

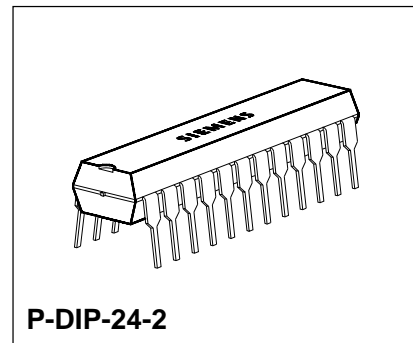
Video and Sound IF with V & S SCART

TDA 5940-2

Bipolar IC

Features

- Features video / sound scart
- Active FM-PLL demodulator
- AF control
- Alignment - free sound IF



Type	Ordering Code	Package
TDA 5940-2	Q67000-A5144	P-DIP-24-2

Functional Description and Application

Video IF Section

Video IF-broadband amplifier followed by a quasi-synchronous demodulator for negative modulated IF signals. A Full-SCART interface is included in the video section. A separate video output after the demodulator permits the installation of one or more sound traps at the input of the SCART switch. The tuner AGC threshold is set by means of a potentiometer, all other functions can be switched with open collector transistors.

Sound IF Section

FM-IF limiter with FM-PLL demodulator. The AF section has a Full-SCART switch followed by a volume control. The volume is controlled by an analog voltage.

Application

The TDA 5940-2 is suitable for application in television receivers with Full-SCART.

Circuit Description**Video IF Section**

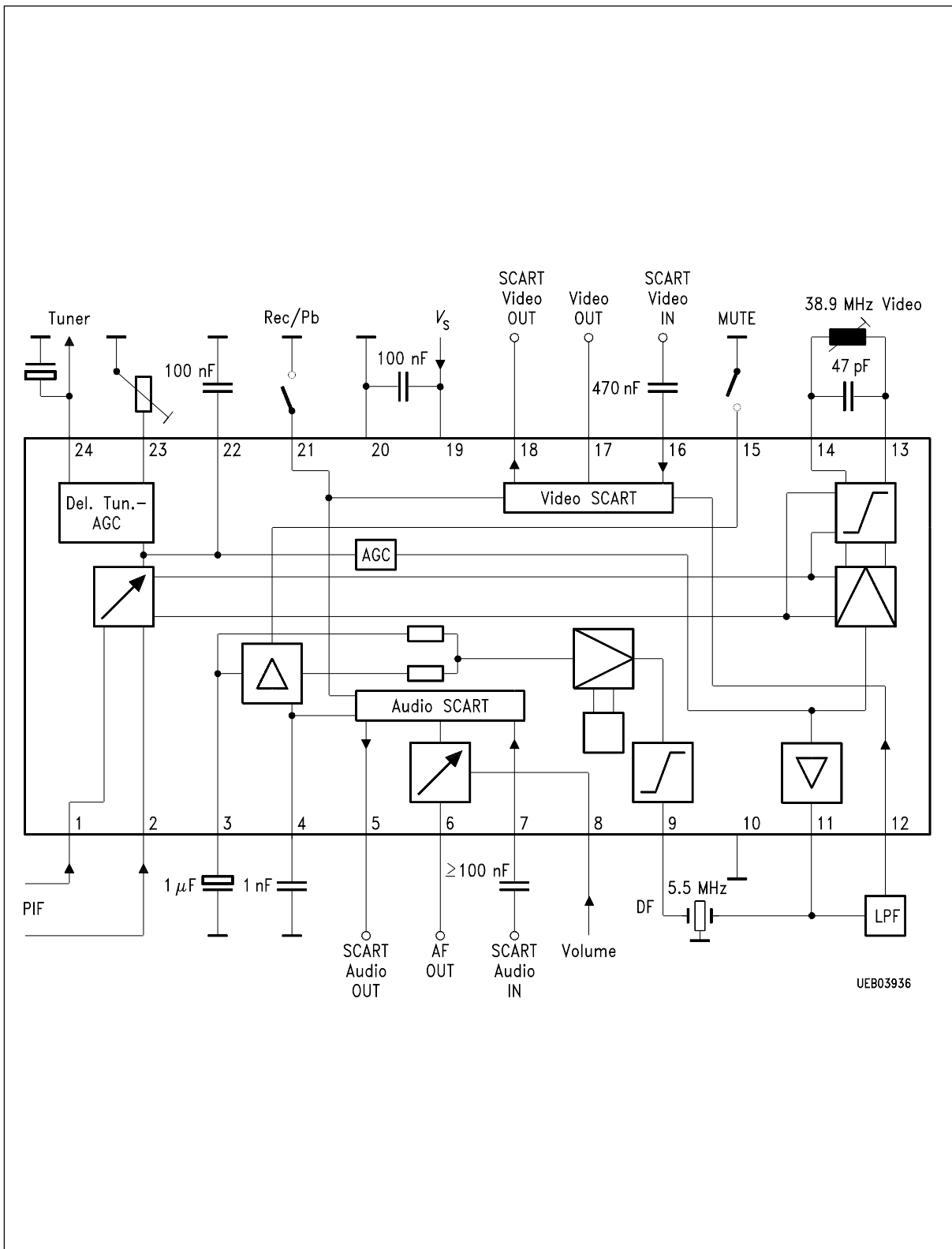
The video IF section incorporates a four-stage, capacitively coupled, symmetrical and controlled amplifier, a limiter with selection and a mixer for quasi-synchronous demodulation of negative modulated IF signals followed by a video output amplifier. The video demodulator output and the SCART-switch input are connected by means of a sound trap. The SCART switch has two inputs (for signals from video demodulator and SCART socket) and two outputs (SCART socket and TV output). Parallel to the video output amplifier the video signal is used for generating the AGC voltage. The control circuit is designed on the integralaction AGC principle, employing a noise-free peak value detector. A delayed tuner AGC voltage with positive control direction is derived from the AGC -voltage via a threshold amplifier that is set by means of an external potentiometer.

