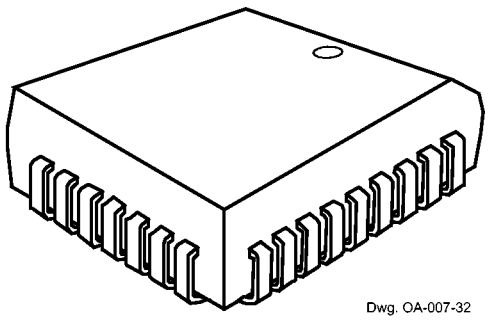
2488

Data Sheet
27464.5

QUAD AIRBAG DIAGNOSTIC AND DEPLOYMENT SYSTEM (QuADDS™)



Dwg. OA-007-32

PRELIMINARY INFORMATION
(Subject to change without notice)
October 1, 1998

ABSOLUTE MAXIMUM RATINGS

Supply Voltage, V_{BAT} ..... **32 V**
Peak Output Current, I_{OM} ..... **3.2 A**
Logic Input Voltage Range,
V_I ..... **-0.3 V to +5.3 V**
Operating Temperature Range,
T_A ..... **-40°C to +85°C**
Storage Temperature Range,
T_S ..... **-55°C to +150°C**

The A2488EEQ Quad Airbag Diagnostic and Deployment System (QuADDS™) provides the application-specific functions of a four-loop automotive airbag system. These functions include a password-protected 16-bit serial interface, full system diagnostics, and four current-controlled squib-firing loops. The device may be used independently or to add additional squib loops to an A2487EEP-based sensor diagnostic module.

Command and diagnostic status reporting is via a 16-bit serial peripheral interface. The A2488EEQ provides a full set of diagnostic functions for monitoring system faults. These include the ability to discriminate between wiring harness and internal switch shorts. Both analog and fast digital diagnostic capabilities are provided. The designer can utilize the internally preset fault levels, reported via the SPI bus (digital mode). Alternatively, the analog diagnostic voltage may be read by the system A/D permitting the flexibility of software fault limits (analog mode).

Precise squib resistance measurements are made possible through the use of an external calibration resistor. A second external resistor sets the squib test current for all four output loops.

An analog multiplexer provides interface capability for the diagnostic functions as well as for providing interfaces for other system components such as accelerometers and occupant detection.

