High performance video signal Switcher

Triple Circuits Video Signal Switchers

BA7602F, 03F, 06F/FS, 07F, 09F, 27FV

●Description

These video switching ICs, which contain two or three 2-input circuits, were developed for switching TV, DVD, and other video signals. Input pin formats can be selected from bias mode (R=20 kΩ), sync-tip mode, and pedestal clamp mode. Having a large dynamic range and broad frequency characteristics, these switches are suited to a wide range of applications from audio signals to video signals.

●Features

1) Contain three 2-input, 1-output switch circuits (BA7602F,03F,06F/06FS,07F,09F,27FV)
2) Power supply voltage (4.5~5.5 V)
3) Low power consumption
4) Good frequency characteristics
5) Large dynamic range
6) Bias input (BA7602F)
   Sync-tip clamp input (BA7603F)
   Pedestal clamp input (BA7606F/06FS)
   Bias input + sync-tip clamp input (BA7607F,09F, 27FV)
7) Large input impedance (Typ.20kΩ)
8) Fast switching speed (Typ. 50ns)

●Use

For switching TV, DVD, and Other video signals

●Lineup

Part No.	Circuit current (mA)	Built-in circuit	Input type	Distortion (%)	Maximum output level (V_{P-P})	Package
BA7602F	14.0	2 in 3 circuits	Bias	—	3.1	SOP16
BA7603F	13.0	2 in 3 circuits	Clamp	—	2.9	SOP16
BA7606F/FS	15.0	2 in 3 circuits	Pedestal Clamp	—	2.6	SOP16/ SSOP-A16
BA7607F	12.5	2 in 3 circuits	Clamp 2 Bias1	0.007	3.0	SOP16
BA7609F	12.5	2 in 3 circuits	Clamp 1 Bias 2	0.007	3.0	SOP16
BA7627FV	12.5	2 in 3 circuits	Clamp 2 Bias1	0.007	3.0	SSOP-B16

Aug. 2008

●Absolute Maximum Ratings（Ta=25℃）

Parameter		Symbol	Limits	Unit
Supply voltage		Vcc	9	V
Power dissipation	BA7602F BA7603F BA7606F BA7607F BA7609F	Pd	500 *1	mW
	BA7606FS		650 *2	
	BA7627FV		450 *1	
Operating temperature		Topr	−40～＋85	℃
Storage temperature		Tstg	−55～＋125	℃

*1 Deratings is done at 5.0mW/℃ above Ta=25℃.（BA7604N, 05N ,02F, 03F, 06F, 07F, 09F, 27FV）

*2 Deratings is done at 6.5mW/℃ above Ta=25℃.（BA7606FS）

●Operating Range（Ta=25℃）

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	Vcc	4.5	5.0	5.5	V

●Electrical characteristics (Unless otherwise noted, Ta=25℃ and Vcc=5.0V)

Parameter		Symbol	Typical value						Unit	Conditions
			02F	03F	06F/FS	07F	09F	27FV		
Circuit current		Icc	14.0	13.0	15.0	12.5			mA	—
Maximum output level1	Clamp	Vom1	—	2.9	—	2.9			V_{P-P}	f=1kHz, THD=0.5%, with clamp
Maximum output level2	Bias	Vom2	3.1	—	—	3.0			V_{P-P}	f=1kHz, THD=0.5%, without clamp
Maximum output level U	Pedestal clamp	VomU	—		1.65	—			V_{P-P}	Dynamic range on positive side of clamp level
Maximum output level D	Pedestal clamp	VomD	—		0.95	—			V_{P-P}	Dynamic range on negative side of clamp level
Voltage gain		Gv	0						dB	f =1MHz, V_{IN}＝1 V_{P-P}
Interchannel crosstalk		C_T	-65						dB	f =4.43MHz, V_{IN}=1 V_{P-P}
Frequency characteristic		Gf	0		-1	0			dB	10MHz/1MHz, V_{IN}= V_{P-P}
Total harmonic distortion		THD	—			0.007			%	f =1kHz, 1Vp-p, Bias type
CTL pin switching level		V_{TH}	2.5						V	H: IN1 L: IN2
Clamp input level		V_{ct}	L≦0.75 H≧2.2						V	Only BA7606F/FS

