

SIEMENS

S 041 P FM IF Amplifier with Demodulator

S 041 P is a symmetrical, six-stage amplifier with symmetrical coincidence demodulator for amplifying, limiting, and demodulating frequency-modulated signals. The IC is particularly suited for sets where low current consumption is of importance, or where major supply fluctuations occur.

The pin configuration corresponds to the well-known TBA 120. Pin 5 of S 041 P, however, is not connected internally. These types are especially suited for applications in narrow-band FM systems (455 kHz) and in conventional or standard FM IF systems (10.7 MHz).

Features

- Good limiting properties
- Wide voltage range
- Low current consumption
- Few external components

Maximum ratings

Supply voltage	V_S	15	V
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	-40 to 125	°C
Thermal resistance (system-air)	$R_{th, SA}$	90	K/W

S 041 P

Operating range

Supply voltage range	V_S	4 to 15	V
Frequency range	f_i	0 to 35	MHz
Ambient temperature range	T_{amb}	-25 to 85	°C

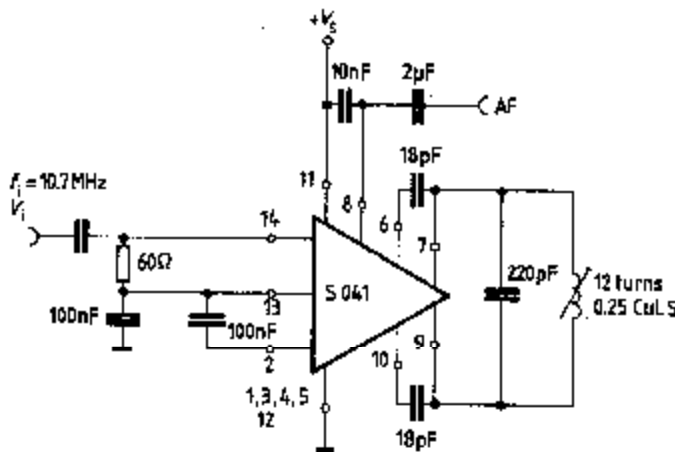
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Characteristics ($V_S = 12\text{ V}$, Q approx. 35, $f_{mod} = 1\text{ kHz}$, $T_{amb} = 25^\circ\text{C}$)

	min	typ	max		
Current consumption					
AF output voltage	I_B	4.0	5.4	6.8	mA
($f_i = 10.7\text{ MHz}$, $\Delta f = \pm 50\text{ kHz}$, $V_i = 10\text{ mV}$)	$V_{a\text{ rms}}$	100	170		mV
Total harmonic distortion	THD		0.66	1.0	%
($f_i = 10.7\text{ MHz}$, $\Delta f = \pm 50\text{ kHz}$, $V_i = 10\text{ mV}$)	ΔV_{FM}		1.6		dB
Deviation of AF output voltage	V_{lim}		30	60	μV
($V_S = 15\text{ V} \rightarrow 4\text{ V}$, $f_i = 10.7\text{ MHz}$, $\Delta f = \pm 50\text{ kHz}$)	G_v		68		dB
Input voltage for limiting	V_{app}		130		mV
($f_i = 10.7\text{ MHz}$, $\Delta f = \pm 60\text{ kHz}$)	Z_i		20/2		k Ω /pF
IF voltage gain ($f_i = 10.7\text{ MHz}$)	Z_i		50/4		k Ω /pF
IF output voltage for limiting	R_a	3.5	5	8.5	k Ω
(each output)	V_{11-8}		1.5		V
Input impedance $f_i = 10.7\text{ MHz}$	B_{AM}		60		dB
$f_i = 455\text{ kHz}$					
Output resistance (pin 8)					
Voltage drop at AF ballast resistance					
AM suppression					
($V_i = 10\text{ mV}$, $\Delta f = \pm 50\text{ kHz}$, $m = 30\%$)					

