

## Single Operational Amplifiers

**TAA 762**  
**TAA 765**

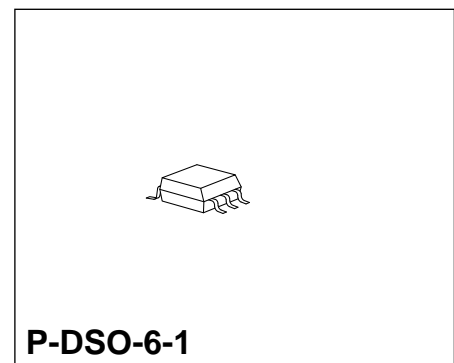
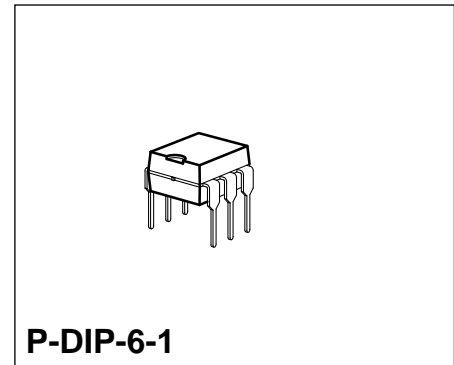
### Bipolar IC

#### Features

- Wide common-mode range
- Large supply voltage range
- Large control range
- Wide temperature range (TAA 762)
- High output frequency compensation
- Open collector output

#### Applications

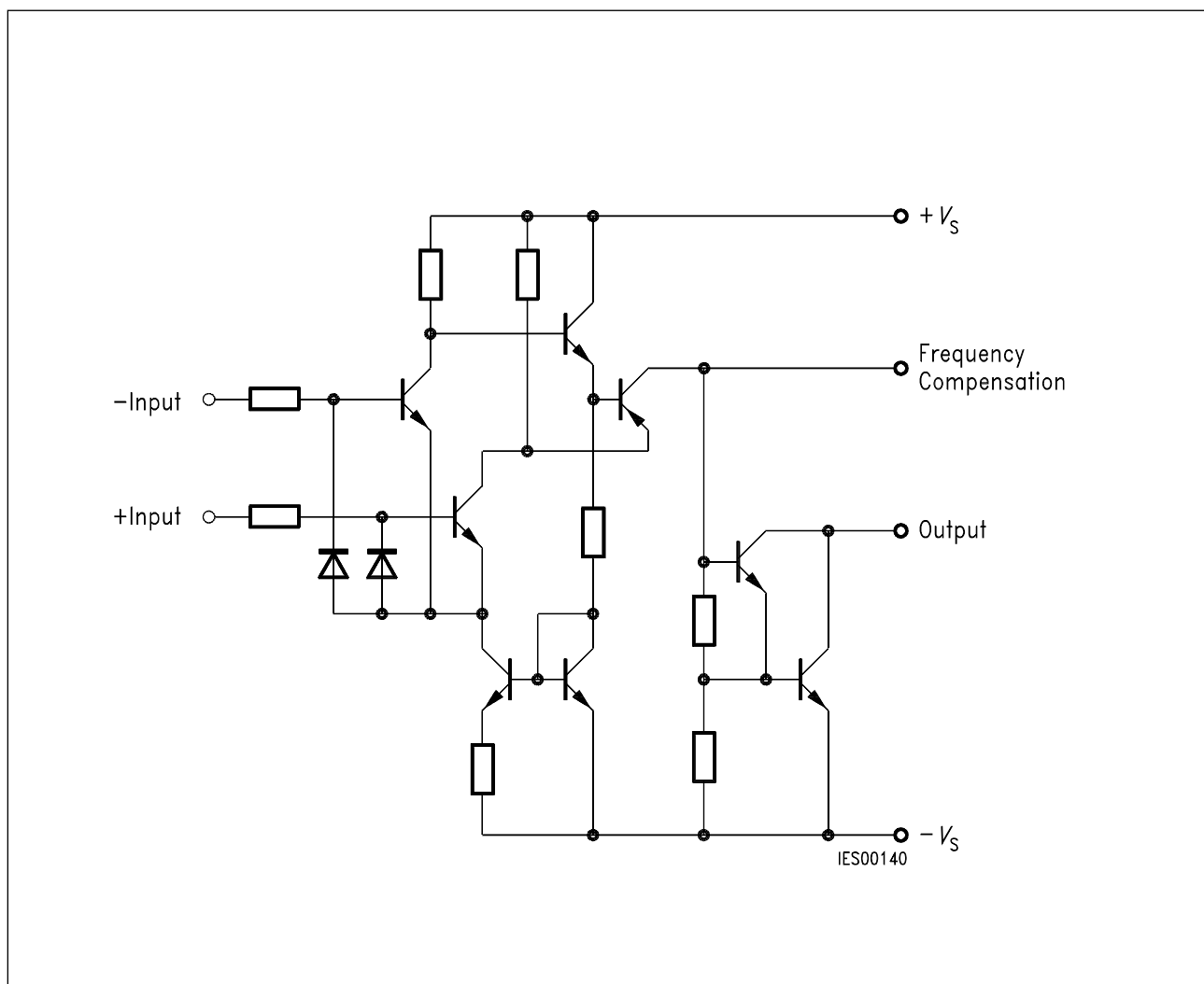
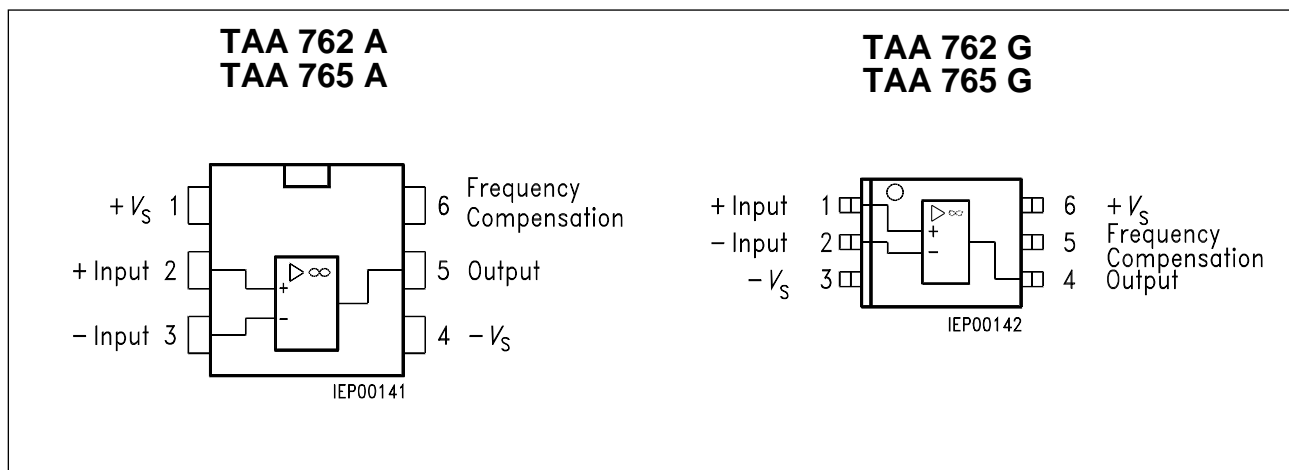
- Amplifier
- Comparator
- Level converter
- Driver



