Abbreviations

BLDC	Brush-Less DC motor
CP	Charge pump
CSA	Current sense amplifier
CYL	Cylinder
GDI	Gasoline direct injection
I/F	Interface
LDO	Low drop output regulator
LSD/HSD	Low side driver/ High side driver
OC	Over current
OL	Open load
OT	Over temperature
OTP	One time programming
OV	Over voltage
P/N	Part number
SBC	System basic chip
STG	Short to ground
STB	Short to battery
Tj	Junction temperature
UV	Under voltage
VER	Voltage of energy reserve
VSF	Voltage of safing FET
Vas	Voltage of asynchronous mode
VRS	Variable-reluctance sensor
WD	Watchdog

life.augmented

Automotive powertrain and safety ICs

Selection guide

life.augmented

life.augmented

MIX
Paper from responsible sources
FSC® C003379

© STMicroelectronics - October 2016 - Printed in United Kingdom - All rights reserved
The STMicroelectronics corporate logo is a registered trademark
of the STMicroelectronics group of companies
All other names are the property of their respective owners

www.st.com

Order code: SGPWTRAIN1016

For more information on ST products and solutions, visit www.st.com



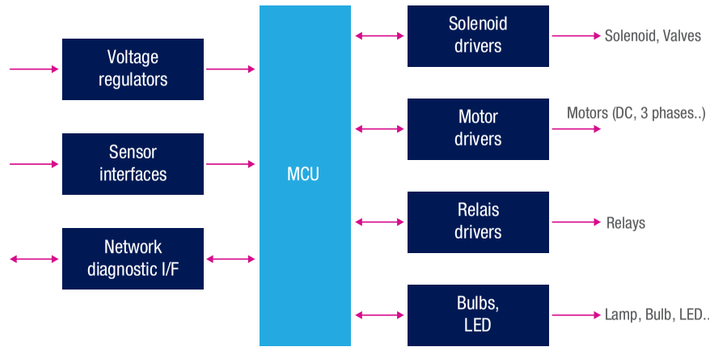
Content

Introduction 2
Engine management sytem 3
Alternator regulator 8
Steering 11
Transmission 13
Airbag systems 16
Braking 18
General Purpose ICs 20
Abbreviations 24

Introduction

The list of products included in this selection guide is organized in two sections

- Systems
  - Engine managent System
  - Alternator Voltage Regulator
  - Transmission
  - Airbag
  - Breaking
- Functions
  - General/Common Product Offer



Addressed functions by products included in the selection guide

Most of the Electronics Control Unit of the systems included in the selection guide share a similar architecture

TRANSCEIVER ICS

Part number	Description	Operating voltage	Transmission frequency max.	Features	Tj [°C]	Package	Status
L9616	High Speed CAN bus transceiver	Vs: 4.5 - 5.5V	1 MHz	Meet ISO/DIS 11898 standard Short circuit protection from -5 V -36 V Slope control to reduce EMI and RFI; High speed mode: <1 MHz/ Low speed mode: <250 KHz ESD level: up to 4 KV	-40~150	SO8	Production
L9637	ISO9141 Interface	Vcc: 3 - 7 V Vs: 4.5 - 36 V	50 KHz	Compatible with ISO 9141 interface & functions Low quiescent current in off condition (120 µA) Reverse battery protected down to VS -24 V	-40~150	SO8	Production
L9663	PSI5 transceiver	Vbat: 4.3 - 35 V VDD: 3.3 V / 5 V	189 KHz	High data transmission speed of 125 kbps (optional 83.3 kbps and 189 kbps) Integrated FLL module for high accuracy timing control 2x PSI5 async. or sync operation compatible with v1.3 & v2.0 revisions 32 bit SPI interface STG, LTG, OL, STB, Short between channels UV, OV, Reverse voltage protection	-40~175	VFQFPN28	Production

Engine management system

U-CHIPS ICS

Part number	Description	WD	Interface	Regulators	Outputs (Rdson@Tj=150°C, OC_Threshold/Min., Clamping Voltage/Typ.)		Tj [°C]	Features	Package	Status
L9177	1/2 cylinders small engine U-chip IC	No	SPI + 6 I/O IN ISO9141 (K-Line) VRS	5 V/±2%/300 mA 5 V tracking/40 mA 5 V standby/2.5 mA	3×Relay 2×Injector 1×02 Heater 1×Tach Current 1×Lamp Current Stepper driver 1xHigh side OUT	1.5 W max./1.2 A/45 V 0.6 W max./2.8 A/60 V 0.5 W max./3.8 A/45 V 5 W max./100 mA 1.5 W max./1.2 A (min.2 A in-rush)/45 V 2.6 W max./0.85 A 14 Ω max./100 mA	-40~150	Diagnosis: OL, STG, OC, STB, OT	PowerSO46	Production
L9177A									TQFP64-EP	Under qualification
L9779WD-SPI	- Up to 4 cylinders engine - U-chip IC - Multifunction IC with SPI interface for engine management system	Yes	SPI + 12 I/O IN ISO9141 (K-Line) CAN VRS	5 V/±2%/external NMOS 600 mA 3.3 V/±2%/100 mA 2×5 V tracking/100 mA	1×Main Relay 1×Start Relay 5×Relay 4×Injector 2×02 Heater 1×High Current 1×Low Current Stepper driver or 4×LSD 4×IGBT Pre-driver	2.4 W max./600 mA/48 V 1.5 W max./1 A/45 V 1.5 W max./1 A/45 V 0.72 W max./3 A/58 V 0.47 W max./7.8 A/45 V 0.72 W max./3.7 A/58 V 20 W max. /70 mA/45 V 1.5 W max./1 A	-40~150	Smart Reset: Monitoring 5V logic voltage management and safety control. Diagnosis: OL, STG, OC, STB, OT	HiQUAD-64	Production

