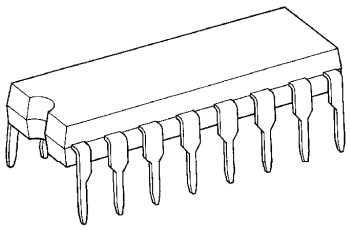
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62318AP, TD62318AF

4CH LOW INPUT ACTIVE HIGH-CURRENT DARLINGTON SINK DRIVER

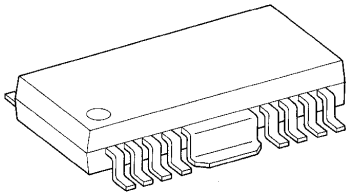
The TD62318AP, TD62318AF are non-inverting transistor array which are comprised of four NPN darlington output stages and PNP input stages.
These devices are low level input active driver and are suitable for operation with TTL, 5V CMOS and 5V Microprocessor which have sink current output drivers.
Applications include relay, hammer, lamp and stepping moter drivers.

TD62318AP



DIP16-P-300-2.54A

TD62318AF



HSOP16-P-300-1.00

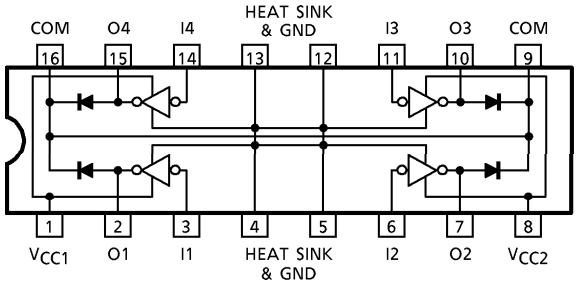
Weight
DIP16-P-300-2.54A : 1.11g (Typ.)
HSOP16-P-300-1.00 : 0.50g (Typ.)

FEATURES

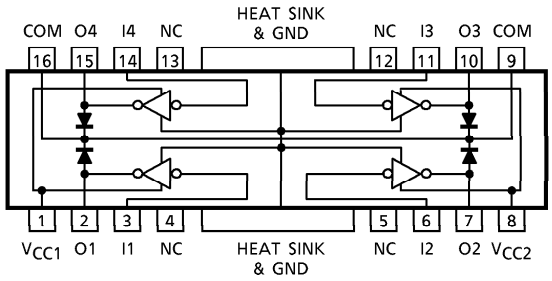
- Output current (single output) 700mA (Max.)
- High sustaining voltage output 50V (Min.)
- Output clamp diodes
- Input compatible with TTL and 5V CMOS
- Low level active inputs
- Standard supply voltage
- Two V_{CC} terminals V_{CC1}, V_{CC2} (separeted)
- GND and SUB terminal = heat sink
- Package type-AP : DIP-16pin
- Package type-AF : PFP-16pin

PIN CONNECTION (TOP VIEW)

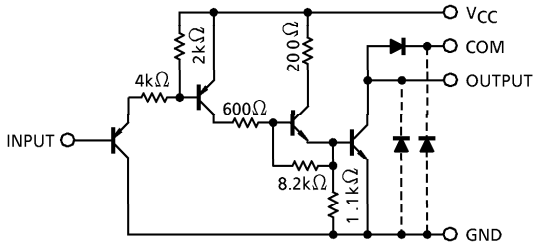
TD62318AP



TD62318AF



SCHEMATICS (EACH DRIVER)



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

961001EBA2

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	−0.5~17	V
Output Sustaining Voltage		$V_{CE\ (SUS)}$	−0.5~50	V
Output Current		I_{OUT}	700	mA / ch
Input Current		I_{IN}	−10	mA
Input Voltage		V_{IN}	−0.5~30	V
Clamp Diode Reverse Voltage		V_R	50	V
Clamp Diode Forward Current		I_F	700	mA
Power Dissipation	AP	P_D	1.47 / 2.7 (Note 1)	W
	AF		0.9 / 1.4 (Note 2)	
Operating Temperature		T_{opr}	−40~85	°C
Storage Temperature		T_{stg}	−55~150	°C

(Note 1) On Glass Epoxy (50 × 50 × 1.6mm Cu 50%)
(Note 2) On Glass Epoxy (60 × 30 × 1.6mm Cu 30%)

RECOMMENDED OPERATING CONDITIONS (Ta = −40~85°C)

