

**GENERAL DESCRIPTION**

The RM710 and RC710 integrated circuits are monolithic, high speed, differential voltage comparators. Manufactured by the planar process, component matching is inherent. Characteristic of the devices is low offset voltage and low drift parameters as well as high accuracy and fast response.

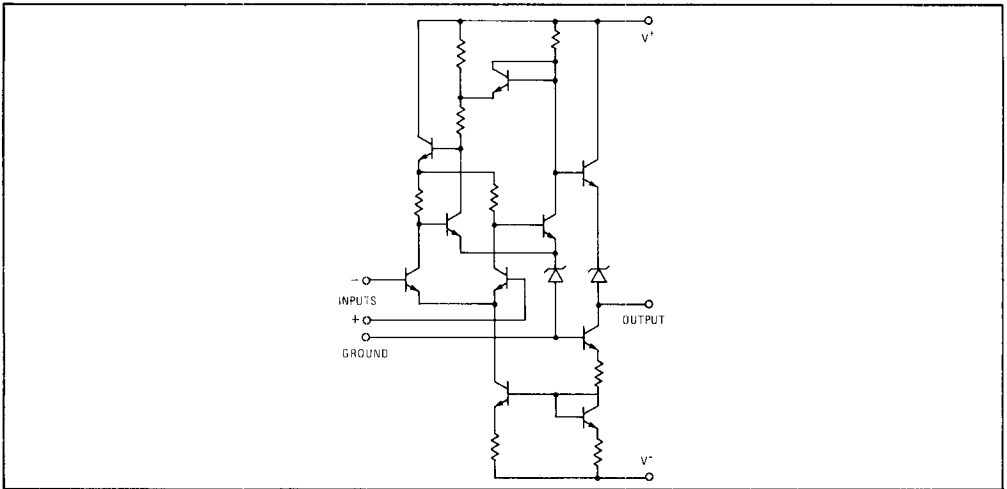
These voltage comparators are specially designed for a variety of applications such as high speed A/D converter, memory sense amplifier, zero crossing detector, amplitude discriminator and variable threshold Schmitt trigger.

The RM710 operates over the full military temperature range from  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ . The RC710, commercial equivalent of the RM710, operates over a temperature from  $0^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$ .

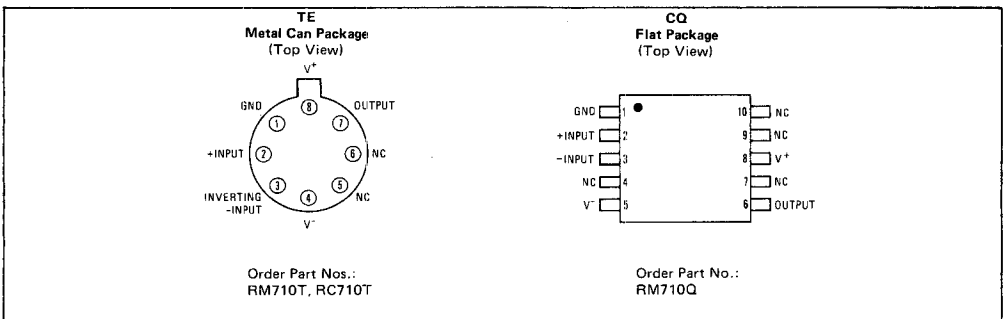
**DESIGN FEATURES**

- Low Offset Voltage and Drift Over Entire Temperature Range
- Fast Response Time
- Output Logic Compatible With All Existing Integrated Logic Forms
- Meets or Exceeds All Environmental Requirements of MIL-S-19500, MIL-STD-202, and MIL-STD-750

**SCHEMATIC DIAGRAM**



**CONNECTION INFORMATION**



## ABSOLUTE MAXIMUM RATINGS

Positive Supply Voltage	+14V	Operating Temperature Range	
Negative Supply Voltage	-7.0V	RM710	-55°C to +125°C
Peak Output Current	10.0mA	RC710	0°C to +70°C
Differential Input Voltage	±5.0V	Internal Power Dissipation (Note 1)	
Input Voltage	±7.0V	TO-5	300mW
Storage Temperature Range	-65°C to +150°C	Flat Package	200mW
Lead Temperature (Soldering, 60s)	300°C		

