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# Automotive Audio Power Amplifiers





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# Introduction



ST is the recognized leader in automotive power amplifiers.

Our car audio amplifiers provide the traditional clean and powerful sound that users have come to expect, as well as all the protection and safety features needed to make our devices robust in an automotive environment.

ST has a complete family of green-power products specifically designed to be compliant with advanced technologies for cleaner cars, such as engine start/stop.

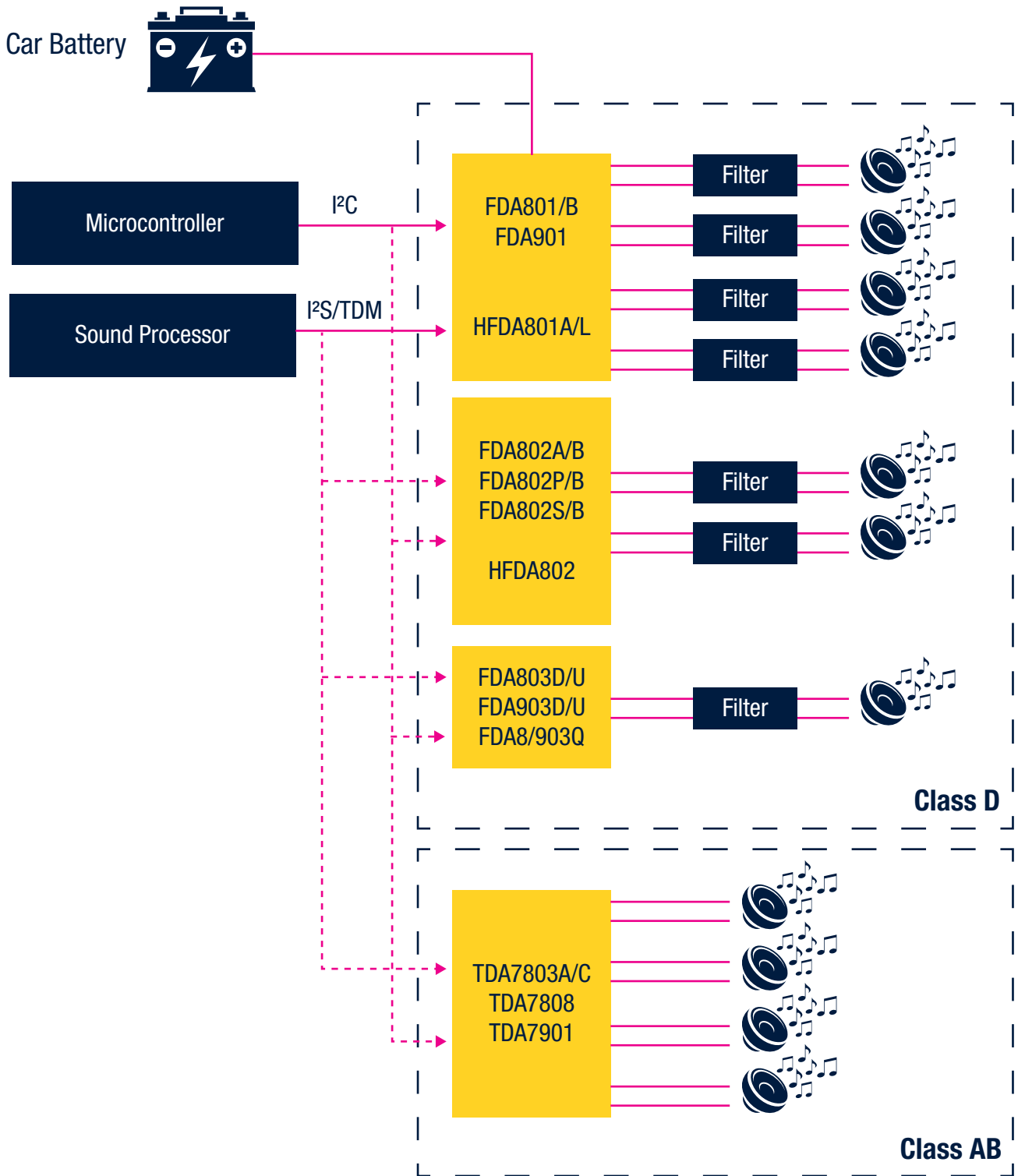
ST's product portfolio includes class AB, SB (high efficiency), SB-I (improved high efficiency) , Class G (with buck controller embedded) and class D devices, with or without an I<sup>2</sup>C interface, and with analog or digital inputs.

ST audio amplifiers implements a wide range of diagnostic feature set specifically designed for the automotive needs, ranging from the simplest pin and I<sup>2</sup>C diagnostic to the most sophisticated load value measurements and load current monitor, available also in play.