CHARACTERISTIC		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	AP	I_{OUT}	DC 1 circuit, Ta = 25°C		0	—	570	mA / ch
			T_{pw} = 25ms 4 circuits Ta = 85°C T_j = 120°C	Duty = 10%	0	—	570	
				Duty = 50%	0	—	570	
	AF			Duty = 10%	0	—	570	
				Duty = 50%	0	—	480	
Input Voltage		V_{IN}			0	—	15	V
Input Voltage	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	AP	P_D	Ta = 85°C (Note 1)		—	—	1.4	W
	AF		Ta = 85°C (Note 2)		—	—	0.7	

(Note 1) On Glass Epoxy (50 × 50 × 1.6mm Cu 50%)
(Note 2) On Glass Epoxy (60 × 30 × 1.6mm Cu 30%)

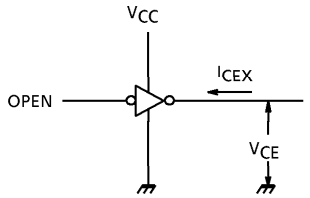
961001EBA2'

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

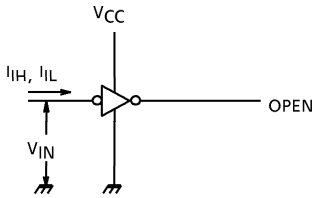
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Voltage	"H" Level	V_{IH}	—		V_{CC} – 1.6	—	25	V
	"L" Level	V_{IL}			0	—	V_{CC} – 3.6	
Input Current	"H" Level	I_{IH}	2		—	—	10	μA
	"L" Level	I_{IL}			—	– 0.05	– 0.36	mA
Output Leakage Current		I_{CEX}	1	V_{CE} = 50V, Ta = 25°C	—	—	50	μA
				V_{CE} = 50V, Ta = 85°C	—	—	100	
Output Saturation Voltage		$V_{CE\ (sat)}$	3	I_{OUT} = 0.5A, V_{CC} = 4.5V	—	—	0.8	V
				I_{OUT} = 0.2A, V_{CC} = 4.5V	—	—	0.45	
Clamp Diode Reverse Current		I_R	4	V_R = 50V, Ta = 25°C	—	—	50	μA
				V_R = 50V, Ta = 85°C	—	—	100	
Clamp Diode Forward Voltage		V_F	5	I_F = 500mA	—	—	2.0	V
Supply Current	Output On	$I_{CC\ (ON)}$	2	V_{CC} = 5.5V, V_{IN} = 0V	—	35	40	mA / ch
	Output Off	$I_{CC\ (OFF)}$	2	V_{CC} = 5.5V, V_{IN} = V_{CC}	—	—	10	μA
Turn-On Delay		t_{ON}	6	V_{OUT} = 50V, R_L = 90Ω	—	0.4	0.8	μs
Turn-Off Delay		t_{OFF}		V_{CC} = 5.0V, C_L = 15pF	—	8.0	16.0	