MULTI-CHANNEL DRIVER ICS

Part number	Description	Interface	Operating Voltages	Outputs (Rdson@Tj=150°C, OC_Threshold/Min., Clamping Voltage/Typ.)		Typical application	Tj [°C]	Features	Package	Status
L9709(*)	Multiple low side Driver (8 ch)	Control: SPI/ Parallel Config.& Diag.: SPI	VB: 6-16 V Vcc: 4.9-5.3 V	6×LSD (parallel) 4×LSD (parallel) 2×LSD (parallel) 6×Pre-driver (parallel)	0.62 W max./2.5 A/75 V 0.6 W max./1.5 A/50 V 0.27 W max./5.5 A/35 V 12.5/32 mA	Injector driver Solenoids/Relays lambda heaters Spark plug ignition	-40~150	Diagnosis: LSD : OC, OL, STG; Pre-drivers: OL, STG, STB; General: OT.	HiQUAD-64	Production
L9733CN L9733XP	Configurable high side-low side driver (8 ch)	Control: SPI / Parallel Config.& Diag.: SPI	VB: 4.5-18 V Vcc: 4.5-5.5 V	8×LSD/HSD - CHN1-5: SPI driving - CHN6-8: SPI/PWM driving	1.2 W max./1 A/450 V(LSD) 1.2 W max./1 A/-14 V(HSD)	Driver for Relays, Lamps, DC and stepper motor	-40~150	Diagnosis: OC, STG, OL, STB, OT	PowerSSO28	Production
L9753(*)	Configurable high side-low side driver (8 ch)	Control: SPI/ Parallel Config.& Diag.: SPI	VB: 7-18 V Vcc: 4.75-5.25 V VDDI: 2.97-5.5 V	2×LSD/HSD (SPI) 4×LSD/HSD (SPI/ parallel) 2×LSD (SPI)	1.4 Ω max/55 V(LS)/-32 V(HS) OC:0.4 A/0.8 A (configurable)	Driver for Solenoids, Relays, Lamps, LED	-40~150	Diagnosis: OC, STG, OL, STB, OT	PowerSSO28	Production
L9848	Configurable high side-low side driver (8 ch)	Control: SPI/ Parallel Config.& Diag.: SPI	VB: 9-18 V Vcc: 4.75-5.25 V	2×LSD (CHN7-8) (SPI) 4×LSD/HSD (CHN1-4) (Self Configurable, SPI) 2×LSD/HSD (CHN5-6) (Self Configurable, SPI/Parallel)	2 Ω max/ 0.8 A/ 45 V (LSD)/ -30 V (HSD)	Driver for Relays, Lamps, DC and stepper motor	-40~150	Diagnosis: OC, STG, OL, STB, OT	SO28	Production
L9651	Quad low side driver	Control: Parallel Config.& Diag.: SPI	4.7-30V	4×LSD (parallel)	0.85 W max./2.2 A/70 V	Driver for injector, EGR, VVT valve etc.	-40~150	Diagnosis: OL, STB, STG, OT; Filter time: 100us	PowerSO20	Production
L9825	Octal low side driver	Control: SPI / Parallel Config.& Diag.: SPI	Vcc: 4.5-5.5 V	6×LSD (SPI) 2×LSD (SPI/parallel)	1.5 Ω max/1.05 A/50 V	Typical application with - R = 16W to 200W, - L= 0 to 600mH loads.	-40~150	Diagnosis: OC for CHN1-6 OC and OT for CHN7-8 OL and STG for all CHN Fly-back current rec Di inside Max. 10mJ/CHN	PowerSO20	Production

Note: * Available upon request. Contact ST sales office.

Part number	Description	Interface	Operating Voltages	Outputs (Rdson@Tj=150°C, OC_Threshold/Min., Clamping Voltage/Typ.)		Typical application	Tj [°C]	Features	Package	Status
L9826	Octal low side driver	Control: SPI/ Parallel Config.& Diag.: SPI	Vcc: 4.5-5.5 V	6×LSD (SPI) 2×LSD (SPI/parallel)	3 Ω max/0.5 A/50 V	Typical application with - R = 30 W to 100 W, - L= 0 to 600 mH loads	-40~150	Diagnosis: OC for CHN1-6 OC and OT for CHN7-8 OL and STG for all CHN Fly-back current rec Di inside Max. 10mJ/CHN	SO20	Production
L9301	Multiple configurable driver	Control: SPI/ Parallel Config.& Diag.: SPI	VB:5 V-18 V Vcc:4.75 V-5.25 V VDDI: 3-5.5 V	Basic as below (4 optional configurations refer to datasheet) 4 x LS/HS FETs/max.0.6 Ω/37 V/SPI controlled/DRN/SRC1-4 4 x LS FETs/max.0.6 Ω/37 V/IN1-4 controlled /OUT1-4 4 x LS FETs/max.0.3 Ω/37 V/IN5-8 controlled/OUT5-8			-40~175	Logic inputs: TTL/CMOS-compatible Diagnosis: OT, OL, STG, STB, UV, OV	PowerSSO36	Production

SYSTEM BASIC ICS

Part number	Description	Interface	Supply Voltages	Outputs	Tj [°C]	Features	Package	Status
L9758	Multiple supply for engine control	N/A	Buck pre-regulator/2A (RMS) 5 V/±2%/1 A VDD 3.3 V or 2.6 V/2%/1 A/external transistor VDDL VCORE /1.5V/2%/1 A/external transistor and divider VKAM/1 V or 1.5 V/10%/10m A/standby memory regulator VSTBY/3.3 V or 2.6 V/10%/10 mA/ alternate standby regulator 4 x 5 V ± 7 mV tracking/50mA Boost converter for low battery condition (optional)	N/A	-40~150	Boost/buck operating frequency: 300-450 kHz	PowerSO36	Production

