

Power amplifiers and voltage regulators



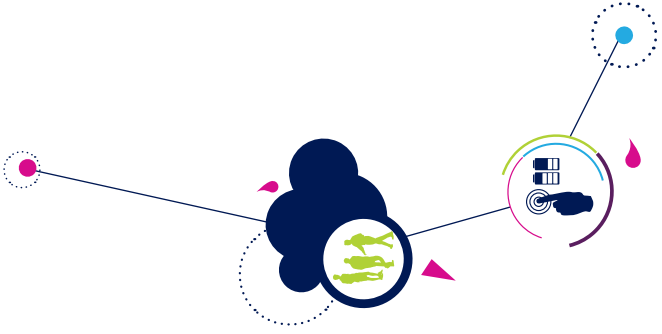
For car audio and infotainment systems

life.augmented

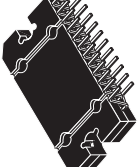
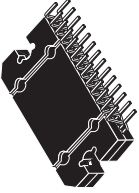
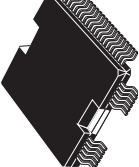
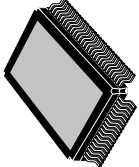
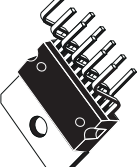
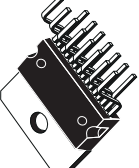
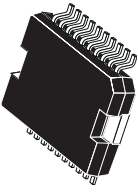
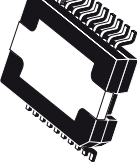
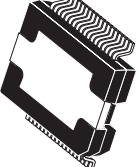
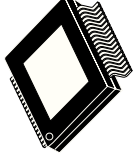
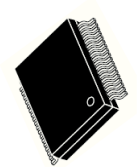
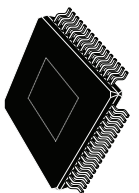


Content

Power amplifiers and voltage regulators for car infotainment.....	2
Introduction	2
Automotive audio power amplifiers.....	3
Bipolar single/dual.....	3
Bipolar quad.....	3
Intelligent power.....	4
24 V compliant.....	6
Class D	6
MOSFET quad	7
Multifunctional voltage regulators	8
Multifunctional voltage regulators.....	8
Packages.....	11



Packages

	Flexiwatt25 horizontal		Flexiwatt25 smd		Flexiwatt25 vertical		Flexiwatt25 (exp. pad)		Flexiwatt27 horizontal		Flexiwatt27 smd
	Flexiwatt27 vertical		Flexiwatt27 (exp. pad)		HiQuad64		HiQuad92		Multiwatt11		Multiwatt15
	PowerS020 slug-down		PowerS020 slug-up		PowerS036 slug-up		PowerSS036 slug-down		S024		
	TQFP-64		TQFP-100		VFQFPN						

Power amplifiers and voltage regulators for car infotainment

INTRODUCTION

ST is the recognized leader in automotive power amplifiers and voltage regulators.

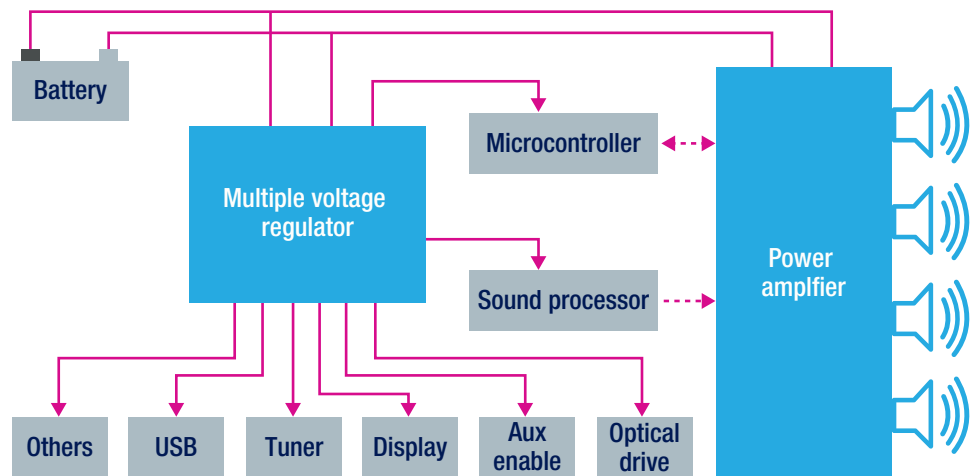
Our car audio amplifiers provide the traditional clean and powerful sound that users have come to expect, as well as all the protection and safety features needed to make our devices robust in an automotive environment.

