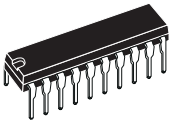
STABP01

BASH® DIGITAL PROCESSOR

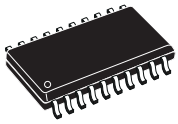
■ **BASH® LICENCE REQUIRED**

DESCRIPTION

The STABP01 processor is used to control the BASH® Digital Converter. When used in conjunction with BASH® amplifiers a fully integrated high efficiency power amplifier is realized.
By analyzing the audio input, the Processor determines the appropriate on/off events and generates a digital pulse for the Digital Converter. The converter turns this pulse into a power signal that feeds the power amplifier. The feedback system allows the processor to constantly adapt to the audio signal and regenerate the digital pulse thereby maintaining a constant voltage across the output devices.



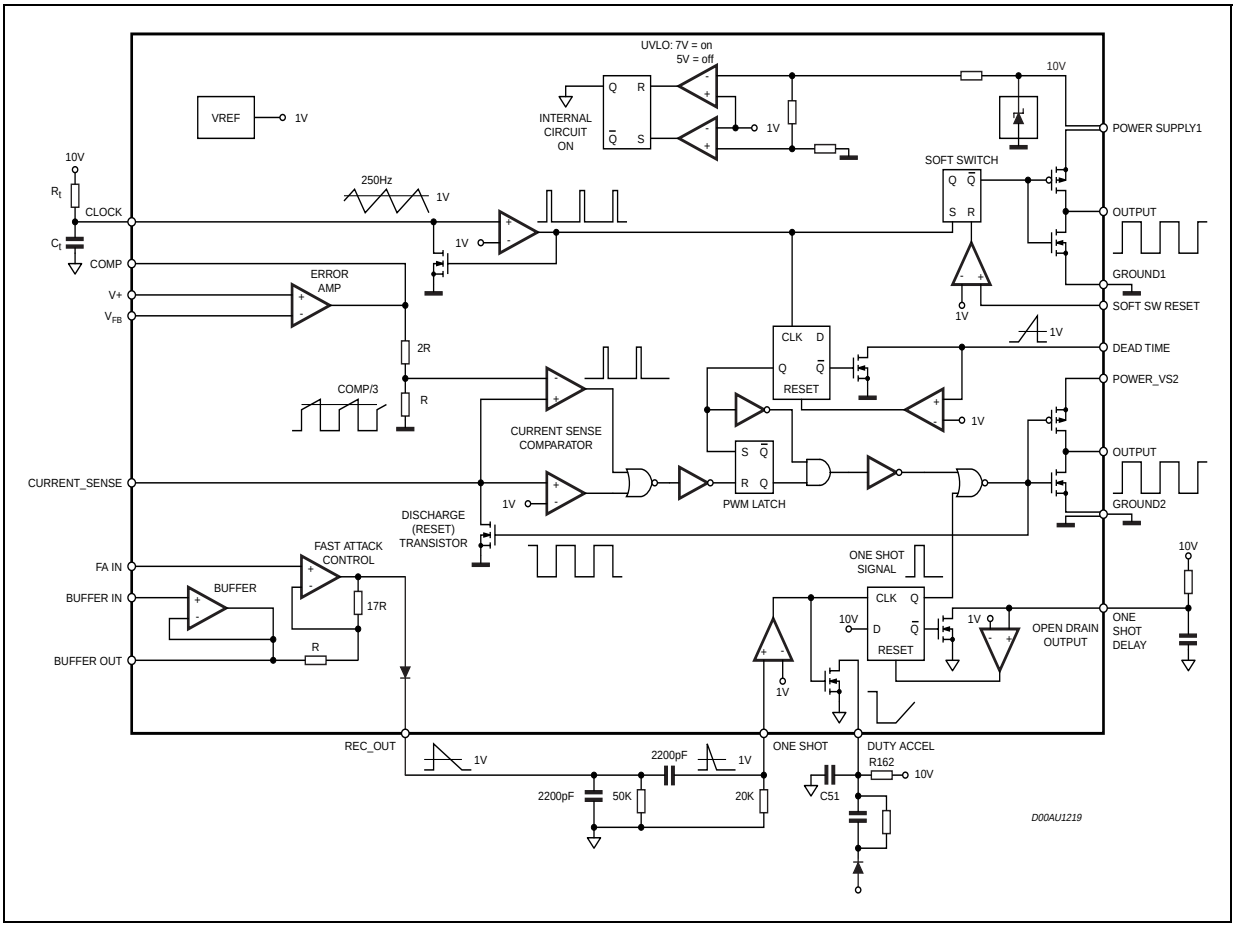
DIP20



SO20

ORDERING NUMBERS:
STABP01 (DIP20)
STABP01D (SO20)

