MCZ5601SC

Driver IC

Feature

• Floating Channel for Bootstrap Operation to +600V
• Output Source / Sink Current : 400mA/400mA
• 3.3 V and 5 V input logic compatible
• Halogen free
• Pb free
• RoHS:Yes

Outline

House Name: SOP8J

1. 絶対最大定格
Absolute Maximum Ratings

以下、IN1,IN2=IN と省略する
Abridgement each as follows IN1,IN2=IN

1-1 入出力定格
Input Output Ratings

<div align="right">特に指定のない場合はTj=25℃
Tj=25℃ unless otherwise specified.</div>

項目 Item	記号 Symbol	規格値 Ratings	単位 Units
Vcc端子最大印加電圧 Vcc maximum applied voltage	Vcc	−0.3 〜22	V
IN端子最大印加電圧 IN maximum applied voltage	VIN	−0.3 〜6.0	V
VB端子最大印加電圧 VB maximum applied voltage	VB	−0.3 〜 600	V
VS端子最大印加電圧 VS maximum applied voltage	VS	VB−22 〜 VB+0.3	V
VB−VS最大印加電圧 VB−VS maximum applied voltage	VBS	−0.3 〜 22	V
HO端子最大印加電圧 HO maximum applied voltage	VHO	VS−0.3 〜 VB+0.3	V
dVS/dt 最大許容オフセット電圧 dVS/dt maximum offset voltage	dVS/dt	50	V/ns

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.

1-2 熱規格
Thermal Ratings

<div align="right">特に指定のない場合はVcc=VB=16V,VS=GND,Tj=25℃
Vcc=VB=16V, VS=GND and Tj=25℃ unless otherwise specified.</div>

項目 Item	記号 Symbol	規格値 Ratings	単位 Units
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	Pd	1.5 （※1）	W
熱抵抗 Thermal Resistance	θ ja	83.3 （※1）	℃/W

※1 ガラエポ基板：114.3mm×76.2mm、厚さ：1.6mm、内面銅箔サイズ：74.2mm×74.2mm、厚さ：35μm
　　 Glass-Epoxy Board：114.3×76.2mm、Thickness：1.6mm、Inside copper foil：74.2mm×74.2mm、Thickness：35μm

<div align="center">5SK-175030-1</div>

2 推奨動作条件
Recommended Operation Conditions

特に指定のない場合はVcc=VB=16V,VS=GND,Tj=25℃
Vcc=VB=16V, VS=GND and Tj=25℃ unless otherwise specified.

項目 Item	記号 Symbol	推奨値 Recommended value			単位 Units
		min	typ	max	
動作温度 Operating temperature	Tj(ope)	−20	―――	120	℃
Vcc端子印加電圧 Vcc applied voltage	Vcc	10	―――	20	V
IN端子印加電圧 IN applied voltage	VIN	0	―――	5.5	V
VB端子印加電圧 VB applied voltage	VB	VS+10	―――	VS+20	V
VS端子印加電圧 VS applied voltage	VS	0	―――	500	V
VB-VS端子印加電圧 VB-VS applied voltage	VBS	10	―――	20	V
HO端子印加電圧 HO applied voltage	VHO	VS	―――	VB	V

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=105℃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 = 105℃ or less is recommended for the equipment where a long life is expected.

3　電気的特性
Electrical Characteristics

特に指定のない場合はVcc=VB=16V,VS=GND,Tj=25℃
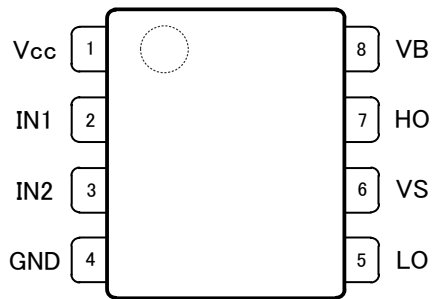Vcc=VB=16V, VS=GND and Tj=25℃ unless otherwise specified.