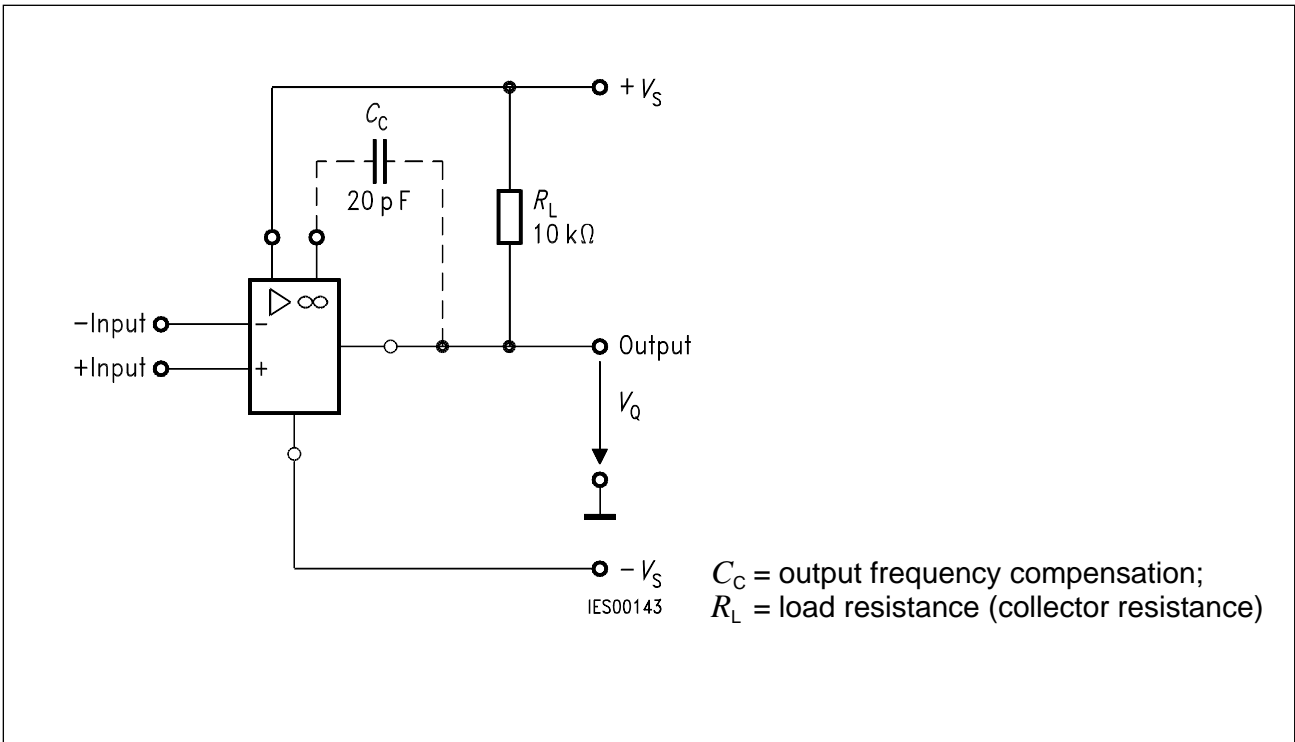
Type	Ordering Code	Package
TAA 762 A	Q67000-A2271	P-DIP-6-1
TAA 762 G	Q67000-A2273	P-DSO-6-1 (SMD)
TAA 765 A	Q67000-A524	P-DIP-6-1
TAA 765 G	Q67000-A599-G403	P-DSO-6-1 (SMD)

Particularly economic and versatile op amps. Owing to their excellent performance qualities they are well suited for a wide scope of applications, as in control engineering, automotive electronics, AF circuits, analog computers, etc.

