Operational Amplifier

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

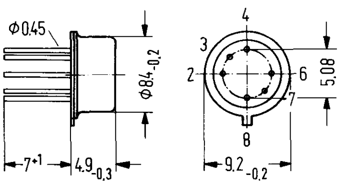
A particularly economical and universal operational amplifier which by its excellent performance qualities is well suited for a wide range of applications, such as automatic controls, automobile electronics, AF-circuits, analog computers etc.
In addition to a high gain, high input resistance, low offset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

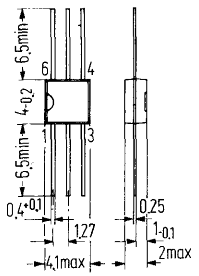
Package outlines

TAA 761, TAA 762, TAA 765



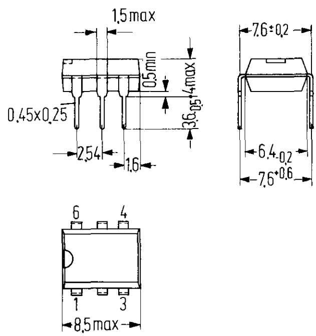
Case 5 H 6
DIN 41873
(similar TO–18)
Weight approx. 1 g

TAA 761 W, TAA 765 W



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

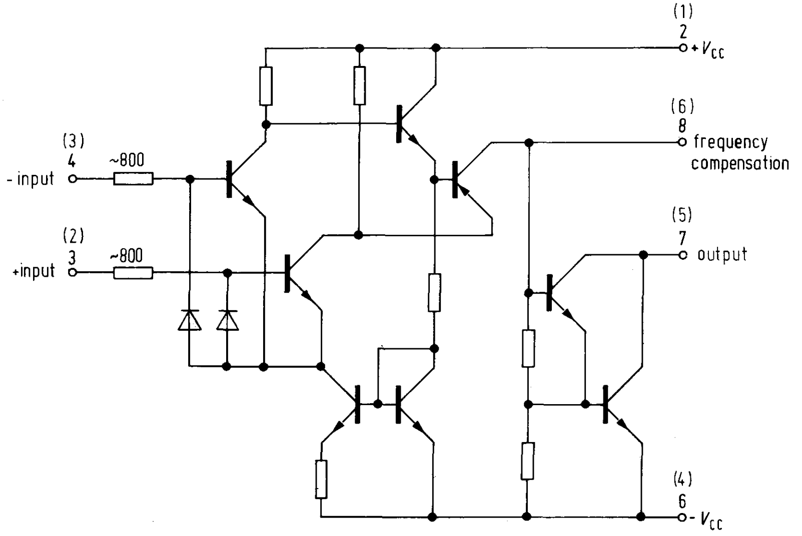
TAA 761 A, TAA 765 A



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

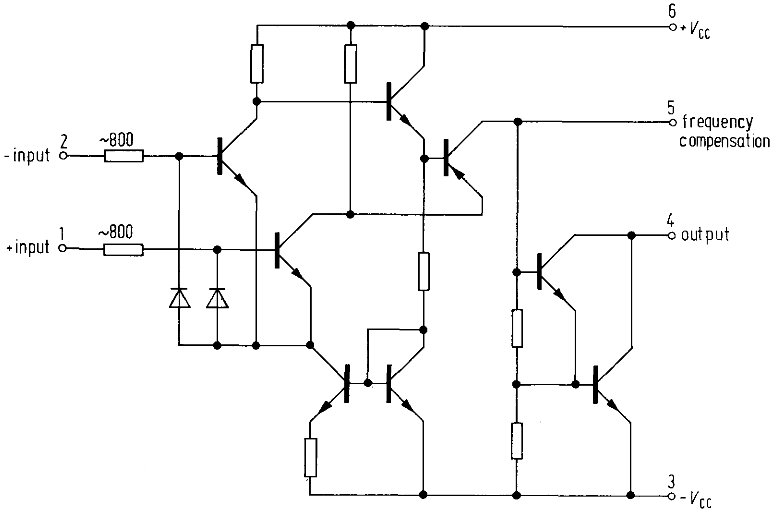
Dimensions in mm

Circuit for TAA 761, 762, 765



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

Circuit for TAA 761 W and TAA 765 W

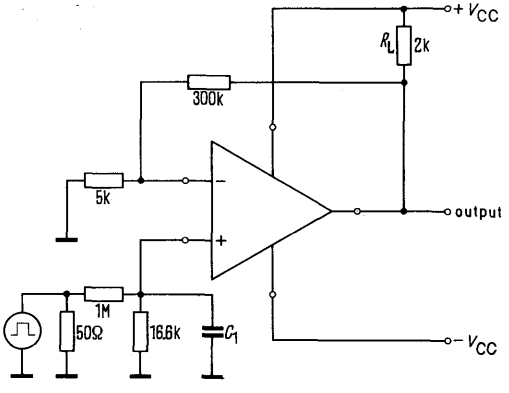


Maximum ratings		TAA 761/TAA 761 A TAA 761W/TAA 762 TAA 765/TAA 765 A TAA 765 W	
Supply voltage	V_{CC}	±18	V
Output current	I_q	70	mA
Differential input voltage	V_{ID}	$\pm V_{CC}$	
Junction temperature	T_j	150	°C
Storage temperature	T_S	−55 to +125	°C
Thermal resistances:			
System-case (TAA 761, TAA 762, TAA 765)	$R_{thScase}$	80	K/W
System-ambient air (TAA 761/762/765)	R_{thSamb}	190	K/W
System-ambient air (TAA 761 A, TAA 765 A)	R_{thSamb}	140	K/W
