

DUAL 2 A LOW DROP OUT INTELLIGENT POWER SWITCH

ADVANCE DATA

- LOW POWER DISSIPATION (LOW V_{SAT} : 0.6 V @ 2 A)
- ALL INPUTS ARE OPERATIONAL WITH CONTROL SIGNALS HIGHER THAN V_{CC}
- ALL INPUTS WITHSTAND VOLTAGES LOWER THAN GROUND
- HIGH OUTPUT CURRENTS
- PROTECTION OF OUTPUT TRANSISTORS (UP TO + 32 V)
- THE OUTPUTS CAN WITHSTAND VOLTAGES LOWER THAN GROUND
- WITHSTAND ON V_{CC} SPIKES UP TO (60 V, 10 ms)
- DIFFERENTIAL INPUTS

DESCRIPTION

The UAF1780-1781-1782 are dual interface circuits delivering high output currents and capable of driving any type of load.

An on-chip dc/dc conversion unit in conjunction with a few low-cost external components (a low value inductor and a low voltage capacitor) are implemented to limit the saturation voltage thereby optimizing the efficiency.

The devices are particularly well protected against destructive overloads. Each output implements a current limit circuitry, a desaturation monitoring unit for the detection of overloads and short-circuits, and a thermal protection feature.

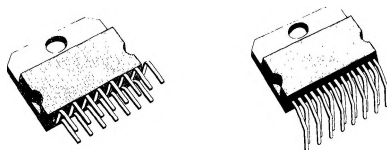
Corresponding output is turned off in case of prolonged desaturation or excessive internal dissipation. This condition is reflected by a low level on ALARM output terminal. This protection unit can be reactivated by applying a logic low signal to RESET input.

However, for inductive loads, a delay is imposed on signal applied to this RESET input so as to prevent a rapid and premature conduction of output transistors.

A logic high signal applied to STROBE input will disable both power outputs.

The devices operates within a supply voltage range of + 8 V to + 32 V.

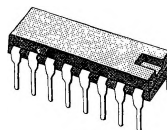
MULTIWATT-15



ORDER CODES :

UAF1780SP
 UAF1782SP
 UAF1780HSP
 UAF1782HSP

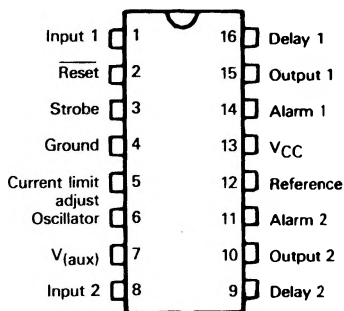
DIP-16/2



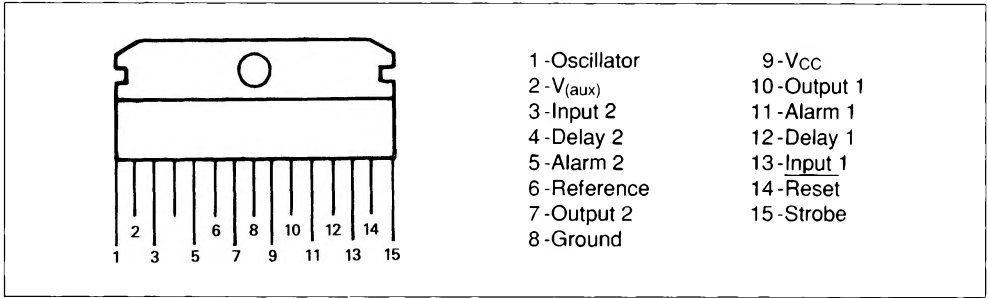
ORDER CODE :

