

TOSHIBA Bipolar Digital Integrated Circuit Silicon Monolithic

TD62318APG, TD62318AFG

4ch Low Input Active High-Current Darlington Sink Driver

The TD62318APG and TD62318AFG are non-inverting transistor arrays which are comprised of four NPN darlington output stages and PNP input stages.

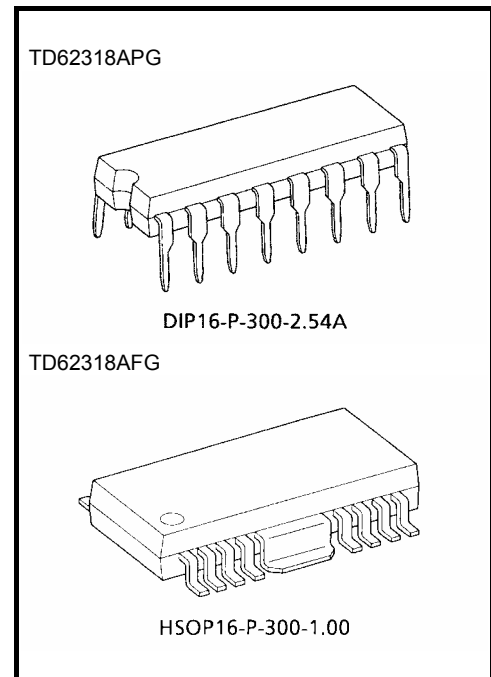
These devices can be operated by source input voltage and are suitable for operation with a 5-V general purpose logic IC such as TTL, 5-V CMOS and 5-V Microprocessor which have sink current output drivers.

Applications include relay, hammer, lamp and stepping motor drivers.

Please observe the thermal condition for using.

Features

- Output current (single output) 700 mA (max)
- High sustaining voltage output 50 V (min)
- Output clamp diodes
- Input compatible with TTL and 5-V CMOS
- Low level active inputs
- Standard supply voltage
- Two V_{CC} terminals V_{CC1}, V_{CC2} (separated)
- GND and SUB terminal = heat sink
- Package type-APG: DIP-16 pin
- Package type-AFG: HSOP-16 pin



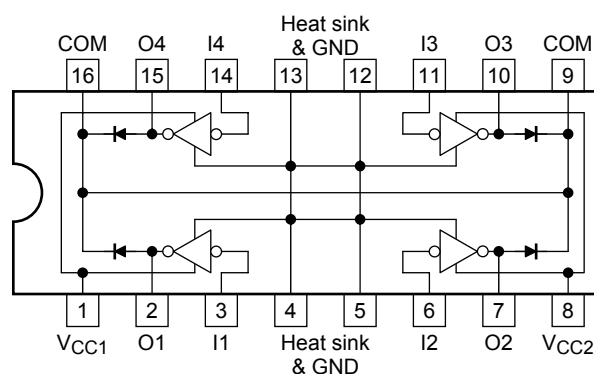
Weight

DIP16-P-300-2.54A : 1.11 g (typ.)

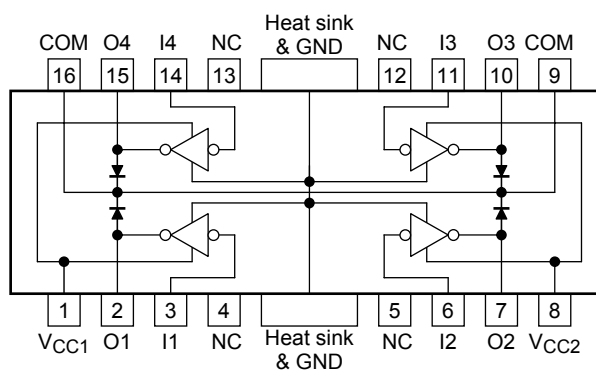
HSOP16-P-300-1.00 : 0.50 g (typ.)

Pin Connection (top view)

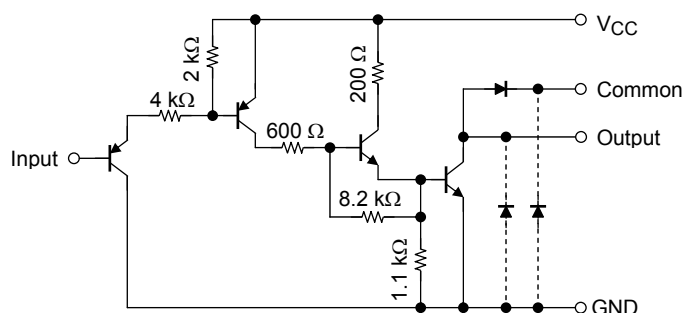
TD62318APG



AD62318AFG



Schematics (each driver)



Note: The input and output parasitic diodes cannot be used as clamp diodes.

