

Single Operational Amplifiers

TAA 762
TAA 765

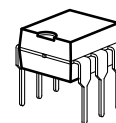
Bipolar IC

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



P-DIP-6-1

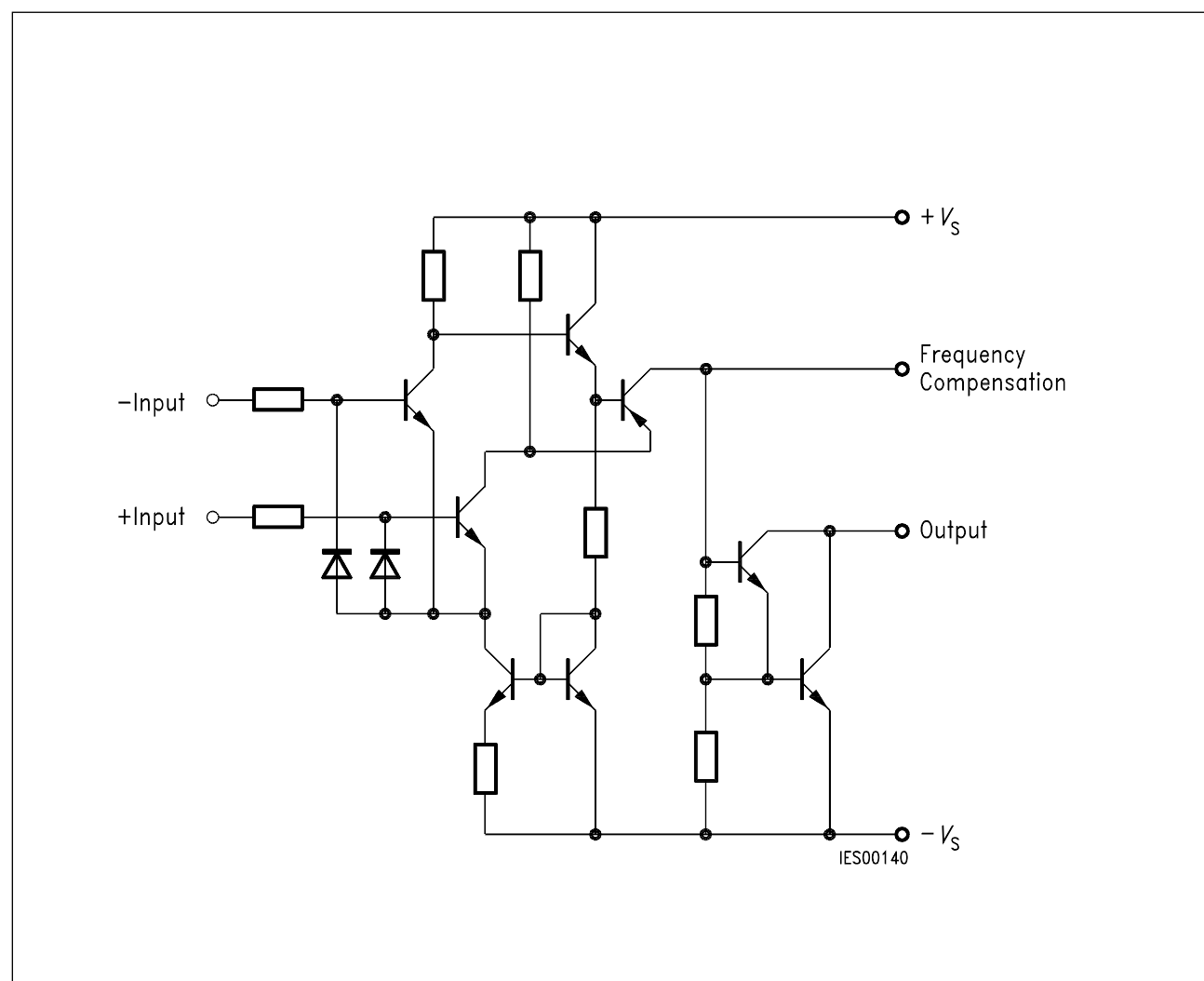
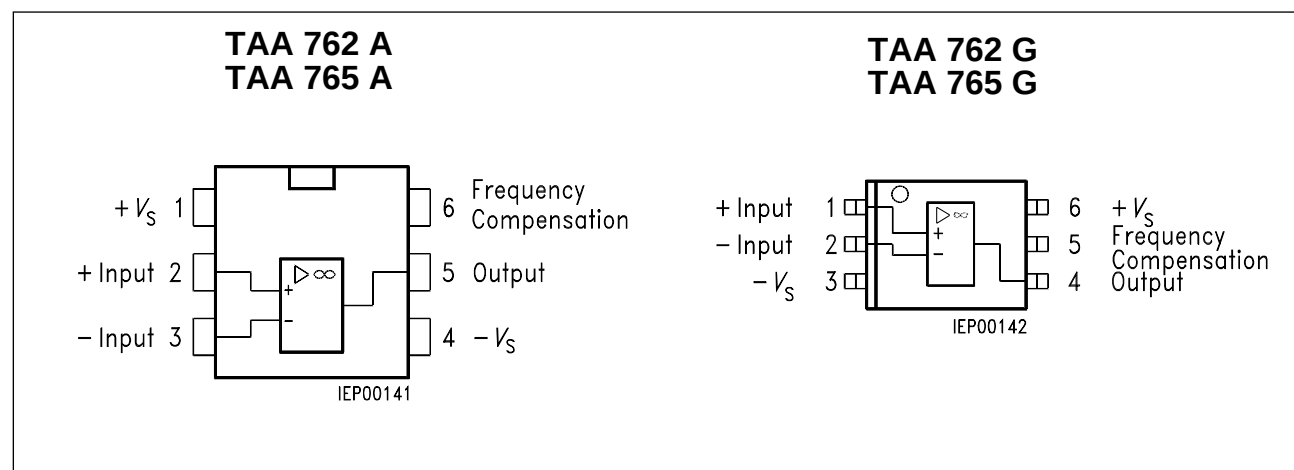


