

7597360 RAYTHEON CO.

57C 04682 D

T-79-06-20

**PRELIMINARY
PRODUCT SPECIFICATIONS**

LINEAR INTEGRATED CIRCUITS

**High Performance
Raytheon Dual Low Noise Operational Amplifier**

**RC5532,
5532A**

Features

- Small signal bandwidth — 10MHz
- Output drive capability — 600Ω, 10V (rms)
- Input noise voltage — 5nV/√Hz
- DC voltage gain — 50,000
- AC voltage gain — 2200 at 10kHz
- Power bandwidth — 140kHz
- Slew rate — 8V/μS
- Large supply voltage range — ±3 to ±20V

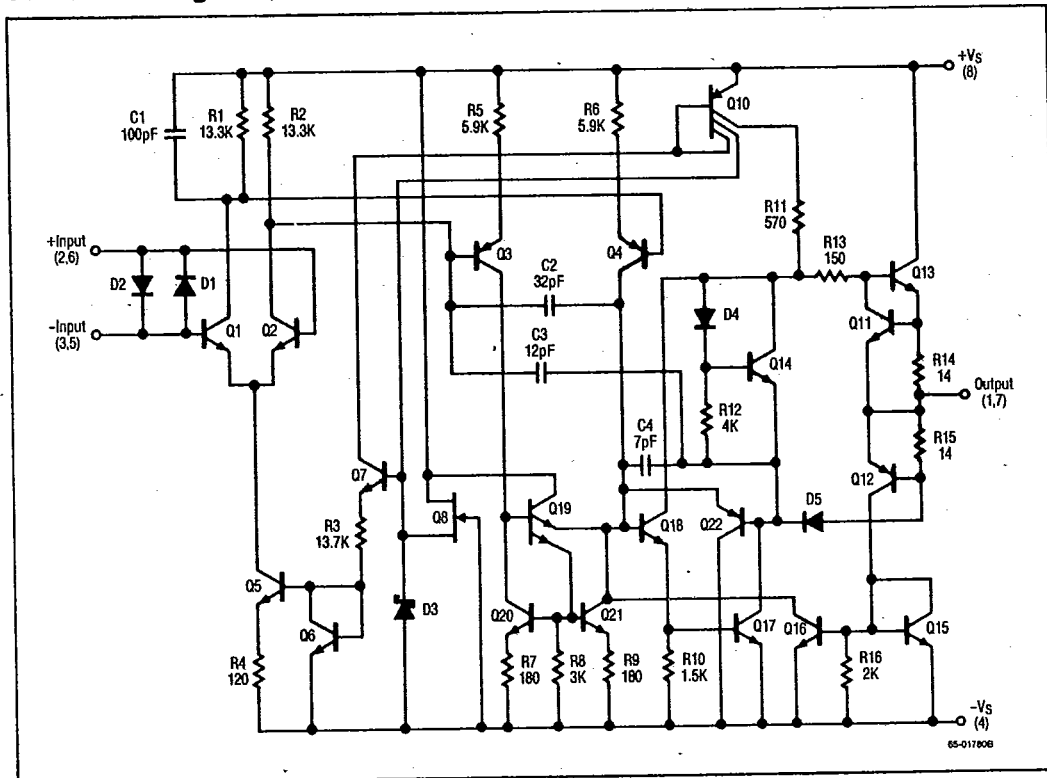
dual operational amplifiers, such as the 1458, it shows better noise performance, improved output drive capability, and considerably higher small-signal and power bandwidths.

This makes the device especially suitable for application in high quality and professional audio equipment, instrumentation, and control circuits, and telephone channel amplifiers. The op amp is internally compensated for gains equal to one. If very low noise is of prime importance, it is recommended that the 5532A version be used which has guaranteed noise specifications.

