Dual Operational Amplifier

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

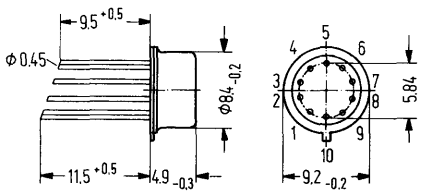
TBB 0747 and TBC 0747 are monolithic integrated dual operational amplifiers in packages similar to 5 J 10 DIN 41873 (TO 100). They are outstanding by reason their large common-mode voltage range and short circuit protection. In addition, they feature an adjustable input offset-voltage. No external components 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

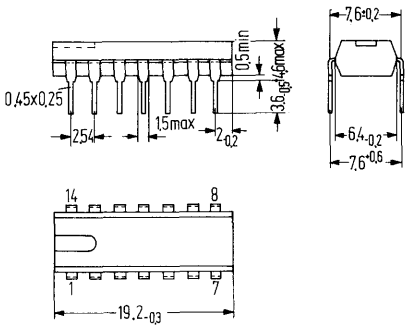
Package outlines

TBB 0747, TBC 0747



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

TBB 0747 A



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

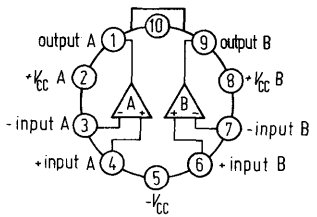
Dimensions in mm

		TBB 0747 TBB 0747 A	TBC 0747	
Maximum ratings				
Supply voltage	V_{CC}	±18	±22	V
Input voltage[1])	V_I	±15	±15	V
Differential input voltage	V_{ID}	±30	±30	V
Short circuit duration[2])	t_{SC}	∞	∞	
Storage temperature	T_S	−65 to +150	−65 to +150	°C
Junction temperature	T_j	150	150	°C
Thermal resistance:				
System-case (TBB/TBC 0747)	$R_{thScase}$	80	80	K/W
System-ambient air (TBB/TBC 0747)	R_{thSamb}	190	190	K/W
System-ambient air (TBB 0747 A)	R_{thSamb}	110		K/W
Range of operation				
Supply voltage	V_{CC}	±4 to ±18	±4 to ±22	V
Ambient temperature in operation	T_{amb}	0 to +70	−55 to +125	°C

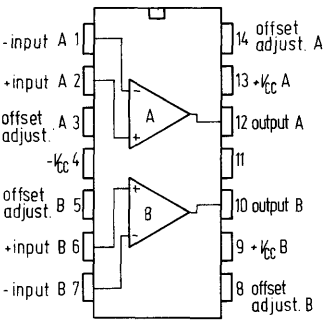
[1]) For supply voltage less than ± 15 V the maximum input voltage is equal to the supply voltage
[2]) Short circuit may be ground or ± V_{CC}.

Pin connection

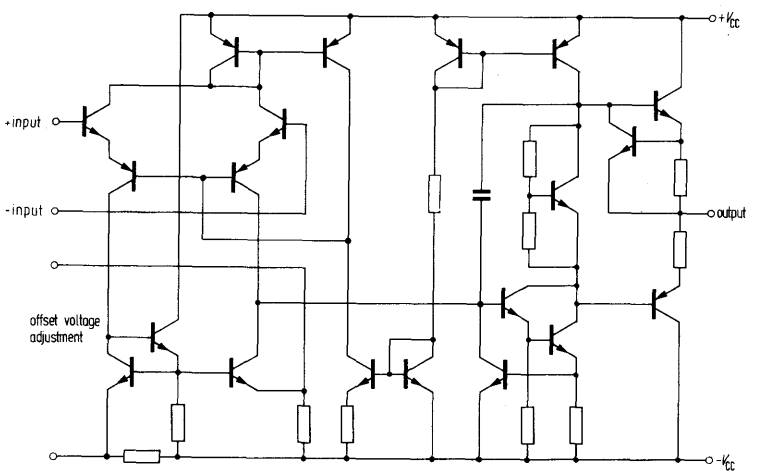
TBB 0747
TBC 0747



TBB 0747 A



Circuit diagram of a single op amp



Operating characteristics (V_{CC} = ±15 V, T_{amb} = 25 °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
($R_G \leq 10$ kΩ, T_{amb} = 0 to 70 °C)	V_{io}	−7.5		7.5				mV
($R_G \leq 10$ kΩ, T_{amb} = −55 to +125°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 to 70 °C)	I_{io}	−300		300				nA
(T_{amb} = −55 to +125 °C)	I_{io}				−500		500	nA
Input current	I_i		80	500		80	350	nA
(T_{amb} = 0 to 70 °C)	I_i			800				nA
(T_{amb} = −55 to +125 °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		kΩ
Input capacitance	C_i		1.4			1.4		pF
Output resistance	R_q		75			75		Ω
Output voltage ($R_L \geq 10$ kΩ)	V_{qpp}	12	±14	−12	13	±14	−12.5	V
($R_L \geq 2$ kΩ)	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_{qpp} = ±10 V, $R_L \geq 2$ kΩ)	G_V	86	100		94	106		dB
T_{amb} = 0 to 70°C	G_V	83.5						dB
T_{amb} = −55 to +125°C	G_V				88			dB
Common-mode rejection ratio ($R_G \leq 10$ kΩ)	*CMRR*	70	90		80	90		dB
Sensitivity to supply voltage variations	$\frac{\Delta V_{io}}{\Delta V_{CC}}$		30	150		30	150	µV/V
Transient behaviour of the output voltage (G_V = 1, V_i = 20 mV, R_L = 2 kΩ, C_L < 100 pF)								
Rise time	t_r		.3			.3		µs
Overshoot			5			5		%
Leading edge slope ($R_L \geq 2$ kΩ)	$\frac{dV_{qpp}}{dt}$		.5			.5		V/µs
Temperature coefficient of V_{io}	α_{Vio}					3		µV/K
Temperature coefficient of I_{io}	α_{Iio}					.4		nA/K

Test circuits and typical performance curve see TBA 221