System-ambient air (TAA 761 W, TAA 765 W)	R_{thSamb}	200	K/W
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} = ±15 V		**TAA 761/A/W** **TAA 765/A/W** T_{amb} = 25 °C			**TAA 762** T_{amb} = 25 °C			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 Ω)	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 kΩ)	V_{qpp}	14.9		−14	14.9		−14	14.8	−14	V
(R_L = 620 Ω)	V_{qpp}	14.9		−12.5	14.9		−12.5	14.8	−12	V
(R_L = 2 kΩ, f = 100 kHz)	V_{qpp}		±10			±10				V
Input impedance (f = 1 kHz)	Z_i		200			200				kΩ
Open-loop voltage gain										
(R_L = 2 kΩ, f = 1 kHz)	G_V	81.5	85		85	87		80		dB
(R_L = 10 kΩ, f = 1 kHz)	G_V		90			92				dB
(R_L = 2 kΩ, f = 1 MHz)	G_V		43			43				dB
Output leakage current	I_{qlk}		1	10		1	10			µA

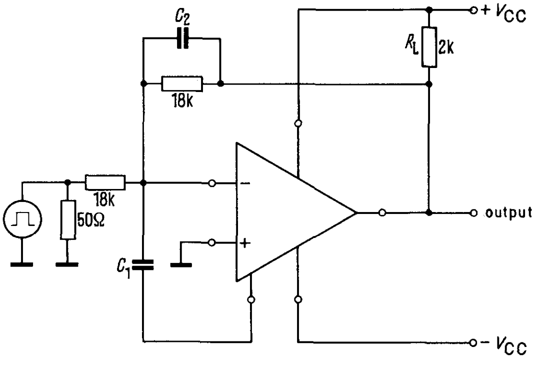
Operating characteristics V_{CC} = ±15 V		**TAA 761/A/W TAA 765/A/W** T_{amb} = 25 °C			**TAA 762** T_{amb} = 25 °C			T_{amb} = −55 to +125 °C		
		min	typ	max	min	typ	max	min	max	
Input common-mode range (R_L = 2 kΩ)	V_{ICM}	12	±13.5	−12	12	±13.5	−12			V
Common-mode rejection ratio (R_L = 2 kΩ)	*CMRR*	65	79		70	81				dB
Sensitivity to supply voltage variations (G_V = 100)	$\frac{\Delta V_{io}}{\Delta V_{CC}}$		25	200		25	200			µV/V
Temp. coefficient of V_{io} (R_G = 50 Ω)	α_{Vio}		6			6	25			µV/K
Temp. coefficient of I_{io} (R_G = 50 Ω)	α_{Iio}		.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 kΩ)	V_N		3			3				µV
V_{CC} = ±5 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 kΩ)	V_{qpp}	4.9		−4	4.9		−4	4.8	−4	V
Open loop voltage gain (R_L = 2 kΩ, f = 1 kHz)	G_V	70			70					dB