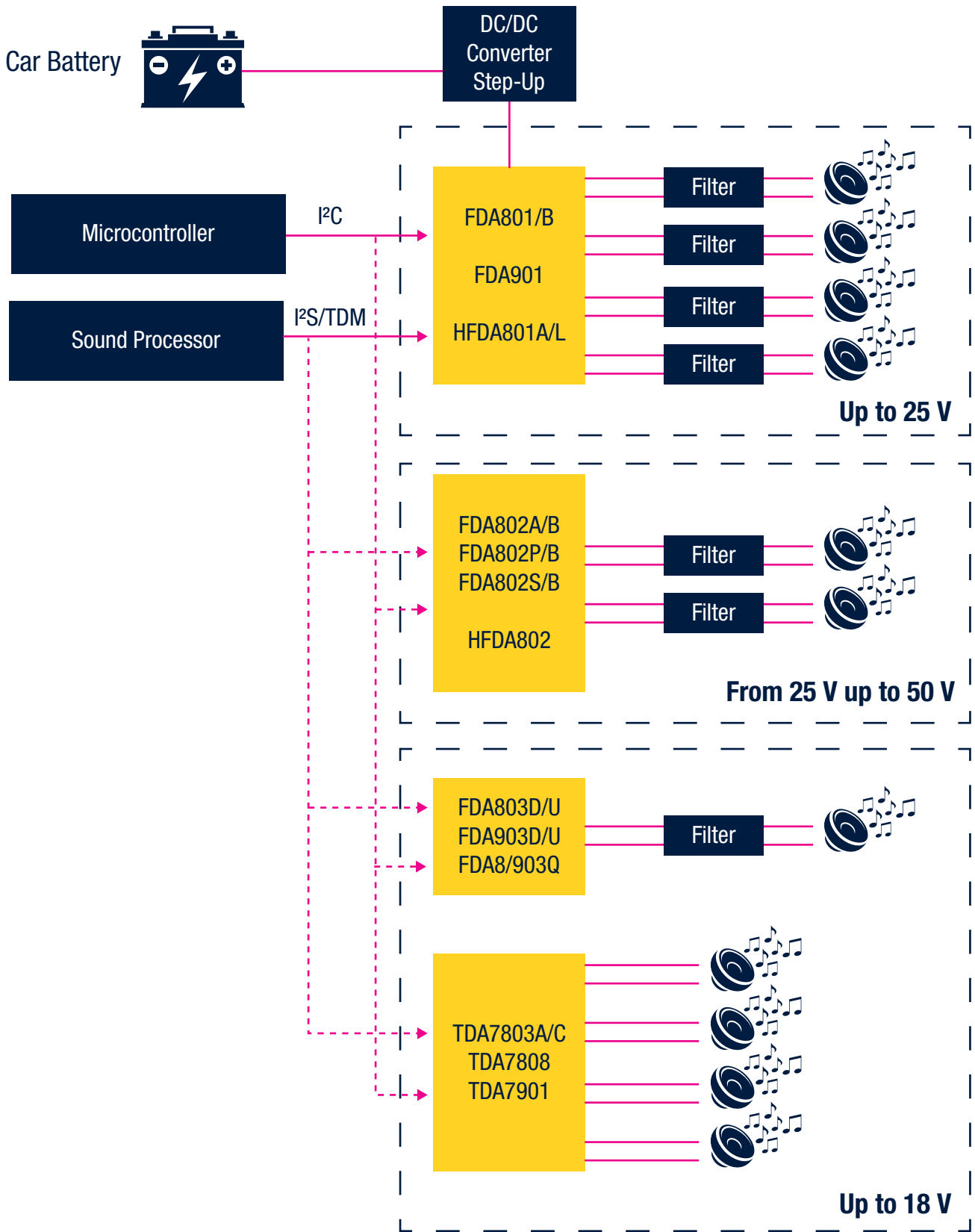
We offer a range of packages and pin-to-pin compatible ICs, covering different power requirements and supporting one to four channels.

The wider portfolio allows to design audio for several automotive applications including Head Units and e-cockpit, external sound systems, AVAS, clusters and emergency call. Some example of applications are displayed below.

