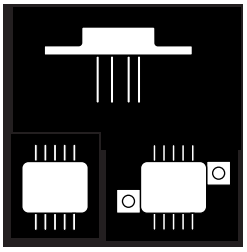
HIGH POWER, HIGH CURRENT OPERATIONAL AMPLIFIER APPROVED TO DESC DRAWING 5962-90828



5 Amp Peak Operational Amplifier, Low Distortion A/B Output Stage

FEATURES

- Available In Isolated Standard TO-3, “Copper Slug” TO-3 And Power DIP Packages
- 5 Amp Peak Output Current
- ±10V to ±30V Supply Range
- Low Distortion, Class A/B Output Stage
- Approved to DESC Drawing 5962-90828

DESCRIPTION

The OMA511 series is a high voltage, high current power operational amplifier designed to drive a wide variety of resistive and reactive loads. Its complimentary class A/B output stage provides superior performance in applications requiring freedom from cross over distortion. This hybrid is housed in a variety of isolated hermetic packages and is ideally suited for critical environments and is approved to DESC drawing 5962-90828.

ABSOLUTE MAXIMUM RATINGS @ 25°C

Supply Voltage	±50V
Output Current: Source	5A
Power Dissipation, Internal	67W
Input Voltage: Differential	±50 V - 3V
Common Mode	±50V
Operating Temperature Range	-55°C to 125°C
Storage Temperature Range	-65°C to 150°C
Lead Temperature (10 Sec. Soldering)	300°C

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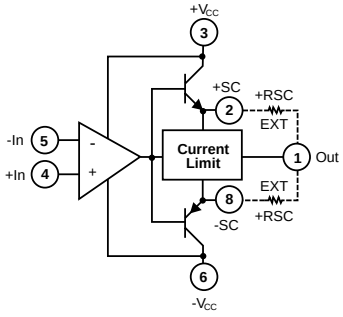
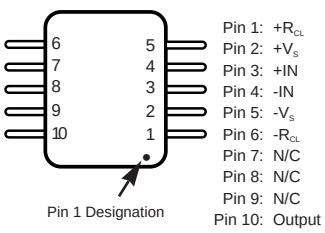
SCHEMATIC

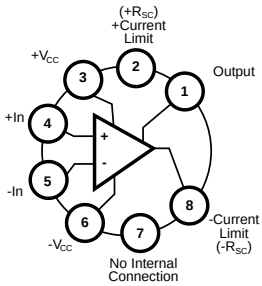


PIN CONNECTION



Pin 1: $+R_{CL}$
Pin 2: $+V_S$
Pin 3: +IN
Pin 4: -IN
Pin 5: $-V_S$
Pin 6: $-R_{CL}$
Pin 7: N/C
Pin 8: N/C
Pin 9: N/C
Pin 10: Output

TOP VIEW D-10



TOP VIEW TO-3

ELECTRICAL PERFORMANCE CHARACTERISTICS

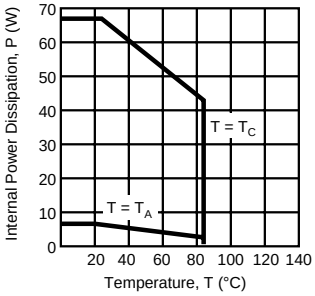
TEST	SYMBOL	CONDITIONS 1/ -55 °C ≤ T_C ≤ +125 °C V_S = ±40 V dc unless otherwise specified	GROUP A Subgroups 3/	LIMITS MIN	LIMITS MAX	Units
Supply Current	I_S	V_{IN} = 0 V dc, G = 100, 2/ ±R_{CL} = 1.0 Ω VCM = 0 V dc	1,2 3		30 75	mA
Input Offset Voltage	V_{OS}	V_{IN} = 0 V dc, G = 100, 2/ V_S = ±10 V dc, ± R_{CL} = 1.0 Ω	1 2 3	-12.0 -18.5 -17.2	+12.0 +18.5 +17.2	mV
		V_{IN} = 0 V dc, G = 100, 2/ V_S = ±40 V dc, ± R_{CL} = 1.0 Ω	1 2 3	-6.0 -12.5 -11.2	+6.0 +12.5 +11.2	mV
		V_{IN} = 0 V dc, G = 100, 2/ V_S = ±45 V dc, ± R_{CL} = 1.0 Ω	1 2 3	-7.0 -13..5 -12.2	+7.0 +13.5 +12.2	mV
Input Bias Current, +IN	$+I_B$	V_{IN} = 0 V dc, R_{BIAS} ≤ 100 MΩ	1 2 3		30.0 70.0 115.0	nA
Input Bias Current, -IN	$-I_B$	V_{IN} = 0 V dc, R_{BIAS} ≤ 100 MΩ	1 2 3		30.0 70.0 115.0	nA
Input Offset Current	I_{OS}	V_{IN} = 0 V dc, R_{BIAS} ≤ 100 MΩ	1 2 3		30.0 70.0 115.0	nA
Output Voltage	V_O	V_S = ±45 V dc, I_O = 80 mA, R_L = 500 Ω	4,5,6	40		V
		V_S = ±30 V dc, I_O = 2 A, R_L = 12 Ω	4,5,6	24		V
		V_S = ±18 V dc, I_O = 5 A, R_L = 2.07 Ω	4,6	10		V
		V_S = ±14.3 V dc, I_O = 3 A, R_L = 2.07 Ω	5	6.3		V
Current Limits	I_{CL}	R_L = 12 Ω, ± R_{CL} = 1.0 Ω, 2/ V_S = ±17 V dc	4	0.6	.89	A
Stability/noise	E_N	G = 1, C_L = 680 pF	4,5,6		1.0	mV
Slew rate	S_R	R_L = 500 Ω, V_{IN} ≥ 4 V_{p-p}	4,5,6	2.0	10.0	V/ms
Open loop gain	A_{OL}	R_L = 500 Ω, f = 15 Hz, V_{IN} ≥ .4 V_{p-p}	4,5,6	96		dB
Common mode rejection	CMR	V_S = ±15 V dc, f = dc V_{CM} = ±9 V dc	4,5,6	74		dB