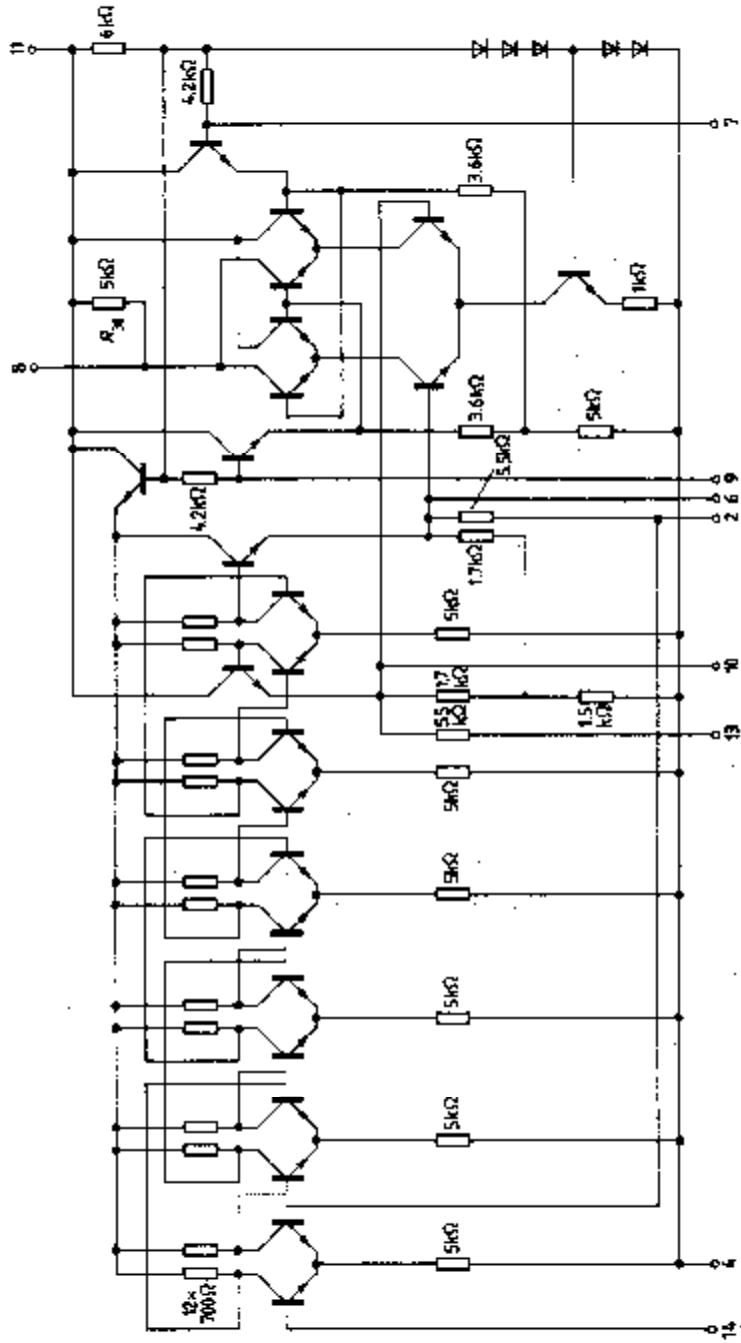
All connections mentioned in the Index refer to S 041 P (e.g. V_1)

Test circuit

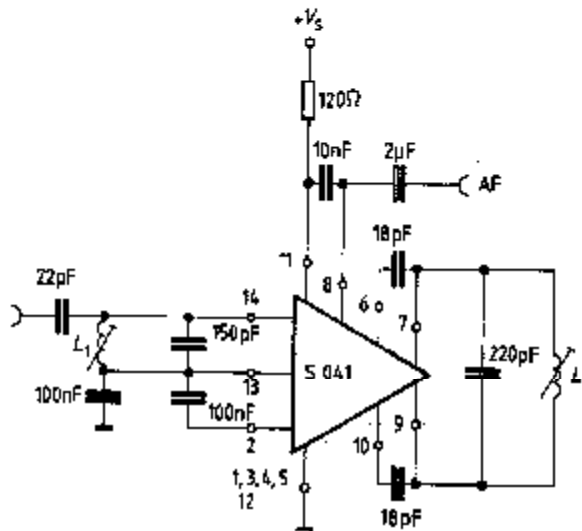




Circuit diagram



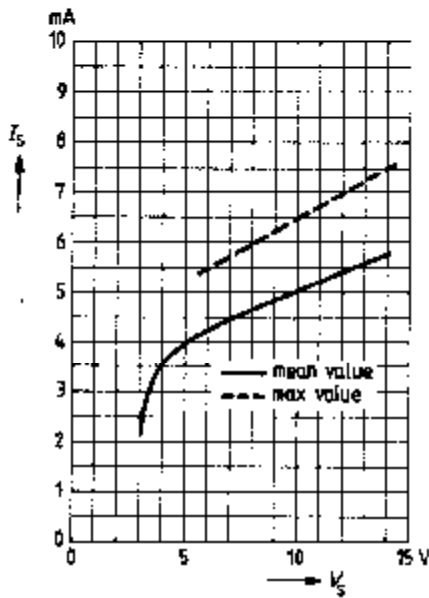
**Application circuit for 10.7 MHz (FM IF)
and 455 kHz (narrow-band FM)**



