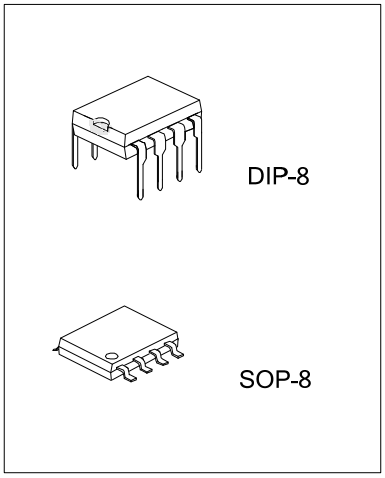
L8562

LINEAR INTEGRATED CIRCUIT

POWER FACTOR CORRECTOR



■ DESCRIPTION

The UTC **L8562** is a Power Factor Corrector, which can work in wide input voltage range applications (from 85V ~ 265V) with an excellent THD. It has very low start up current (about 20 uA) and a disable function on the ZCD pin, which is designed to keep lower current consumption in stand by mode.

The device is operating in transition mode, and is able to drive a Power MOS or IGBT with a ± 400mA current for sourcing and sinking.

■ FEATURES

* 1% Precision (@ T_J = 25℃) Internal Reference Voltage
* Output Overvoltage Protection
* Very Low Power Start-Up Current
* Current Sense Filter On Chip
* Disable Function (with ZCD pin)
* Transition Mode Operation
* Gate Driving Current: ± 400mA
* 15V Gate clamped

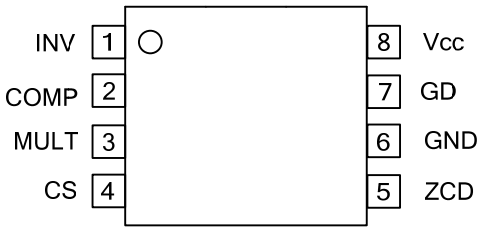
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
L8562L-D08-T	L8562G-D08-T	DIP-8	Tube
L8562L-S08-R	L8562G-S08-R	SOP-8	Tape Reel
L8562L-S08-T	L8562G-S08-T	SOP-8	Tube

L8562L-D08-T
(1)Packing Type
(2)Package Type
(3)Lead Free

(1) R: Tape Reel, T: Tube
(2) S08: SOP-8, D08: DIP-8
(3) G: Halogen Free, L: Lead Free

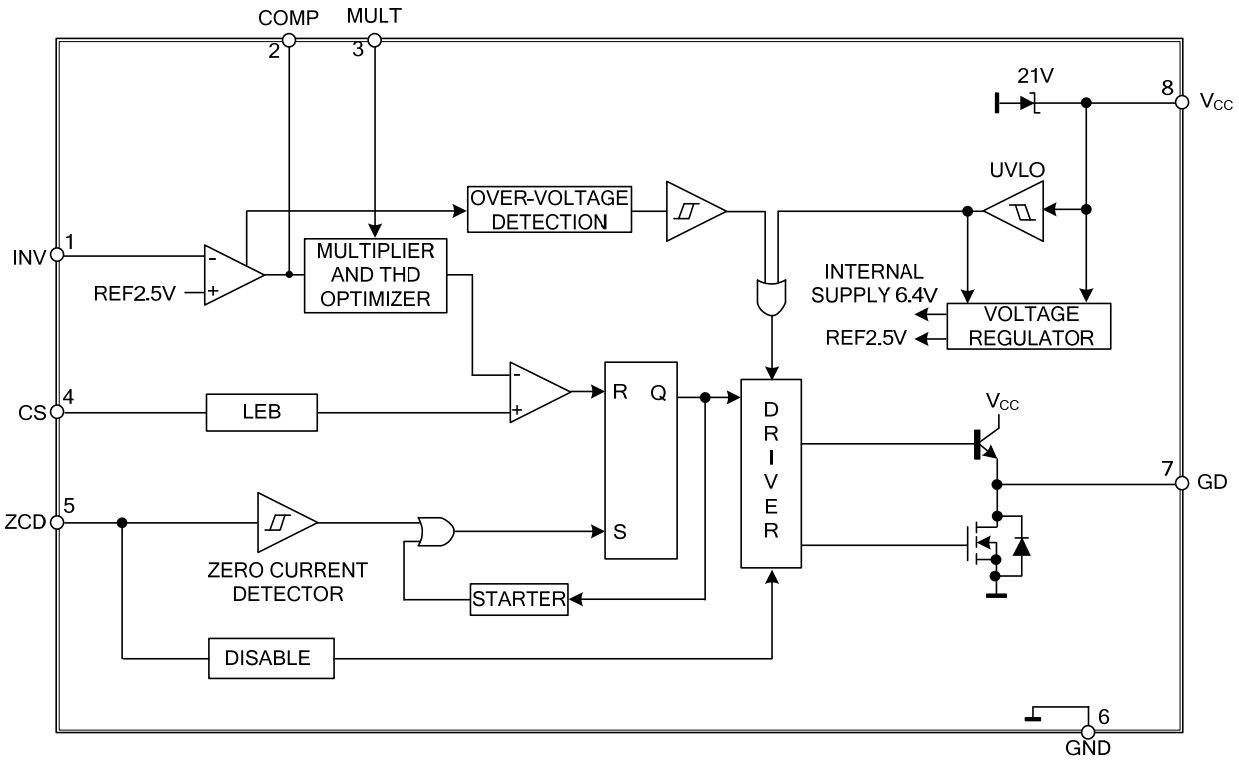
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO	PIN NAME	DESCRIPTION
1	INV	Inverting input of the error amplifier.
2	COMP	Output of the error amplifier.
3	MULT	Input of the multiplier stage.
4	CS	Input of the current sense stage.
5	ZCD	Input of the zero current detection .
6	GND	Ground.
7	GD	Gate driver output.
8	V_{CC}	Voltage supply.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25℃, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Analog Inputs & Outputs		INV, COMP MULT	-0.3 ~ 7	V
Current Sense Input		CS	-0.3 ~ 7	V
Iq+Iz (I_{GD} = 0)		IV_{CC}	30	mA
Output Totem Pole Peak Current (2ms)		I_{GD}	±700	mA
Zero Current Detector		ZCD	50 (source) -10 (sink)	mA mA
Power Dissipation @ T_A=50℃	SOP-8	P_D	1	W
	DIP-8		0.65	W
Junction Temperature		T_J	125	℃
Operating Temperature		T_{OPR}	-20 ~ +85	℃
Storage Temperature		T_{STG}	-40 ~ +150	℃