TEST CIRCUIT

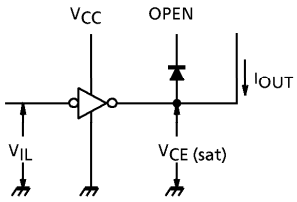
1. I_{CEX}



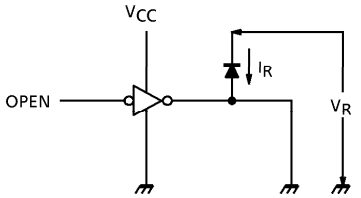
2. I_{IH}, I_{IL}



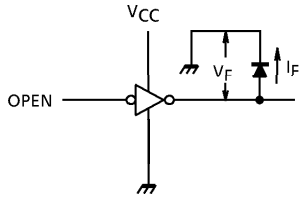
3. $V_{CE\ (sat)}$



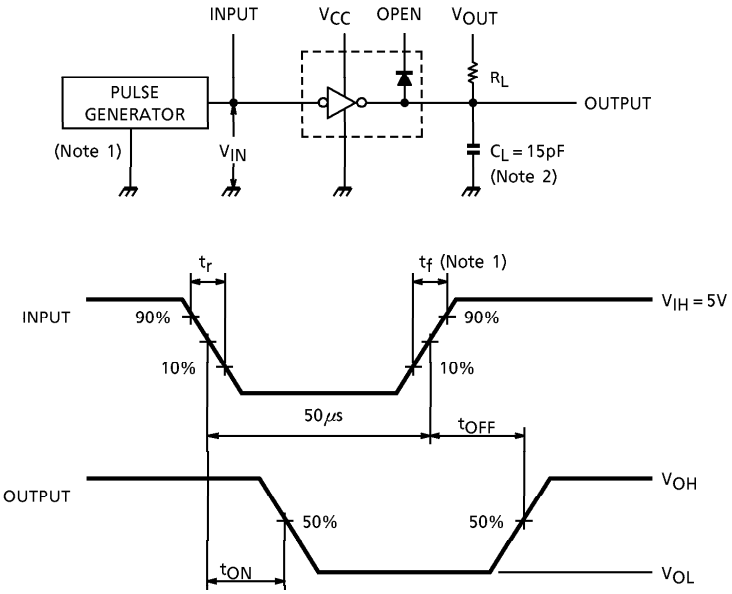
4. I_R



5. V_F



6. t_{ON}, t_{OFF}



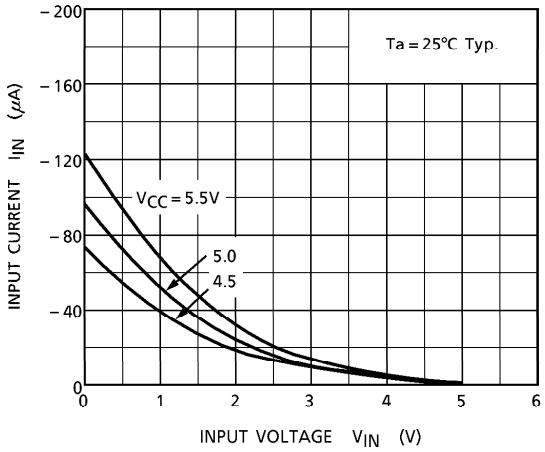
(Note 1) Pulse width 50μs, duty cycle 10%
Output impedance 50Ω $t_r \leqq 5$ns, $t_f \leqq 10$ns

(Note 2) C_L includes probe and jig capacitance.

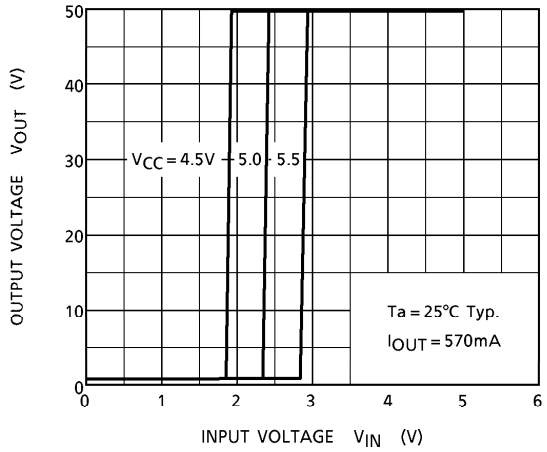
PRECAUTIONS for USING

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.