## Pin Configurations (top view)



## Circuit Diagram



### Connection Diagram

### Absolute Maximum Ratings (TAA 762)

Parameter	Symbol	Limit Values	Unit
Supply voltage	$V_S$	$\pm 18$	V
Output current	$I_Q$	70	mA
Differential input voltage	$V_{ID}$	$\pm V_S$	V
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	- 55 to 125	°C
Thermal resistance system - air	TAA 762 A TAA 762 G $R_{th SA}$ $R_{th SA}$	115 200	K/W K/W

### Operating Range (TAA 762)

Supply voltage	$V_S$	$\pm 1.5$ to $\pm 18$	V
Ambient temperature	$T_A$	- 55 to 125	°C

## Characteristics (TAA 762)

$V_S = \pm 5 \text{ V}$  to  $\pm 15 \text{ V}$ ;  $R_L = 2 \text{ k}\Omega$ ,  
unless otherwise specified

Parameter	Symbol	Limit Values $T_A = 25 \text{ }^\circ\text{C}$			Limit Values $T_A = -55$ to $125 \text{ }^\circ\text{C}$		Unit
		min.	typ.	max.	min.	max.	
Open-loop supply current consumption	$I_S$		1.5	2.5		2.5	mA
Input offset voltage $R_G = 50 \text{ }\Omega$	$V_{IO}$	-4		4	-6	6	mV
Input offset current	$I_{IO}$	-100	$\pm 50$	100	-300	300	nA
Input current	$I_I$		0.3	0.7		1.0	$\mu\text{A}$
Control range $V_S = \pm 15 \text{ V}$	$V_{Qpp}$	14.9		-14	14.8	-14	V
$R_L = 620 \text{ }\Omega$ , $V_S = \pm 15 \text{ V}$	$V_{Qpp}$	14.9		-12.5	14.8	-12	V
$V_S = \pm 15 \text{ V}$ , $f = 100 \text{ kHz}$	$V_{Qpp}$		$\pm 10$				V
Input impedance $f = 1 \text{ kHz}$	$Z_I$		200				$\text{k}\Omega$
Open-loop voltage gain $f = 1 \text{ kHz}$	$G_{V0}$	85	87		80		dB
$R_L = 10 \text{ k}\Omega$ , $f = 1 \text{ kHz}$	$G_{V0}$		92				dB
$f = 1 \text{ MHz}$	$G_{V0}$		43				dB
Output reverse current	$I_{QR}$			1		5	$\mu\text{A}$
Common-mode input voltage range	$V_{IC}$	$-V_S + 2$		$V_S - 2$	$-V_S + 3$	$V_S - 3$	V
Common-mode rejection	$k_{CMR}$	80	85		75		dB
Supply voltage rejection $G_V = 100$	$k_{SVR}$		25	200		200	$\mu\text{V/V}$

### Characteristics (TAA 762) (cont'd)

$V_S = \pm 5 \text{ V}$  to  $\pm 15 \text{ V}$ ;  $R_L = 2 \text{ k}\Omega$ ,  
unless otherwise specified

Parameter	Symbol	Limit Values $T_A = 25 \text{ }^\circ\text{C}$			Limit Values $T_A = -55$ to $125 \text{ }^\circ\text{C}$		Unit
		min.	typ.	max.	min.	max.	
Temperature coefficient of $V_{IO}$ $R_G = 50 \text{ } \Omega$	$\alpha_{VIO}$		6	25		25	$\mu\text{V/K}$
Temperature coefficient of $I_{IO}$ $R_G = 50 \text{ } \Omega$	$\alpha_{IIO}$		0.3	1.5		1.5	nA/K
Slew rate of $V_Q$ for non-inverting operation <b>(test circuit 1)</b>	$SR$		9				V/ $\mu\text{s}$
Slew rate of $V_Q$ for inverting operation <b>(test circuit 2)</b>	$SR$		18				V/ $\mu\text{s}$
Noise voltage (in acc. with DIN 45 405; referred to input; $R_S = 2.5 \text{ k}\Omega$ )	$V_n$		3				$\mu\text{V}$

### Characteristics (TAA 762)

$V_S = \pm 2 \text{ V}$ ;  $R_L = 2 \text{ k}\Omega$

Input offset voltage $R_G = 50 \text{ } \Omega$	$V_{IO}$	-4		4	-6	6	mV
Input offset current	$I_{IO}$	-70		70	-200	200	nA
Input current	$I_I$		0.2	0.5		0.8	$\mu\text{A}$
Open-loop voltage gain $f = 1 \text{ kHz}$	$G_{V0}$	80			75		dB

## Absolute Maximum Ratings (TAA 765)

Parameter	Symbol	Limit Values	Unit
Supply voltage	$V_S$	$\pm 18$	V
Output current	$I_Q$	70	mA
Differential input voltage	$V_{ID}$	$\pm V_S$	V
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	- 55 to 125	°C
Thermal resistance system - air	TAA 765 A TAA 765 G	$R_{th SA}$ $R_{th SA}$	K/W K/W
		115 200	

