

Operational Amplifier

TAA 761; A; W
TAA 762
TAA 765; A; W

A particularly economical and universal operational amplifier which by its excellent performance qualities is well suited for a wide range of applications, such as automatic controls, automobile electronics, AF-circuits, analog computers etc.

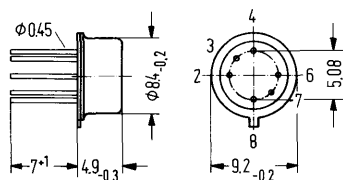
In addition to a high gain, high input resistance, low offset voltage, low temperature- and supply voltage-dependence, the amplifier features

- Wide common-mode range,
- Large supply voltage range,
- Large control range,
- Wide temperature range (TAA 762),
- High output current,
- Simple frequency compensation

Type	Ordering codes
TAA 761	Q67000-A224
TAA 761 A	Q67000-A522
TAA 761 W	Q67000-A598
TAA 762	Q67000-A523
TAA 765	Q67000-A226
TAA 765 A	Q67000-A524
TAA 765 W	Q67000-A599

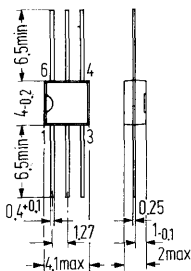
Package outlines

TAA 761, TAA 762, TAA 765



Case 5 H 6
DIN 41873
(similar TO-18)
Weight approx. 1 g

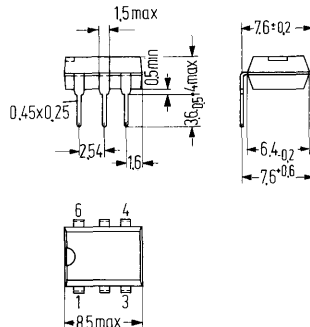
TAA 761 W, TAA 765 W



Miniature plastic case
6 Pins
Weight approx. .1 g
Colour code
TAA 761 W white/white
TAA 765 W yellow/yellow