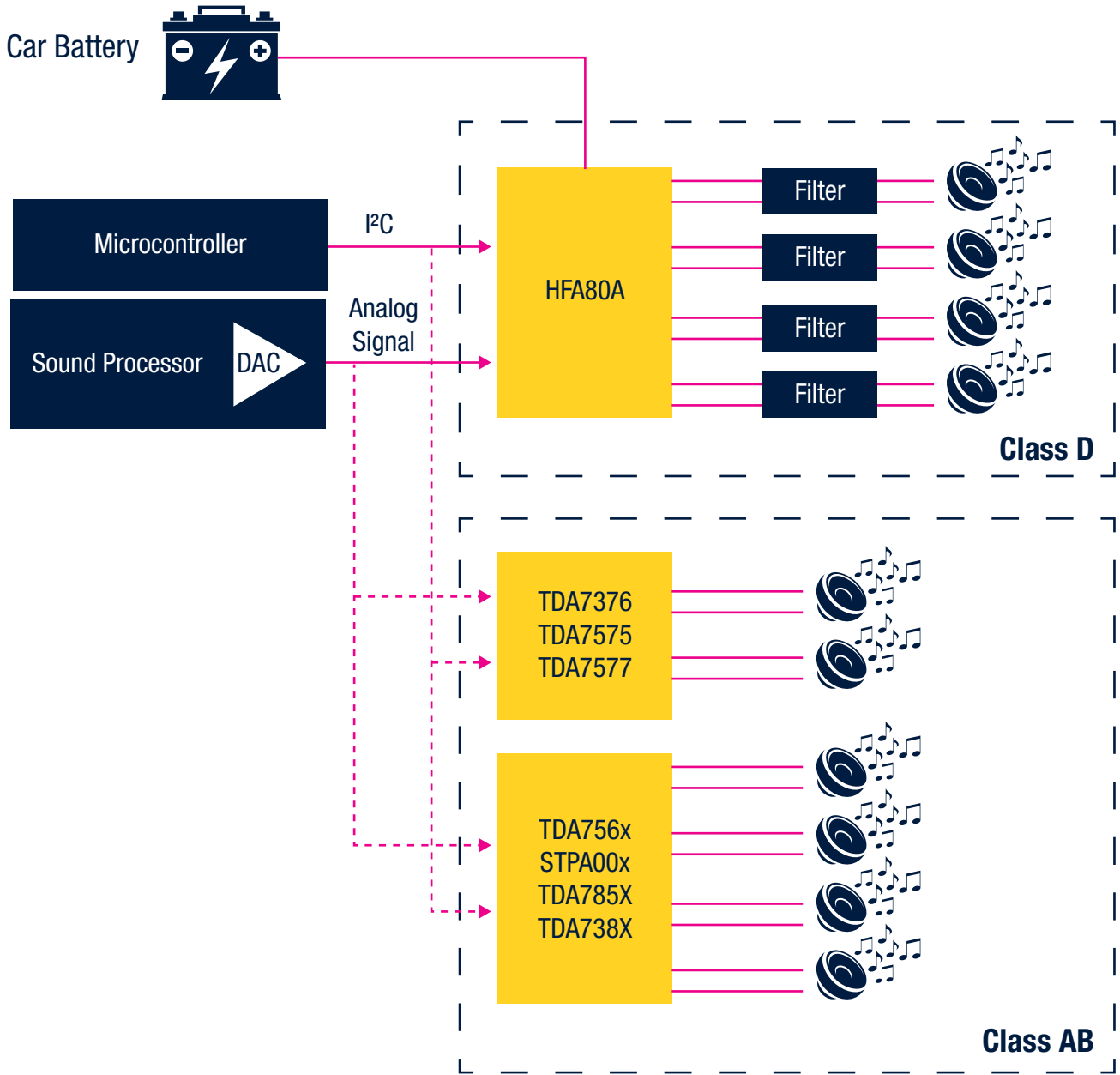
# BATTERY OPERATED DIGITAL PLATFORMS



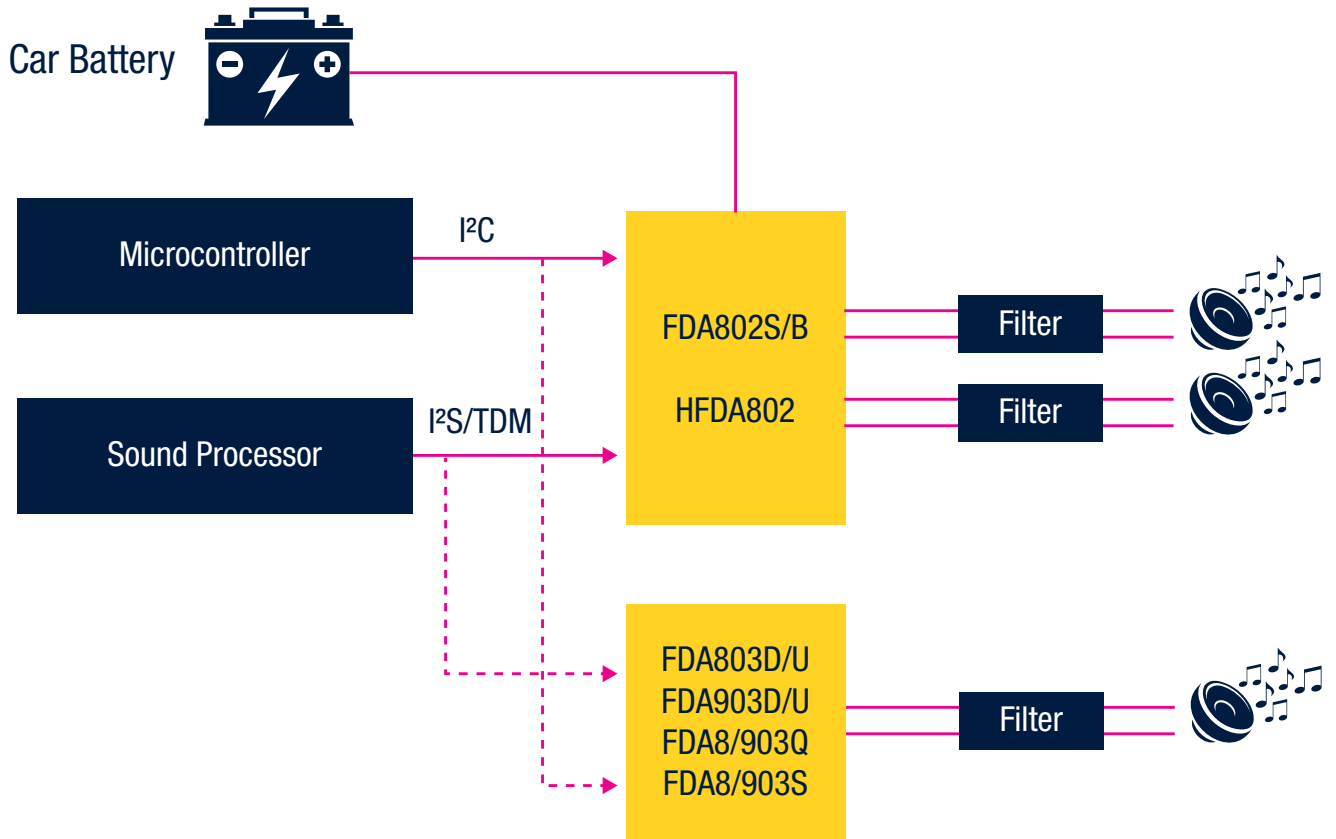
# STEP-UP PLATFORMS



# BATTERY OPERATED ANALOG PLATFORMS

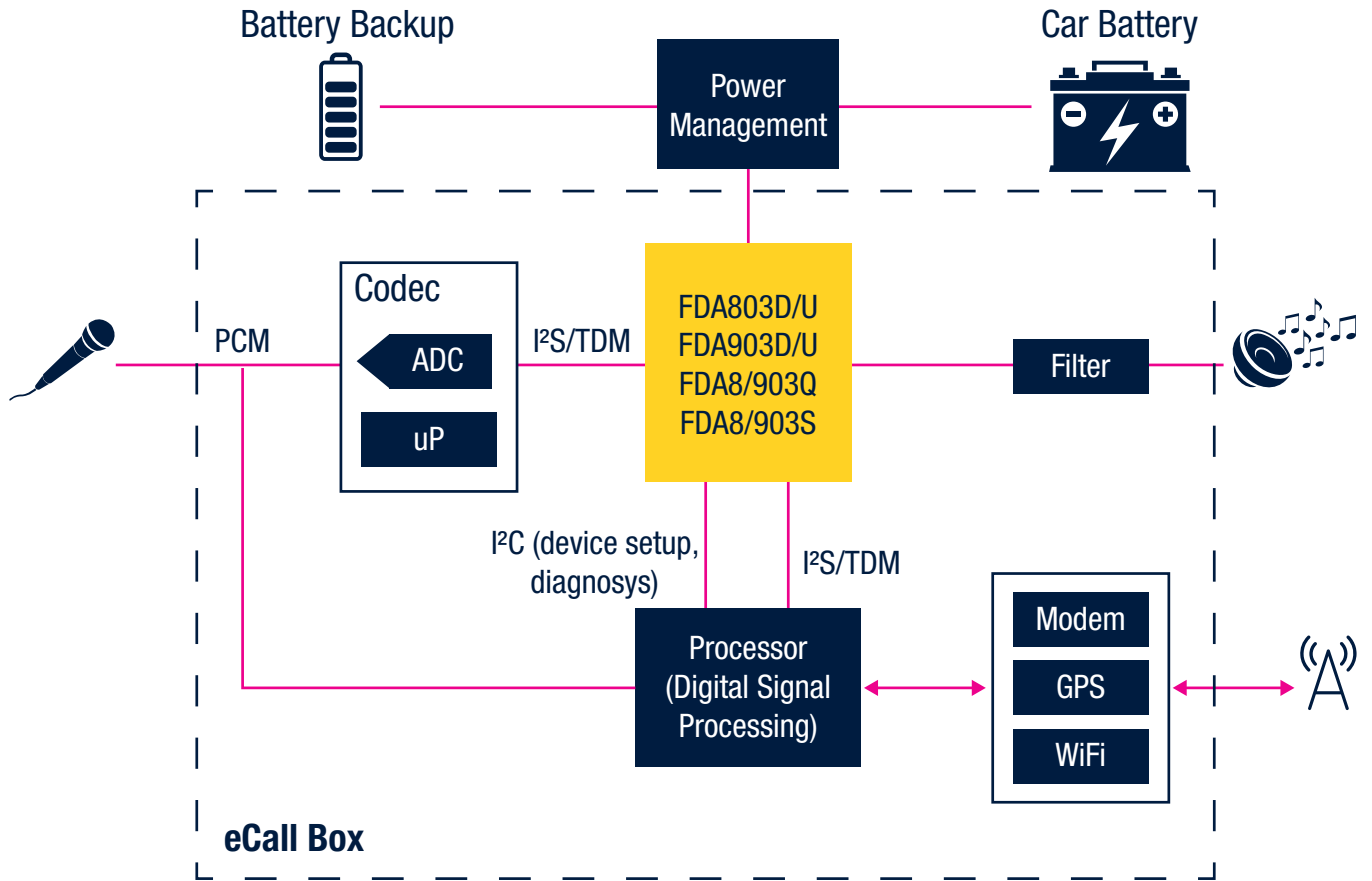


## AVAS PLATFORMS





## TELEMATIC & ECALL PLATFORMS



# Automotive audio power amplifiers

## CLASS D

Pin comp.	Part number	Package	General description	Max power capability (15.2 V, 4 Ω)	Power at 10% THD (14.4 V, 4 Ω)	Amplifier class	Gain (dB)	Diagnostics	Load (min ohm)	Supply voltage	
										min V	max V
	FDA2100BLV	TQFP-64	2 x 180 W/1 x 300 W low voltage operation PWM digital input with I <sup>2</sup> C diagnostics and step-up driver	-	2x29 W	D	-	I <sup>2</sup> C bus	1	6	35
	FDA450LV	TQFP-100	4 x 50 W low voltage operation PWM digital input with I <sup>2</sup> C diagnostics	-	4 x 29 W	D	-	I <sup>2</sup> C bus	1	6	25
	FDA4100LV	HiQuad-92	4 x 135 W/2 x 270 W low voltage operation PWM digital input with I <sup>2</sup> C diagnostics and step-up driver	-	4 x 29 W	D	-	I <sup>2</sup> C bus	1	6	25
A	FDA801	LQFP64	4 x 50 W class-D digital input power amplifier with I <sup>2</sup> C diagnostics and low voltage operation	-	4x30W	D	-	I <sup>2</sup> C bus	1	5.5	25
A	FDA801B	LQFP64	4 x 50 W class-D digital input automotive power amplifier with load value recognition	-	4x30W	D	-	I <sup>2</sup> C bus	1	5.5	25
A	FDA901	LQFP64	4 x 50 W class-D digital input automotive power amplifier with load value recognition and load current monitoring	-	4x30W	D	-	I <sup>2</sup> C bus	1	5.5	25
A	FDA802/ FDA802A	LQFP64	2x150 W class D digital input automotive power amplifier with diagnostics features and low voltage	-	2x28W	D	-	I <sup>2</sup> C bus	1	5.5	50
A	FDA802B/ FDA802AB	LQFP64	2x150 W class D digital input automotive power amplifier with diagnostics features, load value recognition and low voltage	-	2x28W	D	-	I <sup>2</sup> C bus	1	5.5	50