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) and class D devices, with or without an I²C interface, and with analog or digital inputs.

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

What's more, ST has a wide multifunctional voltage regulator portfolio that meets all automotive infotainment needs. They are protected against load dump and support battery voltage variations and transients, providing multiple linear or switching voltage outputs, with or without an I²C bus, and have a very low standby quiescent current.



Automotive audio power amplifiers

BIPOLAR SINGLE/DUAL

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
	TDA2004R	Multiwatt11	Dual SE output	-	2 x 6.5 W	AB	adjustable	-	2	8	18
	TDA2005	Multiwatt11	Single BTL or dual SE output	-	1 x 20 W 2 x 6.5 W	AB	adjustable	-	2	8	18
Z	TDA7375AV	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	TDA7375V	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
	TDA7376B	Multiwatt15	Differential input, dual BTL output with adjustable clip detection	2 x 44 W	2 x 25 W	AB	26	-	2	8	18
	TDA7376PD	PowerSO36	Differential input, dual BTL output with adjustable clip detection	2 x 44 W	2 x 25 W	AB	26	-	2	8	18
	TDA7391	Multiwatt11 PowerSO20	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	8	18
	TDA7391LV	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
	TDA7396	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

BIPOLAR 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
Y	TDA7381	Flexiwatt25	Quad BTL output with hardware standby and mute, clip detection	4 x 34 W	4 x 18 W	AB	26	by pin	4	8	18
Y	TDA7384A	Flexiwatt25	Quad BTL output with hardware standby and mute	4 x 46 W	4 x 27 W	AB	26	-	4	8	18
Y	TDA7385	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	TDA7386	Flexiwatt25	Quad BTL output with hardware standby and mute	4 x 49 W	4 x 28 W	AB	26	-	4	8	18

BIPOLAR 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
Y	TDA7387EP	Flexiwatt25 EP	Quad BTL output with hardware standby and mute	4 x 41W	4 x 21W	AB	26	-	4	8	18
Y	TDA7388	Flexiwatt25	Quad BTL output with hardware standby and mute	4 x 45 W	4 x 26 W	AB	26	-	4	8	18
W	TDA7388EP	Flexiwatt25 EP	Quad BTL output with hardware standby and mute	4 x 45 W	4 x 26 W	AB	26	-	4	8	18
W	TDA7388A	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
W	TDA7388AEP	Flexiwatt27 EP	Quad BTL output with hardware standby and mute, clip and offset detection	4 x 46 W	4 x 27 W	AB	26	by spin	4	8	18

INTELLIGENT POWER

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
V	TDA7561	Flexiwatt25	Intelligent quad BTL output with full I ² C diagnostics	4 x 45 W	4 x 25 W	AB	26/12	I ² C bus	2	8	18
U	TDA7562	Flexiwatt27	Intelligent quad BTL output with full I ² C diagnostics and hardware standby/mute	4 x 45 W	4 x 25 W	AB	30/16	I ² C bus	2	8	18
U	TDA7562B	Flexiwatt27	Intelligent quad BTL output with full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 46 W	4 x 27 W	AB	30/16	I ² C bus	2	8	18
U	TDA7562BEP	Flexiwatt27 EP	Intelligent quad BTL output with full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 46 W	4 x 27 W	AB	30/16	I ² C bus	2	8	18
U / T	TDA7563A	Flexiwatt27, PowerS036	Intelligent quad BTL output with full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 50 W	4 x 28 W	SB	26/12	I ² C bus	2	8	18
U / T	TDA7563AEP	Flexiwatt27 EP	Intelligent quad BTL output with full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 50 W	4 x 28 W	SB	26/12	I ² C bus	2	8	18
U / T	TDA7563ARH	Flexiwatt27 Hrztl	Intelligent quad BTL output with full I ² C diagnostics in a reflow compatible package	4 x 50 W	4 x 28 W	SB	26/12	I ² C bus	2	8	18
U / T	TDA7563B	Flexiwatt27, PowerS036	Intelligent quad BTL output with full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 50 W	4 x 28 W	SB	30/16	I ² C bus	2	8	18
S / T	TDA7564B	Flexiwatt25, PowerS036	Intelligent quad BTL output with full I ² C diagnostics including tweeter detection	4 x 50 W	4 x 28 W	SB	26/12	I ² C bus	2	8	18