## Operating Range (TAA 765)

Supply voltage	$V_S$	$\pm 1.5$ to $\pm 18$	V
Ambient temperature	$T_A$	- 25 to 85	°C

## Characteristics (TAA 765)

$V_S = \pm 5 \text{ V}$  to  $\pm 15 \text{ V}$ ;  $R_L = 2 \text{ k}\Omega$ , unless otherwise specified

Parameter	Symbol	Limit Values $T_A = 25 \text{ }^\circ\text{C}$			Limit Values $T_A = -25$ to $85 \text{ }^\circ\text{C}$		Unit
		min.	typ.	max.	min.	max.	
Open-loop supply current consumption	$I_S$		1.5	2.5		2.5	mA
Input offset voltage $R_G = 50 \text{ }\Omega$	$V_{IO}$	- 5.5		5.5	- 7	7	mV
Input offset current	$I_{IO}$	- 200	$\pm 80$	200	- 300	300	nA
Input current	$I_I$		0.5	0.8		1.0	$\mu\text{A}$
Control range $V_S = \pm 15 \text{ V}$ $R_L = 620 \text{ }\Omega$ , $V_S = \pm 15 \text{ V}$ $V_S = \pm 15 \text{ V}$ , $f = 100 \text{ kHz}$	$V_{Qpp}$ $V_{Qpp}$ $V_{Qpp}$	14.9 14.9	$\pm 10$	- 14 - 12.5	14.8 14.8	- 14 - 12	V V V
Input impedance $f = 1 \text{ kHz}$	$Z_I$		200				k $\Omega$
Open-loop voltage gain $f = 1 \text{ kHz}$ $R_L = 10 \text{ k}\Omega$ , $f = 1 \text{ kHz}$ $f = 1 \text{ MHz}$	$G_{V0}$ $G_{V0}$ $G_{V0}$	80	85 90 43		80		dB dB dB
Output reverse current	$I_{QR}$			10		20	$\mu\text{A}$
Common-mode input voltage range	$V_{IC}$	$-V_S + 2$		$V_S - 2$	$-V_S + 3$	$V_S - 3$	V
Common-mode rejection	$k_{CMR}$	75	83		75		dB
Supply voltage rejection $G_V = 100$	$k_{SVR}$		25	200		200	$\mu\text{V/V}$

### Characteristics (TAA 765) (cont'd)

$V_S = \pm 5 \text{ V}$  to  $\pm 15 \text{ V}$ ;  $R_L = 2 \text{ k}\Omega$ , unless otherwise specified

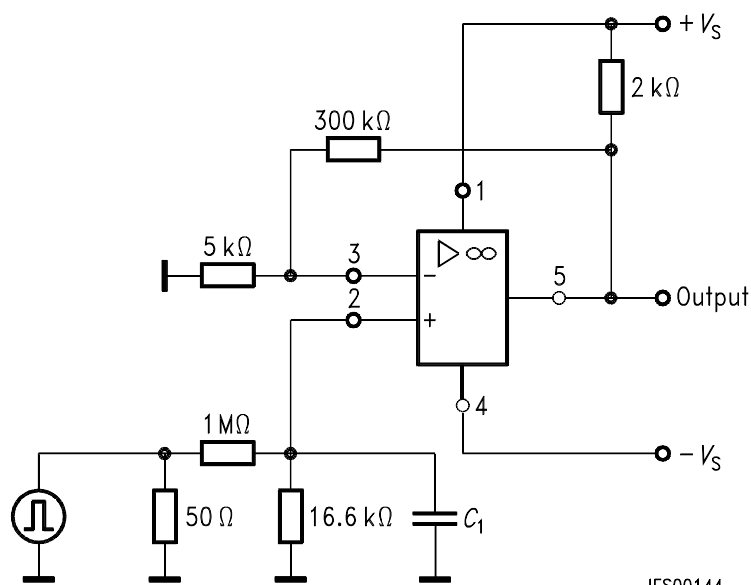
Parameter	Symbol	Limit Values $T_A = 25 \text{ }^\circ\text{C}$			Limit Values $T_A = -25$ to $85 \text{ }^\circ\text{C}$		Unit
		min.	typ.	max.	min.	max.	
Temperature coefficient of $V_{IO}$ $R_G = 50 \text{ }\Omega$	$\alpha_{VIO}$		6	25		25	$\mu\text{V/K}$
Temperature coefficient of $I_{IO}$ $R_G = 50 \text{ }\Omega$	$\alpha_{VIO}$		0.3	1.5		1.5	nA/K
Slew rate of $V_Q$ for non-inverting operation (test circuit 1)	$SR$		9				V/ $\mu\text{s}$
Slew rate of $V_Q$ for inverting operation (test circuit 2)	$SR$		18				V/ $\mu\text{s}$
Noise voltage (in acc. with DIN 45 405; referred to input; $R_S = 2.5 \text{ k}\Omega$ )	$V_n$		3				$\mu\text{V}$

