

Precision Voltage Reference

FEATURES

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 +125°C)
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 A] `] h U f m ' D f c W Y g g] b [' 5 j U

APPLICATIONS

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 ments

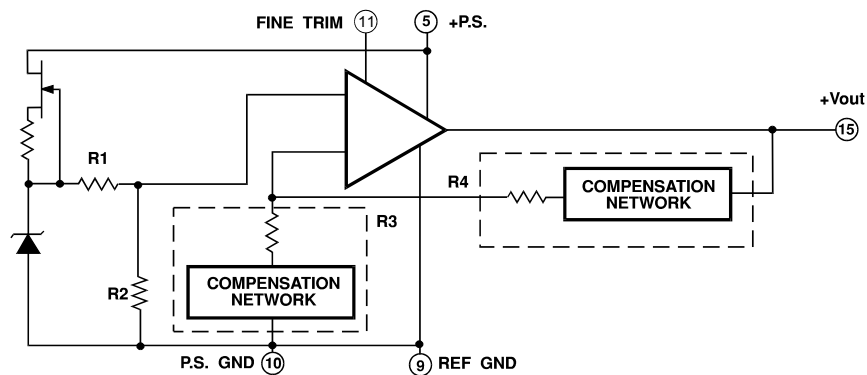
DESCRIPTION

VRE204 Series Precision Voltage References provide
 ultra-stable +4.5 V outputs with up to ±0.8 mV initial
 accuracy and ±0.5 ppm/°C over the full military temperature range,
 with successive-approximation type Analog-to-Digital
 Converters (ADCs). Specify an ADC with exceptional
 temperature drift, which can only be as good as the
 external reference used. The VRE204 combined with
 the right ADC will provide the lowest drift data conver-
 sion obtainable.

The VRE204 series is available in the military operat-
 ing temperature range of -55°C to +125°C, and two per-
 formance grades. All devices are packaged in 20-ter-
 minal LCC ceramic packages for maximum long-term
 stability. These "M" versions are screened for high reli-
 ability and quality.

Superior stability, accuracy, and quality make the
 VRE204 ideal for all precision applications which may
 require a 4.5 V reference. High-accuracy test and
 measurement instrumentation, and transducer exci-
 tation from the high accuracy of the VRE204.

Figure 1. BLOCK DIAGRAM



SELECTION GUIDE

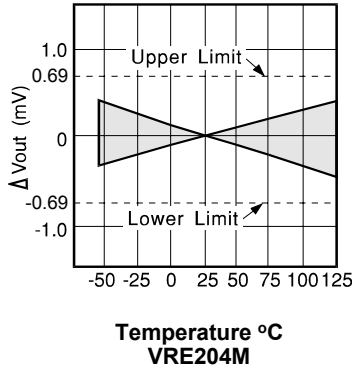
Model	Output (V)	Temperature Operating Range	Volt Deviation (MAX)
VRE204M	+4.5V	-55°C to +125°C	- \$ " * - a J
VRE204MA	+4.5V	-55°C to +125°C	- \$ " * \$ a J



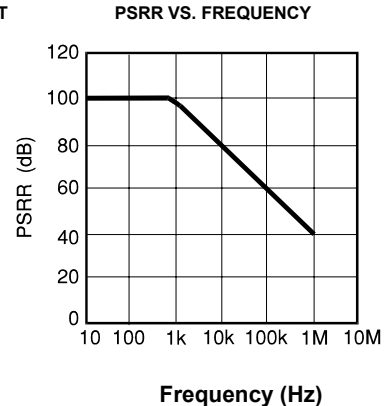
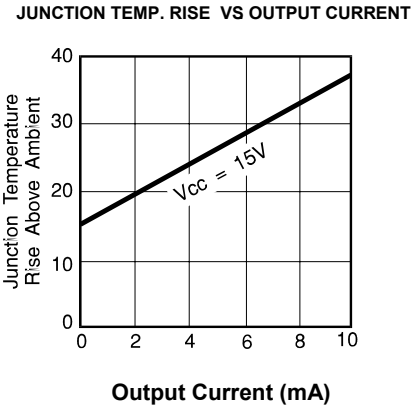
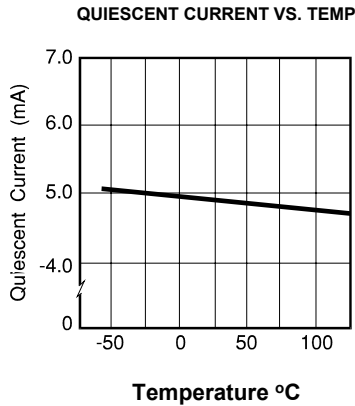
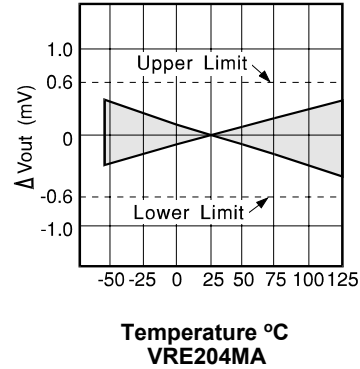
**20-terminal Ceramic LCC
Package Style HD**

2. TYPICAL PERFORMANCE GRAPHS

V_{OUT} vs. TEMPERATURE



V_{OUT} vs. TEMPERATURE



3. THEORY OF OPERATION

over time and temperature.

since the voltage vs. temperature function is nonlinear this compensation technique is not well suited for wide temperature ranges.

