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) S 041 P	$R_{th\ SA}$	90	K/W

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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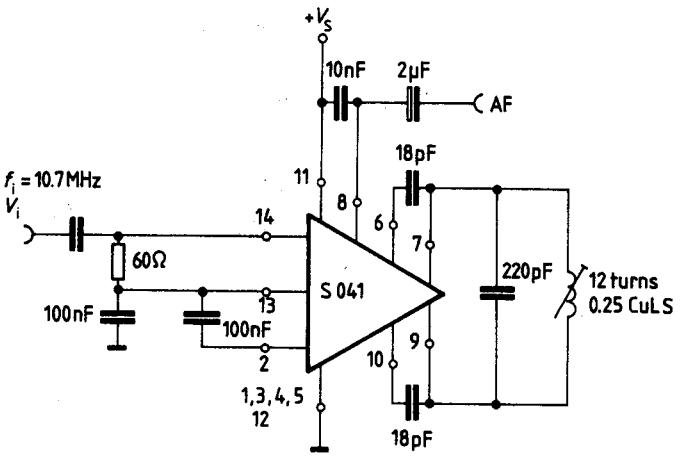
Characteristics (V_S = 12 V, Q approx. 35, f_{mod} = 1 kHz, T_{amb} = 25°C)

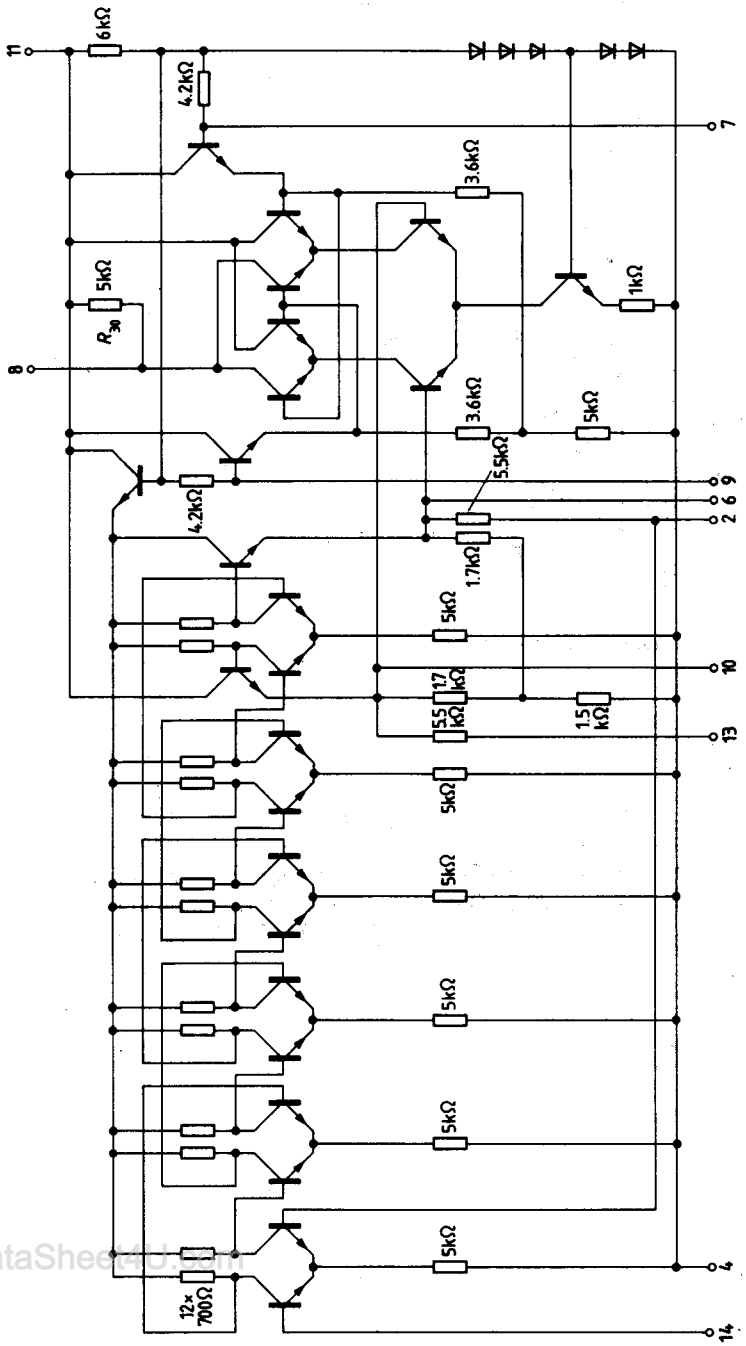
		min	typ	max	
Current consumption	I_S	4.0	5.4	6.8	mA
AF output voltage (f_i = 10.7 MHz, Δf = ± 50 kHz, V_i = 10 mV)	$V_{q\,rms}$	100	170		mV
Total harmonic distortion (f_i = 10.7 MHz, Δf = ± 50 kHz, V_i = 10 mV)	THD		0.55	1.0	%
Deviation of AF output voltage (V_S = 15 V → 4 V, f_i = 10.7 MHz, Δf = ± 50 kHz)	ΔV_q		1.5		dB
Input voltage for limiting (f_i = 10.7 MHz, Δf = ± 50 kHz)	$V_{i\,lim}$		30	60	µV
IF voltage gain (f_i = 10.7 MHz)	G_v		68		dB
IF output voltage for limiting (each output)	$V_{q\,pp}$		130		mV
Input impedance f_i = 10.7 MHz	Z_i		20/2		kΩ/pF
f_i = 455 kHz	Z_i		50/4		kΩ/pF
Output resistance (pin 8)	R_q	3.5	5	8.5	kΩ
Voltage drop at AF ballast resistance	V_{11-8}		1.5		V
AM suppression (V_i = 10 mV, Δf = ± 50 kHz, m = 30%)	a_{AM}		60		dB