P-DSO-6-1

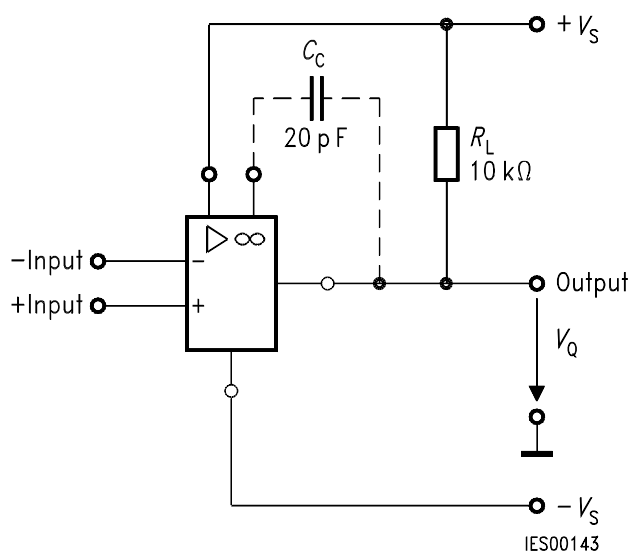
Type	Ordering Code	Package
TAA 762 A	Q67000-A2271	P-DIP-6-1
TAA 762 G	Q67000-A2273	P-DSO-6-1 (SMD)
TAA 765 A	Q67000-A524	P-DIP-6-1
TAA 765 G	Q67000-A599-G403	P-DSO-6-1 (SMD)

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



C_C = output frequency compensation;
 R_L = load resistance (collector resistance)

Connection Diagram

Absolute Maximum Ratings (TAA 762)

Parameter	Symbol	Limit Values	Unit
Supply voltage	V_S	± 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	$R_{th SA}$	115	K/W
TAA 762 A	$R_{th SA}$	200	K/W
TAA 762 G			

Operating Range (TAA 762)