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Supply voltage		V _{CC}	−0.5 to 17	V
Output sustaining voltage		V _{CE (SUS)}	−0.5 to 50	V
Output current		I _{OUT}	700	mA/ch
Input current		I _{IN}	−10	mA
Input voltage		V _{IN}	−0.5 to 30	V
Clamp diode reverse voltage		V _R	50	V
Clamp diode forward current		I _F	700	mA
Power dissipation	APG	P _D	1.47/2.7 (Note 1)	W
	AFG		0.9/1.4 (Note 2)	
Operating temperature		T _{opr}	−40 to 85	°C
Storage temperature		T _{sta}	−55 to 150	°C

Note 1: On glass epoxy PCB (50 × 50 × 1.6 mm Cu 50%)

Note 2: On glass epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

Recommended Operating Conditions (Ta = −40 to 85°C)

Characteristics	Symbol	Condition	Min	Typ.	Max	Unit
Supply voltage	V _{CC}		4.5	—	5.5	V
Output Sustaining voltage	V _{CE (SUS)}		0	—	50	V
Output current	I _{OUT}	DC 1 circuit, Ta = 25°C	0	—	570	mA/ch
		T _{pw} = 25 ms	0	—	570	
		4 circuits	0	—	570	
		Ta = 85°C	0	—	570	
		T _j = 120°C	0	—	480	
Input voltage	V _{IN}		0	—	15	V
	Output on	V _{IN (ON)}	0	—	V _{CC} − 3.6	V
	Output off	V _{IN (OFF)}	V _{CC} − 1.6	—	5.5	
Clamp diode reverse voltage	V _R		—	—	50	V
Clamp diode forward current	I _F		—	—	500	mA
Power dissipation	APG	P _D	Ta = 85°C (Note 1)	—	1.4	W
	AFG				0.7	

Note 1: On glass epoxy PCB (50 × 50 × 1.6 mm Cu 50%)

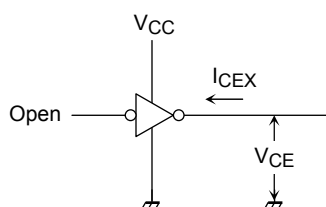
Note 2: On glass epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

Electrical Characteristics (Ta = 25°C)

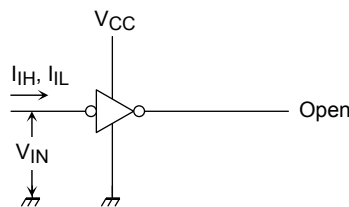
Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input voltage	"H" level	V_{IH}	—		$V_{CC} - 1.6$	—	25	V
	"L" level	V_{IL}			0	—	$V_{CC} - 3.6$	
Input current	"H" level	I_{IH}	2		—	—	10	μA
	"L" level	I_{IL}			—	-0.05	-0.36	mA
Output leakage current		I_{CEX}	1	$V_{CE} = 50 \text{ V}, T_a = 25^\circ \text{C}$	—	—	50	μA
				$V_{CE} = 50 \text{ V}, T_a = 85^\circ \text{C}$	—	—	100	
Output saturation voltage		$V_{CE(sat)}$	3	$I_{OUT} = 0.5 \text{ A}, V_{CC} = 4.5 \text{ V}$	—	—	0.8	V
				$I_{OUT} = 0.2 \text{ A}, V_{CC} = 4.5 \text{ V}$	—	—	0.45	
Clamp diode reverse current		I_R	4	$V_R = 50 \text{ V}, T_a = 25^\circ \text{C}$	—	—	50	μA
				$V_R = 50 \text{ V}, T_a = 85^\circ \text{C}$	—	—	100	
Clamp diode forward voltage		V_F	5	$I_F = 500 \text{ mA}$	—	—	2.0	V
Supply current	Output on	$I_{CC(ON)}$	2	$V_{CC} = 5.5 \text{ V}, V_{IN} = 0 \text{ V}$	—	35	40	mA/ch
	Output off	$I_{CC(OFF)}$	2	$V_{CC} = 5.5 \text{ V}, V_{IN} = V_{CC}$	—	—	10	μA
Turn-on delay		t_{ON}	6	$V_{OUT} = 50 \text{ V}, R_L = 90 \Omega$ $V_{CC} = 5.0 \text{ V}, C_L = 15 \text{ pF}$	—	0.4	0.8	μs
Turn-off delay		t_{OFF}			—	8.0	16.0	

