

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62164BP, TD62164BF

4CH HIGH-CURRENT DARLINGTON SINK DRIVER

The TD62164BP and TD62164BF are high-voltage, high-current darlington drivers comprised of four NPN darlington pairs. All units feature integral clamp diodes for switching inductive loads.

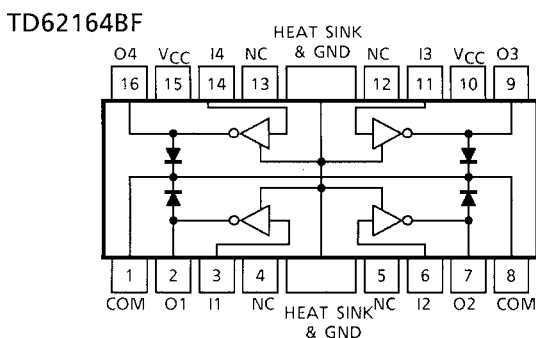
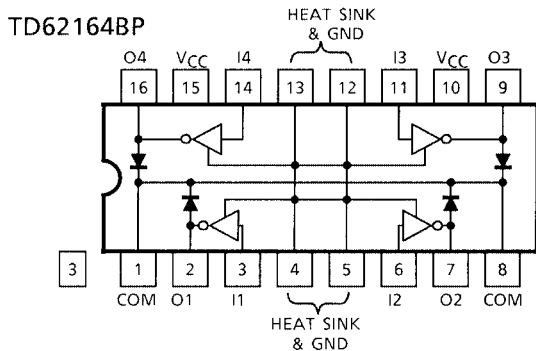
Applications include relay, hammer, lamp and stepping motor drivers.

Please observe the thermal condition for using.

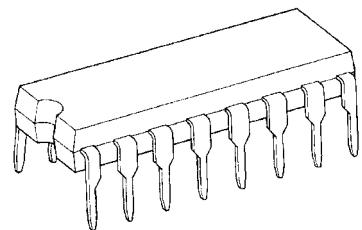
FEATURES

- Two VCC Terminals (Separated)
- Package Type BP : DIP16 pin
BF : HSOP16 pin
- High Sustaining Voltage output : $V_{CE(SUS)} = 80\text{ V (Min)}$
- Output Current (Single Output) : $I_{OUT} = 700\text{ mA ch (Max)}$
- Output Clamp Diodes
- Input Compatible with TTL and 5-V CMOS
- GND and SUB Terminal Heat Sink

PIN CONNECTION (TOP VIEW)

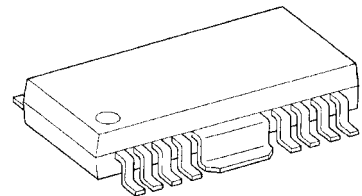


TD62164BP



DIP16-P-300-2.54A

TD62164BF

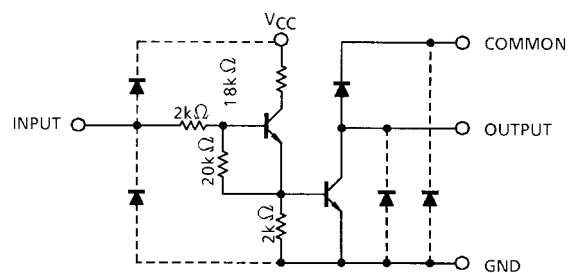


HSOP16-P-300-1.00

Weight

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

SCHEMATICS (EACH DRIVER)



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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V _{CC}	-0.5~17	V
Output Sustaining Voltage		V _{CE (SUS)}	-0.5~80	V
Output Current		I _{OUT}	700	mA / ch
Input Current		I _{IN}	50	mA
Input Voltage		V _{IN}	17	V
Clamp Diode Reverse Voltage		V _R	80	V
Clamp Diode Forward Current		I _F	700	mA
Power Dissipation	BP	P _D	1.47 / 2.7 (Note 1)	W
	BF		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 PCB (50 × 50 × 1.6 mm Cu 50%)