INTELLIGENT POWER

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
	TDA7565	Flexiwatt27	Intelligent quad BTL output with full I ² C diagnostics, built in step up and hardware mute	4 x 59 W ⁽²⁾	4 x 27 W	AB	26/12	I ² C bus	2	8	18
S	TDA7566	Flexiwatt25	Intelligent quad BTL output with full I ² C diagnostics	4 x 45 W	4 x 25 W	AB	26/12	I ² C bus	2	8	18
	TDA7567PD	PowerS036	Intelligent differential input, quad BTL output with full I ² C diagnostics including tweeter detection	4 x 50 W	4 x 28 W	SB	26/16	I ² C bus	2	8	18
U	TDA7569BLV	Flexiwatt27, PowerS036	Low voltage operation intelligent quad BTL output with full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 50 W	4 x 28 W	SB	26/16	I ² C bus	2	6	18
X	TDA7569BDLV	PowerS036	Low voltage operation differential intelligent quad BTL output with full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 50 W	4 x 28 W	SB	26/16	I ² C bus	2	6	18
U	TDA75610SLV	Flexiwatt27, PowerS036	Low voltage operation intelligent quad BTL output with full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 45 W	4 x 25 W	SB	26/16	I ² C bus	2	6	18
U	TDA75610SEP	Flexiwatt27 EP	Low voltage operation intelligent quad BTL output with full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 45 W	4 x 25 W	SB	26/16	I ² C bus	2	6	18
X	TDA75610DLV	PowerS036	Low voltage operation differential intelligent quad BTL output with full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 45 W	4 x 25 W	SB	26/16	I ² C bus	2	6	18
U	TDA75612LV	Flexiwatt 27	Low voltage operation intelligent quad BTL output with speaker safety routine (SSR), full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 45 W	4 x 25 W	AB	30/16	I ² C bus	2	6	18
U	TDA75612EP	Flexiwatt27 EP	Low voltage operation intelligent quad BTL output with speaker safety routine (SSR), full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 45 W	4 x 25 W	AB	30/16	I ² C bus	2	6	18
U	TDA75613LV	Flexiwatt 27	Low voltage operation intelligent quad BTL output with speaker safety routine (SSR), full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 45 W	4 x 25 W	SB	30/16	I ² C bus	2	6	18
U	TDA75616LV	Flexiwatt 27	Low voltage operation, intelligent, quad BTL output with speaker safety routine (SSR), full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 45 W	4 x 25 W	AB	26/16	I ² C bus	2	6	18
U	TDA75616EP	Flexiwatt27 EP	Low voltage operation, intelligent, quad BTL output with speaker safety routine (SSR), full I ² C diagnostics including tweeter detection and hardware standby/mute	4 x 45 W	4 x 25 W	AB	26/16	I ² C bus	2	6	18

INTELLIGENT POWER

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
R	TDA7575B	Flexiwatt27, PowerSO36	Intelligent differential input, dual BTL output with full I ² C diagnostics, standby and hardware mute	2 x 50 W	2 x 28 W	SB	26/12	I ² C bus	1	8	18
R	TDA7577BLV	Flexiwatt27, PowerSO36	Low voltage operation differential intelligent quad BTL output with full I ² C diagnostics including tweeter detection and hardware standby/mute	2 x 50 W	2 x 28 W	SB	26/16	I ² C bus	1	6	18
Q	TDA7801	Flexiwatt27, PowerSO36	Digital input (I ² S), intelligent quad BTL output with full I ² C diagnostics	4 x 50 W	4 x 28 W	AB	16/10.5/8/2.5	I ² C bus	2	8	18
Q	TDA7802	Flexiwatt27, PowerSO36	Low voltage operation, digital input (I ² S), intelligent quad BTL output with full I ² C diagnostics	4 x 50 W	4 x 28 W	SB-I	16/10.5/8/2.5	I ² C bus	1	6	18

24 V COMPLIANT

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
	TDA7576B	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 D

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
	TDA7570	HiQUAD-64	Single or dual PWM BTL output	-	1 x 250 W 2 x 70 W	D	-	by pin	2	± 12	± 30
	TDA7572	HiQUAD-64	Single PWM BTL output with built-in audio processing and step-up driver	-	1 x 200 W	D	-	I ² C bus	2	8	58
	FDA2100LV	TQFP-64	2 x 180 W/1 x 300 W low voltage operation PWM digital input with I ² C diagnostics and step-up driver	-	4 x 29 W	D	-	I ² C bus	1	6	30
	FDA450LV	TQFP-100	4 x 50 W low voltage operation PWM digital input with I ² C diagnostics	-	4 x 29 W	D	-	I ² C bus	1	6	25
	FDA4100LV	HiQuad-92	4 x 135 W/2 x 270 W low voltage operation PWM digital input with I ² C diagnostics and step-up driver	-	4 x 29 W	D	-	I ² C bus	1	6	25

