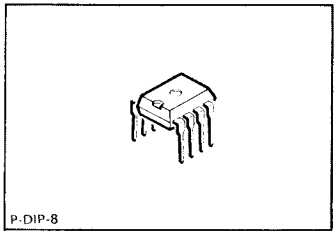
Dual PNP Operational Amplifiers

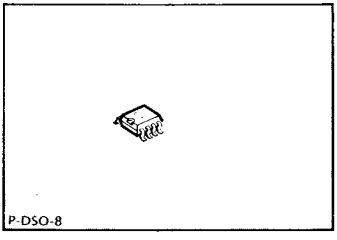
TAE 2453
TAF 2453

Bipolar IC

Features

- Supply voltage range between 2 V (1.8 V) and 36 V
- Low current consumption, 0.8 mA typ.
- Extremely large control range
- Low output saturation voltage, almost independent of load current
- Output current up to 70 mA (max. 100 mA)
- Output virtually short-circuit proof
- Wide common-mode voltage range
- Wide operating temperature range (TAF 2453 A; G)
- Pin-compatible to TBB 1458 B
- The characteristic curves of the electric parameters correspond to those of type TAE 1453 A; G


P-DIP-8


P-DSO-8

Applications

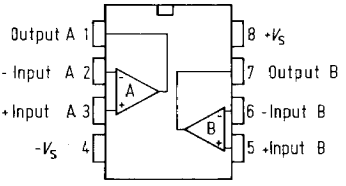
- Amplifier
- Level converter
- Driver
- Zero voltage switch
- Comparator

Type	Ordering Code	Package	Color Code
S TAE 2453 A	Q67000-A2107	P-DIP-8	–
S TAE 2453 G	Q67000-A2108	P-DSO-8 (SMD)	white
S TAF 2453 A	Q67000-A2210	P-DIP-8	–
TAF 2453 G	Q67000-A2211	P-DSO-8 (SMD)	green

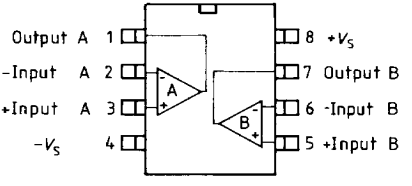
The TAF 2453/TAE 2453 consists of two independent, frequency-compensated op amps, each having a PNP input differential stage and an open collector output. The integrated regulator provides for all parameters a large degree of independence from the supply voltage.

Pin Configurations
(top view)

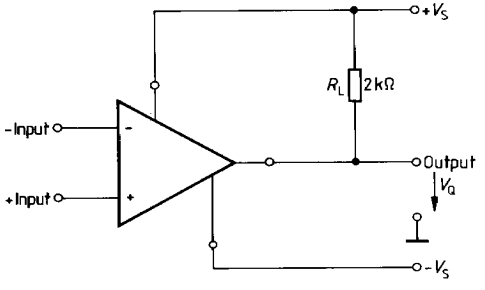
TAE 2453 A
TAF 2453 A



TAE 2453 G
TAF 2453 G

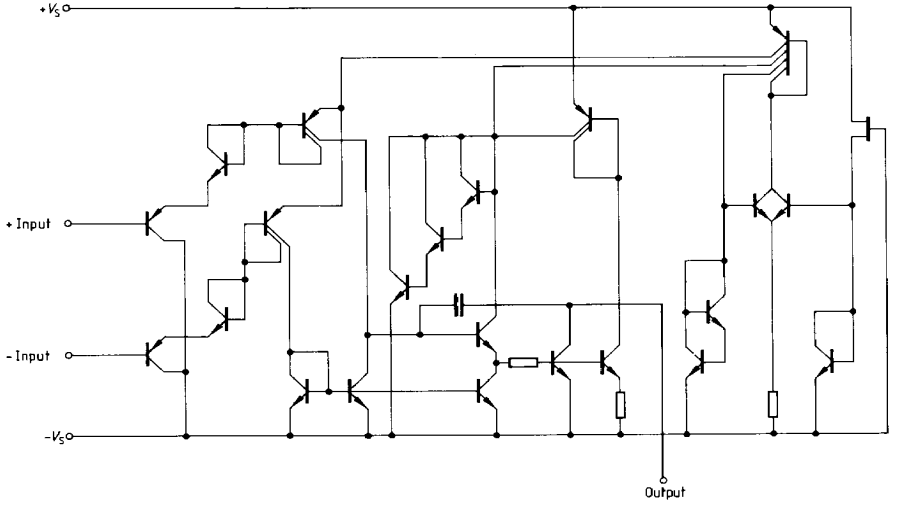


Connection Diagram



R_L = load resistance (collector resistance)

Circuit Diagram



Absolute Maximum Ratings (TAE 2453)

Parameter	Symbol	Limit Values	Unit
Supply voltage	V_S	±18	V
Output current	I_Q	100	mA
Differential input voltage	V_{ID}	$\pm V_S$	V
Junction temperature Storage temperature range	T_j T_{stg}	150 −55 to 125	°C °C
Thermal resistance system – air TAE 2453 A TAE 2453 G	 $R_{th\ SA}$ $R_{th\ SA}$	 100 170	 K/W K/W
Operating Range (TAE 2453)			
Supply voltage	V_S	±1.0 to ±18 (±0.9 V with slightly increased offset voltage)	V
Ambient temperature	T_A	−25 to 85	°C

Characteristics (TAE 2453)