●Cautions on use

1) Numbers and data in entries are representative design values and are not guaranteed values of the items.
2) Although we are confident in recommending the sample application circuits, carefully check their characteristics further when using them. When modifying externally attached component constants before use, determine them so that they have sufficient margins by taking into account variations in externally attached components and the Rohm LSI, not only for static characteristics but also including transient characteristics.
3) Absolute maximum ratings
   If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.
4) GND potential
   Make the GND pin voltage such that it is the lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the GND pin, including transient phenomena.
5) Thermal design
   Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use.
6) Shorts between pins and misinstallation
   When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is misinstalled and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.
7) Operation in strong magnetic fields
   Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.
8) A bias input coupling capacitor on the order of 10 μF~33 μF is appropriate.
9) A clamp input coupling capacitor on the order of 0.1 μF~1 μF is appropriate.
10) Make the clamp pulse width of the BA7606F/FS at least 1 μs.

●Block diagram

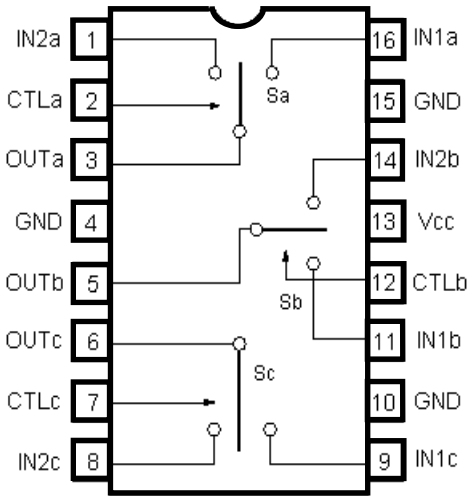


Fig.1 BA7602F

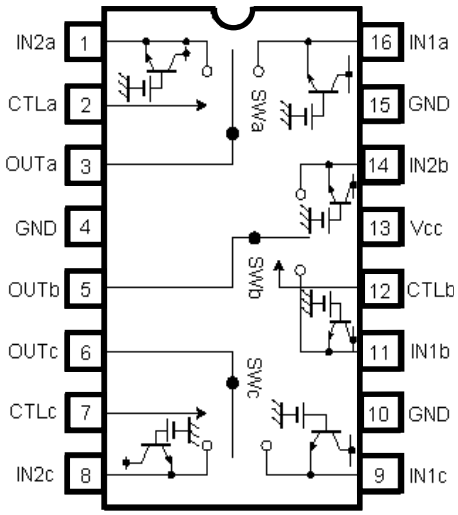


Fig.2 BA7603F

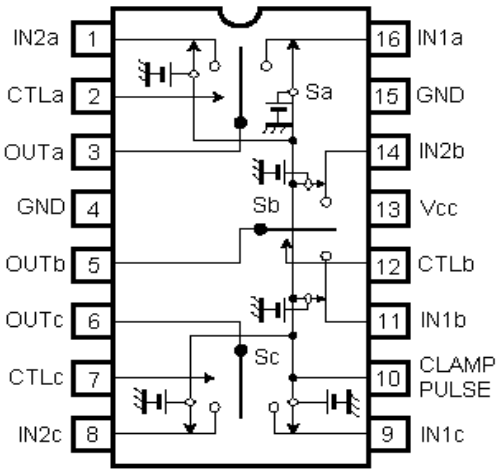


Fig.3 BA7606F/FS

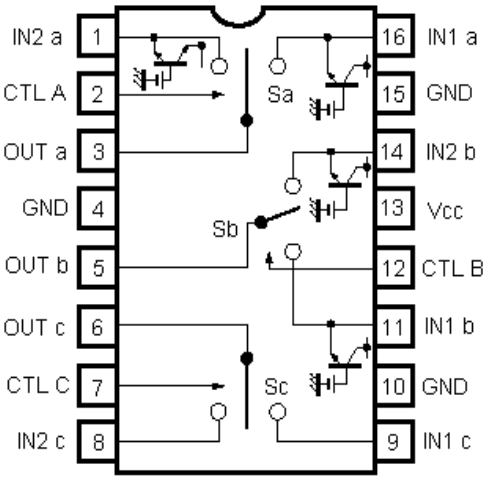


Fig.4 BA7607F, BA7627FV

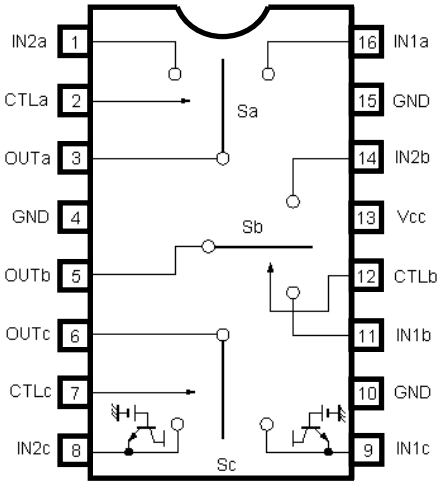


Fig.5 BA7609F

CTL pin settings

CTL	OUTPUT
L	IN2
H	IN1

●Reference data

Pin DC voltage（VCC=5V, Ta=25℃）

Pin No.	Pin DC voltage (V)				
	BA7602F	BA7603F	BA7606F/FS	BA7607F BA7627FV	BA7609F
1	3.27	2.05	2.96	2.05	2.48
2	4.91	4.91	4.91	4.91	4.91
3	1.84	0.65	1.54	0.65	1.76
4	0	0	0	0	0
5	1.84	0.65	1.54	0.65	1.76
6	1.84	0.65	1.54	1.76	0.65
7	4.91	4.91	4.91	4.91	4.91
8	3.27	2.05	2.96	2.48	2.05
9	3.27	2.05	2.96	2.48	2.05
10	0	0	4.97	0	0
11	3.27	2.05	2.96	2.05	2.48
12	4.91	4.91	4.91	4.91	4.91
13	5.00	5.00	5.00	5.00	5.00
14	3.27	2.05	2.96	2.05	2.48
15	0	0	0	0	0
16	3.27	2.05	2.96	2.05	2.48

Input/Output impedance

Parameter		Limits (Typical)					Unit
		02F	03F	06F/FS	07F/27FV	09F	
Input impedance	Bias	20k	—	—	20k		Ω
Input impedance	Clamp	—	1.7M				Ω
Output impedance		30		30※	30		Ω

※The 6pin output impedance in the BA7606F/FS is 130Ω.

●Measurement circuit 1/2 (BA7602F,BA7603F,BA7607F, BA7609F)

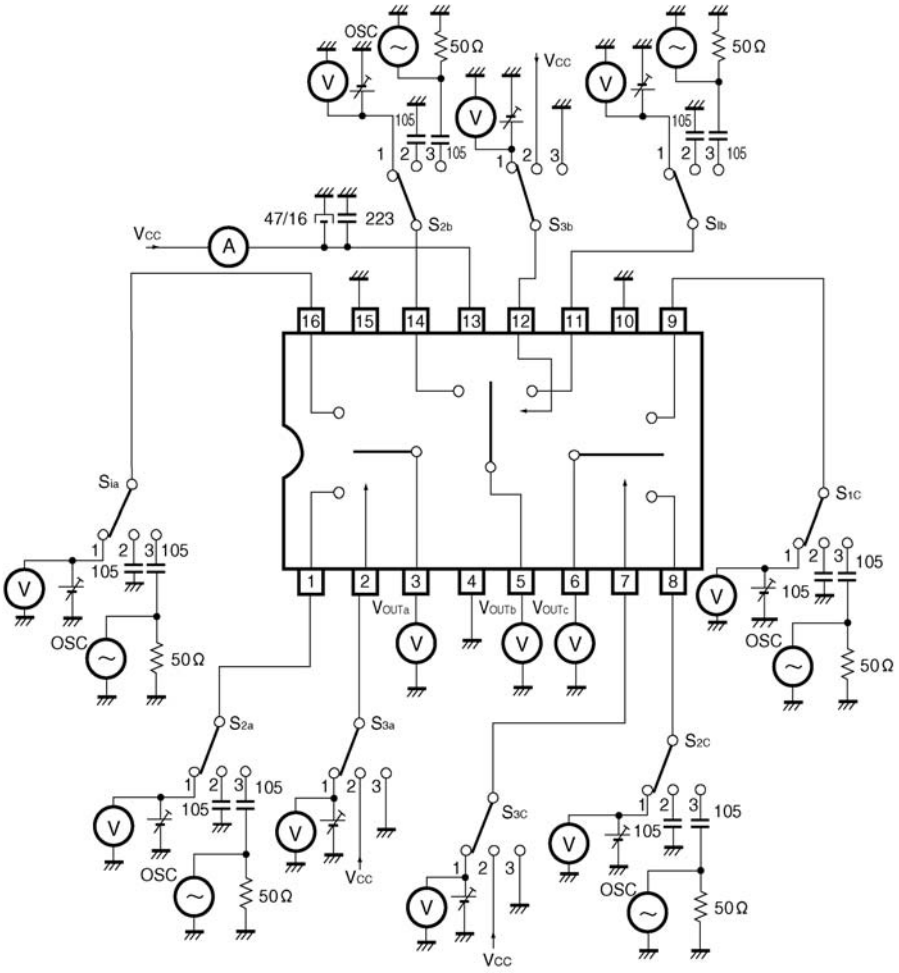


Fig.6 BA7602F, BA7603F, BA7607F, BA7609F, BA7627FV

●Measurement circuit 2/2 (BA7606F/FS)

