

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

**TD62101P, TD62101F, TD62103P, TD62103F**  
**TD62104P, TD62104F, TD62105P, TD62105F**

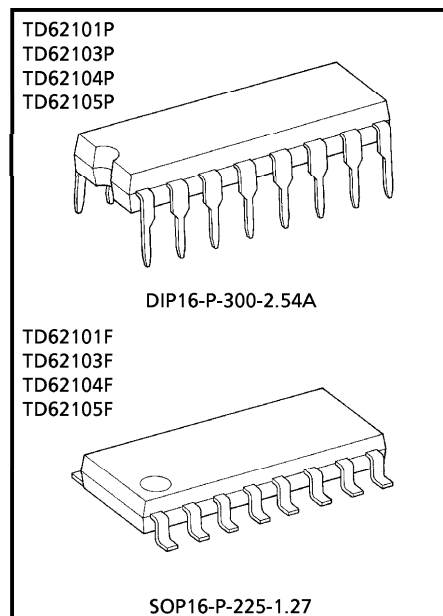
**7CH DARLINGTON SINK DRIVER**

The TD62101P/F series are high-voltage, high-current darlington drivers comprised of seven NPN darlington pairs.

**FEATURES**

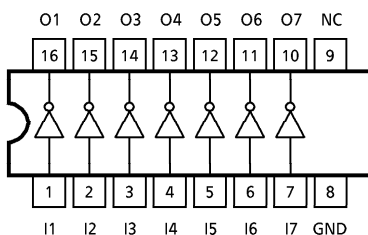
- Output current (single output) : 500mA (Max.)
- High sustaining voltage output : 25V (Min.)
- Inputs compatible with various types of logic.
- Package type-P : DIP-16 pin.
- Package type-F : SOP-16 pin.

TYPE	INPUT BASE RESISTOR	DESIGNATION
TD62101P/F	External	General Purpose
TD62103P/F	2.7kΩ	TTL, 5V CMOS
TD62104P/F	10.5kΩ	6~15V CMOS, PMOS
TD62105P/F	20kΩ	12~25V CMOS, PMOS



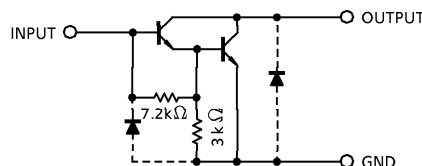
Weight  
 DIP16-P-300-2.54A : 1.11g (Typ.)  
 SOP16-P-225-1.27 : 0.16g (Typ.)

**PIN CONNECTION (TOP VIEW)**



**SCHEMATICS (EACH DRIVER)**

TD62101P/F



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

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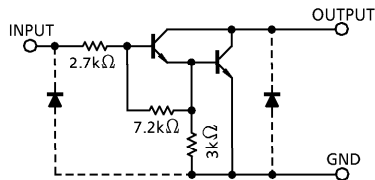
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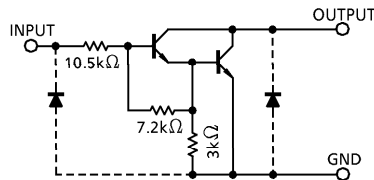
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SCHEMATICS (EACH DRIVER)

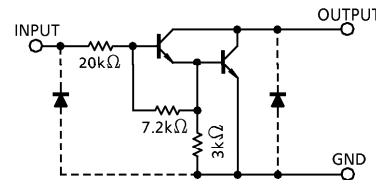
TD62103P / F



TD62104P / F



TD62105P / F



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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Output Sustaining Voltage	$V_{CE(SUS)}$	-0.5 ~ 25	V
Output Current	$I_{OUT}$	500	mA / ch
Input Voltage	$V_{IN}$ (Note 1)	-0.5 ~ 30	V
Input Current	$I_{IN}$ (Note 2)	25	mA
Power Dissipation	P	1.0	W
	F	0.625 (Note 3)	
Operating Temperature	P	-30 ~ 75	°C
	F	-40 ~ 85	
Storage Temperature	$T_{stg}$	-55 ~ 150	°C

(Note 1) Except TD62101P / F

(Note 2) Only TD62101P / F

(Note 3) On Glass Epoxy PCB (30 × 30 × 1.6mm Cu 50%)