LAMBDA SENSOR INTERFACE ICS

Part number	Description	Interface	Operating Voltages	Outputs	Tj [°C]	Features	Package	Status
L9780	Wide range air fuel sensor control interface	SPI Compensation network IF Lambda sensor IF	Vcc: 4.9-5.1 V	Heater FET driver for Linear Lambda Sensor Voltage controlled current source pump cell driver Protection FET drivers for pump cell	-40~150	Compatible with all main WRAF sensors available in market Bosch NTK Delphi, Denso	LQFP48	Production

DIESEL SYSTEM DRIVER ICS & DIRECT INJECTION ICS

Part number	Description	Interface	Operating Voltages	Outputs	Tj [°C]	Features	Package	Status
L9781(*)	4cyl GDI/diesel injection drivers plus 1 high pressure fuel pump driver	SPI Parallel	VB:5-26 V Vcc: 4.5-5.5 V VCCI: 3 – 5.5 V	1 x Boost voltage controller for injection (high voltage) - V-boost up to 80 V 2 x controllers for injection (both HSD and LSD) including: -1 x HSD pre-driver pushing pull to V-boost -1 x HSD pre-driver pushing pull to V-Bat -2 x LSD pre-drivers -1 x differential amplifier for current sensing 1 x peak-hold controller for fuel pump driving including: -1 x HSD pre-driver pushing pull to V-Bat -1 x LSD pre-drivers -1 x differential amplifier for current sensing	-40~150	V-boost HSD frequency: 50 kHz V-Bat HSD frequency: 100 kHz LSD frequency: 100 kHz Diagnosis: OV, UV, OC, OL, STG, STB	LQFP64	Production
L9524C	Glow plug system control IC in diesel system	N/A	Vs: 5-18 V; VB: 5-18 V	4 x HSD N-FET pre-driver for glow-plug driving 6 x current sensing (shunt sense/transistor sense) 1 x relay pre-driver 6 x operating modes (set by MS, BAT, IO, CI pins)	-40~125	Diagnosis: OC, OV, UV, OT, STG, STB; Support up to 6ch glow plugs control	SO24	Production

Note: * Available upon request. Contact ST sales office.

MOTOR DRIVER ICS

Part number	Description	Interface	Operating Voltages	Operating frequency max.	Rdson max.	Tj [°C]	Features	Package	Status
L9958	Low Rdson SPI controlled H-Bridge (DC motor)	SPI PWM & Dir	VB: 4 – 28 V VC: 4.5 – 5.5 V	20 kHz	300 mΩ @ full path	-40~150	Current Limitation:2.5 A,4 A,6,6 A,8.6 A Power Stage control: PWM & Dir Diagnosis: STG, STB, OC, OL, OT;	PowerSO20	Production
L9958SB								PowerSO16	
L9958XP								PowerSO24	
L9960	Single H-bridge (DC Motor)	SPI, PWM & Dir, IN1&IN2	VS1,VS2 : 4V – 28V; VDD5: 4.5V-5.5V; VDDIO: 3V-5.5V	20 kHz	400 mΩ @full path	-40~150	4 Current Limitation Limits are selectable through SPI; Diagnosis: STG, STB, OC, OL, OT;	PowerSSO36	Production
L9960T	Dual H-bridge (DC Motor)	SPI, PWM & Dir, IN1&IN2	VS1,VS2 : 4V – 28V; VDD5: 4.5V-5.5V; VDDIO: 3V-5.5V	20 kHz	400 mΩ @full path	-40~150	4 Current Limitation Limits are selectable through SPI; Diagnosis: STG, STB, OC, OL, OT; Diagnosis: STG, STB, OC, OL, OT;	PowerSSO36	Production
L9942XP	Integrated stepper motor driver for bipolar stepper motor switch micro-stepping and programmable current profile	SPI PWM & Step	VB: 7– 20V VC: 3.- 5.3V	20 kHz/ 30 kHz	1 Ω@HS/LS	-40~150	2 x full bridge with Max. 1.3A Stepping mode programmable (full/half/mini/micro) Slew rate and Decay rate programmable OL, OC, OT shut-down Typical Applications: - light levelling - bending light - throttle control	PowerSSO24	Production

Alternator regulator

MULTI-FUNCTION ICS

Part number	Setting voltage	Field Drv.	Setting voltage temp spec (mV/°C)	Starting speed (rpm)@RT/max.	LRC cut-off speed (rpm)@RT	LRC DT/starting DT(s)	Driver	Tj [°C]	Package	Status
L9409F	14.5±0.2 V@25°C	HS	3-slope (flat +down +flat)	1600	3000±300	3.5Max./ 2.9Max.	Lamp/ Relay	-40~150	Multiwatt8	Production
L9460N(*)	14.77±0.25 V@71°C	HS	1- slope(down)	701.5	3100±465	10±1.5/0	Lamp	-45~160	Multiwatt8	Production
L9462N(*)	14.10±0.25 V@71°C	HS	1- slope(down)	701.5	3100±465	10±1.5/0	Lamp	-45~160	Multiwatt8	Production
L9465N(*)	14.2±0.2 V@71°C	HS	flat	701.5	3100±465	2.5±0.38/0	Lamp	-45~160	Multiwatt8	Production
L9466N	14.8±0.25 V@23°C	HS	1- slope(down)	1670	3000±450	10±1.5/2	Lamp/ Relay	-40~150	Multiwatt8	Production
L9468N	14.8 V@23°C/ 14.1 V@71°C	HS	1- slope(down)	701.5	3100±465	2.5±0.38/0	Lamp	-40~150	Multiwatt8	Production
L9484	14.8 V	HS	1- slope(down)	1670	3000±450	2.5/2	Lamp/ Relay	-40~150	Multiwatt8	Production
L9408FDIETR	14.45±0.15V@20°C	LS	-3±1	1200	3130±470	2.88/0	Lamp/ Relay	-40~150	Bare Die	Production
L9474N	13.8	HS	Flat or RVC	720	3100±470	2.5/N/A	Lamp	-40~150	Multiwatt8	Production
L9911P	14.4±0.4 V@20°C	HS	-3.5±1	1320	3000±300	2.5/0	Lamp/ Relay	-40~150	Multiwatt8	Production
L9911F	14.4±0.4 V@20°C	HS	-3.5±1	1590	3000±300	9-Feb	Lamp/ Relay	-40~150	Multiwatt8	Production
L9911I	14.5±0.15 V@23°C	HS	-10±1.8	1590	3000±300	9-Feb	Lamp/ Relay	-40~150	Multiwatt8	Production
L9911V	14.5±0.15 V@23°C	HS	-10±1.8	1320	3000±300	2.5/0.5	Lamp/ Relay	-40~150	Multiwatt8	Production
L9911K	14.2±0.15 V@20°C	HS	-2.5±1	1320	3000±300	2.5/0	Lamp/ Relay	-40~150	Multiwatt8	Production
L9911U	14.4±0.4 V@20°C	HS	-3.5±1	1320	3000±300	2.5/2	Lamp/ Relay	-40~150	Multiwatt8	Production

