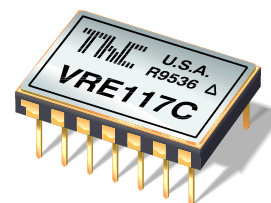




VRE117/118/119

Precision Reference Supplies



THALER CORPORATION • 2015 N. FORBES BOULEVARD • TUCSON, AZ. 85745 • (520) 882-4000

FEATURES

- VERY HIGH ACCURACY: 3.000 V OUTPUT $\pm 200 \mu\text{V}$
- EXTREMELY LOW DRIFT: 0.6 ppm/ $^{\circ}\text{C}$ -55°C to $+125^{\circ}\text{C}$
- LOW WARM-UP DRIFT: 1 ppm Typ.
- EXCELLENT STABILITY: 6 ppm/1000 Hrs. Typ.
- EXCELLENT LINE REGULATION: 3 ppm/V Typ.
- HERMETIC 14-PIN CERAMIC DIP
- MILITARY PROCESSING OPTION

APPLICATIONS

- PRECISION A/D and D/A CONVERTERS
- TRANSDUCER EXCITATION
- ACCURATE COMPARATOR THRESHOLD REFERENCE
- HIGH RESOLUTION SERVO SYSTEMS
- DIGITAL VOLTMETERS
- HIGH PRECISION TEST and MEASUREMENT INSTRUMENTS

DESCRIPTION

VRE117 Series Precision Voltage References provide ultrastable +3.000V (VRE117), -3.000V (VRE118) and $\pm 3.000\text{V}$ (VRE119) outputs with $\pm 0.200 \text{ mV}$ initial accuracy and temperature coefficient as low as 0.6 ppm/ $^{\circ}\text{C}$ over the full military temperature range. This improvement in accuracy is made possible by a unique, proprietary multipoint laser compensation technique developed by Thaler Corporation. Significant improvements have been made in other performance parameters as well, including initial accuracy, warm-up drift, line regulation, and long-term stability, making the VRE117 series the most accurate and stable 3.0V reference available.

VRE117/118/119 devices are available in two operating temperature ranges, -25°C to $+85^{\circ}\text{C}$ and -55°C to $+125^{\circ}\text{C}$, and two performance grades. All devices are packaged in 14-pin hermetic ceramic packages for maximum long-term stability. "M" versions are screened for high reliability and quality.

Superior stability, accuracy, and quality make these references ideal for precision applications such as A/D and D/A converters, high-accuracy test and measurement instrumentation, and transducer excitation.

SELECTION GUIDE

Type	Output	Temperature Operating Range	Max. Volt Deviation
VRE117C	+3.0V	-25°C to $+85^{\circ}\text{C}$	200 μV
VRE117CA	+3.0V	-25°C to $+85^{\circ}\text{C}$	100 μV
VRE117M	+3.0V	-55°C to $+125^{\circ}\text{C}$	400 μV
VRE117MA	+3.0V	-55°C to $+125^{\circ}\text{C}$	200 μV
VRE118C	-3.0V	-25°C to $+85^{\circ}\text{C}$	200 μV
VRE118CA	-3.0V	-25°C to $+85^{\circ}\text{C}$	100 μV
VRE118M	-3.0V	-55°C to $+125^{\circ}\text{C}$	400 μV
VRE118MA	-3.0V	-55°C to $+125^{\circ}\text{C}$	200 μV
VRE119C	$\pm 3.0\text{V}$	-25°C to $+85^{\circ}\text{C}$	200 μV
VRE119CA	$\pm 3.0\text{V}$	-25°C to $+85^{\circ}\text{C}$	100 μV
VRE119M	$\pm 3.0\text{V}$	-55°C to $+125^{\circ}\text{C}$	400 μV
VRE119MA	$\pm 3.0\text{V}$	-55°C to $+125^{\circ}\text{C}$	200 μV

ELECTRICAL SPECIFICATIONS

VRE117/118/119

Vps = ±15V, T = 25°C, RL = 10kΩ unless otherwise noted.