### Characteristics (TAA 765)

$V_S = \pm 2 \text{ V}$ ;  $R_L = 2 \text{ k}\Omega$

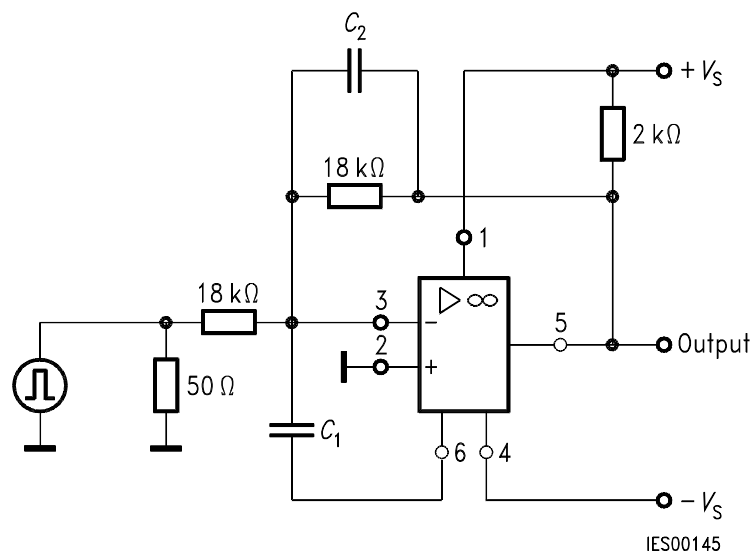
Input offset voltage $R_G = 30 \text{ }\Omega$	$V_{IO}$	- 6		6	- 7.5	7.5	mV
Input offset current	$I_{IO}$	- 150		150	- 200	200	nA
Input current	$I_I$		0.2	0.6		0.8	$\mu\text{A}$
Open-loop voltage gain $f = 1 \text{ kHz}$	$G_{V0}$	75			75		dB





$C_1$  for min. overshoot (approx. 22 pF)

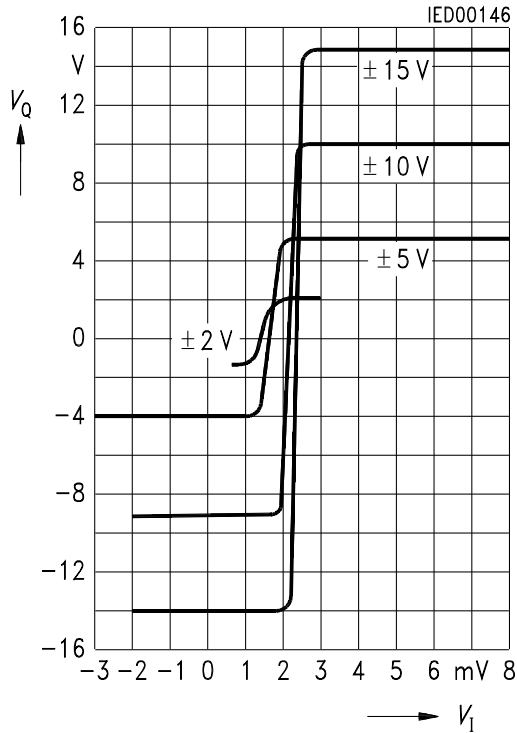
### Test Circuit 1 for Slew Rate (non-inverting operation)



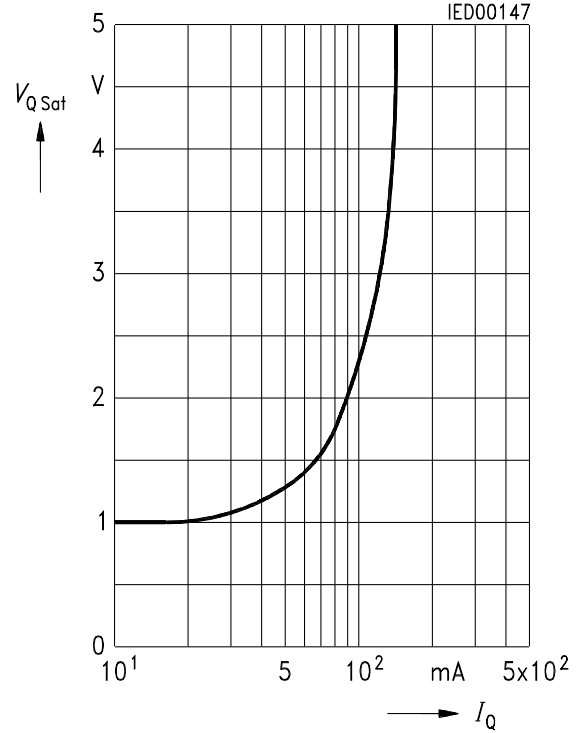
$C_2$  causes a frequency-dependent compensation to reduce rise times (approx. 390 pF)  
 $C_1$  for min. overshoot (approx. 3.9 pF)