項目 Item	記号 Symbol	条件 Conditions	規格値 Ratings			単位 Units
			min	typ	max	
Vcc起動電圧 Vcc start-up voltage	Vcc_start		8.50	9.00	9.50	V
Vcc停止電圧 Vcc stop voltage	Vcc_stop		7.75	8.20	8.60	V
VccUVLOヒステリシス Vcc UVLO hysteresis voltage	Vcc_UVLO_Δ	Δ = Vcc_start − Vcc_stop	0.50	0.80	1.10	V
Vcc消費電流 Vcc operating current	Icc	IN1,2=0V	0.3	0.6	0.9	mA
VB-VS起動電圧 VBS start-up voltage	VBS_start		7.50	8.00	8.50	V
VB-VS停止電圧 VBS stop voltage	VBS_stop		6.70	7.20	7.70	V
VBSUVLOヒステリシス VBS UVLO hysteresis voltage	VBS_UVLO_Δ	Δ = VBS_start − VBS_stop	0.50	0.80	1.10	V
VBS消費電流 VBS operating current	IBS	IN1,2=0V	0.3	0.6	0.9	mA
ハイサイド最低動作電圧（※1） High side minimum operating voltage	VBS_min				5.0	V
ローサイド最低動作電圧（※1） Low side minimum operating voltage	Vcc_min				5.0	V
固定デッドタイム Dead time	DT		70	160	250	ns
ターンオン伝達遅延時間 Turn-on propagation delay time	ton	IN↑～HO↑,CL=1000pF	100	210	400	ns
ターンオフ伝達遅延時間 Turn-off propagation delay time	toff	IN↓～HO↓,CL=1000pF	100	195	400	ns
遅延時間差 propagation delay time	DM	(IN1↑～HO↑)-(IN2↑～HO2↑) (IN1↓～HO↓)-(IN2↓～HO2↓)	−50	0	50	ns
IN端子上側しきい値電圧 Input upper threshold voltage	VIH		1.6	2.0	2.4	V
IN端子下側しきい値電圧 Input lower threshold voltage	VIL		0.9	1.2	1.6	V
IN端子しきい値ヒステリシス電圧 Input threshold hysteresis voltage	VINhys	VINhys=VIH-VIL	0.4	0.8	1.2	V
IN端子抵抗値 Input terminal resistance	RIN		240	400	560	kΩ
出力ソース電流 Output source current	IHO_H ILO_H	IN1=5V, HO-VS=0V IN2=5V, LO-GND=0V	0.30	0.40	0.65	A
出力シンク電流 Output sink current	IHO_L ILO_L	IN1=0V,HO-VS=16V IN2=0V,LO-GND=16V	−0.65	−0.40	−0.30	A
出力立上り時間（※1）（※2） Output rise time	tr	CL=1000pF		33		ns
出力立下がり時間（※1）（※2） Output fall time	tf	CL=1000pF		30		ns

（※1）設計保証
　　　Design assurance.
（※2）Vcc=16V(10%→1.6V, 90%→14.4V)

4 端子配置および端子機能
Pin Assignment & Pin Function

```
           ┌──────────────┐
Vcc  ─┤1│    ◌         │8├─ VB
       └─┘              └─┘
IN1  ─┤2│              │7├─ HO
       └─┘              └─┘
IN2  ─┤3│              │6├─ VS
       └─┘              └─┘
GND  ─┤4│              │5├─ LO
           └──────────────┘
```

端子番号 Pin No.	端子名 Name	機能 Function
1	Vcc	電源端子 Input terminal for power supply
2	IN1	入力端子1 Input1 terminal
3	IN2	入力端子2 Input2 terminal
4	GND	GND端子 Ground terminal
5	LO	ドライバ2出力端子 Driver2 output terminal
6	VS	ドライバ1基準端子 Driver1 ground terminal
7	HO	ドライバ1出力端子 Driver1 output terminal
8	VB	ドライバ1電源端子 Driver1 input terminal for power supply

