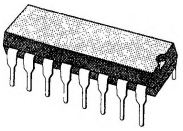
SGS-THOMSON MICROELECTRONICS

TEF3718
TEF3718S

STEPPER MOTOR DRIVER

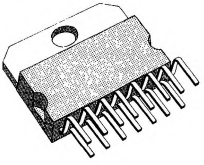
- HALF AND FULL-STEP MODES
- BIPOLAR DRIVE OF STEPPER MOTOR FOR MAXIMUM MOTOR PERFORMANCE
- BUILT-IN PROTECTION DIODES
- WIDE RANGE OF CURRENT CONTROL : 5 TO 1500 mA
- WIDE VOLTAGE RANGE : 10 TO 50 V
- DESIGNED FOR UNSTABILIZED MOTOR SUPPLY VOLTAGE
- CURRENT LEVELS CAN BE SELECTED IN STEPS OR VARIED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



POWERDIP 12 + 2 + 2

ORDER CODE :

TEF3718DP TEF3718SDP



MULTIWATT 15

ORDER CODE :

TEF3718SP TEF3718SSP

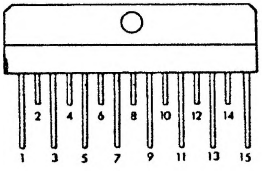
DESCRIPTION

The TEF3718 and TEF3718S are bipolar monolithic integrated circuits intended to control and drive the current in one widing of a bipolar stepper motor. The circuits consists of an LS-TLL - 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

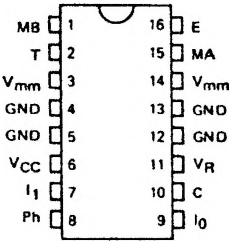
1 - V_{CC}
2 - I_1
3 - Ph
4 - I_O
5 - C
6 - V_{ref}
7 - ALARM OUT
8 - GND
9 - NC
10 - V_{mm}
11 - T
12 - MA
13 - E
14 - MB
15 - V_{mm}



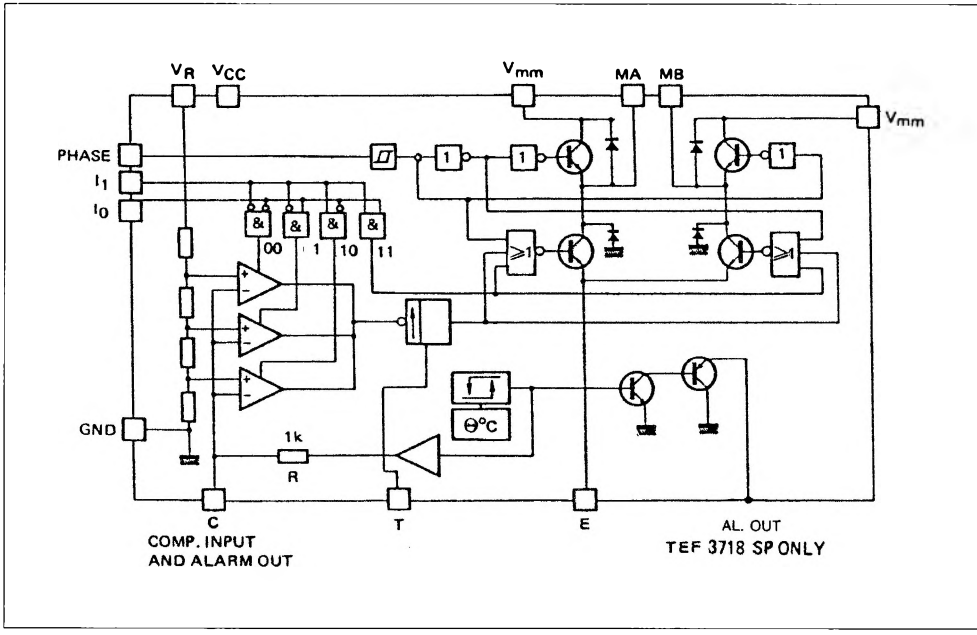
TEF3718S

1 - V_{CC}
2 - I_1
3 - Ph
4 - I_O
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}