Note 2: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

RECOMMENDED OPERATING (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	—	80	V	
Output Current	BP (Note 1)	I _{OUT}	DC1 Circuit, Ta = 25°C	0	—	570	mA / ch	
			Tp _w = 25ms	Duty = 10%	0	—		570
				Duty = 50%	0	—		520
			4 Circuits	Duty = 10%	0	—		570
				Duty = 50%	0	—		270
Input Voltage	Output On	V _{IN (ON)}	I _{OUT} = 500 mA	hFE = 150	10.0	—	15	V
			hFE = 2000	2.4	—	15		
			Output Off	V _{IN (OFF)}	0	—	0.4	
Input Current		I _{IN}		0	—	20	mA	
Clamp Diode Reverse voltage		V _R		—	—	80	V	
Clamp Diode Forward voltage		I _F		—	—	700	mA	
Power Dissipation	BP	P _D	Ta = 85°C (Note 1)	—	—	1.4	W	
	BF		Ta = 85°C (Note 2)	—	—	0.7		

Note 1: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 50%)

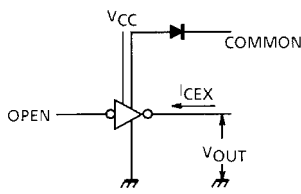
Note 2: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

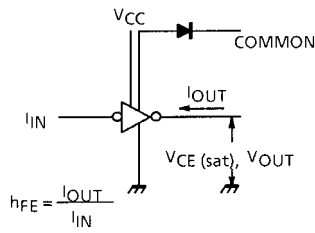
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT	
Output Leakage Current	I _{CEX}	1	V _{CE} = 80 V, Ta = 25°C	—	—	50	μA	
			V _{CE} = 80 V, Ta = 85°C	—	—	100		
Output Saturation Voltage	V _{CE (sat)}	2	I _{OUT} = 500 mA, V _{CC} = 5 V	—	—	0.8	V	
			I _{OUT} = 200 mA, V _{CC} = 5 V	—	—	0.45		
DC Current Transfer Ratio	h _{FE}	2	V _{CE} = 2 V, I _{OUT} = 500 mA	2000	—	—		
Input Voltage (Output On)	V _{IN (ON)}	3	I _{OUT} = 500 mA, h _{FE} = 150	7.0	—	10.0	V	
			I _{OUT} = 500 mA, h _{FE} = 2000	1.8	—	2.4		
Clamp Diode Leakage Current	I _R	4	V _R = 80 V, Ta = 25°C	—	—	50	μA	
			V _R = 80 V, Ta = 85°C	—	—	100		
Clamp Diode Forward Voltage	V _F	5	I _F = 500 mA	—	—	2.0	V	
Supply Current	Output On	I _{CC (ON)}	3	V _{CC} = 5.5 V, V _{IN} = 2.4 V	—	35	40	mA / ch
	Output Off	I _{CC (OFF)}						
Input Capacitance	C _{IN}	6	V _{IN} = 0, f = 1 MHz	—	15	—	pF	
Turn-On Delay	t _{ON}	7	V _{OUT} = 80V, R _L = 125 Ω Ta = 60°C, V _{CC} = 5.0 V, C _L = 15 pF	—	0.2	0.4	μs	
Turn-Off Delay	t _{OFF}			—	4.0	8.0		