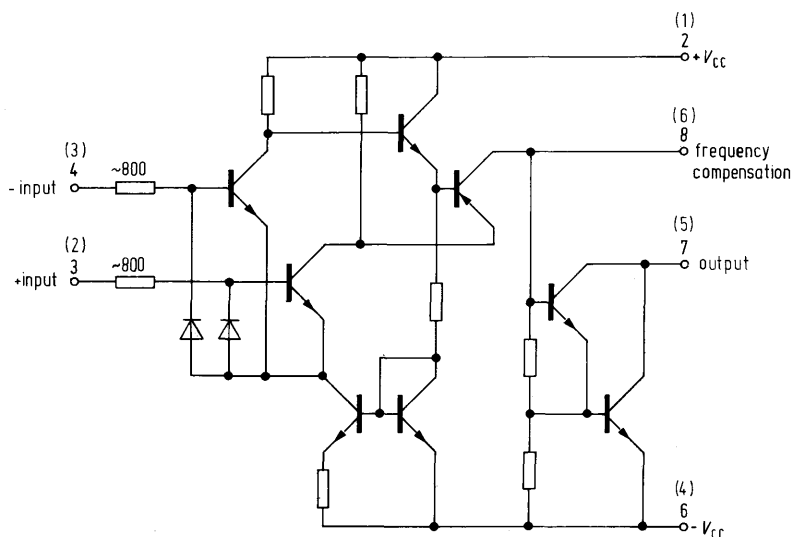
Dimensions in mm

TAA 761 A, TAA 765 A



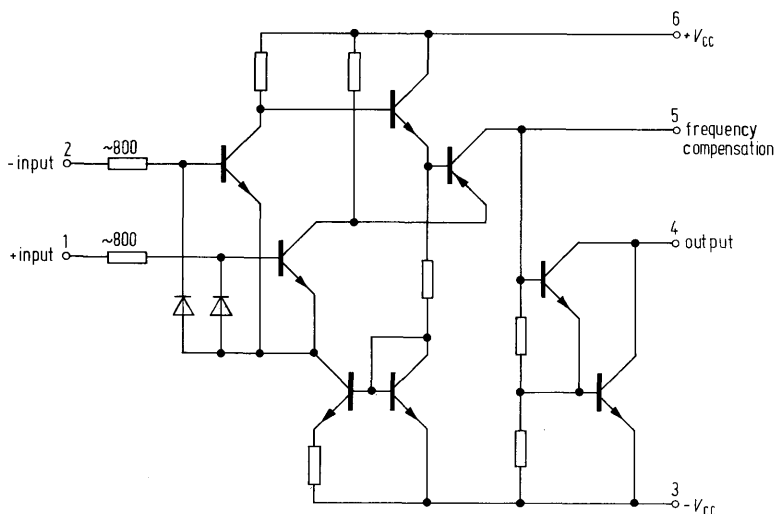
Plastic plug-in case
6 Pins
20 A 6 DIN 41866
Weight approx. .7 g

Circuit for TAA 761, 762, 765



Pin-numbers in brackets refer to TAA 761A and TAA 765A

Circuit for TAA 761 W and TAA 765 W



Maximum ratings

	TAA 761/TAA 761 A TAA 761 W/TAA 762 TAA 765/TAA 765 A TAA 765 W	
Supply voltage	V_{CC}	± 18
Output current	I_q	70
Differential input voltage	V_{iD}	$\pm V_{CC}$
Junction temperature	T_j	150
Storage temperature	T_s	-55 to +125
Thermal resistances:		
System-case (TAA 761, TAA 762, TAA 765)	$R_{thScase}$	80
System-ambient air (TAA 761/762/765)	R_{thSamb}	190
System-ambient air (TAA 761 A, TAA 765 A)	R_{thSamb}	140
System-ambient air (TAA 761 W, TAA 765 W)	R_{thSamb}	200

Range of operation

Supply voltage	V_{CC}	± 1.5 to ± 18	V
Ambient temperature in operation			
TAA 761/A/W	T_{amb}	0 to +70	°C
TAA 765/A/W	T_{amb}	-25 to +85	°C
TAA 762	T_{amb}	-55 to +125	°C

Operating characteristics

$V_{CC} = \pm 15$ V

		TAA 761/A/W TAA 765/A/W $T_{amb} = 25^\circ\text{C}$			TAA 762 $T_{amb} = 25^\circ\text{C}$			TAA 762 $T_{amb} = -55$ to 125 °C		
		min	typ	max	min	typ	max	min	max	
Supply current	I_{CC}		1.5	2.5		1.5	2.5			mA
Input offset voltage ($R_G = 50\ \Omega$)	V_{io}	-6		6	-4		4	-6	6	mV
Input offset current	I_{io}	-300	± 80	300	-100	± 50	100	-300	300	nA
Input current	I_i		.5	1.0		.3	.7		1.0	μA
Output voltage ($R_L = 2\ \text{k}\Omega$)	V_{qpp}	14.9		-14	14.9		-14	14.8	-14	V
($R_L = 620\ \Omega$)	V_{qpp}	14.9		-12.5	14.9		-12.5	14.8	-12	V
($R_L = 2\ \text{k}\Omega$, $f = 100\ \text{kHz}$)	V_{qpp}		± 10			± 10				V
Input impedance ($f = 1\ \text{kHz}$)	Z_i		200			200				k Ω
Open-loop voltage gain ($R_L = 2\ \text{k}\Omega$, $f = 1\ \text{kHz}$)	G_v	81.5	85		85	87		80		dB
($R_L = 10\ \text{k}\Omega$, $f = 1\ \text{kHz}$)	G_v		90			92				dB
($R_L = 2\ \text{k}\Omega$, $f = 1\ \text{MHz}$)	G_v		43			43				dB
Output leakage current I_{qlik}			1	10		1	10			μA