Sound IF Section

The sound IF section incorporates a five-stage, symmetrical limiter amplifier followed by a PLL demodulator. The AF section contains an analog switch for the Full-SCART interface and a volume control with AF output.

Pin Functions

Pin No.	Function
1	Video IF input
2	Video IF input
3	Low-pass capacitor
4	De-emphasis capacitor
5	Audio SCART output
6	Audio output
7	Audio SCART input
8	Audio volume control
9	Sound IF input
10	Ground
11	Video demodulator output
12	Video input at sound trap output
13	Demodulator tank circuit
14	Demodulator tank circuit
15	MUTE control
16	Video SCART input
17	Video output
18	Video SCART output
19	+ V_S supply voltage
20	Ground
21	SCART control
22	AGC-time constant
23	Delayed tuner AGC threshold
24	Delayed tuner AGC output



Block Diagram

Absolute Maximum Ratings

$T_A = 0$ to 85 °C

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Supply voltage	V_S		13.2	V
Junction temperature	T_j		150	°C
Storage temperature	T_{stg}		125	°C
Thermal resistance	$R_{th JA}$		70	K/W

Operating Range

Supply voltage	V_S	7.5	13.2	V
Supply voltage delayed tuner AGC	V_1	1	10	V
Ambient temperature during operation	T_A	0	85	°C
Input frequency range	f_{IF}	12	80	MHz

Characteristics

$T_A = 0$ to 85 °C; $V_S = 12$ V

Parameter	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		
Total current	I_{19}		46		mA	

SCART Switch

H/open = SCART = Pb	V_{21}	2		5	V	
L = RF	V_{21}	0		1.5	V	

Volume Control Voltage

Minimal volume	V_8	0			V	
Maximal volume	V_8		3.6	5	V	

MUTE Voltage

H/open = AF ON	V_{15}	2		5	V	
L = AF MUTE	V_{15}	0		1.5	V	

Dynamic Parameter

Video IF Section

IF-input sensitivity	$V_{1/2}$		70	100	μ V	$V_{\text{Video}} - 3$ dB
Max. IF-input voltage	$V_{1/2}$	100	140		mV	$V_{\text{Video}} + 3$ dB
IF-control range	ΔV_{IF}		66		dB	
Video demodulator output voltage	$V_{11\text{pp}}$	1.35	1.5	1.65	V	$V_{\text{IF IN}} = 10$ mV

Gain of SCART Switch

SCART/Video output	G_{16-17}		2			
Video/SCART output	G_{12-18}		- 1			
Video/Video output	G_{12-17}		2			
Cross talk attenuation	a		50		dB	$f_{\text{IN}} = 0 \dots 5$ MHz

Characteristics (cont'd)