Test Circuit

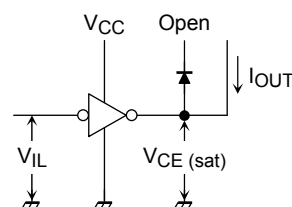
1. I_{CEX}



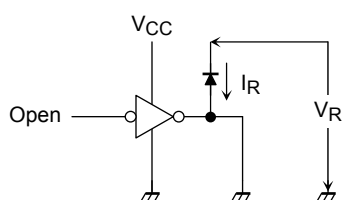
2. I_{IH}, I_{IL}



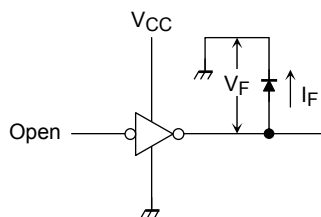
3. $V_{CE(sat)}$



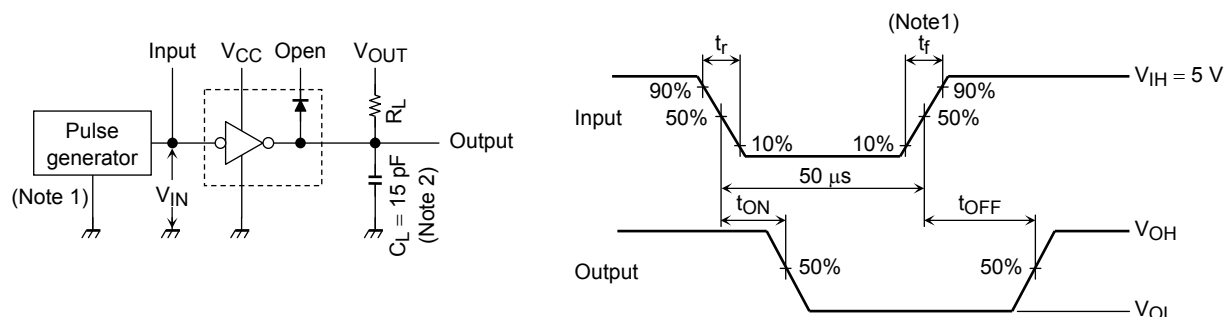
4. I_R



5. V_F



6. t_{ON} , t_{OFF}



Note 1: Pulse width $50\text{ }\mu\text{s}$, duty cycle 10%, output impedance $50\text{ }\Omega$, $t_r \leq 5\text{ ns}$, $t_f \leq 10\text{ ns}$

Note 2: C_L includes probe and jig capacitance.