Note: * Available upon request. Contact ST sales office.

MULTI-FUNCTION ICS

Part number	Description	Setting voltage @30°C	Setting voltage temp spec (mV/°C)	Starting speed (rpm)@RT/ max.	LRC cut-off speed (rpm)@ RT	LRC DT/starting DT(s)	Field DRv.	Driver	Features	Tj [°C]	Package	Status
		Configurable in OPT cell										
L9916	Multifunction alternator voltage regulator with programmable parameters for 12 V / 24 V	13.5±0.15 V@12 V Sys. 13.6±0.15 V@12 V Sys. 13.7±0.15 V@12 V Sys. 13.8±0.15 V@12 V Sys. 13.9±0.15 V@12 V Sys. 14.0±0.15 V@12 V Sys. 14.1±0.15 V@12 V Sys. 14.2±0.15 V@12 V Sys. 14.3±0.15 V@12 V Sys. 14.4±0.15 V@12 V Sys. 14.5±0.15 V@12 V Sys. 14.6±0.15 V@12 V Sys. 14.7±0.15 V@12 V Sys. 14.8±0.15 V@12 V Sys. 14.9±0.15 V@12 V Sys. 15.0±0.15 V@12 V Sys. 27.0±0.25 V@24 V Sys. 27.2±0.25 V@24 V Sys. 27.4±0.25 V@24 V Sys. 27.6±0.25 V@24 V Sys. 27.8±0.25 V@24 V Sys. 28.0±0.25 V@24 V Sys. 28.2±0.25 V@24 V Sys. 28.4±0.25 V@24 V Sys. 28.6±0.25 V@24 V Sys. 28.8±0.25 V@24 V Sys. 29.0±0.25 V@24 V Sys. 29.2±0.25 V@24 V Sys. 29.4±0.25 V@24 V Sys. 29.6±0.25 V@24 V Sys. 29.8±0.25 V@24 V Sys. 30.0±0.25 V@24 V Sys.	0±1@12 V Sys. -2.5±1@12 V Sys. -3.5±1@12 V Sys. -7.0±1@12 V Sys.; -10±1@12 V Sys.; 0±2@24 V Sys.; -2.5±2@24 V Sys.; -3.5±2@24 V Sys.; -7.0±2@24 V Sys.; -10±2@24 V Sys.;	900, 1200, 1500, 1800	1500, 2800, 3000, 3200	LRC time: 2.5/3/5/6/7.5/9/10/12 Start delay time: 0.5/2.5/5/10	HS	Lamp/ Relay	- Set point clamp voltage configurable - Field switching frequency configurable - Self start phase detection voltage configurable - Alarm validation time configurable - Self-start function selectable - LRC enable/ disable - Lamp driver enable/disable - Direct/ reverse FM output signal selectable	-40~150	Multiwatt8/ Bare Die	Production

PROTOCOL DRIVEN ICS AND FLEXIBLE MULTI-FUNCTION ICS

Part number	Description	Setting voltage	Field Drv.	Interface	Setting voltage temp spec (mV/°C)	Starting speed (rpm)@RT/max.	LRC cut-off speed (rpm)@RT	LRC DT/ starting DT(s)	Driver	Tj [°C]	Package	Status
L9914A	RVC Protocol Alternator Voltage regulator	13.8 V/RCV	HS	RVC	Flat/RCV	830	3100±450	2.5/N.A.	Lamp	-40~150	Multiwatt8	Production
L9914B		13.8 V/RCV	HS	RVC	Flat/RCV	830	3100±450	5/N.A.	Lamp	-45~150	Multiwatt8	Production
L9914C		13.8 V/RCV	HS	RVC	Flat/RCV	1410	3500±500	2.5/N.A.	Lamp	-45~150	Multiwatt8	Production
L9915CB	C-terminal alternator voltage regulator (CTAVR)	14.55±0.18 V @300C/C-term	HS	C-term	-3.5±2/C-term	1380	3000±300	5/5'	Lamp	-45~150	Multiwatt8	Production
L9915B	C-terminal alternator voltage regulator (CTAVR)	14.55±0.18 V @300C/C-term	HS	C-term	-7±2/C-term	1380	3000±300	0/0	Lamp	-40~150	Multiwatt8	Production
L9912(*)	Programmable Control	Software set	HS/LS	RCV/PCM/ C-term/ LIN	Software set	Software set	Software set	Software set	Lamp/Relay	-40~150	TQFP44EP	Production
L9912L(*)	Alt. Volt. Reg. 12 V Vehicles											
L9924(*)	Programmable Control	Software set	HS/LS	RCV/PCM/ C-term/ LIN	Software set	Software set	Software set	Software set	Lamp/Relay	-40~150	TQFP44EP	Production
L9924L(*)	Alt. Volt. Reg. 24 V Vehicles											