Description

The 5532 is a high performance dual low noise operational amplifier. Compared to the standard

Schematic Diagram (1/2 Shown for 5532)



7597360 RAYTHEON CO.

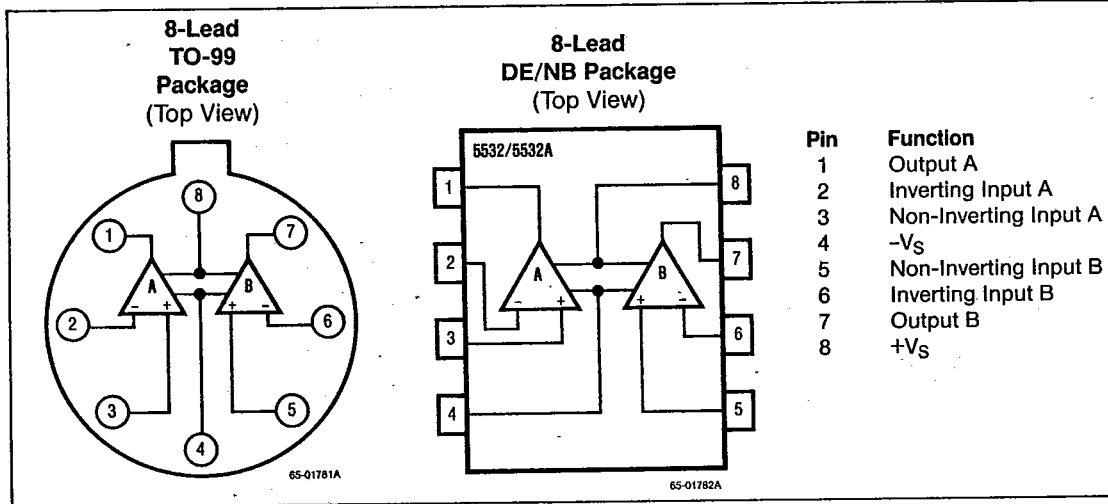
57C 04683

D T-79-06-20

RC5532, 5532A

High Performance Dual Low Noise Operational Amplifier

Connection Information



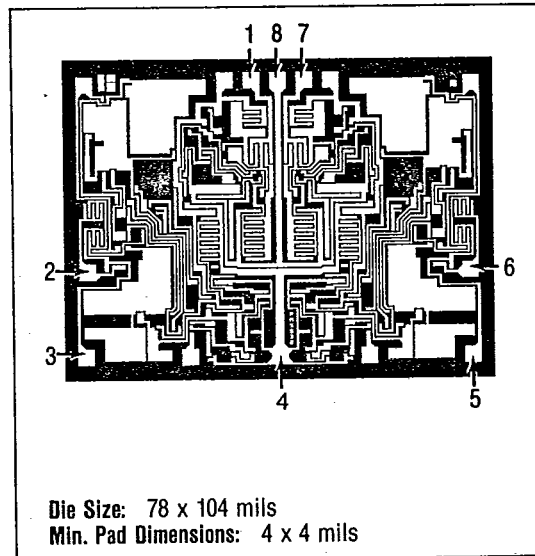
Absolute Maximum Ratings

- Supply Voltage ±22V
- Input Voltage ±V Supply
- Differential Input Voltage¹ 0.5V
- Operating Temperature Range
 - RM5532 -55°C to +125°C
 - RV5532 0°C to +70°C
- Storage Temperature Range -65°C to +150°C
- Lead Soldering Temperature (10 Sec) +300°C

Thermal Characteristics

	8-Lead Plastic DIP	8-Lead Ceramic DIP	8-Lead TO-99 Metal Can
Max. Junction Temp.	125°C	175°C	175°C
Max. P _D T _A < 50°C	468mW	833mW	658mW
Therm. Res. θ _{JC}	—	45°C/W	50°C/W
Therm. Res. θ _{JA}	160°C/W	150°C/W	190°C/W
For T _A > 50°C Derate at	6.25mW per °C	8.33mW per °C	5.26mW per °C

Mask Pattern



The information contained in this data sheet has been carefully compiled; however, it shall not by implication or otherwise become part of the terms and conditions of any subsequent sale. Raytheon's liability shall be determined solely by its standard terms and conditions of sale. No representation as to application or use or that the circuits are either licensed or free from patent infringement is intended or implied. Raytheon reserves the right to change the circuitry and other data at any time without notice and assumes no liability for inadvertent errors.