1) During all testing, terminal connection F.O. (pin 7) is left open.
2) A current limiting resistor (R_{CL}) is connected between C_L + to the output and C_L - to the output during these tests.
3) See MIL-H-38524 for definition.

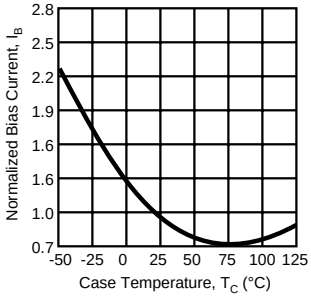
TYPICAL PERFORMANCE CURVES

T_A = +25°C, V_S = ±V_{DC} unless otherwise noted

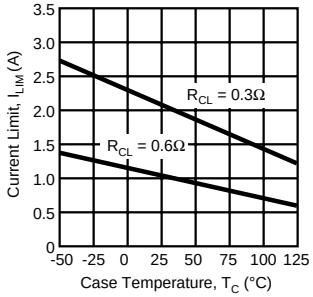
Power Derating



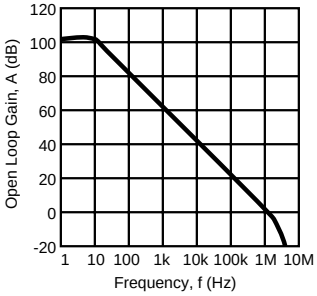
Bias Current



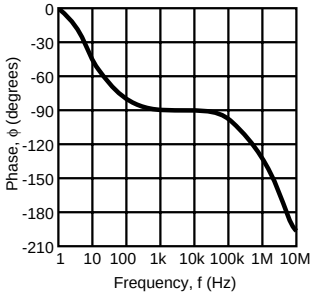
Current Limit



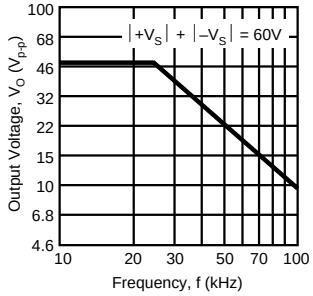
Small Signal Response



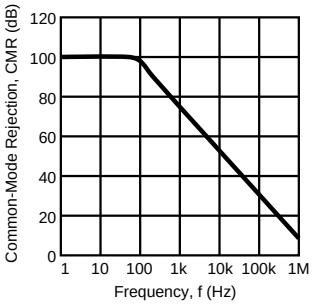
Phase Response



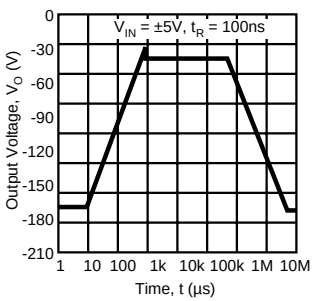
Power Response



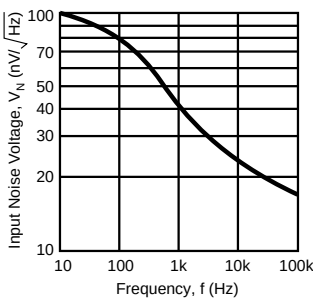
Common-Mode Rejection



Pulse Response



Input Noise



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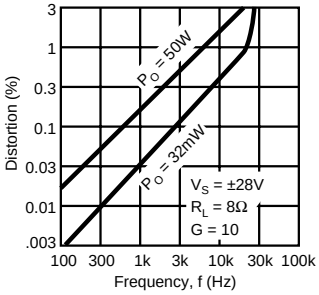
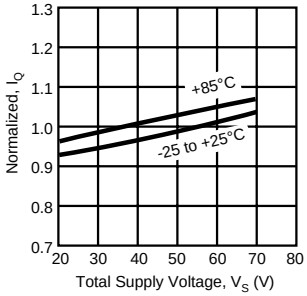
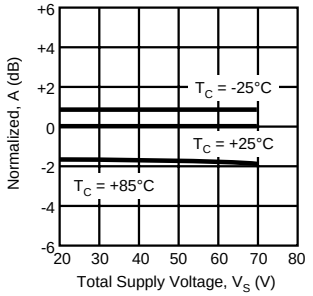
Harmonic Distortion



Quiescent Current



Open Loop Gain



Omnirel

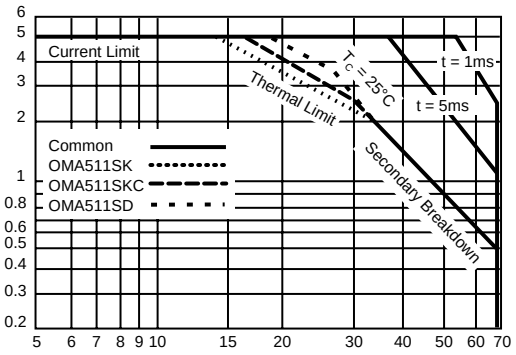
OMA511SKB OMA511SKCB OMA511SDB OMA511SDZB

Thermal Resistance Maximum	Conditions	Standard TO-3	Copper Slug TO-3	Power DIP	Units
AC Junction-to-Case		2.1	1.7	1.30	
DC Junction-to-Case	f < 60 Hz	2.6	2.0	1.55	°C/W
