

**Radiation Hardened Power-Up/Down  
Microprocessor Reset Circuit**



The Radiation Hardened IS-705RH is a monolithic device that monitors the power supply voltage used by satellite control units and provides a

reset output pulse during power-up and power-down. The reset threshold is 4.65V (Typ) and the reset pulse width is set at 200ms (Typ). A watchdog circuit is incorporated for easy interfacing with microprocessors and controllers. If the watchdog input has not been toggled within a preset 1.6s (Typ) time period, an output signal is generated, which can be used as an interrupt. The power function input (PFI) may be used to monitor other voltage levels. The circuit has a 1.25V (Typ) threshold and provides a PFO output when low voltage is detected. An active-low manual reset input is also provided for direct control of the reset function.

Constructed with the Intersil UHF2X-CMOS process, these devices have been specifically designed to provide highly reliable performance in harsh radiation environments. This process has been tested for single event latch-up and has demonstrated an immunity to 90MeV/mg/cm<sup>2</sup>.

**Specifications for Rad Hard QML devices are controlled by the Defense Supply Center in Columbus (DSCC). The SMD numbers listed here must be used when ordering.**

**Detailed Electrical Specifications for these devices are contained in SMD 5962-00538. A “hot-link” is provided on our homepage for downloading.**  
<http://www.dscclia.mil/downloads/milspec/smd/00538.pdf>

**Features**

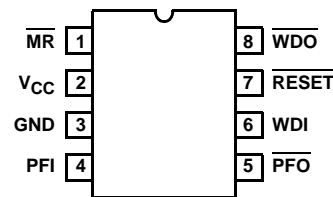
- Electrically Screened to SMD #5962-00538
- QML Qualified per MIL-PRF-38535 Requirements
- Radiation Hardness
  - Total Dose . . . . . 100 krad(Si) (Max)
  - Single Event Latch-up . . . . . >90MeV/mg/cm<sup>2</sup>
- Precision 4.65V Voltage Monitor
- Supply Voltage Range . . . . . 4.75V to 5.5V
- $\overline{\text{RESET}}$  Valid at  $V_{CC} = 1.2V$
- Low Supply Current . . . . . 420 $\mu$ A (Typ)
- 200ms (Typ)  $\overline{\text{RESET}}$  Pulse Width
- Pb-Free Plus Anneal Available (RoHS Compliant)

**Applications**

- Flight Computers
- Controllers
- Critical Microprocessor Power Monitoring
- Reliable Replacement of Discrete Solutions

**Pinout**

**IS-705RH  
(8 LD FLATPACK)  
TOP VIEW**



**Ordering Information**

ORDERING NUMBER	INTERNAL MKT. NUMBER	PART MARKING	TEMP. RANGE (°C)	PACKAGE (Pb-Free)	PKG. DWG. #
5962R0053801QXC	IS9-705RH-8	Q 5962R00 53801QXC	-55 to +125	8 Ld Flatpack, Solder SL	K8.A
5962R0053801VXC	IS9-705RH-Q	Q 5962R00 53801VXC	-55 to +125	8 Ld Flatpack, Solder SL	K8.A
5962R0053801V9A	IS0-705RH-Q		-55 to +125	8 Ld Flatpack, Solder SL	K8.A
IS9-705RH/Proto	IS9- 705RH /Proto	IS9- 705RH /Proto	-55 to +125	8 Ld Flatpack, Solder SL	K8.A

NOTE: Intersil Pb-free plus anneal products employ special Pb-free material sets; molding compounds/die attach materials and 100% matte tin plate termination finish, which are RoHS compliant and compatible with both SnPb and Pb-free soldering operations. Intersil Pb-free products are MSL classified at Pb-free peak reflow temperatures that meet or exceed the Pb-free requirements of IPC/JEDEC J STD-020.

**Die Characteristics**

**DIE DIMENSIONS:**

1500 $\mu$ m x 1830 $\mu$ m (59mils x 72mils)  
 Thickness: 483 $\mu$ m  $\pm$  25.4 $\mu$ m (19mils  $\pm$  1mil)

**INTERFACE MATERIALS**

**Glassivation**

Type: Nitride (Si<sub>3</sub>N<sub>4</sub>) over Silox (SiO<sub>2</sub>)  
 Nitride Thickness: 4.0k $\text{Å}$   $\pm$  1.0k $\text{Å}$   
 Silox Thickness: 12.0k $\text{Å}$   $\pm$  4.0k $\text{Å}$

**Top Metallization**

Top Metal 3: TiAlCu  
 Thickness: 0.8 $\mu$ m  $\pm$  0.02 $\mu$ m  
 Metal 1 and 2: TiAlCu  
 Thickness: 0.4 $\mu$ m  $\pm$  0.01 $\mu$ m

**Metallization Mask Layout**

**Substrate:**

UHF2X-CMOS

**Backside Finish:**

Silicon

**ASSEMBLY RELATED INFORMATION**

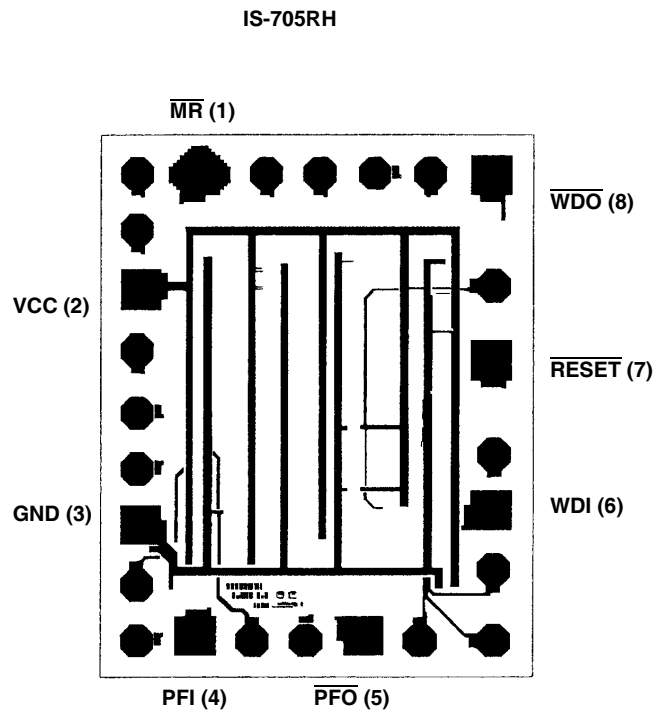
**Substrate Potential:**

Backside internally connected to GND  
 (May be left floating or connected to GND.)

