

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.

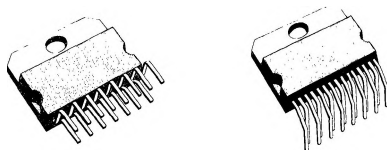
Corresponding output is turned off in case of prolonged desaturation or excessive internal dissipation. This condition is reflected by a low level on ALARM output terminal. This protection unit can be reactivated by applying a logic low signal to RESET input.

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.

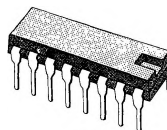
MULTIWATT-15



ORDER CODES :

UAF1780SP
 UAF1782SP
 UAF1780HSP
 UAF1782HSP

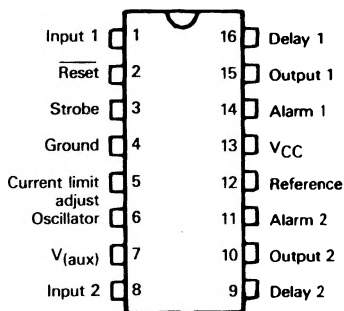
DIP-16/2



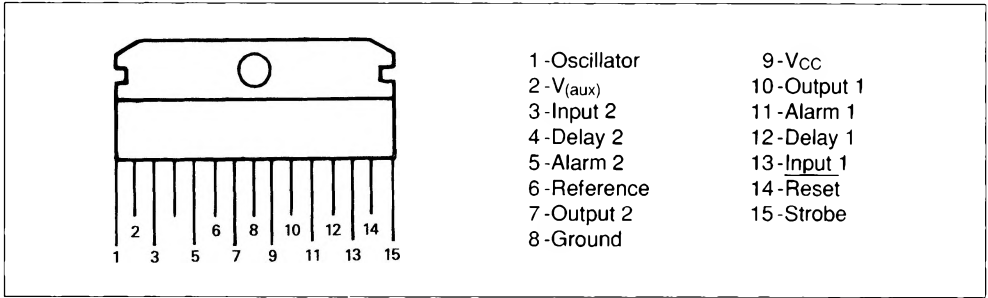
ORDER CODE :