TAA 761; A; W
TAA 762
TAA 765; A; W

Operating characteristics

$V_{CC} = \pm 15 \text{ V}$

TAA 761/A/W
TAA 765/A/W

$T_{amb} = 25^\circ\text{C}$

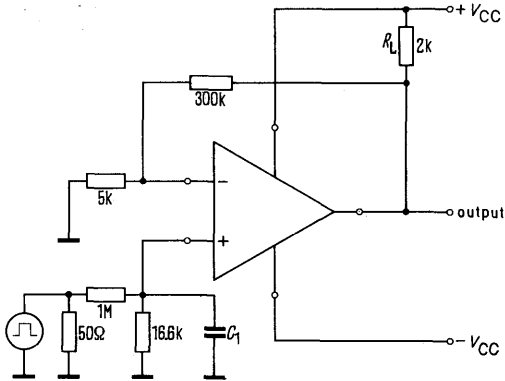
TAA 762

$T_{amb} = 25^\circ\text{C}$

$T_{amb} = -55 \text{ to } +125^\circ\text{C}$

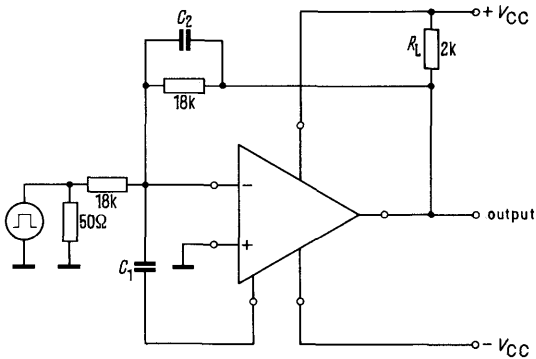
		$T_{amb} = 25^\circ\text{C}$			$T_{amb} = 25^\circ\text{C}$			$T_{amb} = -55 \text{ to } +125^\circ\text{C}$	
		min	typ	max	min	typ	max	min	max
Input common-mode range ($R_L = 2 \text{ k}\Omega$)	V_{ICM}	12	± 13.5	-12	12	± 13.5	-12		V
Common-mode rejection ratio ($R_L = 2 \text{ k}\Omega$)	$CMRR$	65	79		70	81			dB
Sensitivity to supply voltage variations ($G_V = 100$)	$\frac{\Delta V_{io}}{\Delta V_{CC}}$		25	200		25	200		$\mu\text{V/V}$
Temp. coefficient of V_{io} α_{Vio} ($R_G = 50 \Omega$)			6			6	25		$\mu\text{V/K}$
Temp. coefficient of I_{io} α_{Iio} ($R_G = 50 \Omega$)			.3			.3	1.5		nA/K
Rise time of V_q for non-inverting operation (test circuit 1)	$\frac{dV_q}{dt_r}$		9			9			V/ μs
Rise time for V_q for inverting operation (test circuit 2)	$\frac{dV_q}{dt_r}$		18			18			V/ μs
Noise voltage (to spec. DIN 45405; measured at input $R_S = 2.5 \text{ k}\Omega$)	V_N		3			3			μV
$V_{CC} = \pm 5 \text{ V}$									
Supply current	I_{CC}		0.7			0.7			mA
Input offset voltage	V_{io}	-6		6	-4		4		mV
Input offset current	I_{io}	-300		300	-70		70		nA
Input current	I_i			1.0			0.6		μA
Output voltage ($R_L = 2 \text{ k}\Omega$)	V_{opp}	4.9		-4	4.9		-4	4.8	-4 V
Open loop voltage gain G_V ($R_L = 2 \text{ k}\Omega$, $f = 1 \text{ kHz}$)		70			70				dB