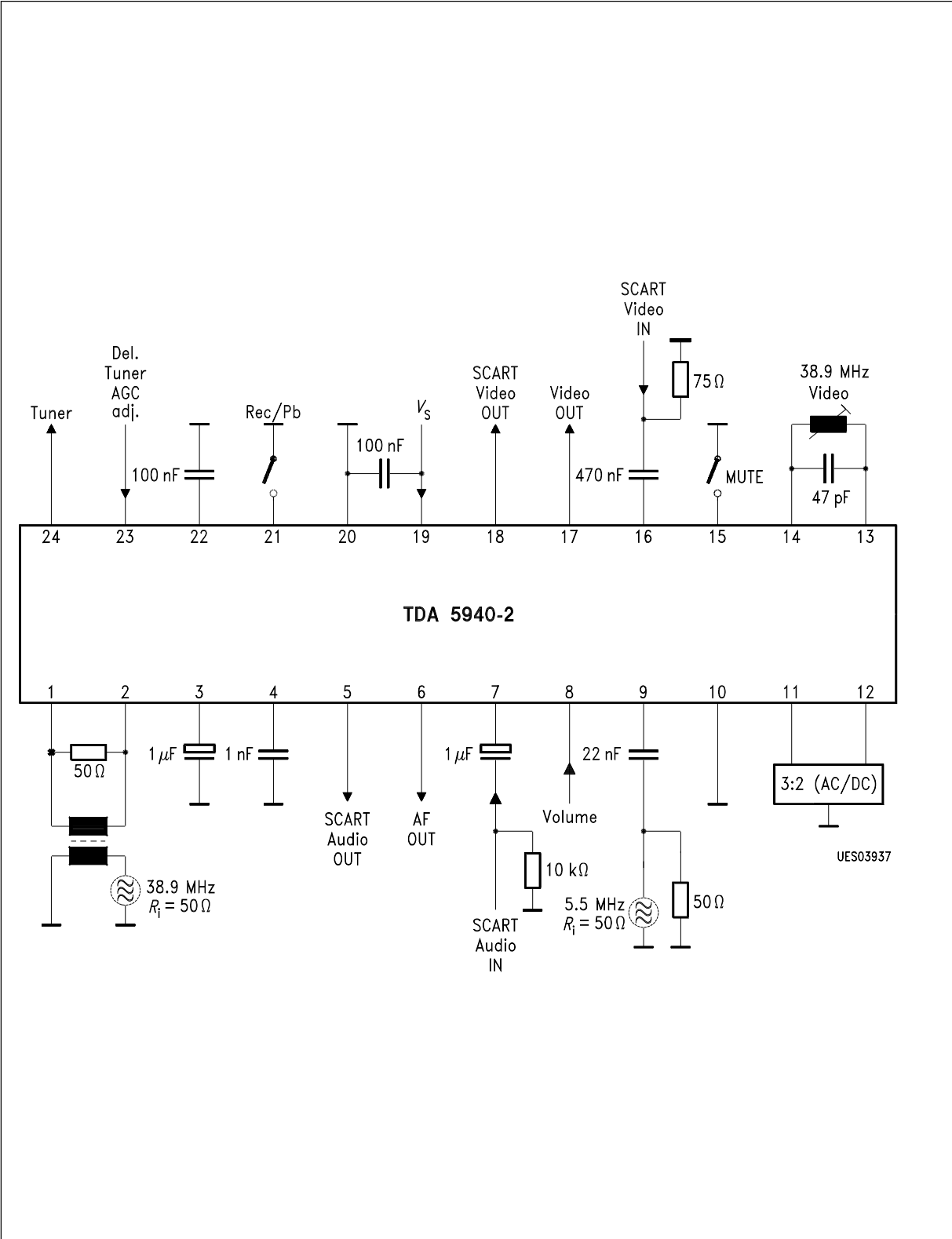
Parameter	Symbol	Limit Values			Unit	Test Condition
		min.	typ.	max.		