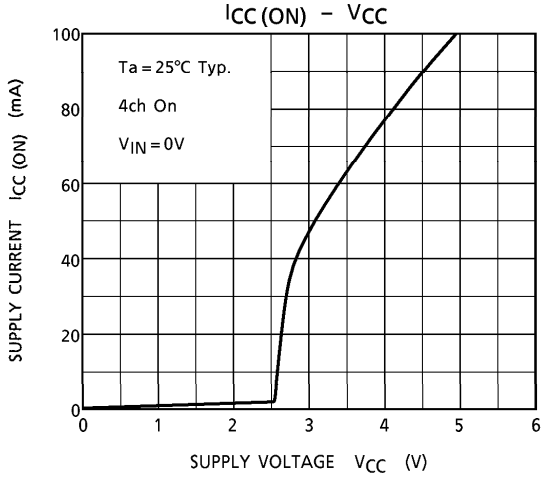
I_{IN} – V_{IN}



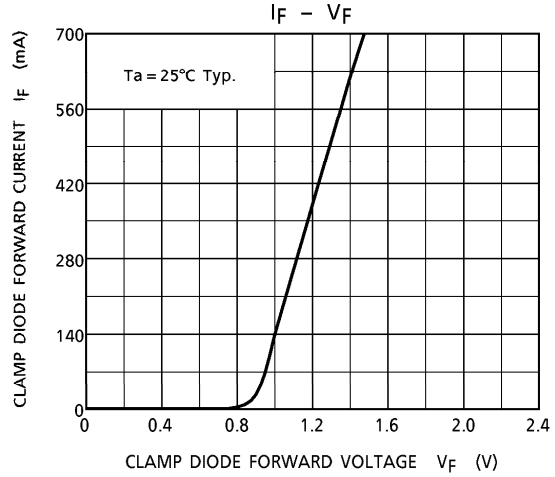
V_{OUT} – V_{IN}



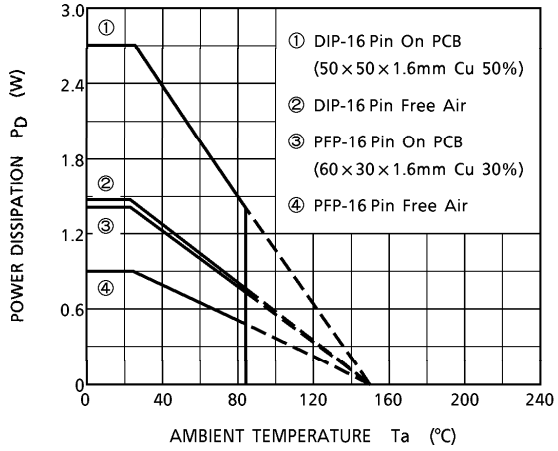
$I_{CC\,(ON)}$ – V_{CC}

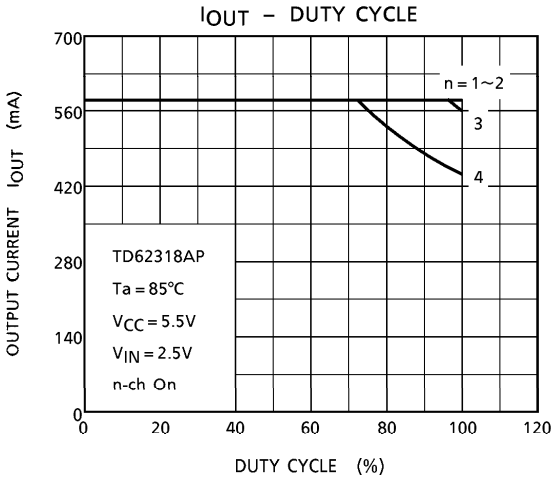


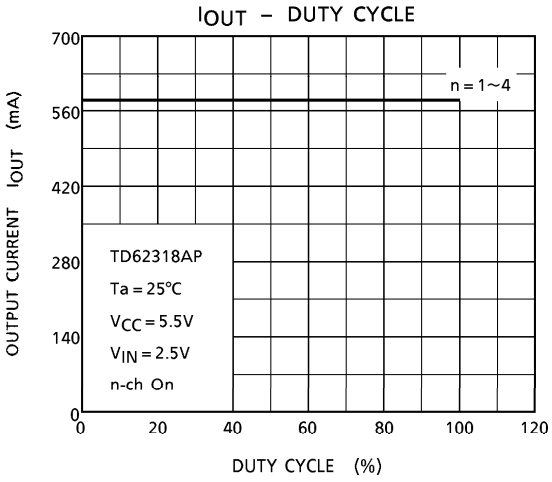
I_F – V_F

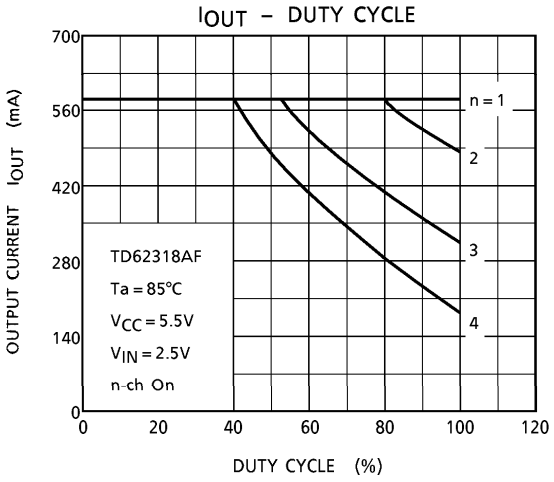


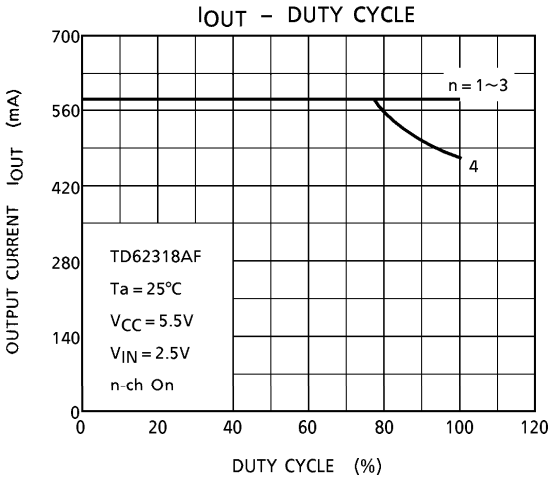
P_D – Ta




IOUT – DUTY CYCLE
OUTPUT CURRENT IOUT (mA)
700
560
420
280
140
0
0 20 40 60 80 100 120