7597360 RAYTHEON CO,

57C 04684 D

**High Performance
Dual Low Noise Operational Amplifier**

RC5532, 5532A

T-79-06-20

DC Electrical Characteristics ($V_S = \pm 15V$ and $T_A = +25^\circ C$ unless otherwise noted)^{2,3}

Parameters	Test Conditions	RM5532/5532A			RC5532/5532A			Units
		Min	Typ	Max	Min	Typ	Max	
Input Offset Voltage			0.5	2.0		0.5	4.0	mV
	Over Temperature			3.0			5.0	mV
Input Offset Current				100		10	150	nA
	Over Temperature			200			200	nA
Input Bias Current			200	400		200	800	nA
	Over Temperature			700			1000	nA
Supply Current			6.0	11		6.0	16	mA
	Over Temperature			13			22	mA
Input Voltage Range		± 12	± 13		± 12	± 13		V
Common Mode Rejection Ratio		80	100		70	100		dB
Power Supply Rejection Ratio		86	100		80	100	100	dB
Large Signal Voltage Gain	$R_L \geq 2k\Omega, V_O = \pm 10V$	50			25	100		V/mV
	Over Temperature	25			15	50		V/mV
	$R_L \geq 600\Omega, V_O = \pm 10V$	40			15	50		V/mV
	Over Temperature	20			10			V/mV
Output Voltage Swing	$R_L \geq 600\Omega$	± 12	± 13		± 12	± 13		V
	$R_L \geq 600\Omega, V_S = \pm 18V$	± 15	± 16		± 15	± 16		V
	$R_L \geq 2k\Omega$	± 12	± 13					V
Input Resistance (Differential Mode)		30	300		30	300		k Ω
Short Circuit Current			38			38		mA

- Notes: 1. Diodes protect the inputs against over-voltage. Therefore, unless current-limiting resistors are used, large currents will flow if the differential input voltage exceeds 0.6V. Maximum current should be limited to $\pm 10mA$.
 2. For RC5532/RC5532A: $T_{MIN} = 0^\circ C, T_{MAX} = +70^\circ C$
 3. For RM5532/RM5532A: $T_{MIN} = -55^\circ C, T_{MAX} = +125^\circ C$

7597360 RAYTHEON CO,

57C 04685

D

T-79-06-20

High Performance Dual Low Noise Operational Amplifier

RC5532, 5532A

AC Electrical Characteristics ($V_S = +15V$ and $T_A = +25^\circ C$)

Parameters	Test Conditions	RC/RM5532/5532A			Units
		Min	Typ	Max	
Output Resistance	$A_V = 30dB$ Closed Loop $f = 10kHz$, $R_L = 600\Omega$		0.3		Ω
Overshoot	Unity Gain $V_{IN} = 100mV_{p-p}$ $C_L = 10pF$, $R_L = 600\Omega$		10		%
Gain	$f = 10kHz$		2.2		V/mV
Gain Bandwidth Product	$C_L = 100pF$, $R_L = 600\Omega$		10		MHz
Slew Rate			8.0		V/ μS
Power Bandwidth	$V_{OUT} = \pm 10V$		140		kHz
	$V_{OUT} = \pm 14V$, $R_L = 600\Omega$ $V_{CC} = \pm 18V$		100		kHz

Electrical Characteristics ($V_S = +15V$ and $T_A = +25^\circ C$)

Parameters	Test Conditions	RC/RM5532			RC/RM5532A			Units
		Min	Typ	Max	Min	Typ	Max	
Input Noise Voltage Density	$f_0 = 30Hz$		8.0			8.0	12	nV/\sqrt{Hz}
	$f_0 = 1kHz$		5.0			5.0	6.0	
Input Noise Current Density	$f_0 = 30Hz$		2.7			2.7		pA/\sqrt{Hz}
	$f_0 = 1kHz$		0.7			0.7		
Channel Separation	$f = 1kHz$, $R_S = 5k\Omega$		110			110		dB