### Test Circuit 2 for Slew Rate (inverting operation)

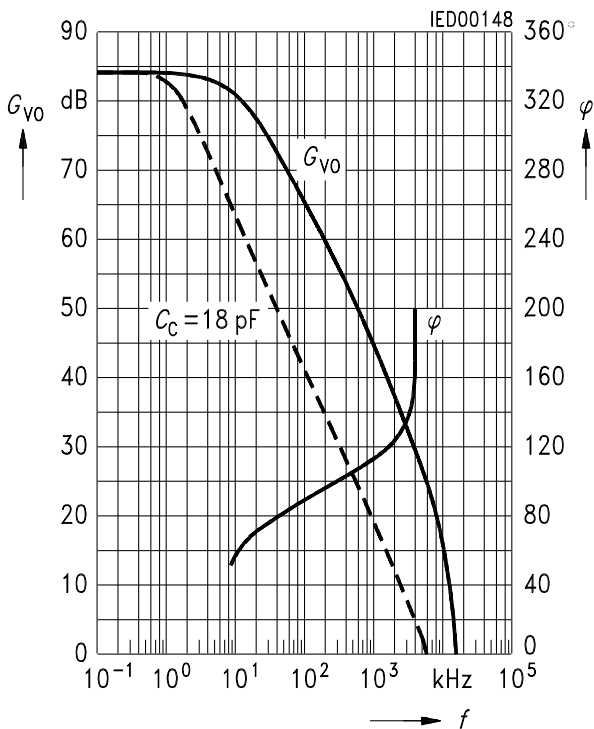
**Transfer Characteristic**  
**Output Voltage versus Input Voltage**  
 $V_S = \text{parameter}, R_L = 2 \text{ k}\Omega$



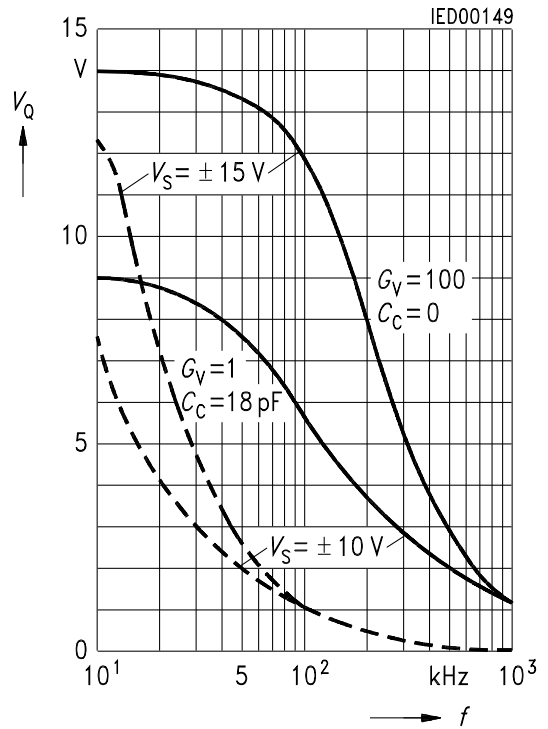
**Saturation Voltage versus**  
**Output Current**  
 $T_A = 25 \text{ }^\circ\text{C}$



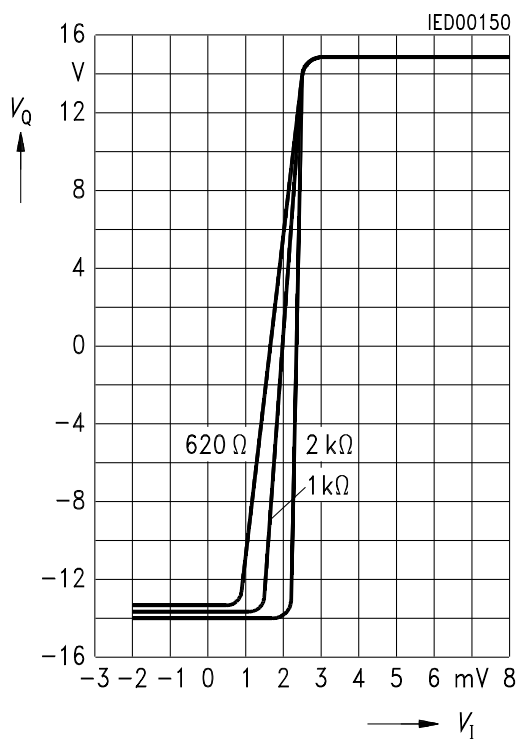
**Open-Loop Voltage Gain and**  
**Phase versus Frequency**  
 $V_S = \pm 15 \text{ V}; R_L = 2 \text{ k}\Omega$



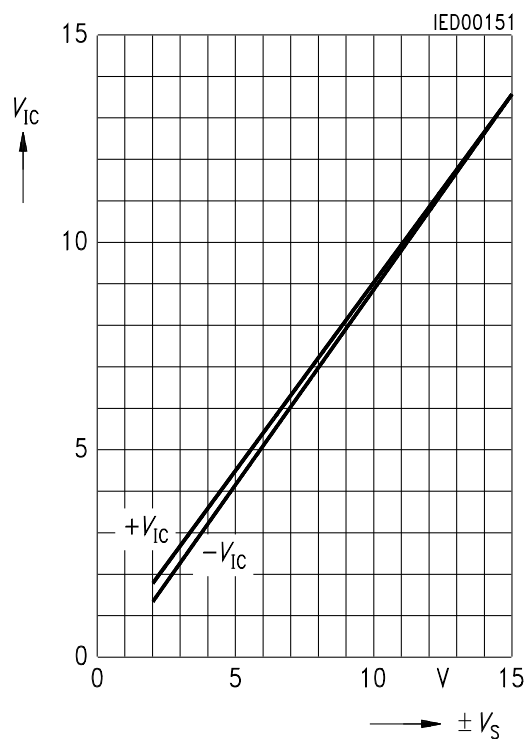
**Frequency Dependence of Large**  
**Signal Modulation Output Voltage**  
**versus Frequency**



