SGS-THOMSON MICROELECTRONICS

STV5712

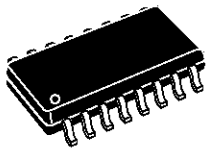
ADVANCED FM AUDIO PLAY-BACK AND RECORD AMPLIFIER FOR VCR

PLAY-BACK MODE

- LOW NOISE 68dB AMPLIFIERS FOR 2 HEADS
- AUTOMATIC OFFSET CANCELLATION BETWEEN THE 2 SELECTED HEADS
- ONE PLAY-BACK OUTPUT
- MODE SELECTION BY LOGIC INPUT

RECORD MODE

- ONE INTEGRATED I/I CONVERTER WITH ACCURATE CONTROL OF TRANSCONDUCTANCE
- RECORD AMPLIFIER WITH AUTOMATIC PROTECTION AGAINST SHORT CIRCUIT
- 5V SUPPLY VOLTAGE



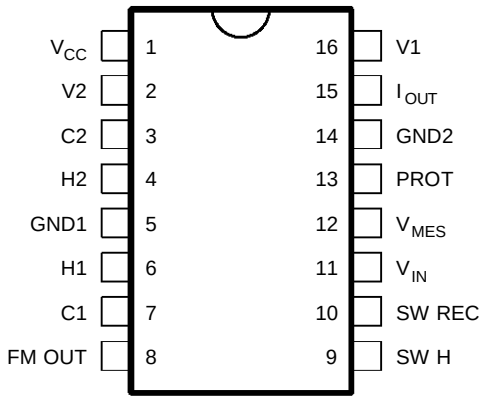
SO16 NARROW
(Plastic Micropackage)

ORDER CODE : STV5712

DESCRIPTION

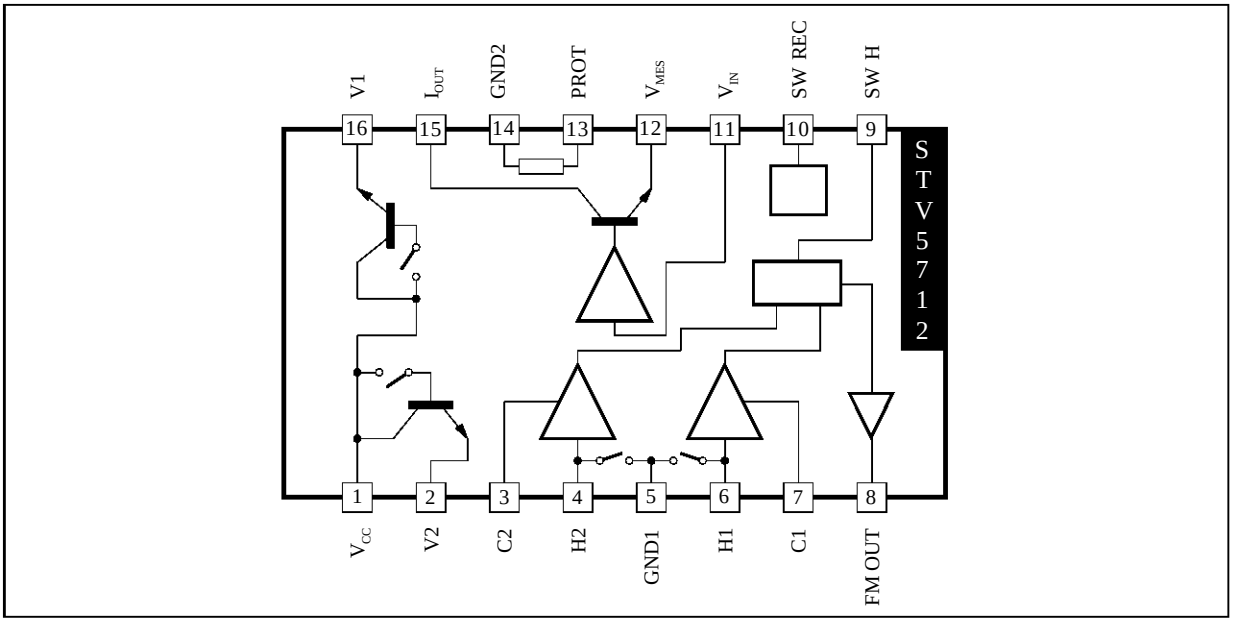
The STV5712 is an advanced two head FM audio record and play-back amplifier for VCR.