Ordering Information

Part Number	Package	Operating Temperature Range
RC5532NB	Plastic MiniDIP	$0^\circ C$ to $+70^\circ C$
RC5532DE	Ceramic MiniDIP	$0^\circ C$ to $+70^\circ C$
RC5532T	Metal Can	$0^\circ C$ to $+70^\circ C$
RC5532ANB	Plastic MiniDIP	$0^\circ C$ to $+70^\circ C$
RC5532ADE	Ceramic MiniDIP	$0^\circ C$ to $+70^\circ C$
RC5532AT	Metal Can	$0^\circ C$ to $+70^\circ C$
RM5532DE	Ceramic MiniDIP	$-55^\circ C$ to $+125^\circ C$
RM5532T	Metal Can	$-55^\circ C$ to $+125^\circ C$
RM5532ADE	Ceramic MiniDIP	$-55^\circ C$ to $+125^\circ C$
RM5532AT	Metal Can	$-55^\circ C$ to $+125^\circ C$

7597360 RAYTHEON CO,

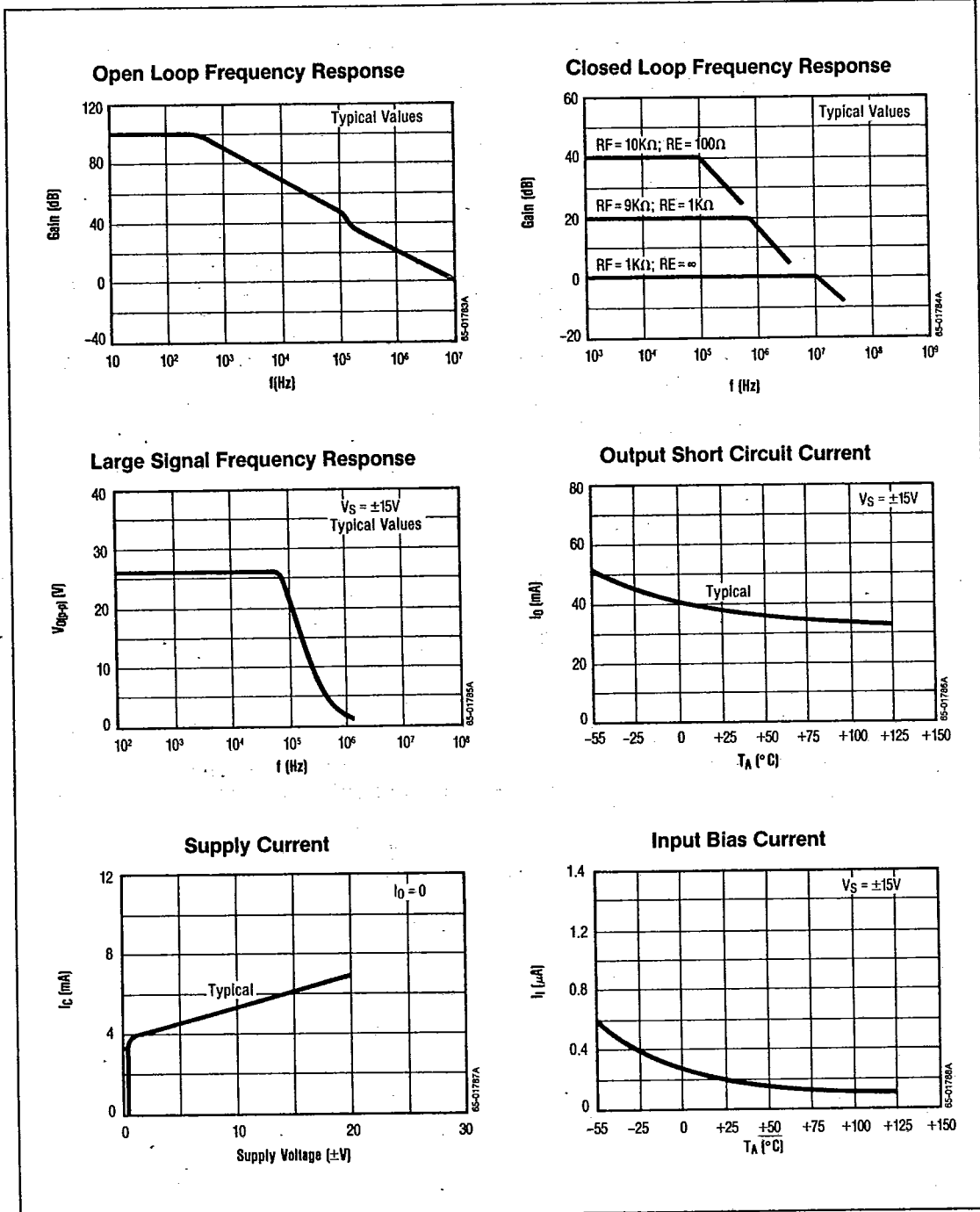
57C 04686 D

T-79-06-20

High Performance Dual Low Noise Operational Amplifier