Sound IF Section

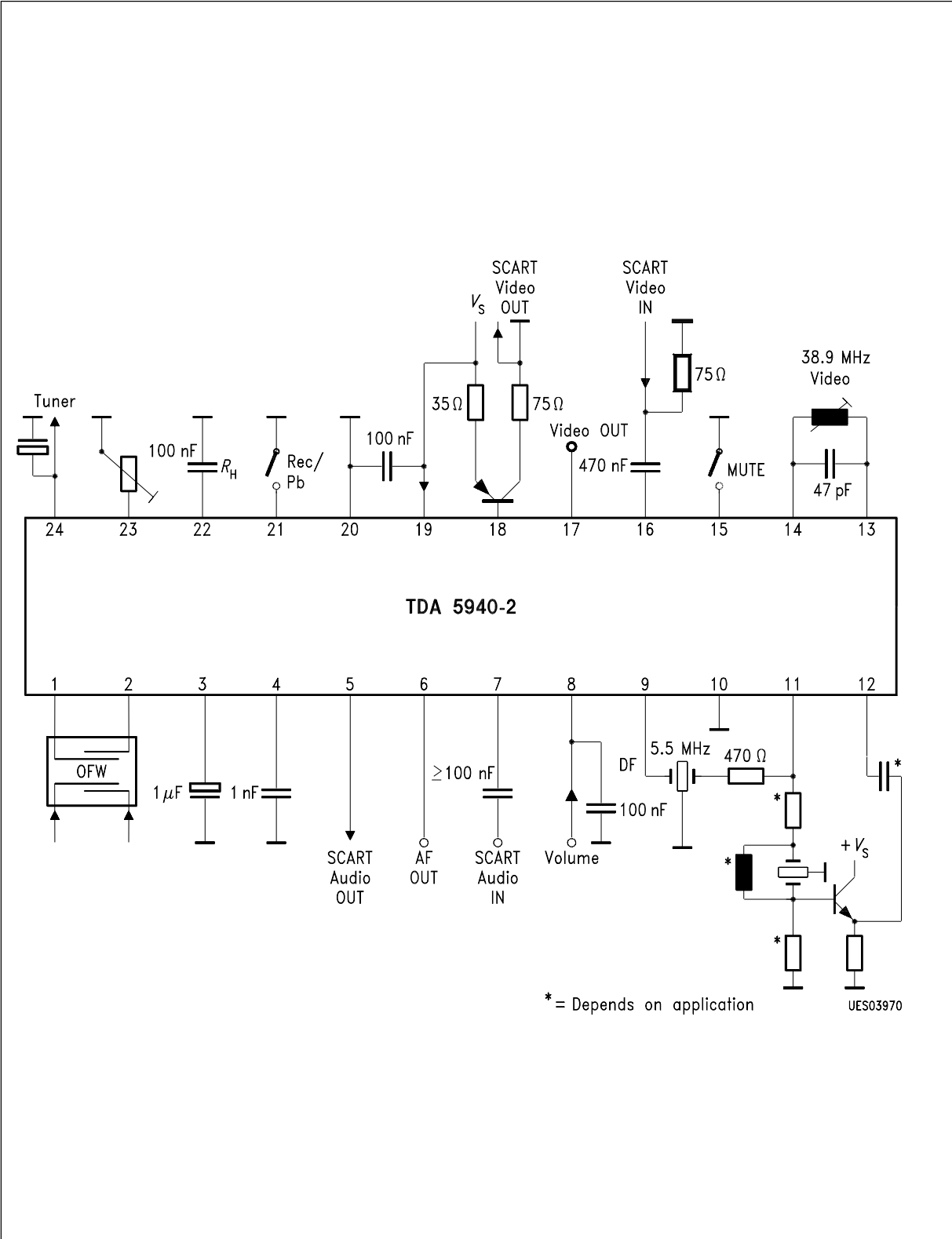
Min. sound IF-input voltage (min. control)	V_9		70		μV	
AF-output voltage	V_6	500			mV	$\Delta f = 30 \text{ kHz}$ $f_{\text{mod}} = 1 \text{ kHz}$ $F_{\text{SIF}} = 5.5 \text{ MHz}$
SCART AF-output voltage	V_5	500			mV	$\Delta f = 30 \text{ kHz}$ $f_{\text{mod}} = 1 \text{ kHz}$ $F_{\text{SIF}} = 5.5 \text{ MHz}$
Total harmonic distortion	THD_{AF0}			0.5	%	$\Delta f = 30 \text{ kHz}$ $f_{\text{mod}} = 1 \text{ kHz}$ $F_{\text{SIF}} = 5.5 \text{ MHz}$
Max. SCART-input voltage	$V_{7\text{RMS}}$			2	V	
Gain SCART-sound switch	G_{7-6}		1			$V_8 \geq 3.6 \text{ V}$

Alignment Instructions

At a video carrier input level of $V_{1/2} = 4 \text{ mVrms}$, $f_{\text{PC}} = 38.9 \text{ MHz}$, and a superimposed AGC voltage of $V_{22} = 1.5 \text{ V}$, the demodulator tank circuit is preliminarily aligned until a max. video signal $V_{11\text{pp}}$ is obtained at the video output. Any suitable video test signal can be used for modulation. The AGC voltage V_{22} is reduced until the signal is approx. 1 Vpp and the max. video signal is obtained when fine-aligning the demodulator tank circuit. The alignment is not critical due to relatively large bandwidth of the demodulator tank circuit. Fine-tuning to intercarrier S/N , differential phase or 2T-pulse characteristics is possible.



Test Circuit



Application Circuit