TEST CIRCUIT

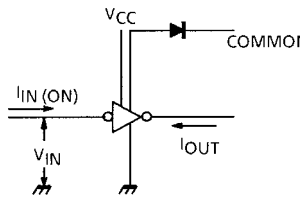
1. I_{CEX}



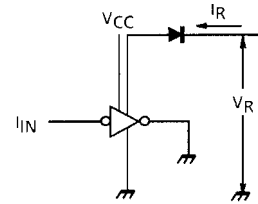
2. h_{FE} , $V_{CE(sat)}$



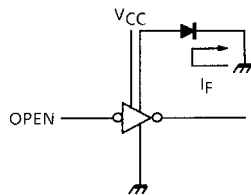
3. $V_{IN(ON)}$



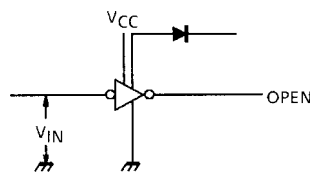
4. I_R



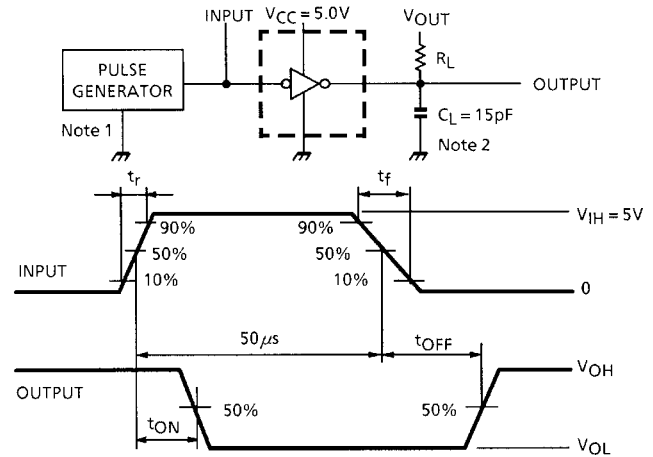
5. V_F



6. $I_{CC(ON)}$, $I_{CC(OFF)}$



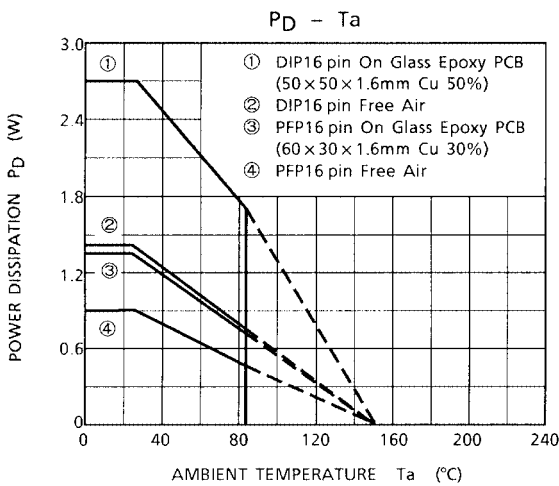
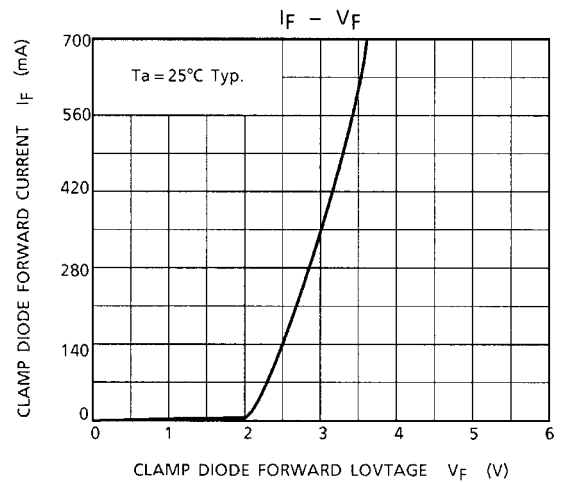
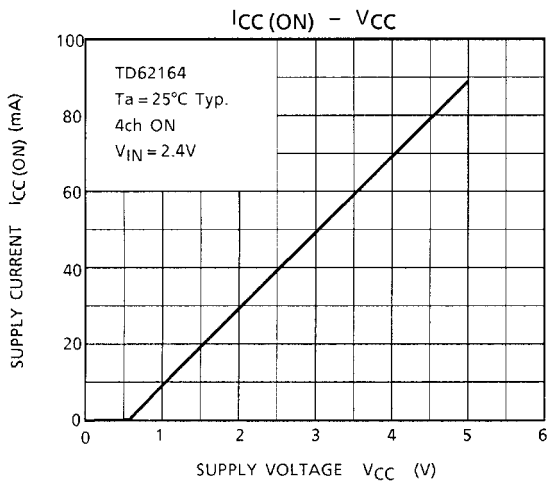
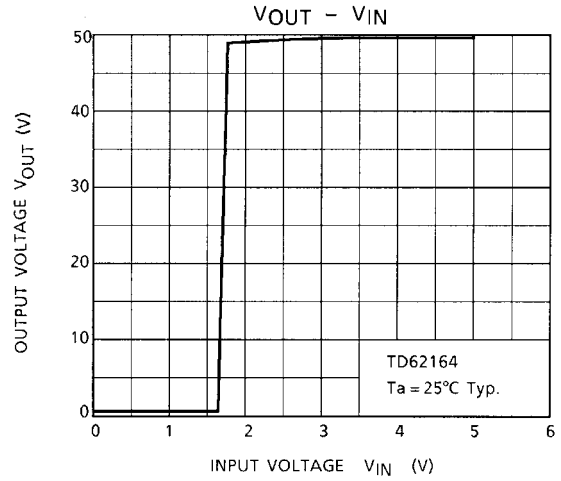
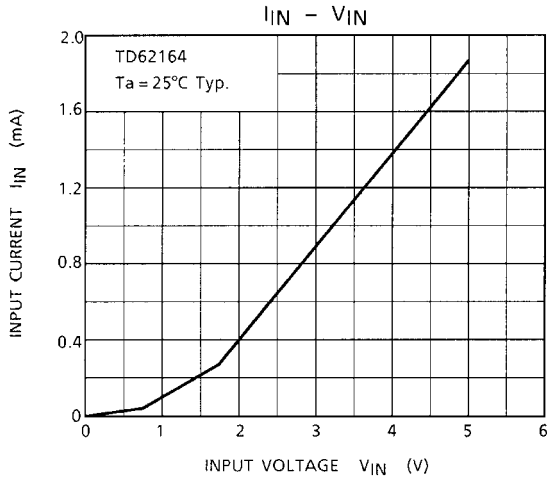
7. t_{ON} , t_{OFF}

