Features

- Precision supply-voltage monitor
  - 4.3V(RS/IT811M), 4.0V(RS/IT811J)
  - 3.08V(RS/IT811T), 2.93V(RS/IT811S)
  - 2.63V(RS/IT811R), 2.32V(RS/IT811Z)
  - 1.5~2.2V (Contact us)
- 140ms(min) reset pulse width
- Push-Pull /RESET Output Configurations
- Debounced CMOS-compatible manual-reset input
- 12μA Supply Current
- Guaranteed Reset(/Reset) Valid to V_{CC} = +1.0V
- Power Supply Transient Immunity
- No External Components

Ordering Information

Part Number	Package
RS/IT811XTB	Lead free and Green SOT143

Note: "x" refers to voltage range, see below table.

Description

The RS/IT811 are microprocessor (μP) supervisory circuits used to monitor the power supplies in μP and digital systems. They provide excellent circuit reliability and low cost by eliminating external components and adjustments when used with +3.3V, +3.0V, or 2.5V powered circuits.

These circuits perform a single function: they assert a reset signal whenever the VCC supply voltage declines below a preset threshold or Manual -reset, keeping it asserted for at least 140ms. Reset thresholds suitable for operation with a variety of supply voltages are available.

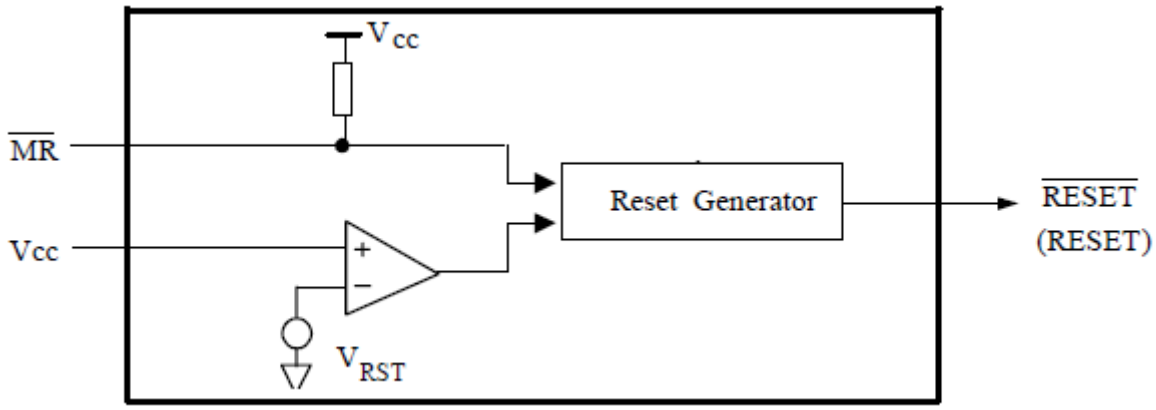
The RS/IT811 have push-pull outputs and have an active-low /RESET output. The reset comparator is designed to ignore fast transients on V_{CC}, and the outputs are guaranteed to be in the correct logic state for V_{CC} down to 1V.

Low supply current makes the RS/IT811 ideal for use in portable equipment. The ICs are available in 4 pin SOT143 packages.

