

# Audio Amplifiers

## Speaker Amplifiers

Portable Amplifier 1.9W+1.9W Stereo Speaker Amplifier													
Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Standby Current (μA)	Voltage Gain (dB)	Output Power (W)		Distortion (%)	Output Noise Voltage (μVrms)	Package			
BD7836EFV	4.5 to 5.5	1.0	5	0.1	6/10/15.6/21.6	1.9 (V <sub>DD</sub> =5V, 4Ω, THD+N=1%)		0.1	16	HTSSOP-B20			
Portable Amplifier 1.1W to 1.5W Monaural Speaker Amplifier													
Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Standby Current (μA)	Voltage Gain (dB)	Output Power (R <sub>L</sub> =8Ω, THD=10%)		Distortion (%)	Output Noise Voltage (dBV)	Package			
						V <sub>CC</sub> =3.6V	V <sub>CC</sub> =5.0V						
BD7830NUV	2.4 to 5.5	0.53	3.2	0	0 to 20	0.77W	1.5W	0.1	-100	VSON008V2030			
Portable Amplifiers Analog Input Monaural Class-D Speaker Amplifiers													
Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Voltage Gain (dB)	Output Power (W)		Distortion (%)	Output Noise Voltage (μVrms)	ALC Circuit	Package (mm)			
					(V <sub>DD</sub> =5V, R <sub>L</sub> =4Ω, THD+N=10%)	(V <sub>DD</sub> =3.6V, R <sub>L</sub> =8Ω, THD+N=10%)							
BD5460GUL	2.5 to 5.5	0.69	2.0 (V <sub>DD</sub> =3.6V)	6	2.5 (V <sub>DD</sub> =5V, R <sub>L</sub> =4Ω, THD+N=10%)	0.85 (V <sub>DD</sub> =3.6V, R <sub>L</sub> =8Ω, THD+N=10%)	0.3 (V <sub>DD</sub> =3.6V)	30	—	VCSP50L1 1.6x1.6			
BD5461GUL	2.5 to 5.5	0.69	2.0 (V <sub>DD</sub> =3.6V)	12	2.5 (V <sub>DD</sub> =5V, R <sub>L</sub> =4Ω, THD+N=10%)	0.85 (V <sub>DD</sub> =3.6V, R <sub>L</sub> =8Ω, THD+N=10%)	0.3 (V <sub>DD</sub> =3.6V)	40	—	VCSP50L1 1.6x1.6			
BD27400GUL	2.5 to 5.5	0.69	2.9 (V <sub>DD</sub> =3.6V)	External Variable	2.5 (V <sub>DD</sub> =5V, R <sub>L</sub> =4Ω, THD+N=10%)	0.85 (V <sub>DD</sub> =3.6V, R <sub>L</sub> =8Ω, THD+N=10%)	0.3 (V <sub>DD</sub> =3.6V)	40	—	VCSP50L1 1.5x1.5			
BD5632NUX	2.5 to 5.5	0.52	2.7 (V <sub>DD</sub> =3.6V)	6	2.5 (V <sub>DD</sub> =5V, R <sub>L</sub> =4Ω, THD+N=10%)	0.85 (V <sub>DD</sub> =3.6V, R <sub>L</sub> =8Ω, THD+N=10%)	0.3 (V <sub>DD</sub> =3.6V)	40	—	VSON008X2030			
BD5634NUX	2.5 to 5.5	0.52	2.7 (V <sub>DD</sub> =3.6V)	12	2.5 (V <sub>DD</sub> =5V, R <sub>L</sub> =4Ω, THD+N=10%)	0.85 (V <sub>DD</sub> =3.6V, R <sub>L</sub> =8Ω, THD+N=10%)	0.3 (V <sub>DD</sub> =3.6V)	40	—	VSON008X2030			
BD5638NUX	2.5 to 5.5	0.52	2.7 (V <sub>DD</sub> =3.6V)	18	2.5 (V <sub>DD</sub> =5V, R <sub>L</sub> =4Ω, THD+N=10%)	0.85 (V <sub>DD</sub> =3.6V, R <sub>L</sub> =8Ω, THD+N=10%)	0.3 (V <sub>DD</sub> =3.6V)	40	—	VSON008X2030			
BD5465GUL	2.5 to 5.5	0.69	3.3 (V <sub>DD</sub> =3.6V)	12	0.6 (V <sub>DD</sub> =3.6 to 5.5V)		0.3 (V <sub>DD</sub> =3.6V)	40	✓	VCSP50L1 1.8x1.8			
BD5466GUL	2.5 to 5.5	0.69	3.0 (V <sub>DD</sub> =3.6V)	18	1.5 (V <sub>DD</sub> =5V, R <sub>L</sub> =4Ω, THD+N≤1%)	0.5 (V <sub>DD</sub> =3.6V, R <sub>L</sub> =8Ω, THD+N≤1%)	0.3 (V <sub>DD</sub> =3.6V)	40	✓	VCSP50L1 1.7x1.7			
BD5467GUL	2.5 to 5.5	0.69	3.0 (V <sub>DD</sub> =3.6V)	13	1.5 (V <sub>DD</sub> =5V, R <sub>L</sub> =4Ω, THD+N≤1%)	0.5 (V <sub>DD</sub> =3.6V, R <sub>L</sub> =8Ω, THD+N≤1%)	0.3 (V <sub>DD</sub> =3.6V)	40	✓	VCSP50L1 1.7x1.7			
BD5468GUL	2.5 to 5.5	0.69	3.0 (V <sub>DD</sub> =3.6V)	13	1.5 (V <sub>DD</sub> =5V, R <sub>L</sub> =4Ω, THD+N≤1%)	0.5 (V <sub>DD</sub> =3.6V, R <sub>L</sub> =8Ω, THD+N≤1%)	0.3 (V <sub>DD</sub> =3.6V)	40	✓	VCSP50L1 1.7x1.7			
BD5469GUL	2.5 to 5.5	0.69	3.0 (V <sub>DD</sub> =3.6V)	13	0.88 (V <sub>DD</sub> =4.2V, R <sub>L</sub> =8Ω, THD+N≤1%)	0.64 (V <sub>DD</sub> =3.6V, R <sub>L</sub> =8Ω, THD+N≤1%)	0.3 (V <sub>DD</sub> =3.6V)	40	✓	VCSP50L1 1.7x1.7			
Portable Amplifier Analog Input Stereo Class-D Speaker Amplifier													
Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Voltage Gain (dB)	Output Power (W)		Distortion (%)	Output Noise Voltage (μVrms)	Max LDO Current (mA)	Package			
BD28412MUV	4.5 to 13.0	3.20	16 (V <sub>CC</sub> =11V)	20/26/ 32/36	18 (V <sub>CC</sub> =12V, R <sub>L</sub> =4Ω, THD+N=10%, PBTL)	9 (V <sub>CC</sub> =12V, R <sub>L</sub> =8Ω, THD+N=10%)	0.03 (V <sub>CC</sub> =11V)	100	—	VQFN032V5050			
Mid./High-Power Amplifier Class-D Speaker Amplifiers for Digital Input with Built-in DSP													
Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Output Power (W)		Distortion (%)	Output Noise Voltage (μVrms)	DSP					Package
				(V <sub>CC</sub> =13V, R <sub>L</sub> =8Ω)	(V <sub>CC</sub> =18V, R <sub>L</sub> =8Ω)			Volume	DC Cut HPF	Hard Clipper	Parametric EQ	DRC	
BM28723AMUV	10 to 24	4.56 (4-Layer Board)	45 (V <sub>CC</sub> =18V)	10 (V <sub>CC</sub> =13V, R <sub>L</sub> =8Ω)	17 (V <sub>CC</sub> =18V, R <sub>L</sub> =8Ω)	0.08	150	✓	✓	✓	✓ (12 Band)	✓ (3 Band)	VQFN032V5050