Note: (*) Sales currently only through selected partners (EVB Avnet)

Steering

SYSTEM BASIC ICS

Part number	Description	Operating voltage	Regulator	VDD	Interface	Tracking regulator	ADC	WD	Pre-driver	Fault output	Diagnostics	Tj [°C]	Package	Status
L9396	Multiple power supply for automotive applications	6~19 V without boost; 4.5~19 V with boost	Buck: 6.5 V, 7.2 V (1 A) LDO: 5 V (250 mA) LDO: 3.3 V, 5 V (100 mA) Buck (1 A) or LDO (300 mA): 0.8 V-5 V Boost (opt): 9 V (300 mA) Tracking: 2 x 3.3 V, 5 V (120 mA)	SPI, 16-bit	4-ch active sensor I/F; 2-ch can be configured as tracking regulator	10bits	2 x WD (Q&A WD/ temporal WD)	HS pre-driver for failsafe FET and motor FET (both with drain-source monitor) and for recirculation FET	FSN pin	UV, OV, OC, OL, OT		40~175	LQFP64	In qualification
L9777A/B/C	Low power voltage regulator	5.6~31 V VDD: 3.3 V/5 V	1 x 5 V±2% /210 mA	5 V	N/A	1 x 5 V±2% /110 mA A ver. 1 x 5 V±2% /55mA B ver. 1 x 5 V±2% /55 mA C ver.	N/A	signal WD	N/A	N/A	OT, short circuit	-40~150	PowerSSO-12	Production

MOTOR DRIVER ICS

Part number	Description	Vs	Interface	Output	Control input	CSA	Static current	Braking mode (freewheeling)	Diagnostics	Tj [°C]	Package	Status
L9904	H-bridge pre-driver	8~28 V	K-Line	2 x HSD 2 x LSD	DIR/PWM	N/A	5.8 mA	Active	OV, UV, short circuit and thermal shutdown	-40~150	PowerSO-20	Production
L9907	3 phase bridge pre-driver	6~54 V	SPI (16-bit, 8 MHz)	3 x HSD 3 x LSD Max. gate current 600 mA (adjustable)	SPI+PWM	2 CSA, gain factors programmable	Low standby current (not specified)	Passive/Active	- FET driver: FET driver supply Under voltage (UV) diagnostic; Gate to source output voltage limit; Gate to source passive switch off. - Power supply pins VB and VCC: OV, UV; diagnostic and protection - All logic pins withstand 35 V - OC, OT	-40~150	TQFP64-EP	In development

Transmission

U-CHIP ICS

Part number	Operating voltage	Regulator	Interface	WD	Pre-driver	Valve driver	Current control	Diagnostics	Tj [°C]	Package	Status
L9300	VB: 5~18 V	VDD1: 5 V/6.5 V buck, 1.3 A, 3% VDD2: Tracking (±20 mV)/ linear 5 V (2%), 200 mA VDD3: 0.8~5 V,1 A,2%, external FET VDD4: linear 2%/buck 3%, 0.8~5 V, 1 A, TRK1~4: 3.3~5 V, 100 mA, ±20 mV	SPI (global) CAN Transceiver Parallel 4-ch active sensor I/F	Double WD (Q&A WD & PWM WD)	Fail-safe pre-driver Pump motor FET	6 high/low side configurable (0.5Ω)	HW current PID control loop through SPI SW control loop through parallel input 1% accuracy 0.5~1.5A for TCU	OL, OV, UV, OT, configurable Watchdog (Time-out/Window/ Periods) Temperature sensor Fail-Safe Outputs (FSN) Wake-up input	-40~175	TQFP80	In development

EXTENSION ICS

Part number	Description	Operating voltage	Interface	WD	Valve driver	Diagnostics	Tj [°C]	Package	Status
L9301	Multiple configurable driver	VB: 5~18 V VDD: 5 V±5%	SPI Parallel PWM and ON/OFF mode configurable	N/A	4 x HSD/LSD (0.6Ω) 4 x LSD (0.6Ω) 4 x LSD (0.3Ω)	OH, OC, OL, STG, STB output status, low charge pump, freewheel diode loss	-40~175	PowerSSO36	Production

SYSTEM BASIC ICS

Part number	Description	Operating voltage	Regulator	Interface	ADC	WD	Outputs	Diagnostics	Tj [°C]	Package	Status
L9396	Multiple Power Supply IC (ABS,ESP, TCU etc…)	VB: 6~18 V VDD: 3.3 V	1 x boost regulator 9 V/300 mA for low battery; boost work while 4.5 V < input voltage<6 V 1 x buck regulator 6.5 V/7.2 V/1 A for internal use 1 x LDO 5 V/250 mA for uC I/O and ADC 1 x LDO 3.3 V/5 V 100 mA for uC I/O 1 x LDO 0.8 V/3.3 V for uC core supply; 1A in buck configuration w/ external FET 500 mA in linear configuration w/ external FET	SPI, 32-bit; 4 x WWS IF tracking regulators	5 x ADC input I/O / 10bits	2 x WD (Q&A WD & PWM WD)	Fail-safe(HSD) Pump motor (half bridge)	UV, OV, OC, OL, OT	-40~175	TQFP64EP	In qualification

