

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62064BP-1, TD62064BF

4CH HIGH-CURRENT DARLINGTON SINK DRIVER

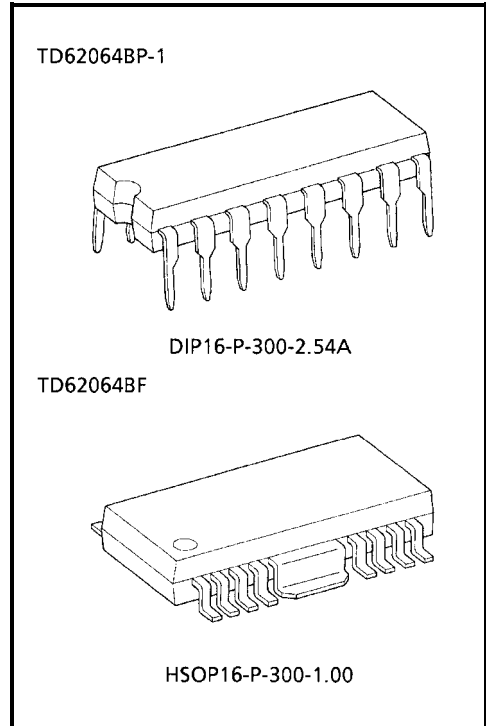
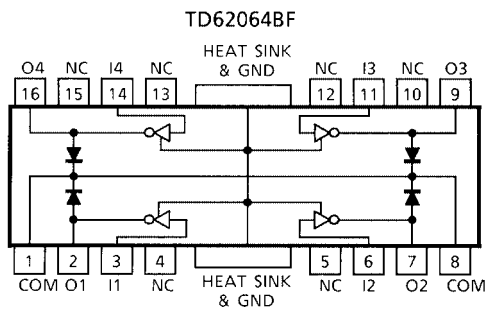
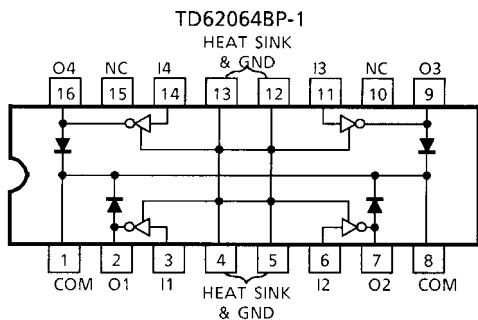
The TD62064BP-1 and TD62064BF are high-voltage, high-current darlington drivers comprised of four NPN darlington pairs. All units feature integral clamp diodes for switching inductive loads.

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

FEATURES

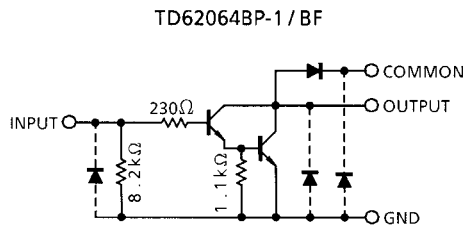
- Package Type BP-1 : DIP16 pin
BF : HSOP16 pin
- High Output Sustaining Voltage : $V_{CE(SUS)} = 80\text{ V (Min)}$
- Output Current (Single Output) : $I_{OUT} = 1.5\text{ A / ch (Max)}$
- Output Clamp Diodes
- Input Compatible with TTL and 5 V CMOS
- GND and SUB Terminal = Heat Sink

PIN CONNECTION (TOP VIEW)



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.

PRECAUTIONS for USING

- (1) 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, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.
- (2) If a TD62064BP-1/BF is being used to drive an inductive load (such as a motor, solenoid or relay), Toshiba recommends that the diodes (pins 1 and 8) be connected to the secondary power supply pin so as to absorb the counter electromotive force generated by the load. Please adhere to the device's maximum ratings. Toshiba recommends that zener diodes be connected between the diodes (pins 1 and 8) and the secondary power supply pin (as the anode) so as to enable rapid absorption of the counter electromotive force. Again, please adhere to the device's maximum ratings.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Output Sustaining Voltage	$V_{CE(SUS)}$	-0.5 ~ 80	V
Parasitic Transistor Output Voltage	V_{CEF} (Note 1)	80	V
Output Current	I_{OUT}	1.5	A / ch
Input Current	I_{IN}	50	mA
Input Voltage	V_{IN}	7	V
Clamp Diode Reverse Voltage	V_R	80	V
Clamp Diode Forward Current	I_F	1.5	A
Power Dissipation	BP-1	P_D	W
	BF		
		1.47 / 2.7 (Note 2)	
		0.9 / 1.4 (Note 3)	
Operating Temperature	T_{opr}	-40 ~ 85	°C
Storage Temperature	T_{stg}	-55 ~ 150	°C