5 ブロック図
Block Diagram
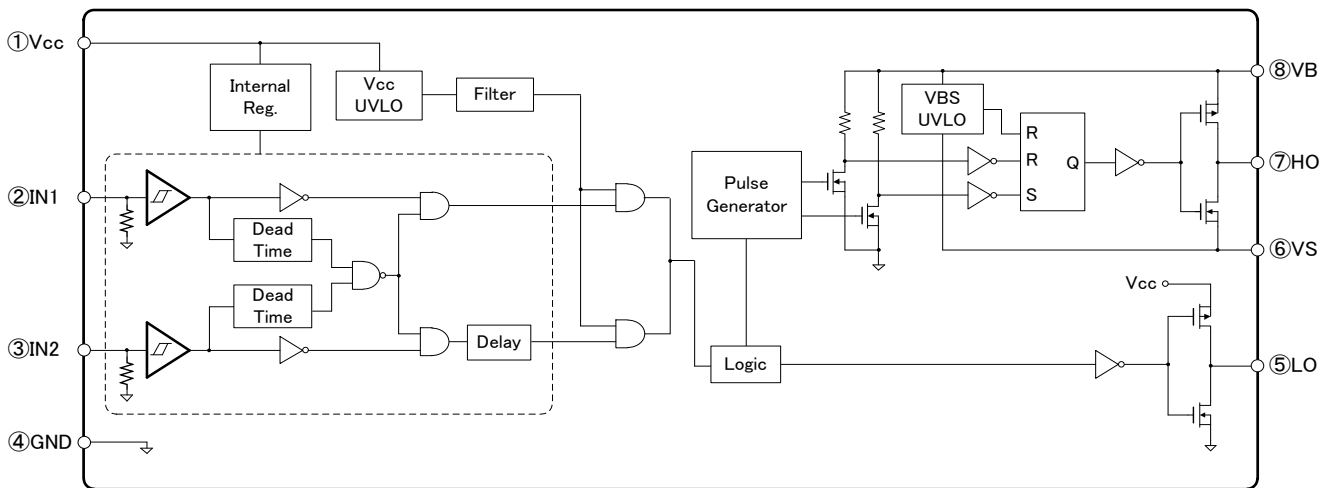
6 タイミングチャートおよび真理値表
　Timing diagram & Truth table

6-1 タイミングチャート
　　Timing diagram
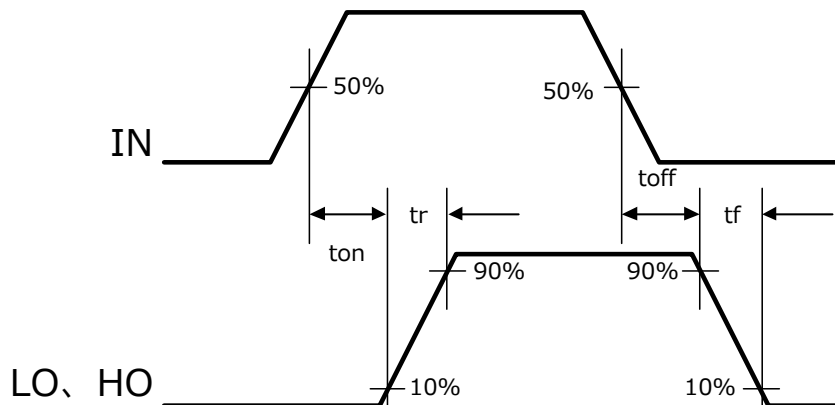
6-2 真理値表
　　Truth table

IN1	IN2	Vcc	VBS	HO	LO
−	−	L	L	L	L
−	−	L	H	L	L
−	L	H	L	L	L
L	L	H	H	L	L
L	H	H	L	L	H
L	H	H	H	L	H
H	L	H	H	H	L
H	H	H	L	L	L
H	H	H	H	L	L