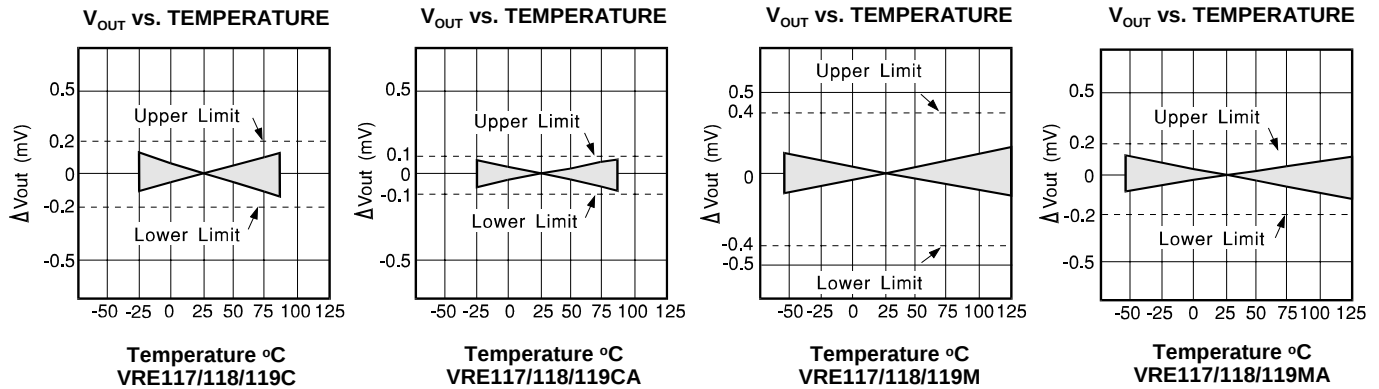
MODEL	C			CA			M			MA			
PARAMETERS	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	UNITS
ABSOLUTE MAXIMUM RATINGS													
Power Supply	±13.5		±22	*		*	*		*	*		*	V
Operating Temperature	-25		85	*		*	-55		125	-55		125	°C
Storage Temperature	-65		150	*		*	*		*	*		*	°C
Short Circuit Protection	Continuous				*			*			*		
OUTPUT VOLTAGE													
VRE117		+3.0			*			*			*		V
VRE118		-3.0			*			*			*		V
VRE119		±3.0			*			*			*		V
OUTPUT VOLTAGE ERRORS													
Initial Error			300			200			300			200	μV
Warmup Drift		2			1			2			1		ppm
Tmin - Tmax ⁽¹⁾			200			100			400			200	μV
Long-Term Stability		6			*			*			*		ppm/1000hr.
Noise (.1-10Hz)		1.5			*			*			*		μVpp
OUTPUT CURRENT													
Range	±10			*			*			*			mA
REGULATION													
Line		3	10		*	*		*	*		*	*	ppm/V
Load		3			*			*			*		ppm/mA
OUTPUT ADJUSTMENT													
Range		5			*			*			*		mV
Temperature Coefficient		1			*			*			*		μV/°C/mV
POWER SUPPLY CURRENTS ⁽²⁾													
VRE117 +PS/ -PS		5	7		*	*		*	*		*	*	mA
VRE119 +PS		7	9		*	*		*	*		*	*	mA
VRE118/119 -PS		4	6		*	*		*	*		*	*	mA

NOTES: *Same as C Models.

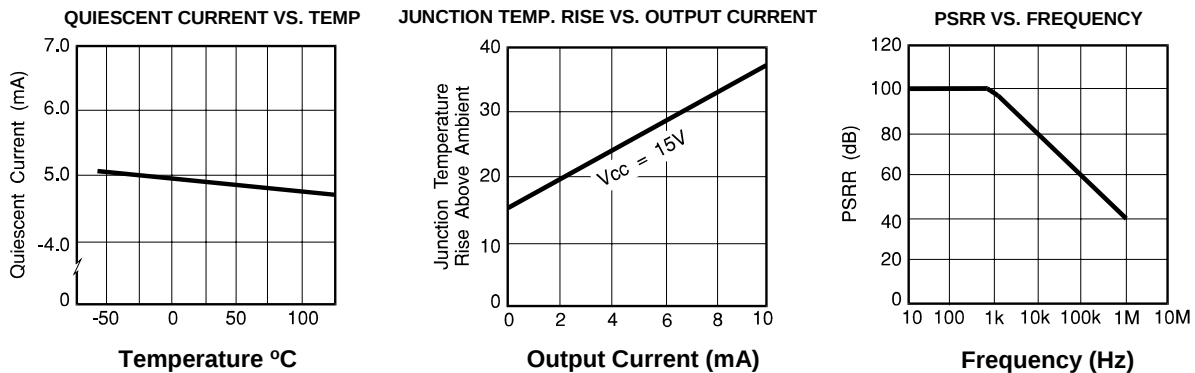
1. Using the box method, the specified value is the maximum deviation from the output voltage at 25°C over the specified operating temperature range.