DUTY CYCLE (%)
n = 1~2
3
4
TD62318AP
Ta = 85°C
VCC = 5.5V
VIN = 2.5V
n-ch On


IOUT – DUTY CYCLE
OUTPUT CURRENT IOUT (mA)
700
560
420
280
140
0
0 20 40 60 80 100 120
DUTY CYCLE (%)
n = 1~4
TD62318AP
Ta = 25°C
VCC = 5.5V
VIN = 2.5V
n-ch On

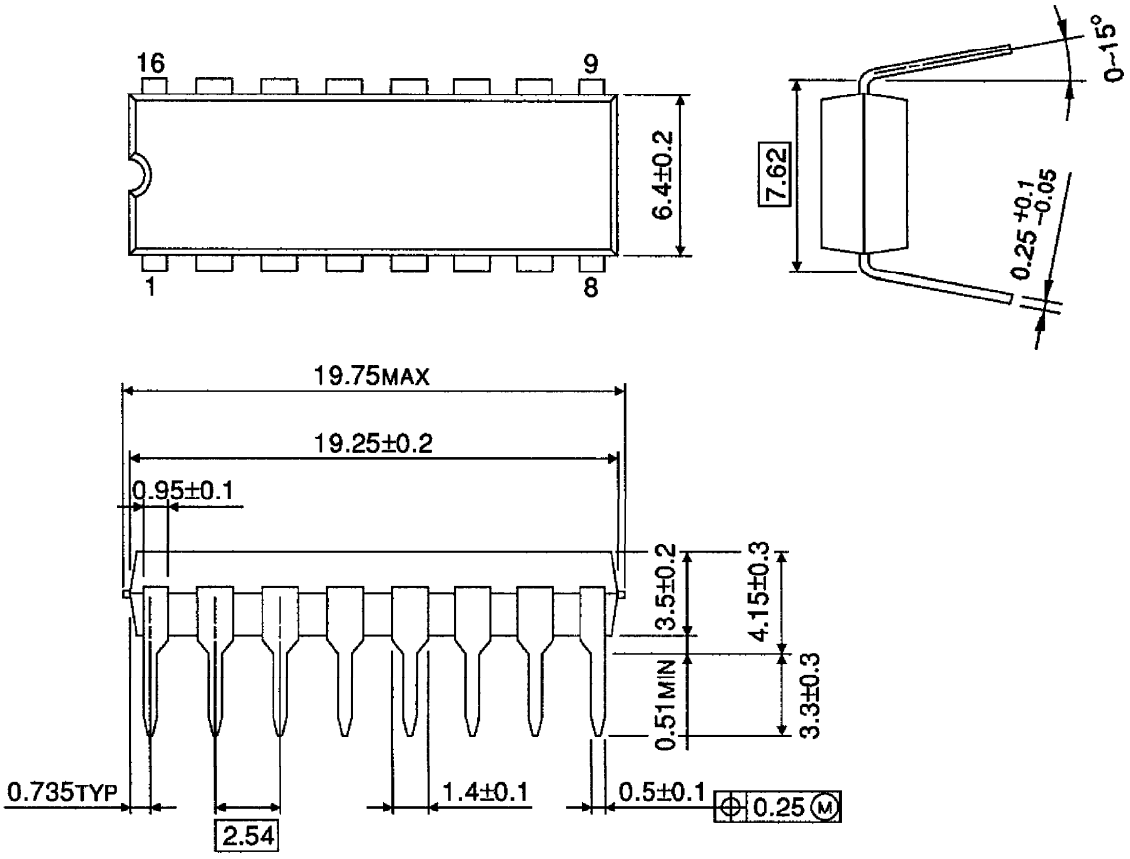

IOUT – DUTY CYCLE
OUTPUT CURRENT IOUT (mA)
700
560
420
280
140
0
0 20 40 60 80 100 120
DUTY CYCLE (%)
n = 1
2
3
4
TD62318AF
Ta = 85°C
VCC = 5.5V
VIN = 2.5V
n-ch On


