GENERAL DESCRIPTION

The RC4444 is a monolithic dielectrically isolated crosspoint array arranged into a 4x4x2 matrix. The primary applications are for balanced switching of 600 ohm transmission lines. The ring and tip are selected by selective biasing of the P+ and P– gate.

Designed to replace reed-relays in telephone switchboards, it does not require a constant gate drive to keep the SCR in the "on" condition. It is several orders faster, with no bouncing, and has a much longer operating life than its mechanical counterpart.

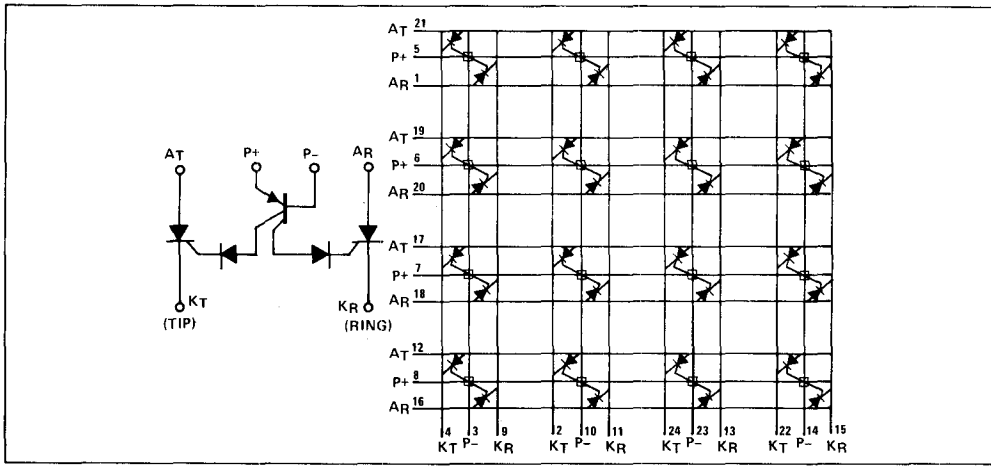
The 16 SCR pairs with the gating system are packaged in a 24 pin dual-in-line package.

The RC4444 is a monolithic pin-for-pin replacement for the MC3416 and MCBH7601.

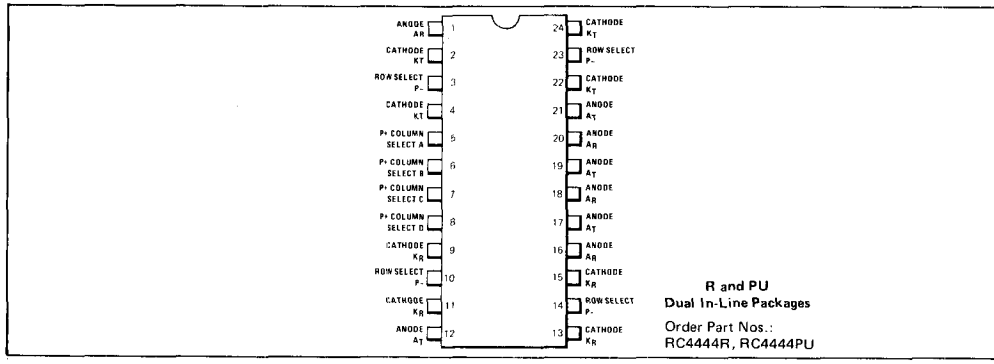
DESIGN FEATURES

- Low Bi-Directional R_{on}
- High R_{off}
- Excellent Matching of Gates
- Low Capacitance
- High Rate Firing
- Predictable Holding Current

SCHEMATIC DIAGRAM



CONNECTION INFORMATION



R and PU
Dual In-Line Packages

Order Part Nos.:
RC4444R, RC4444PU

RAYTHEON

ABSOLUTE MAXIMUM RATINGS

Operating Voltage (Note 1)	25V	Storage Temperature Range	−65°C to +150°C
Internal Power Dissipation (Note 2)	900mW	Operating Temperautre Range	0°C to +70°C
Operating Current per Crosspoint (Note 2)	100mA	Lead Temperature (Soldering, 60s)	300°C

ELECTRICAL CHARACTERISTICS ($0°C \leq T_A \leq 70°C$ unless otherwise noted)