Note 1: Parasitic Transistor (COMMON - GND - OUTPUT) Output Voltage

Note 2: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 50%)

Note 3: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

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

CHARACTERISTIC	SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT	
Output Sustaining Voltage	V _{CE(SUS)}		0	—	80	V	
Output Current	I _{OUT}	DC 1 Circuit, Ta = 25°C	0	—	1250	mA / ch	
		T _{pw} = 25ms 4 Circuits T _j = 120°C Ta = 85°C	Duty = 10 %	0	—		1250
			Duty = 50 %	0	—		380
		BP-1 (Note 1)	Duty = 10 %	0	—		900
Duty = 50 %	0		—	170			
Input Voltage	V _{IN}		0	—	5.5	V	
	(Output On)	V _{IN(ON)}	I _{OUT} = 1.25 A	2.5	—	8	V
	(Output Off)	V _{IN(OFF)}		0	—	0.4	V
Input Current	I _{IN}		0	—	20	mA	
Clamp Diode Reverse Voltage	V _R		0	—	80	V	
Clamp Diode Forward Current	I _F		—	—	1.25	A	
Power Dissipation	BP-1	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%)

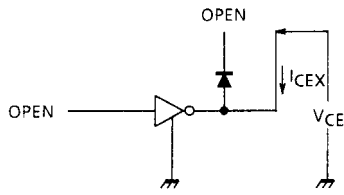
Note 2: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C unless otherwise noted)

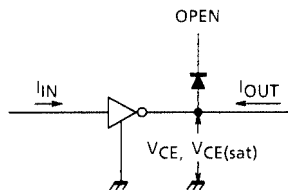
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current	I _{CEX}	1	V _{CE} = 80 V, Ta = 25°C	—	—	50	μA
			V _{CE} = 80 V, Ta = 85°C	—	—	100	
Output Saturation Voltage	V _{CE(sat)}	2	I _{OUT} = 1.25 A, V _{IN} = 2.4 V	—	—	1.6	V
			I _{OUT} = 0.75 A, V _{IN} = 2.4 V	—	—	1.25	
DC Current Transfer Ratio	h _{FE}	2	V _{CE} = 2 V, I _{OUT} = 1.25 A	—	1500	—	
Input Voltage (Output On)	V _{IN(ON)}	3	I _{OUT} = 1.25 A, I _{IN} = 2 mA	—	—	2.4	V
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 = 1.25 A	—	1.5	2.0	V
Input Capacitance	C _{IN}	6	V _{IN} = 0, f = 1 MHz	—	15	—	pF
Turn-On Delay	t _{ON}	7	V _{OUT} = 80 V, R _L = 68 Ω	—	0.1	—	μs
Turn-Off Delay	t _{OFF}			—	1.0	—	
Parasitic Transistor Output Voltage	V _{CEF}	8	I _{CEF} = 150 mA	80	—	—	V