SYSTEM BASIC ICS

Part number	Description	Operating voltage	Interface	Outputs	Features	Tj [°C]	Package	Status
L9907A	FET driver for 3-phase BLDC motor	VB: 6–54 V VC: 3.3-5 V	SPI Parallel 2 x current sensing amplifiers with programmable gain (10/ 30/ 50/ 100)	3 x HSD &3 x LSD FET pre-drivers	12 V, 24 V, 48 V system compatible Stand with -7 – 90 V@ FET output pins PWM operation frequency up to 20 kHz Full diagnosis by 10-bit SPI - pre-drivers: OL, STG, STB - input DC voltage: OV, UV - general diagnostic: over-temperature	-40~150	TQFP64-EP	In development
L99ASC03	Brushless/ sensorless 3-phase motor pre-driver	VB: 6-28 V	SPI; LIN transceiver Parallel Back EMF input for phase detecting 1 x 5 V 100 mA output to uC 1 x Analog output for Tj / VS 1 x current sense amplifier (SPI configurable)	3 x half bridge pre-drivers	Very low current consumption in standby mode (typ. 15 µA) Window watchdog and fail-safe functionality Two-stage charge pump supporting 100% duty cycle PWM operation up to 80 kHz (not restricted) Disable input to turn off gate driver outputs Diagnostic: OP(programmable),OL	-40~150	TQFP48	Production
L9904	Motor bridge controller	VB: 8-28 V	K-line PWM & Dir	1 x H bridge pre-driver	Overvoltage Max. 40 V Setup Converter implement voltage Min. 6 V Quiescent current in Standby mode less than 50 uA ISO 9141 compatible interface Charge pump for driving power MOS as reverse battery protection PWM operation frequency up to 30KHz Real time diagnostic: OV, UV, Short circuit and thermal protection	-40~150	SO20	Production

Airbag systems

U-CHIP ICS

Part number	Description	Operating voltage	VSUP typ.	VER	VSF	Interface	Remote sensor I/F	DC sensor I/F	GPO driver	Deployment	Tj [°C]	Package	Status
L9678P	4 loops U-chip IC	Vbat: 6 V~18 V VDD: 3.3 V/ 5 V±4%	N/A	23 V/33 V±5% 1.882 MHz (programmable)	20 V/25 V (programmable)	SPI ISO9141 (K-Line)	N/A	4x hall effective/ resistive sensor I/F	2 HS/LS configurable drivers with PWM control	4 channel HSD/LSD 25 V maximum deployment voltage 1.2 A @ 2 ms and 1.75 A @0.5/0.7 ms deployment profiles	-40~150	LQFP64	Production
L9678P-S	4 loops U-chip IC with 2 channels PSI5 remote sensor interface	Vbat: 6 V~18 V VDD: 3.3 V/ 5 V±4%	7.2V±4%	23 V/33 V±5% 1.882 MHz (programmable)	20 V/25 V (programmable)	SPI ISO9141 (K-Line)	2x PSI5 v1.3 asynchronous operation	4x hall effective/ resistive sensor I/F	2 HS/LS configurable drivers with PWM control	4 channel HSD/LSD 25 V maximum deployment voltage 1.2 A @ 2 ms and 1.75 A @0.5/0.7 ms deployment profiles	-40~150	LQFP64	Production
L9679P	8 loops U-chip IC with 2 channels PSI5 remote sensor interface	Vbat: 6 V~18 V VDD: 3.3 V/ 5 V±4%	7.2 V/9 V±4%	23 V/33 V±5% 1.882 MHz (programmable)	20 V/25 V (programmable)	ISO9141 (K-Line) 2xSPI	2x PSI5 v1.3 synchronous operation	9x hall effective/ resistive sensor I/F	3 HS/LS configurable drivers with PWM control	8 channel HSD/LSD 25 V maximum deployment voltage 1.2 A@22 V@3.2 ms 1.75 A@17 V@2 ms/	-40~150	LQFP64	Production
										1.75 A@15 V@3.2 ms	-40~150	TQFP100	Production
L9680	12 loops U-chip IC with 4 channels PSI5 remote sensor interface	Vbat: 6V~18V VDD: 3.3 V/ 5 V±4%	7.2 V/9 V±4%	23 V/33 V±5% 1.882 MHz (programmable)	20 V/25 V (programmable)	2xSPI	4x PSI5 v1.3 synchronous operation	9x hall effective/ resistive sensor I/F	3 HS/LS configurable drivers with PWM control	12 channel HSD/LSD 25 V maximum deployment voltage 1.2 A@22 V@3.2 ms 1.75 A@17 V@2 ms/	-40~150	TQFP100	Production
										1.75 A@15 V@3.2 ms	-40~150	TQFP100	Production

SENSOR INTERFACE ICS

Part number	Description	Operating voltage	Vas	Interface	Remote sensor I/F	Features	Diagnostics	Tj [°C]	Package	Status
L9663	PSI5 Transceiver	Vbat: 4.3 V~35 V VDD: 3.3 V/5 V	5.3 V/7.6 V	SPI (32-bit)	2x PSI5 async or sync operation compatible with both v1.3 and v2.0 revisions	High data transmission speed of 125 kbps (optional 83.3 kbps and 189 kbps) Integrated FLL module for high accuracy timing control	STG, LTG, OL, STB, Short between channels UV, OV, Reverse voltage protection	-40~175	VFQFPN28	In production

FIRING DRIVER ICS

Part number	Description	Interface	Remote sensor I/F	Deployment	Features	Diagnostics	Tj [°C]	Package	Status
L9662	8 loop deployment driver with quad Manchester/PSI5 encoded sensor interface	SPI1&SPI2 (5.5 MHz)	4x PSI5 (parity) sync or async operation	4 channel HSD/LSD 1.2 A(min)/2 ms, 1.75 A (min)/1.0 ms and 1.75 A (min)/0.65 ms between VRES of 7 V to 37 V 1.5 A(min)/2 ms between VRES of 7 V to 25 V	Capability to deploy the squib when the low side MOS is shorted to ground Independently controlled high-side and low-side MOS for diagnosis Programmable independent current trip points for each satellite channel Analog output available for resistance measurement	STG, STB, independent Mosfet diagnostic, voltage monitoring, satellite message error detection	-40~150	LQFP64	In production