RECOMMENDED OPERATING CONDITIONS (Ta = -40 ~ 85°C and Ta = -30 ~ 75°C for only Type-P)

CHARACTERISTIC	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Output Sustaining Voltage	$V_{CE(SUS)}$		0	—	25	V
Output Current	$I_{OUT}$	DC 1 Circuit	0	—	350	mA / ch
		$T_{pw} = 25ms, Duty = 10\%$ 7 Circuits, Ta = 85°C, Tj = 120°C	0	—	300	
Input Voltage	Except TD62101P / F $V_{IN}$		0	—	20	V
Input Current	Only TD62101P / F $I_{IN}$		—	—	10	mA
Power Dissipation	P	$P_D$	—	—	0.44	W
	F		(Note)	—	—	

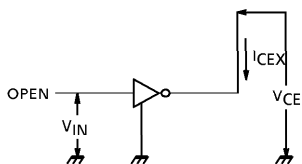
(Note) On Glass Epoxy PCB (30 × 30 × 1.6mm Cu 50%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

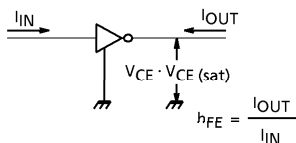
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT		
Output Leakage Current	P	I <sub>CEX</sub>	1	V <sub>CE</sub> = 25V I <sub>IN</sub> = 0	Ta = 75°C	—	100	μA		
	F				Ta = 85°C	—	100			
Collector-Emitter Saturation Voltage		V <sub>CE (sat)</sub>	2	I <sub>OUT</sub> = 350mA, I <sub>IN</sub> = 600μA	—	1.3	2.2	V		
					I <sub>OUT</sub> = 200mA, I <sub>IN</sub> = 400μA	—	1.1		2.0	
					I <sub>OUT</sub> = 100mA, I <sub>IN</sub> = 200μA	—	1.0		1.8	
DC Current Transfer Ratio		h <sub>FE</sub>	2	V <sub>CE</sub> = 2V, I <sub>OUT</sub> = 350mA	1000	—	—			
Input Current	Output On	I <sub>IN (ON)</sub>	3	V <sub>CE</sub> = 2V	I <sub>OUT</sub> = 350mA	—	0.25	mA		
						—	1.00			
						—	0.4			
						—	1.2			
						—	1.5			
	Output Off	I <sub>IN (OFF)</sub>	4	I <sub>OUT</sub> = 500μA	Ta = 75°C	50	65	—	μA	
				Ta = 85°C	50	65	—			
Input Voltage	Output On	V <sub>IN (ON)</sub>	5	V <sub>CE</sub> = 2V	I <sub>OUT</sub> = 125mA	—	—	2.1	V	
						—	—	4		
						—	—	6.4		
						I <sub>OUT</sub> = 250mA	—	—		2.7
							—	—		7
							—	—		12
						I <sub>OUT</sub> = 350mA	—	—		3.3
							—	—		8.8
							—	—		15
Input Capacitance		C <sub>IN</sub>	6	V <sub>IN</sub> = 0, f = 1MHz	—	15	—	pF		
Turn-On Delay		t <sub>ON</sub>	7	V <sub>OUT</sub> = 25V, R <sub>L</sub> = 70Ω C <sub>L</sub> = 15pF	—	0.1	—	μs		
Turn-Off Delay		t <sub>OFF</sub>			—	0.2	—			

TEST CIRCUIT

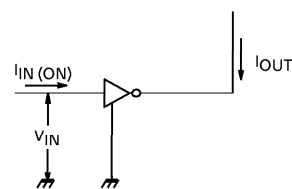
1. I<sub>CEX</sub>



2. h<sub>FE</sub>, V<sub>CE (sat)</sub>

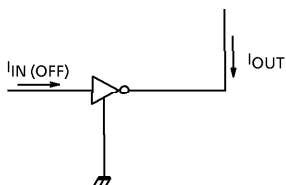


3. I<sub>IN (ON)</sub>

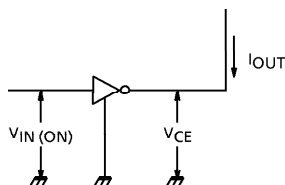


TEST CIRCUIT

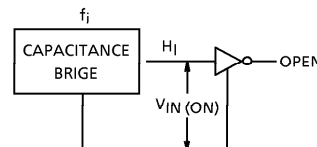
4.  $I_{IN}$  (OFF)