Audio & Video

**Mid./High-Power Amplifier Class-D Speaker Amplifier for Digital Input**

Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Output Power (W)		Distortion (%)	Output Noise Voltage ( $\mu$ Vrms)	Power Limiter Function	Package
<b>BD28623MUV</b>	8.5 to 24.0	3.56 (4-Layer Board) 2.21 (2-Layer Board)	40 ( $V_{CC}=18V$ )	–	15 ( $V_{CC}=16V, R_L=8\Omega$ )	0.08	150	✓ (GAIN)	VQFN024V4040

**Mid./High-Power Amplifiers Analog Input/BTL Output Class-D Speaker Amplifiers**

Part No.	Supply Voltage (V)	Power Dissipation (W)	Quiescent Current (mA)	Voltage Gain (dB)	Output Power (W)		Distortion (%)	Output Noise Voltage ( $\mu$ Vrms)	Power Limiter Function	Package
<b>BD5424EFS</b>	10.0 to 18.0	4.5 (4-Layer Board) 2.0 (2-Layer Board)	30 ( $V_{CC}=12V$ )	28	10 ( $V_{CC}=12V, R_L=8\Omega$ )	20 ( $V_{CC}=17V, R_L=8\Omega$ )	0.1	80	✓ (Power Limiter)	HTSSOP-A44
<b>BD5423AEFS</b>	10.0 to 16.5	4.5 (4-Layer Board) 2.0 (2-Layer Board)	25 ( $V_{CC}=12V$ )	28	10 ( $V_{CC}=12V, R_L=8\Omega$ )	17 ( $V_{CC}=12V, R_L=4\Omega$ )	0.1	80	✓ (Power Limiter)	HTSSOP-A44
<b>BD5426EFS</b>	10.0 to 16.5	4.5 (4-Layer Board) 2.0 (2-Layer Board)	25 ( $V_{CC}=12V$ )	28	9 ( $V_{CC}=12V, R_L=8\Omega$ )	10 ( $V_{CC}=13V, R_L=8\Omega$ )	0.1	80	✓ (Power Limiter)	HTSSOP-A44
<b>BD5413EFV</b>	6.0 to 10.5	2.8 (4-Layer Board) 1.1 (2-Layer Board)	12 ( $V_{CC}=9V$ )	30	4 ( $V_{CC}=9V, R_L=8\Omega$ )	5 ( $V_{CC}=9V, R_L=6\Omega$ )	0.2	90	–	HTSSOP-B24

**Headphone Amplifiers**

**Ultra-Compact Coupling Capacitorless Headphone Amplifiers**

Part No.	Supply Voltage (V)	Quiescent Current (mA)	Gain (V/V)	Maximum Output Power (mW)	Distortion (%)	Output Noise Voltage ( $\mu$ Vrms)	Ripple Rejection (dB)	Note	Package (mm)
<b>BD88200GUL</b>	2.4 to 5.5	2	Variable Gain with external resistor	80 ( $V_{DD}=3.3V, R_L=16\Omega$ )	0.006 ( $V_{DD}=3.3V, R_L=16\Omega$ )	10	–80 ( $f=217Hz$ )	Virtual ground based	VCSP50L2 2.1x2.1
<b>BD88210GUL</b>	2.4 to 5.5	2	–1.0	80 ( $V_{DD}=3.3V, R_L=16\Omega$ )	0.006 ( $V_{DD}=3.3V, R_L=16\Omega$ )	10	–80 ( $f=217Hz$ )	Virtual ground based	VCSP50L2 2.1x2.1
<b>BD88215GUL</b>	2.4 to 5.5	2	–1.5	80 ( $V_{DD}=3.3V, R_L=16\Omega$ )	0.006 ( $V_{DD}=3.3V, R_L=16\Omega$ )	10	–80 ( $f=217Hz$ )	Virtual ground based	VCSP50L2 2.1x2.1
<b>BD88220GUL</b>	2.4 to 5.5	2	–2.0	80 ( $V_{DD}=3.3V, R_L=16\Omega$ )	0.006 ( $V_{DD}=3.3V, R_L=16\Omega$ )	10	–80 ( $f=217Hz$ )	Virtual ground based	VCSP50L2 2.1x2.1
<b>BD88400GUL</b>	2.4 to 5.5	2	Variable Gain with external resistor	80 ( $V_{DD}=3.3V, R_L=16\Omega$ )	0.006 ( $V_{DD}=3.3V, R_L=16\Omega$ )	10	–80 ( $f=217Hz$ )	Ground based	VCSP50L2 2.1x2.1
<b>BD88400FJ</b>	2.4 to 5.5	2	Variable Gain with external resistor	80 ( $V_{DD}=3.3V, R_L=16\Omega$ )	0.006 ( $V_{DD}=3.3V, R_L=16\Omega$ )	10	–80 ( $f=217Hz$ )	Ground based	SOP-J14
<b>BD88410GUL</b>	2.4 to 5.5	2	–1.0	80 ( $V_{DD}=3.3V, R_L=16\Omega$ )	0.006 ( $V_{DD}=3.3V, R_L=16\Omega$ )	10	–80 ( $f=217Hz$ )	Ground based	VCSP50L2 2.1x2.1
<b>BD88415GUL</b>	2.4 to 5.5	2	–1.5	80 ( $V_{DD}=3.3V, R_L=16\Omega$ )	0.006 ( $V_{DD}=3.3V, R_L=16\Omega$ )	10	–80 ( $f=217Hz$ )	Ground based	VCSP50L2 2.1x2.1
<b>BD88420GUL</b>	2.4 to 5.5	2	–2.0	80 ( $V_{DD}=3.3V, R_L=16\Omega$ )	0.006 ( $V_{DD}=3.3V, R_L=16\Omega$ )	10	–80 ( $f=217Hz$ )	Ground based	VCSP50L2 2.1x2.1

**Headphone Amplifier Designed for 0.93V Low Voltage Operation**

Part No.	Supply Voltage (V)	Quiescent Current (mA)	Maximum Output Power (mW)		Distortion (%)		Output Noise Voltage ( $\mu$ Vrms)	Package
			Single-ended (16 $\Omega$ )	BTL (8 $\Omega$ )	Single-ended (16 $\Omega$ )	BTL (8 $\Omega$ )		
<b>BU7150NUV</b>	0.93 to 3.50 ( $T_a=0^\circ C$ or more)	1	14 ( $V_{DD}=1.5V$ )	85 ( $V_{DD}=1.5V$ )	0.1 ( $P_o=5mW$ )	0.2 ( $P_o=25mW$ )	10	VSON010V3030

**Standard Headphone Amplifiers**

Part No.	Supply Voltage (V)	Quiescent Current (mA)	Voltage Gain (dB)	Maximum Output Power (mW) $R_L=16\Omega$	Distortion (%)	Ripple Rejection (dB)	Package
<b>BH3544F</b>	2.8 to 6.5	7.0	6	62	0.02	57	SOP8
<b>BH3547F</b>	4.5 to 6.5	3.7	6	77	0.05	57	SOP8
<b>BH3548F</b>	4.0 to 5.5	6.5	6	62 (120@ $R_L=8\Omega$ )	0.02	57	SOP8