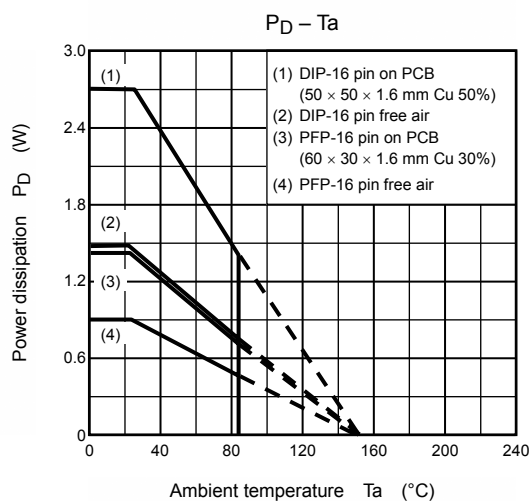
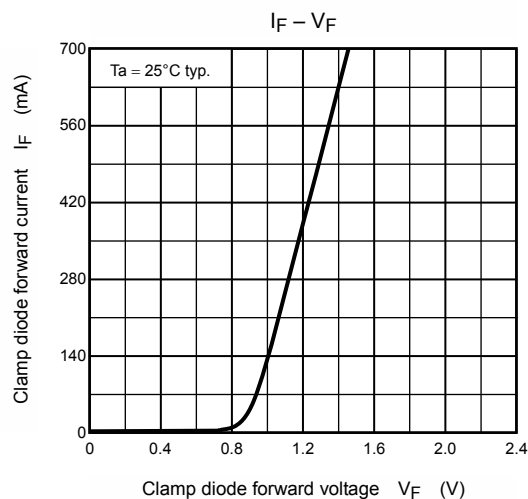
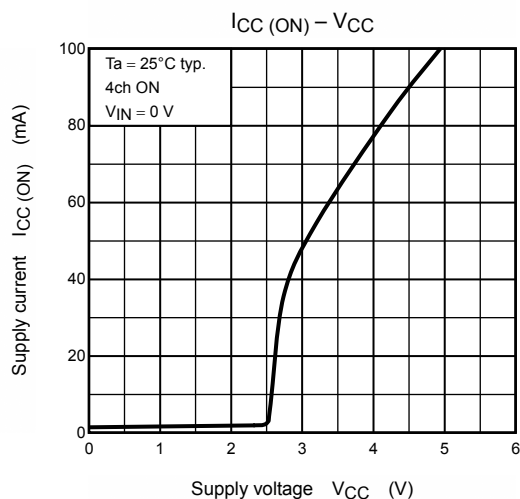
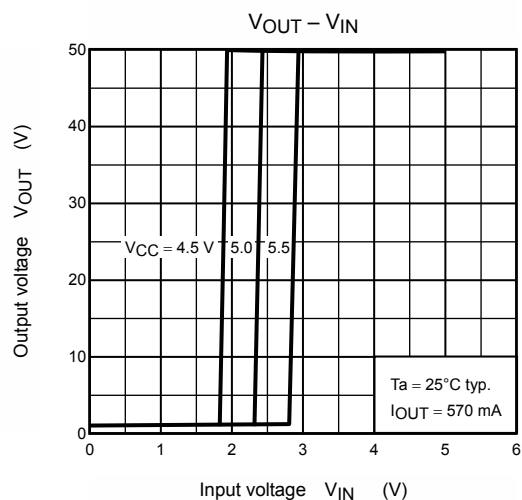
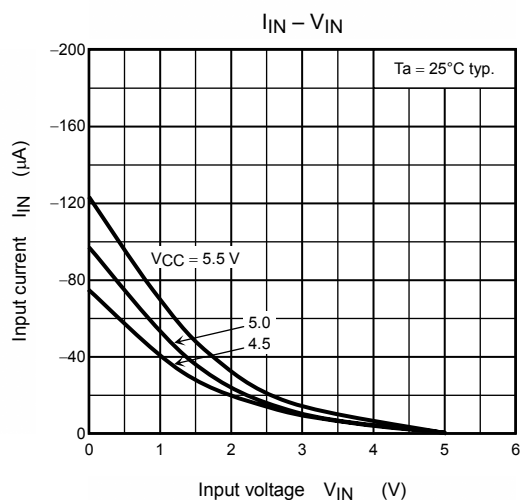
Precautions for Using