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
IV	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
IV	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
IV	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
IV	STPA008	Flexiwatt25, Flexiwatt27	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	TDA7454	Flexiwatt25	Quad BTL output with clip detection, hardware standby and mute	4 x 44 W	4 x 25 W	SB	26	by pin	2	8	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

Multifunctional voltage regulators

MULTIFUNCTIONAL VOLTAGE REGULATORS

Part number	Package	General description	Min Vop (V)	V _{OUT} linear - I _{MAX}	V _{OUT} standby - I _{MAX}	V _{OUT} PWM - I _{MAX}	High-side drivers	Device configuration
L4953G	Multiwatt15	Voltage regulator with backup and reset, ignition comparator and low-voltage warning	11	5 V at 1 A 9.2 V at 500 mA	5 V at 100 mA	-	HSD: 2 A	-
L4954	Multiwatt15	Voltage regulator with backup and reset, overvoltage protection and low-voltage warning	11	10 V at 40 mA 8.5 V at 175 mA 5 V at 650 mA 5 V at 100 mA	-	-	HSD1: 2 A HSD2: 300 mA HSD3: 300 mA	-
L5950	Multiwatt15	Voltage regulator with very low standby current and very accurate output voltage	-	10 V at 350 mA 8.5 V at 175 mA 5 V at 350 mA 8/10 V at 1 A 5 V at 250 mA	-	-	HSD1: 2 A HSD2: 450 mA HSD3: 450 mA	I ² C
L5955	Flexiwatt27	Voltage regulator with low-voltage warning, short-circuit protection and overvoltage shutdown		10 V at 40 mA 8.5 V at 200 mA 3.3 V at 850 mA 8/10 V at 1 A 1.8/3.3/5 V at 200 mA 1.8/2.5 V at 200 mA	3.3 V at 125 mA 1.5 V at 300 mA	-	HSD1: 2 A HSD2: 450 mA HSD3: 450 mA	I ² C
L5956	PowerSO20 Multiwatt15	Voltage regulator with ignition comparator, reset, overcurrent protection, 3.3 V regulator with independent enable	9	8.5 V at 500 mA 5 V at 800 mA 3.3 V at 800 mA	5 V at 300 mA	-	HSD: 2 A	-
L5957	PowerSO20 Multiwatt15	Voltage regulator with ignition comparator, reset, overcurrent protection, 5 V regulator (CAN) with independent enable	9	8.5 V at 500 mA 5 V at 800 mA 3.3 V at 800 mA	5 V at 300 mA	-	HSD: 2 A	-
L5958	Flexiwatt27	Switchable linear regulators, reset, battery voltage warning	9	8.5 V at 200 mA 5 V at 300 mA 3.3 V at 250 mA 1.8 V at 350 mA	3.3 V at 100 mA 1.8 V at 100 mA	-	HSD: 2 A	-
L5959	Multiwatt15	Voltage regulator with very low standby current, reset, hold, back-up, under/overvoltage detection, overcurrent limitation	9	8.5 V at 200 mA 8/10 V at 1 A 3.3 V at 800 mA	3.3 V at 100 mA	-	HSD1: 100 mA HSD2: 300 mA	-

MULTIFUNCTIONAL VOLTAGE REGULATORS

Part number	Package	General description	Min Vop (V)	V_{OUT} linear - I_{MAX}	V_{OUT} standby - I_{MAX}	V_{OUT} PWM - I_{MAX}	High-side drivers	Device configuration
L5962	PowerS036	Voltage regulator with DC-DC converter plus switchable linear regulators controlled by I ² C bus; second linear regulator has external supply pin	4.1	5/8.5 V at 350 mA 3.3 to 10 V at 1 A	3.3/5 V at 150 mA	1.2 to 8 V at 1.2/2.5 A	HSD1: 500 mA HSD2: 500 mA	I ² C
L5963 ¹	PowerSS036 QFN48	Fully adjustable voltage regulator with 2 DC-DC converters, LDO/standby and HSD	3.5	1 to 26 V at 250 mA	1 to 40 V at 50 mA	1 to 26 V at 3 A	HSD: 500 mA	-

Note:
1.In development