IOUT – DUTY CYCLE
OUTPUT CURRENT IOUT (mA)
700
560
420
280
140
0
0 20 40 60 80 100 120
DUTY CYCLE (%)
n = 1~3
4
TD62318AF
Ta = 25°C
VCC = 5.5V
VIN = 2.5V
n-ch On

OUTLINE DRAWING

DIP16-P-300-2.54A

Unit : mm

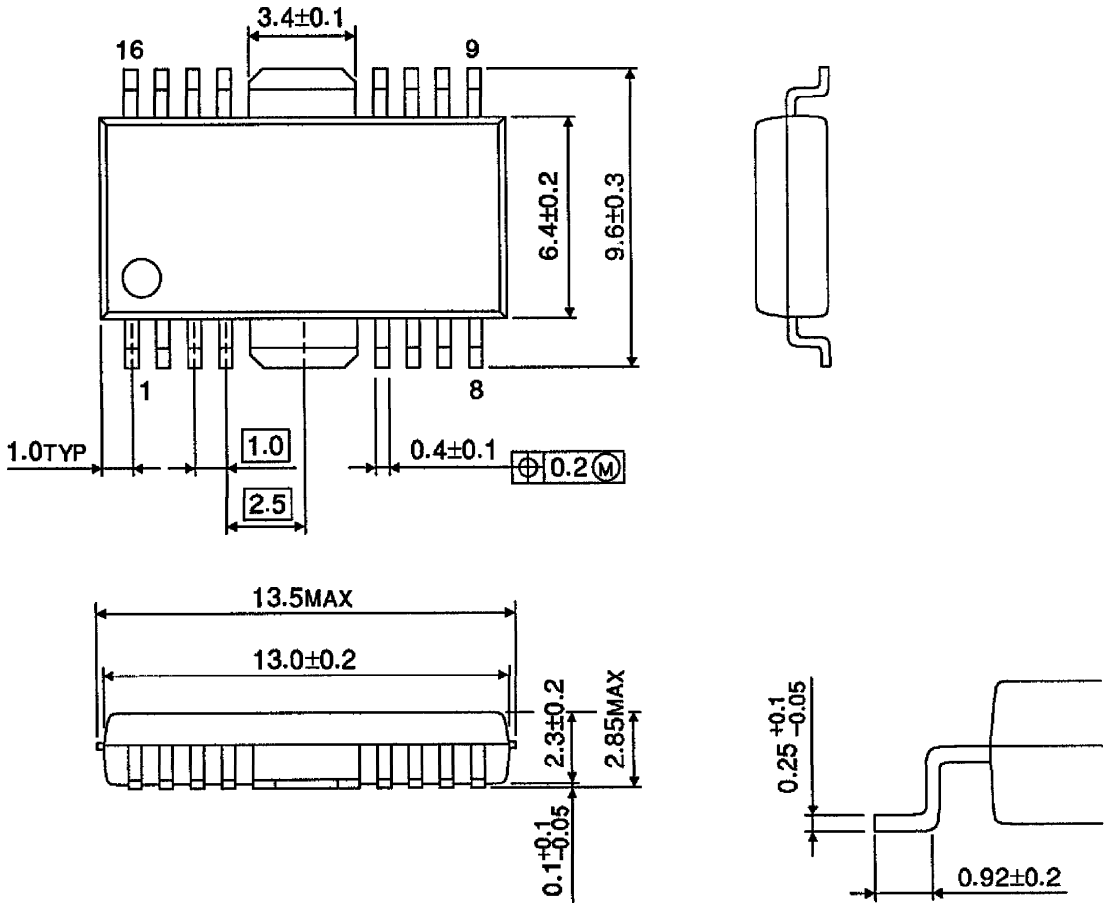


Weight : 1.11g (Typ.)

OUTLINE DRAWING

HSOP16-P-300-1.00

Unit : mm



Weight : 0.50g (Typ.)