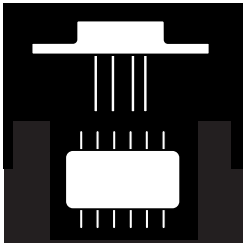


# DUAL HIGH POWER OPERATIONAL AMPLIFIER



## 8-Pin TO-3 And 12-Pin DIP, Dual 5 Amp Operational Amplifier

### FEATURES

- Available In Isolated Standard TO-3, "Copper Slug" TO-3 And Power DIP Packages
- 5 Amp Peak Output Current
- Power Supplies to  $\pm 40V$
- FET Input
- Dual Configuration
- Available Screened to MIL-STD-883

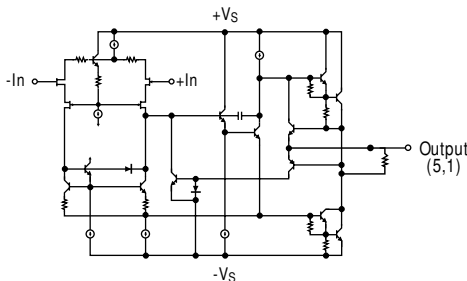
### DESCRIPTION

The OMA2541 is a high performance dual power operational amplifier capable of operation from power supplies up to  $\pm 40V$  and continuous output current up to 5A. This device is ideally suited for Military motor driver, servo amplifiers, bridge amplifier, synchro/resolver exertation as well as other power management driver applications. Internal circuitry limits output current to approximately 6 Amps. All products are available with Hi-Rel screening.

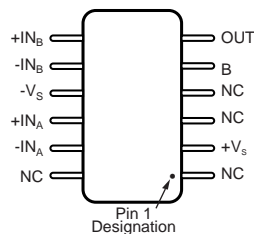
### ABSOLUTE MAXIMUM RATINGS @ 25°C

Supply Voltage, $+V_S$ to $-V_S$ .....	80V
Output Current, Continuous .....	5A
Power Dissipation, Internal .....	125W
Operating Temperature Range .....	$-55^\circ C$ to $125^\circ C$
Storage Temperature Range .....	$-55^\circ C$ to $150^\circ C$
Maximum Junction Temperature .....	$175^\circ C$
Lead Temperature (10 Sec. Soldering) .....	$300^\circ C$

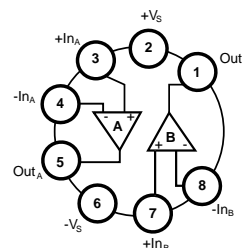
### SCHEMATIC



### PIN CONNECTION



TOP VIEW D-12



TOP VIEW TO-3

3.4

OMA2541SK OMA2541SKC OMA2541SD

**ELECTRICAL CHARACTERISTICS** ( $T_c = 25^\circ\text{C}$ ;  $V_s = \pm 34 V_{dc}$  unless otherwise noted.)

Parameter	Conditions	Min.	Typ.	Max.	Units
<b>Input Offset Voltage</b>					
$V_{os}$			$\pm 0.01$	$\pm 2$	mV
vs Temperature	$-25^\circ\text{C}$ to $+125^\circ\text{C}$		$\pm 15$	$\pm 30$	$\mu\text{V}/^\circ\text{C}$
vs Temperature	$-55^\circ\text{C}$ to $-25^\circ\text{C}$		$\pm 20$	$\pm 40$	$\mu\text{V}/^\circ\text{C}$
vs Supply Voltage	$V_s = \pm 10\text{V}$ to $\pm V_{max}$		$\pm 2.5$	$\pm 10$	$\mu\text{V}/\text{V}$
vs Power			$\pm 20$	$\pm 60$	$\mu\text{V}/\text{W}$
<b>Input Bias Current</b>			4	50	pA
$I_b$					
<b>Input Offset Current</b>			$\pm 1$	$\pm 30$	pA
$I_{os}$	Specified Temperature Range		$\pm 5$	$\pm 20$	nA
<b>Input Characteristics</b>					
Common-Mode Voltage Range	$-55^\circ\text{C}$ to $+85^\circ\text{C}$	$\pm(\text{CMV}_{GE} - 6)$	$\pm(\text{CMV}_{GE} - 3)$		V
	$+85^\circ\text{C}$ to $+125^\circ\text{C}$	$\pm(\text{CMV}_{GE} - 6.5)$	$\pm(\text{CMV}_{GE} - 3.2)$		V
Common-Mode Rejection	$V_{cm} = \pm(\text{CMV}_{GE} - 6\text{V})$		113		dB
	$V_{cm} = \pm 22\text{V}$	95			dB
Input Capacitance*			5		pF
Input Capacitance, DC*			1		T
<b>Gain Characteristics</b>					
Open Loop Gain at 10Hz	$R_L = 10\text{k}$	90	97		dB
Gain Bandwidth Product*			1.6		MHz
<b>Output</b>					
Voltage Swing	$I_o = 5\text{A}$ , Continuous	$\pm(\text{OV}_{GE} - 5.5)$	$\pm(\text{OV}_{GE} - 4.5)$		V
	$I_o = 2\text{A}$	$\pm(\text{OV}_{GE} - 4.5)$	$\pm(\text{OV}_{GE} - 3.6)$		V
	$I_o = 0.5\text{A}$	$\pm(\text{OV}_{GE} - 4)$	$\pm(\text{OV}_{GE} - 3.2)$		V
Current Peak		9	10		A
<b>AC Performance</b>					
Slew Rate		6	10		V/ $\mu\text{S}$
Power Bandwidth*	$R_L = 8$ , $V_o = 20V_{max}$		55		KHz
Setting Time to 0.1%*	2V Step		2		$\mu\text{S}$
Capacitive Load*	Specified Temperature Range, $G = 1$	3.3			A
	Specified Temperature Range, $G > 10$			SOA	
Phase Margin*	Specified Temperature Range, $R_L = 8$		40		Degrees
<b>Power Supply</b>					
Power Supply Voltage, $\pm V_s$		$\pm 10$	$\pm 35$	$\pm 40$	V
Current Quiescent -			50	60	mA
Both Amplifiers	Specified Temperature Range		60	70	mA