UAF1780DP-1781DP

PIN CONNECTIONS



PIN CONNECTIONS



ABSOLUTE MAXIMUM RATINGS

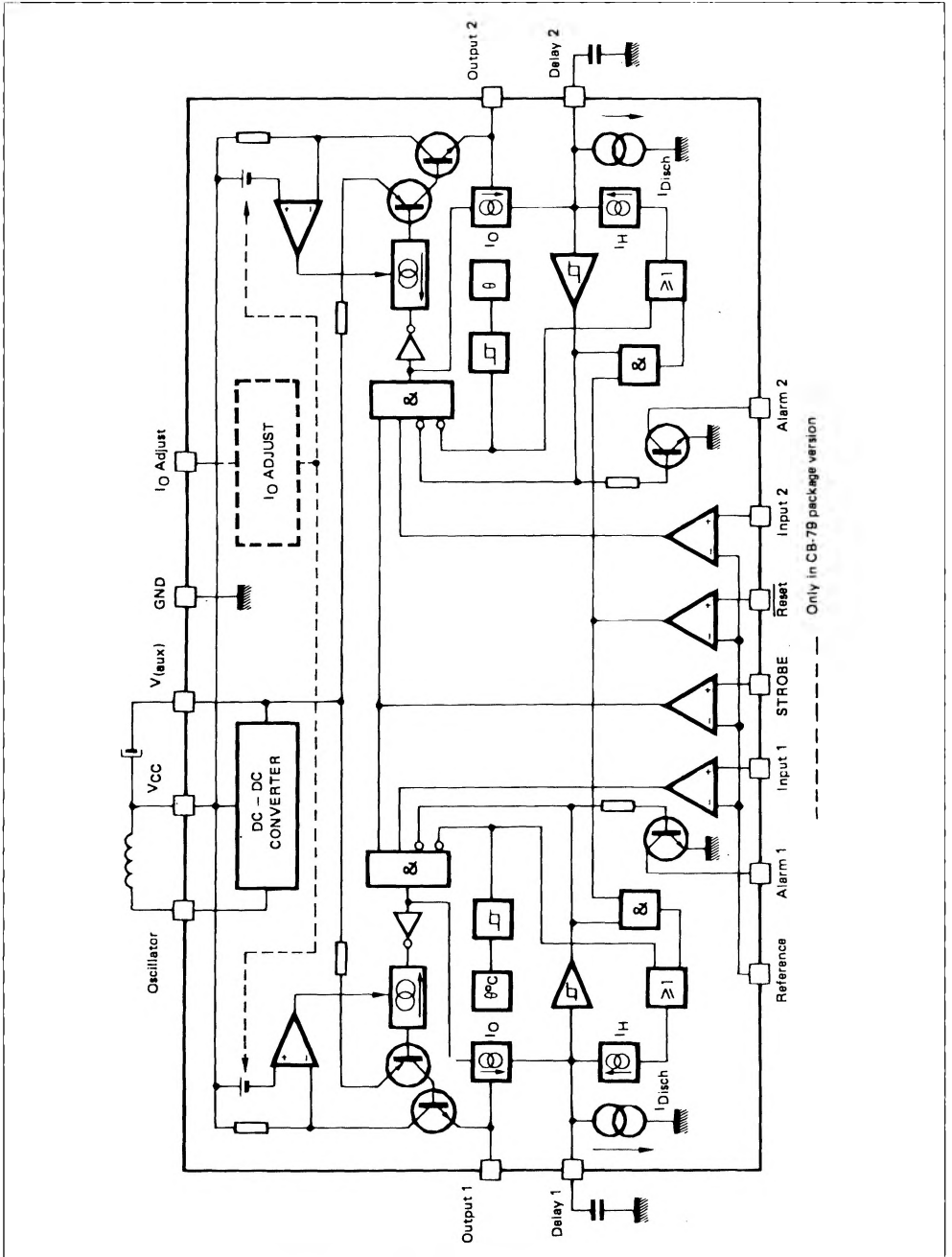
Symbol	Parameter	Value	Unit
V _{CC} (*)	Supply Voltage	+ 35	V
V _{I1} V _{I2} V _{reset} V _{strobe}	Input Voltages	30 to + 55	V
I _O	Output Current	Internally Limited	A
I _L	Current In DC/DC Converter Inductance	0.4	A
P _{tot}	Total Power Dissipation	Internally Limited	W
T _{oper}	Operating Free-air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

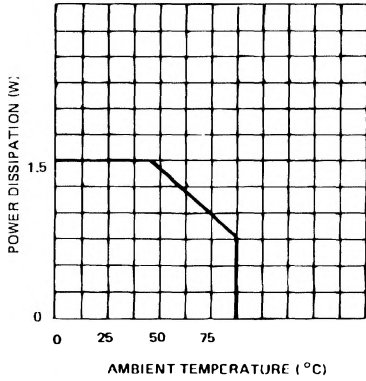


Fig 2 - MULTIWATT PACKAGE.

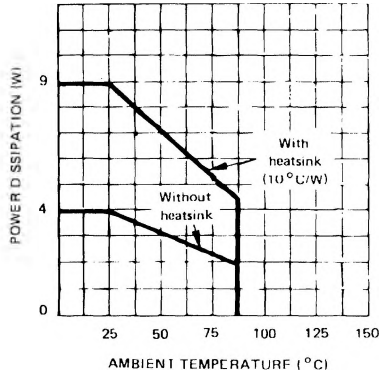


Fig. 3 - AVAILABLE OUTPUT CURRENT VS EXTERNAL RESISTANCE VALUE DIP. 16 PACKAGE.

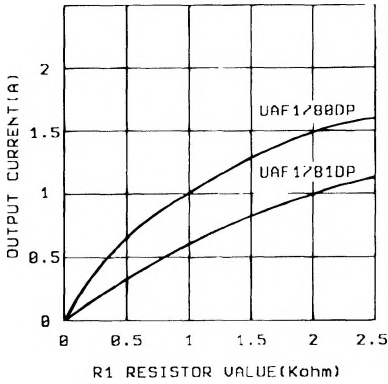


Fig 4 - SATURATION VOLTAGE VS OUTPUT CURRENT

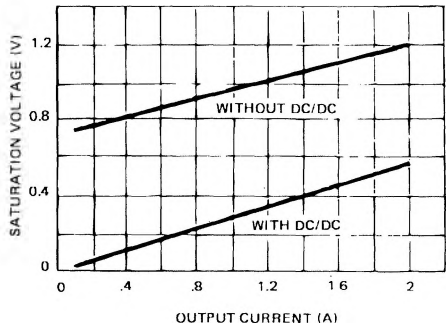


Fig 5 - RESPONSE TIME.