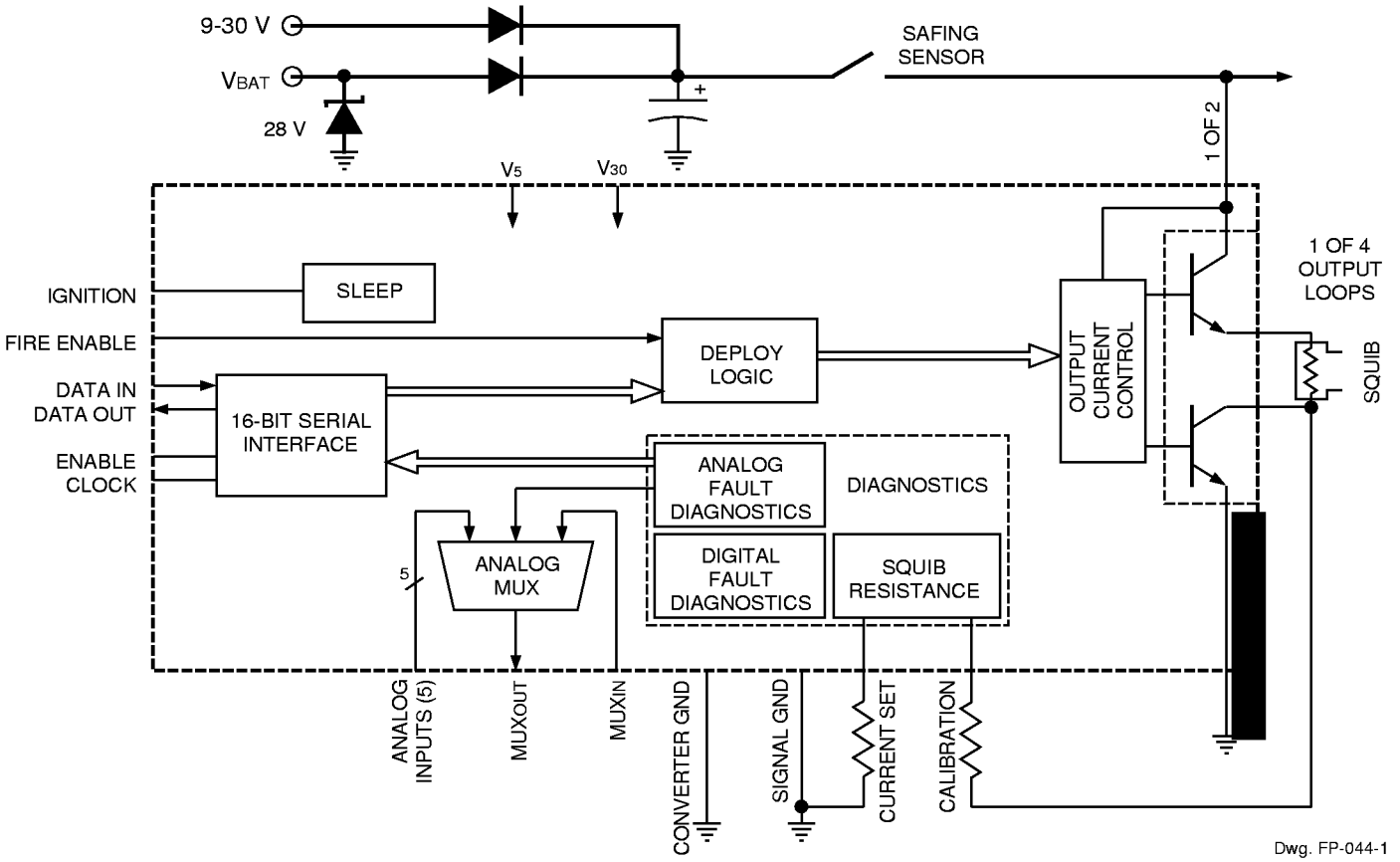
FEATURES

- Low-Current Sleep Mode
- Software or Hardware Power Down
- Five-Input Analog Multiplexer
- Password-Protected Serial I/O
- 16-Bit Command Structure
- 16-Bit Status Reporting
- Separate Fire-Enable Line
- Internal vs. External Shorts Discrimination
- Dual-Mode A/D Fault Diagnostic Capability
- High-Accuracy Squib Measurement Technique
- Safing Sensor Status

Always order by complete part number: **A2488EEQ** .

Allegro® MicroSystems, Inc.

FUNCTIONAL BLOCK DIAGRAM



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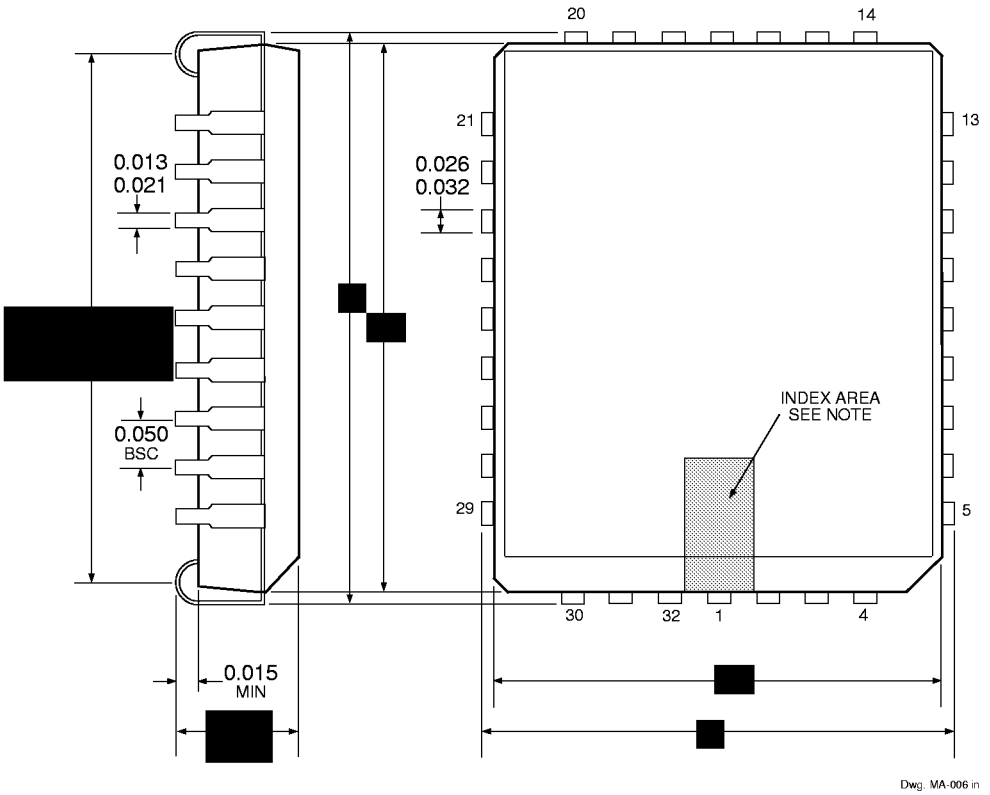
ELECTRICAL CHARACTERISTICS over operating temperature range, 6.3 V ≤ V_{IGN} ≤ 15.3 V, 6.5 V ≤ V_{BAT} ≤ 31.5 V, unless otherwise specified.