## Others

Audio Subsystems															
Part No.	Supply Voltage (V)	Power Dissipation (mW)	Quiescent Current (mA)	Standby Current (μA)	SP Amplifier			HP Amplifier			Package				
					Voltage Gain (dB)	Distortion (%)	Output Power (W) V <sub>CC</sub> =5V	Voltage Gain (dB)	Distortion (%)	HP AMP/Maximum Output Voltage (dBV) V <sub>CC</sub> =3.3V					
BH7881EFV	3.3 to 5.5	1,100	18	0	11 (SE)/ 17 (BTL)	0.04	2	5.5	0.02	1.4	HTSSOP-B24				
BH7884EFV	3.0 to 5.5	1,100	9	0.2	12 (SE)/ 18.2 (BTL)	0.1	1	5.6	0.03	1.0	HTSSOP-B24				

  

Line Amplifier (OP Amp)															
Part No.	Supply Voltage (V)	Circuit Current (mA)	Open Loop Gain (dB)	Input	CMRR (dB)	Supply Voltage Rejection Ratio (dB)	Common-mode Input Voltage Range (V) V <sub>CC</sub> =8V	Offset Voltage (mV)	Offset Current (nA)	Input Bias Current (nA)	Distortion (%)	ch Separation (dB)	Gain Bandwidth Product (MHz)	Slew Rate (V/μs)	Package
BA3131FS	6.0 to 16.0	4.9	110	3	72	90	6	0.5	5	50	0.0025	115	2.6	1.2	SSOP-A20

  

Line Amplifiers (Output Coupling Capacitor-less Line Amplifiers)											
Part No.	Supply Voltage (V)	Circuit Current (mA)	ch	Voltage Gain (dB)	Maximum Output Voltage (Vrms)	Distortion (%)	Output Noise Voltage (μVrms)	Channel Separation (dB)	Ripple Rejection (dB)	Charge Pump	Package
BD8876FV	3.0 to 5.5	3.2	2	6 or 9	3.5	0.003	8	80	65	✓	SSOP-B14
BD8878FV	3.0 to 5.5	3.2	2	6.7	3.0	0.003	10	65	65	✓	SSOP-B14

  

Isolation Amplifiers													
Part No.	Supply Voltage (V)	Operating Temperature (°C)	Circuit	Circuit Current (mA)	Voltage Gain (dB)	CMRR (dB)	Common-mode Input Voltage Range (V) V <sub>CC</sub> =8V	THD (%)	Output Noise Voltage (μVrms)	Channel Separation (dB)	Slew Rate (V/μs)	Input Resistance (kΩ)	Package
BA3121F	4.0 to 18.0	-30 to +85	2	9.0	-0.04	57	3.75	0.002	3.5	82	2.0	55	SOP8
BA3123F	4.0 to 18.0	-40 to +85	2	9.0	-0.04	57	3.75	0.002	3.5	82	2.0	55	SOP8

## Power Supply ICs for Audio

### Power Supply ICs for High Fidelity Audio

\*The following products are belonging to ICs. (Refer P.43) Please ensure that minimum Input Voltage always exceeds the sum of Output Voltage and drop out voltage for the device.

Power Supply ICs for High Fidelity Audio											
Part No.	Output Current (A)	Input Voltage (V)	Output Voltage (V)	Reference Voltage Accuracy (%)	Dropout Voltage (mV)	Noise Level (μVrms)	PSRR (dB)	Over Current Protection	Thermal Protection	Package	
BD37201NUX	0.5	2.7 to 5.5	Variable 1.0 to 4.5	±1	200	4.72	90 (f=1kHz) 55 (f=1MHz)	✓	✓	VSON008X2030	

## Audio Processors

### Analog Audio Processors

6ch/8ch Sound Processors with Built-in Micro-step Volume												
Part No.	Supply Voltage (V)	Circuit Current (mA)	Output Noise Voltage (μVrms)	Distortion (%)	Selector	Main Volume (dB)		Zone Volume (dB)		Tone Control	Serial Control	Package
						ch	ch	ch	ch			
BD34704KS2	±6.5 to ±7.5	±32	1.2	0.0004	18	+32 to -95 0.5/Step	8	+7.5 to -91.5 0.5/Step	2	—	2Wire	SQFP-T80C
BD34705KS2	±6.5 to ±7.5	±32	1.2	0.0004	12	+32 to -95 0.5/Step	8	+6 to -16 1/Step, -16 to -56 2/Step	2	—	2Wire	SQFP-T64
BD34701KS2	±6.5 to ±7.5	±22	1.5	0.0004	8	+32 to -95 0.5/Step	8	—	—	—	2Wire	SQFP-T52
BD3471KS2	±6.5 to ±7.5	±30	1.5	0.0004	12	+24 to -95 0.5/Step	8	—	—	—	2Wire	SQFP-T80C
BD3473KS2	±6.5 to ±7.5	±30	1.5	0.0004	12	+24 to -95 0.5/Step	8	—	—	Bass, Treble	2Wire	SQFP-T80C
BD3474KS2	±6.5 to ±7.5	±30	1.5	0.0004	12	+32 to -95 0.5/Step	8	—	—	Bass, Treble	2Wire	SQFP-T80C

  

2ch/4ch/6ch Sound Processors												
Part No.	Supply Voltage (V)	Circuit Current (mA)	Output Noise Voltage (μVrms)	Distortion (%)	Selector	Main Volume (dB)	ch	Zone Volume (dB)	ch	Tone Control	Serial Control	Package
BD34700FV	±6.5 to ±7.5	±22	1.5	0.0004	—	+32 to -95 0.5/Step	4	—	—	—	2Wire	SSOP-B40
BD34710FV	±6.5 to ±7.5	±22	1.5	0.0004	3	+32 to -95 0.5/Step	6	—	—	—	2Wire	SSOP-B40
BD3812F	±5.0 to ±7.3	±2	1.2	0.0050	—	0,6 to 18 2/Step, 0 to -103 1/Step	2	—	—	—	2Wire	SOP14
BD3814FV	±5.0 to ±7.3	±7	1.0	0.001	—	0 to -95 1/Step	6	—	—	Bass, Treble	2Wire	SSOP-B40

: Under Development

**6ch Sound Processors**

Part No.	Supply Voltage (V)	Circuit Current (mA)	Output Noise Voltage ( $\mu$ Vrms)	Distortion (%)	Selector	Input Gain (dB)	Output Gain (dB)	Volume (dB)	Volume	Tone Control	Bass Boost	Serial Control	Package
<b>BD3811K1</b>	$\pm 5.0$ to $\pm 7.3$	$\pm 15$	2.0	0.005	8	0, 6	0, 6 to 18, 2/Step	0 to -103, 1/Step	6	Bass, Treble	23mm	2Wire	QFP80

**7ch Sound Processors**

Part No.	Supply Voltage (V)	Current Consumption (mA)	Output Noise Voltage ( $\mu$ Vrms)	Distortion (%)	Selector	Input Gain (dB)	Output Gain (dB)	Volume (dB)	Volume	Tone Control	Serial Control	Package
<b>BD3816K1</b>	$\pm 5.0$ to $\pm 7.3$	$\pm 24$	1.2	0.001	7	0 to 7, 1/Step	0 to 17, 1/Step	0 to -95, 1/Step	7	Bass, Treble	2Wire	QFP80
<b>BD3817KS</b>	$\pm 5.0$ to $\pm 7.3$	$\pm 24$	1.2	0.001	10	0 to 7, 1/Step	0 to 17, 1/Step	0 to -95, 1/Step	7	Bass, Treble	2Wire	SQFP100

**6ch/9ch Stereo Input Selector ICs Maximum Input Voltage: 4.2V**

Part No.	Supply Voltage (V)	Current Consumption (mA)	Output Noise Voltage ( $\mu$ Vrms)	Distortion (%)	Selector	Serial Control	Package
<b>BD3843FS</b>	$\pm 4.0$ to $\pm 7.3$	$\pm 3$	1.0	0.004	6	2Wire	SSOP-A24
<b>BD3841FS</b>	$\pm 5.0$ to $\pm 7.3$	$\pm 3$	1.0	0.004	9	2Wire	SSOP-A32