PIN CONNECTIONS



5712-01.EPS

BLOCK DIAGRAM



FUNCTIONAL DESCRIPTION

STV5712 is intended for 2 heads FM audio VCR applications.

High performance technology allows very low noise levels (current and voltage). In play-back mode a special feature suppresses the DC offset when switching two channels. Optimized play-back output stage gives to the STV5712 large capability to directly drive a coaxial cable in order to reduce number of external components.

Only one power supply is necessary for play-back and record modes. The mode can be chosen through a logic input. A special care has been taken to avoid current peaks through the rotary transformers.

During play-back mode, record output is grounded via an internal transistor and during record mode preamplifiers are turned off.

There is one output current for the two heads, the DC current and the AC characteristics can be very precisely controled with accurate external resistors. If recommended resistances are used, a ±5% transconductance accuracy is guaranted.

The recording amplifier includes a protection system which protects the IC and the application board against overheating in case of short circuit on the recording transconductance components.

STV5712 is fully protected against ESD.

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Power Supply Voltage	6	V
T_J	Junction Temperature	+ 150	^oC

5712-01.TBL

THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ (j-a)}$	Junction-ambient Thermal Resistance	Typ.	100	$^oC/W$

5712-02.TBL

ELECTRICAL OPERATING CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Power Consumption

Parameter	Play-Back		Record (1)	
	Typ.	Max.	Typ.	Max.
V_{CC} = 5V	25mA	35mA	60mA	80mA

5712-03.TBL

Note : 1. R1 = 5.6Ω

Play-back Mode

V_{CC} = 5V, no load on Pin V_{OUT}

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CC1}	Supply Current			25	35	mA
V_{CC}	Supply Voltage		4.75	5	5.25	V
FM OUT						
G_{PB}	Pre-amplification Gain	Sinus wave 1.6MHz 400mV$_{PP}$ on output, Input on Pin H1 or H2	63	68	73	dB
ΔG_{PB}	Gain Difference of Output Signal on Pin FM OUT between Channel 1 and Channel 2	Sinus wave 1.6MHz 0.1mV$_{PP}$ on inputs H1 or H2			1.2	dB
e_N	Equivalent Input Voltage Noise Level	Input grounded via switching transistor on Pins H1, H2		0.34	0.5	nV/$\sqrt{Hz}$
i_N	Equivalent Input Current Noise	Pins H1, H2		3.6	5.0	pA/$\sqrt{Hz}$
CRT	Crosstalk	Sinus wave 1.6MHz 100µV$_{PP}$, All switches combinated		-45	-40	dB
 F_{LCPB} F_{HCPB}	Bandwidth Cut-off Frequency	-3dB attenuation 50Ω in parallel on the input Low High		 8	 0.1	 MHz MHz
C_{IN}	Input Capacitance Pins H1, H2			45		pF
R_{IN}	Pre-amplifier Input Resistance Pins H1, H2	At 1.6MHz		600		Ω
Z_{PB}	Output Impedance	DC		30	50	Ω
V_{DCPB}	DC Level at Pin FMOUT		1.8	2.4	3	V
ΔV_{DC}	Head Switch Offset				150	mV
SH_{PB1}	Second Harmonic	Sinus wave 1.6MHz 100µV$_{PP}$ on input 500Ω//100pF		-45	-40	dB

5712-04.TBL

ELECTRICAL OPERATING CHARACTERISTICS (T_A = 25°C unless otherwise specified) (continued)