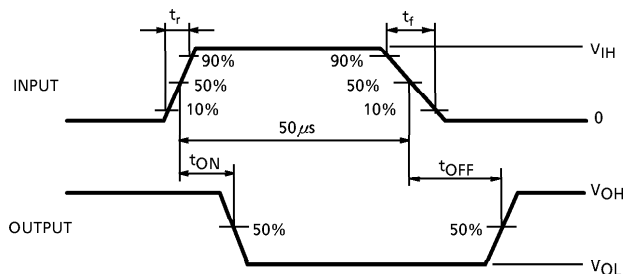
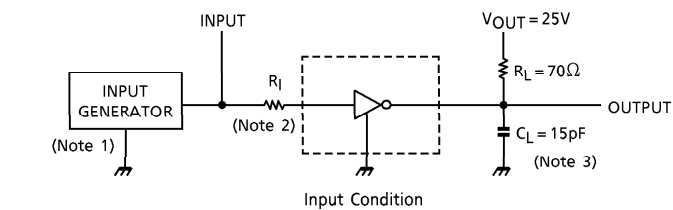
5.  $V_{IN}$  (ON)



6.  $C_{IN}$



7.  $t_{ON}$ ,  $t_{OFF}$



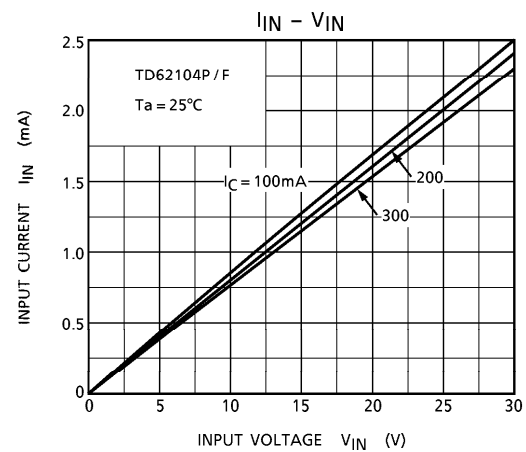
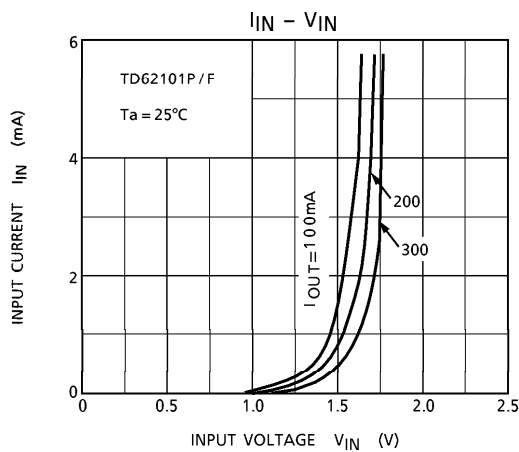
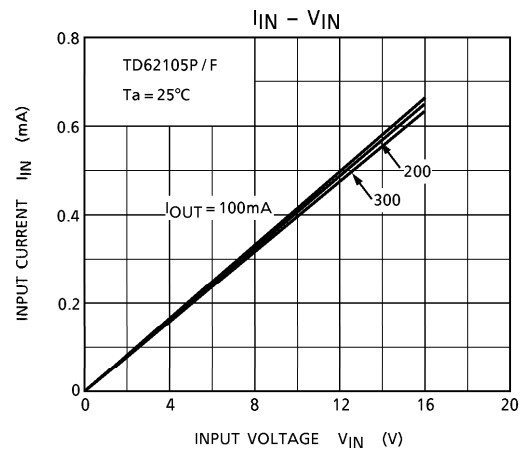
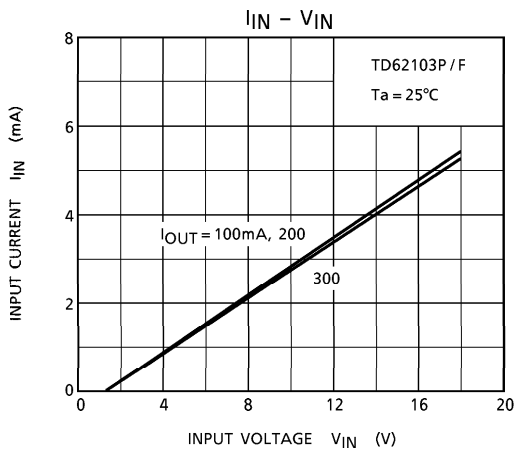
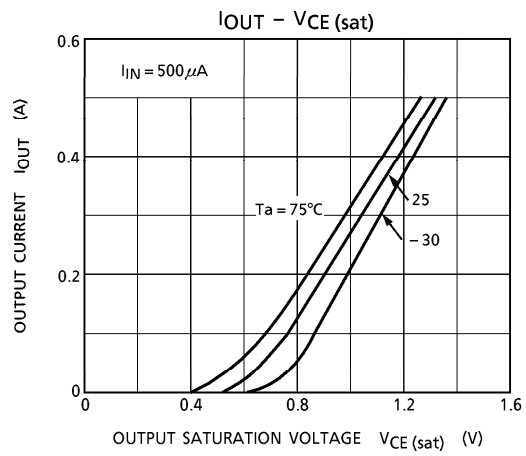
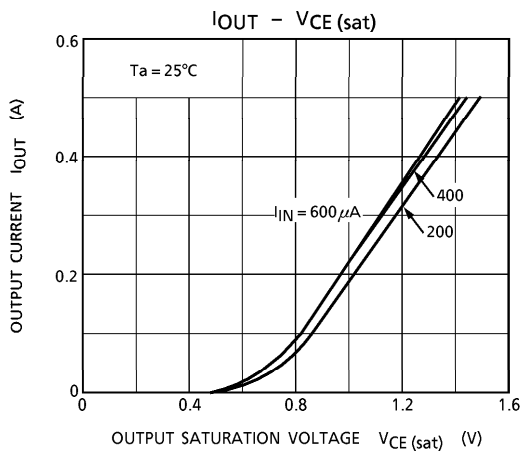
- (Note 1) Pulse Width  $50\mu s$ , Duty Cycle 10%  
Output Impedance  $50\Omega$ ,  $t_r \leq 5ns$ ,  $t_f \leq 10ns$
- (Note 2) See right.
- (Note 3)  $C_L$  includes probe and jig capacitance.