TEST CIRCUIT

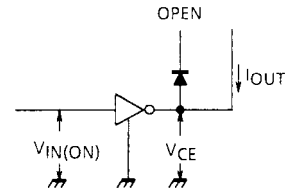
1. I_{CEX}



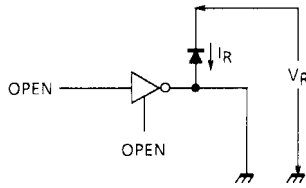
2. $V_{CE(sat)}$, h_{FE}



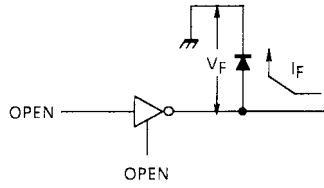
3. $V_{IN(ON)}$



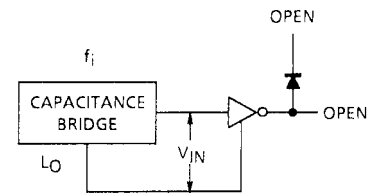
4. I_R



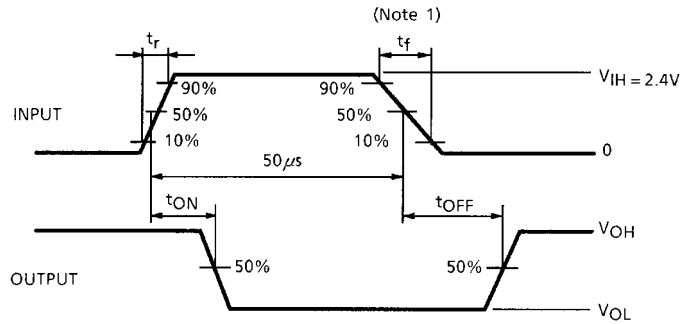
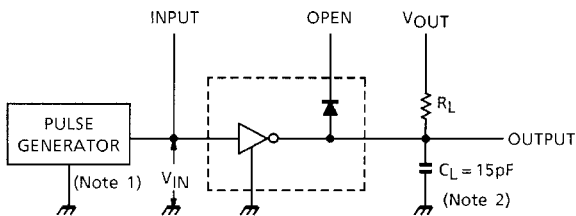
5. V_F



