ShinDengen

MH2501SC

Power Factor Correction(PFC) IC

Feature

- Leader IC
- Leader-Follower interleaved critical current mode
- Two or greater phase interleaving achieved
- One-phase PFC can be configured using just the leader IC
- Vcc(max)=26V
- Over voltage protection
- Over current protection
- Feedback open / short protection
- Output diode short protection
- Pb free
- RoHS:Yes

Outline

House Name: SOP8J

1 絶対最大定格 (at Tc=25℃)
Absolute Maximum Ratings (at Tc=25℃)

1-1 熱規格
Thermal Ratings

項 目 Item	記 号 Symbol	規 格 値 Ratings	単 位 Unit
保存温度 Storage temperature	Tstg	−55～150	℃
接合部温度 Junction temperature	Tj	−40～150	℃
許容損失 Total power dissipation	Pt	1.5	W

1-2 電気的規格
Electrical Ratings

項 目 Item	記 号 Symbol	規 格 値 Ratings	単 位 Unit
VCC端子最大印加電圧 VCC maximum applied voltage	VCC	26	V
Z/C端子最大流入電流 Z/C into maximum current	IZ/C	±5	mA
FB端子最大流入電流 FB into maximum current	IFB	±5	mA
COMP端子最大流入電流 COMP into maximum current	ICOMP	±5	mA
OCL端子最大流入電流 OCL into maximum current	IOCL	±5	mA
IL_OUT端子最大流入電流 IL_OUT into maximum current	IIL_OUT	±5	mA

注意 ：本仕様書に記載されていない項目、使用条件、論理の組み合わせでの使用は保証していません。
記載されている以外の条件で使用する場合は必ず事前に当社担当営業部門までご相談下さい。
記載内容は改良などのためにお断り無しに変更することがあります。

Notes : Using with parameters, condition of use and logic controls that are not specified in the specifications are not assured.
When used with the conditions that are not specified, please consult us in advance.
The contents described herein are subject to change without notice.

2 推奨動作条件
Recommended Operation Conditions

項 目 Item	記 号 Symbol	推 奨 値 Recommended value			単 位 Unit
		min	typ	max	
動作温度 Operating temperature	Top	−20	---	125	℃
VCC端子印加電圧 VCC applied voltage	VCC	13	---	23	V
Z/C端子入力電流 Z/C into current	IZ/C	−4.5	---	4.5	mA

注意 ：上記の規格範囲内においても、製品寿命に関しましてはお客様の使用環境により異なりますので、長寿命を期待される製品にご使用される場合には、Tj=100℃以下でご使用頂く事を推奨致します。

Notes : The product life depends on the condition of use even within the above operating conditions.
Using at Tj = 100℃ or less is recommended for the equipment where a long life is expected.

3 電気的・熱的特性 (at Ta=25℃)
Electrical/Thermal Characteristics (at Ta=25℃)

3-1 電気的 (at Ta=25℃)
Electrical Characteristics (at Ta=25℃)

項目 Item	記号 Item	条件 Condition	規格値 Ratings			単位 Unit
			min	typ	max	
VCC端子 (VCC Terminal)						
発振開始電圧 On-state voltag	VCC(start)	FB=1V COMP=3.0V OCL=0V	10.1	11.0	12.0	V
発振停止電圧 Off-state voltage	VCC(stop)	FB=1V COMP=3.0V OCL=0V	8.3	9.0	10.0	V
VCC電流(動作時) VCC current (Active mode)	ICC(active)	VCC=15V FB=1V f_Z/C=30kHz OCL=0V COMP=4.5V	1.0	2.0	3.0	mA
ﾗｯﾁ解除電圧 Latch reset voltage	VUL	FB=1V COMP=3.0V OCL=0V	7.0	8.0	9.0	V
ﾗｯﾁ解除電圧ﾋｽﾃﾘｼｽ Latch reset voltage hysteresis	VCC(stop)-VUL	-	0.2	1.0	2.0	V
OUT端子 (OUT Terminal)						
ｿｰｽ電流 Source current	Iout(source)	VCC=12V OUT=6.5V	-0.8	-0.5	-0.2	A
ｼﾝｸ電流 Sink current	Iout(sink)	VCC=12V OUT=4.0V	0.8	1.2	1.5	A
IL_OUT端子 (IL_OUT Terminal)						
ｿｰｽ電流 Source current	IL_Iout(source)	IL_OUT=0V	-6.5	-4.5	-2.0	mA
ｼﾝｸ電流 Sink current	IL_Iout(sink)	IL_OUT=5V	12	22	32	mA
過電圧保護ﾀｲﾏ Overvoltage protection timer	FB_OVP_TIMER	OCL=0V FB=1V→4V	60	80	100	μs
Z/C端子 (Z/C Terminal)						
ｾﾞﾛ電流検出電圧 Zero current detection voltage	VZ/C(L)	FB=1V COMP=3.0V OCL=0V	0.2	0.5	0.8	V
	VZ/C(H)	FB=1V COMP=3.0V OCL=0V	1.2	1.5	1.8	V
ｸﾗﾝﾌﾟ電圧(H) Clamp voltage (H)	VCL(H)	I_Z/C=5mA	6.0	6.5	7.0	V
ｸﾗﾝﾌﾟ電圧 (L) Clamp voltage (L)	VCL(L)	I_Z/C=-5mA	-0.9	-0.8	-0.7	V
ｵﾝﾃﾞｯﾄﾞﾀｲﾑ On dead time	Tondead	FB=1V OCL=0V	-	700	-	ns