Record Mode

V_{CC} = 5V, Load resistor 50Ω on Pin I_{OUT}

Transconductance network defined by : R1 = 5.6Ω 1% Pins PROT/V_{MES}
R2 = 1kΩ 1% Pins V_{MES}/V_{IN}
R3 = 750Ω 1% Pins V_{IN}

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CC2}	Current Supply	V_{CC} = 5V		60	80	mA
I_{OUT}						
I_{max}	Max. Record Current			70		mA_{PP}
I_{BIAS}	Biasing Current of the record amplifier		33	40	47	mA
TR	Transconductance	V_{IN} = 200mV_{PP}		220		mA/V
Z_{OUT}	Output Resistance		7	100		kΩ
SH_{REC}	Second Harmonic	Output Current 40mA_{PP} at 1.6MHz		-43	-38	dB
F_{LCREC} F_{HCREC}	Bandwidth Cut-off Frequency	-3dB attenuation Output current 60mA_{PP} Low High	 5		 0.1	 MHz MHz
	Maximum Input Current on Pin PROT	5V on Pin PROT	150	250	400	mA
	Maximum Saturation Voltage on Pin PROT	Input current 50mA		100	150	mV
	Input Resistance	Equivalent value of R3 resistor	500	700	900	Ω

5712-05.TBL

Switching Levels

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{SWH1}	Head Selection Pin SW	Head number 1 (high level)	2.4		V_{CC}	V
V_{SWL1}		Head number 2 (low level)	0		1.5	V
I_{SWH1}		Input current (high level)		20	50	µA
I_{SWL1}		Output current (low level)		20	50	µA
V_{SWH2}	Mode Selection Pin SW REC	Record mode (high level)	2.4		V_{CC}	V
V_{SWL2}		Play-back mode (low level)	0		1.5	V
I_{SWH2}		Input current (high level)		20	50	µA
I_{SWL2}		Output current (low level)		20	50	µA
t_{ON1}	Selection Pin SW Transient Response	Delay time selection ON (output signal appears on Pin FM OUT)		250	500	ns
t_{OFF1}		Delay time selection OFF (output signal disappears on Pin FM OUT)		250	500	ns
t_{ON2}	Selection Pin SW REC Transient Response	Delay time selection ON (output signal appears on Pin I_{OUT})		4	40	µs
t_{OFF2}		Delay time selection OFF (output signal appears on Pin FM OUT)		1.3	10	ms

5712-06.TBL

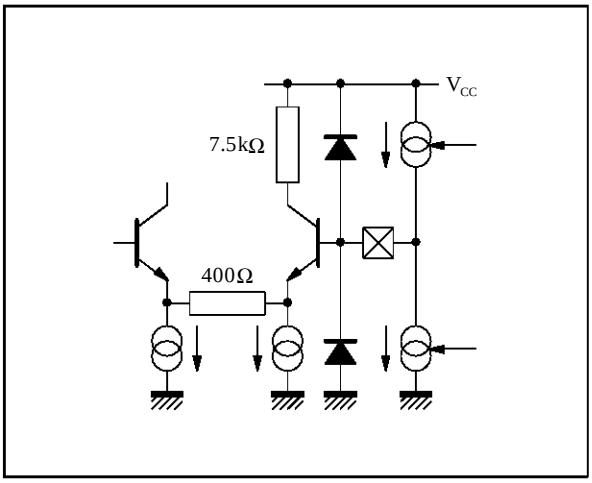
ELECTRICAL OPERATING CHARACTERISTICS ($T_A = 25^oC$ unless otherwise specified) (continued)
Power Supply

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{CC}	Positive Supply Voltage Pin V_{CC}		4.75	5	5.25	V
SVR	Supply Voltage Rejection	0.5mV$_{PP}$ on Pin V_{CC} 75µV$_{PP}$ on Pin H1, H2 Measurement on Pin FM OUT	15	20		dB