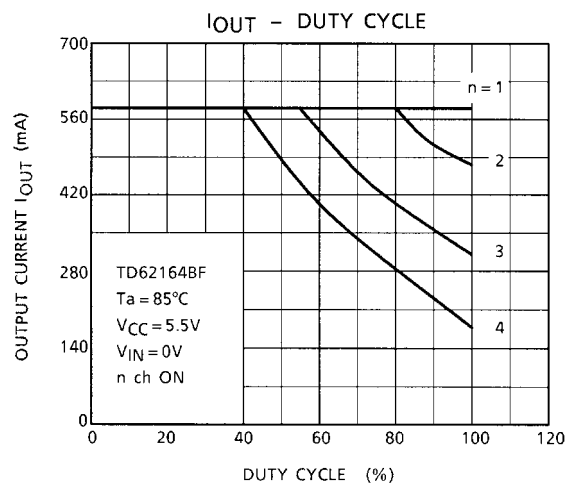
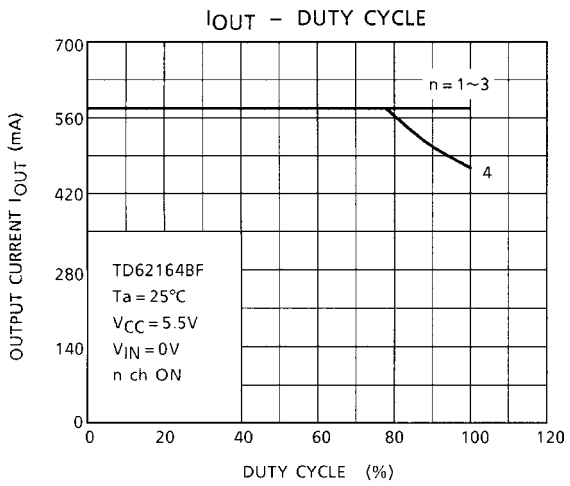
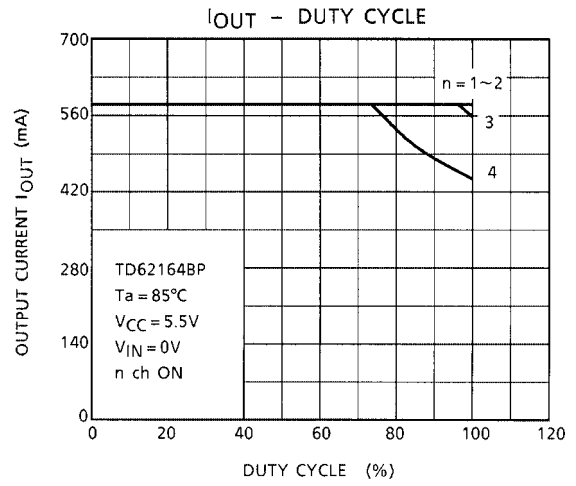
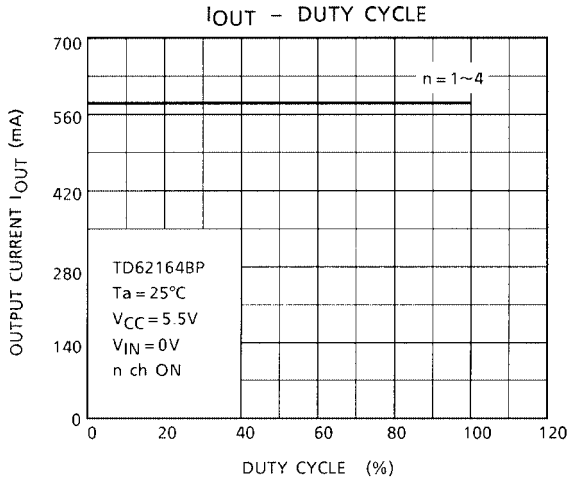