## ELECTRICAL CHARACTERISTICS (V<sup>+</sup> = 12.0V, V<sup>-</sup> = -6.0V, T<sub>A</sub> = +25°C unless otherwise specified)

PARAMETER	CONDITIONS	RM710			RC710			UNITS
		MIN	TYP	MAX	MIN	TYP	MAX	
Input Offset Voltage (Note 3)	R <sub>S</sub> ≤ 200Ω		0.6	2.0		1.6	5.0	mV
Input Offset Current (Note 3)			0.75	3.0		1.8	5.0	μA
Input Bias Current			13	20		16	25	μA
Voltage Gain		1250	1700		1000	1500		V/V
Output Resistance			200			200		Ω
Output Sink Current	ΔV <sub>in</sub> ≥ 5mV, V <sub>out</sub> = 0	2.0	2.5		1.6	2.5		mA
Response Time (Note 2)			40	60		40		ns
The following specifications apply for -55°C ≤ T <sub>A</sub> ≤ +125°C.					The following specifications apply for 0°C < T <sub>A</sub> < +70°C.			
Input Offset Voltage (Note 3)	R <sub>S</sub> ≤ 200Ω			3.0			6.5	mV
Average Temperature Coefficient of Input Offset Voltage	R <sub>S</sub> = 20Ω, T <sub>A</sub> = Low to T <sub>A</sub> = High, R <sub>S</sub> = 20Ω		3.5	10		5.0	20	μV/°C
	T <sub>A</sub> = 25°C to T <sub>A</sub> = Low		2.7	10				
Input Offset Current (Note 3)	T <sub>A</sub> = +125°C		0.25	3.0				μA
	T <sub>A</sub> = Low		1.8	7.0			7.5	
Average Temperature Coefficient of Input Offset Current	T <sub>A</sub> = 25°C to T <sub>A</sub> = High		5.0	25		15	50	nA/°C
	T <sub>A</sub> = 25°C to T <sub>A</sub> = Low		15	75		24	100	
Input Bias Current	T <sub>A</sub> = Low		27	45		25	40	μA
Input Voltage Range	V <sup>-</sup> = -7.0V	±5.0			±5.0			V
Common Mode Rejection Ratio	R <sub>S</sub> ≤ 200Ω	80	100		70	98		dB
Differential Input Voltage Range		±5.0			±5.0			V
Voltage Gain		1000			800			
Positive Output Level	ΔV <sub>in</sub> ≥ 5mV, 0 ≤ I <sub>out</sub> ≤ 5.0mA	2.5	3.2	4.0	2.5	3.2	4.0	V
Negative Output Level	ΔV <sub>in</sub> ≥ 5mV	-1.0	-0.5	0	-1.0	-0.5	0	V
Output Sink Current	T <sub>A</sub> = Low, ΔV <sub>in</sub> ≥ 5mV, V <sub>out</sub> = 0	0.5	2.3		0.5			mA
	T <sub>A</sub> = High, ΔV <sub>in</sub> ≥ 5mV, V <sub>out</sub> = 0	0.5	1.7		0.5			
Positive Supply Current	V <sub>out</sub> ≤ 0		5.2	9.0		5.2	9.0	mA
Negative Supply Current			4.6	7.0		4.6	7.0	mA
Power Consumption			90	150		90	150	mW

### NOTES:

- The thermal characteristics are based on a maximum chip temperature of 160°C. Derate maximum power dissipation of TO-5 Can by 6.7mW/°C for T<sub>A</sub> ≥ 114°C, and of Flat Pak by 5.3mW/°C for T<sub>A</sub> ≥ 103°C. The ratings apply for -55°C ≤ T<sub>A</sub> ≤ +125°C.
- The response time specified (see definitions) is for a 100mV input step with 5mV overdrive.
- The input offset voltage and input offset current are specified for a logic threshold voltage as follows: For RM710 grade 1.8V at -55°C, 1.4V at +25°C and 1.0V at +125°C. For RC710 grade 1.5V at +25°C and 1.2V at +70°C.