DATASHEET 4062
PART NUMBER: UC1625L REV. A

BRUSHLESS DC MOTOR CONTROLLER

DESCRIPTION: INTEGRATED CIRCUIT ELECTRICALLY EQUIVALENT TO Unitrode UC1625L
PACKAGE: HERMETIC CERAMIC 28 PIN LEADLESS CHIP CARRIER

ABSOLUTE MAXIMUM RATINGS

V_{CC} Supply Voltage. . . . . +20V
Pwr V_{CC} Supply Voltage . . . . . +20V
PWM In . . . . . –0.3 to 6V
E/A IN(+), E/A IN(–) . . . . . –0.3 to 12V
I_{SENSE1}, I_{SENSE2}. . . . . –1.3 to 6V
OV–Coast, Dir, Speed-In, S_{START}, Quad Sel . . . . . –0.3 to 8V
H1, H2, H3. . . . . –0.3 to 12V
PU Output Voltage. . . . . –0.3 to 50V
PU Output Current . . . . . +200 mA continuous
PD Output Current . . . . . ±200 mA continuous
E/A Output Current . . . . . ±10 mA
I_{SENSE} Output Current . . . . . –10 mA
Tach Out Output Current . . . . . ±10 mA
V_{REF} Output Current . . . . . –50 mA continuous
Operating Temperature Range . . . . . –55°C to 110°C

PINOUT

1	E/A In (+)	15	E/A In (-)
2	Vref	16	E/A Out
3	Isense	17	PWM In
4	Isense 1	18	RC-Osc
5	Isense 2	19	Sstart
6	Dir	20	OV-Coast
7	Speed-In	21	Quad Sel
8	H1	22	RC-Brake
9	H2	23	Tach-Out
10	H3	24	Vcc
11	PWR Vcc	25	PUA
12	PDC	26	PUB
13	PDB	27	PUC
14	PBA	28	Gnd

ELECTRICAL CHARACTERISTICS: Unless otherwise stated, these specifications apply for: $T_A = 25^0$C; Pwr V_{CC} = V_{CC} = 12V; R_{OSC} = 20k to V_{REF}; C_{OSC} = 2nF; R_{TACH} = 33k; C_{TACH} = 10nF; and all outputs unloaded. $T_A = T_J$.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Overall					
Supply current*	Over Operating Range		14.5	30.0	mA
V_{CC} Turn-On Threshold*	Over Operating Range	8.65	8.95	9.45	V
V_{CC} Turn-Off Threshold*	Over Operating Range	7.75	8.05	8.55	V
Overvoltage/Coast					
OV-Coast Inhibit Threshold*	Over Operating Range	1.65	1.75	1.85	V
OV-Coast Restart Threshold*		1.55	1.65	1.75	V
OV-Coast Hysteresis		0.05	0.10	0.15	V
OV-Coast Input Current		–10	–1	0	µA
Logic Inputs					
H1, H2, H3 Low Threshold	Over Operating Range	0.8	1.0	1.2	V
H1, H2, H3 High Threshold	Over Operating Range	1.6	1.9	2.0	V
H1, H2, H3 Input Current	Over Operating Range, to 0V	-400	-250	–120	µA
Quad Sel, Dir Thresholds	Over Operating Range	0.8	1.4	2.0	V
Quad Sel Hysteresis			70		mV
Dir Hysteresis			0.6		V
Quad Sel Input Current		30	50	150	µA
Dir Input Current		30	–1	30	µA
PWM Amp/Comparator					
E/A In(+), E/A In(–) Input Current*	To 2.5V	–5.0	–0.1	5.0	µA
PWM In Input Current	To 2.5V	0	3	30	µA
Error Amp Input Offset*	$0V < V_{COMMON-MODE} < 3V$	–10		10	mV
Error Amp Voltage Gain		70	90		dB
E/A Out Range		0.25		3.50	V
S_{START} Pull-up Current	To 0V	–16	–10	–5	µA