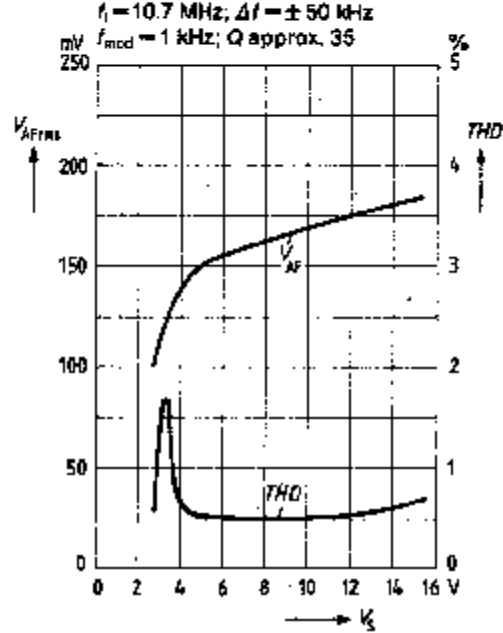
Data in parentheses for 455kHz (narrow-band FM)

Coils	10.7 MHz	455 kHz
L ₁	15 turns/0.15 CuLS	71.5 turns/12 x 0.04 CuLS
L ₂	12 turns/0.25 CuLS	71.5 turns/12 x 0.04 CuLS
Coil set	D 41-2165	D 41-2393 of Messrs. Vagt

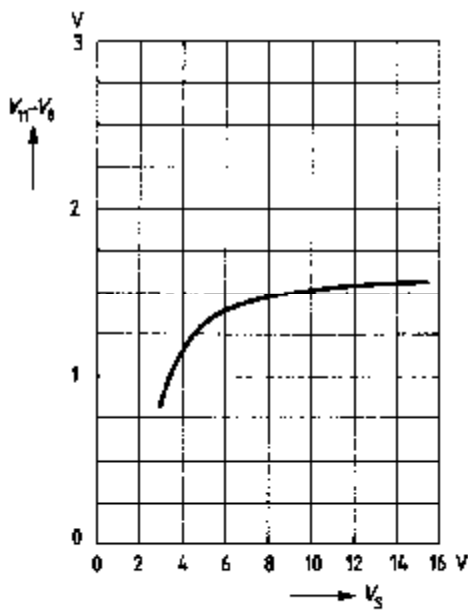
Current consumption versus supply voltage



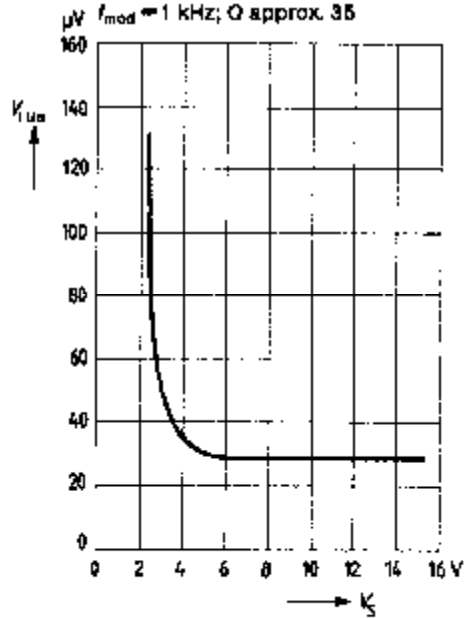
AF output voltage and total harmonic distortion versus supply voltage



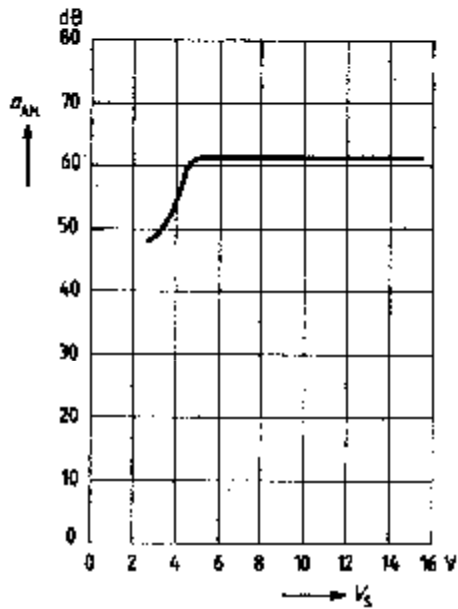
DC output voltage difference versus supply voltage (without signal)



Input voltage for limiting versus supply voltage



AM suppression versus supply voltage
 $f_i = 10.7 \text{ MHz}$; $\Delta f = \pm 50 \text{ kHz}$;
 $V_i = 10 \text{ mV}$, $f_{mod} = 1 \text{ kHz}$, $m = 30\%$



AF output voltage and total harmonic distortion versus Q-factor
 $V_s = 12 \text{ V}$; $f_i = 10.7 \text{ MHz}$;
 $\Delta f = \pm 50 \text{ kHz}$, $f_{mod} = 1 \text{ kHz}$