項目 Item	記号 Item	条件 Condition	規格値 Ratings			単位 Unit
			min	typ	max	

FB端子 (FB Terminal)

ｴﾗｰｱﾝﾌﾟしきい値 Error ampfilter threshold voltage	FB_ref	COMP=1V	2.465	2.500	2.535	V
過電圧保護電圧 Overvoltage protection voltage	FB_OVP	-	1.07* FB_ref	1.08* FB_fef	1.09* FB_ref	V
ｵｰﾌﾟﾝ保護電圧 Open protection voltage	FB_open	OCL=0V	0.3	0.4	0.5	V

COMP端子 (COMP Terminal)

ｴﾗｰｱﾝﾌﾟ出力ｿｰｽ電流 Error amplifier output source current	Icompso	FB=1V COMP=1V	-60	-50	-40	μs
ｴﾗｰｱﾝﾌﾟ出力ｼﾝｸ電流 Error amplifier output sink current	Icompsi	FB=4V COMP=1V	40	50	60	μs
ﾊﾞｰｽﾄしきい値電圧 Burst threshold voltage	Vth(burst)	FB=1V OCL=0V	1.1	1.2	1.3	V
ｸﾗﾝﾌﾟ電圧1 Clamp voltage 1	COMP_Clamp1	Vth(burst)以下	0.7	0.8	0.9	V
ｸﾗﾝﾌﾟ電圧2 Clamp voltage 2	COMP_Clamp2	FB_open以下 or VCC(stop)以下	1.1	1.2	1.3	V

OCL端子 (OCL Terminal)

過電流保護電圧 Overcurrent protection voltage	VTH_OCL	FB=1V COMP=3.0V	0.45	0.50	0.55	V
ﾘｰﾃﾞｨﾝｸﾞｴｯｼﾞﾌﾞﾗﾝｸﾀｲﾑ Leading edge blanking time	TLEB	VCC=15V FB=1V COMP=3.0V OCL=0V	-	500	-	ns

ON/OFFタイマ機能 (ON/OFF timer section)

最小ON時間 Minimum on time	Ton(min)	FB=1V OCL=0V COMP≒1.2V	150	400	500	ns
最大ON時間 Maximum on time	Ton(max)	FB=1V OCL=0V COMP≧4.0V	24.0	27.5	30.0	μs
ﾘｽﾀｰﾄﾀｲﾏ Restart timer	Trestart_OUT	FB=1V COMP=3.0V OCL=0V Z/C=0V	120	160	200	μs

3-2 電気的・熱的特性 (at Ta=25℃)
Electrical/Thermal Characteristics (at Ta=25℃)