A	FDA802S	LQFP64	2 channels class-D digital input automotive power amplifier with I <sup>2</sup> C diagnostics and low voltage operation for car radio applications	-	2x28W	D	-	I <sup>2</sup> C bus	1	5.5	25
A	FDA802SB	LQFP64	2 channels class-D digital input automotive power amplifier with I <sup>2</sup> C diagnostics, load value recognition and low voltage operation for car radio applications	-	2x28W	D	-	I <sup>2</sup> C bus	1	5.5	25
A	FDA802P	LQFP64	2 channels class-D digital input automotive power amplifier with I <sup>2</sup> C diagnostics and low voltage operation for car radio applications	-	2x28W	D	-	I <sup>2</sup> C bus	1	5.5	37
A	FDA802PB	LQFP64	2 channels class-D digital input automotive power amplifier with I <sup>2</sup> C diagnostics, load value recognition and low voltage operation for car radio applications	-	2x28W	D	-	I <sup>2</sup> C bus	1	5.5	37
B	FDA803D	PowerSSO-36 (slug down)	1 x 45 W class D digital input automotive power amplifier with diagnostics, wide voltage operation range for car audio and telematic	-	1x30W	D	-	I <sup>2</sup> C bus	2	3.3	18
B	FDA903D	PowerSSO-36 (slug down)	1 x 45 W class D digital input automotive power amplifier with ILoad current monitoring, wide voltage operation range for car audio and telematic	-	1x30W	D	-	I <sup>2</sup> C bus	2	3.3	18
C	FDA803U	PowerSSO-36 (slug up)	1 x 45 W class D digital input automotive power amplifier with diagnostics, wide voltage operation range for car audio and telematic	-	1x30W	D	-	I <sup>2</sup> C bus	2	3.3	18
C	FDA903U	PowerSSO-36 (slug up)	1 x 45 W class D digital input automotive power amplifier with ILoad current monitoring, wide voltage operation range for car audio and telematic	-	1x30W	D	-	I <sup>2</sup> C bus	2	3.3	18

## CLASS D

Pin comp.	Part number	Package	General description	Max power capability (15.2 V, 4 Ω)	Power at 10% THD (14.4 V, 4 Ω)	Amplifier class	Gain (dB)	Diagnostics	Load (min ohm)	Supply voltage	