BLOCK DIAGRAM



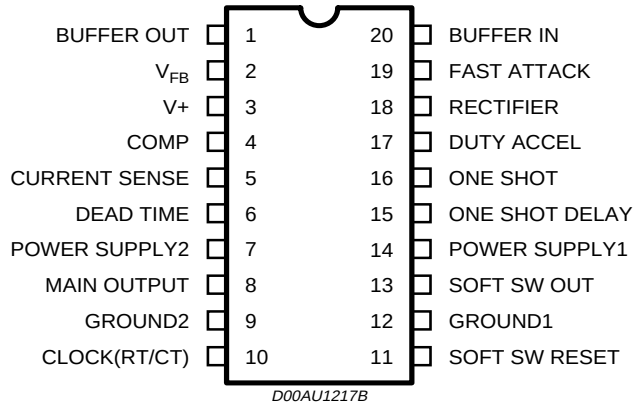
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
Vs	Supply Voltage	10.5	V
Io	Output Current	±0.6	A
Eo	Output Energy(capacitive load)	5	µJ
Vi	Analog Input Voltage	-0.3 to 8	V
Io	Error Amplifier Output Sink Current	10	mA
P_{tot}	Power Dissipation at Tamb	500	mW
T_{stg}	Storage Ambient Temperature	-65 to 150	°C
T_L	Lead Temperature (soldering 10s)	300	°C
T_{op}	Operating Temperature Range	-25 to 85	°C

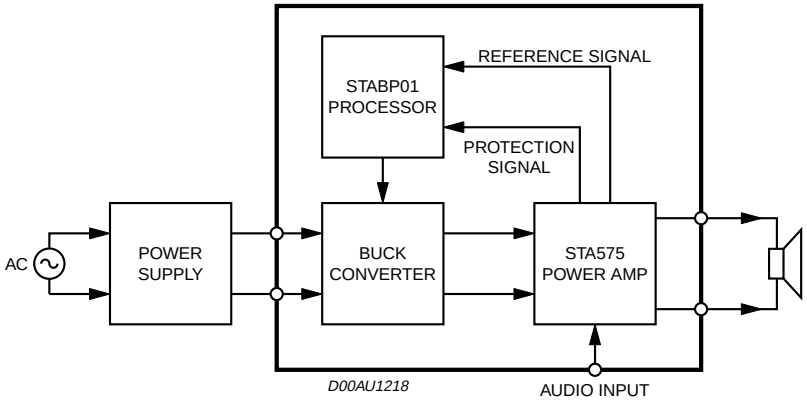
THERMAL DATA

Symbol	Parameter	SO20	DIP20	Unit
$R_{th\ j\text{-}amb}$	Thermal Resistance junction-ambient soldered on PCB	95	90	°C/W

PIN CONNECTION



TYPICAL APPLICATION CIRCUIT



ELECTRICAL CHARACTERISTCS (Vs = 10V; Rt = 22kΩ; Ct = 2.2nF; t = 25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
OSCILLATOR SECTION						
fs	Initial Accuracy (*)	Tj=25C, SW Out Off	225	250	300	kHz
Ts	Temperature Stability	Tmin<Tamb<Tmax		5		%
	Amplitude	Vpin10 Peak to Peak		0.5		V
ERROR AMP SECTION						
Ib	Input Bias Current				1	µA
A_{VOL}	Open loop Gain		65	90		dB
B	Unity Gain Bandwidth		0.7	1		MHz
SVR	Supply Voltage Rejection	6<Vs<10V	60	70		dB
I_{CMR}	Input Common Mode Range		0		8	V
C_{MRR}	Common Mode Rejection Ratio			90		dB
O_R	Output Voltage Range	I = 1mA	0.5		8.5	V
CURRENT SENSE SECTION						
Gv	Gain	V4/V5, V5 <1V, Duty Cycle = 80%	2.7	3	3.3	V/V
V5	Maximum Input Signal	V4 = 5V	0.9	1	1.1	V
Ib	Input Bias Current	V5 <0.9V,			1	µA
Odt	Delay to Output (minimum output pulse)			150	300	ns
OUTPUT SECTION						
V_{OL}	Output Low Level	Isink=20mA Isink=200mA		0.1 1.5	0.4 2.2	V V
V_{OH}	Output High Level	Isource=20mA Isource=200mA	9.6 7.8	9.9 8.5		V V
tr	Rise Time	Tj=25°C CL=1nF		50	150	ns
tf	Fall Time	Tj=25°C CL=1nF		50	150	ns
UNDER-VOLTAGE LOCKOUT SECTION						
UVstart	Start Threshold		6.3	7	7.7	V
UVstop	Min Operating Voltage After Turn-on		4.5	5	5.5	V
TOTAL STANDBY CURRENT						
Ist	Start-up Current			0.5	1	mA
Is	Operating Supply Current			10	20	mA