Thermal Resistance Maximum	Conditions	Standard TO-3	Copper Slug TO-3	Power DIP	Units
$\theta_{jc}$ (Junction-to-Case)	Both Amplifiers <sup>(2)</sup> , AC Output $f > 60\text{Hz}$	1.0	.8	.65	$^\circ\text{C}/\text{W}$
	Both Amplifiers <sup>(2)</sup> , DC Output	1.2	1.0	.80	$^\circ\text{C}/\text{W}$
	One Amplifier, AC Output $f > 60\text{Hz}$	1.5	1.2	1.00	$^\circ\text{C}/\text{W}$
	One Amplifier, DC Output	1.9	1.5	1.15	$^\circ\text{C}/\text{W}$
$\theta_{ja}$ (Junction-to-Ambient)	No Heat Sink	30	30	30	$^\circ\text{C}/\text{W}$

NOTES: (1) Input bias and offset current approximately doubles for every  $10^\circ\text{C}$  increase in temperature.

(2) Assumes equal dissipation in both amplifiers.

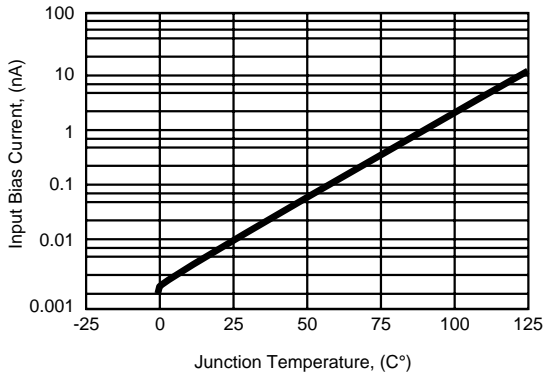
\* Guaranteed - not tested 100%.

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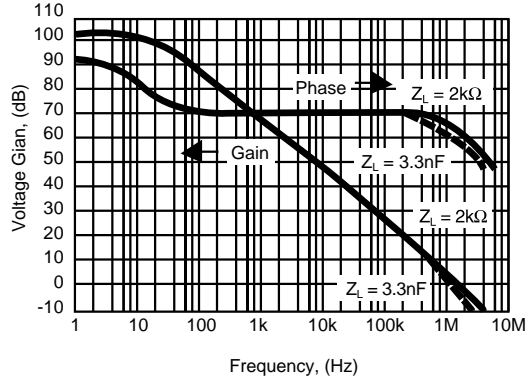
## TYPICAL PERFORMANCE CURVES

$T_A = +25^\circ\text{C}$ ,  $V_S = \pm V_{DC}$  unless otherwise noted

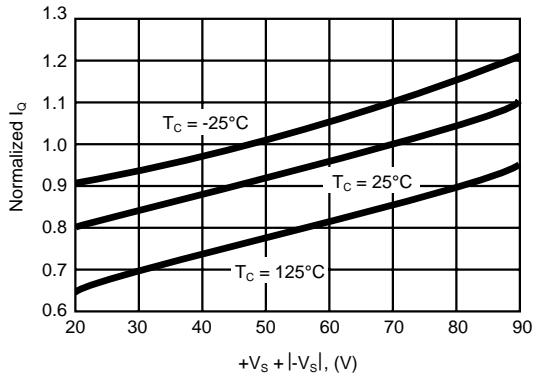
**Input Bias Current VS Temperature**



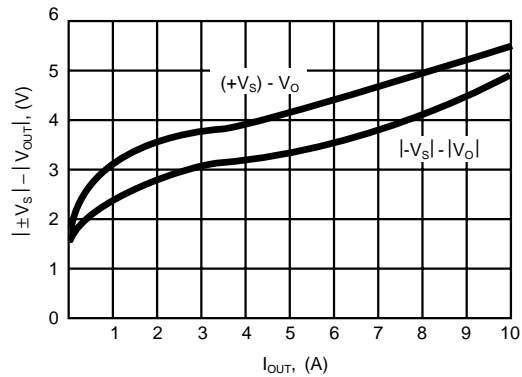
**Open-Loop Gain and Phase VS Frequency**