Braking

U-CHIP ICS

Part number	Operating voltage	Regulator	Interface	WSS	ADC	WD	Pre-driver	Fault output	Diagnostics	Tj [°C]	Package	Status
L9396	6~19 V without boost 4.5~19 V with boost	Buck: 6.5 V,7.2 V (1 A) LDO: 5 V (250 mA) LDO: 3.3 V, 5 V (100 mA) Buck (1 A) or LDO (300 mA): 0.8 V-5 V Boost (opt): 9 V (300 mA) Tracking : 2 x 3.3 V, 5 V (120 mA)	SPI, 16-bit	4-ch active sensor I/F; 2-ch can be configured as tracking regulator	10bits	2 x WD (Q&A WD/ temporal WD)	HS pre-driver for failsafe FET and motor FET (both with drain-source monitor) and for recirculation FET	FSN pin	UV, OV, OC, OL, OT	-40~175	LQFP64	In qualification

VALVE DRIVER ICS

Part number	Description	Operating voltage	Interface	Valve driver	Output control	Current accuracy	Diagnostics	Tj [°C]	Package	Status
L9301	Multiple configurable driver	Vbat: 5~18 V VDD: 5 V±5%	SPI (32bit, 6 Mhz) /parallel input	4 high/low side (0.6 Ω) 4 low side (0.6 Ω) 4 low side (0.3 Ω)	PWM and ON/OFF mode configurable	N/A	Thermal/OC protection, output status, low charge pump, freewheel diode loss, OL, STB(HS) /STG(LS)	-40~175	PowerSSO-36	Production
L9375TRLF	8 channel valve driver	Vbat: 5.2 ~ 20 V VDD: 5 V±5%	SPI (16bit, 5 Mhz)	4 Low side (0.16 Ω) 4 PWM controlled Low side (0.2 Ω)	4-ch ON/OFF controlled 4-ch PWM controlled (duty cycle can be programmed individually	N/A	OC & OL, UC, UV, output status, thermal warning, OT, PGND/SGND loss, freewheel diode loss	-40~150	PowerSO-36	Production
L9374LF	4 channel valve driver	Vbat: 5.2 ~ 20V VDD: 3.3 V/5 V±5%	SPI (16bit, 5 Mhz)	2 PWM controlled low side (0.14 Ω) 2 current controlled low side (0.25 Ω,0~1.8 A,6%)	2-ch current controlled 2-ch PWM controlled (duty cycle can be programmed individually	24 mA (0~400 mA) 6% (400 mA~1.8 A)	OC & OL, UC, UV, output status, thermal warning, OT, PGND/SGND loss, freewheel diode loss, current not reachable	-40~150	PowerSO-36	Production
L9347	4 channel valve driver	Vbat: 4.8~18 V VDD: 3.3 V/5 V±5%	parallel input	2 Low side (0.2 Ω) 2 Low side (0.35 Ω)	2-ch ON/OFF controlled 2-ch PWM controlled with current regulation	0.25 A~0.40 A 10% 0.40 A~0.80 A 6% 0.80 A~2.25 A 10%	OC & OL, short circuit, selective OT shutdown, ground and supply loss detection, regulator drift detection	-40~150	PowerSO-36	Production
L9348	4 channel valve driver	Vbat: 4.8~18 V VDD: 3.3 V±2%	parallel input	2 Low side (0.2 Ω) 2 Low side (0.35 Ω)	2-ch ON/OFF controlled 2-ch PWM controlled	N/A	OC & OL, short circuit, selective OT shutdown, ground and supply loss detection, regulator drift detection	-40~150	PowerSO-36	Production
L9349-LF	4 channel valve driver	Vbat: 4.5~32 V VDD: 3.3 V±2%	parallel input	2 Low side (0.2 Ω) 2 Low side (0.3 Ω)	4-ch ON/OFF controlled	N/A	OC & OL, short circuit, load bypass, selective OT shutdown, Signal and power ground loss shutdown	-40~150	PowerSO-20	Production
L9352B	4 channel valve driver	Vbat: 4.8~18 V VDD: 5 V±10%	parallel input	4 Low side (0.2 Ω)	2-ch ON/OFF controlled 2-ch PWM controlled with current regulation	0.00 A~0.25 A 25 mA 0.25 A~0.40 A 10% 0.40 A~0.80 A 6% 0.80 A~2.25 A 6%	OC & OL, short to ground & supply, OT, regulator drift detection	-40~150	PowerSO-36	Production

General Purpose ICs

MOTOR DRIVER ICS

Part number	Description	Interface	Operating voltage	Operating frequency max.	Rdson max.	Features	Tj [°C]	Package	Status
L9958	Low Rdson SPI controlled H-Bridge (DC Motor)	SPI PWM & Dir	VB: 4 – 28 V VC: 4.5 – 5.5 V	20 kHz	300 mΩ @full path	Current Limitation:2.5 A,4 A,6,6 A,8.6 A Power Stage control: PWM & Dir Diagnosis: STG, STB, OC, OL, OT	-40~150	PowerSO20	Production
L9958SB								PowerSO16	
L9958XP								PowerSO24	
L9960	Single H-bridge (DC Motor)	SPI, PWM & Dir, IN1&IN2	VS1,VS2 : 4 V – 28 V VDD5: 4.5 V-5.5 V VDDIO: 3 V-5.5 V	20 kHz	400 mΩ @full path	4 Current Limitation Limits are selectable through SPI; Diagnosis: STG, STB, OC, OL, OT	-40~150	PowerSSO36	Production
L9960T	Dual H-bridge (DC Motor)	SPI, PWM & Dir, IN1&IN2	VS1,VS2 : 4 V – 28 V VDD5: 4.5 V-5.5 V VDDIO: 3 V-5.5 V	20 kHz	400 mΩ @full path	4 Current Limitation Limits are selectable through SPI; Diagnosis: STG, STB, OC, OL, OT	-40~150	PowerSSO36	Production
L9904	Single H-bridge pre-driver (DC Motor)	K-line; PWM & Dir	VB: 8 V to 28 V	30 KHz	-	Overvoltage Max. 40 V Setup Converter implement voltage Min. 6 V Quiescent current in Standby mode < 50 µA ISO 9141 compatible interface CP for driving MOS as reverse battery protection Diagnostic: OV, UV, Short circuit ,thermal protection	-40~150	SO20	Production
L9907	FET driver for 3 phase BLDC motor	SPI Parallel	VB: 6– 54 V VC: 3.2 – 5.25 V	20 kHz	-	12 V , 24 V, 48 V system compatible Can withstand-7 – 90 V@Motor output pins 3x half bridge drivers 2 x current sensing with gain (10, 30, 50, 100) Full diagnosis by 16-bit SPI OL, STG, STB, OT, OV, UV	-40~150	TQFP64-EP	In development (Recommended)
L99ASC03	Brushless / sensor less 3-phase motor pre-driver	SPI Parallel LIN	VB: 6–28 V	80 KHz	-	Low current consumption in standby mode (typ. 15 µA) Window watchdog and fail-safe functionality Two-stage charge pump supporting 100% duty cycle Disable input to turn off gate driver outputs Diagnostic: OP (programmable), OL	40~150	TQFP48	Production