5712-07.TBL

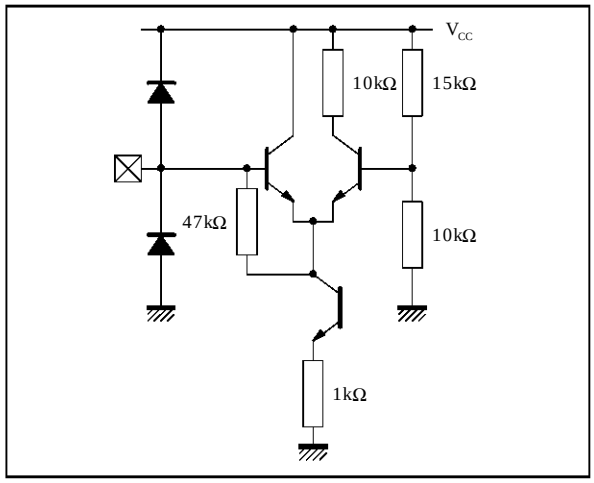
INPUT/OUTPUTS EQUIVALENT INTERNAL DIAGRAM

Pins : C1, C2



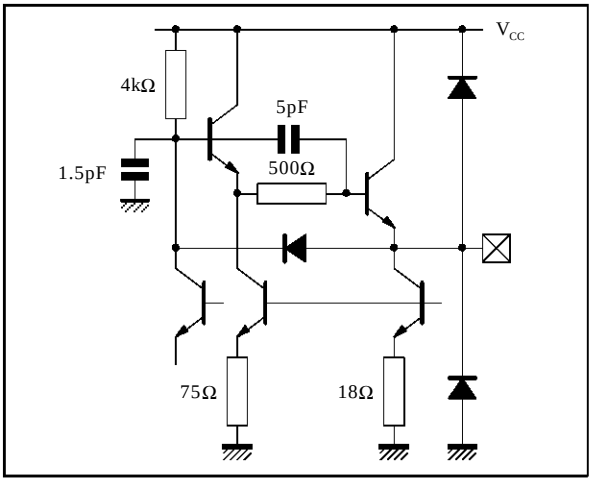
5712-03.EPS

Pin : SW



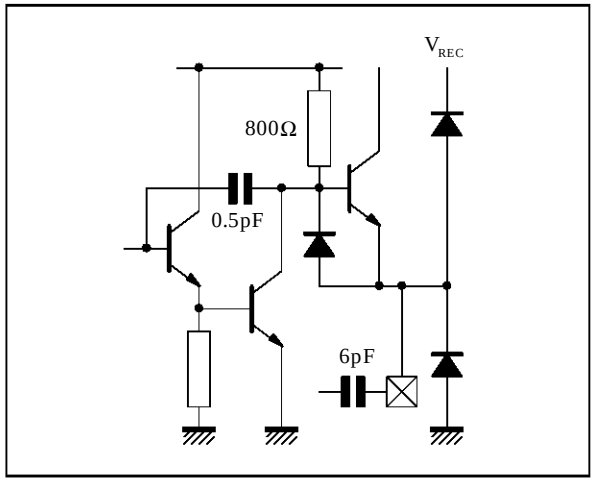
5712-04.EPS

Pin : FM OUT



5712-05.EPS

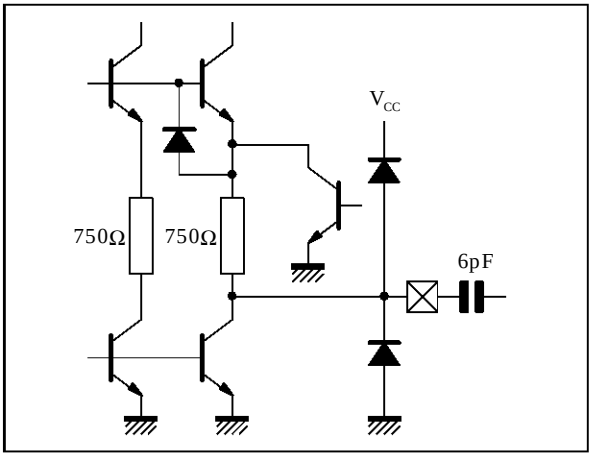
Pin : V_{MES}



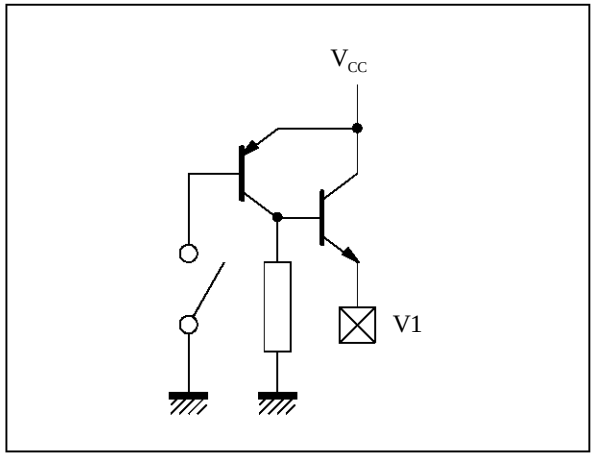
5712-06.EPS

INPUT/OUTPUTS EQUIVALENT INTERNAL DIAGRAM (continued)