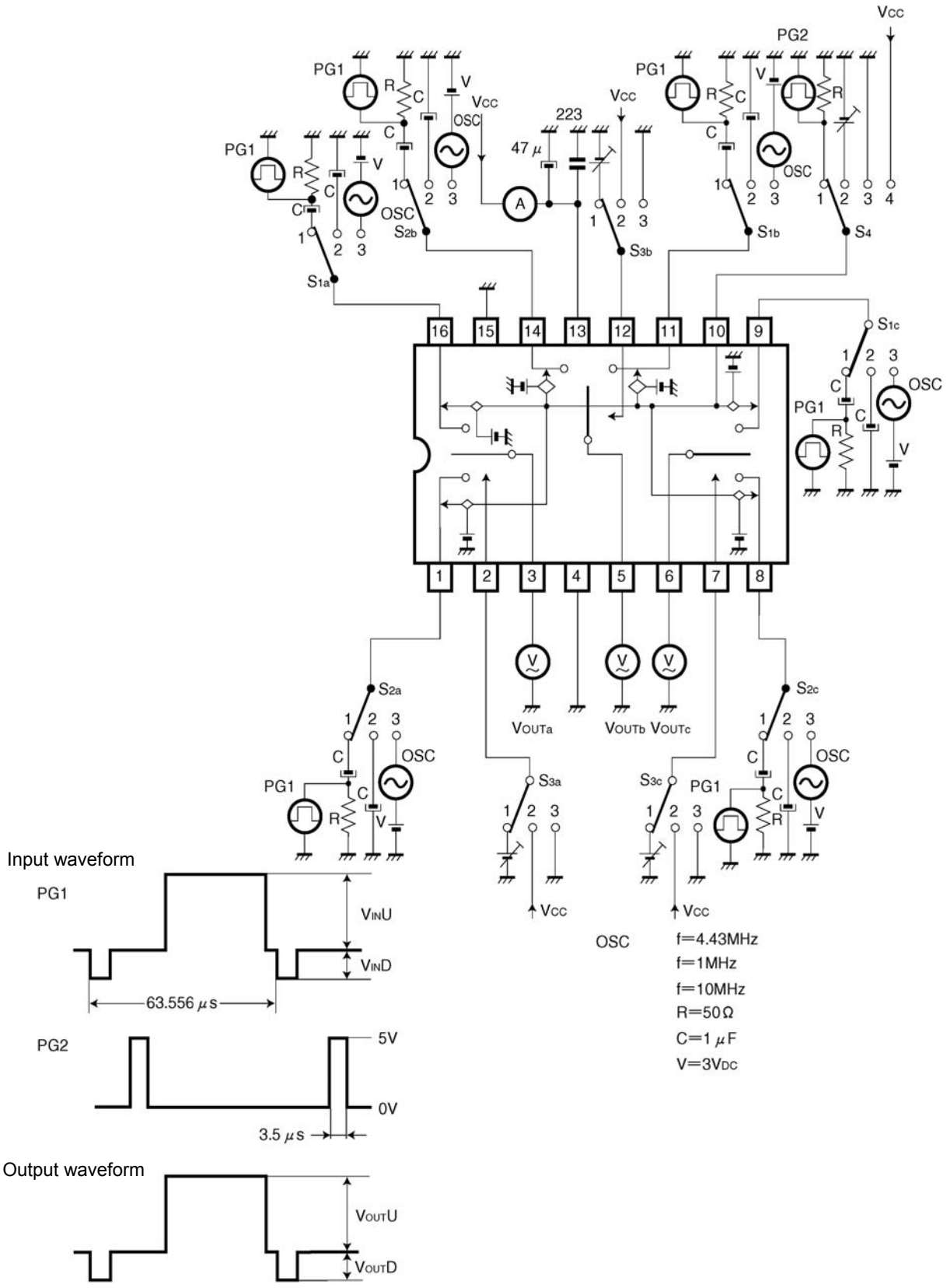


Fig.7 BA7606F/FS

●Reference data

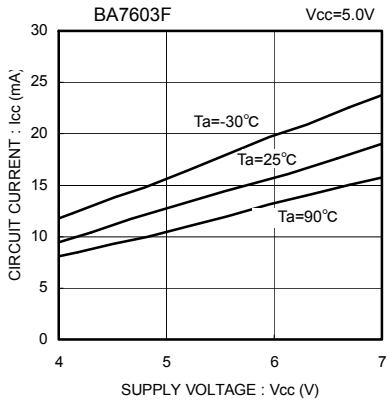


Fig.8 Circuit current vs. Supply voltage

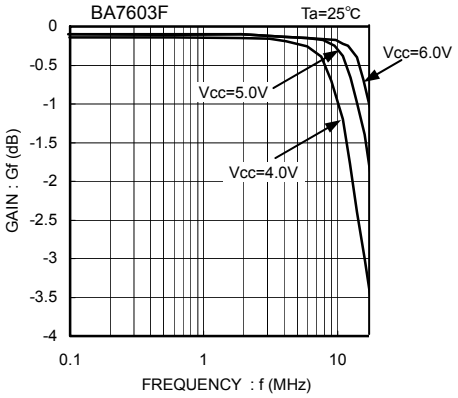


Fig.9 Frequency characteristics vs. Supply voltage

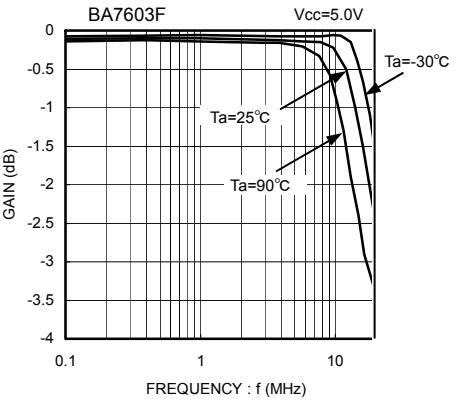


Fig.10 Frequency characteristics vs. temperature

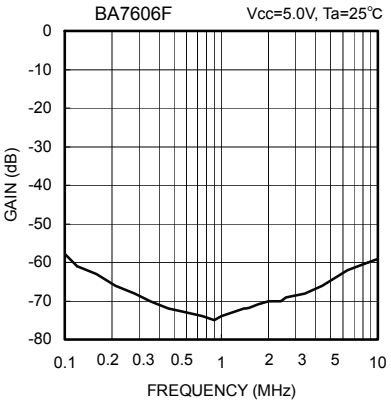


Fig.11 Interchannel crosstalk

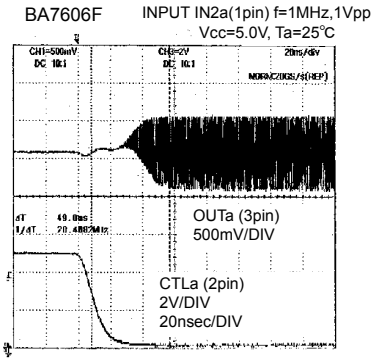


Fig.12 Switching characteristics1

OFF→ON

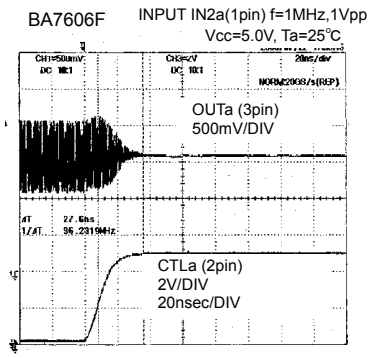


Fig.13 Switching characteristics2

ON→OFF

●Selection of order type

B	A	7	6	0	2	F	—	E	2

Part. No

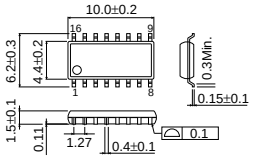
BA7602F
BA7603F
BA7606F/FS
BA7607F
BA7609F
BA7627FV

Tape and Reel information

BA7602F	E2
BA7603F	E2
BA7606F/FS	E2
BA7607F	E2
BA7609F	E2
BA7627FV	E2

SOP16

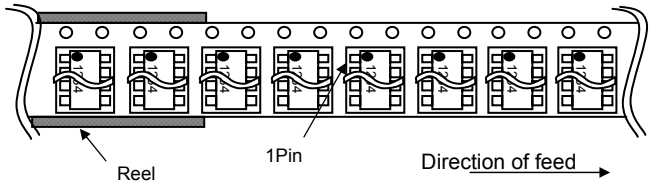
<Dimension>



(Unit:mm)

<Tape and Reel information>

Tape	Embossed carrier tape
Quantity	2500pcs
Direction of feed	E2 (The direction is the 1pin of product is at the upper left when you hold reel on the left hand and you pull out the tape on the right hand)



※When you order , please order in times the amount of package quantity.