Note 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. The device is guaranteed to meet performance specification within 0℃~70℃ operating temperature range and assured by design from –20℃~85℃.

■ ELECTRICAL CHARACTERISTICS (V_{CC}=12V, T_A=-25℃ ~ 125℃, unless otherwise specified)

PARAMETER	PIN	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SUPPLY VOLTAGE SECTION							
Operating Range	8	V_{CC}	after turn-on	11		18	V
Turn-on Threshold	8	$V_{CC(ON)}$		14	15.3	16.5	V
Turn-off Threshold	8	$V_{CC\ OFF}$		7.2	7.9	8.7	V
Hysteresis	8	Hys		6.5		8.3	V
SUPPLY CURRENT SECTION							
Start-up Current	8	$I_{START-U}$	V_{CCON}-1V		30	50	□A
Quiescent Current	8	Iq			6	9	mA
Operating Supply Current	8	I_{CC}	C_L=1nF @ 70KHz		10	15	mA
			In OVP condition V_{pin1}=2.7V			6.8	mA
Quiescent Current	8	Iq	V_{PIN5}□150mA, V_{CC}>$V_{CC\ off}$			6	mA
	8		V_{PIN5}□150mV, V_{CC}<V_{CC} off	4	7	10	□A
Zener Voltage	8	V_Z	I_{CC}=20mA	18	21	24	V
ERROR AMPLIFIER SECTION							
Voltage Feedback Input Threshold	1	V_{INV}	T_A=25℃	2.465	2.5	2.535	V
			10.3V<V_{CC}<18V	2.44		2.56	V
Line Regulation			V_{CC}=10.3 ~ 18V		3	5	mV
Input Bias Current	1	I_{INV}			-0.1	-1	□A
Voltage Gain		G_V	Open loop	60	80		dB
Gain Bandwidth		G_B			0.8		MHz
Source Current	2	I_{COMP}	V_{COMP}=4V, V_{INV}=2.4V	-2	-4	-8	mA
Sink Current			V_{COMP}=4V, V_{INV}=2.6V	2.5	4.5		mA
Upper Clamp Voltage	2	V_{COMP}	I_{SOURCE}=0.5mA	4.5	5	5.5	V
Lower Clamp Voltage			I_{SINK}=0.5mA	2.25	2.4	2.55	V
MULTIPLIER SECTION							
Linear Operating Voltage	3	V_{MULT}		0~ 2.5	0 ~ 3.5		V
Output Max.Slope		$\frac{\triangle V_{CS}}{\triangle V_{MULT}}$	V_{MULT}=from 0V ~ 0.5V V_{COMP}=Upper Clam Voltage	1.65	1.9		
Gain		K	V_{MULT}=1V, V_{COMP}=4V	0.5	0.7	0.9	1/V