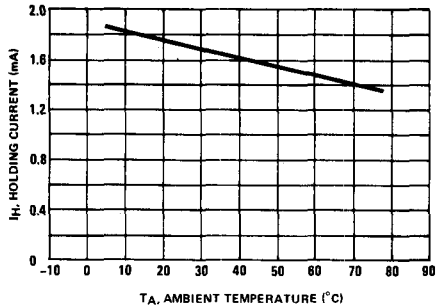
CHARACTERISTIC	SYMBOL	MIN	MAX	UNIT
Anode-Cathode Breakdown Voltage (I_{AK} = 25μA)	BV_{AK}	25	–	Vdc
Cathode-Anode Breakdown Voltage (I_{KA} = 25μA)	BV_{KA}	25	–	Vdc
Base-Cathode Breakdown Voltage (I_{BK} = 25μA)	BV_{BK}	25	–	Vdc
Cathode-Base Breakdown Voltage (I_{KB} = 25μA)	BV_{KB}	25	–	Vdc
Base-Emitter Breakdown Voltage (I_{BE} = 25μA)	BV_{BE}	25	–	Vdc
Emitter-Cathode Breakdown Voltage (I_{EK} = 25μA)	BV_{EK}	25	–	Vdc
OFF State Resistance (V_{AK} = 10V)	r_{off}	100	–	MΩ
Dynamic ON Resistance	r_{on}			Ω
(Center Current = 10mA)		4.0	12	
(Center Current = 20mA)		2.0	10	
Holding Current (See Figure 10)	I_H	0.9	3.8	mA
Enable Current (V_{BE} = 1.5V)	I_{En}	4.0	–	mA
Anode-Cathode ON Voltage	V_{AK}			V
(I_{AK} = 10mA)		–	1.0	
(I_{AK} = 20mA)		–	1.1	
Gate Sharing Current Ratio @ Cathodes (Under Select Conditions with Anodes Open)	G_{Sh}	0.8	1.25	mA/mA
Inhibit Voltage (V_B = 3.0V)	V_{inh}	–	0.3	V
Inhibit Current (V_B = 3.0V)	I_{inh}	–	0.1	mA
OFF State Capacitance (V_{AK} = 0V)	C_{off}	–	2.0	pF
Turn-ON Time	t_{on}	–	1.0	μs
Minimum Voltage Ramp (Which Could Fire the SCR Under Transient Conditions)	dv/dt	800	–	V/μs

NOTES:

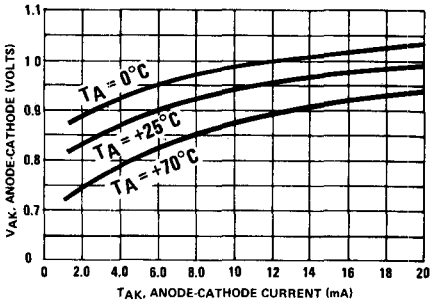
1. Maximum voltage from anode to cathode.
2. Package thermal resistance θ_{JA} typically .055°C/mW. Package power dissipation limited to 900mW.

TYPICAL APPLICATIONS

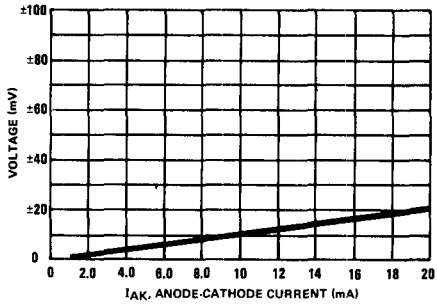
HOLDING CURRENT VERSUS AMBIENT TEMPERAUTRE



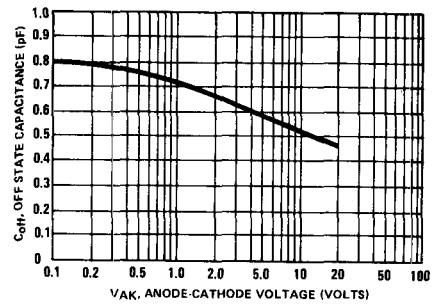
ANODE-CATHODE ON VOLTAGE VERSUS CURRENT AND TEMPERATURE



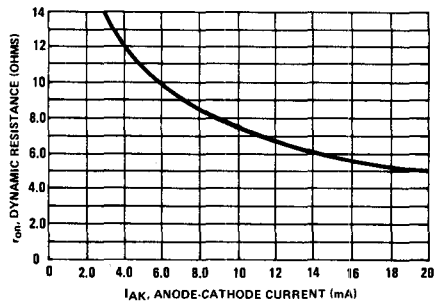
DIFFERENCE IN ANODE-CATHODE ON VOLTAGE (Between Associate Pairs of SCR's) VERSUS ANODE-CATHODE CURRENT