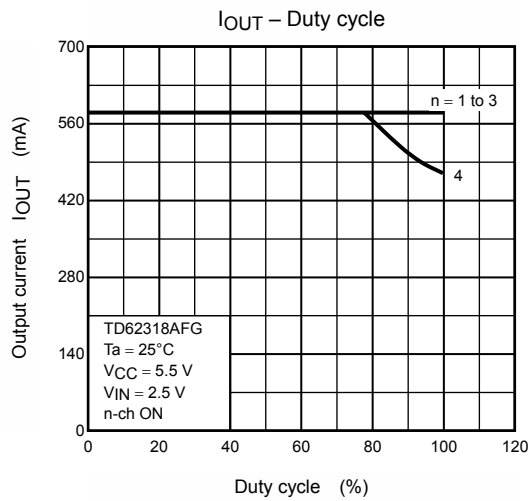
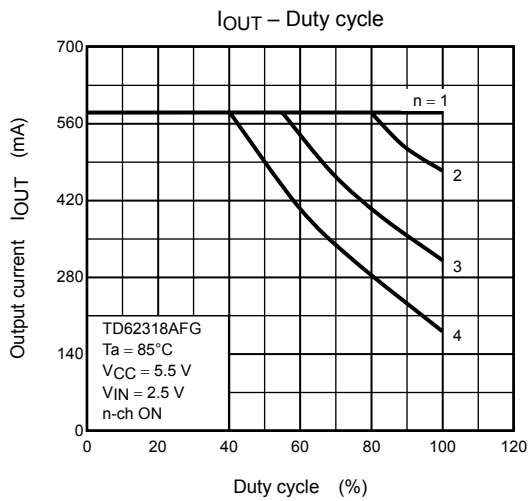
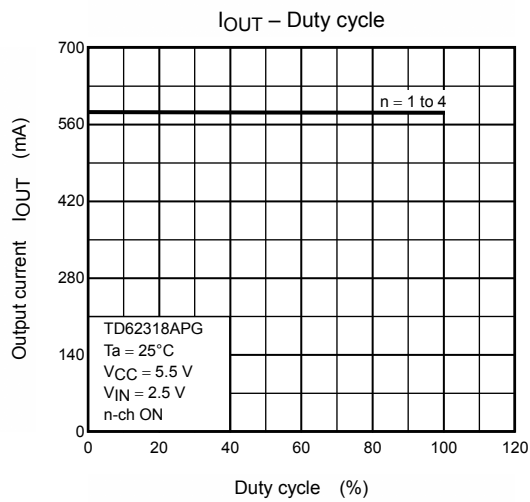
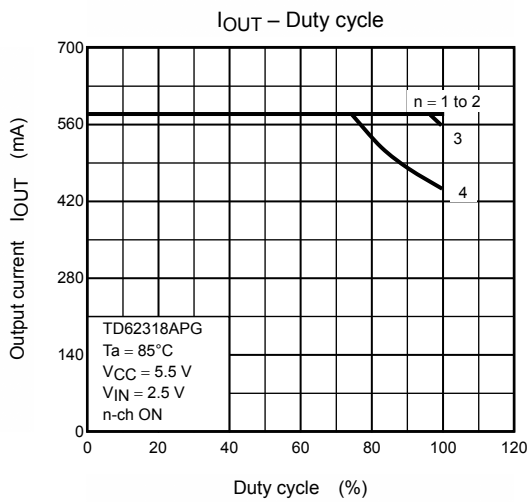
This IC does not include built-in protection circuits for excess current or overvoltage.

If this IC is subjected to excess current or overvoltage, it may be destroyed.

Hence, the utmost care must be taken when systems which incorporate this IC are designed.

Utmost care is necessary in the design of the output line, V_{CC} , COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