$V_S = \pm 5$ V to ± 15 V; $R_L = 10$ kΩ, unless otherwise specified

		Limit Values $T_A = 25$ °C			Limit Values $T_A = -25$ to 85 °C		
Parameter	**Symbol**	**min**	**typ**	**max**	**min**	**max**	**Unit**
Open-loop supply current consumption, total	I_S		0.8	1.5		1.8	mA
Input offset voltage $R_G = 50\ \Omega$	V_{IO}	−5.5		5.5	−7	7	mV
Input offset current Input current	I_{IO} I_I	−15	 40	15 150	−100	100 200	nA nA
Control range $R_L = 2$ kΩ, $V_S = \pm 15$ V $R_L = 620\ \Omega$, $V_S = \pm 15$ V	 $V_{Q\ pp}$ $V_{Q\ pp}$	 14.9 14.9		 −14.7 −14.5	 14.9 14.9	 −14.7 −14.4	 V V
Input impedance $f = 1$ kHz	Z_I		200				kΩ
Open-loop voltage gain $R_L = 2$ kΩ	G_{V0}	80	85		80		dB
Output reverse current	I_{QR}			10		20	µA
Common-mode input voltage range $R_L = 2$ kΩ	V_{IC}	$-V_S$-0.2		V_S-1.8	$-V_S$	V_S-2.0	V
Common-mode rejection $R_L = 2$ kΩ	k_{CMR}	75	80		75		dB

Characteristics (TAE 2453)

$V_S = \pm 5$ V to ± 15 V; $R_L = 2$ kΩ, unless otherwise specified

Parameter	Symbol	Limit Values $T_A = 25$ °C min.	typ.	max.	Limit Values $T_A = -25$ to 85 °C min.	max.	Unit
Supply voltage rejection $G_V = 100$	k_{SVR}		25	100		100	µV/V
Temperature coefficient of I_{IO} $R_G = 50\ \Omega$	α_{IIO}		0.1				nA/K
Temperature coefficient of V_{IO} $R_G = 50\ \Omega$	α_{VIO}		6				µV/K
Slew rate for non-inverting operation[1])	SR		1				V/µs
Slew rate for inverting operation[1])	SR		1				V/µs

Characteristics $V_S = \pm 2$ V, $R_L = 10$ kΩ (TAE 2453)

Input offset voltage $R_G = 50\ \Omega$	V_{IO}	−6		6	−7.5	7.5	mV
Input offset current	I_{IO}	−75		75	−100	100	nA
Input current	I_I		40	150		200	nA
Open-loop voltage gain	G_{V0}	70			70		dB

Absolute Maximum Ratings (TAF 2453)

Parameter	Symbol	Limit Values	Unit
Supply voltage	V_S	± 18	V
Output current	I_Q	100	mA
Differential input voltage	V_{ID}	$\pm V_S$	V
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55 to 150	°C
Thermal resistance system – air TAF 2453 A	$R_{th\ SA}$	100	K/W
TAF 2453 G	$R_{th\ SA}$	170	K/W

Operating Range (TAF 2453)

Supply voltage	V_S	± 1.0 to ± 18 (± 0.9 with sligthly increased offset voltage)	V
Ambient temperature	T_A	−55 to 125	°C

[1]) For the relationship between power bandwidth and slew rate refer to **"Introduction to Operational Amplifiers"**

1

Characteristics (TAF 2453)
$V_S = \pm 5$ V to ± 15 V; $R_L = 2$ kΩ,
unless otherwise specified

Parameter	Symbol	Limit Values $T_A = 25$ °C min.	typ.	max.	Limit Values $T_A = -55$ to 125 °C min.	max.	Unit
Open-loop supply current consumption total	I_S		0.8	1.5		1.8	mA
Input offset voltage $R_G = 50\ \Omega$	V_{IO}	−4		4	−6	6	mV
Input offset current Input current	I_{IO} I_I	−10	 40	10 100	−75	75 150	nA nA
Control range $R_L = 2$ kΩ, $V_S = \pm 15$ V $R_L = 620\ \Omega$, $V_S = \pm 15$ V	 $V_{Q\,pp}$ $V_{Q\,pp}$	 14.9 14.9		 −14.7 −14.5	 14.8 14.8	 −14.7 −14.4	 V V
Input impedance $f = 1$ kHz	Z_I		200				kΩ
Open-loop voltage gain $R_L = 2$ kΩ	G_{V0}	85	87		80		dB
Output reverse current	I_{QR}			1		5	µA
Common-mode input voltage range	V_{IC}	$-V_S$−0.3		V_S−1.5	$-V_S$	V_S−1.8	V
Common-mode rejection $R_L = 2$ kΩ	k_{CMR}	80	85		75		dB
Supply voltage rejection $G_V = 100$	k_{SVR}		25	100		100	µV/V
Temperature coefficient of I_{IO} $R_G = 50\ \Omega$ Temperature coefficient of V_{IO} $R_G = 50\ \Omega$	α_{IIO} α_{VIO}		0.1 6	0.8 25		0.8 25	nA/K µV/K
Slew rate for non-inverting operation[1]) Slew rate for inverting operation[1])	SR SR		1 1				V/µs V/µs

Characteristics (TAF 2453)
$V_S = \pm 2$ V

Input offset voltage $R_G = 50\ \Omega$	V_{IO}	−4		4	−6	6	mV
Input offset current Input current	I_{IO} I_I	−50	 40	50 100	−75	75 150	nA nA
Open-loop voltage gain $R_L = 2$ kΩ	G_{V0}	75			70		dB

[1]) For the relationship between power bandwidth and slew rate refer to **"Introduction to Operational Amplifiers"**