										min V	max V
D	FDA803Q	VFQFPN48	1 channel class D digital input automotive power amplifier with diagnostics, wide voltage operation range for car audio and telematic	-	1x31W	D	-	I <sup>2</sup> C bus	2	3.3	18
D	FDA903Q	VFQFPN48	1 Chclass D digital input automotive power amplifier with diagnostics, load current monitoring wide voltage operation range for car audio and telematic	-	1x31W	D	-	I <sup>2</sup> C bus	2	3.3	18
E	HFDA801A	LQFP64	4 x 80 W digital input class-D automotive audio amplifier with Hi-Fi audio quality, advanced diagnostics, 2MHz switching frequency and High Resolution Bandwidth	-	4x30W	D	-	I <sup>2</sup> C bus	1	4.5	25
E	HFDA801L	LQFP64	4 channels digital input class-D automotive audio amplifier with Hi-Fi audio quality, advanced diagnostics, 2 MHz switching frequency and High Resolution Bandwidth	-	4x30W	D	-	I <sup>2</sup> C bus	1	4.5	18
E	HFDA802 <sup>(*)</sup>	LQFP64	2x80W digital input class-D automotive audio amplifier with Hi-Fi audio quality, advanced diagnostics, 2MHz switching frequency and High Resolution Bandwidth	-	2x30W	D	-	I <sup>2</sup> C bus	1	4.5	25
	HFA80A <sup>(*)</sup>	LQFP48	4 channles analog input class-D automotive audio amplifier with Hi-Fi audio quality, advanced diagnostics, 2MHz switching frequency and High Resolution Bandwidth	-	4x27W	D	-	I <sup>2</sup> C bus	1	4.5	18
F	FDA803S <sup>(*)</sup>	QFN32	1 channel class D digital input automotive power amplifier with diagnostics, wide voltage operation range for car audio and telematic	10 W	-	D	-	I <sup>2</sup> C bus	4	3.3	18
F	FDA903S <sup>(*)</sup>	QFN32	1 channel class D digital input automotive power amplifier with diagnostics, load current monitoring wide voltage operation range for car audio and telematic	10 W	-	D	-	I <sup>2</sup> C bus	4	3.3	18