RC5532, 5532A

Typical Performance Characteristics

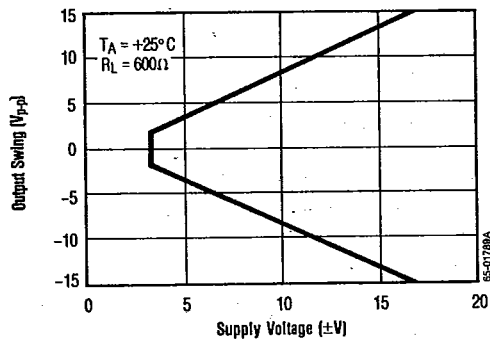


RC5532, 5532A

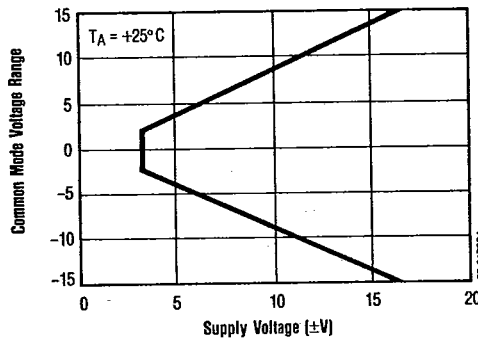
High Performance
Dual Low Noise Operational Amplifier

Typical Performance Characteristics (Continued)

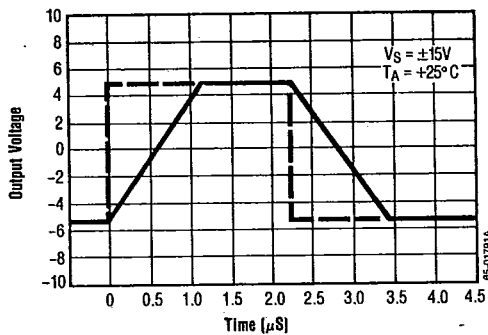
Typical Output Voltage as a Function of Supply Voltage



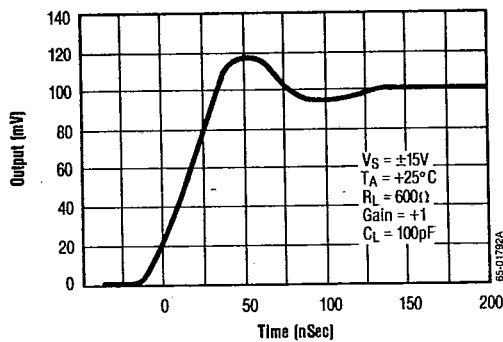
Common Mode Range as a Function of Supply Voltage



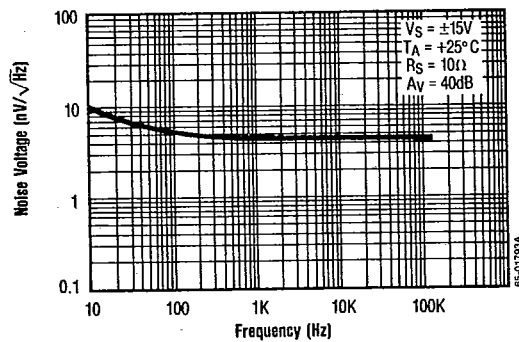
Voltage Follower Large Signal Pulse Response



Transient Response



Input Noise Voltage Density



7597360 RAYTHEON CO.

57C 04688

D

T-79-06-20

High Performance Dual Low Noise Operational Amplifier

RC5532, 5532A

Test Circuits