Part number	Description	Interface	Operating voltage	Operating frequency max.	Rdson max.	Features	Tj [°C]	Package	Status
L9942XP	Integrated stepper motor driver for bipolar stepper motor switch micro-stepping and programmable current profile	SPI PWM & Step	VB: 7– 20 V VC: 3.- 5.3 V	20 kHz/30 kHz	1 Ω @HS/LS	2 x full bridge with Max. 1.3 A Stepping mode programmable (full/half/mini/micro) Slew rate and Decay rate programmable OL, OC, OT shut-down Typical Applications: - light levelling/bending light/throttle control	-40~150	PowerSSO24	Production

HS/LS DRIVER ICS

Part number	Description	Interface	Operating voltage	Outputs (Rdson@Tj=150 °C, OC_Threshold/Min., Clamping voltage/Typ.)		Typical application	Features	Tj [°C]	Package	Status
L9733CN L9733XP	Configurable high side - Low side driver (8 ch)	Control: SPI/Parallel Config.& Diag.: SPI	VB: 4.5-18 V Vcc: 4.5-5.5 V	8×LSD/HSD - CHN1-5: SPI driving - CHN6-8: SPI/PWM driving	1.2 W max./1 A/ 450 V (LSD) 1.2 W max./1 A/ -14 V (HSD)	Driver for relays, lamps, DC and stepper motor	OC, STG, OL, STB, OT	-40~150	PowerSSO28	Production
L9753(*)	Configurable high side - Low side driver (8 ch)	Control: SPI/Parallel Config.& Diag.: SPI	VB: 7-18 V Vcc: 4.75-5.25 V VDDI: 2.97-5.5 V	2×LSD/HSD (SPI) 4×LSD/HSD (parallel/SPI) 2×LSD (SPI)	1.4 Ω max/55 V (LS)/-32V (HS) OC:0.4 A/0.8 A (configurable)	Driver for solenoids, Relays, lamps, LED	OC, STG, OL, STB, OT	-40~150	PowerSSO28	Production
L9848	Configurable high side - Low side driver (8 ch)	Control: SPI/Parallel Config.& Diag.: SPI	VB: 9-18 V Vcc: 4.75-5.25 V	2×LSD (CHN7-8) (SPI) 4×LSD/HSD (CHN1-4) (Self Configurable, SPI) 2×LSD/HSD (CHN5-6) (Self Configurable, SPI/ Parallel)	2 Ω max/0.8 A/ 45 V (LSD)/-30 V (HSD)	Driver for relays, lamps, DC and stepper motor	OC, STG, OL, STB, OT	-40~150	SO28	Production
L9651	Quad low side driver	Control: Parallel Config.& Diag.: SPI	4.7-30 V	4×LSD (parallel)	0.85 W max./ 2.2 A /70 V	Driver for injector, EGR, VVT valve etc.	OL, STB, STG, OT Filter time: 100us	-40~150	PowerSO20	Production
L9825	Octal low side driver	Control: SPI/Parallel Config.& Diag.: SPI	Vcc: 4.5-5.5 V	6×LSD (SPI) 2×LSD (SPI/parallel)	1.5 Ω max/ 1.05 A /50 V	Typical application with - R = 16 W to 200 W, - L= 0 to 600 mH loads.	OC for CHN1-6 OC and OT for CHN7-8 OL and STG for all CHN Fly-back current rec Di inside Max. 10mJ/CHN	-40~150	PowerSO20	Production
L9826	Octal low side driver	Control: SPI/Parallel Config.& Diag.: SPI	Vcc: 4.5-5.5 V	6×LSD (SPI) 2×LSD (SPI/parallel)	3 Ω max/0.5 A /50 V	Typical application with - R = 30 W to 100 W, - L= 0 to 600 mH loads.	OC for CHN1-6 OC and OT for CHN7-8 OL and STG for all CHN Fly-back current rec Di inside Max. 10mJ/CHN	-40~150	SO20	Production
L9301	Multiple configurable driver	Control: SPI/Parallel Config.& Diag.: SPI	VB:5 V-18 V Vcc:4.75-5.25 V VDDI: 3-5.5 V	Basic as below (4 optional configurations refer to datasheet) 4 x LS/HS FETs/ max.0.6 Ω/ 37 V /SPI controlled/DRN/SRC1-4 4 x LS FETs/ max.0.6 Ω/ 37 V /IN1-4 controlled /OUT1-4 4 x LS FETs/ max.0.3 Ω/ 37 V /IN5-8 controlled/OUT5-8			Logic inputs: TTL/CMOS-compatible Diagnosis: OT, OL, STG, STB, UV, OV	-40~175	PowerSSO36	Production

Note: * Available upon request. Contact ST sales office.