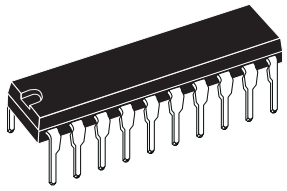
ELECTRICAL CHARACTERISTCS (continued)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
BUFFER SECTION						
Ib	Input Bias Current				1	µA
B	Unity Gain Bandwidth		0.7	1		MHz
SVR	Supply Voltage Rejection	6<Vs<10V	60	70		dB
I_{CMR}	Input Common Mode Range		0		9	V
O_R	Output Range	I = 1mA	0.5		8.5	V
SOFT SWITCH SECTION						
V_{OL}	Output Low Level	Isink=20mA Isink=200mA		0.1 1.5	0.4 2.2	V V
V_{OH}	Output High Level	Isource=20mA Isource=200mA	9.6 7.8	9.9 8.5		V V
tr	Rise Time	Tj=25°C CL=1nF		50	150	ns
tf	Fall Time	Tj=25°C CL=1nF		50	150	ns
V_{reset}	Reset Level			1		V
FAST ATTACK CONTROL SECTION						
G_{diff}	Differential Gain		16	18	20	V/V
OS_{th}	Level for one shot		0.9	1	1.1	V
OSD_{th}	Level for one shot delay		0.9	1	1.1	V
$I15_{leak}$	Leakage pin 15	V15 = 0.8V			0.2	µA
$I17_{leak}$	Leakage pin 17	V17 = 10V, V16 = 0V			0.2	µA

(*) Rt, Ct = 1% precision component

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
a1	0.254			0.010		
B	1.39		1.65	0.055		0.065
b		0.45			0.018	
b1		0.25			0.010	
D			25.4			1.000
E		8.5			0.335	
e		2.54			0.100	
e3		22.86			0.900	
F			7.1			0.280
I			3.93			0.155
L		3.3			0.130	
Z			1.34			0.053

