

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

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

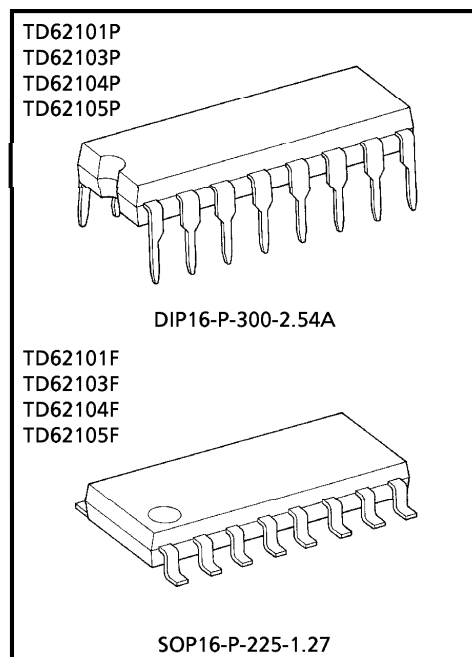
7CH DARLINGTON SINK DRIVER

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

FEATURES

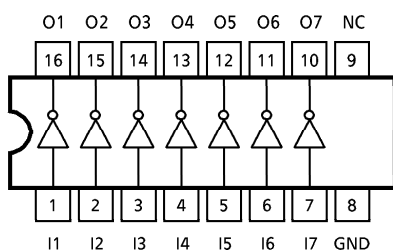
- Output current (single output) : 500mA (Max.)
- High sustaining voltage output : 25V (Min.)
- Inputs compatible with various types of logic.
- Package type-P : DIP-16 pin.
- Package type-F : SOP-16 pin.

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



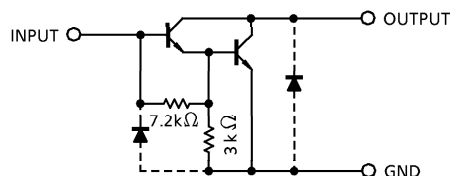
Weight
 DIP16-P-300-2.54A : 1.11g (Typ.)
 SOP16-P-225-1.27 : 0.16g (Typ.)

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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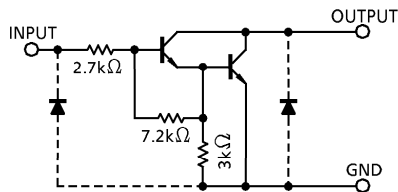
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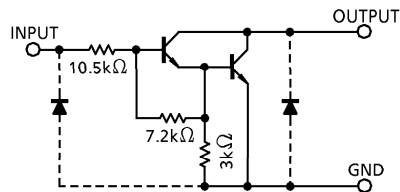
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SCHEMATICS (EACH DRIVER)

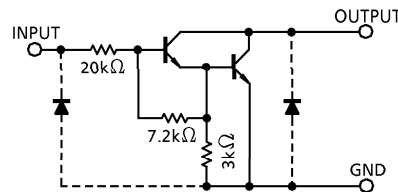
TD62103P / F



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	P_D	1.0	W
	F		0.625 (Note 3)	
Operating Temperature	P	T_{opr}	-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, $T_a = 85°C, T_j = 120°C$	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	(Note)	—	—	0.44	W
	F			—	—	0.325	

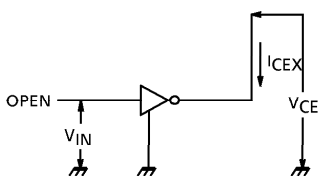
(Note) On Glass Epoxy PCB (30 × 30 × 1.6mm Cu 50%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

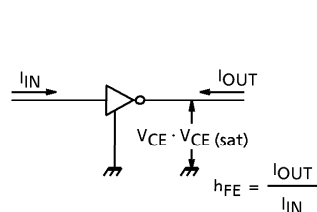
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT		
Output Leakage Current	P	I _{CEX}	1	V _{CE} = 25V I _{IN} = 0	Ta = 75°C	—	—	100	μA	
	F				Ta = 85°C	—	—	100		
Collector-Emitter Saturation Voltage		V _{CE (sat)}	2	I _{OUT} = 350mA, I _{IN} = 600μA	—	1.3	2.2	V		
					I _{OUT} = 200mA, I _{IN} = 400μA	—	1.1		2.0	
					I _{OUT} = 100mA, I _{IN} = 200μA	—	1.0		1.8	
DC Current Transfer Ratio		h _{FE}	2	V _{CE} = 2V, I _{OUT} = 350mA	1000	—	—			
Input Current	Output On	I _{IN (ON)}	3	V _{CE} = 2V	I _{OUT} = 350mA	V _{IN} = 1.5V	—	0.25	mA	
						V _{IN} = 1.75V	—	1.00		
						V _{IN} = 2.4V	—	0.4		
						V _{IN} = 13.5V	—	1.2		
						V _{IN} = 20.0V	—	1.0		
	Output Off	I _{IN (OFF)}	4	I _{OUT} = 500μA	Ta = 75°C	50	65	—	μA	
					Ta = 85°C	50	65	—		
Input Voltage	Output On	V _{IN (ON)}	5	V _{CE} = 2V	I _{OUT} = 125mA	—	—	2.1	V	
						—	—	4		
						—	—	6.4		
						I _{OUT} = 250mA	—	—		2.7
							—	—		7
							—	—		12
						I _{OUT} = 350mA	—	—		3.3
							—	—		8.8
							—	—		15
Input Capacitance		C _{IN}	6	V _{IN} = 0, f = 1MHz	—	15	—	pF		
Turn-On Delay		t _{ON}	7	V _{OUT} = 25V, R _L = 70Ω C _L = 15pF	—	0.1	—	μs		
Turn-Off Delay		t _{OFF}			—	0.2	—			