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



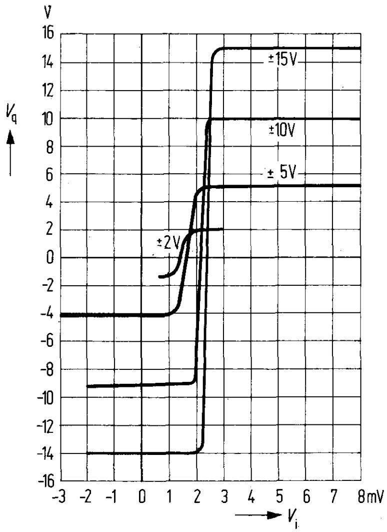
$C_1 \approx$ 22 pF for min overshoot

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

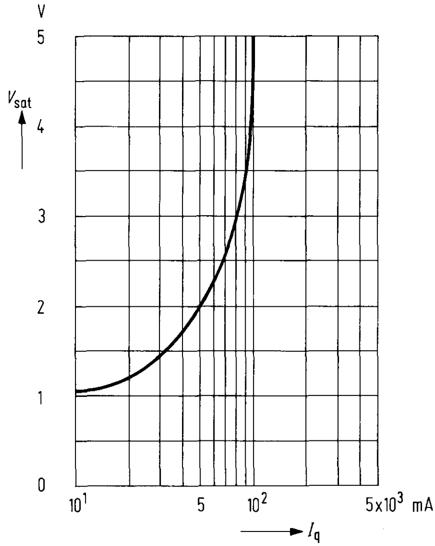


C_2 is for a frequency dependent compensation of the reduction of rise times
C_1 3.9 pF for min overshoot

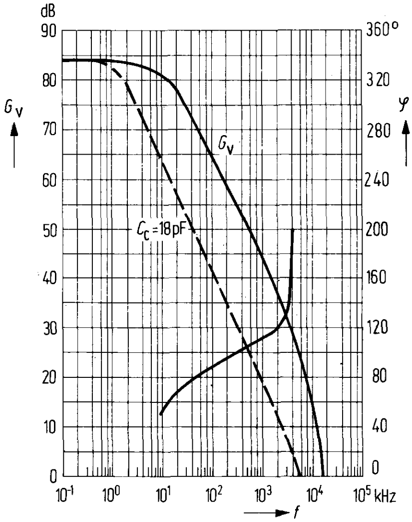
Transfer characteristic $V_q = f(V_i)$
V_{CC} = parameter, $R_L = 2\ k\Omega$



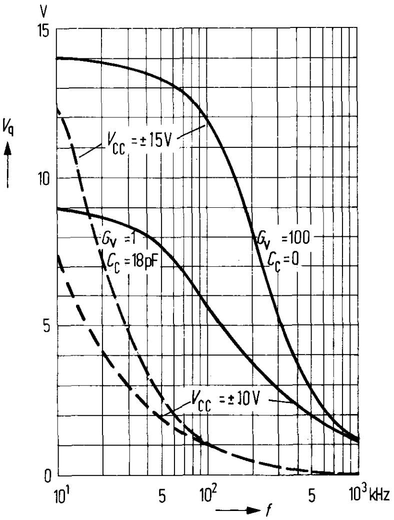
Saturation voltage $V_R = f(I_q)$
$T_{amb} = 25\ °C$



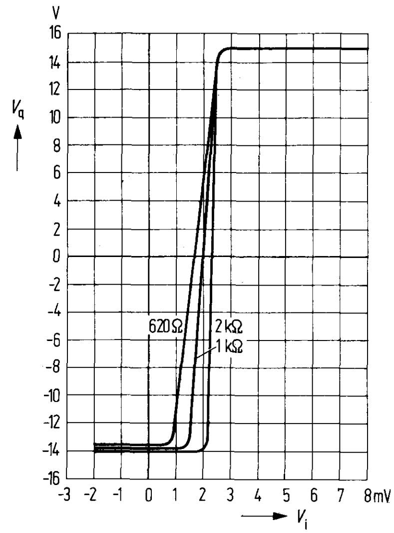
Open-loop voltage gain and phase
$G_V = f(f)$; $\varphi = f(f)$; $V_{CC} = \pm 10\ V/\pm 15\ V$