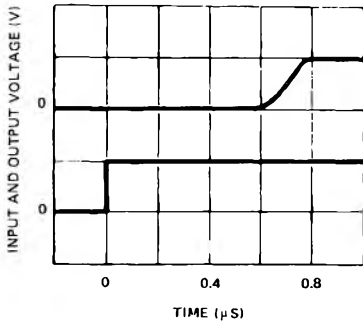


Fig. 6 RESPONSE TIME.

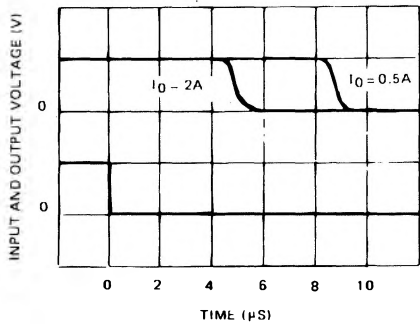
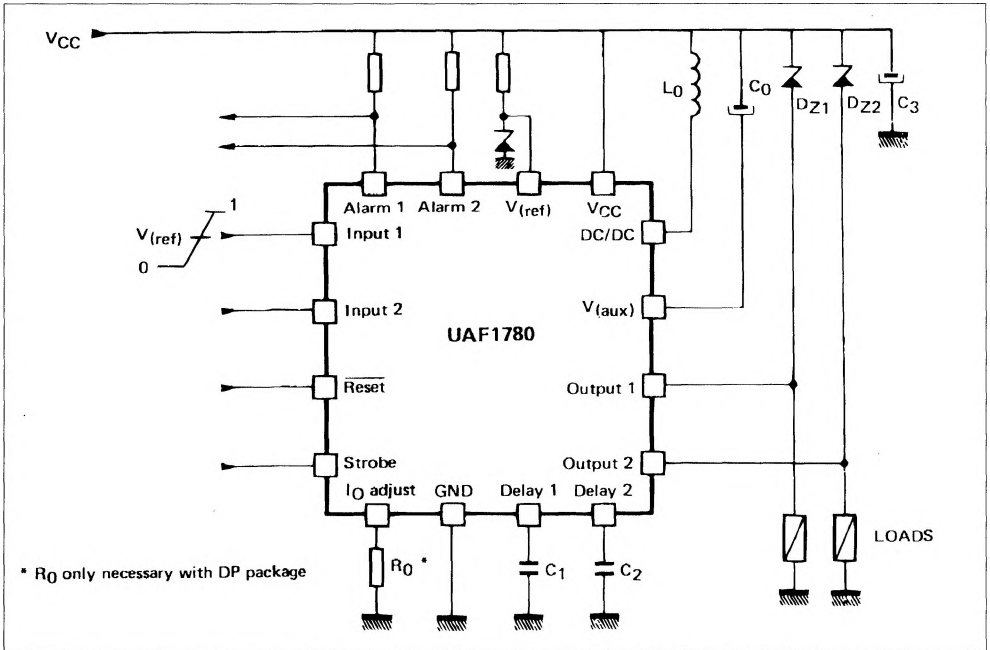


Figure 7 : Typical Application.



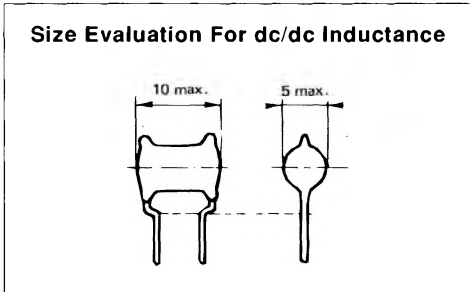
- L₀ and C₀ are the external elements of the dc/dc converter. Typical values and characteristics of these components are as follows :
For L₀ : - inductance = 100 μH (tolerance ± 10%)
- maximal current ≥ 400 mA

- C₁ and C₂ 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.

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

With C₂ = C₃ = 1 μF, 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.

- DZ₁ and DZ₂ Zener Diodes are required in the case of inductive loads. V_Z of these diodes should be < 60 V.
- R₀ 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 C₀ : The value of this capacitor is not critical, a capacitor of C₁ ≥ 47 F, V_n ≥ 6.3 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.