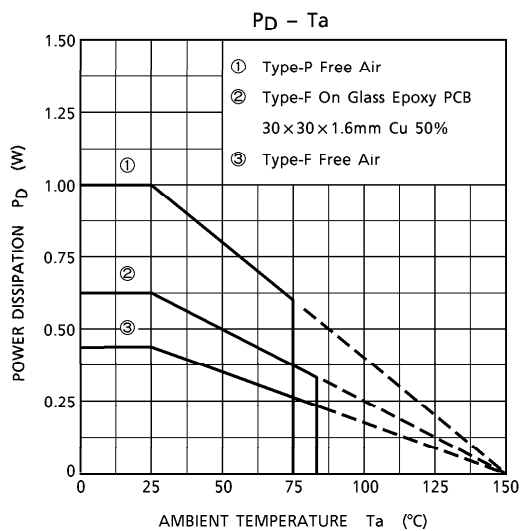
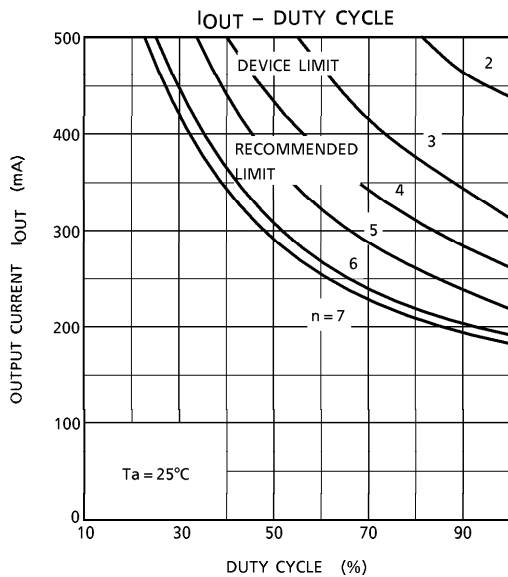
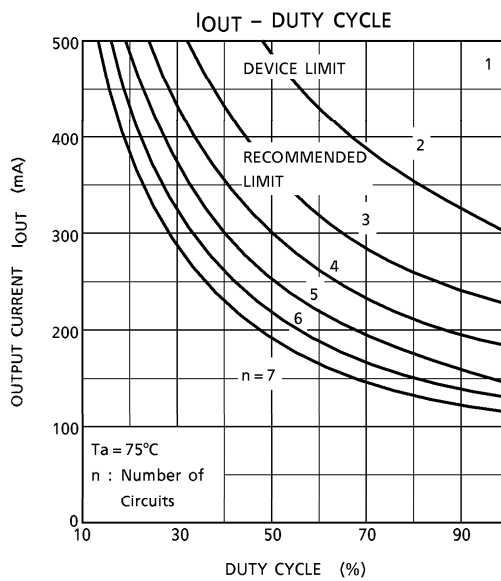
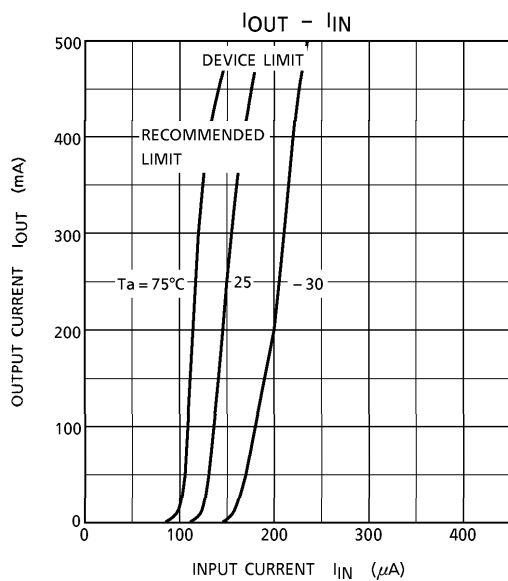
INPUT CONDITION