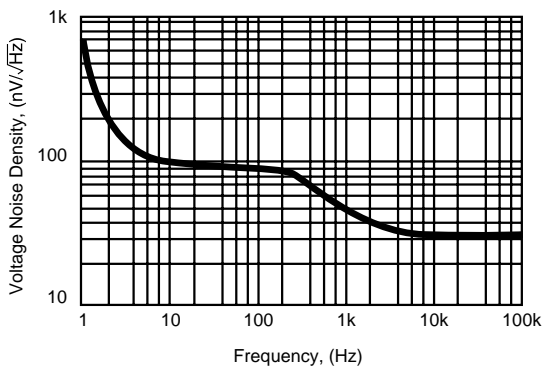
**Normalized Quiescent Current VS Total Power Supply Voltage**



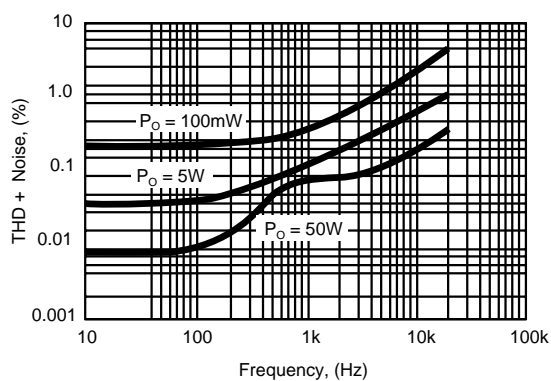
**Output Voltage Swing VS Output Current**



**Voltage Noise Density VS Frequency**



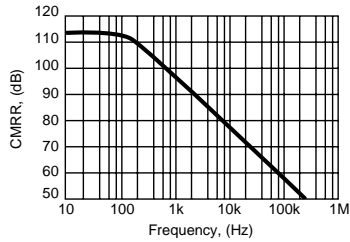
**Total Harmonic Distortion VS Frequency**



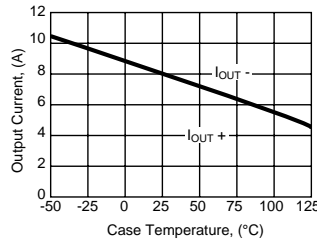
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OMA2541SK OMA2541SKC OMA2541SD

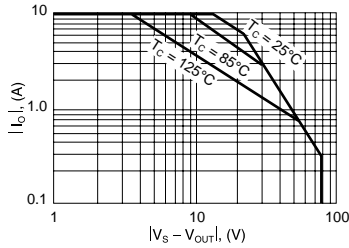
Typical Common-Mode Rejection VS Frequency (Case Dependent)



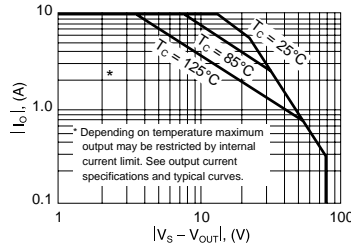
Typical Output Current VS Temperature (Case Dependent)



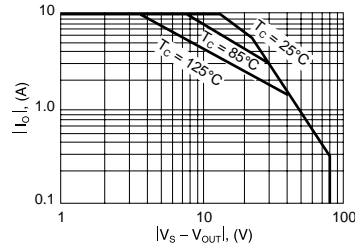
Copper Slug TO-3 Safe Operating Area OMA2541SKC



Standard TO-3 Safe Operating Area OMA2541SK

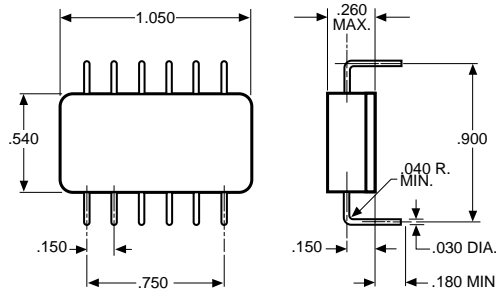


Power DIP Safe Operating Area OMA2541SD/SDZ

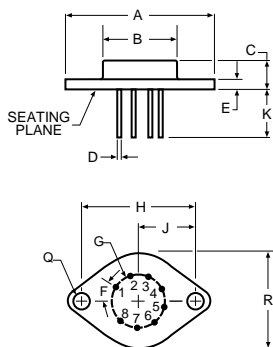


MECHANICAL OUTLINE

D-12



TO-3-8



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.510	1.550	38.35	39.37
B	.745	.770	18.92	19.56
C	.260	.300	6.60	7.62
D	.038	.042	0.97	1.07
E	.080	.105	2.03	2.67
F	40° BASIC		40° BASIC	
G	.500 BASIC		12.7 BASIC	
H	1.186 BASIC		30.12 BASIC	
J	.593 BASIC		15.06 BASIC	
K	.400	.500	10.16	12.70
Q	.151	.161	3.84	4.09
R	.980	1.020	24.89	25.91

Note: Leads in true position within 0.010" (0.25mm) R at MMC at seating plane. Pin numbers shown for reference only. Numbers may not be marked on package.