROUND PLANE

10

28-PIN SOIC MECHANICAL DIMENSIONS



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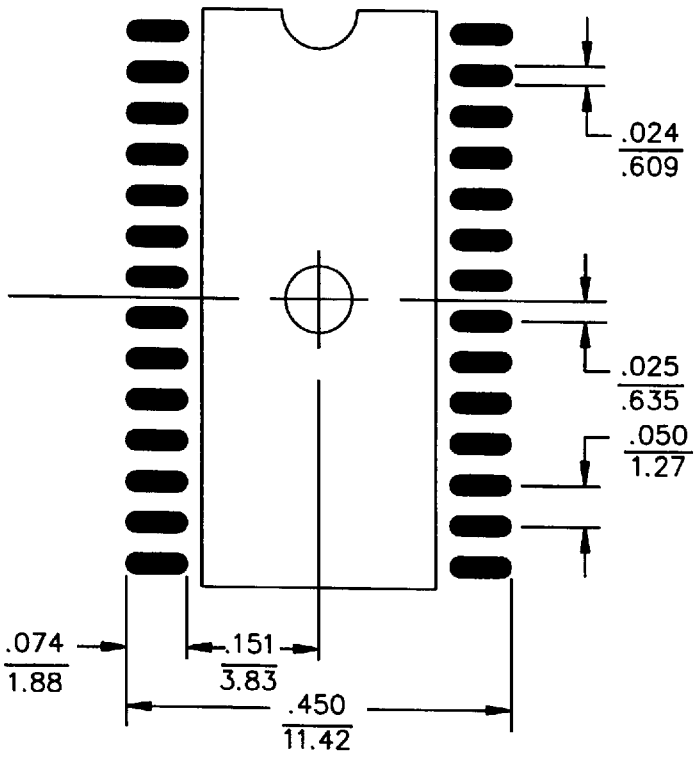
28 SOIC (.300" BODY) LANDPATTERN



UNITS $\frac{\text{INCHES}}{\text{MM}}$ NOMINAL DIMENSIONS

28-PIN SOIC MECHANICAL DIMENSIONS