Note \* Coming soon



## CLASS AB - BIPOLAR SINGLE/DUAL

Pin comp.	Part number	Package	General description	Max power capability (15.2 V, 4 Ω)	Power at 10% THD (14.4 V, 4 Ω)	Amplifier class	Gain (dB)	Diagnostics	Load (min ohm)	Supply voltage	
										min V	max V
	<b>TDA2004R</b>	Multiwatt11	Dual SE output	-	2 x 6.5 W	AB	adjustable	-	2	8	18
	<b>TDA2005</b>	Multiwatt11	Single BTL or dual SE output	-	1 x 20 W 2 x 6.5 W	AB	adjustable	-	2	8	18
Z	<b>TDA7375AV</b>	Multiwatt15	Quad SE or dual BTL output with hardware standby and clip detection	4 x 11 W 2 x 47 W	4 x 7 W 2 x 26 W	AB	26/20	by pin	2	8	18
Z	<b>TDA7375V</b>	Multiwatt15	Quad SE or dual BTL output with hardware standby and clip detection	4 x 10 W 2 x 44 W	4 x 7 W 2 x 25 W	AB	26/20	by pin	2	8	18
	<b>TDA7376B</b>	Multiwatt15	Differential input, dual BTL output with adjustable clip detection	2 x 44 W	2 x 25 W	AB	26	-	2	8	18
	<b>TDA7376PD</b>	PowerSO36	Differential input, dual BTL output with adjustable clip detection	2 x 44 W	2 x 25 W	AB	26	-	2	8	18
	<b>TDA7391LV</b>	Multiwatt11 PowerSO20	Low voltage operation, differential input, single BTL output with hardware standby and clip detection	1 x 45 W	1 x 26 W	AB	30	by pin	3.2	6	18
	<b>TDA7396</b>	Multiwatt11	Differential input, single BTL output with hardware standby and clip detection	1 x 46 W	1 x 27 W	AB	26	by pin	2	8	18

## CLASS AB - BIPOLAR QUAD

Pin comp.	Part number	Package	General description	Max power capability (15.2 V, 4 Ω)	Power at 10% THD (14.4 V, 4 Ω)	Amplifier class	Gain (dB)	Diagnostics	Load (min ohm)	Supply voltage	
										min V	max V
Y	<b>TDA7385</b>	Flexiwatt25	Quad BTL output with hardware standby and mute, clip detection	4 x 42 W	4 x 23 W	AB	26	by pin	4	8	18
Y	<b>TDA7387EP</b>	Flexiwatt25 EP	Quad BTL output with hardware standby and mute	4 x 41 W	4 x 21 W	AB	26	-	4	8	18
W	<b>TDA7388</b>	Flexiwatt25	Quad BTL output with hardware standby and mute	4 x 45 W	4 x 26 W	AB	26	-	4	8	18
W	<b>TDA7388EP</b>	Flexiwatt25 EP	Quad BTL output with hardware standby and mute	4 x 45 W	4 x 26 W	AB	26	-	4	8	18
W	<b>TDA7388A</b>	Flexiwatt27	Quad BTL output with hardware standby and mute, clip and offset detection	4 x 46 W	4 x 27 W	AB	26	by pin	4	8	18

## CLASS AB - 24V COMPLIANT

Pin comp.	Part number	Package	General description	Max power capability (15.2 V, 4 Ω)	Power at 10% THD (14.4 V, 4 Ω)	Amplifier class	Gain (dB)	Diagnostics	Load (min ohm)	Supply voltage	
										min V	max V
	<b>TDA7576B</b>	Multiwatt15	Dual BTL output for 24 V systems with hardware standby and mute, clip and offset detection	2 x 45 W @ 28 V	2 x 28 W @ 28 V	AB	26	by pin	4	8	32