1. Test circuit for rise time of V_q (non-inverting operation)



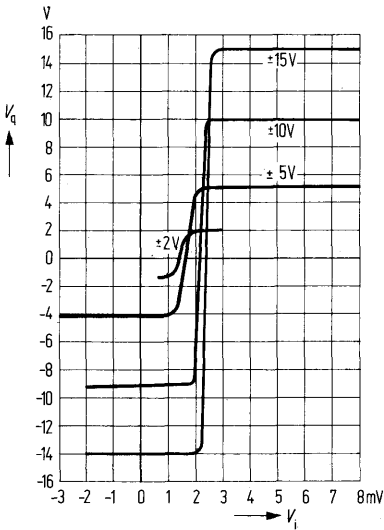
$C_1 \approx 22$ pF for min overshoot

2. Test circuit for rise time of V_q (inverting operation)

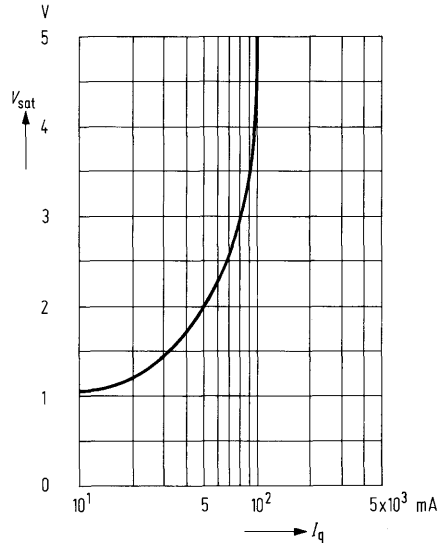


C_2 is for a frequency dependent compensation of the reduction of rise times
 C_1 3.9 pF for min overshoot

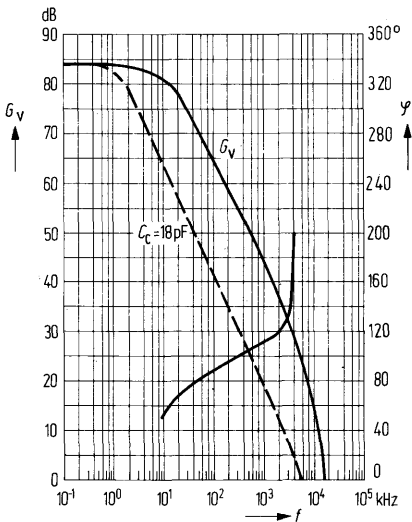
Transfer characteristic $V_o = f(V_i)$
 V_{CC} = parameter, $R_L = 2 \text{ k}\Omega$



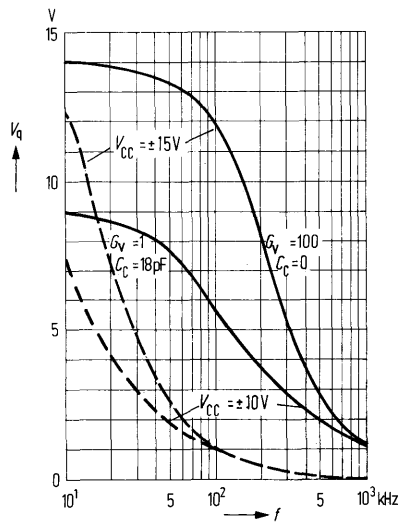
Saturation voltage $V_R = f(I_q)$
 $T_{amb} = 25^\circ \text{C}$



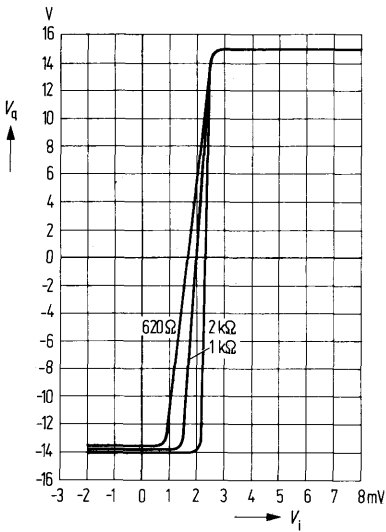
Open-loop voltage gain and phase
 $G_V = f(f)$; $\varphi = f(f)$; $V_{CC} = \pm 10 \text{ V}/\pm 15 \text{ V}$



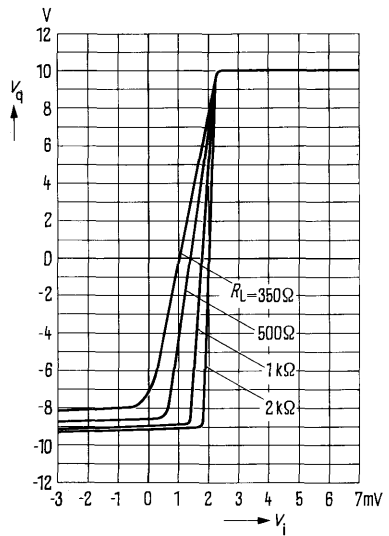
Frequency dependence of large signal modulation $V_o = f(f)$