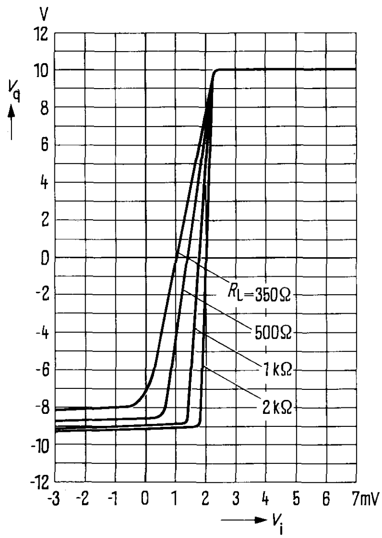
Frequency dependance of large signal modulation $V_q = f(f)$



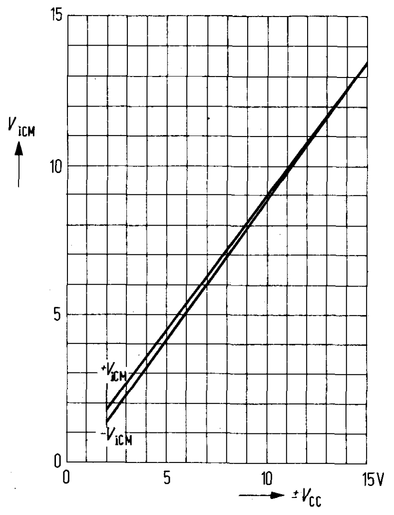
Transfer characteristic $V_q = (V_i)$
$V_{RR} = \pm 15$ V, R_c = parameter



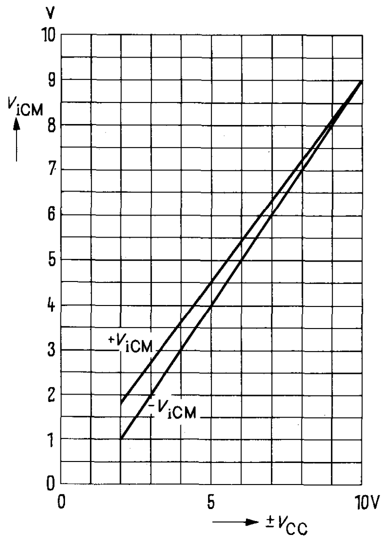
Transfer characteristic $V_q = f(V_i)$
$V_{CC} = \pm 15$ V, R_c = parameter



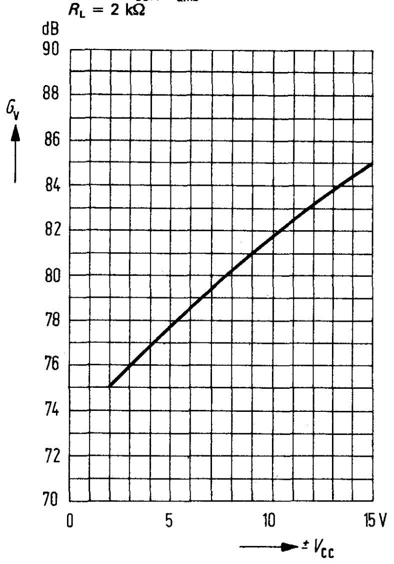
Common mode range $V_{iCM} = f(V_{CC})$



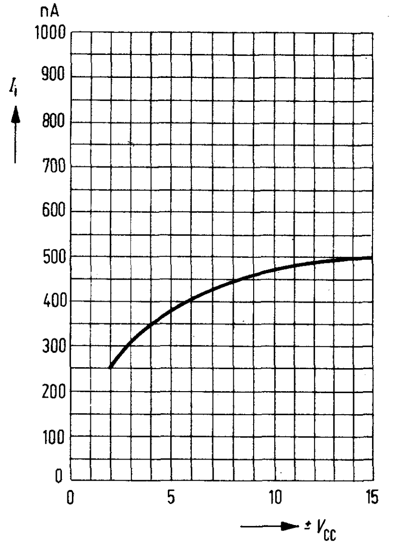
Common mode range $V_{iCM} = f(V_{CC})$



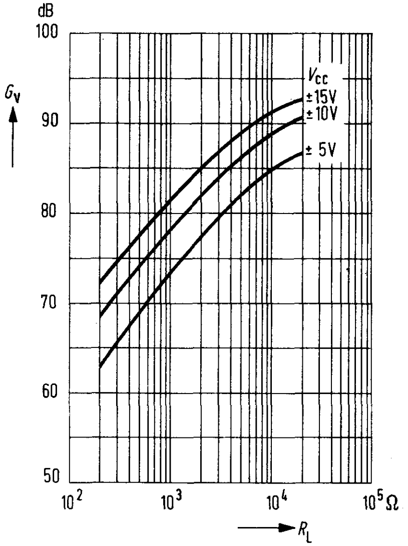
Open-loop voltage gain
$G_V = f(V_{CC})$; $T_{amb} = 25\ °C$
$R_L = 2\ k\Omega$