2. The specified values are unloaded.

TYPICAL PERFORMANCE CURVES

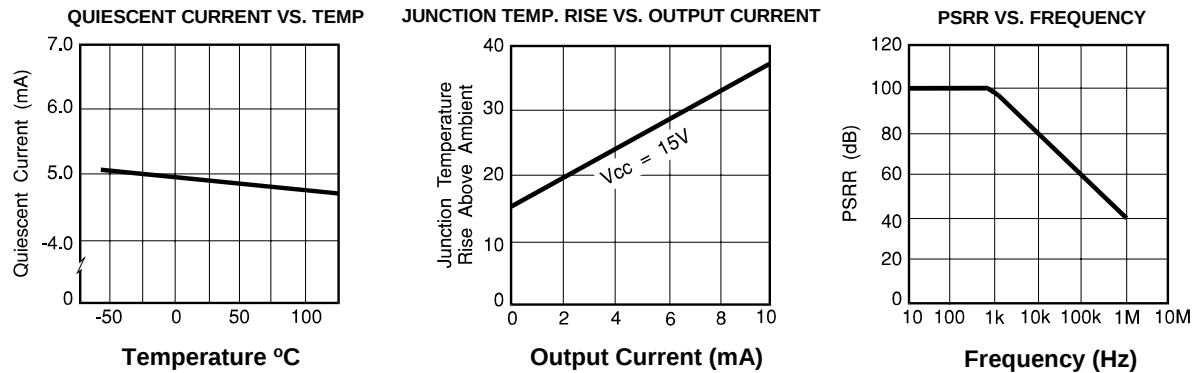


VRE117/118

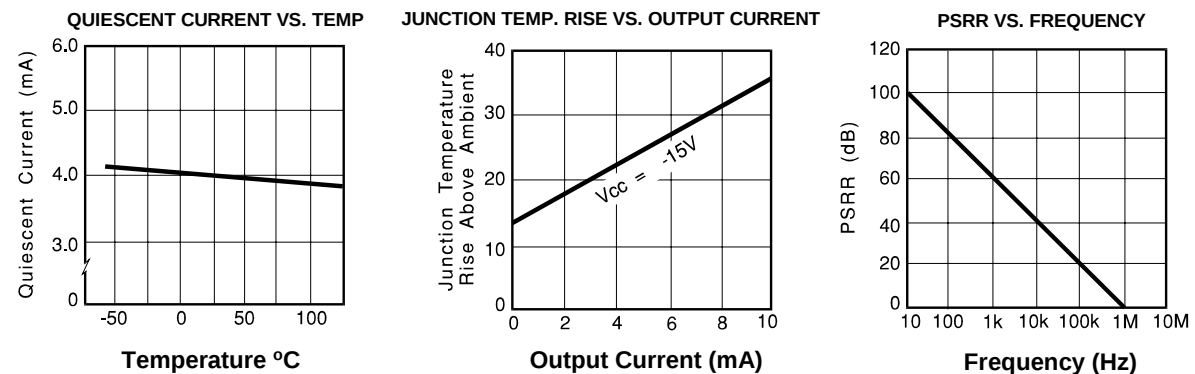


VRE119

POSITIVE OUTPUT



NEGATIVE OUTPUT



EXTERNAL CONNECTIONS

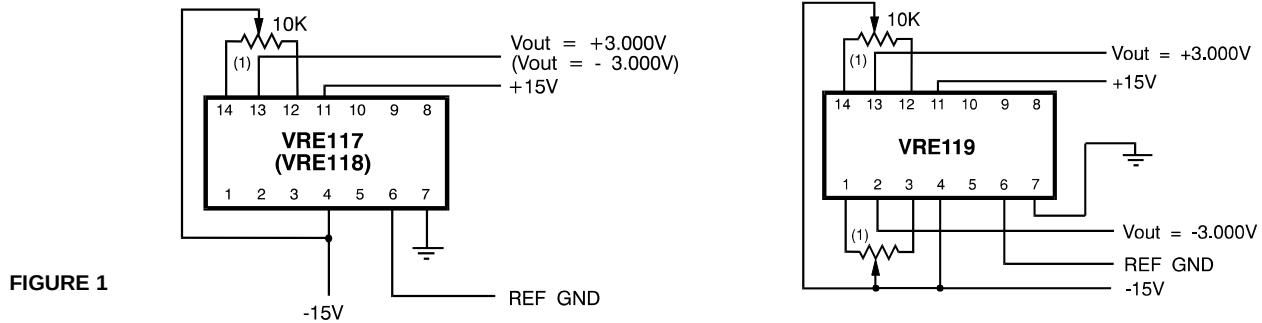
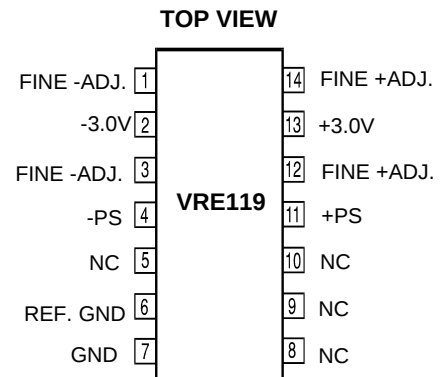
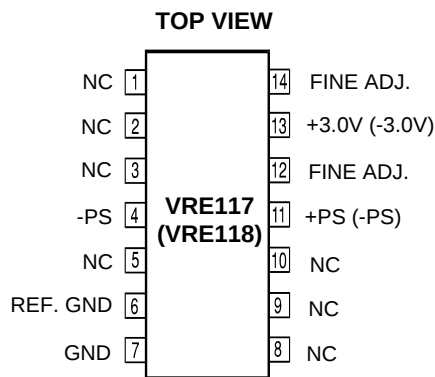


FIGURE 1

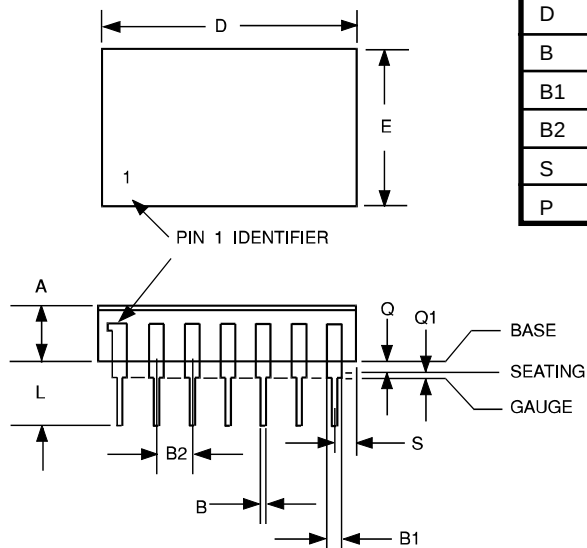
- Optional Fine Adjust for approximately $\pm 5\text{mV}$. VRE118 trim pot center tap connects to -15V.

PIN CONFIGURATION



MECHANICAL

14-PIN HYBRID PACKAGE



	INCHES		MILLIMETER			INCHES		MILLIMETER	
DIM	MIN	MAX	MIN	MAX	DIM	MIN	MAX	MIN	MAX
E	.480	.500	12.1	12.7	A	.120	.155	3.0	4.0
L	.195	.215	4.9	5.4	Q	.015	.035	0.4	0.9
D	.775	.805	19.7	20.4	Q1	N/A	.030	N/A	0.7
B	.016	.020	0.4	0.5	C	.009	.012	0.2	0.3
B1	.038	.042	0.9	1.0	G1	.290	.310	7.3	7.8
B2	.095	.105	2.4	2.6					
S	.085	.105	2.1	2.6					
P	.004	.006	0.10	0.15					