Supply voltage	V_S	± 1.5 to ± 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	± 50	100	- 300	300	nA
Input current	I_I		0.3	0.7		1.0	μA
Control range $V_S = \pm 15 \text{ V}$ $R_L = 620 \text{ }\Omega$, $V_S = \pm 15 \text{ V}$ $V_S = \pm 15 \text{ V}$, $f = 100 \text{ kHz}$	$V_{Q \text{ pp}}$ $V_{Q \text{ pp}}$ $V_{Q \text{ pp}}$	14.9 14.9	± 10	- 14 - 12.5	14.8 14.8	- 14 - 12	V V V
Input impedance $f = 1 \text{ kHz}$	Z_I		200				k Ω
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}	85	87 92 43		80		dB dB dB
Output reverse current	I_{QR}			1		5	μA
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} $R_G = 50 \text{ }\Omega$	α_{VIO}		6	25		25	$\mu\text{V/K}$
Temperature coefficient of I_{IO} $R_G = 50 \text{ }\Omega$	α_{IIO}		0.3	1.5		1.5	nA/K
Slew rate of V_Q for non-inverting operation (test circuit 1)	SR		9				V/ μs
Slew rate of V_Q for inverting operation (test circuit 2)	SR		18				V/ μs
Noise voltage (in acc. with DIN 45 405; referred to input; $R_S = 2.5 \text{ k}\Omega$)	V_n		3				μV

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	μA
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	± 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	$R_{th SA}$ $R_{th SA}$	115 200	K/W K/W

Operating Range (TAA 765)

Supply voltage	V_S	± 1.5 to ± 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	± 80	200	- 300	300	nA
Input current	I_I		0.5	0.8		1.0	μA
Control range $V_S = \pm 15 \text{ V}$ $R_L = 620 \text{ }\Omega$, $V_S = \pm 15 \text{ V}$ $V_S = \pm 15 \text{ V}$, $f = 100 \text{ kHz}$	$V_{Q \text{ pp}}$ $V_{Q \text{ pp}}$ $V_{Q \text{ pp}}$	14.9 14.9	± 10	- 14 - 12.5	14.8 14.8	- 14 - 12	V V V
Input impedance $f = 1 \text{ kHz}$	Z_I		200				k Ω
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	μA
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)

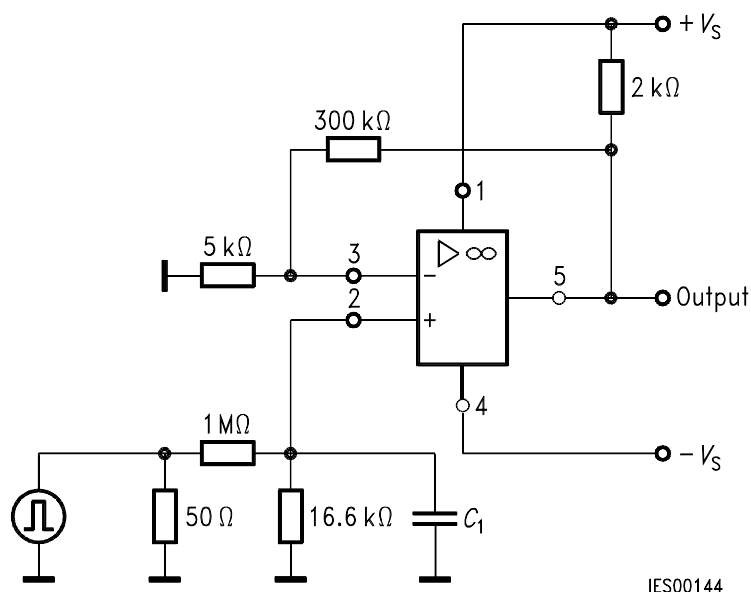
$V_S = \pm 5 \text{ V}$ to $\pm 15 \text{ V}$; $R_L = 2 \text{ k}\Omega$, unless otherwise specified

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} $R_G = 50 \text{ }\Omega$	α_{VIO}		6	25		25	$\mu\text{V/K}$
Temperature coefficient of I_{IO} $R_G = 50 \text{ }\Omega$	α_{VIO}		0.3	1.5		1.5	nA/K
Slew rate of V_Q for non-inverting operation (test circuit 1)	SR		9				V/ μs
Slew rate of V_Q for inverting operation (test circuit 2)	SR		18				V/ μs
Noise voltage (in acc. with DIN 45 405; referred to input; $R_S = 2.5 \text{ k}\Omega$)	V_n		3				μV