**Sound Processors with Built-in 2-band Equalizer**

Part No.	Supply Voltage (V)	Current Consumption (mA)	Selector		Input Gain (dB)	Volume (dB)	Fader		Parametric EQ	Loudness	LPF for Sub Woofer	Option	Serial Control	Output Noise Voltage ( $\mu$ Vrms)	Distortion (%)	Package
			Single	Diff.			(dB)	Output								
<b>BD37503FV</b>	7.0 to 9.5	20	3	1	0 to +20	0 to -36, - $\infty$	0 to -63, - $\infty$	4	-	$\checkmark^*$	-	Anti-aliasing Filter*	I <sup>2</sup> C BUS	5.8	0.001	SSOP-B20
<b>BD37511FS</b>	7.0 to 9.5	15	3	0	0 to +20	0 to -40	0 to -62, - $\infty$	4	-	-	-	-	I <sup>2</sup> C BUS	6.0	0.005	SSOP-A20
<b>BD37512FS</b>	7.0 to 9.5	15	3	1	0 to +20	0 to -40	0 to -62, - $\infty$	4	-	-	-	-	I <sup>2</sup> C BUS	6.0	0.005	SSOP-A20
<b>BD37513FS</b>	7.0 to 9.5	38	3	1	0 to +20	+15 to -79, - $\infty$	0 to -79, - $\infty$	4	-	$\checkmark$	-	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-A20
<b>BD37514FS</b>	7.0 to 9.5	38	3	1	0 to +20	+15 to -79, - $\infty$	0 to -79, - $\infty$	5	$\checkmark$	$\checkmark$	-	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-A20
<b>BD37515FS</b>	7.0 to 9.5	38	3	1	0 to +20	+15 to -79, - $\infty$	+15 to -79, - $\infty$	5	$\checkmark$	$\checkmark$	$\checkmark$	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-A20
<b>BD37521FS</b>	7.0 to 9.5	38	3	1	0 to +20	+15 to -79, - $\infty$	0 to -79, - $\infty$	4	-	EXT	-	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-A24
<b>BD37522FS</b>	7.0 to 9.5	38	4	1	0 to +20	+15 to -79, - $\infty$	0 to -79, - $\infty$	4	$\checkmark$	$\checkmark$	-	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-A24
<b>BD37523FS</b>	7.0 to 9.5	38	4	1	0 to +20	+15 to -79, - $\infty$	+15 to -79, - $\infty$	5	$\checkmark$	$\checkmark$	$\checkmark$	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-A24
<b>BD3870FS</b>	4.5 to 9.5	8	3	-	0/6/12/18	0 to -87, - $\infty$	-	2	EXT	-	-	Surround	2Wire	4.5	0.01	SSOP-A24
<b>BD3871FS</b>	4.5 to 9.5	8	3	-	24/26/28	0 to -87, - $\infty$	-	2	EXT	-	-	Surround	2Wire	40 (Gv=24dB)	0.01	SSOP-A24
<b>BD3872FS</b>	4.5 to 9.5	8	5	-	0/5/10/19/23/26/28	0 to -87, - $\infty$	-	2	EXT	-	-	Surround	2Wire	4.5	0.01	SSOP-A32
<b>BD3873FS</b>	4.5 to 9.5	8	3	-	18/21/24/27	0 to -87, - $\infty$	-	2	EXT	-	-	Surround	2Wire	40 (Gv=24dB)	0.01	SSOP-A24
<b>BD3490FV</b>	4.75 to 9.50	7	4	-	0/2/4/6/8/12/16/20	0 to -87 (2ch Independent control), - $\infty$	-	2	EXT	-	-	Bass Boost, Surround	I <sup>2</sup> C BUS	5.0	0.002	SSOP-B28
<b>BD3491FS</b>	4.75 to 9.50	7	6	-	0/2/4/6/8/12/16/20	0 to -87 (2ch Independent control), - $\infty$	-	2	EXT	-	-	Bass Boost, Surround	I <sup>2</sup> C BUS	5.0	0.002	SSOP-A32

Sound Processors with Built-in 2-band Equalizer: Built-in Bass and Treble control \*Loudness and Anti-aliasing Filter can be used exclusively. EXT: Set by external components  
 BD37511FS and BD37512FS are all function-compatible. BD37513FS, BD37514FS and BD37515FS are all function-compatible. BD37522FS and BD37523FS are all function-compatible.

## Analog Audio Processors

Sound Processors with Built-in 3-band Equalizer																			
Part No.	Supply Voltage (V)	Current Consumption (mA)	Selector		Input Gain (dB)	Fader		Outputs	Parametric EQ	Loudness	LPF/HPF for Sub Woofer	Mixing		Level Meter	Option	Serial Control	Output Noise Voltage ( $\mu$ Vrms)	Distortion (%)	Package
			Single	Diff.		(dB)	Outputs					ATT							
BD37524FS	7.0 to 9.5	38	4	1	0 to +20	+15 to -79, - $\infty$	+15 to -79, - $\infty$	6	✓	✓	LPF	-	-	✓	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-A24
BD37531FV	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to -79, - $\infty$	+15 to -79, - $\infty$	6	✓	✓	-	-	-	-	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-B28
BD37532FV	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to -79, - $\infty$	+15 to -79, - $\infty$	6	✓	✓	LPF	-	-	-	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-B28
BD37533FV	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to -79, - $\infty$	+15 to -79, - $\infty$	6	✓	✓	LPF	✓	✓	-	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-B28
BD37534FV	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to -79, - $\infty$	+15 to -79, - $\infty$	6	✓	✓	LPF	✓	✓	✓	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-B28
BD37541FS	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to -79, - $\infty$	0 to -79, - $\infty$	6	✓	EXT	-	✓	-	-	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-B28
BD37542FS	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to -79, - $\infty$	+15 to -79, - $\infty$	6	✓	EXT	LPF	✓	✓	-	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-A32
BD37543FS	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to -79, - $\infty$	+15 to -79, - $\infty$	6	✓	EXT	LPF+HPF	✓	✓	✓	-	I <sup>2</sup> C BUS	3.8	0.001	SSOP-A32
BD37544FS	7.0 to 9.5	38	1/3/4	3/2/1	0 to +20	+15 to -79, - $\infty$	+15 to -79, - $\infty$	6	✓	-	LPF+HPF	✓	✓	-	Super Bass	I <sup>2</sup> C BUS	3.8	0.001	SSOP-A32
BD37545FS	7.0 to 9.5	38	2/3/5	3/2/1	0 to +20	+15 to -79, - $\infty$	+15 to -79, - $\infty$	6	✓	-	LPF+HPF	✓	✓	✓	External I/O	I <sup>2</sup> C BUS	3.8	0.001	SSOP-A32
BD37033FV-M	7.0 to 9.5	31	3/5	2/1	0 to +16	+15 to -79, - $\infty$	+15 to -79, - $\infty$	6	✓	✓	LPF	✓	✓	✓	-	I <sup>2</sup> C BUS	5.5	0.002	SSOP-B28
BD37034FV-M	7.0 to 9.5 V <sub>ccL</sub> to 13	36	3/5	2/1	0 to +16	+15 to -79, - $\infty$	+15 to -79, - $\infty$	6	✓	✓	LPF+HPF	✓	✓	✓	High Voltage Output	I <sup>2</sup> C BUS	6.0	0.002	SSOP-B28
BD3883FS	6.5 to 9.5	8	5	-	0/6/12/16/20/23/26/29	0 to -87, - $\infty$	0/-10	2	EXT	-	-	-	-	-	Surround	2Wire	4.0	0.01	SSOP-A32
BD3403FV	6.5 to 9.5	16	5	-	0 to +26 (2/Step)	0 to -30 (2/Step)	0 to -59, - $\infty$	2	EXT	-	-	-	-	-	Surround	2Wire	8.0	0.02	SSOP-B40