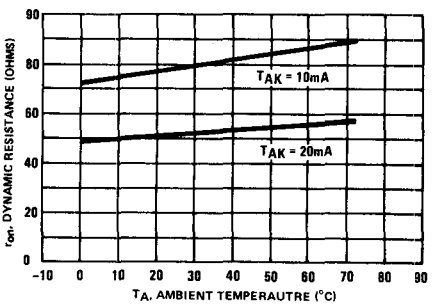
OFF-STATE CAPACITANCE VERSUS ANODE CATHODE VOLTAGE



DYNAMIC ON RESISTANCE VERSUS ANODE-CATHODE CURRENT

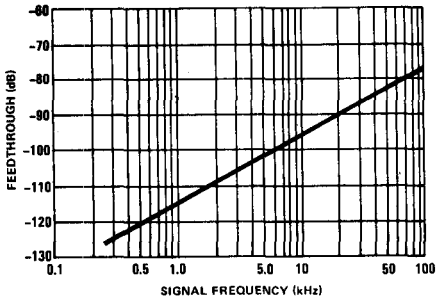


DYNAMIC ON RESISTANCE VERSUS AMBIENT TEMPERATURE

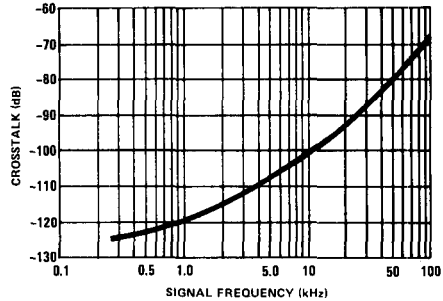


TYPICAL APPLICATIONS

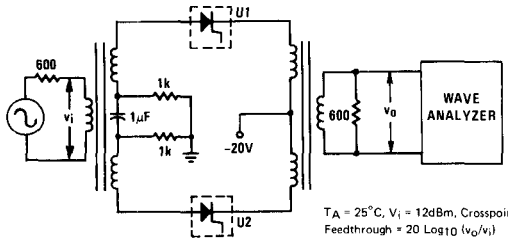
FEEDTHROUGH VERSUS SIGNAL FREQUENCY



CROSSTALK VERSUS SIGNAL FREQUENCY

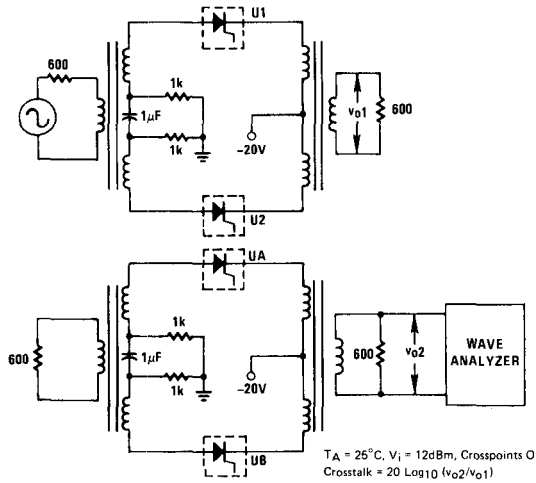


TEST CIRCUIT FOR FEEDTHROUGH VERSUS FREQUENCY



T_A = 25°C, V_i = 12dBm, Crosspoints Off
Feedthrough = 20 Log_{10} (v_o/v_i)

TEST CIRCUIT FOR CROSSTALK VERSUS FREQUENCY



T_A = 25°C, V_i = 12dBm, Crosspoints On
Crosstalk = 20 Log_{10} (v_{o2}/v_{o1})