

STEPPER MOTOR DRIVER

- HALF AND FULL-STEP MODES
- BIPOLAR DRIVE OF STEPPER MOTOR FOR MAXIMUM MOTOR PERFORMANCE
- BUILT-IN PROTECTION DIODES
- WIDE RANGE OF CURRENT CONTROL : 5 TO 1500 mA
- WIDE VOLTAGE RANGE : 10 TO 50 V
- DESIGNED FOR UNSTABILIZED MOTOR SUPPLY VOLTAGE
- CURRENT LEVELS CAN BE SELECTED IN STEPS OR VARIED CONTINUOUSLY
- THERMAL OVERLOAD PROTECTION
- ALARM OUTPUT* (TEF3718SP) OR PRE-ALARM OUTPUT (TEF3718SSP)

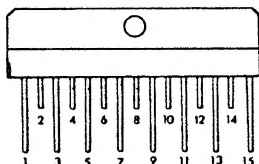
DESCRIPTION

The TEF3718 and TEF3718S are bipolar monolithic integrated circuits intended to control and drive the current in one winding of a bipolar stepper motor. The circuits consists of an LS-TTL - compatible logic input, a current sensor, a monostable and an output stage with built-in protection diodes. Two TEF3718 or TEF3718S and a few external components form a complete control and drive unit for LS-TTL or microprocessor controlled stepper motor systems.

PIN CONNECTON

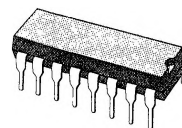
TEF3718

- 1 - V_{CC}
- 2 - I₁
- 3 - Ph
- 4 - I₀
- 5 - C
- 6 - V_{ref}
- 7 - ALARM OUT
- 8 - GND
- 9 - NC
- 10 - V_{mm}
- 11 - T
- 12 - MA
- 13 - E
- 14 - MB
- 15 - V_{mm}



TEF3718S

- 1 - V_{CC}
- 2 - I₁
- 3 - Ph
- 4 - I₀
- 5 - C
- 6 - V_{ref}
- 7 - PRE-ALARM OUT
- 8 - GND
- 9 - NC
- 10 - V_{mm}
- 11 - T
- 12 - MA
- 13 - E
- 14 - MB
- 15 - V_{mm}

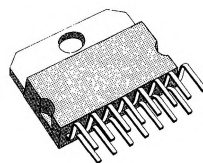


POWERDIP 12 + 2 + 2

ORDER CODE :

TEF3718DP

TEF3718SDP



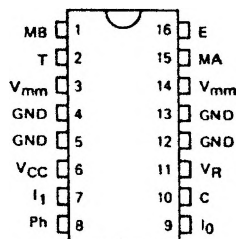
MULTIWATT 15

ORDER CODE :