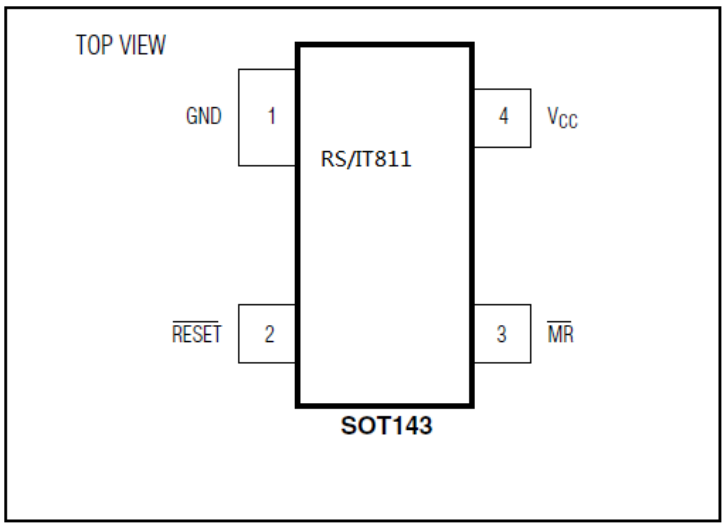
Suffix: X—Monitored Voltage

X	M	J	T	S	R	Z
Reset Threshold (V)	4.3	4.0	3.08	2.93	2.63	2.32V

Block Diagram



Pin Configuration



Pin Description

Pin	Type	Description
VCC	-	**Supply Voltage.** Reset is asserted when V_{CC} drops below the Reset Threshold Voltage (V_{RST}). Reset remains asserted until V_{CC} rises above V_{RST} and keep asserted for the duration of the Reset Timeout Period (t_{RS}) once V_{CC} rises above V_{RST}.
GND	-	**Ground**
$\overline{\text{RESET}}$	O	**Active-Low Reset Output (Push-Pull).** It goes low when Vcc is below the reset threshold. It remains low for about 200ms after Vcc rises above the reset threshold (V_{RST}).
$\overline{\text{MR}}$	I	Manual-Reset: (CMOS). Active low. Pull low to force a reset. Reset remains asserted for the duration of the Reset Timeout Period after MR transitions from low to high. Leave unconnected or connected to VCC if not used.

Functional Description

Reset Output

A microprocessor (µP) reset input starts the µP in a known state. Whenever the µP is in an unknown state, it should be held in reset. The supervisory circuits assert reset during power-up and prevent code execution errors during power-down or brownout conditions.

On power-up, once Vcc reaches about 1.0V, /RESET is a guaranteed logic low of 0.4V or less. As Vcc rises, /RESET stays low. When Vcc rises above the reset threshold, an internal timer releases /RESET after about 200ms. /RESET pulses low whenever Vcc drops below the reset threshold, i.e. brownout condition. If brownout occurs in the middle of a previously initiated reset pulse, the pulse continues for at least another 200ms. On power-down, once Vcc falls below the reset threshold, /RESET stays low and is guaranteed to be 0.4V or less until Vcc drops below 1.0V. R*eset Timing Diagram* shows the timing relationship.

Manual Reset

The manual-reset input (MR) allows reset to be triggered by a push button switch. MR has an internal pullup resistor, so it can be left open when not used.

Maximum Ratings

Storage Temperature .....-55°C to +150°C
Ambient Temperature with Power Applied..... -40°C to +85°C
Supply Voltage to Ground Potential (Vcc to GND) .....-0.3V to +6.0V
DC Input Voltage (All inputs except Vcc and GND).....-0.3V to V_{CC}+0.3V
DC Output Current (All outputs) 20mA
Power Dissipation 320mW

Note:
Stresses greater than those listed under MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

Recommended Operation Conditions

Sym	Description	Test Conditions	Min	Typ	Max	Unit
V_{CC}	Supply Voltage for 811(L/M)	-	4.5	5.0	5.5	V
	Supply Voltage for 811(T/S)	-	3.0	3.3	5.5	V
	Supply Voltage for 811(R)	-	2.7	3.0	5.5	V
T_A	Operating Temperature	-	-40	-	85	℃

DC Electrical Characteristics

(V_{CC} = V_{RN} + 5% to 5.5V, T_A= -40~85℃, unless otherwise noted.)(Note 1)