SSOP-A16

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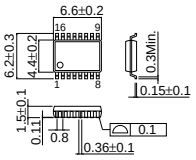
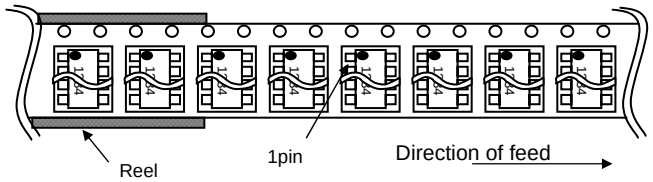


(Unit:mm)

<Tape and Reel information>

Tape	Embossed carrier tape
Quantity	2500pcs
Direction of feed	E2 (The direction is the 1pin of product is at the upper left when you hold reel on the left hand and you pull out the tape on the right hand)



※When you order , please order in times the amount of package quantity.

SSOP-B16

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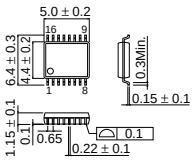

(Unit:mm)

<Tape and Reel information>

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Quantity	2500pcs
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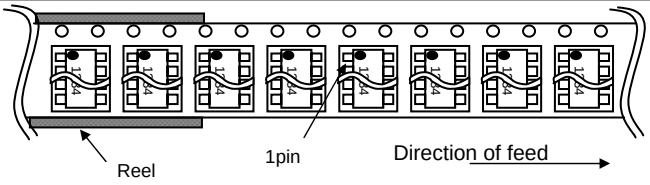

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Munich	TEL: +49-8999-216168	FAX: +49-8999-216176
Stuttgart	TEL: +49-711-7272-370	FAX: +49-711-7272-3720
France	TEL: +33-1-5697-3060	FAX: +33-1-5697-3080
United Kingdom	TEL: +44-1-908-306700	FAX: +44-1-908-235788
Denmark	TEL: +45-3694-4739	FAX: +45-3694-4789
Espoo	TEL: +358-9725-54491	FAX: +358-9-7255-4499
Salo	TEL: +358-2-7332234	FAX: +358-2-7332237
Oulu	TEL: +358-8-5372930	FAX: +358-8-5372931
Barcelona	TEL: +34-9375-24320	FAX: +34-9375-24410
Hungary	TEL: +36-1-4719338	FAX: +36-1-4719339
Poland	TEL: +48-22-5757213	FAX: +48-22-5757001
Russia	TEL: +7-495-739-41-74	FAX: +7-495-739-41-74
Seoul	TEL: +82-2-8182-700	FAX: +82-2-8182-715
Masan	TEL: +82-55-240-6234	FAX: +82-55-240-6236
Dalian	TEL: +86-411-8230-8549	FAX: +86-411-8230-8537
Beijing	TEL: +86-10-8525-2483	FAX: +86-10-8525-2489
Tianjin	TEL: +86-22-23029181	FAX: +86-22-23029183
Shanghai	TEL: +86-21-6279-2727	FAX: +86-21-6247-2066
Hangzhou	TEL: +86-571-87658072	FAX: +86-571-87658071
Nanjing	TEL: +86-25-8689-0015	FAX: +86-25-8689-0393
Ningbo	TEL: +86-574-87654201	FAX: +86-574-87654208
Qingdao	TEL: +86-532-5779-312	FAX:+86-532-5779-653
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Wuxi	TEL: +86-510-82702693	FAX: +86-510-82702992
Shenzhen	TEL: +86-755-8307-3008	FAX: +86-755-8307-3003
Dongguan	TEL: +86-769-8393-3320	FAX: +86-769-8398-4140
Fuzhou	TEL: +86-591-8801-8698	FAX: +86-591-8801-8690
Guangzhou	TEL: +86-20-3878-8100	FAX: +86-20-3825-5965
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