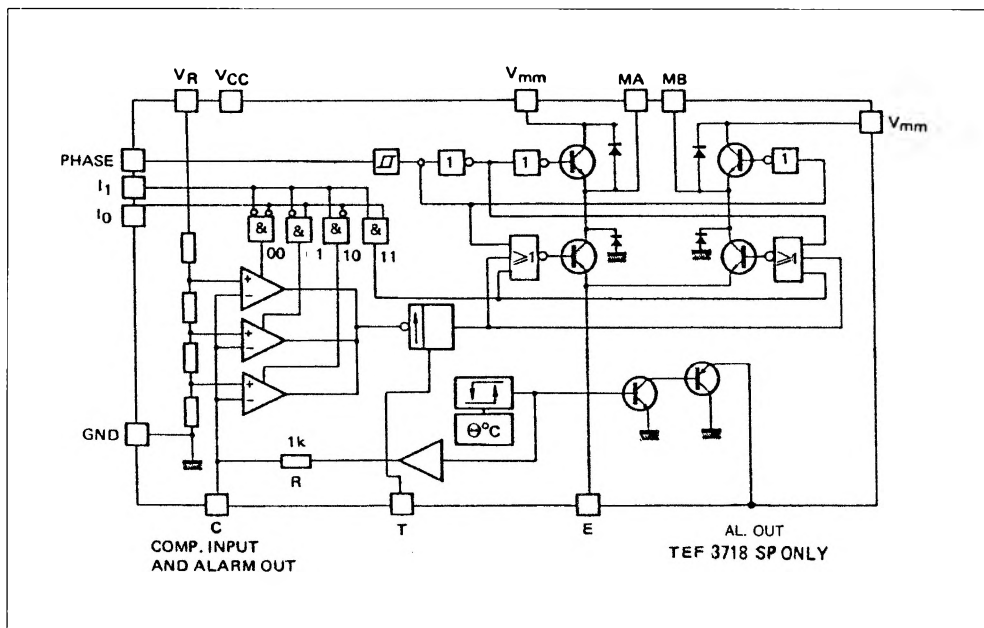
TEF3718SP

TEF3718SSP

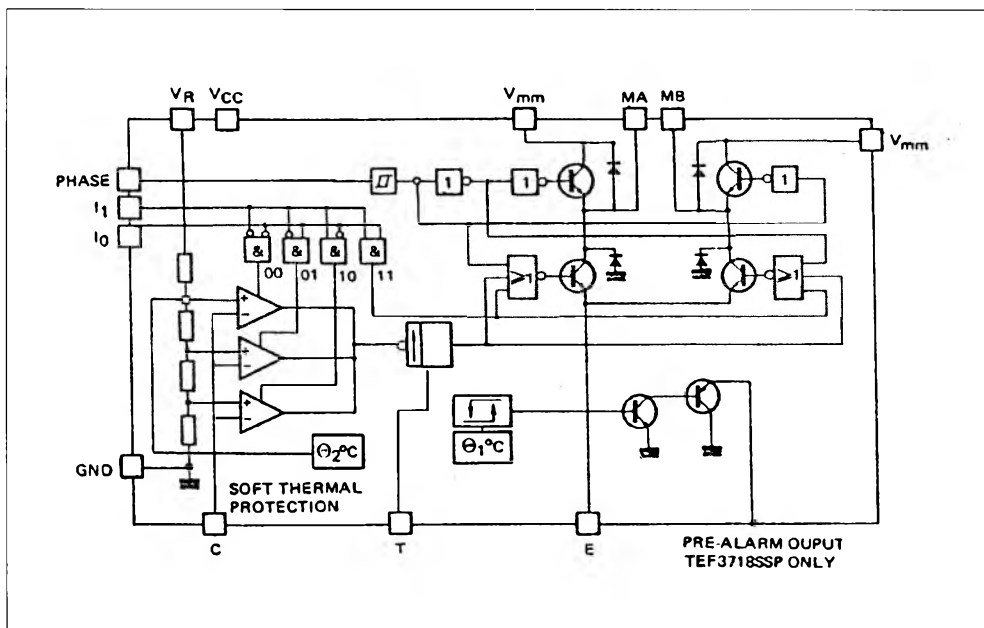
TEF3718
TEF3718S



BLOCK DIAGRAM (TEF3718)



BLOCK DIAGRAM (TEF3718S)



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC} V_{MM}	Supply Voltage	7 50	V
V_I	Input Voltage : Logic Inputs Analog Inputs Reference Input	6 V_{CC} 15	V
I_I	Input Current : Logic Inputs Analog Inputs	10 10	mA
I_O	Output Current	± 1.5	A
T_j	Junction Temperature	+ 150	°C
T_{oper}	Operating Ambient Temperature Range	- 40 to + 85	°C
T_{stg}	Storage Temperature Range	- 55 to 150	°C

THERMAL CHARACTERISTICS

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Maximum Junction-case Thermal Resistance POWERDIP MULTIW	11 3	°C/W
$R_{th(j-a)}$	Maximum Junction-ambient Thermal Resistance POWERDIP MULTIW	45 (*) 40	°C/W

(*) Soldered on a 35 μ m thick 20 cm² PC board cooper area.**RECOMMENDED OPERATING CONDITIONS**

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{CC} V_{MM}	Supply Voltage	4.75 10	5 —	5.25 45	V
I_m	Output Current	0.020	—	1.2	A
T_{amb}	Ambient Temperature	- 40	—	85	°C
t_r	Rise Time Logic Inputs	—	—	2	μ s
t_f	Fall Time Logic Inputs	—	—	2	μ s

ELECTRICAL CHARACTERISTICS
 $V_{CC} = 5\text{ V} \pm 5\%$, $V_{MM} = -10\text{ V to } +45\text{ V}$, $T_{amb} = -40\text{ }^{\circ}\text{C to } +85\text{ }^{\circ}\text{C}$ (Unless otherwise specified)