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PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
S_{START} Discharge Current	To 2.5V	0.1	0.4	3.0	mA
S_{START} Restart Threshold		0.1	0.2	0.3	V
Current Amp					
Gain	I_{SENSE1} = .3V, I_{SENSE2} = .5V to .7V	1.75	1.95	2.15	V/V
Level Shift*	I_{SENSE1} = .3V, I_{SENSE2} = .3V	2.4	2.5	2.65	V
Peak Current Threshold*	I_{SENSE1} = 0V, Force I_{SENSE2}	0.14	0.20	0.26	V
Over Current Threshold*	I_{SENSE1} = 0V, Force I_{SENSE2}	0.26	0.30	0.36	V
I_{SENSE1}, I_{SENSE2} Input Current	To 0V		320	0	µA
I_{SENSE1}, I_{SENSE2} Offset Current	To 0V		±2	±12	µA
Range I_{SENSE1}, I_{SENSE2}		–1		2	V
Tachometer/Brake					
Tach-Out High Level	Over Operating Range, 10k to 2.5V	4.7	5	5.3	V
Tach-Out Low Level	Over Operating Range, 10k to 2.5V			0.2	V
On Time		170	220	280	µs
On Time Change With Temp	Over Operating Range		0.1		%
RC-Brake Input Current	To 0V	–4.0	–1.9		mA
Threshold to Brake, RC-Brake	Over Operating Range	0.8	1.0		V
Brake Hysteresis, RC-Brake			0.09		V
Speed-In Threshold	Over Operating Range	220	257		mV
Speed-In Input Current		–30	–5		µA
Low-Side Drivers					
Voh, –1mA, Down From V_{CC}*	Over Operating Range		1.60	2.1	V
V Voh, –50mA, Down From V_{CC}*	Over Operating Range		1.75	2.2	V
Vol, 1mA*	Over Operating Range		0.05	0.4	V
Vol, 50mA*	Over Operating Range		0.36	0.8	V
Rise/Fall Time	10% to 90% Slew Time, into 1nF		50		ns
High-Side Drivers					
Vol, 1mA	Over Operating Range		0.1	0.4	V
Vol, 50mA	Over Operating Range		1.0	1.8	V
Leakage Current	Output Voltage = 50V			25	µA
Fall Time	10% to 90% Slew Time, 50mA Load		50		ns
Oscillator					
Frequency		40	50	60	kHz
Frequency	Over Operating Range	35		65	kHz
Reference					
Output Voltage*		4.9	5.0	5.1	V
Output Voltage*	Over Operating Range	4.7	5.0	5.3	V
Load Regulation	0mA to –20mA Load	–40	–5		mV
Line Regulation	10V to 18V V_{CC}	–10	–1	10	mV
Short Circuit Current	Over Operating Range	50	100	150	mA
Miscellaneous					
Output Turn-On Delay			1		µs
Output Turn-Off Delay			1		µs

*only the parameters with an asterisk are tested

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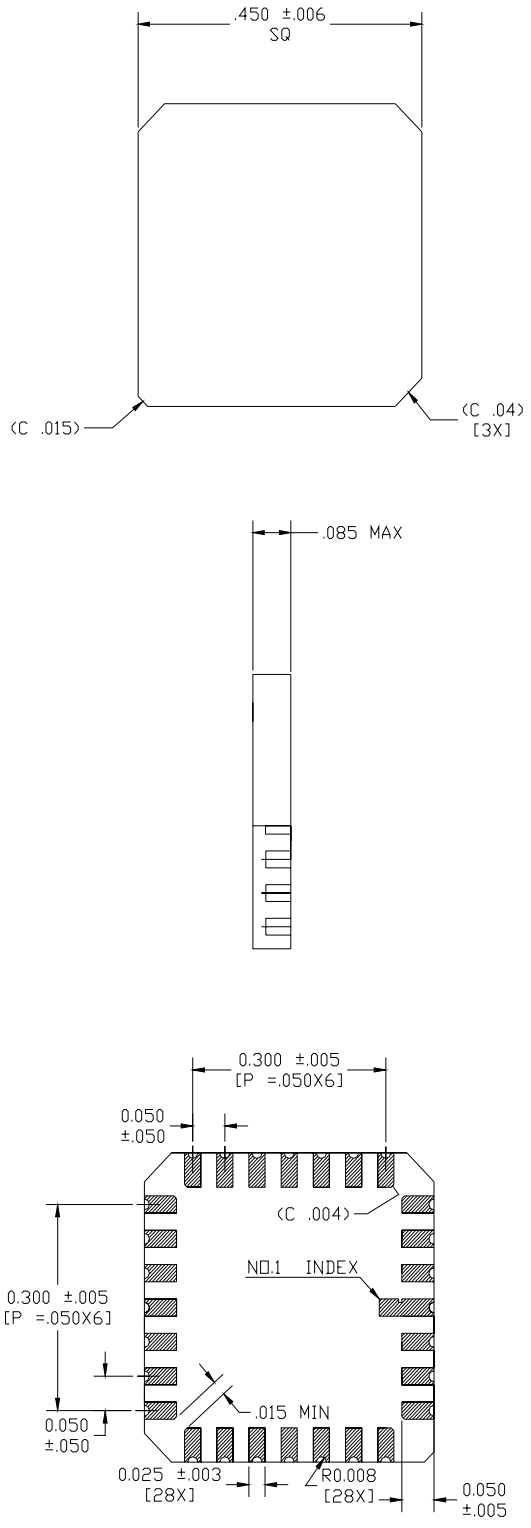
MECHANICAL DRAWING – CERAMIC LCC28 (inches)



TECHNICAL DATA

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