  

General-Purpose Electronic Volume with Built-in Advanced Switch																		
Part No.	Supply Voltage (V)	Current Consumption (mA)	Selector		Input Gain (dB)	Fader Volume (dB)	Outputs	Mixing		Post Filter	High-Voltage Output (dB)	Serial Control	Output Noise Voltage ( $\mu$ Vrms)	Distortion (%)	Package			
			Single	Diff.				ch	ATT (dB)									
BD3464FV	7.0 to 9.5	25	-	-	-	+23 to -79, - $\infty$ (1/Step)	4	-	-	-	-	I <sup>2</sup> C BUS	1.9	0.0004	SSOP-B20			
BD3465FV	7.0 to 9.5	25	-	-	-	+23 to -79, - $\infty$ (1/Step)	4	3	+0 to -64, - $\infty$ (8/Step)	-	-	I <sup>2</sup> C BUS	1.9	0.0004	SSOP-B20			
BD3460FS	7.0 to 9.5	25	-	-	-	+23 to -79, - $\infty$ (1/Step)	6	-	-	-	-	I <sup>2</sup> C BUS	1.9	0.0004	SSOP-A24			
BD3461FS	7.0 to 9.5	25	-	-	-	+23 to -79, - $\infty$ (1/Step)	6	3	+0 to -64, - $\infty$ (8/Step)	-	-	I <sup>2</sup> C BUS	1.9	0.0004	SSOP-A24			
BD34602FS-M	7.0 to 9.5	35	-	-	-	+23 to -79, - $\infty$ (1/Step)	6	3	+0 to -79, - $\infty$ (1/Step)	-	-	I <sup>2</sup> C BUS	1.3	0.0004	SSOP-A24			
BD37067FV-M	7.0 to 9.5	37	2/3/4/5	4/3/2/1	+23 to -15 (1/Step)	+23 to -79, - $\infty$ (1/Step)	6	1	-	✓	-	I <sup>2</sup> C BUS	8	0.003	SSOP-B40			
BD37068FV-M	7.0 to 9.5 V <sub>ccL</sub> to 17.8	30/7	1/2/3/4/5	5/4/3/2/1	+23 to -15 (1/Step)	+23 to -79, - $\infty$ (1/Step)	6	1	-	✓	0/8.3	I <sup>2</sup> C BUS	23 (High-Voltage Mode)	0.003	SSOP-B40			
BD37069FV-M	7.0 to 9.5 V <sub>ccL</sub> to 17.8	30/7	2/3/4/5	4/3/2/1	+23 to -15 (1/Step)	+23 to -79, - $\infty$ (1/Step)	6	1	-	✓	2/4.6/8.3	I <sup>2</sup> C BUS	23 (High-Voltage Mode)	0.003	SSOP-B40			

  

Single Power Supply Sound Processors with Built-in Pre Amplifier for Tape Recording and Playback																		
Part No.	Supply Voltage (V)	Current Consumption (mA)	Selector	Input Gain (dB)	Volume (dB)	Tone Control	Dynamic Bass	Surround	REC/PB Amplifier	Vocal Cut	Output for Spectrum Analyzer	Serial Control	Output Noise Voltage ( $\mu$ Vrms)	Max Output (Vrms)	Distortion (%)	Package		
BD3402KS2	8.0 to 9.5	28	5	-5/0/3.5	0 to -76/- $\infty$ (2/4/Step)	Bass, Treble	-	-	✓	-	-	2Wire	2.5	2.5	0.005	SQFP-T64		

  

Bandpass Filter ICs for Spectrum Analyzer Display										
Part No.	Supply Voltage (V)	Current Consumption (mA)	Band	Input Mix Amplifier	REC Level Display	Standard Output (V)	Maximum Output (V)	BPF Center Frequency (Hz)	Package	
BA3835F	4.5 to 6.5	8.5	5	✓	-	1.35	4.8	105, 340, 1k, 3.4k, 10.5k	SOP18	
BA3834F	4.5 to 6.5	10.0	7	✓	-	1.35	4.8	68, 170, 420, 1k, 2.4k, 5.9k, 14.4k	SOP18	

Sound Processors with Built-in 3-band Equalize: EXT: Set by external components

BD37531FV, BD37532FV, BD37533FV and BD37534FV are pin-compatible.

BD37541FS, BD37542FS and BD37543FS are pin-compatible. BD37033FV-M and BD37034FV-M are pin-compatible.

General-Purpose Electronic Volume with Built-in Advanced Switch: BD3464FS and BD3465FS are pin-compatible. BD3461FS and BD34602FS-M are pin-compatible. BD37067FV-M and BD37068FV-M are pin-compatible.

## AUDIO SoC

Audio 1Chip System ICs													
Part No.	Supply Voltage (V)	USB I/F	SD I/F	CD DSP	SDRAM	Quad SPI I/F (ch)	SPI I/F	I <sup>2</sup> C I/F	UART I/F	Digital Audio I/F	GPIO (Dedicated pins)	Operating Temperature (°C)	Package
<b>BM94715EKU</b>	HVcc 3.0 to 3.6 LVcc 1.45 to 1.65	USB2.0 Dual Role Full Speed (Host/Device) (1ch)	SDIO	3Beam Method	16Mbit Stack	1	Master 1ch Slave 1ch	Master Slave 2ch	HS UART 2ch	I <sup>2</sup> S IN 2ch 2series, I <sup>2</sup> S OUT 2ch 1series	77 (16)	-40 to +85	HTQFP128UA
<b>BM94803AEKU</b>	HVcc 3.0 to 3.6 LVcc 1.45 to 1.65	USB2.0 Dual Role High Speed (Host/Device) (1ch)	SDIO	3Beam Method	16Mbit Stack	1	Master 1ch Slave 1ch	Master Slave 2ch	HS UART 2ch	I <sup>2</sup> S IN 2ch 2series, I <sup>2</sup> S OUT 2ch 1series	77 (13)	-40 to +85	HTQFP128UA

## Media Decoders

AAC/WMA/MP3/WAV+SD Memory Card+CD-ROM																
Part No.	Supply Voltage (V)	USB	SD	iPod	Serial I/F	Display Information	MP3	WMA	AAC	CD-ROM Mode	CD-ROM File System	MP3 Recording Format	File Search	Audio Output		Package
														Analog	Digital	
<b>BU94605AKV</b>	3.0 to 3.6	USB2.0 Full Speed	MMC SD, miniSD, microSD, SDHC	-	I <sup>2</sup> C BUS	Folder number, File number, Play time, Folder name, File name, TAG (Artist, Album, Title)	MPEG1, 2, 2.5 LAYER1, 2, 3	WMA9 Standard	MPEG4 AAC-LC	Mode1, Mode2, form1/2, Romeo, Joliet	ISO 9660 Level1, 2	-	Search during the playback	Line	I <sup>2</sup> S SPDIF	VQFP80
<b>BU94607AKV</b>	3.0 to 3.6	USB2.0 Full Speed	MMC SD, miniSD, microSD, SDHC	iPod touch, iPhone, iPad	I <sup>2</sup> C BUS	Folder number, File number, Play time, Folder name, File name, TAG (Artist, Album, Title)	MPEG1, 2, 2.5 LAYER1, 2, 3	WMA9 Standard	MPEG4 AAC-LC	Mode1, Mode2, form1/2, Romeo, Joliet	ISO 9660 Level1, 2	-	Search during the playback	Line	I <sup>2</sup> S SPDIF	VQFP80
<b>BU94702AKV</b>	3.0 to 3.6	USB2.0 Full Speed	MMC SD, miniSD, microSD, SDHC	-	I <sup>2</sup> C BUS	Folder number, File number, Play time, Folder name, File name, TAG (Artist, Album, Title)	MPEG1, 2, 2.5 LAYER1, 2, 3	WMA9 Standard	MPEG4 AAC-LC	Mode1, Mode2, form1/2, Romeo, Joliet	ISO 9660 Level1, 2	MPEG1 Layer3 Sample Rate: 32, 44.1, 48kHz Bit Rate: 32, 64, 128, 192, 256, 320kHz	Search during the playback	Line	I <sup>2</sup> S SPDIF	VQFP80
<b>BU94705AKV</b>	3.0 to 3.6	USB2.0 Full Speed	MMC SD, miniSD, microSD, SDHC	iPod touch, iPhone, iPad	I <sup>2</sup> C BUS	Folder number, File number, Play time, Folder name, File name, TAG (Artist, Album, Title)	MPEG1, 2, 2.5 LAYER1, 2, 3	WMA9 Standard	MPEG4 AAC-LC	Mode1, Mode2, form1/2, Romeo, Joliet	ISO 9660 Level1, 2	MPEG1 Layer3 Sample Rate: 32, 44.1, 48kHz Bit Rate: 32, 64, 128, 192, 256, 320kHz	Search during the playback	Line	I <sup>2</sup> S SPDIF	VQFP80