Vcc(VBS)：『H』は、Vcc(VBS)がVcc_start(VBS_start)以上、またはVcc_stop(VBS_stop)以上（UVLO解除後）
Vcc(VBS)：『L』は、Vcc(VBS)がVcc_stop(VBS_stop)以下、またはVcc_start(VBS_start)以下（UVLO解除前）

UVLO解除後：Vcc_start(VBS_start)以上の電圧印加をした状態
UVLO解除前：起動時、またはUVLO解除後に、Vcc_stop(VBS_stop)以下の電圧印加をした状態

Vcc(VBS)：『H』 is the case where Vcc(VBS) is Vcc_start(VBS_start) or more, or more than
　　　　　Vcc_stop(VBS_stop) （After UVLO is released.）

Vcc(VBS)：『L』 is the case where Vcc(VBS) is Vcc_stop(VBS_stop) or less, or less than
　　　　　Vcc_start(VBS_start). （Before UVLO is released.）

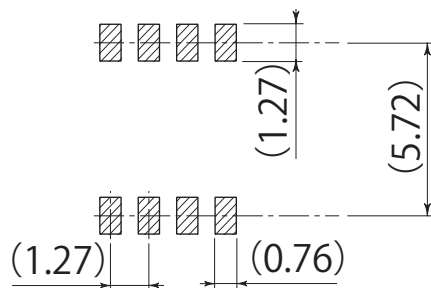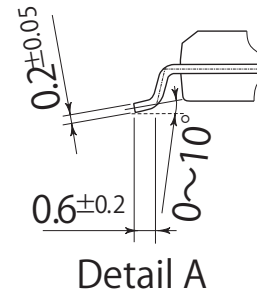After UVLO release： In a state where a voltage of Vcc_start(VBS_start) or more is applied.
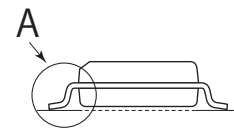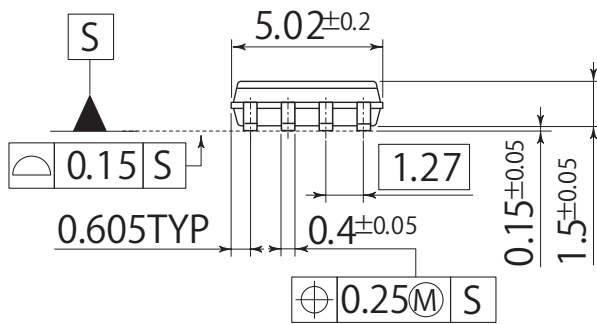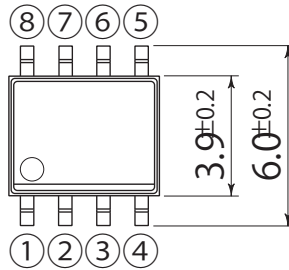Before UVLO release： At the time of startup or after UVLO released, a state in which
　　　　　a voltage of Vcc_stop （VBS_stop) or less is applied.

Package Outline-Dimensions

unit : mm
scale: 4/1

L2

JEDEC Code	–
JEITA Code	–
House Name	SOP8J

⑧⑦⑥⑤

①②③④

$3.9^{\pm 0.2}$
$6.0^{\pm 0.2}$

S

$\square$ | 0.15 | S

$5.02^{\pm 0.2}$

1.27

0.605TYP

$0.4^{\pm 0.05}$

$\bigoplus$ | 0.25 Ⓜ | S

$0.15^{\pm 0.05}$
$1.5^{\pm 0.05}$

A

$0.2^{\pm 0.05}$

$0.6^{\pm 0.2}$

$0 \sim 10°$

Detail A

(1.27)

(5.72)

(1.27)

(0.76)

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.

U182(2019.02)

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Notes

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