Radiation Hardened Power-Up/Down Microprocessor Reset Circuit

IS-705RH

STAR POWER™ by intersil

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 $\overline{PFO}$ 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 $90MeV/mg/cm^2$.

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.
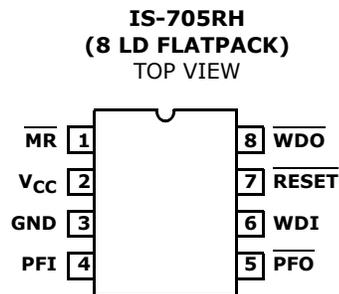**http://www.dscc.dla.mil/downloads/milspec/smd/00538.pdf**

Features

• Electrically Screened to SMD #5962-00538
• QML Qualified per MIL-PRF-38535 Requirements
• Radiation Hardness
  - Total Dose . . . . 100 krad(Si) (Min)
  - Single Event Latch-up . . . . . . >90MeV/mg/cm^2
• Precision 4.65V Voltage Monitor
• Supply Voltage Range . . . . 4.75V to 5.5V
• $\overline{RESET}$ Valid at V_{CC} = 1.2V
• Low Supply Current . . . . .420µA (Typ)
• 200ms (Typ) $\overline{RESET}$ Pulse Width

Applications

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

Pin Configuration

IS-705RH
(8 LD FLATPACK)
TOP VIEW

$\overline{MR}$	1	8 $\overline{WDO}$
V_{CC}	2	7 $\overline{RESET}$
GND	3	6 WDI
PFI	4	5 $\overline{PFO}$

Ordering Information

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

NOTE: These Intersil Pb-free Hermetic packaged products employ 100% Au plate - e4 termination finish, which is RoHS compliant and compatible with both SnPb and Pb-free soldering operations.

Die Characteristics

DIE DIMENSIONS:

1500μmx1830μm (59milsx72mils)
Thickness: 483μm ±25.4μm (19mils ±1mil)

INTERFACE MATERIALS

Glassivation

Type: Nitride (Si$_3$N$_4$) over Silox (SiO$_2$)
Nitride Thickness: 4.0kÅ ±1.0kÅ
Silox Thickness: 12.0kÅ ±4.0kÅ

Top Metallization

Top Metal 3: TiAlCu
Thickness: 0.8μm ±0.02μm
Metal 1 and 2: TiAlCu
Thickness: 0.4μm ±0.01μm

Process:

UHF2X-CMOS, Junction Isolation

Backside Finish:

Silicon

ASSEMBLY RELATED INFORMATION

Substrate Potential:

Unbiased
(May be left floating or connected to GND.)

ADDITIONAL INFORMATION

Worst Case Current Density:

<2.0 x 10^5 A/cm^2

Metallization Mask Layout

IS-705RH
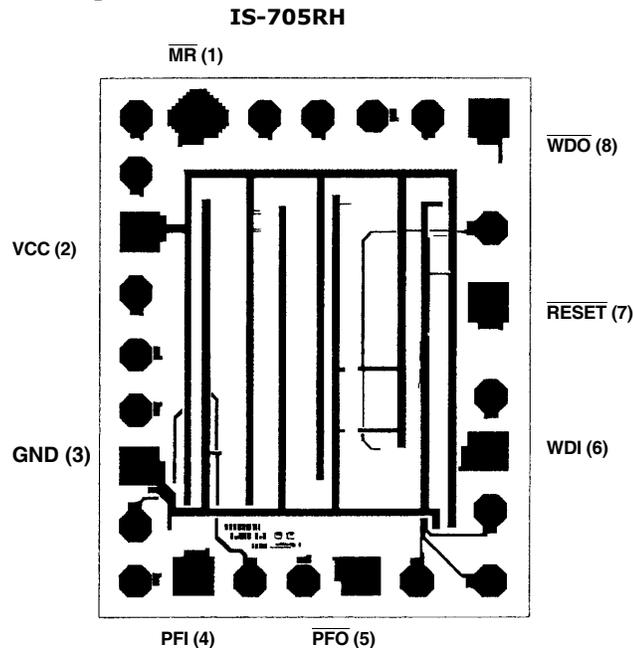
NOTE: Octagonal trim pads should be left unconnected.