TYPE NUMBER	$R_I$	$V_{IH}$
TD62101P / F	$2.7k\Omega$	3V
TD62103P / F	$0\Omega$	3V
TD62104P / F	$0\Omega$	8V
TD62105P / F	$0\Omega$	15V

PRECAUTIONS for USING

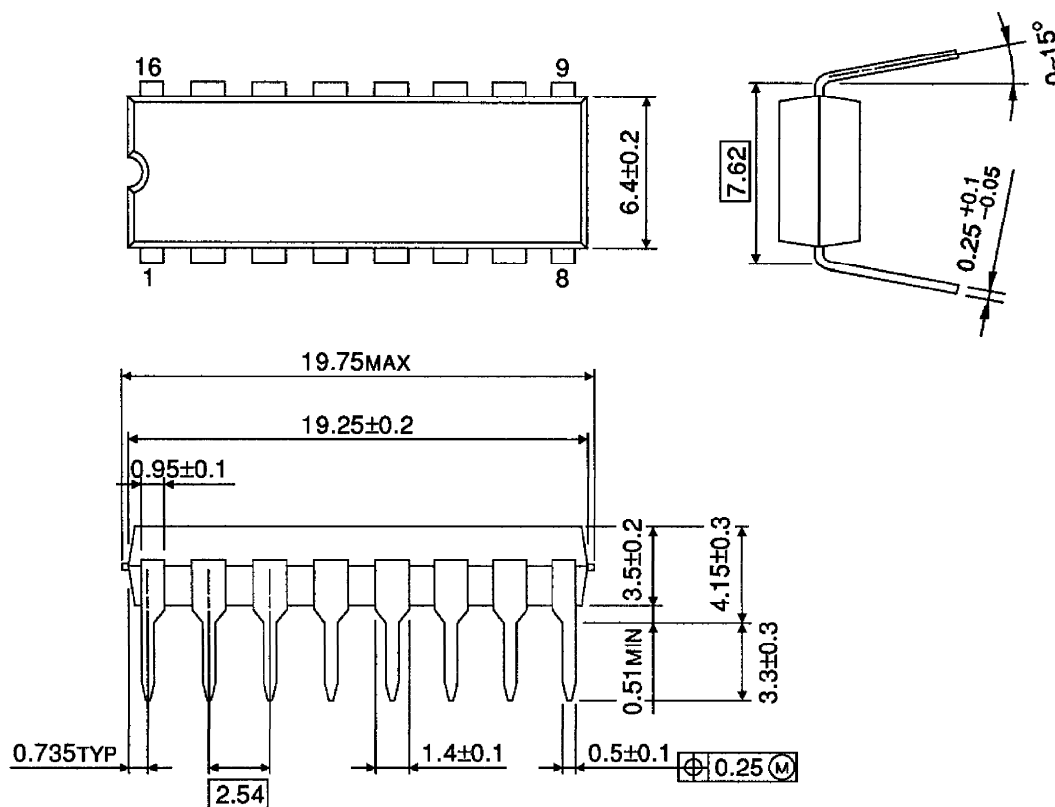
Utmost care is necessary in the design of the output line, GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.