項目 Item	記号 Item	条件 Condition	規格値 Ratings			単位 Unit
			min	typ	max	

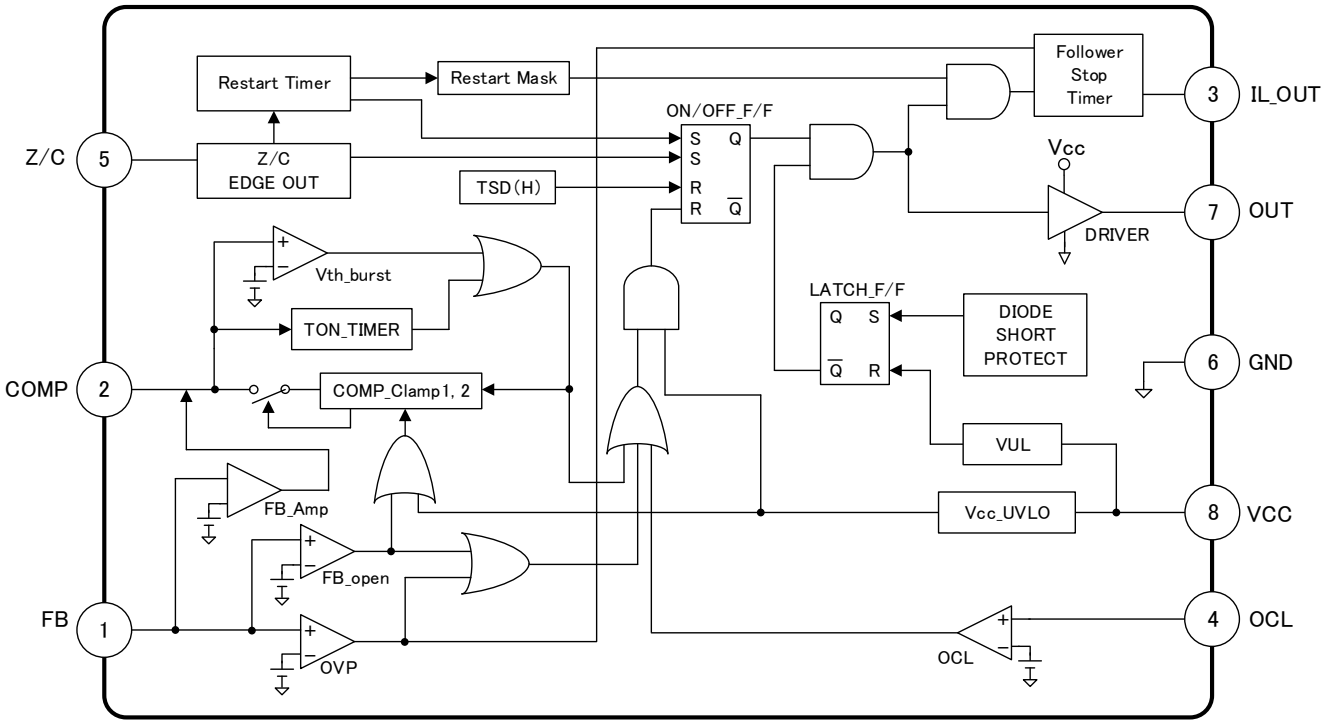
ﾀﾞｲｵｰﾄﾞｼｮｰﾄ保護機能 (Diode Short Protection)

ﾗｯﾁｶｳﾝﾀ Latch counter	OCL_Count	OCL=4V	-	512	-	counts
ﾗｯﾁｶｳﾝﾀ ﾘｾｯﾄ Z/C電圧 Latch counter reset Z/C voltage	Z/C_Reset	-	3.5	4.0	4.5	V

過熱保護 (Thermal shutdown protection)

動作停止温度 Operating stop temperature	TSD(H)	-	130	-	-	℃
動作停止/復帰温度幅 Hysteresis temperature	ΔTSD	-	-	60	-	℃

4 ブロック図および端子機能
Block Diagram & Pin Function

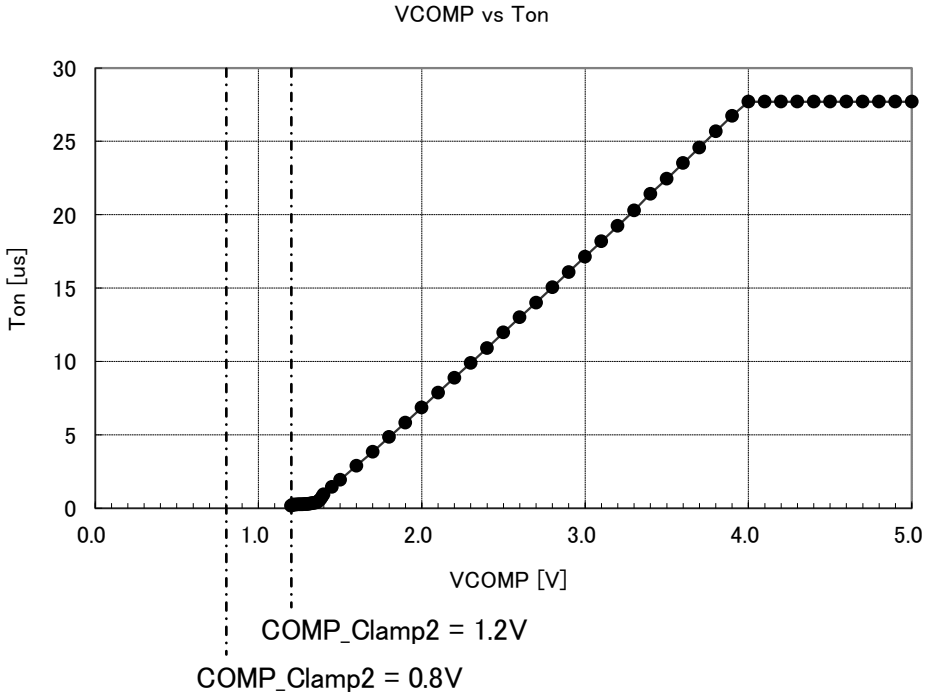


端子番号 Terminal No.	記号 Symbol	端子名称 Terminal Name
1	FB	フィードバックエラーアンプの入力端子 The input terminal of feedback error amplifier
2	COMP	フィードバックエラーアンプの出力端子 The output terminal of feedback error amplifier
3	IL_OUT	インターリーブ動作用信号出力端子 The signal output terminal for interleave operation
4	OCL	過電流検出用入力端子 The input terminal for over current detection
5	Z/C	ゼロ電流検出端子 The input terminal for zero current detection
6	GND	グランド端子 Ground Terminal
7	OUT	MOSFET駆動用出力端子 The output terminal for a MOSFET drive
8	VCC	電源電圧入力端子 The input terminal for Power supply voltage