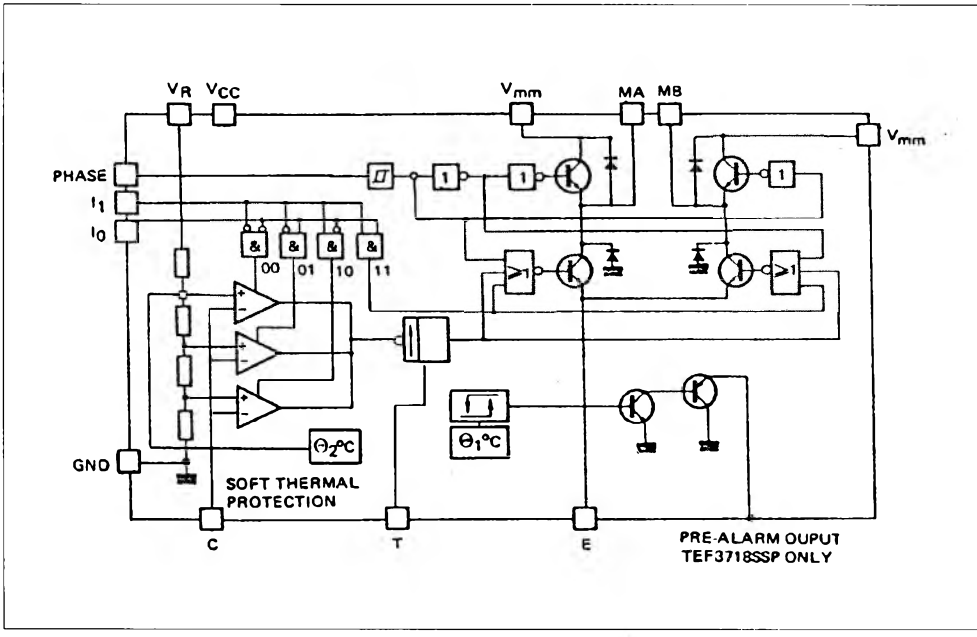
TEF3718
TEF3718S



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 µm thick 20 cm^2 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	µs
t_f	Fall Time Logic Inputs	–	–	2	µs

ELECTRICAL CHARACTERISTICS

V_{CC} = 5 V ± 5 %. V_{MM} = – 10 V to + 45 V. T_{amb} = – 40 C to + 85 °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} V_{CM} V_{CL}	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	390 230 65	420 250 80	440 270 90	mV
I_{CO}	Comparator Input Current			- 20		20	µA
I_{off}	Output Leakage Current (I_O 1, I1 = 1)					100	µA
V_{sat}	Total Saturation Voltage Drop (I_m = 1 A,)		POWERDIP MULTIWATT			2.9 3.3	V
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, $V_{ton} \leq$ 5 µs)			25	30	35	µs
t_d	Turn off Delay (see figures 1 and 2, T_{amb} =+ 25 °C dVC/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
	Saturation Voltage	POWERDIP	I_m = 0.5 A I_m = 1 A			1.25 1.55	
V_f	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	
	Sink Diode Transistor Pair	MULTIWATT	I_m = 0.5 A I_m = 1 A			1.35 1.55	
V_{sat}	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	

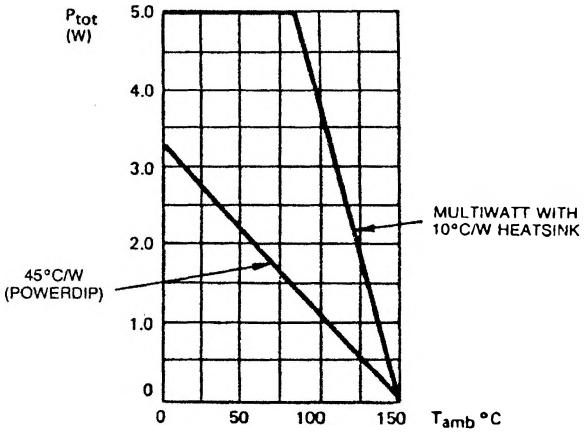
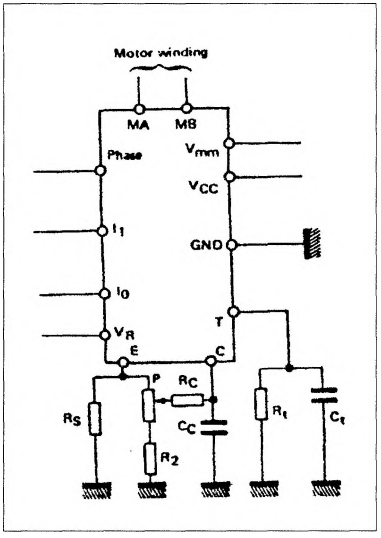


Figure 1.



R_S = 1 Ω inductance free
R_C = 470 Ω
C_C = 820 pF ceramic
R_t = 56 kΩ
C_t = 820 pF ceramic
P = 500 Ω
R_2 = 1 K

Figure 2.