**ADDITIONAL INFORMATION**

**Worst Case Current Density:**

<2.0 x 10<sup>5</sup> A/cm<sup>2</sup>



**NOTES:**

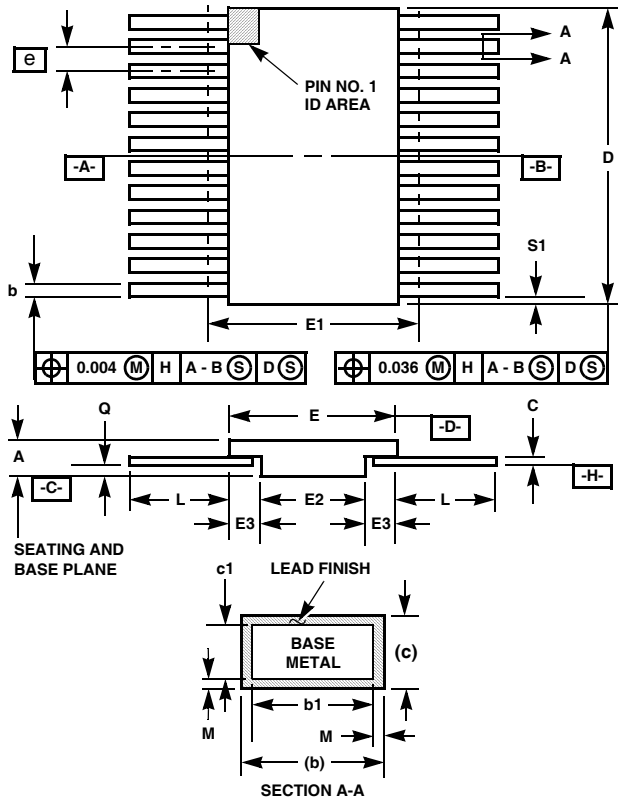
1. Octagonal trim pads should be left unconnected.

All Intersil U.S. products are manufactured, assembled and tested utilizing ISO9000 quality systems.  
 Intersil Corporation's quality certifications can be viewed at [www.intersil.com/design/quality](http://www.intersil.com/design/quality)

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For information regarding Intersil Corporation and its products, see [www.intersil.com](http://www.intersil.com)

Ceramic Metal Seal Flatpack Packages (Flatpack)



**K8.A**  
8 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.070	0.115	1.18	2.92	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.004	0.009	0.10	0.23	-
c1	0.004	0.007	0.10	0.18	-
D	0.245	0.265	6.22	6.73	3
E	0.245	0.265	6.22	6.73	-
E1	-	0.280	-	7.11	3
E2	0.170	0.180	4.32	4.57	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	-	-	-	-	2
L	0.250	0.370	6.35	9.40	-
Q	0.026	-	0.66	-	8
S1	0.005	-	0.13	-	6
M	-	0.0015	-	0.04	-
N	8		8		-

Rev. 0 9/00

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.







## IS-705RH

[Printer Friendly Version](#)

## Rad-Hard Power-Up/Down Microprocessor Reset Circuit

 <a href="#">Datasheets</a>	 <a href="#">Description</a>	 <a href="#">Key Features</a>	 <a href="#">Parametric Data</a>	 <a href="#">Application Diagrams</a>	 <a href="#">Related Devices</a>
<a href="#">Related Docs &amp; Simulations</a>					

## Ordering Information

Part No.	Design-In Status	Temp.	Package	MSL	SMD	Price US \$	
IS0-705RH-Q 	Active	Mil	<a href="#">8 Ld Die (Military Visual)</a>	N/A	5962R0053801V9A	Contact Us	
IS9-705RH-8 	Active	Mil	<a href="#">8 Ld FlatPack</a>	N/A	5962R0053801QXC	Contact Us	
IS9-705RH-Q 	Active	Mil	<a href="#">8 Ld FlatPack</a>	N/A	5962R0053801VXC	Contact Us	

The price listed is the manufacturer's suggested retail price for quantities between 100 and 999 units. However, prices in today's market are fluid and may change without notice.

MSL = Moisture Sensitivity Level - per IPC/JEDEC J-STD-020

SMD = Standard Microcircuit Drawing

 Description

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- RESET Valid at V<sub>CC</sub> = 1.2V
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- 200ms (Typ) RESET Pulse Width
- Pb-Free Plus Anneal Available (RoHS Compliant)

## Related Documentation



Datasheet(s):

- [Radiation Hardened Power-Up/Down Microprocessor Reset Circuit](#)



Military SMD(s):

- [SMD for the device above.](#)



Technical Homepage:

- [Military/Space ICs](#)

Other:

- [Single Event Effects Testing of the IS-705RH Microprocessor Supervisory Circuit](#)



#### Parametric Data

RH Level

100



#### Application Block Diagrams

- [Satellite Power Management](#)

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- Reliable Replacement of Discrete Solutions