6. C_{IN}

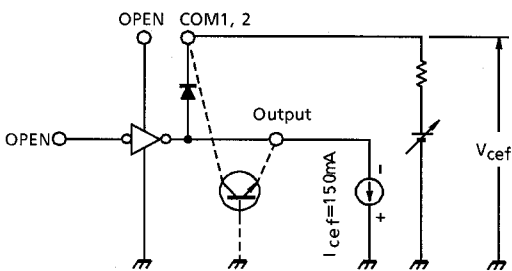


7. t_{ON} , t_{OFF}

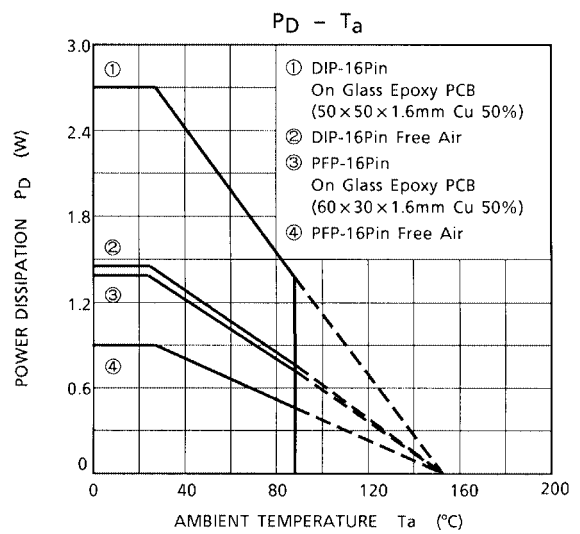
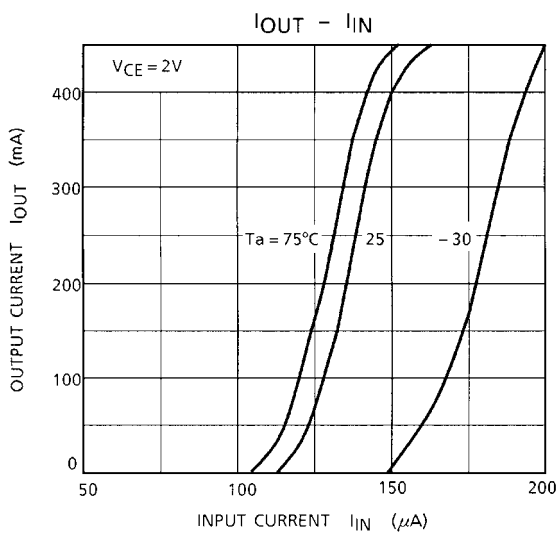
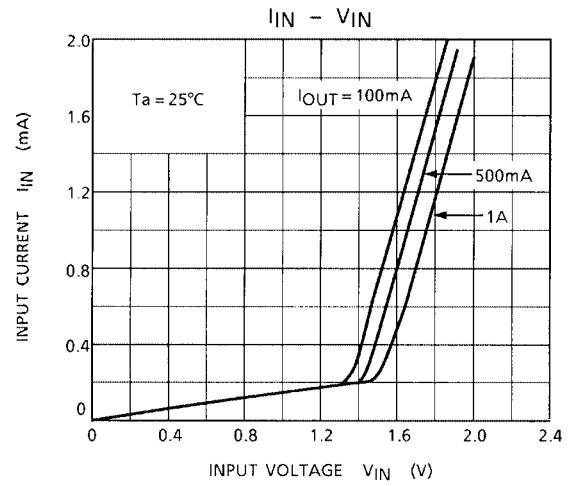
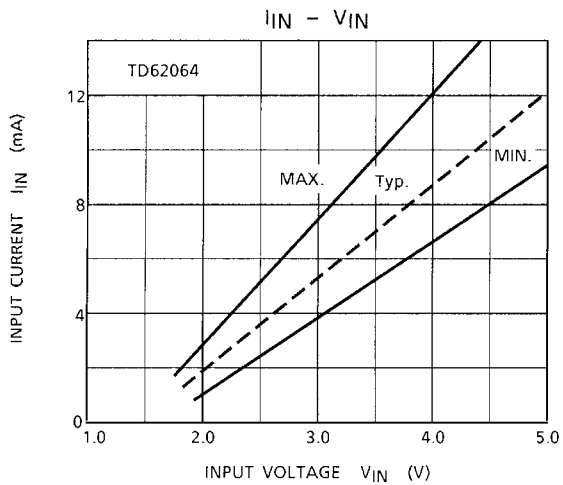
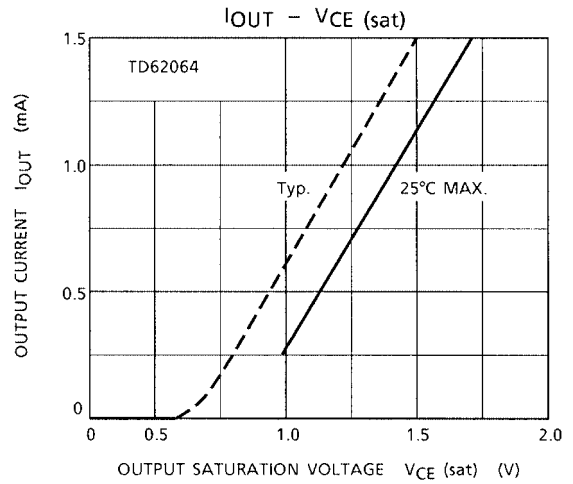
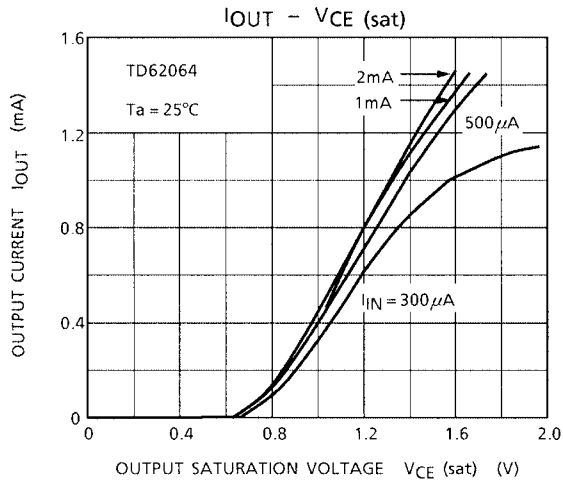