All connections mentioned in the index refer to S 041 P (e.g. V_{11})

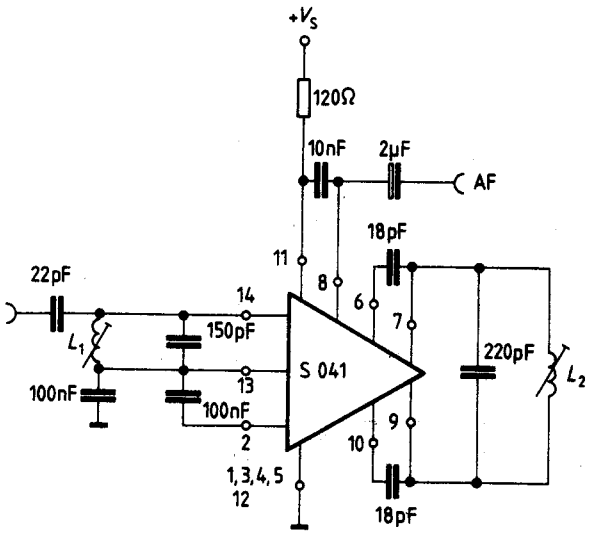
Test circuit



Circuit diagram



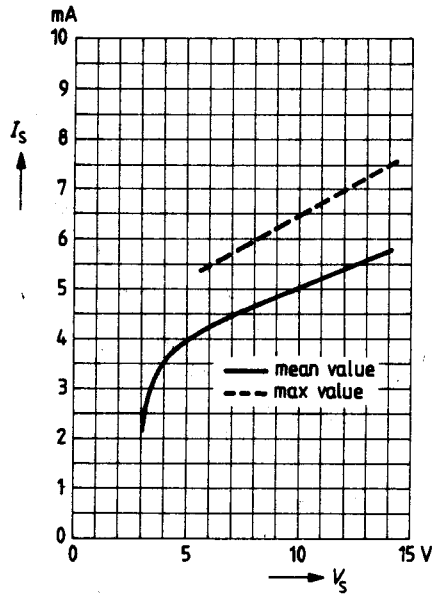
Application circuit for 10.7 MHz (FM IF)
and 455 kHz (narrow-band FM)