## CLASS AB - INTELLIGENT POWER

Pin comp.	Part number	Package	General description	Max power capability (15.2 V, 4 Ω)	Power at 10% THD (14.4 V, 4 Ω)	Amplifier class	Gain (dB)	Diagnostics	Load (min ohm)	Supply voltage	
										min V	max V
U	<b>TDA7562B</b>	Flexiwatt27	Intelligent quad BTL output with full I <sup>2</sup> C diagnostics including tweeter detection and hardware standby/mute	4 x 46 W	4 x 27 W	AB	30/16	I <sup>2</sup> C bus	2	8	18
U / T	<b>TDA7563A</b>	Flexiwatt27, PowerS036	Intelligent quad BTL output with full I <sup>2</sup> C diagnostics including tweeter detection and hardware standby/mute	4 x 50 W	4 x 28 W	SB	26/12	I <sup>2</sup> C bus	2	8	18
U / T	<b>TDA7563ARH</b>	Flexiwatt27 HrztI	Intelligent quad BTL output with full I <sup>2</sup> C diagnostics in a reflow compatible package	4 x 50 W	4 x 28 W	SB	26/12	I <sup>2</sup> C bus	2	8	18
U / T	<b>TDA7563B</b>	Flexiwatt27, PowerS036	Intelligent quad BTL output with full I <sup>2</sup> C diagnostics including tweeter detection and hardware standby/mute	4 x 50 W	4 x 28 W	SB	30/16	I <sup>2</sup> C bus	2	8	18
	<b>TDA7567PD</b>	PowerS036	Intelligent differential input, quad BTL output with full I <sup>2</sup> C diagnostics including tweeter detection	4 x 50 W	4 x 28 W	SB	26/16	I <sup>2</sup> C bus	2	8	18
U	<b>TDA7569BLV</b>	Flexiwatt27, PowerS036	Low voltage operation intelligent quad BTL output with full I <sup>2</sup> C diagnostics including tweeter detection and hardware standby/mute	4 x 50 W	4 x 28 W	SB	26/16	I <sup>2</sup> C bus	2	6	18
X	<b>TDA7569BDLV</b>	PowerS036	Low voltage operation differential intelligent quad BTL output with full I <sup>2</sup> C diagnostics including tweeter detection and hardware standby/mute	4 x 50 W	4 x 28 W	SB	26/16	I <sup>2</sup> C bus	2	6	18
X	<b>TDA75610DLV</b>	PowerS036	Low voltage operation differential intelligent quad BTL output with full I <sup>2</sup> C diagnostics including tweeter detection and hardware standby/mute	4 x 45 W	4 x 25 W	SB	26/16	I <sup>2</sup> C bus	2	6	18
U/T	<b>TDA75610SEP</b>	Flexiwatt27 EP	Low voltage operation differential intelligent quad BTL output with full I <sup>2</sup> C diagnostics including tweeter detection and hardware standby/mute	4 x 45 W	4 x 25 W	SB	26/16	I <sup>2</sup> C bus	2	6	18
U/T	<b>TDA75610SLV</b>	Flexiwatt27, PowerS036 FIpowerS036	Low voltage operation differential intelligent quad BTL output with full I <sup>2</sup> C diagnostics including tweeter detection and hardware standby/mute	4 x 45 W	4 x 25 W	SB	26/16	I <sup>2</sup> C bus	2	6	18
R	<b>TDA7575B</b>	Flexiwatt27, PowerS036	Intelligent differential input, dual BTL output with full I <sup>2</sup> C diagnostics, standby and hardware mute	2 x 50 W	2 x 28 W	SB	26/12	I <sup>2</sup> C bus	1	8	18
R	<b>TDA7577BLV</b>	Flexiwatt27, PowerS036	Low voltage operation differential intelligent quad BTL output with full I <sup>2</sup> C diagnostics including tweeter detection and hardware standby/mute	2 x 50 W	2 x 28 W	SB	26/16	I <sup>2</sup> C bus	1	6	18
Q	<b>TDA7801</b>	Flexiwatt27, PowerS036	Digital input (I <sup>2</sup> S), intelligent quad BTL output with full I <sup>2</sup> C diagnostics	4 x 50 W	4 x 28 W	AB	16/10.5 8/2.5	I <sup>2</sup> C bus	2	8	18
Q	<b>TDA7802</b>	Flexiwatt27, PowerS036	Low voltage operation, digital input (I <sup>2</sup> S), intelligent quad BTL output with full I <sup>2</sup> C diagnostics	4 x 50 W	4 x 28 W	SB-I	16/10.5 8/2.5	I <sup>2</sup> C bus	1	6	18
J	<b>TDA7803A</b>	Flexiwatt27	Low voltage operation, digital input (I <sup>2</sup> S), intelligent quad BTL output with full I <sup>2</sup> C diagnostics	4x47W	4x27W	SB-I	-	I <sup>2</sup> C bus	1	6	18
J	<b>TDA7803C</b>	PowerS036	Low voltage operation, digital input (I <sup>2</sup> S), intelligent quad BTL output with full I <sup>2</sup> C diagnostics	4x47W	4x27W	SB-I	-	I <sup>2</sup> C bus	1	6	18
J	<b>TDA7808</b>	Flexiwatt27 PowerS037	Low voltage operation, digital input (I <sup>2</sup> S), intelligent quad BTL	4x47W	4x27W	SB-I	-	I <sup>2</sup> C bus	1	6	18
	<b>TDA7901<sup>(*)</sup></b>	PowerS036	High efficiency, digital input (I <sup>2</sup> S), intelligent quad BTL output with full I <sup>2</sup> C diagnostics, Class-G integrated	4x47W	4x27W	G	-	I <sup>2</sup> C bus	1	6	18