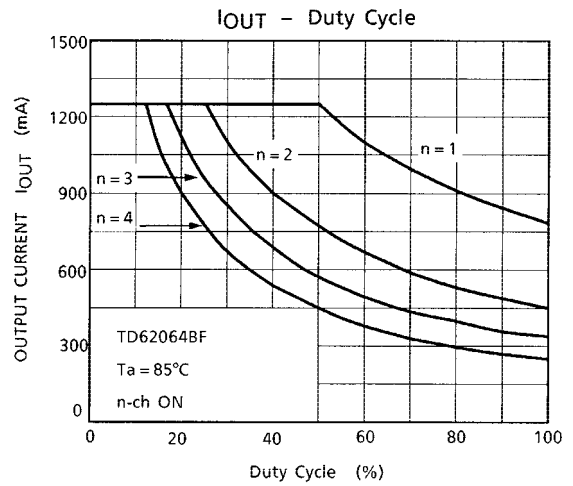
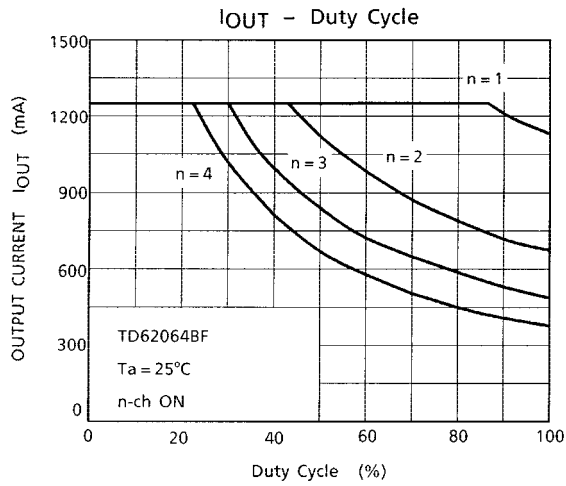
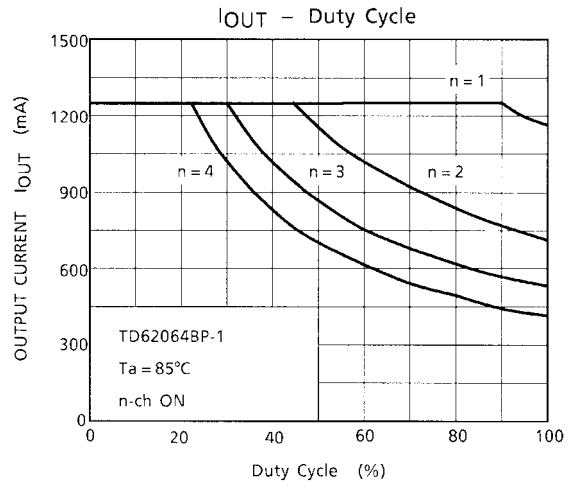
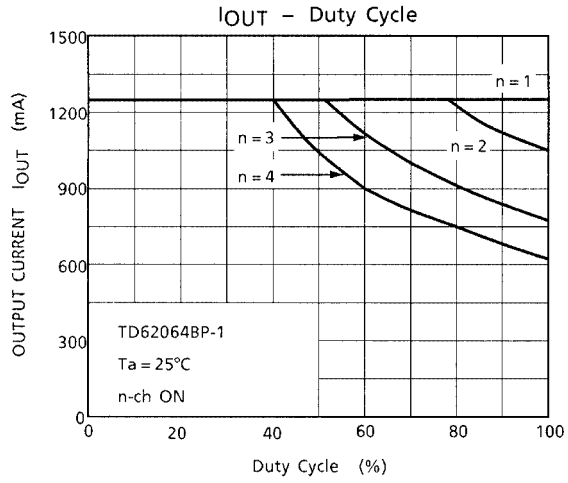
Note 1: Pulse Width 50 μ s, Duty Cycle 10%
Output Impedance 50 Ω , $t_r \leq 5$ ns, $t_f \leq 10$ ns
Note 2: C_L includes probe and jig capacitance

8. V_{CEf}



$I_{CEf} = 150$ mA (at . Single pulse = 5ms)