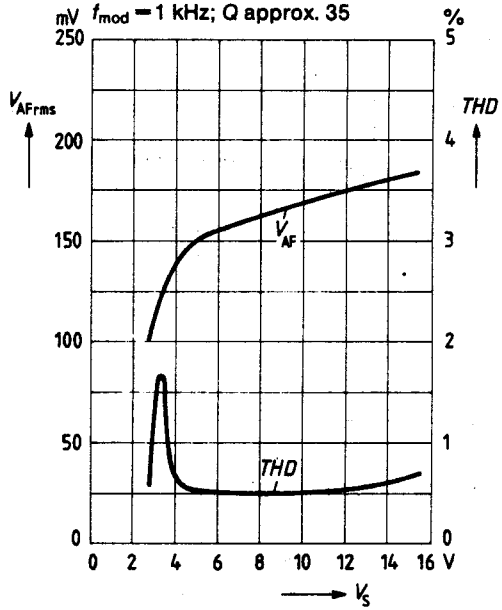
Data in parentheses for 455 kHz (narrow-band FM)

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. Vogt

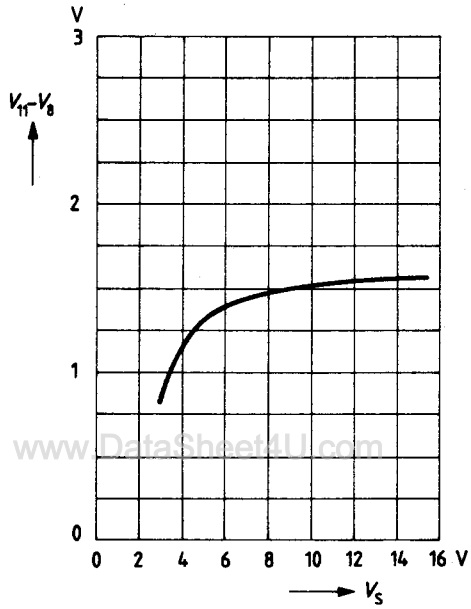
Current consumption versus supply voltage



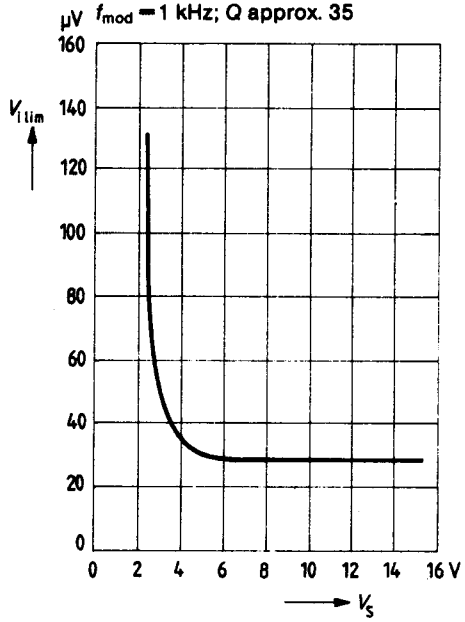
AF output voltage and total harmonic distortion versus supply voltage
f_i = 10.7 MHz; Δf = ± 50 kHz
f_{mod} = 1 kHz; Q approx. 35



DC output voltage difference versus supply voltage
(without signal)



Input voltage for limiting versus supply voltage
f_i = 10.7 MHz; Δf = ± 50 kHz
f_{mod} = 1 kHz; Q approx. 35



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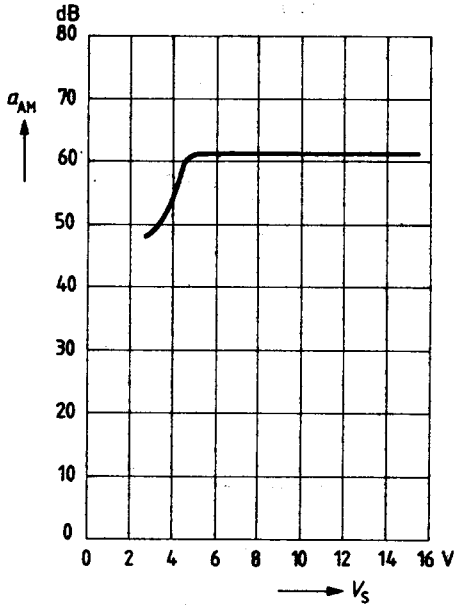
AM suppression versus supply voltage
$f_i = 10.7$ MHz; $\Delta f = \pm 50$ kHz;
$V_i = 10$ mV, $f_{mod} = 1$ kHz, $m = 30\%$



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