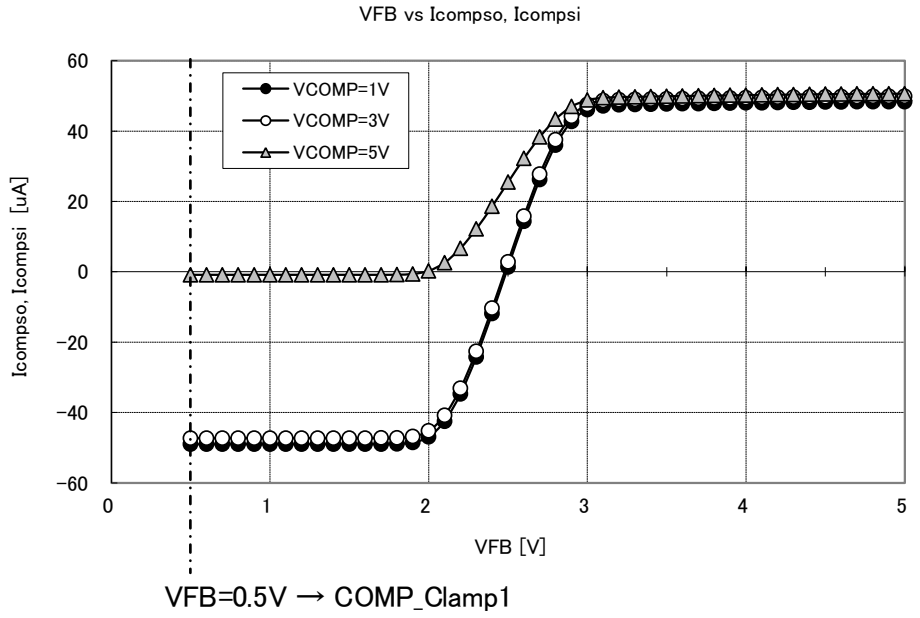
5 特性図
Caracteristics diagram

特に指定なき場合はTj=25℃
Tj=25℃ unless otherwise specified

■COMP電圧-ON幅特性
COMP voltage-ON width characteristic



■FB電圧-Icomp特性
FB voltage-Icomp characteristic

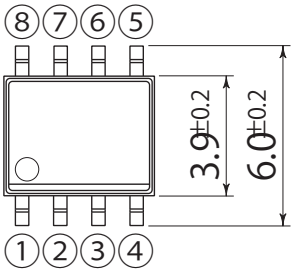


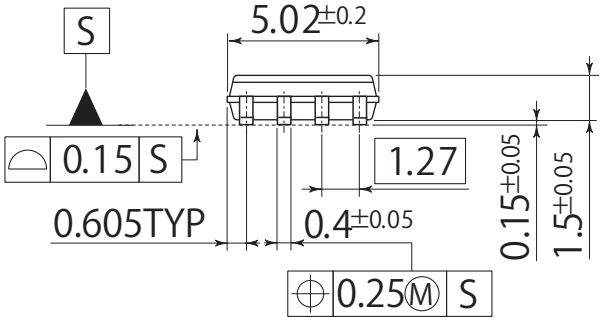
Package Outline-Dimensions

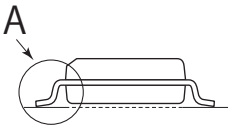
unit : mm
scale: 4/1

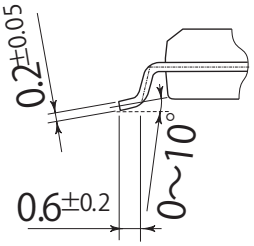
L2

JEDEC Code	–
JEITA Code	–
House Name	SOP8J

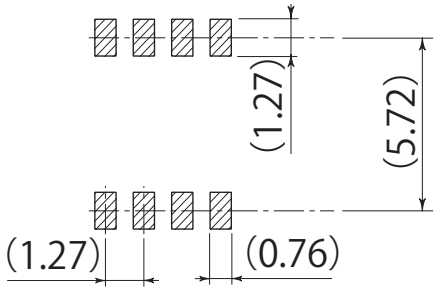








Detail A



Referential Soldering Pad

・量産時には、適正化を図って下さい
・Optimize soldering pad to the board design and soldering condition.

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