**Transfer Characteristic**  
**Output Voltage versus Input Voltage**  
 $V_S = \pm 15 \text{ V}; R_L = \text{parameter}$

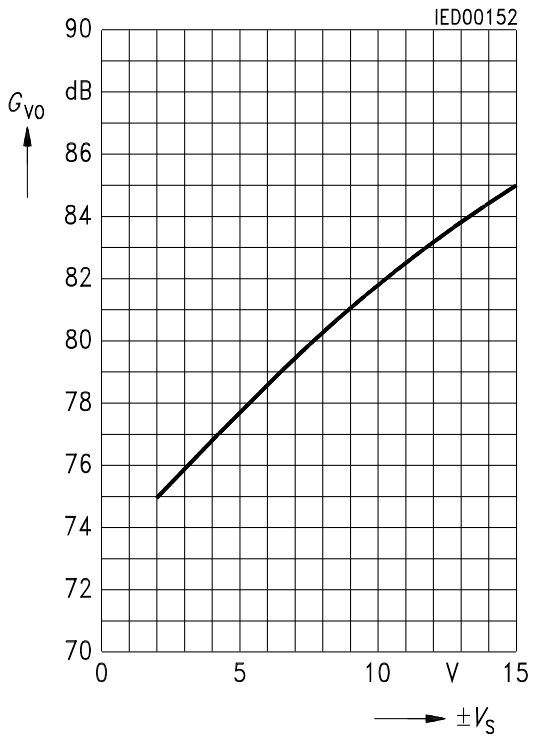


**Common-Mode Voltage Range**  
**Common-Mode Input**  
**Voltage versus Supply Voltage**

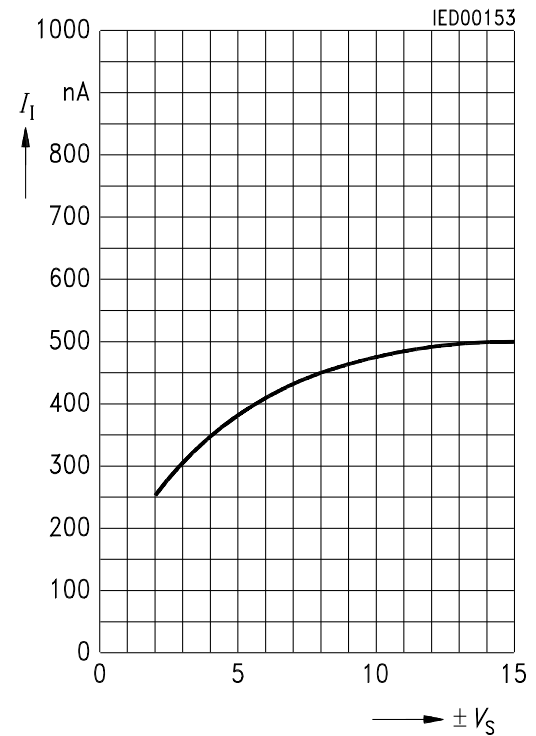


### Open-Loop Voltage Gain versus Supply Voltage

$T_A = 25\text{ }^\circ\text{C}$ ,  $R_L = 2\text{ k}\Omega$

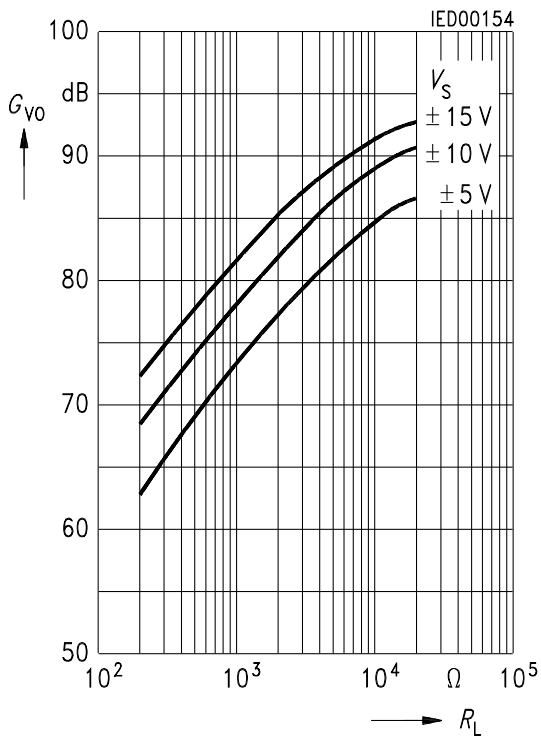


### Input Current versus Supply Voltage



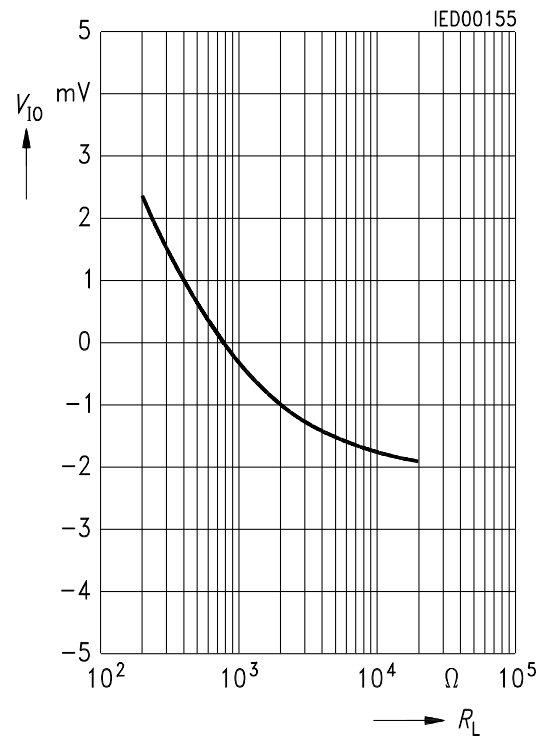
### Open-Loop Voltage Gain versus Load Resistance