Characteristics (TAA 765)

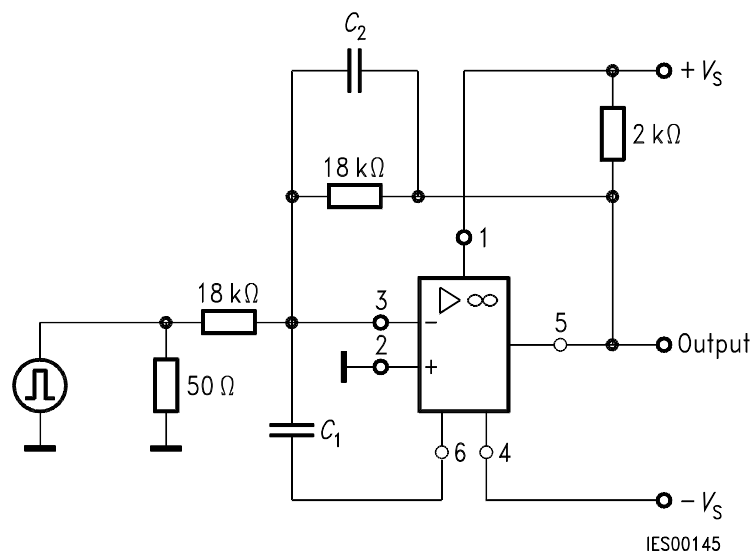
$V_S = \pm 2 \text{ V}$; $R_L = 2 \text{ k}\Omega$

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	μA
Open-loop voltage gain $f = 1 \text{ kHz}$	G_{V0}	75			75		dB



C_1 for min. overshoot (approx. 22 pF)

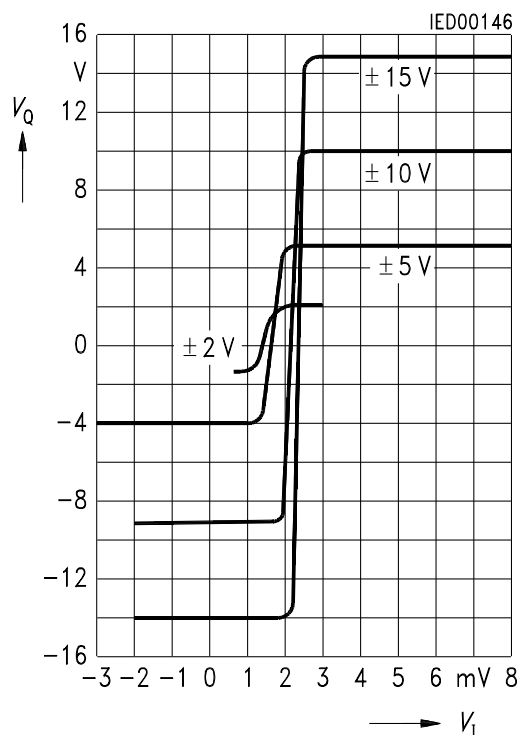
Test Circuit 1 for Slew Rate (non-inverting operation)



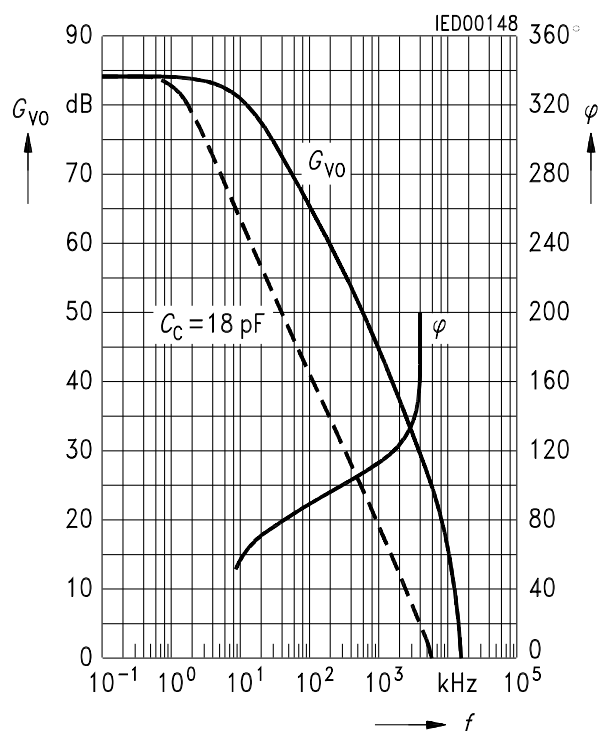
C_2 causes a frequency-dependent compensation to reduce rise times (approx. 390 pF)
 C_1 for min. overshoot (approx. 3.9 pF)