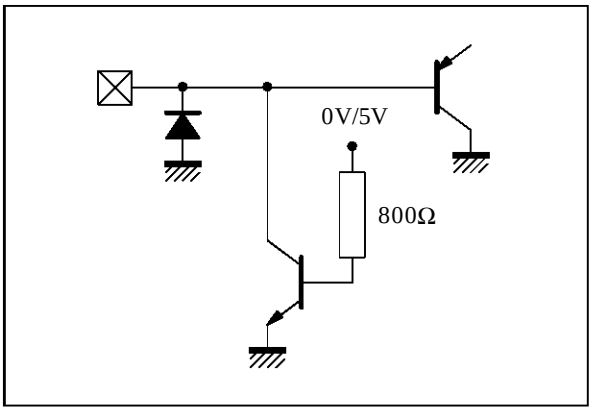
Pin : V_{IN}



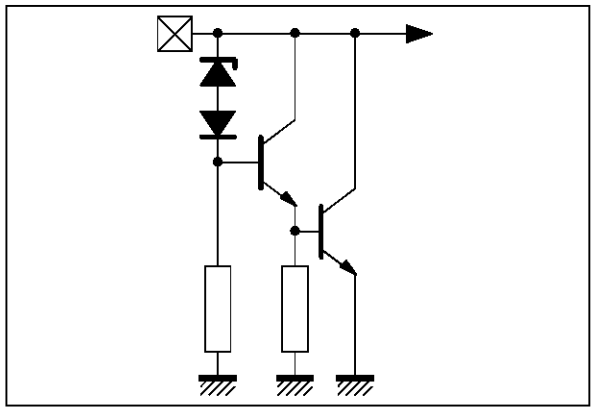
Pin s : V_1, V_2



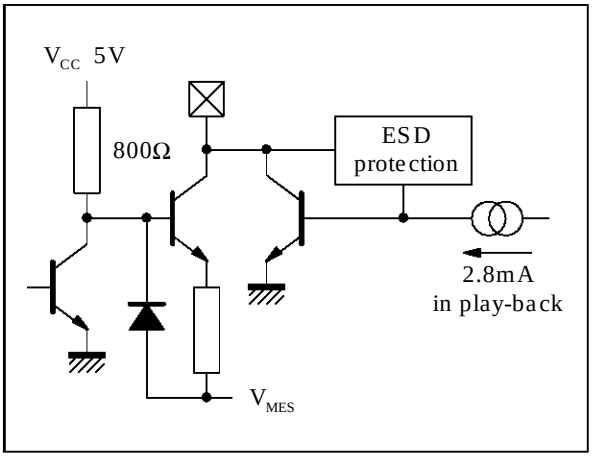
Pin : PROT



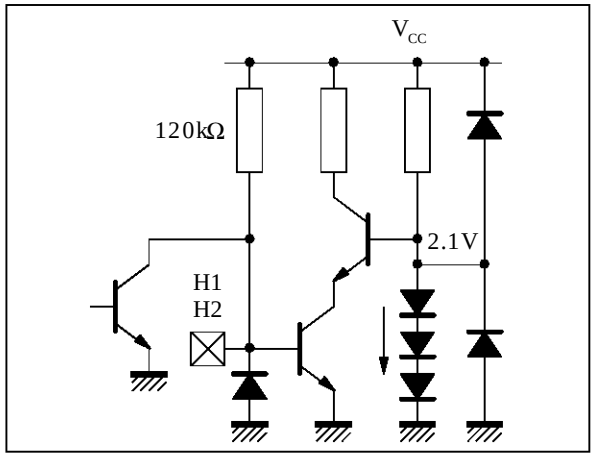
Pin : V_{CC}



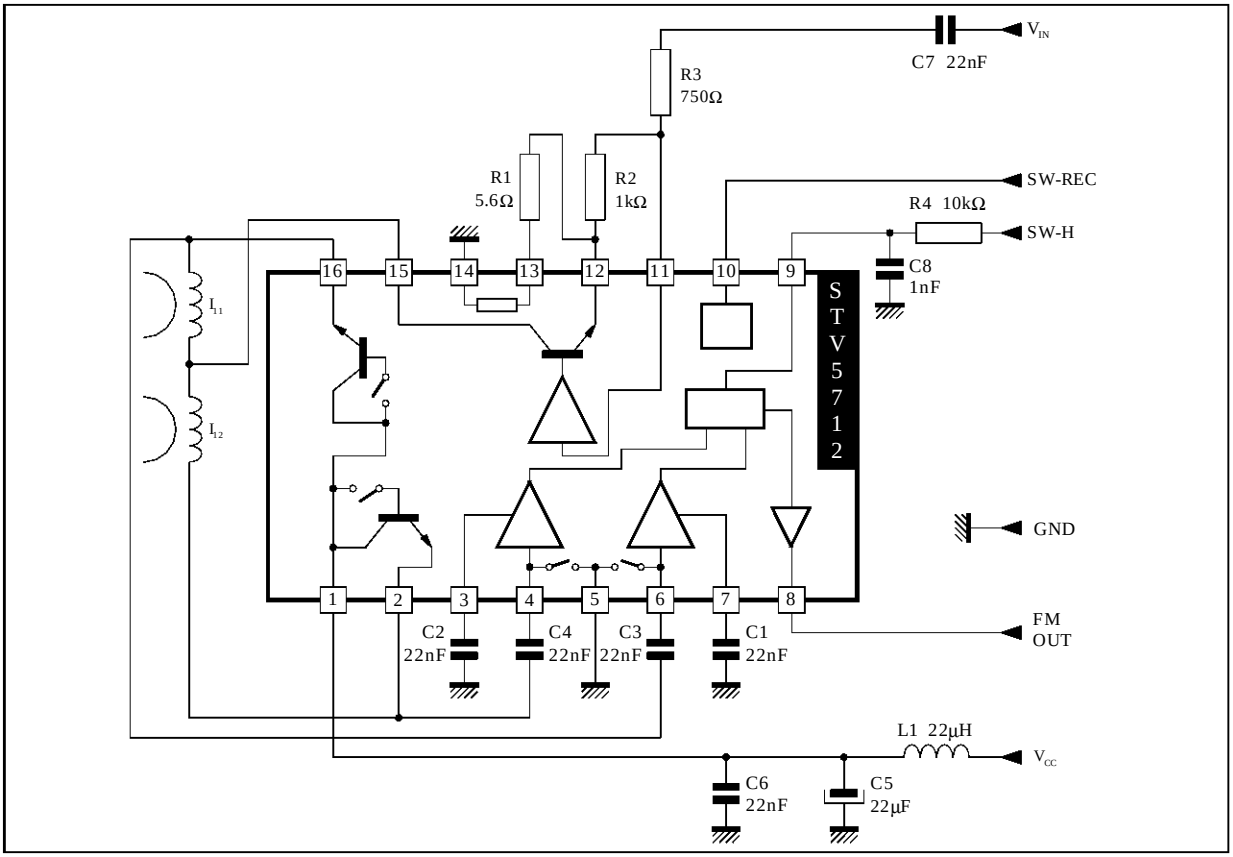