Junction-to-Air		30	30	25	

Rating applies only if the output current alternates between both output transistors at a rate faster than 60 Hz.

Part Number Designator		
Standard Military Drawing Number	Omnirel Part Number	Package
5962-9082801HXX	OMA511SKB	TO-3
5962-9082802HXX	OMA511SKCB	TO-3 Copper Slug
5962-9082801HYX	OMA511SDB	D-10
5962-9082801HZX	OMA511SDZB	D-10Z

TRANSISTOR SAFE OPERATING AREA (SOA)



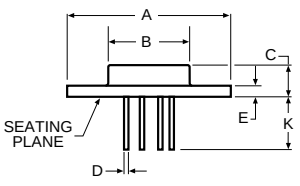
Safe Operating Area (SOA)

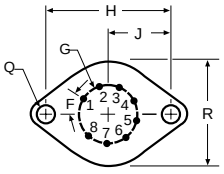
The safe operating area plot provides a comprehensive summary of the power handling limitations of a power amplifier, including maximum current, voltage and power as well as the secondary breakdown region. It shows the allowable output current as a function of the power supply to output voltage differential (voltage across the conducting power device).

MECHANICAL OUTLINE

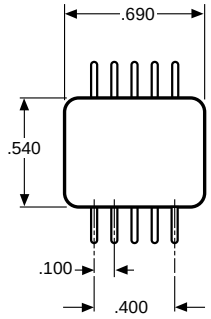
TO-3-8

	INCHES			INCHES	
DIM	MIN	MAX	DIM	MIN	MAX
A	1.510	1.550	G	.500 BASIC	
B	.745	.770	H	1.186 BASIC	
C	.260	.300	J	.593 BASIC	
D	.038	.042	K	.400	.500
E	.080	.105	Q	.151	.161
F	40° BASIC		R	.980	1.020

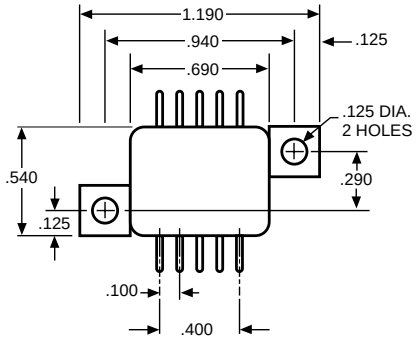




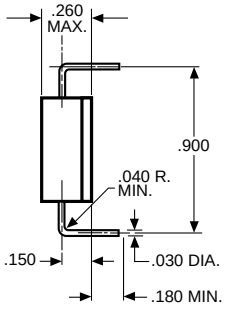
D-10



D-10Z



Common Lead



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