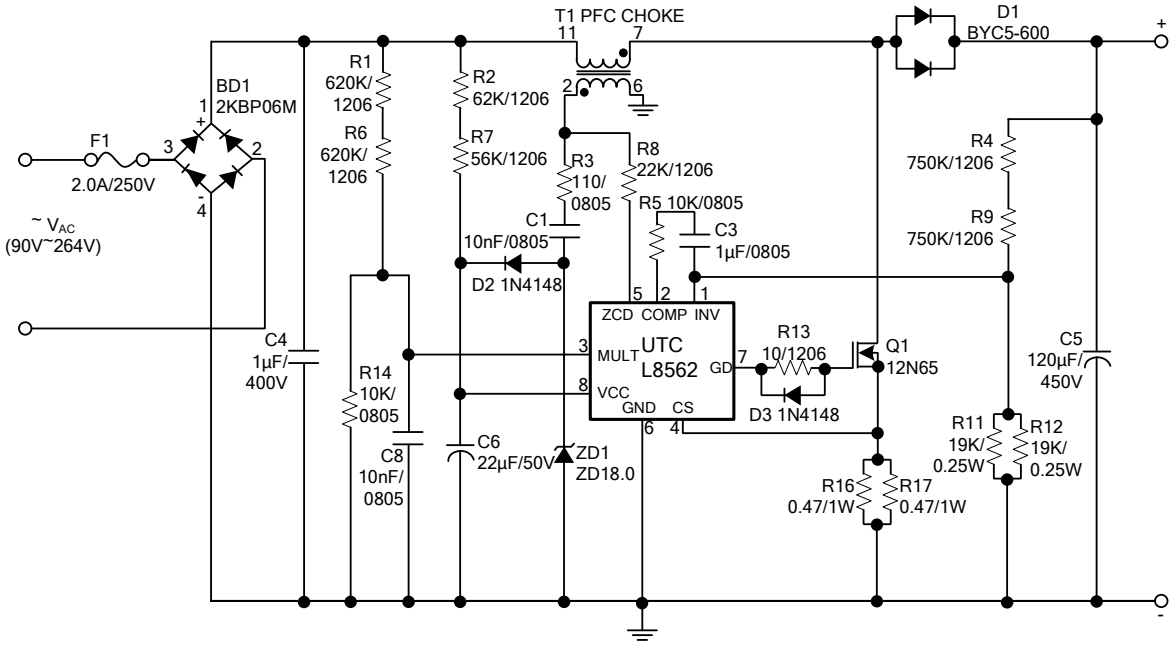
■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	PIN	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
CURRENT SENSE COMPARATOR							
Current Sense Reference Clamp	4	V_{CS}	V_{MULT}=2.5V V_{COMP}=Upper Clamp Voltage	1.6	1.7	1.8	V
Input Bias Current	4	I_{CS}	V_{OS}=0		-0.05	-1	□A
Delay to Output	4	$t_{D(H-L)}$			200	450	ns
ZERO CURRENT DETECTOR							
Input Threshold Voltage Rising Edge	5	V_{ZCD}	(Note)		2.1		V
Hysteresis			(Note)	0.4	0.6	0.8	V
Upper Clamp Voltage	5	V_{ZCD}	I_{ZCD}=20□A	5.9	6.5	7.3	V
Upper Clamp Voltage	5	V_{ZCD}	I_{ZCD}=2.5mA	6.1	6.6	7.5	V
Lower Clamp Voltage	5	V_{ZCD}	I_{ZCD}=-2.5mA	0.3	0.7	1	V
Sink Bias Current	5	I_{ZCD}	1V≦V_{ZCD}≦4.5V		2		□A
Source Current Capability	5	I_{ZCD}		-3		-10	mA
Sink Current Capability	5	I_{ZCD}		3		10	mA
Disable threshold	5	V_{DIS}		100	200	300	mV
Restart Current After Disable	5	I_{ZCD}	V_{ZCD}<V_{DIS}, V_{CC}>V_{CCOFF}	-20	-50		□A
OUTPUT SECTION							
Dropout Voltage	7	V_{GD}	$I_{GD(SOURCE)}$=200mA		1.2	2	V
			$I_{GD(SOURCE)}$=20mA		0.8	1.2	V
			$I_{GD(SINK)}$=200mA		1.2	1.9	V
Output Voltage Rise Time	7	t_R	C_L=1nF		40	100	ns
Output Voltage Fall Time	7	t_F	C_L=1nF		40	100	ns
IGD Sink Current	7	$I_{GD(OFF)}$	V_{CC}=3.5V, V_{GD}=1V	10	40		mA
OUTPUT OVERVOLTAGE SECTION							
OVP Triggering Current	2	I_{OVP}		30	40	50	□A
Static OVP Threshold				2.25	2.4	2.55	V
RESTART TIMER							
Start Timer		t_{START}		70	130	300	□s

Note: Parameter guaranteed by design, not tested in production.

■ TYPICAL APPLICATION CIRCUIT

150W, Wide-range mains



■ TYPICAL CHARACTERISTICS

Output ripple at 0.5W