Test Circuit 2 for Slew Rate (inverting operation)

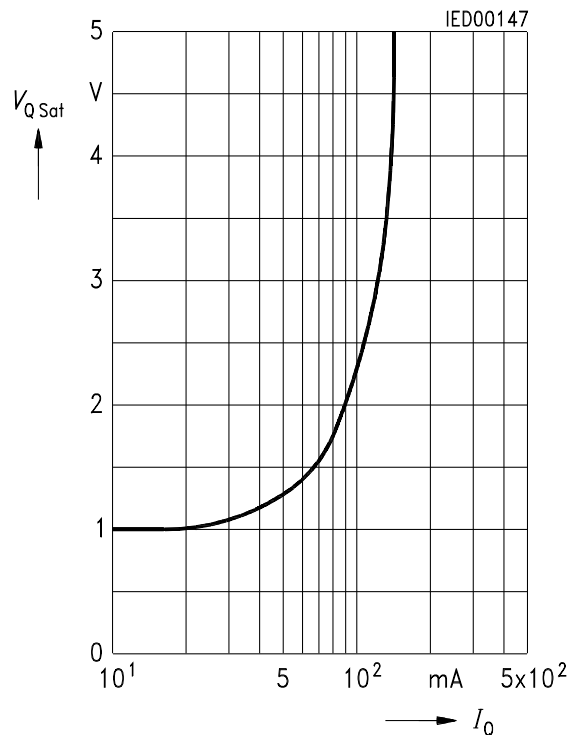
Transfer Characteristic
Output Voltage versus Input Voltage
 $V_S = \text{parameter}, R_L = 2 \text{ k}\Omega$



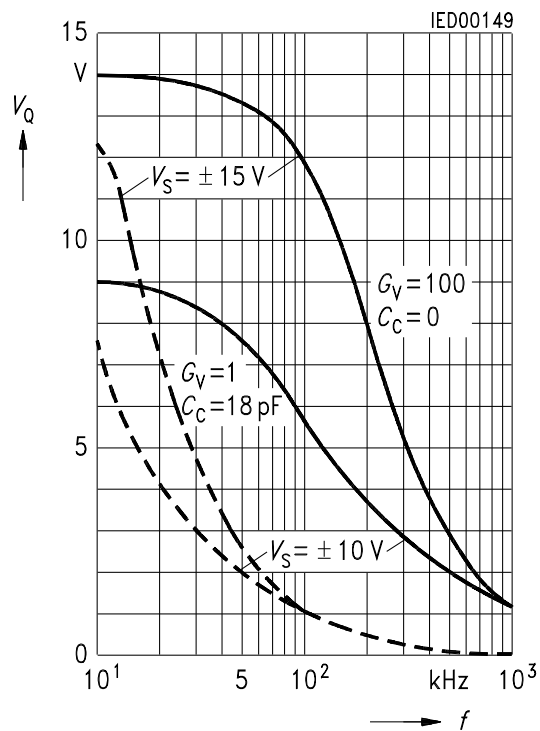
Open-Loop Voltage Gain and
Phase versus Frequency
 $V_S = \pm 15 \text{ V}; R_L = 2 \text{ k}\Omega$