Note 1: Pulse Width 50 μ s, Duty Cycle 10%
 Output Impedance 50 Ω , $t_r \leq 5$ ns, $t_f \leq 10$ ns
 Note 2: C_L includes probe and jig capacitance

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.

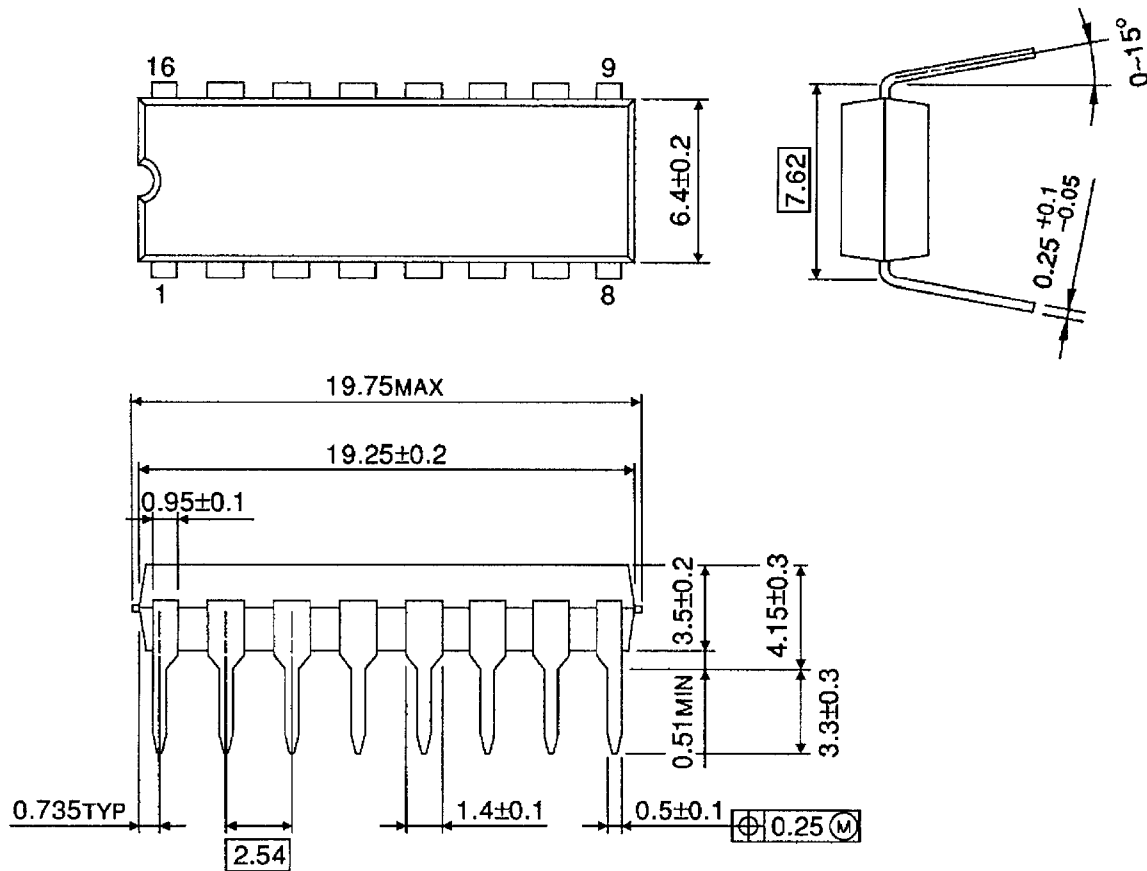




PACKAGE DIMENSIONS