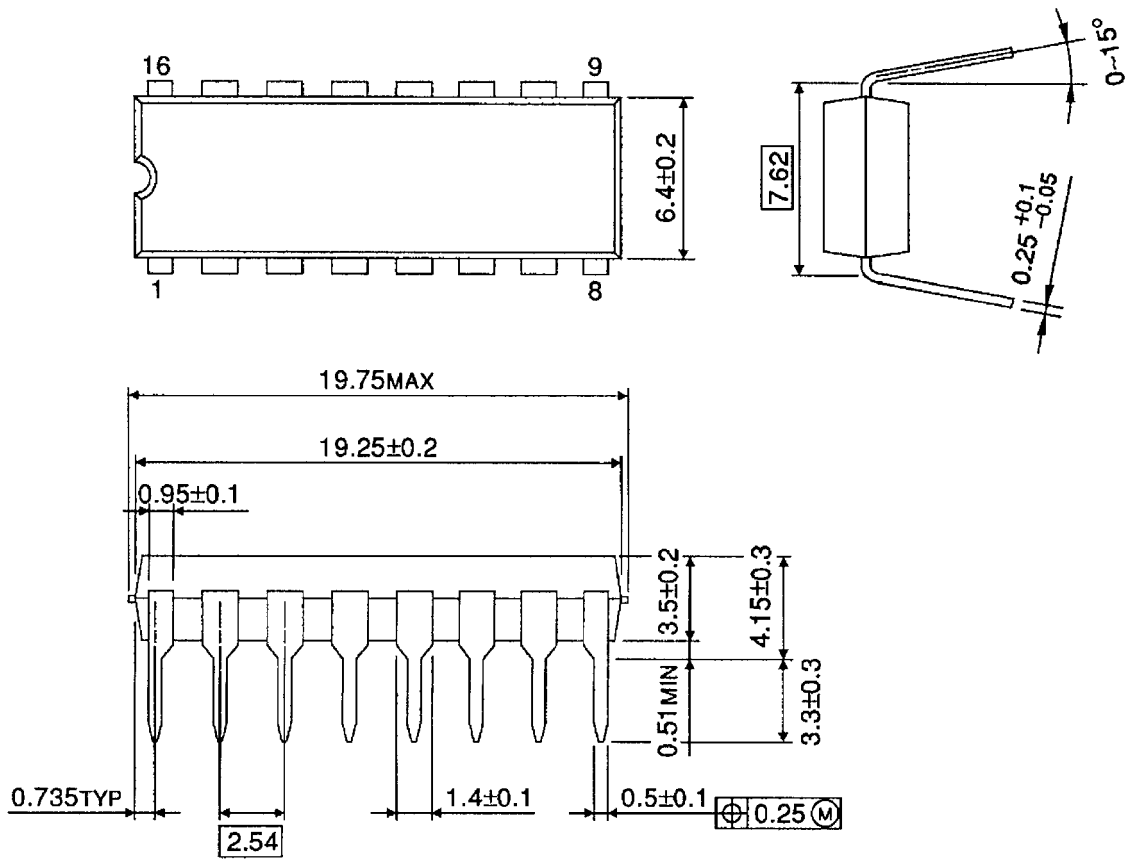




PACKAGE DIMENSIONS

DIP16-P-300-2.54A

Unit : mm

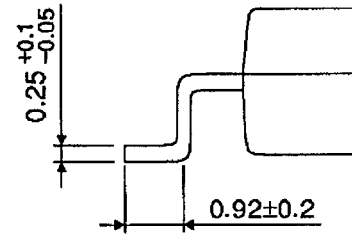
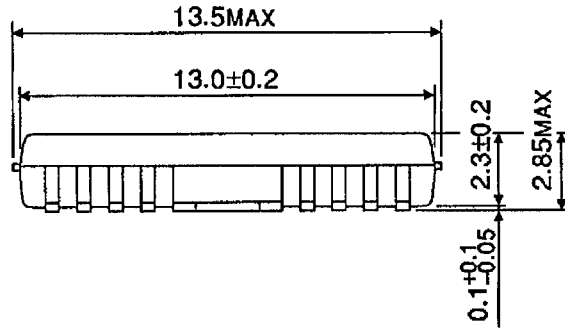
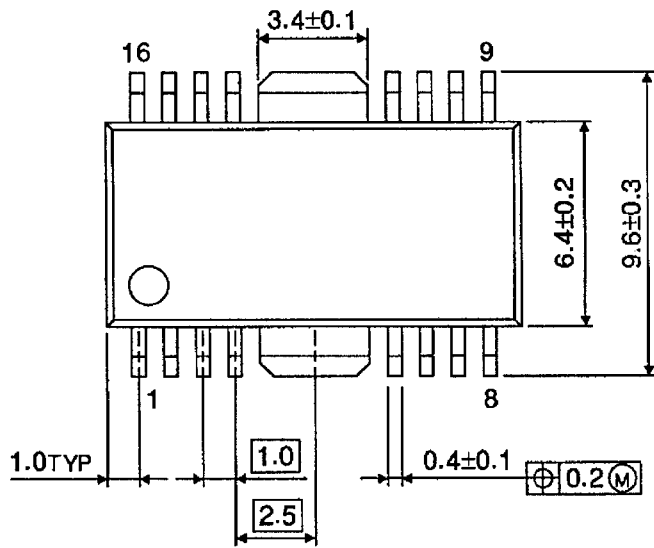


Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

HSOP16-P-300-1.00

Unit : mm



Weight: 0.50 g (Typ.)

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