Characteristic	Test Conditions	Limits			
		Min.	Typ.	Max.	Units
Logic Input Voltage	V_{IL}	–	–	1.5	V
	V_{IH}	3.5	–	–	V
Logic Input Current		–	<0.1	±10	µA
Logic Output Voltage	V_{OL}, I_{OL} = 1 mA	–	–	1.0	V
	V_{OH}, I_{OH} = 1 mA	4.0	–	–	V
Firing Loop					
Voltage Drop	Sink + source, V_{BAT} = 8.3 to 32 V, I_O = 1.5 A	–	–	3.0	V
Current Limit	Source driver	–	–	-3.2	A
	Sink driver	1.5	–	2.0	A
Breakdown Voltage	I_O = 100 µA	35	–	–	V

TERMINAL FUNCTIONS

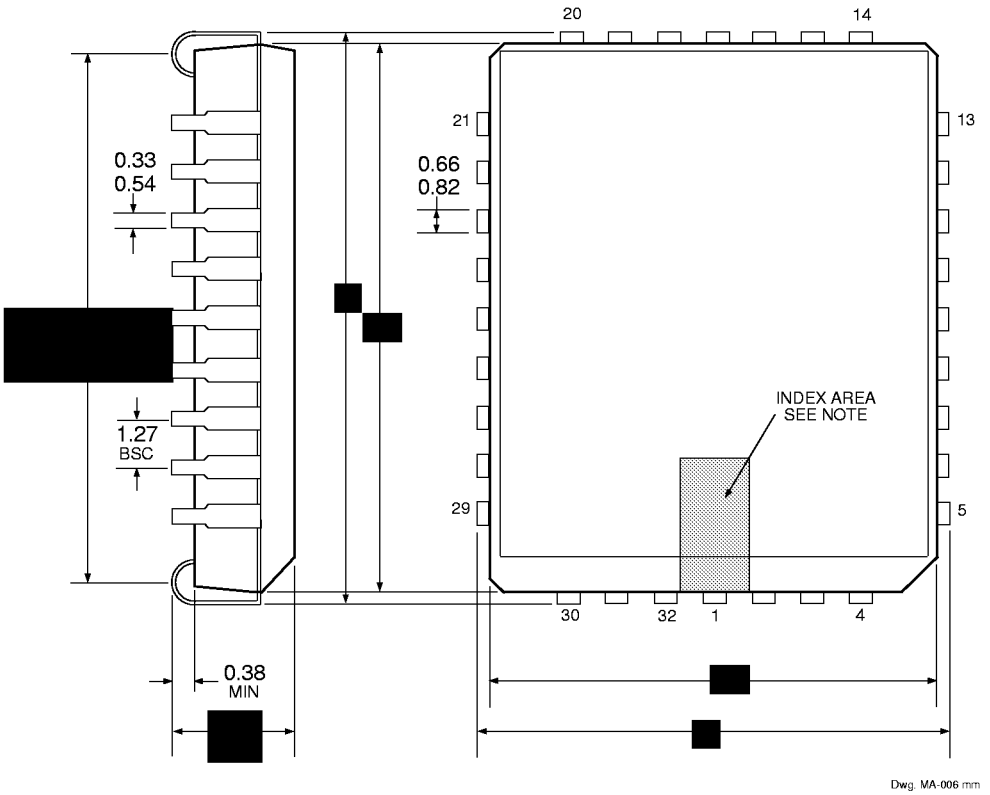
Terminal	Name or symbol	Description
1	GND2-3	Output loops 2 & 3 power ground.
2	S3L	Output loop 3 sink driver.
3	S3H	Output loop 3 source driver.
4	VCC3-4	Output loops 3 & 4 supply.
5	S4H	Output loop 4 source driver.
6	S4L	Output loop 4 sink driver.
7	GND4	Output loop 4 power ground.
8	ANALOG1	Analog input 1 to analog multiplexer.
9	ANALOG2	Analog input 2 to analog multiplexer.
10	ANALOG3	Analog input 3 to analog multiplexer.
11	ANALOG4	Analog input 4 to analog multiplexer.
12	ANALOG5	Analog input 5 to analog multiplexer.
13	V5	Low-voltage supply (typically 5 V).
14	V30	High-voltage supply (9 to 30 V).
15	SUB	Substrate ground.
16	IGNITION	Ignition sense & supply voltage for lamp drivers.
17	CLOCK	Serial port clock.
18	ENABLE	Serial port enable.
19	DATA IN	Serial port data input.
20	DATA OUT	Serial port data output.
21	FIRE ENABLE	Output loops arming.
22	SIGNAL GND	Low-level signal ground.
23	RCAL	Calibration resistor.
24	MUXOUT	Analog multiplexer output to A/D converter.
25	MUXIN	Analog multiplexer default input from accelerometer.
26	RSET	Resistor to ground for squib diagnostic current setting.
27	GND1	Output loop 1 power ground.
28	S1L	Output loop 1 sink driver.
29	S1H	Output loop 1 source driver.
30	VCC1-2	Output loops 1 & 2 supply.
31	S2H	Output loop 2 source driver.
32	S2L	Output loop 2 sink driver.

Dimensions in Inches
(controlling dimensions)



NOTES: 1. Exact body and lead configuration at vendor's option within limits shown.
2. Lead spacing tolerance is non-cumulative.

Dimensions in Millimeters
(for reference only)



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