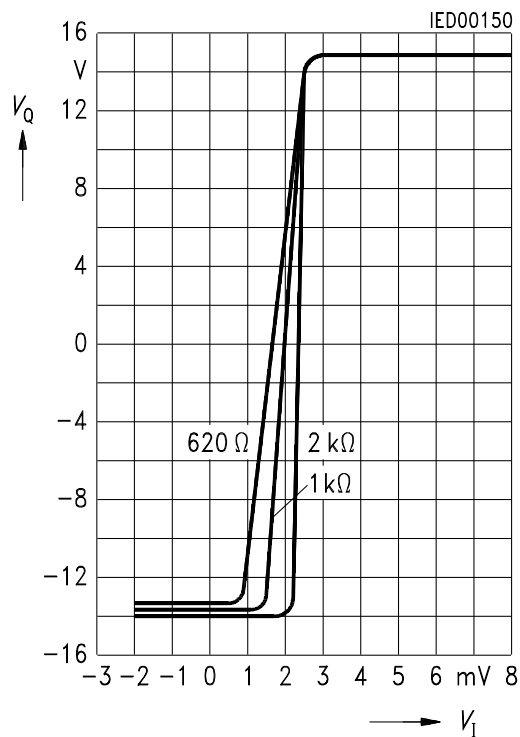
Saturation Voltage versus
Output Current
 $T_A = 25^\circ \text{C}$



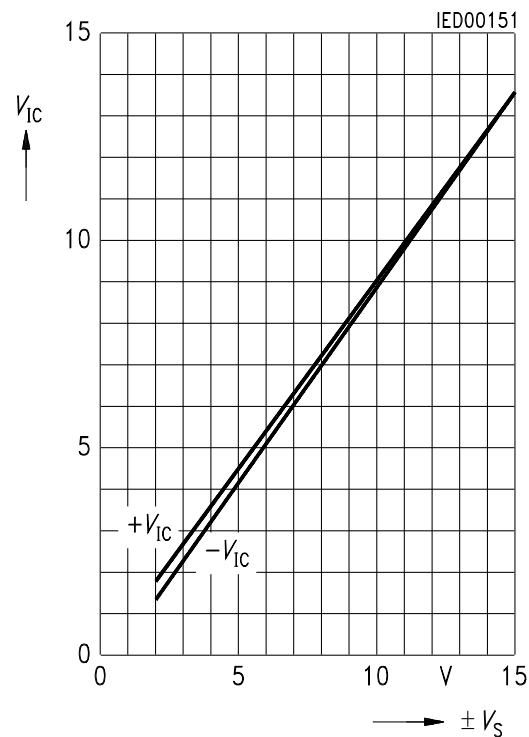
Frequency Dependence of Large
Signal Modulation Output Voltage
versus Frequency