DIP16-P-300-2.54A

Unit : mm

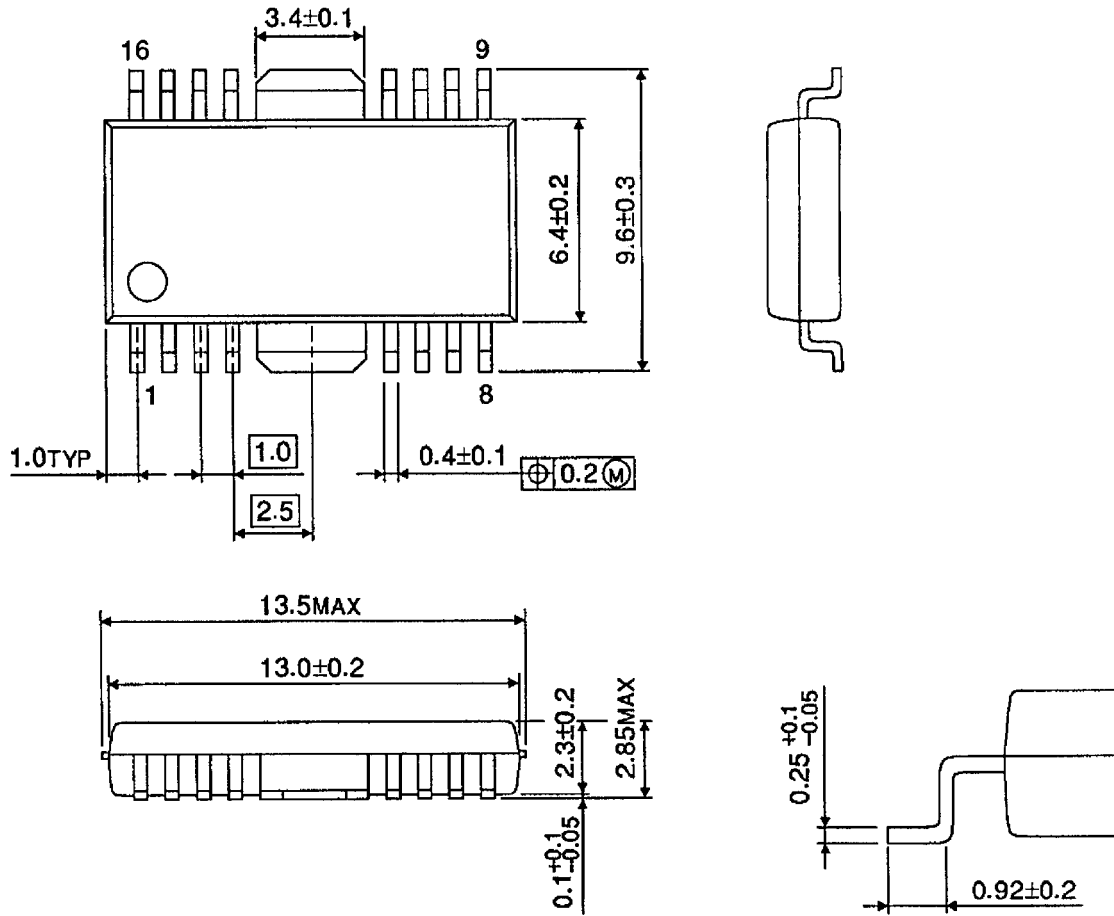


Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

HSOP16-P-300-1.00

Unit : mm



Weight: 0.50 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

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