Note \* Coming soon

## CLASS AB - MOSFET QUAD

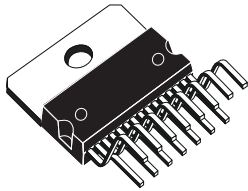
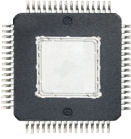

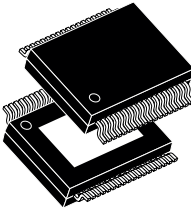

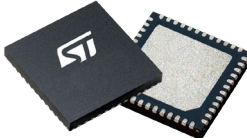
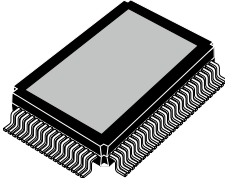
Pin comp. 1	Part number	Package	General description	Max power capability (15.2 V, 4 Ω)	Power at 10% THD (14.4 V, 4 Ω)	Amplifier class	Gain (dB)	Diagnostics	Load (min ohm)	Supply voltage	
										min V	max V
IY	STPA001	Flexiwatt25, Flexiwatt27	High sound quality quad BTL output power amplifier with standby and mute inputs, clip and offset detection, start stop compatibility	4 x 50 W	4 x 28 W	AB	26	by pin	2	6	18
I	STPA001AEP	Flexiwatt27 EP	High sound quality quad BTL output power amplifier with standby and mute inputs, clip and offset detection, start stop compatibility	4 x 50 W	4 x 28 W	AB	26	by pin	2	6	18
IY	STPA002	Flexiwatt25, Flexiwatt27	High sound quality quad BTL output power amplifier with standby and mute inputs, clip and offset detection, start/stop compatibility	4 x 52 W	4 x 30 W	AB	26	by pin	2	6	18
IY	STPA003	Flexiwatt25, Flexiwatt27	High sound quality quad BTL output with excellent GSM noise immunity, clip and offset detection, start-stop compatibility	4 x 52 W	4 x 30W	AB	26	by pin	2	6	18
IY	STPA008	Flexiwatt25, Flexiwatt27, PowerS0-36	High sound quality quad BTL output with excellent GSM noise immunity, clip and offset detection, start-stop compatibility	4 X 50 W	4 x 28 W	AB	26	by pin	2	6	18
Y	TDA7560	Flexiwatt25	Hi-fi quad BTL output with HSD/offset detection, hardware standby and mute	4 x 52 W	4 x 30 W	AB	26	by pin	2	8	18
Y	TDA7850	Flexiwatt25	Quad BTL output with HSD/offset detection, hardware standby and mute	4 x 52 W	4 x 30 W	AB	26	by pin	2	8	18
Y	TDA7850EP	Flexiwatt25 EP	Quad BTL output with HSD/offset detection, hardware standby and mute	4 x 52 W	4 x 30 W	AB	26	by pin	2	8	18
I	TDA7850A	Flexiwatt27	Quad BTL output with HSD, offset detection, hardware standby and mute	4 x 52 W	4 x 30 W	AB	26	by pin	2	8	18
I	TDA7850AEP	Flexiwatt27 EP	Quad BTL output with HSD, offset detection, hardware standby and mute	4 x 52 W	4 x 30 W	AB	26	by pin	2	8	18
I	TDA7851A	Flexiwatt27	Quad BTL ouput with hardware standby and mute, clip and offset detection	4 x 48 W	4 x 28 W	AB	26	by pin	2	8	18
I	TDA7851AEP	Flexiwatt27 EP	Quad BTL ouput with hardware standby and mute, clip and offset detection	4 x 48 W	4 x 28 W	AB	26	by pin	2	8	18
Y	TDA7851F	Flexiwatt25	Quad BTL ouput with hardware standby and mute, offset detection	4 x 48 W	4 x 28 W	AB	26	by pin	2	8	18
I	TDA7851L	Flexiwatt25	Quad BTL ouput with hardware standby and mute, clip detection	4 x 48 W	4 x 28 W	AB	26	by pin	2	8	18
I	TDA7828	Flexiwatt25 EP	Quad BTL ouput with hardware standby and mute, clip detection	4 x 48 W	4 x 28 W	AB	26	by pin	2	8	18

Note:

1. Pin compatibility: products with same letters are pin-to-pin compatible
2. With step-up enabled

BTL = bridge-tied load  
 SE = single ended  
 SB = high-efficiency class  
 SB-I = improved high-efficiency class

# Packages

Package	Available package option	Package	Available package option
 <p>Multiwatt15</p>	Multiwatt 11	 <p>TQFP-64 – slug up</p>	LQFP48 – slug up LQFP64 – slug up TQFP-100 – slug up
 <p>Flexiwatt25 vertical</p>	Flexiwatt25 horizontal Flexiwatt25 smd Flexiwatt25 (exp.pad) Flexiwatt27 horizontal Flexiwatt27 smd Flexiwatt27 vertical Flexiwatt27 (exp.pad)	 <p>PowerSSO36- slug down</p>	PowerSSO36- slug up
 <p>PowerSO20 slug-down</p>	PowerSO20 slug-up PowerSO36 slug-up	 <p>VFQFPN48</p>	QFN32
 <p>HiQuad92 – slug up</p>	None		