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

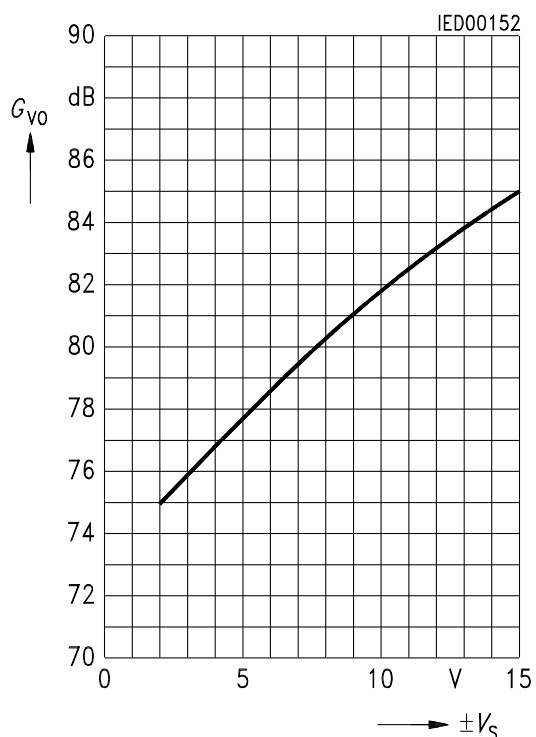


Common-Mode Voltage Range
Common-Mode Input
Voltage versus Supply Voltage

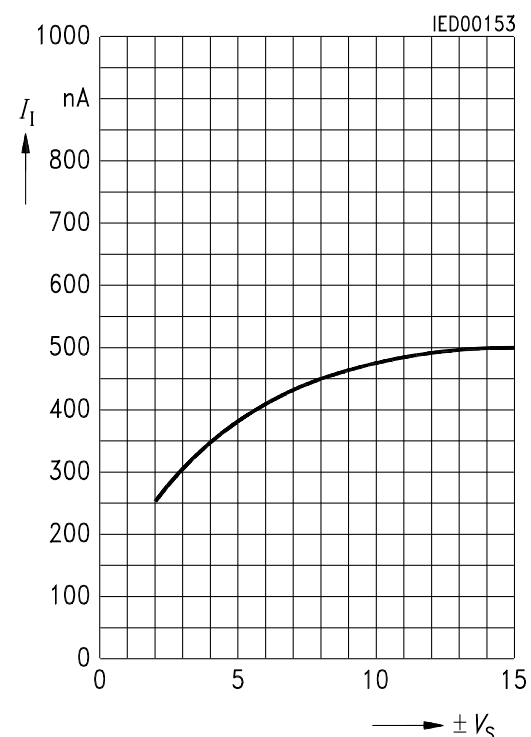


Open-Loop Voltage Gain versus Supply Voltage

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

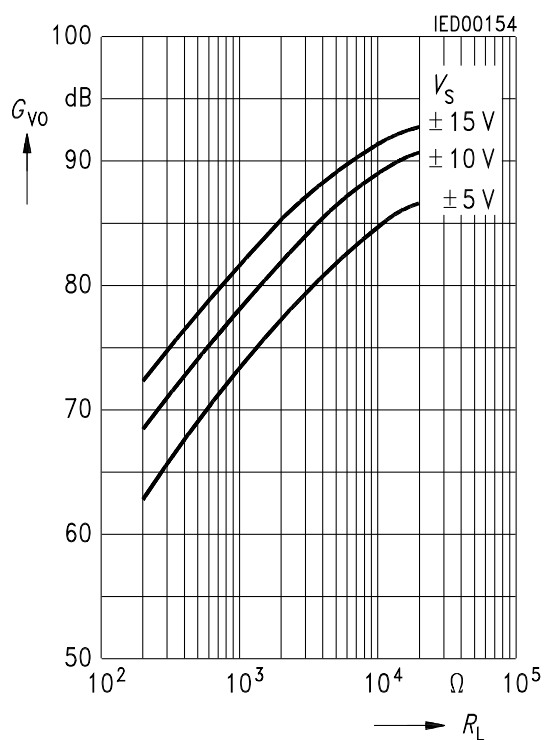


Input Current versus Supply Voltage



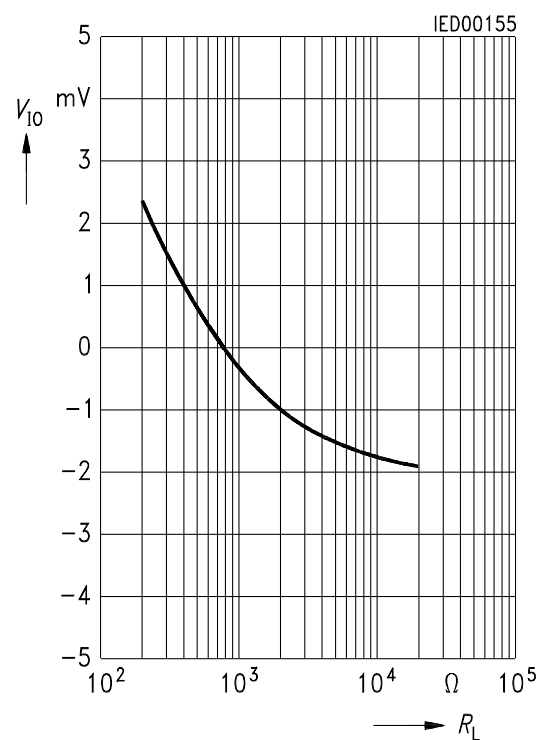
Open-Loop Voltage Gain versus Load Resistance