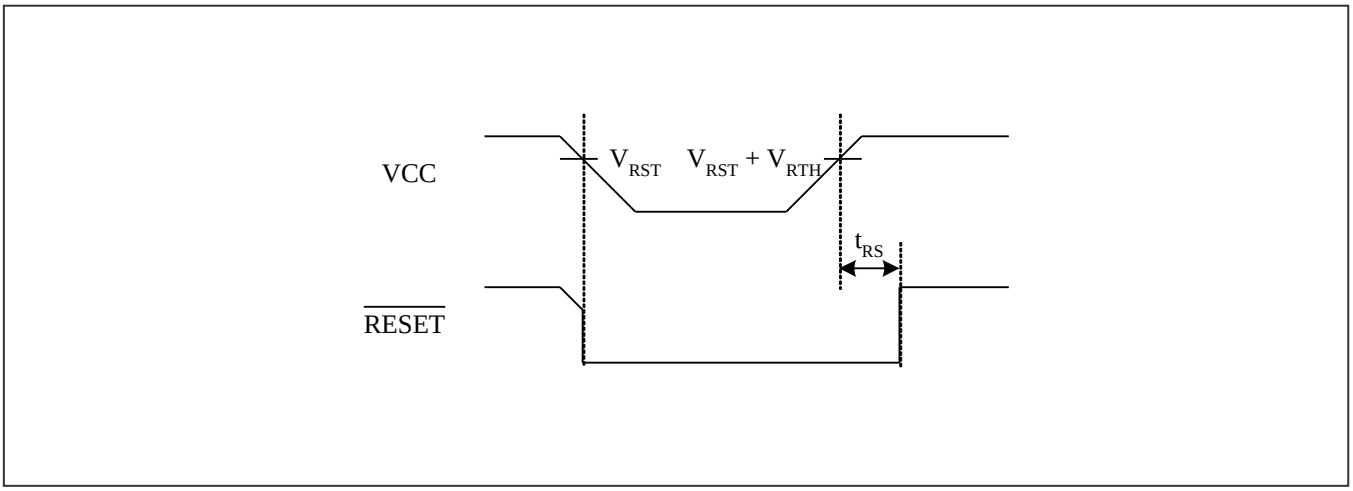
Symbol	Description	Test Conditions		Min	Typ	Max	Unit
V_{CC}	Operating Voltage Range	-		1.0	-	5.5	V
I_{CC}	Supply Current	Vcc < 5.5V, IT8xxL/M		-	10	30	μA
I_{CC}	Supply Current	Vcc < 3.6V, IT8xxR/S/T/Z		-	10	30	
V_{RST} (V_{RTH-})	Threshold Voltage(Falling-edge)(**Note 2**)	T_A= 25℃	RS/IT811M	V_{RN} -1.1%	V_{RN}	V_{RN} +1.1%	V
			All except 811M	V_{RN} - 1.5%	V_{RN}	V_{RN} + 1.5%	
		T_A= -40 ~ 85℃	RS/IT811M	V_{RN} - 1.8%	V_{RN}	V_{RN} + 2%	
		T_A= -40 ~ 85℃	All except 811M	V_{RN} - 2.5%	V_{RN}	V_{RN} + 2.5%	
V_{RTH+}	Threshold Voltage(Rising-edge) (**Note 2**)	T_A= -40 ~ 85℃	RS/IT811M	4.232	4.31	4.396	
V_{RTH}	Reset Threshold Hysteresis (**Note 2**)	Vcc varies between V_{RN} ±5% (Only for 811L/M)		-	50	-	mV
V_{OH}	Output High Voltage	Vcc ≥ 4.5V Isource=800μA		Vcc-1.5	-	-	V
		Vcc ≥ 2.7V Isource=500μA		0.8×Vcc	-	-	
		Vcc ≥ 1.8V Isource=150μA		0.8×Vcc	-	-	
		Vcc ≥ 1.0V Isource=4μA		0.8×Vcc	-	-	
V_{OL}	Output Low Voltage	Vcc ≥ 4.5V Isink=3.2mA		-	-	0.4	V
		Vcc ≥ 2.7V Isink=1.2mA		-	-	0.3	
		Vcc ≥ 1.0V Isink=100μA		-	-	0.3	

Note: 1. Parameters of room temperature guaranteed by production test and parameters of full-temperature guaranteed by design.
2. V_{RST} is Reset threshold voltage when V_{CC} falls from high to low level. V_{RN} is nominal reset threshold voltage.