Pin : I_{OUT}



Pins : H1, H2

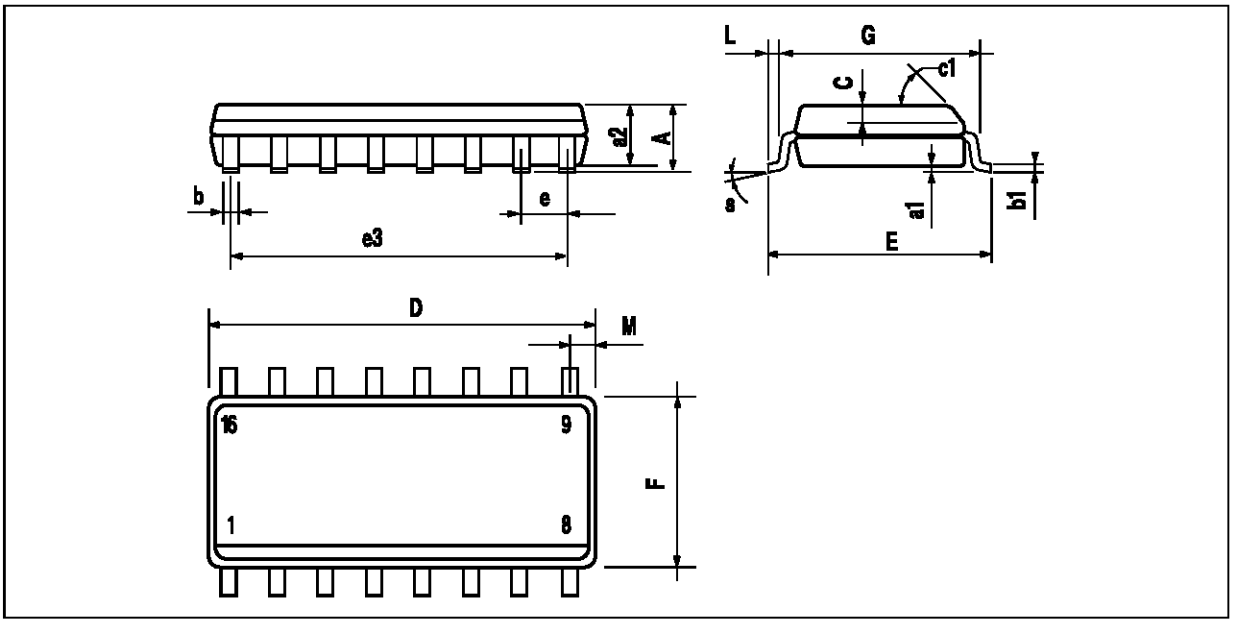


APPLICATION DIAGRAM



PACKAGE MECHANICAL DATA

16 PINS - PLASTIC MICROPACKAGE (SO NARROW)



PM-SO16N.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.25	0.004		0.009
a2			1.6			0.063
b	0.35		0.46	0.014		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.020	
c1	45^o (typ.)					
D	9.8		10	0.386		0.394
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		8.89			0.350	
F	3.8		4.0	0.150		0.157
L	0.4		1.27	0.016		0.050
M			0.62			0.024
S	8^o (Max.)					

SO16N.TBL