**OUTLINE DRAWING**  
DIP16-P-300-2.54A

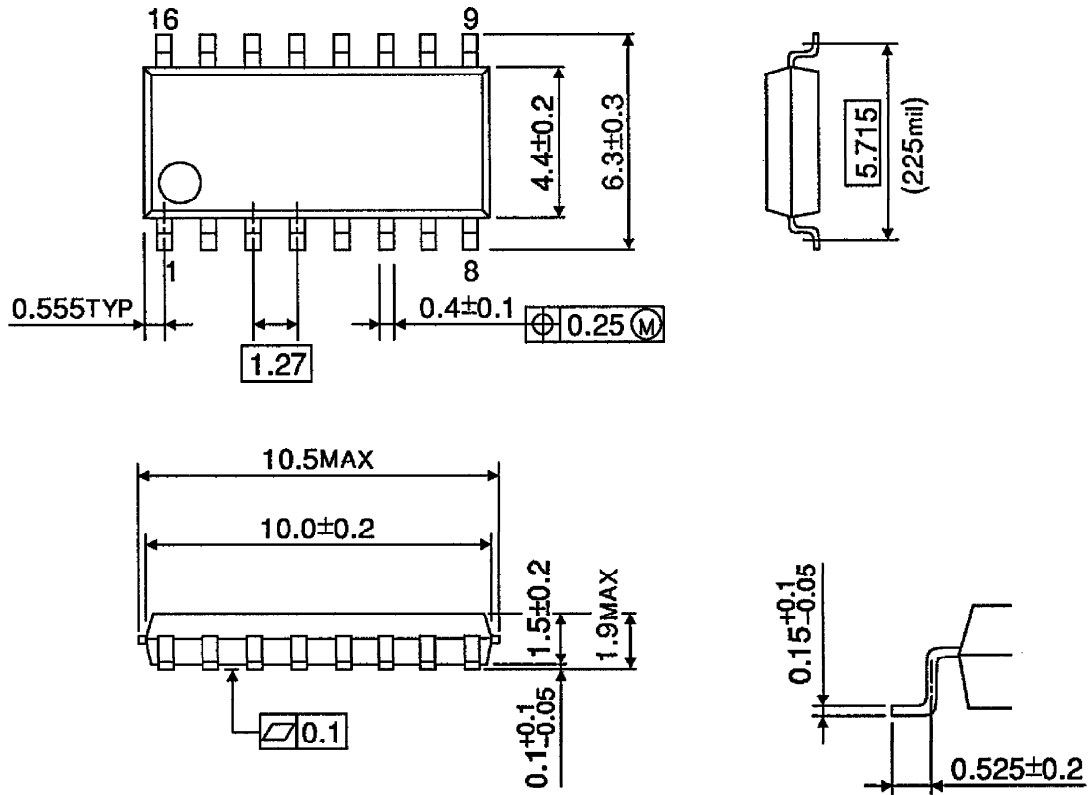
Unit : mm



Weight : 1.11g (Typ.)

**OUTLINE DRAWING**  
SOP16-P-225-1.27

Unit : mm



Weight : 0.16g (Typ.)