UAF1780DP-1781DP

PIN CONNECTIONS



PIN CONNECTIONS



ABSOLUTE MAXIMUM RATINGS

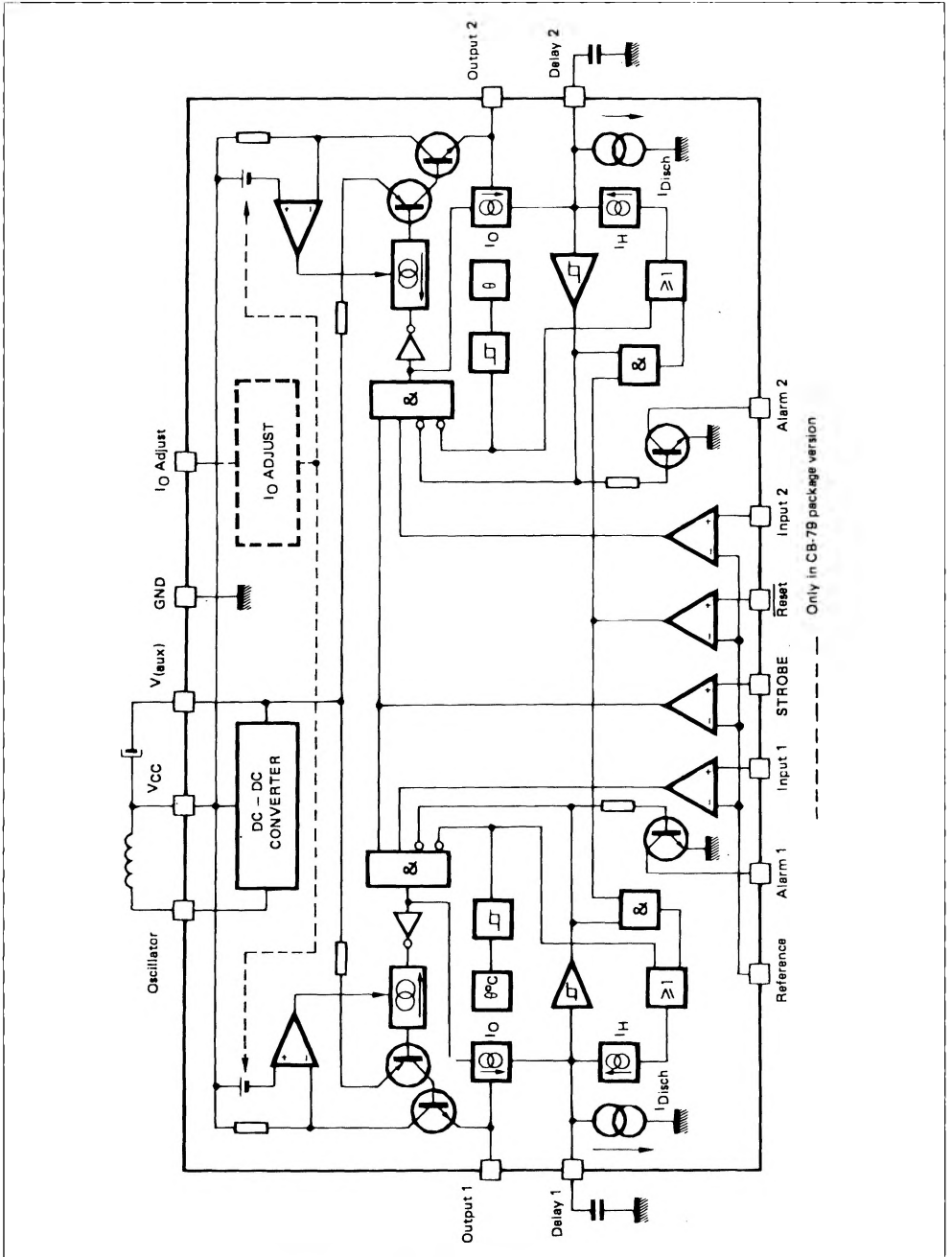
Symbol	Parameter	Value	Unit
V _{CC} (*)	Supply Voltage	+ 35	V
V _{I1} V _{I2} V _{reset} V _{strobe}	Input Voltages	30 to + 55	V
I _O	Output Current	Internally Limited	A
I _L	Current In DC/DC Converter Inductance	0.4	A
P _{tot}	Total Power Dissipation	Internally Limited	W
T _{oper}	Operating Free-air Temperature Range	- 40 to + 85	°C
T _j	Junction Temperature	+ 150	°C

* + 60 V (10 mS)

THERMAL DATA

R _{th(j-c)}	Maximum Junction–case Thermal Resistance	DIP.16 Multiwatt	25 2.5	°C/W
R _{th(j-a)}	Maximum Junction–ambient Thermal Resistance	DIP.16 Multiwatt	70 40	°C/W

BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS

$V_{CC} = +24\text{ V}$, $-40\text{ }^{\circ}\text{C}$, $\leq T_{amb} \leq +85\text{ }^{\circ}\text{C}$ (unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{CC}	Supply Voltage	8		32	V
I_{CC}	Supply Current Input 1 = Input 2 : Low Input 1 = Input 1 : High, $I_O = 2 \times 2\text{ A}$	–	7 25	32	mA
I_I	Input Current (all inputs) $V_I > V_{ref}$ $V_I < V_{ref}$		15 0	50	
I_{OHA}	High Level Alarm Output Leakage Current ($V_A = +10\text{ V}$)		0	10	μA
V_{OLA}	Low Level Alarm Output Voltage ($I_A = +10\text{ mA}$)		1.1	1.3	V
$V_{CC} - V_O$	Power Outputs Dropout Voltage $I_O = 0.5\text{ A}$ $I_O = 1\text{ A}$ $I_O = 2\text{ A}$		0.15 0.3 0.6	0.25 0.4 0.7	V
I_{OL}	Power Outputs Leakage Current			100	μA
t_{reset}	Reset Pulse Duration ($C1 = C2 = 1\text{ }\mu\text{F}$)		400		mS
t_d	Delay Time before Desaturation Monitoring Unit Becomes Active ($C1 = C2 = 1\text{ }\mu\text{F}$) $V_{CC} - V_O = +12\text{ V}$ $V_{CC} - V_O = +24\text{ V}$ $V_{CC} - V_O = +32\text{ V}$		20 10 5		mS
V_{ref}	Reference Input Voltage	1.4		55	V
I_{ref}	Reference Input Current ($V_{ref} = 1.4\text{ V}$) All Inputs $< V_{ref}$ All Inputs $> V_{ref}$	– 1	80 0	150 + 1	μA
I_O	Available Output Current UAF1780DP $R_O = \infty$ $R_O = 2\text{ K}\Omega$ UAF1780SP UAF1781DP $R_O = \infty$ $R_O = 2\text{ K}\Omega$ UAF1782SP	2.5 1 2.5 2 1 2			A
$V_{CC} - V_O$	Maximum Output Voltage Swing		–	50	V
$V_{aux} - V_{CC}$	DC/DC Output Voltage $0.5\text{ A} < I_O < 2\text{ A}$ (each output) $CO = 47\text{ }\mu\text{F}$, $L = 100\text{ }\mu\text{H}$	–	1.25	–	V

Fig. 1 - DIP. 16 PACKAGE.

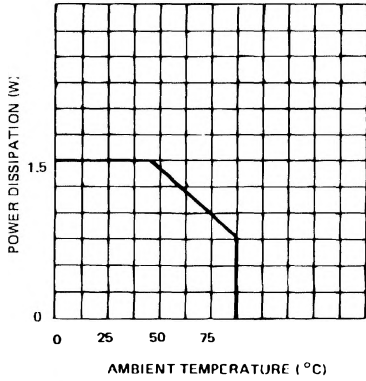


Fig 2 - MULTIWATT PACKAGE.

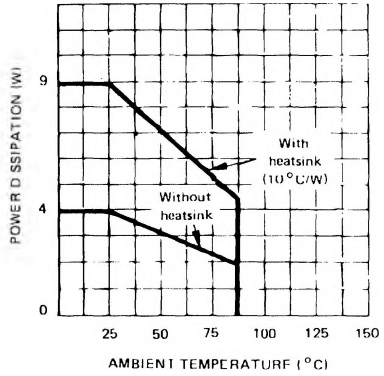


Fig. 3 - AVAILABLE OUTPUT CURRENT VS EXTERNAL RESISTANCE VALUE DIP. 16 PACKAGE.

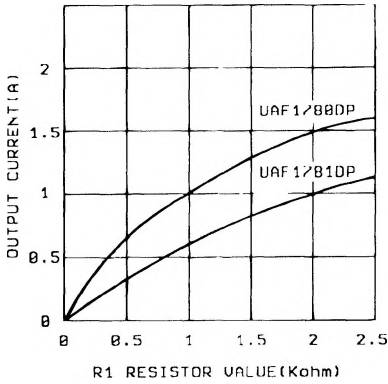


Fig 4 - SATURATION VOLTAGE VS OUTPUT CURRENT

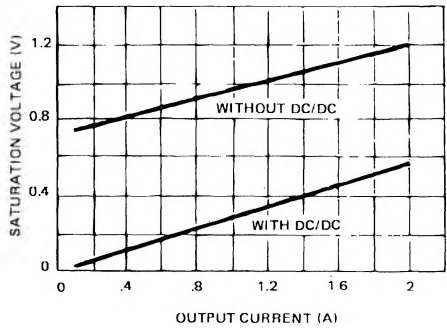


Fig 5 - RESPONSE TIME.

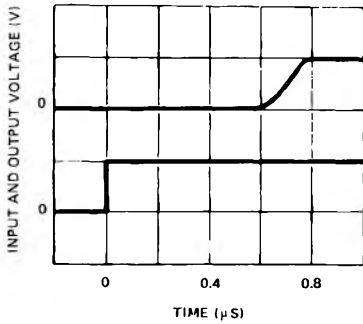


Fig. 6 RESPONSE TIME.