Symbol	Characteristics			Min.	Typ.	Max.	Unit		
I _{CC}	Supply Current					25	mA		
V _{IH}	High Level Input Voltage Logic Input			2			V		
V _{IL}	Low Level Input Voltage Input					0.7	V		
I _{IH}	High Level Input Current Logic Input (V _I = 2.4 V)					20	μA		
I _{IL}	Low Level Input Current Logic Input (V _I = 0.4 V)			0.4			μA		
V _{CH}	Comparator Treshold Voltage (V _R = + 5 V)	I _O = 0 I ₁ = 0 I _O = 1 I ₁ = 0 I _O = 0 I ₁ = 1		390	420	440	mV		
V _{CM}				230	250	270			
V _{CL}				65	80	90			
I _{CO}	Comparator Input Current			- 20		20	μA		
I _{off}	Output Leakage Current (I _O 1, I ₁ = 1)					100	μA		
V _{sat}	Total Saturation Voltage Drop (I _m = 1 A,)			POWERDIP MULTIWATT			2.9	V	
							3.3		
P _{tot}	Total Power Dissipation (I _m = 1 A, f _s = 30 kHz)				3.1	3.6	W		
t _{off}	Cutt off Time (see figures 1 and 2 V _{mm} = + 10 V, V _{ton} ≤ 5 μs)			25	30	35	μs		
t _d	Turn off Delay (see figures 1 and 2, T _{amb} = + 25 °C dV _C /dt ≤ 50 mV/μs)				1.6		μs		
V _{sat}	Alarm Output Saturation Voltage I _O = 2 mA				0.8		V		
I _{ref}	Reference Input Current, V _R = 5 V				0.4	1	mA		
V _{sat}	Source Diode Transistor Pair	MULTIWATT	I _m = 0.5 A I _m = 1 A			1.35 1.75	mA		
V _f	Saturation Voltage		POWERDIP	I _m = 0.5 A I _m = 1 A				1.25 1.55	
	Diode Forward Voltage		I _f = 0.5 A I _f = 1 A			1.5 1.7			
I _{sub}	Substrate Leakage Current		I _f = 1 A			10			
V _{sat}	Sink Diode Transistor Pair	MULTIWATT	I _m = 0.5 A I _m = 1 A			1.35 1.55			
	Saturation Voltage		POWERDIP	I _m = 0.5 A I _m = 1 A				1.25 1.35	
	V _f	Diode Forward Voltage		I _f = 0.5 A I _f = 1 A				1.5 1.8	

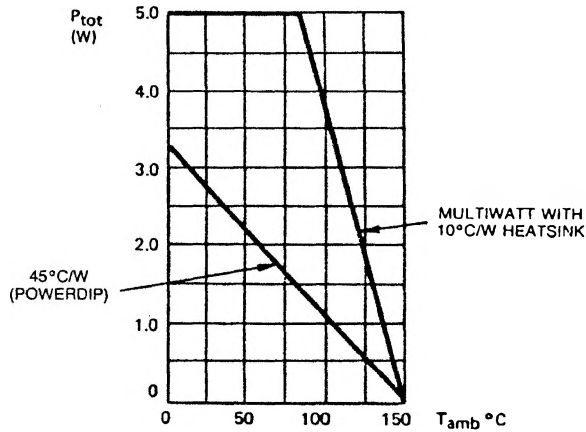
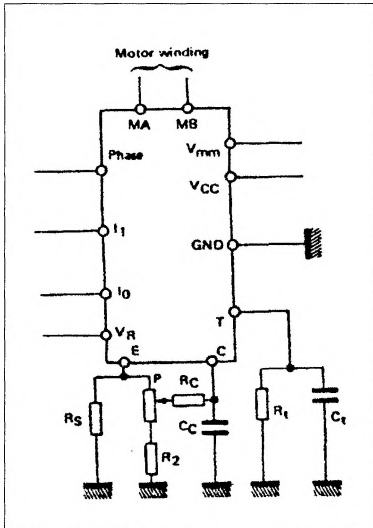


Figure 1.



$R_s = 1 \Omega$ inductance free
 $R_c = 470 \Omega$
 $C_c = 820 \text{ pF}$ ceramic
 $R_t = 56 \text{ k}\Omega$
 $C_1 = 820 \text{ pF}$ ceramic
 $P = 500 \Omega$
 $R_2 = 1 \text{ K}$

Figure 2.