$T_A = 25\text{ }^\circ\text{C}$



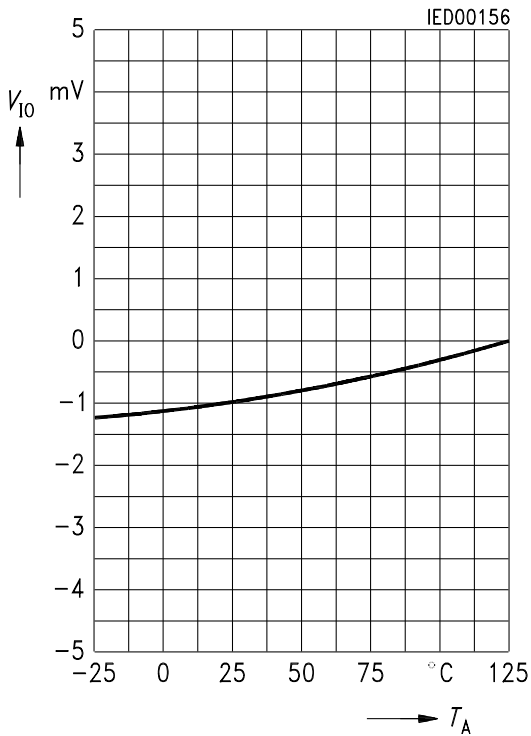
### Input Offset Voltage versus Load Resistance

$V_S = \pm 15\text{ V}$



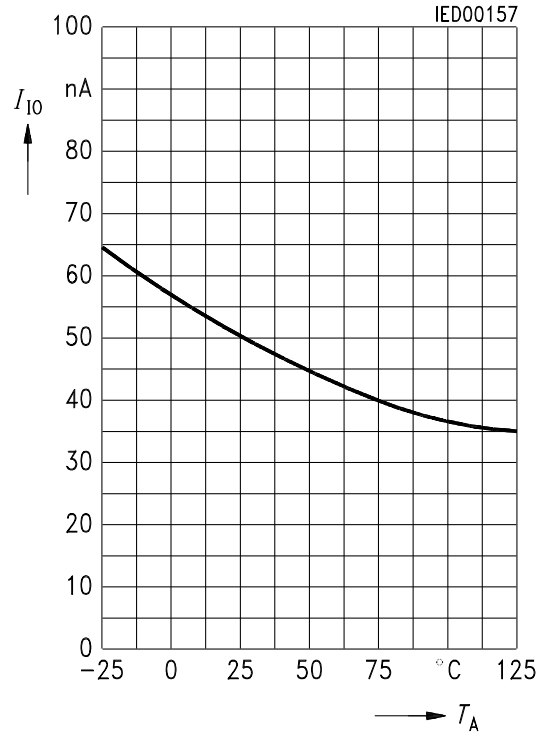
### Input Offset Voltage versus Ambient Temperature

$R_L = 2 \text{ k}\Omega$ ;  $V_S = \pm 15 \text{ V}$



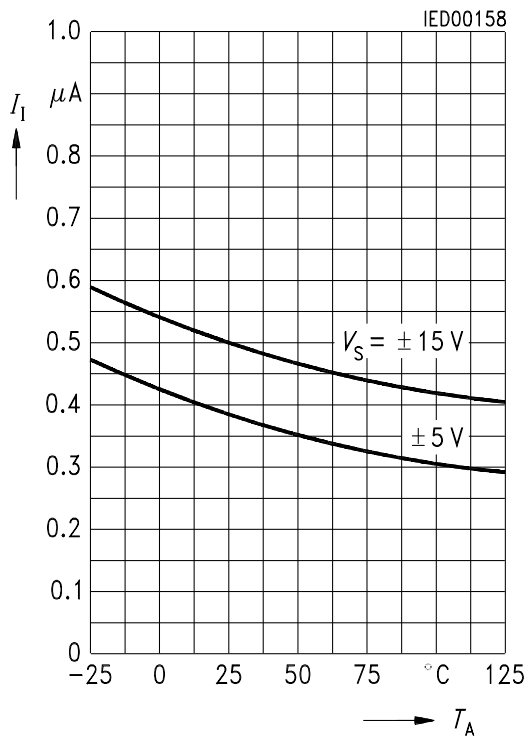
### Input Offset Current versus Ambient Temperature

$R_L = 2 \text{ k}\Omega$ ;  $V_S = \pm 15 \text{ V}$



### Input Current versus Ambient Temperature

$R_L = 2 \text{ k}\Omega$



### Open-Loop Voltage Gain versus Ambient Temperature

$R_L = 2 \text{ k}\Omega$ ;  $f = 1 \text{ kHz}$