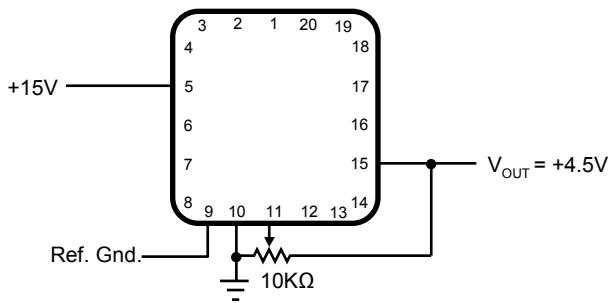
A nonlinear compensation network of thermistors and resistors is used in the VRE series voltage references. This proprietary network eliminates most of the nonlinearity in the voltage vs. temperature function. By then adjusting the slope, the VRE204 series produces a very stable voltage over wide temperature ranges. This network is less than 2% of the overall network resistance so it has a negligible effect on long term stability. By using highly stable resistors in our network, we produce a voltage reference that also has very good long term stability.

4. APPLICATION INFORMATION

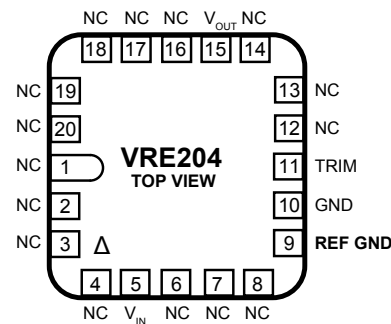
The proper connection of the VRE204 series voltage references with the optional trim resistors is shown below. Pay careful attention to the circuit layout to avoid noise pickup and voltage drops in the lines.

are connected together internally. This allows the user to achieve greater accuracy when using a socket. Voltage

EXTERNAL CONNECTIONS



PIN CONFIGURATION



CONTACTING CIRRUS LOGIC SUPPORT

For inquiries via email, please contact apex.support@cirrus.com.

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7] f f i g @ c [] W z = b W U b X] h g i V g] X] U f] Y g f l 7] f f i g k V Y] Y j Y h U h h Y] b Z c f a U h] c b V h c W U b [Y k] h c i h b c h] W Y U b X] g d f c j] X Y X 5 G = G k] h c i h k U f f U b h m c Z U b m _] b X f l Y information to verify, before placing orders, that information being relied on is current and complete. All products are sold subject to the terms and conditions of sale g i d d] Y X U h h Y h] a Y c Z c f X Y f U W _ b c k Y X [a Y b h z] b W i X] b [h c g Y d Y f h U] b [h c k U f f U for the use of this information, including use of this information as the basis for manufacture or sale of any items, or for infringement of patents or other rights of third parties. This document is the property of Cirrus and by furnishing this information, Cirrus grants no license, express or implied under any patents, mask work rights, copyrights, trademarks, trade secrets or other intellectual property rights. Cirrus owns the copyrights associated with the information contained herein and gives con- g Y b h Z c f W c d] Y g h c V Y a U X Y c Z h Y] b Z c f a U h] c b c b m Z c f i g Y k] h] b m c i f c f [U b] n U h] does not extend to other copying such as copying for general distribution, advertising or promotional purposes, or for creating any work for resale.

7 9 F H 5 = B 5 D D @ = 7 5 H = C B G I G = B ; G 9 A = 7 C B 8 I 7 H C F D F C 8 I 7 H G A 5 M = B J C @ J 9 D C H 9 B H = 5 @ - F = G ? G C : 9 F H M C F 9 B J = F C B A 9 B H 5 @ 8 5 A 5 ; 9 f l 7 F = H = 7 5 @ 5 D D @ = 7 5 H = C B G I k 7 = F F I G D F C 8 I 7 H G 5 F 9 B C H G I = H 5 6 @ 9 : C F I G 9 = B D F C 8 I 7 H G I G I F ; = 7 5 @ M = A D @ 5 B H 9 8 = B H C H < 9 6 C 8 M Z 5 I H C A C H = J 9 G 5 : 9 H I 7 H G C F C H < 9 F 7 F = H = 7 5 @ 5 D D @ = 7 5 H = C B G " = B 7 @ I G = C B C : 7 = F F I G D F C 8 I 7 H G = B I G I 7 < 5 D D @ = 7 5 H C A 9 F D G F = G ? 5 B 8 7 = F F I G 8 = G 7 @ 5 = A G 5 B 8 A 5 ? 9 G B C K 5 F F 5 B H M z 9 L D F 9 G G z G H 5 H I H C F M C F = A A 9 F 7 < 5 B H 5 6 = @ = H M 5 B 8 : = H B 9 G G : C F D 5 F H = 7 I @ 5 F D I F D C G 9 z K = H < F 9 ; 5 F 8 H C 5 B M 7 = F F I G D F C 7 I G H C A 9 F C F 7 I G H C A 9 F D G 7 I G H C A 9 F I G 9 C F D 9 F A = H G H < 9 I G 9 C : 7 = F F I G D F C 8 I 7 H G = B 7 F 6 M G I 7 < I G 9 z H C : I @ M = B 8 9 A B = : M 7 = F F I G z = H G C : = 7 9 F G z 8 = F 9 7 H C F G z 9 A D @ C M 9 9 G z 8 = G H @ = 5 6 = @ = H M z = B 7 @ I 8 = B ; 5 H H C F B 9 M G D : 9 9 G 5 B 8 7 C G H G z H < 5 H A 5 M F 9 G I @ H : F C A C F 5 F = G 9 = B

7] f f i g @ c [] W z 7] f f i g z U b X h Y 7] f f i g @ c [] W c [c X Y g] [b g z 5 d Y I D f Y W] g] c b D c k Y f z 5 d All other brand and product names in this document may be trademarks or service marks of their respective owners.