$T_A = 25\text{ °C}$



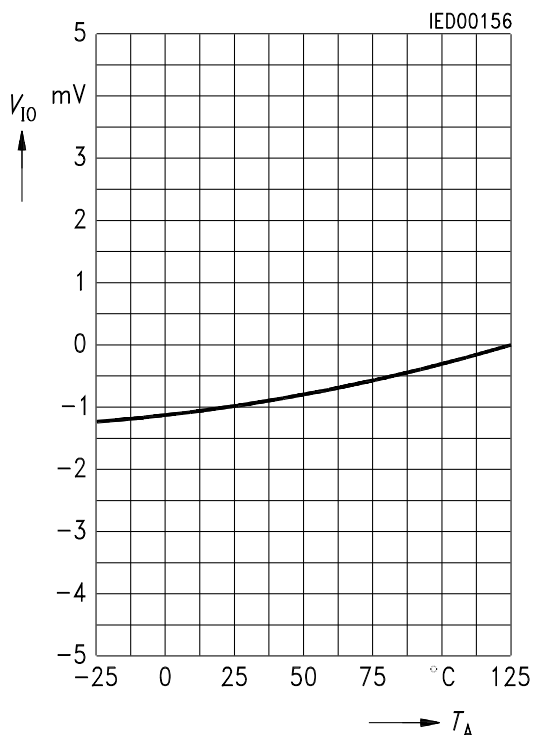
Input Offset Voltage versus Load Resistance

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



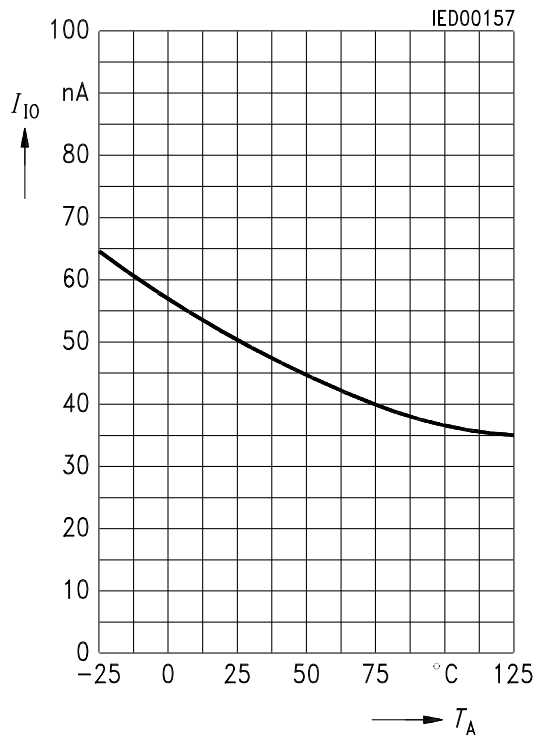
Input Offset Voltage versus Ambient Temperature

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



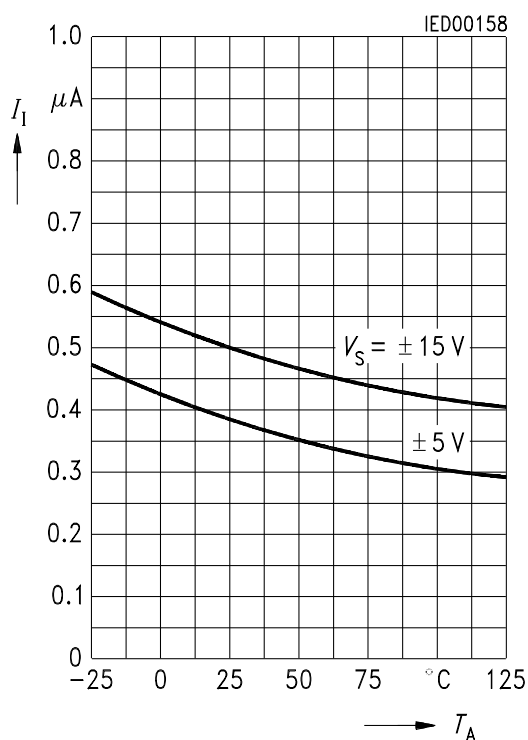
Input Offset Current versus Ambient Temperature

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



Input Current versus Ambient Temperature

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



Open-Loop Voltage Gain versus Ambient Temperature

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