Media Decoders: iPod, iPad and iPhone are registered trademarks of Apple Inc. in the U.S. and other countries. It is necessary to get 'Made for iPod/iPhone/iPad license' for introducing BU94607AKV, BU94705AKV.

## Audio Converters

### Audio Codec

Audio Codec											
Part No.	Supply Voltage (V)	ADC	DAC	Microphone Input	Speaker Output		Headphone Output	Filter		ALC	Package
		ch/bit	ch/bit		Type	Monaural/ Stereo		EQ	Notch		
<b>BU26154MUV</b>	HV <sub>DD</sub> 2.7 to 5.5 LV <sub>DD</sub> 2.7 to 3.6	1ch/24bit	2ch/24bit	1	AB/D	Monaural	Stereo	✓	✓	✓	VQFN040V6060
<b>BU26156RFS</b>	HV <sub>DD</sub> 2.7 to 5.5 LV <sub>DD</sub> 2.7 to 3.6	2ch/24bit	2ch/24bit	2	AB/D	Stereo	Stereo	✓	✓	✓	HTSSOP-A44R



# Video Amplifiers

## Composite Video Amplifiers

Ultra-compact (WL-CSP) Output Capacitor-less 1ch Video Drivers												
Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara.1 (dB)	Freq. Chara.2 (dB)	Input type	LPF	Mute (Standby) (μA)	Output Capa-less	Max Output Level (V <sub>p-p</sub> )	Video Out→In Change Mode	Package (mm)
BH76906GU	2.5 to 3.45	15	6	-0.2 (4.5MHz)	-26 (18MHz)	Bias (150kΩ)	8th order 4.5MHz	0	✓	5.2	—	VCSP85H 1.6x1.6, H=1.0 Max
BH76909GU	2.5 to 3.45	15	9	-0.2 (4.5MHz)	-26 (18MHz)	Bias (150kΩ)	8th order 4.5MHz	0	✓	5.2	—	VCSP85H 1.6x1.6, H=1.0 Max
BH76912GU	2.5 to 3.45	15	12	-0.2 (4.5MHz)	-26 (18MHz)	Bias (150kΩ)	8th order 4.5MHz	0	✓	5.2	—	VCSP85H 1.6x1.6, H=1.0 Max
BH76916GU	2.5 to 3.45	15	16.5	-0.2 (4.5MHz)	-26 (18MHz)	Bias (150kΩ)	8th order 4.5MHz	0	✓	5.2	—	VCSP85H 1.6x1.6, H=1.0 Max
BH76706GU	2.5 to 3.45	15	6	-0.2 (4.5MHz)	-28 (18MHz)	Bias (150kΩ)	8th order 4.5MHz	0	✓	5.2	✓	VCSP85H 1.6x1.6, H=1.0 Max

Output Capacitor-less 1ch Video Drivers												
Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara.1 (dB)	Freq. Chara.2 (dB)	Input type	LPF	Mute (Standby) (μA)	Output Capa-less	Max Output Level (V <sub>p-p</sub> )	Package	
BH76806FVM	2.5 to 3.45	16	6	-0.45 (4.5MHz)	-51 (23.5MHz)	Bias (150kΩ)	8th order 4.5MHz	0	✓	5.2	MSOP8	
BH76809FVM	2.5 to 3.45	16	9	-0.45 (4.5MHz)	-51 (23.5MHz)	Bias (150kΩ)	8th order 4.5MHz	0	✓	5.2	MSOP8	
BH76812FVM	2.5 to 3.45	15	12	-0.45 (4.5MHz)	-51 (23.5MHz)	Bias (150kΩ)	8th order 4.5MHz	0	✓	5.2	MSOP8	
BH76816FVM	2.5 to 3.45	15	16.5	-0.45 (4.5MHz)	-51 (23.5MHz)	Bias (150kΩ)	8th order 4.5MHz	0	✓	5.2	MSOP8	

Compact Low Current 1ch Video Drivers												
Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara.1 (dB)	Freq. Chara.2 (dB)	Input type	LPF	Mute (Standby) (μA)	Output Capa-less	Max Output Level (V <sub>p-p</sub> )	Video Out→In Change Mode	Package
BH76106HFV	2.6 to 5.5	7	6	0.1 (4.5MHz)	-45 (19MHz)	Clamp	8th order 4.5MHz	0	✓	2.6	—	HVSOF6
BH76109HFV	2.6 to 5.5	7	9	0.1 (4.5MHz)	-45 (19MHz)	Clamp	8th order 4.5MHz	0	✓	2.6	—	HVSOF6
BH76112HFV	2.6 to 5.5	7	12	0.1 (4.5MHz)	-45 (19MHz)	Clamp	8th order 4.5MHz	0	✓	2.6	—	HVSOF6
BH76206HFV	2.6 to 5.5	8	6	-0.3 (6MHz)	-40 (27MHz)	Clamp	8th order 6MHz	0	✓	2.6	—	HVSOF6

1ch Video Drivers Built-in Video Switch												
Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara. (dB)	Switchers	Input type	Video Driver	Mute (Standby)	Output Capa-less	Max Output Level (V <sub>p-p</sub> )		Package
										V <sub>CC</sub> =3V	V <sub>CC</sub> =5V	
BH76330FVM	2.8 to 5.5	10	6	0 (10MHz)	3 input-1 output	Clamp	✓	✓ (Standby)	✓	2.7	4.6	MSOP8
BH76331FVM	2.8 to 5.5	10	6	0 (10MHz)	3 input-1 output	Bias	✓	✓ (Standby)	—	2.8	4.6	MSOP8
BH76360FV	2.8 to 5.5	12	6	0 (10MHz)	6 input-1 output	Clamp	✓	✓ (Standby)	✓	2.7	4.6	SSOP-B16
BH76361FV	2.8 to 5.5	12	6	0 (10MHz)	6 input-1 output	Bias	✓	✓ (Standby)	—	2.8	4.6	SSOP-B16