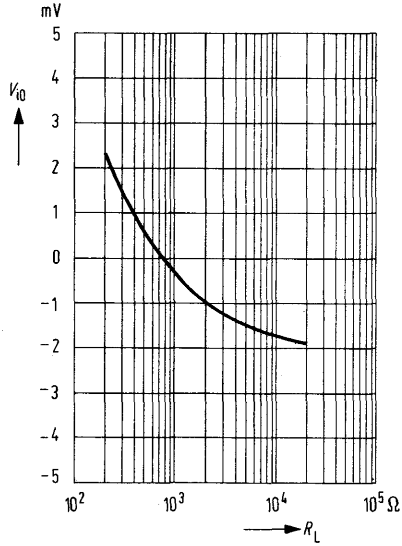
Input current
$I_I = f(V_{CC})$



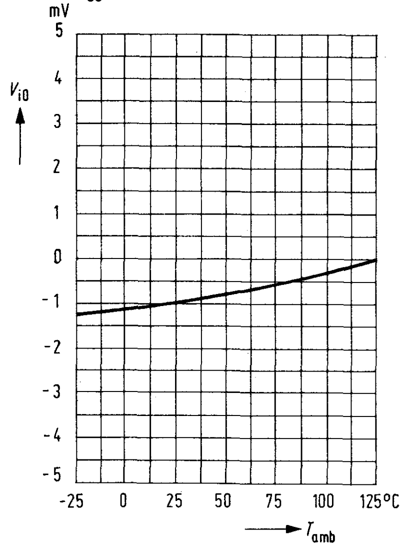
Open-loop voltage gain
$G_V = f(R_L)$; $T_{amb} = 25\ °C$



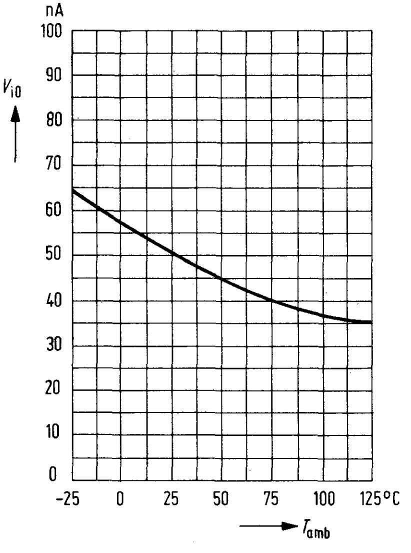
Input offset voltage
$V_{IO} = f(R_L)$; $V_{CC} = \pm 15\ V$



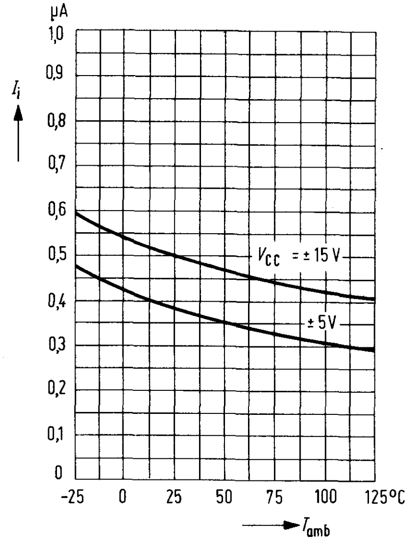
Input offset voltage
$V_{io} = f(T_{amb})$; $R_L = 2\ k\Omega$
$V_{CC} = \pm 10\ V$



Input offset current
$V_{IO} = f(T_{amb})$; $R_L = 2\ k\Omega$
$V_{CC} = \pm 10\ V$



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



Open-loop voltage gain
$G_V = f(T_{amb})$; $R_L = 2\ k\Omega$; $f = 1\ kHz$