OUTLINE AND MECHANICAL DATA



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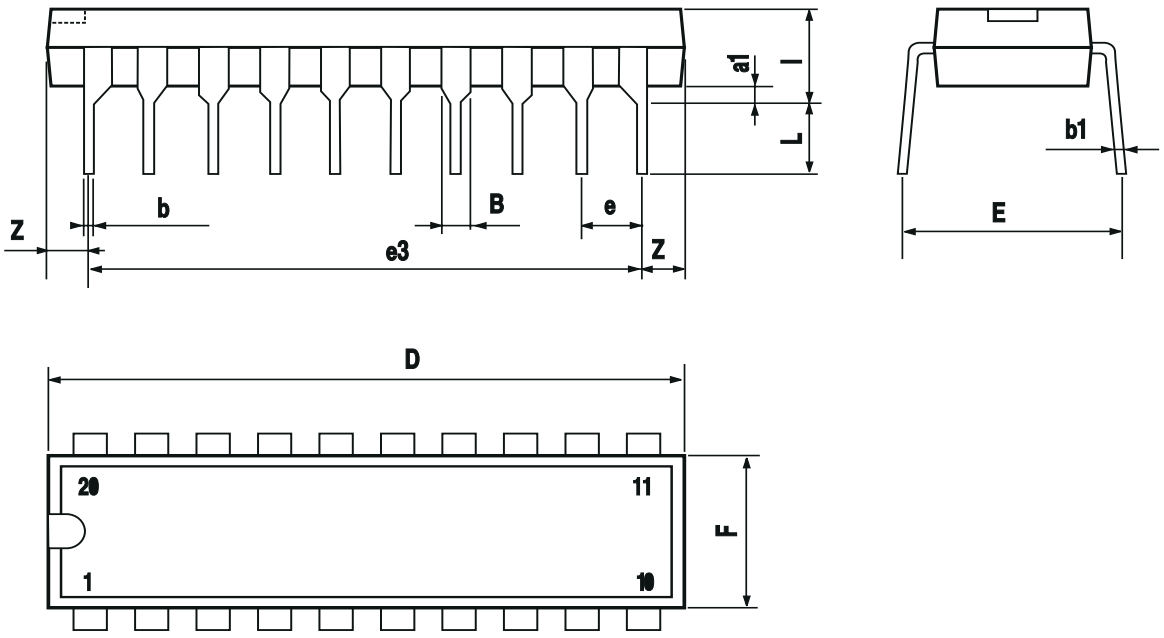
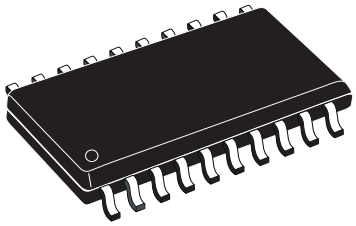


DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	2.35		2.65	0.093		0.104
A1	0.1		0.3	0.004		0.012
B	0.33		0.51	0.013		0.020
C	0.23		0.32	0.009		0.013
D	12.6		13	0.496		0.512
E	7.4		7.6	0.291		0.299
e		1.27			0.050	
H	10		10.65	0.394		0.419
h	0.25		0.75	0.010		0.030
L	0.4		1.27	0.016		0.050
K	0˚ (min.)8˚ (max.)					

OUTLINE AND MECHANICAL DATA



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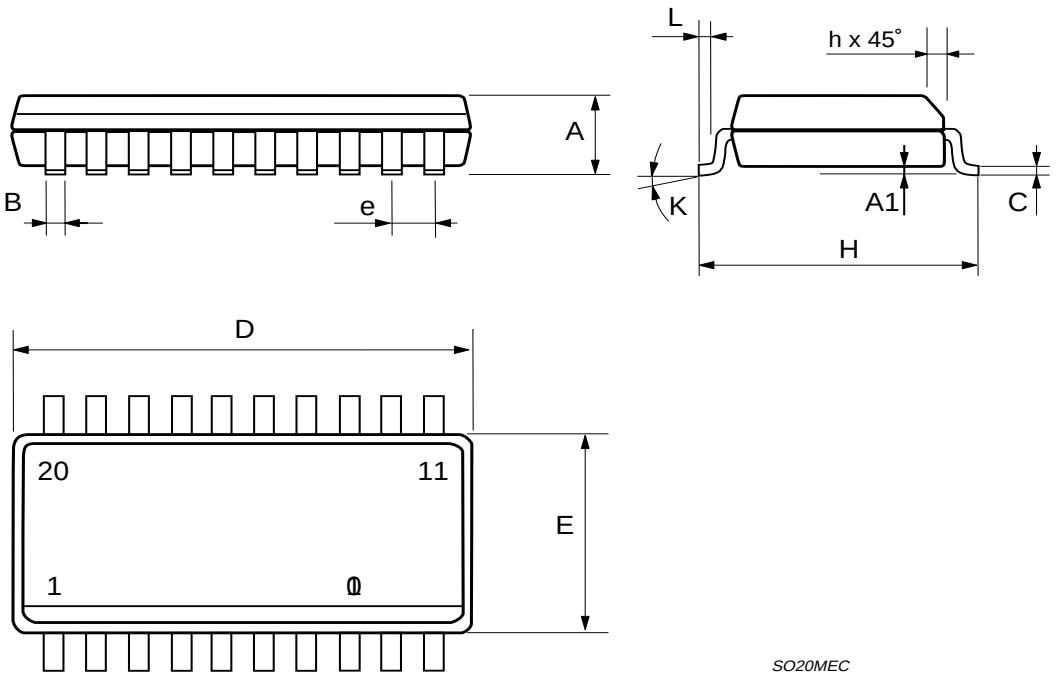

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