## Video Switches

1ch Video Switch (Wide Band-width)												
Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara. (dB)	Switchers	Input type	Video Driver	Mute (Standby)	Crosstalk (dB)	Max Output Level (V <sub>p-p</sub> )		Package
										V <sub>CC</sub> =3V	V <sub>CC</sub> =5V	
BH76332FVM	2.8 to 5.5	9	0	0 (30MHz)	3 input-1 output	Clamp	—	✓ (Standby)	-65 (4.43MHz)	1.8	3.8	MSOP8
BH76333FVM	2.8 to 5.5	8	0	0 (30MHz)	3 input-1 output	Bias	—	✓ (Standby)	-65 (4.43MHz)	1.9	3.4	MSOP8
BH76362FV	2.8 to 5.5	11	0	0 (30MHz)	6 input-1 output	Clamp	—	✓ (Standby)	-65 (4.43MHz)	1.8	3.8	SSOP-B16
BH76363FV	2.8 to 5.5	11	0	0 (30MHz)	6 input-1 output	Bias	—	✓ (Standby)	-65 (4.43MHz)	1.9	3.4	SSOP-B16

Video and Audio Signal Switcher												
Part No.	Supply Voltage (V)	Video Circuit Current (mA)	Audio Circuit Current (mA)	Video Freq. Chara.1 (dB)	Video Freq. Chara.2 (dB)	Video Amplifier Gain (dB)	Audio Freq. Chara.1 (dB)	Audio Freq. Chara.2 (dB)	Audio Amplifier Gain (dB)	Residual Noise (μVrms)	Package	
BH7649KS2	7.5 to 9.5	34	23	0 (6.75MHz)	-30 (27MHz)	-3/-6/0/+3/+6	-0.5 (24kHz)	-26 (96kHz)	-6/0	20	SQFP-T52	

## Others

Isolation Amplifier												
Part No.	Supply Voltage (V)	Circuit Current (mA)	Amplifier Gain (dB)	Freq. Chara. (dB)	ch	Input type	Video Driver	Input Impedance (kΩ)	CMRR (dB)	Max Output Level (V <sub>p-p</sub> )	Package	
BH7673G	4.5 to 5.5	4.8	0	0 (10MHz)	1	Bias	—	150	60	3.8	SSOP5	

# Image Correction

Image Correction IC for Panel											
Part No.	Supply Voltage (V)			Image Data Size	Control I/F	Input/Output Digital I/F	Image Adjustment	PWM Output	LVDS Transmitter	Package	Automotive Grade AEC-Q100
	V <sub>DD</sub> Core	V <sub>DD</sub> I/O	V <sub>DD</sub> LVDS								
<b>BU1523KV</b>	1.65 to 1.95	3.0 to 3.6	3.0 to 3.6	Supports up to WVGA+ (864x480)	I <sup>2</sup> C BUS	24bit RGB Interface 8bit YUV=4 : 2 : 2 ITU-R BT.656	✓	–	✓	VQFP100	Preparing

  

Video Encoders Built-in Image Correction											
Part No.	Supply Voltage (V)			Image Data Size	Control I/F	Input/Output Digital I/F	Fog Reduction	Video Encoder	Package	Automotive Grade AEC-Q100	
	V <sub>DD</sub> Core	V <sub>DD</sub> I/O	AV <sub>DD</sub>								
<b>BU6521KV</b>	1.4 to 1.6	2.7 to 3.6	2.7 to 3.6	ITU-R BT.656	I <sup>2</sup> C BUS Serial EEPROM Interface	8bit YUV=4 : 2 : 2 ITU-R BT.656	✓	✓	VQFP48C	YES	

# Video LSIs

## Video Decoder

(LAPIS Semiconductor products)

CVBS/S-video											
Part No.	Supply Voltage (V)	Input (Analog)		Output (Digital)	Pixel Frequency	Crystal Oscillator supported	Feature	Operating Temperature (°C)	Package	Halogen Free Support <sup>**</sup>	Automotive Grade <sup>**</sup>
		Terminal	Type								
<b>ML86101A</b>	3.3/1.5	CVBS×4 or CVBS×2+S-video×1 or S-video×2	NTSC PAL SECAM	ITU-R BT.656 YUV 8bit	12.2727MHz, 13.5MHz, 14.3181MHz, 14.75MHz	✓	Simple, small	-40 to +85	P-TQFP48-0707-0.50	✓	YES
<b>ML86V7668A</b>	3.3/2.5	CVBS×4 or CVBS×1+S-video×3		ITU-R BT.656 YUV 8/16bit RGB 18bit	12.2727MHz, 13.5MHz	–	RGB output		P-TQFP100-1414-0.50	✓	YES

  

CVBS/S-video/Component/RGB											
<b>ML86V7675</b>	3.3/1.5	CVBS×4 +(Comp or S-video)×1 +Comp×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8bit	7.9930MHz to 33.333MHz	✓	WVGA, EGA analog RGB supported	-40 to +85	P-TQFP64-1010-0.50	✓	YES

<sup>\*\*</sup> A check mark of halogen free support means that we will be able to ship out the halogen free products. For details, please inquire to the sales.  
<sup>\*\*</sup> Please inquire to the sales for AEC-Q100.

## Video Encoder

(LAPIS Semiconductor products)

CVBS											
Part No.	Supply Voltage (V)	Input (Digital)	Output (Analog)		Pixel Frequency	Crystal Oscillator supported	Feature	Operating Temperature (°C)	Package	Halogen Free Support <sup>**</sup>	Automotive Grade <sup>**</sup>
			Terminal	Type							
<b>ML86V76580</b>	3.3/1.8	ITU-R BT.656 YUV 8bit	CVBS	NTSC PAL	12.2727MHz, 13.5MHz, 14.3181MHz, 14.75MHz	–	75Ω drive	-40 to +85	P-TQFP48-0707-0.50 S-VFBGA25-2.76X2.50-0.50	✓ ✓	YES –
<b>ML86640</b>	3.3	TU-R BT.656 YUV 8/16/24bit RGB 24bit	CVBS	NTSC PAL	13.5MHz, 27MHz, 54MHz	–	75Ω drive P/I conversion	-40 to +105	P-TQFP48-0707-0.50	✓	YES

  

CVBS/S-video/Component/RGB											
<b>ML86V7655</b>	3.3/2.5	ITU-R BT.656 YUV 8/16/24bit RGB 24bit	CVBS S-video Component	NTSC PAL	12.2727MHz, 13.5MHz, 14.3181MHz, 14.75MHz, 18MHz	–	I/P, P/I conversion	-40 to +85	P-TQFP100-1414-0.50	✓	YES

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## Video Interface

(LAPIS Semiconductor products)

LVTTTL/LVDS/MIPI Video Interface											
Part No.	Supply Voltage (V)	Input	Output	Feature	Operating Temperature (°C)	Package	Halogen Free Support <sup>**</sup>	Automotive Grade <sup>**</sup>			
<b>New ML86795</b>	3.3 (1.8)/1.5	ITU-R BT.656 YUV 8bit Single/Dual LVDS (RGB 18/24bit) MIPI-CS12 2ch (RGB565/888, YUV422-8bit) 1Gbps/Lane Max	ITU-R BT.656 YUV 16bit Single/Dual LVDS (RGB 18/24bit) MIPI-CS12 (RGB565/888, YUV422-8bit) Two Virtual Channel Supported 1Gbps/Lane Max	LVTTTL/LVDS/MIPI-CS12 I/F, LVTTTL/LVDS/MIPI to LVTTTL/LVDS/MIPI translate, MIPI Virtual Channel	-40 to +105	P-WQFN64-0909-0.50	✓	YES			

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<sup>\*\*</sup> Please inquire to the sales for AEC-Q100.



