

Dual Operational Amplifier

TBB 0747 -747
TBB 0747 A-747
TBC 0747 -747

TBB 0747 and TBC 0747 are monolithic integrated dual operational amplifiers in packages similar to 5 J 10 DIN 41873 (TO 100). They are outstanding by reason their large common-mode voltage range and short circuit protection. In addition, they feature an adjustable input offset-voltage. No external components for frequency compensation are required. An internal gain reduction of 6 dB/octave yields maximum stability in feedback circuit applications. TBB 0747 A (14 pins) in plastic plug-in package.

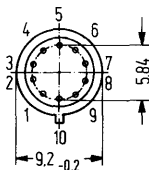
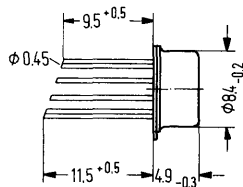
For single performance, see TBA 221 data sheet.

Type	Ordering codes
TBB 0747:	Q67000-A1038
TBB 0747 A:	Q67000-A1039
TBC 0747:	Q67000-A1040

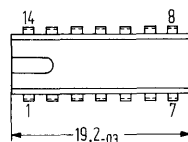
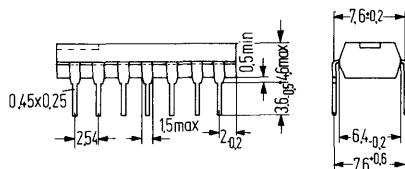
TBB 0747 A

Package outlines

TBB 0747, TBC 0747



Case 5 J 10 DIN 41873
(similar TO-100)
Weight approx. 1.1 g



Plastic plug-in package (14 pins)
20 A 14 DIN 41866 (TO-116)
Weight approx. 1.1 g

Dimensions in mm

Maximum ratings

Supply voltage
Input voltage¹⁾
Differential input voltage
Short circuit duration²⁾
Storage temperature
Junction temperature
Thermal resistance:
System-case (TBB/TBC 0747)
System-ambient air (TBB/TBC 0747)
System-ambient air (TBB 0747 A)

	TBB 0747 TBB 0747 A	TBC 0747	
V_{CC}	± 18	± 22	V
V_I	± 15	± 15	V
V_{ID}	± 30	± 30	V
t_{SC}	∞	∞	
T_S	-65 to +150	-65 to +150	°C
T_J	150	150	°C
$R_{thScase}$	80	80	K/W
R_{thSamb}	190	190	K/W
R_{thSamb}	110		K/W

Range of operation

Supply voltage
Ambient temperature in operation

V_{CC}	± 4 to ± 18	± 4 to ± 22	V
T_{amb}	0 to +70	-55 to +125	°C

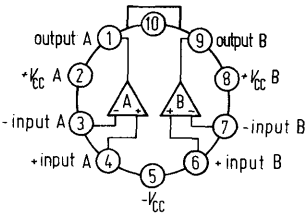
¹⁾ For supply voltage less than ± 15 V the maximum input voltage is equal to the supply voltage

²⁾ Short circuit may be ground or $\pm V_{CC}$.

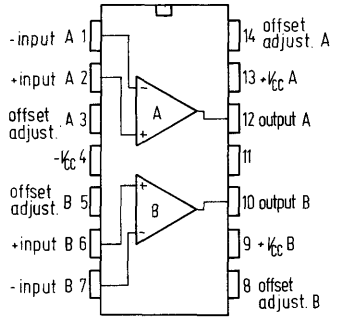
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Pin connection