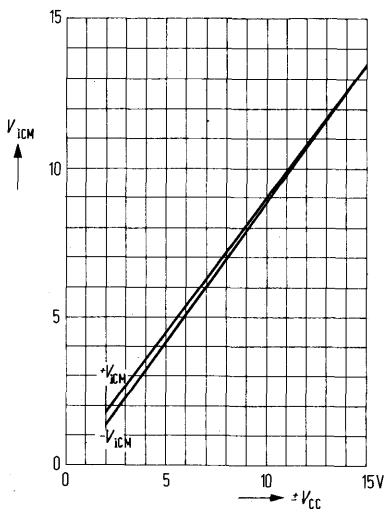
Transfer characteristic $V_o = f(V_i)$
 $V_{RR} = \pm 15 \text{ V}$, $R_c = \text{parameter}$



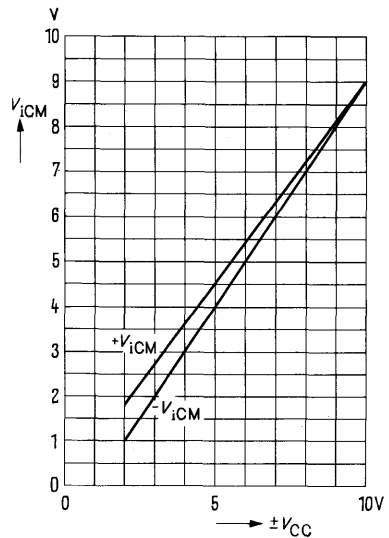
Transfer characteristic $V_o = f(V_i)$
 $V_{CC} = \pm 15 \text{ V}$, $R_c = \text{parameter}$



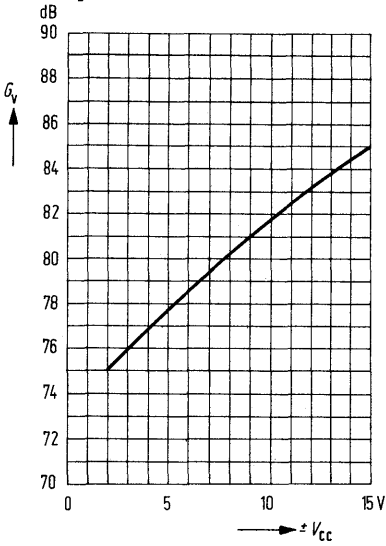
Common mode range $V_{ICM} = f(V_{CC})$



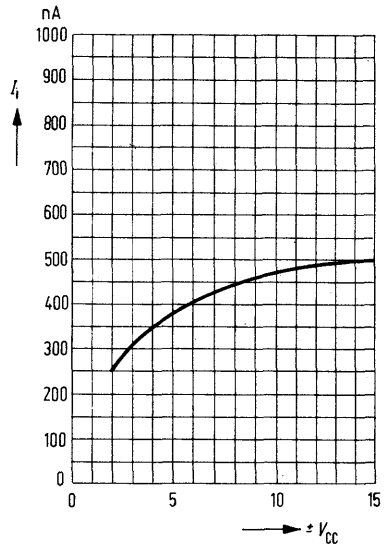
Common mode range $V_{ICM} = f(V_{CC})$



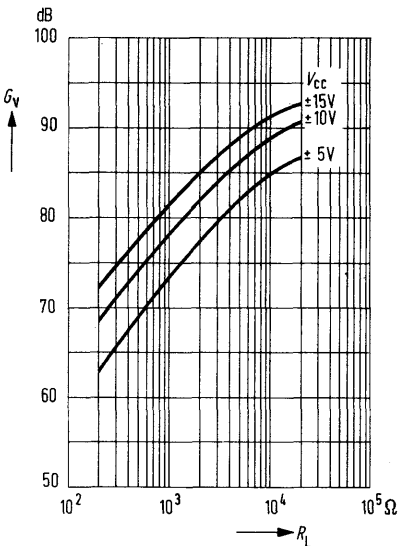
Open-loop voltage gain
 $G_V = f(V_{CC}); T_{amb} = 25^\circ\text{C}$
 $R_L = 2\text{ k}\Omega$