### Display Controller Series for Small to Medium-Sized TFT LCD

(LAPIS Semiconductor products)

Video Decoder, Scaler Included														
Part No.	Supply Voltage (V)	Input (Analog)		Input (Digital)	Output	Resolution	OSD	MCU	Feature	Operating Temperature (°C)	Package	Halogen Free Support <sup>*1</sup>	Automotive Grade <sup>*2</sup>	
		Terminal	Type											
<b>ML86V8201</b>	3.3/1.5	CVBS×2 or S-video×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit	ITU-R BT.656 YUV 8bit RGB 18/24bit	QVGA to WVGA	Line	—	Rear camera function Image quality adjustment	-40 to +85	P-TQFP100-1414-0.50	✓	YES	
<b>ML86203</b>		CVBS×1	—	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit	ITU-R BT.656 YUV 8bit Single LVDS (RGB 18/24bit)	VGA to WXGA	—	—	Rear camera function WXGA panel support Image quality adjustment		P-TQFP80-1010-0.40	✓	YES	
<b>ML86207</b>		CVBS×2	NTSC PAL	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit + Single LVDS (RGB 18/24bit)	ITU-R BT.656 YUV 8bit RGB 18/24bit Single LVDS (RGB 18/24bit)		Text Line	—	—		LVTTL/LVDS I/F Digital video input ×2 WXGA panel support Rear camera function Image quality adjustment OSD function	P-TQFP100-1414-0.50	✓	YES
<b>ML86287</b>						LVTTL/LVDS I/F Digital video input ×2 WXGA panel support Rear camera function Picture in Picture Image quality adjustment OSD, ROM-OSD function					P-TQFP128-1414-0.40	✓	YES	
<b>New ML86209</b>		CVBS single×2 or differential×1	NTSC PAL	ITU-R BT.656 or YUV 8/16bit Single/Dual LVDS (RGB 18/24bit) MIPI-CS12 (RGB565/888, YUV422-8bit) 1Gbps/Lane Max	ITU-R BT.656 or MIPI-CS12 (RGB565/888, YUV422-8bit) 1Gbps/Lane Max	VGA to Full HD	—	—	LVTTL/LVDS/MIPI-CS12 I/F Digital video input ×4 Full HD panel support Rear camera function Image quality adjustment OSD, ROM-OSD function		P-TQFP128-1414-0.40	✓	YES	
<b>New ML86289</b>									LVTTL/LVDS/MIPI-CS12 I/F Digital video input ×4 Full HD panel support Rear camera function Picture in Picture Image quality adjustment OSD, ROM-OSD function		P-TQFP128-1414-0.40	✓	YES	
<b>ML86V8202C</b>	3.3/1.8	CVBS×2 + (Comp or S-video)×1 + Comp×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit	ITU-R BT.656 style YUV 8/16/24bit RGB 18/24bit	QVGA to WVGA	—	—	Component video support Image quality adjustment	P-TQFP100-1414-0.50	✓	YES		
<b>ML86240</b>	3.3/1.5	CVBS×4 or CVBS×2 + (Comp or S-video)×1 + Comp×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit 2ch	ITU-R BT.656 YUV 8bit RGB 18/24bit	QVGA to WVGA	—	—	Component video support Digital video input ×2 Rear camera function Image quality adjustment OSD function	P-TFBGA144-1111-0.80	—	YES		
<b>ML86241</b>	3.3 (1.8)/1.5	CVBS×4 or CVBS×2 + (Comp or S-video)×1 + Comp×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit + Single LVDS (RGB 18/24bit)	ITU-R BT.656 YUV 8/16bit + RGB 18/24bit YUV 16bit Single LVDS (RGB 18/24bit)	QVGA to WXGA	Text Line	—	Component video support LVTTL/LVDS I/F Digital video input ×2 WXGA panel support Rear camera function Image quality adjustment OSD, ROM-OSD function	P-TFBGA144-1111-0.80	—	YES		
<b>New ML86243</b>	3.3/1.5	CVBS single×2 or differential×1	NTSC PAL	<sup>*3</sup> ITU-R BT.656 YUV 8/16bit ITU-R BT.1120 like YUV 8/16bit Single/Dual LVDS (YUV 8/16bit RGB 18/24bit)	<sup>*3</sup> ITU-R BT.656 (YUV 8/16bit RGB 24bit) Single/Dual LVDS (RGB 18/24bit) MIPI-CS12 (RGB565/888 YUV422-16bit)				—	—	Multi Input/Output support LVTTL/LVDS/MIPI-CS12/ CVBS I/F Rear camera function Picture in Picture Image quality adjustment OSD, ROM-OSD function State monitor function	P-TQFP128-1414-0.40	—	YES
<b>ML86245</b>	3.3/1.5	—	—	<sup>*3</sup> ITU-R BT.656 YUV 8/16bit ITU-R BT.1120 like YUV 8/16bit Single/Dual LVDS (YUV 8/16bit RGB 18/24bit)	<sup>*3</sup> ITU-R BT.656 (YUV 8/16bit RGB 24bit) Single/Dual LVDS (RGB 18/24bit) MIPI-CS12 (RGB565/888 YUV422-16bit)				—	—	—	P-TQFP128-1414-0.40	—	YES
<b>New ML86321</b>	3.3/1.5	CVBS single×2 or differential×1	NTSC PAL	ITU-R BT.656 YUV 8/16bit MIPI-CS12 (RGB565/888, YUV422-8bit) 1Gbps/Lane Max	Single LVDS (RGB 18/24bit) YUV 8/16bit	—	—	—	Electronic rear-view mirror support 3-screen synthesis Image correction function (Angle/Aspherical/Keystone/Lens distortion correction) OSD, ROM-OSD function (15windows, 1layer) State monitor function	P-TQFP128-1414-0.40	—	YES		

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: Under Development

\*2 Please inquire to the sales for AEC-Q100.

\*3 Please inquire to the sales for input/output specification.

Audio & Video

Image Adjustment Functions Included													
Part No.	Supply Voltage (V)	Input (Analog)		Input (Digital)	Output	Resolution	OSD	MCU	Feature	Operating Temperature (°C)	Package	Halogen Free Support <sup>*1</sup>	Automotive Grade <sup>*2</sup>
		Terminal	Type										
ML86V8101	3.3	—	—	RGB 18bit	RGB 18bit	QVGA to QHD	—	—	Image quality adjustment function	-40 to +85	P-TQFP64-1010-0.50	✓	YES
ML86V8102	3.3	—	—	RGB 18/24bit	RGB 18/24bit		—	—	RGB 24bits supported image quality adjustment function		P-TQFP80-1010-0.40	✓	YES
<b>New</b> ML86173	3.3/1.5	—	—	ITU-R BT.656 YCbCr 8/10bit RGB 18/24bit Single/Dual LVDS (RGB 18/24bit)	Single/Dual LVDS (RGB 18/24bit)	WVGA to H2880 (Max) V1080 (Max) (Pixel rate 160MHz Max)	Text	—	Image quality adjustment OSD, ROM OSD function (30windows, 2layers) Frequency conversion function State monitor function		P-TQFP100-1414-0.50	✓	YES
ML86175	3.3/1.5	—	—	ITU-R BT.656 YUV 8/16bit RGB 18/24bit Single/Dual LVDS 4ch (RGB 18/24bit)		H 2048 (Max) V 2048 (Max) (Pixel rate 160MHz Max)	Text	—	Image quality adjustment 90 degree rotation function OSD, ROM OSD function (15windows, 1layer) Frequency conversion function State monitor function		TQFP128-1414-0.40	✓	YES
Video decoder, 8051MCU Included													
ML86V8401	3.3/1.8	CVBS×3 or CVBS×2 +S-video×1	NTSC PAL SECAM	ITU-R BT.656 YUV 8/16/24bit RGB 18/24bit	ITU-R BT.656 RGB 18/24bit	QVGA to WVGA	Text	8051 (8bit)	System control MCU installed	-40 to +85	P-TQFP100-1414-0.50	—	YES

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 \*2 Please inquire to the sales for AEC-Q100.

: Under Development