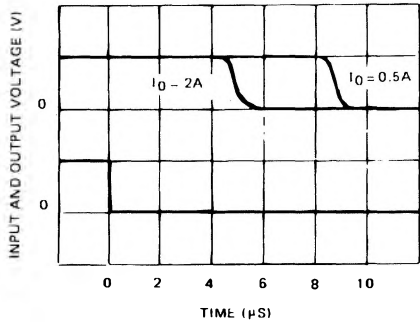
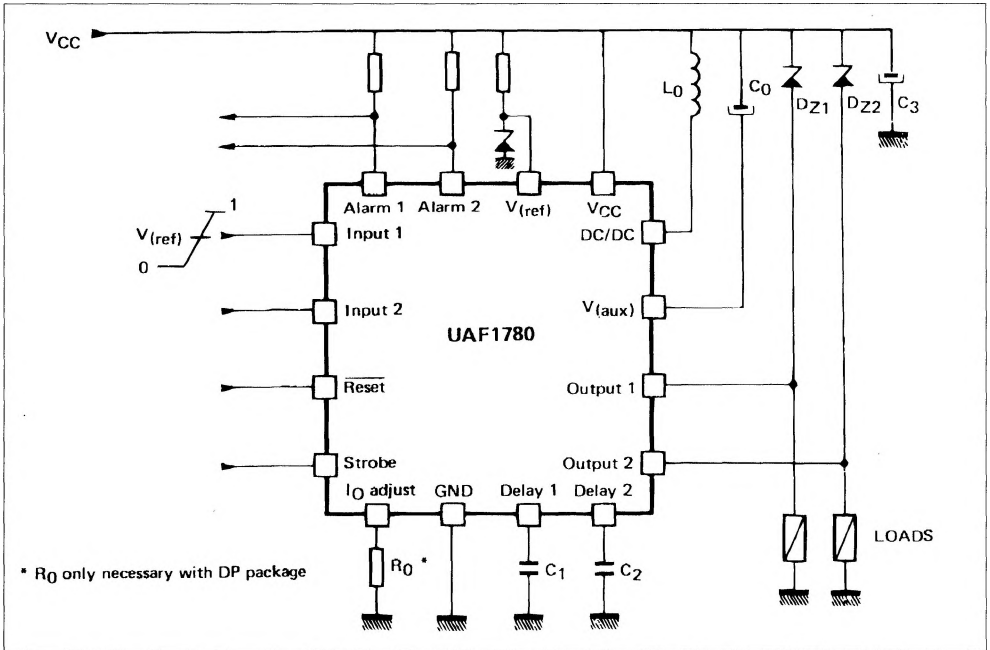


Figure 7 : Typical Application.



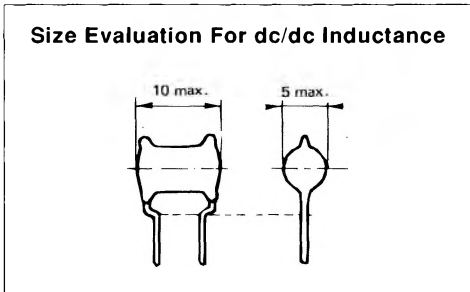
- L_0 and C_0 are the external elements of the dc/dc converter. Typical values and characteristics of these components are as follows :
 For L_0 : - inductance = 100 μH (tolerance $\pm 10\%$)
 - maximal current $\geq 400 \text{ mA}$

- C_1 and C_2 implement two distinct functions :
 - response time required by the desaturation monitoring unit to become active.
 - time delay imposed on each power output prior to conduction.

$$t_d = \frac{C \cdot 3.5 \text{ V}}{7 \mu\text{A}}$$

With $C_2 = C_3 = 1 \mu\text{F}$, the outputs are protected against voltage transients of as high as + 32 V and the response time of the desaturation monitoring unit is 400 ms.

- D_{Z1} and D_{Z2} Zener Diodes are required in the case of inductive loads. V_Z of these diodes should be < 60 V.
- R_0 determines the value of maximum output current (DIP package). Its value is given in curve 3, where output current values are plotted against the corresponding values of this resistor.



For C_0 : The value of this capacitor is not critical, a capacitor of $C_1 \geq 47 \text{ F}$, $V_n \geq 6.3 \text{ V}$ will be suitable for the majority of the applications.

The on-chip dc/dc converter can be disabled by connecting $V_{(aux)}$ terminal to V_{CC} and leaving "Oscillator" pin floating.