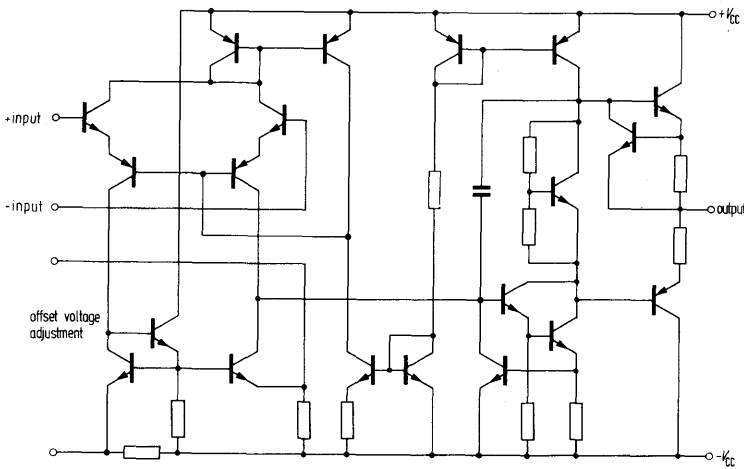
TBB 0747
TBC 0747



TBB 0747 A



Circuit diagram of a single op amp



Operating characteristics

($V_{CC} = \pm 15\text{ V}$, $T_{amb} = 25^\circ\text{C}$
when not otherwise stated)
(for a single opamp)

		TBB 0747 TBB 0747 A			TBC 0747			
		min	typ	max	min	typ	max	
Input offset voltage	V_{io}	-6		6	-4		4	mV
($R_G \leq 10\text{ k}\Omega$, $T_{amb} = 0\text{ to }70^\circ\text{C}$)	V_{io}	-7.5		7.5				mV
($R_G \leq 10\text{ k}\Omega$, $T_{amb} = -55\text{ to }+125^\circ\text{C}$)	V_{io}				-6		6	mV
Adjustable range of input offset voltage	ΔV_{io}	6	± 15	-6	6	± 15	-6	mV
Input offset current	I_{io}	-200	± 20	200	-100	± 20	100	nA
($T_{amb} = 0\text{ to }70^\circ\text{C}$)	I_{io}	-300		300				nA
($T_{amb} = -55\text{ to }+125^\circ\text{C}$)	I_{io}				-500		500	nA
Input current	I_i		80	500		80	350	nA
($T_{amb} = 0\text{ to }70^\circ\text{C}$)	I_i			800				nA
($T_{amb} = -55\text{ to }+125^\circ\text{C}$)	I_i					.3	1.5	μA
Current supply	I_{CC}		1.7	2.8		1.7	2.8	mA
Output short circuit current	I_{qsc}		± 18			± 18		mA
Input resistance	R_i	300	2000		300	2000		k Ω
Input capacitance	C_i		1.4			1.4		pF
Output resistance	R_o		75			75		Ω
Output voltage ($R_L \geq 10\text{ k}\Omega$)	V_{qpp}	12	± 14	-12	13	± 14	-12.5	V
($R_L \geq 2\text{ k}\Omega$)	V_{qpp}	10	± 13	-10	11	± 13	-11	V
Common mode input voltage range	V_{ICM}	12	± 13	-12	12	± 13	-12	V
Voltage gain								
($V_{app} = \pm 10\text{ V}$, $R_L \geq 2\text{ k}\Omega$)	G_v	86	100		94	106		dB
($T_{amb} = 0\text{ to }70^\circ\text{C}$)	G_v		83.5					dB
($T_{amb} = -55\text{ to }+125^\circ\text{C}$)	G_v				88			dB
Common-mode rejection ratio	$CMRR$	70	90		80	90		dB
($R_G \leq 10\text{ k}\Omega$)								
Sensitivity to supply voltage variations	$\frac{\Delta V_{io}}{\Delta V_{CC}}$		30	150		30	150	$\mu\text{V/V}$
Transient behaviour of the output voltage ($G_v = 1$, $V_i = 20\text{ mV}$, $R_L = 2\text{ k}\Omega$, $C_L < 100\text{ pF}$)								
Rise time	t_r		.3			.3		μs
Overshoot			5			5		%
Leading edge slope	$\frac{dV_{qpp}}{dt}$		.5			.5		V/ μs
($R_L \geq 2\text{ k}\Omega$)								
Temperature coefficient of V_{io}	α_{Vio}					3		$\mu\text{V/K}$
Temperature coefficient of I_{io}	α_{Iio}					.4		nA/K

Test circuits and typical performance curve see TBA 221