AC Electrical Characteristics

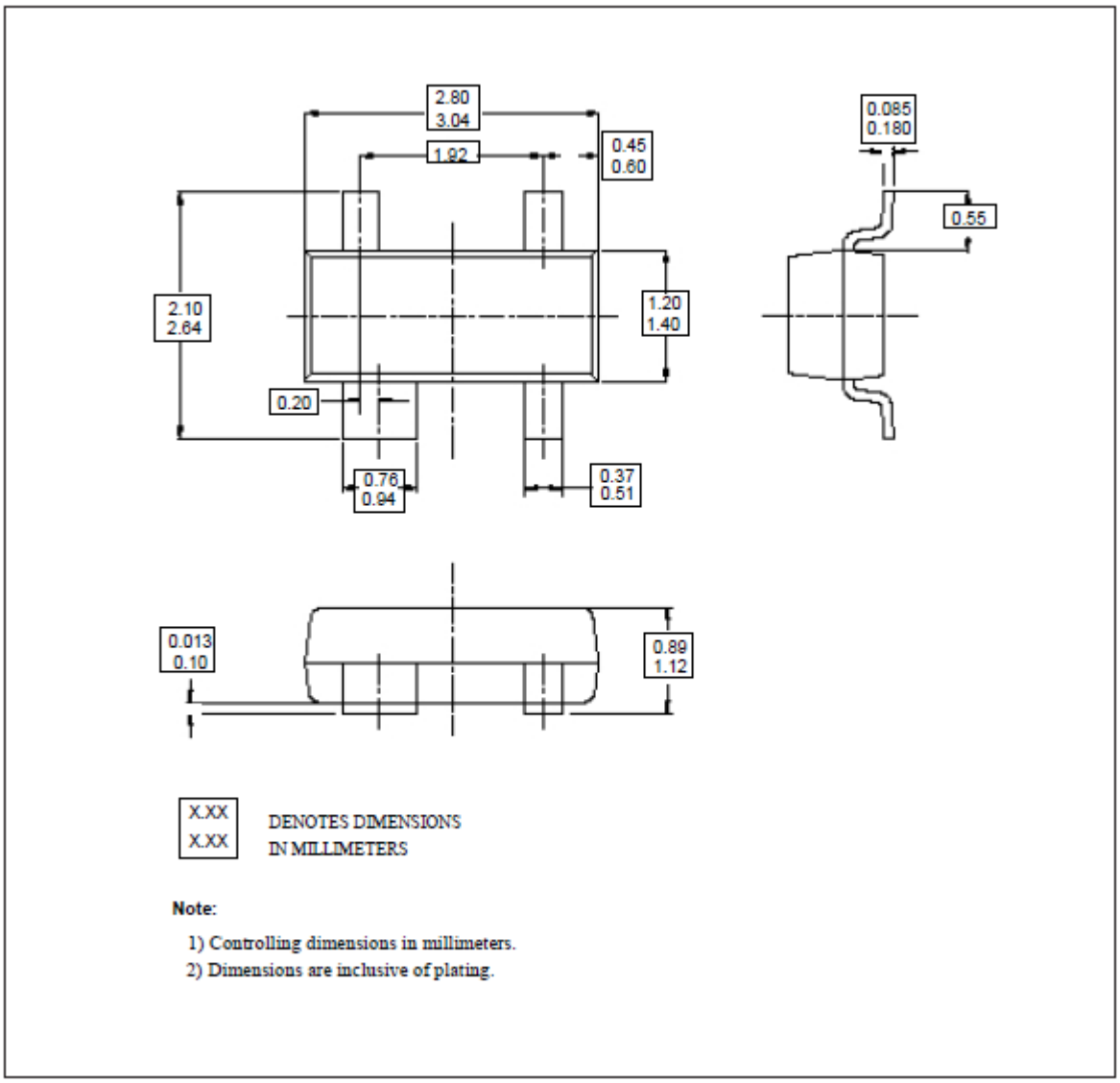
Symbol	Description	Test Conditions		Min	Typ	Max	Unit
t_{RS}	Reset Pulse Width	T_A= 25℃		140	200	280	ms
t_{MR}	MR Pulse Width	T_A= 25℃		1			us

Reset Timing Diagram



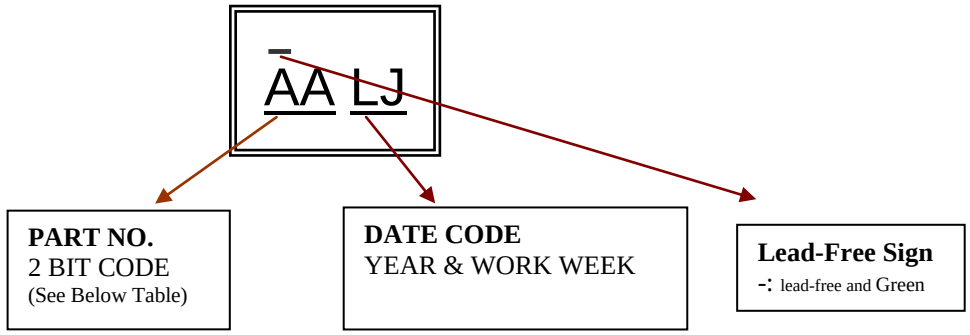
Mechanical Information

TBE (Lead free and Green SOT143)



Note: E Stands for Pb Free

Marking Information



Example: **AAPJ** PART NO.: RS/IT811LTBE
DATE CODE: YEAR 2005 WW10

AAPJ PART NO.: RS/IT811LTBE
DATE CODE: YEAR 2005 WW10
Lead –free package

No.	Part No.	Code
1	RS/IT811L	AO
2	RS/IT811M	AP
3	RS/IT811T	AQ
4	RS/IT811S	AR
5	RS/IT811R	AS

Notes

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