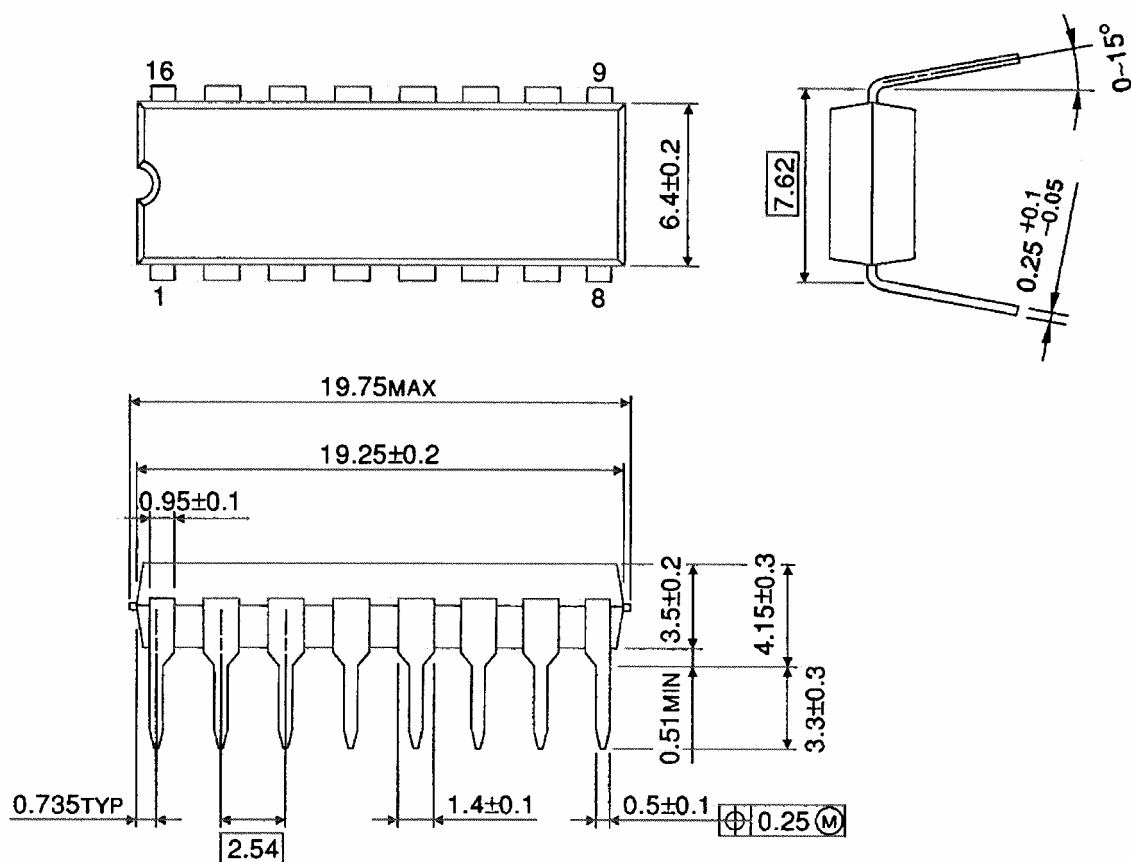




Package Dimensions

DIP16-P-300-2.54A

Unit : mm

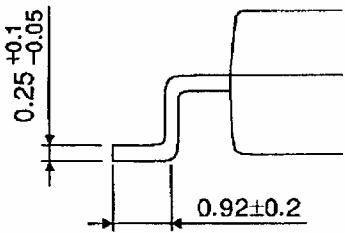
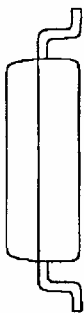
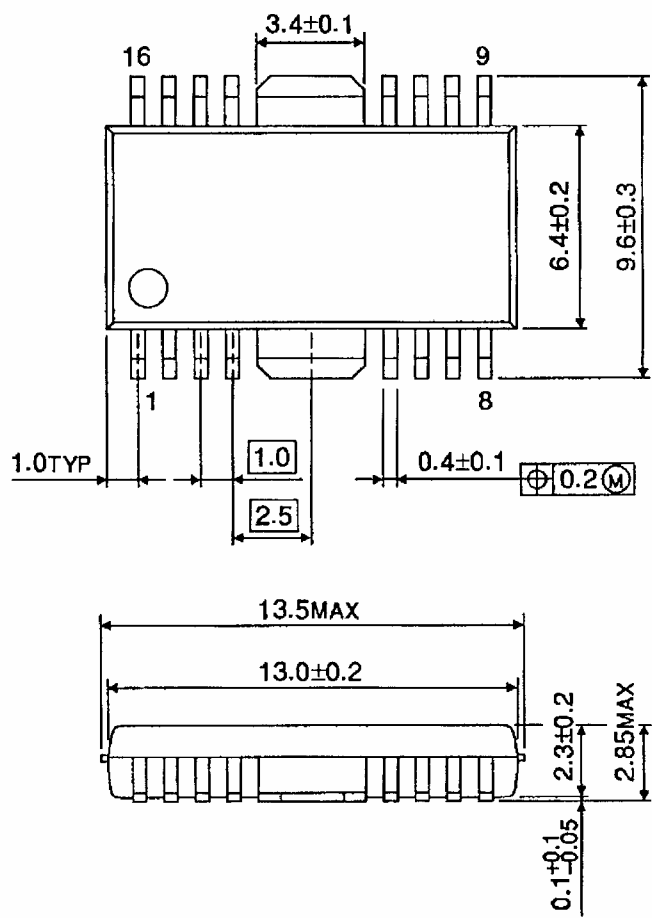


Weight: 1.11 g (typ.)

Package Dimensions

HSOP16-P-300-1.00

Unit : mm



Weight: 0.50 g (typ.)

About solderability, following conditions were confirmed

- Solderability

- (1) Use of Sn-63Pb solder Bath

- solder bath temperature = 230°C
 - dipping time = 5 seconds
 - the number of times = once
 - use of R-type flux

- (2) Use of Sn-3.0Ag-0.5Cu solder Bath

- solder bath temperature = 245°C
 - dipping time = 5 seconds
 - the number of times = once
 - use of R-type flux

RESTRICTIONS ON PRODUCT USE

030619EBA

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