27 Absolute Maximum Ratings

The maximum ratings may not be exceeded under any circumstances. Operating the circuit at or near more than one maximum rating at a time for extended periods shall be avoided by application design.

Parameter	Symbol	Min	Max	Unit
Supply voltage operating with inductive load	V_{VS}, V_{VSA}	-0.5	60	V
Supply and bridge voltage short time peak (limited by peak voltage on charge pump output and Cxx pins*)	V_{VSMAX}		64	V
VSA when different from VS	V_{VSAMAX}	-0.5	60	V
Peak voltages on Cxx bootstrap pins and VCP	V_{CxCP}		76	V
Supply voltage V12	V_{12VOUT}	-0.5	14	V
Peak voltages on BM pins (due to stray inductivity)	V_{BMx}	-6	V_{VS}+6	V
Peak voltages on Cxx bootstrap pins relative to BM	V_{CxBMx}	-0.5	16	V
I/O supply voltage on VCC_IO	V_{VIO}	-0.5	5.5	V
digital VCC supply voltage (normally supplied by 5VOUT)	V_{VCC}	-0.5	5.5	V
Logic input voltage	V_I	-0.5	V_{VIO}+0.5	V
Maximum current to / from digital pins and analog low voltage I/Os (short time peak current)	I_{IO}		+/-500	mA
5V regulator output current (internal plus external load)	I_{5VOUT}		30	mA
5V regulator continuous power dissipation (V_{VSA}-5V) * I_{5VOUT}	P_{5VOUT}		1	W
12V regulator output current (internal plus external load)	I_{12VOUT}		20	mA
12V regulator cont. power dissipation (V_{VM}-12V) * I_{12VOUT}	P_{12VOUT}		0.5	W
Junction temperature	T_J	-50	150	°C
Storage temperature	T_{STG}	-55	150	°C
ESD-Protection for interface pins (Human body model, HBM)	V_{ESDAP}		4	kV
ESD-Protection for handling (Human body model, HBM)	V_{ESD}		1	kV

*) Stray inductivity of power routing will lead to ringing of the supply voltage when driving an inductive load. This ringing results from the fast switching slopes of the driver outputs in combination with reverse recovery of the body diodes of the output driver MOSFETs. Even small trace inductivities as well as stray inductivity of sense resistors can easily generate a few volts of ringing leading to temporary voltage overshoot. This should be considered when working near the maximum voltage.

28 Electrical Characteristics

28.1 Operational Range

Parameter	Symbol	Min	Max	Unit
Junction temperature	T_J	-40	125	°C
Supply voltage for motor and bridge	V_{VS}	10	55	V
Supply voltage VSA	V_{VSA}	10	50	V
Supply voltage for VSA and 12OUT (internal gate voltage regulator bridged)	V_{12VOUT}, V_{VSA}	10	13	V
Lower Supply voltage (reduced spec, short to GND protection not functional), lower limit depending on MOSFETs gate threshold voltage and load current	V_{VS}	8		V
I/O supply voltage on VCC_IO	V_{VIO}	3.00	5.25	V