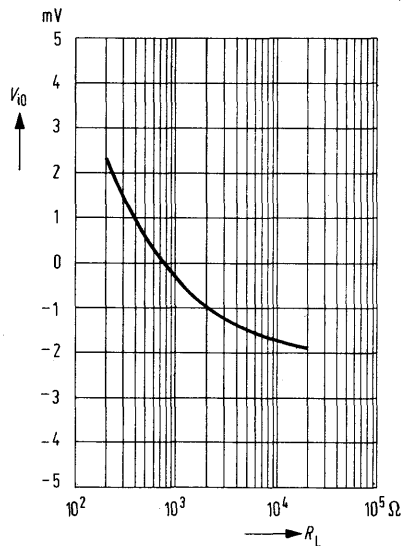
Input current
 $I_i = f(V_{CC})$



Open-loop voltage gain
 $G_V = f(R_L); T_{amb} = 25^\circ\text{C}$

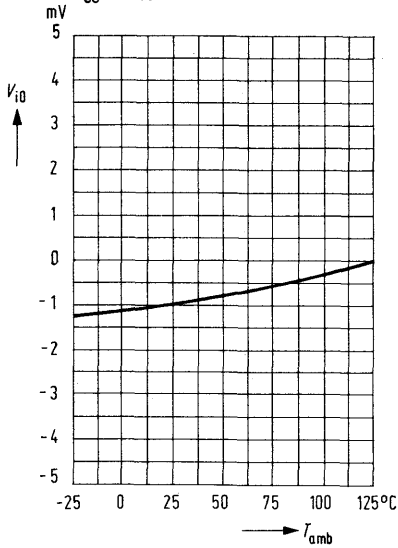


Input offset voltage
 $V_{io} = f(R_L); V_{CC} = \pm 15\text{ V}$



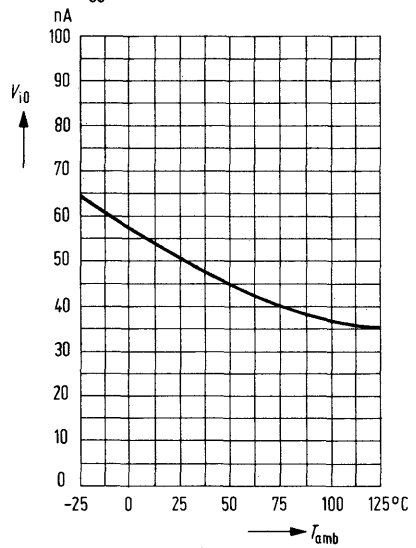
Input offset voltage

$V_{io} = f(T_{amb}); R_L = 2 \text{ k}\Omega$
 $V_{CC} = \pm 10 \text{ V}$



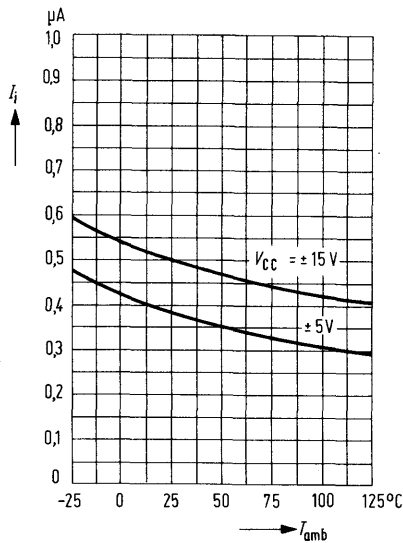
Input offset current

$V_{io} = f(T_{amb}); R_L = 2 \text{ k}\Omega$
 $V_{CC} = \pm 10 \text{ V}$



Input current

$I_i = f(T_{amb}); R_L = 2 \text{ k}\Omega$



Open-loop voltage gain

$G_V = f(T_{amb}); R_L = 2 \text{ k}\Omega; f = 1 \text{ kHz}$