TEST CIRCUIT

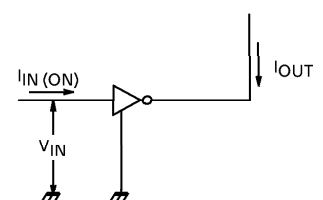
1. I_{CEX}



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

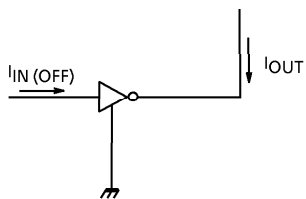


3. I_{IN (ON)}

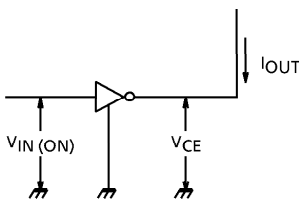


TEST CIRCUIT

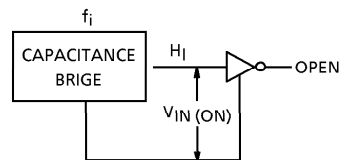
4. I_{IN} (OFF)



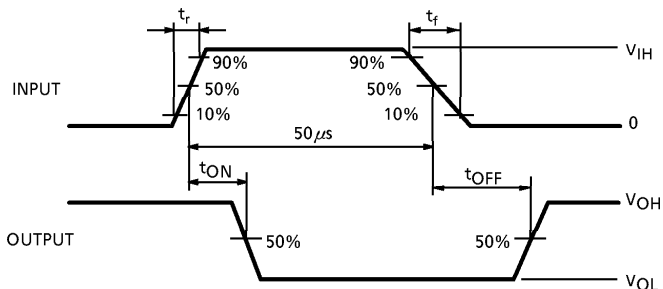
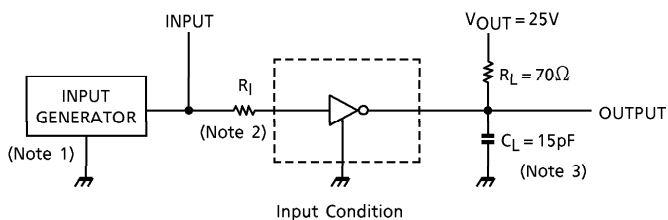
5. V_{IN} (ON)



6. C_{IN}



7. t_{ON} , t_{OFF}



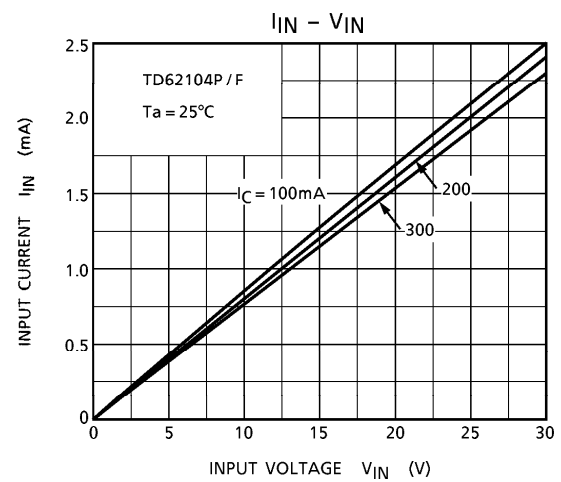
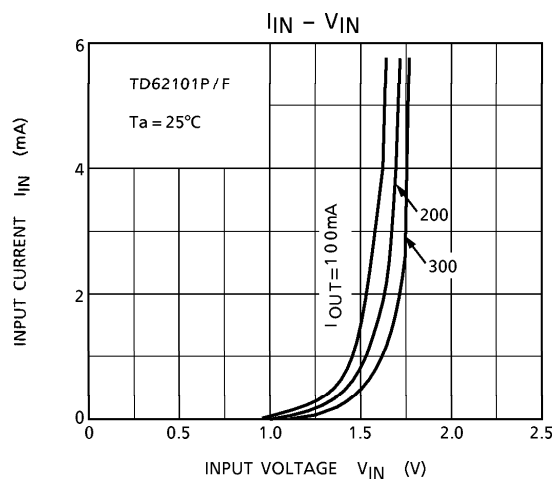
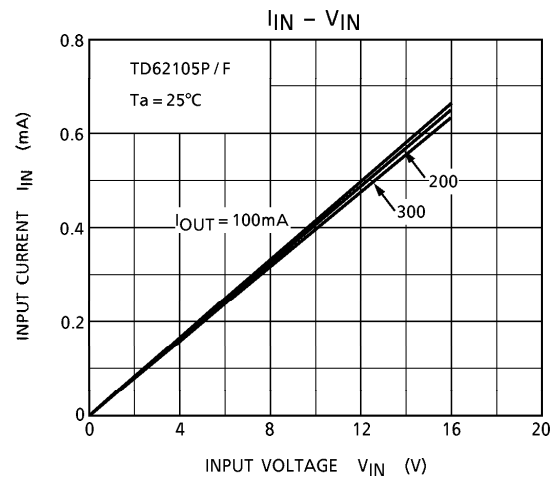
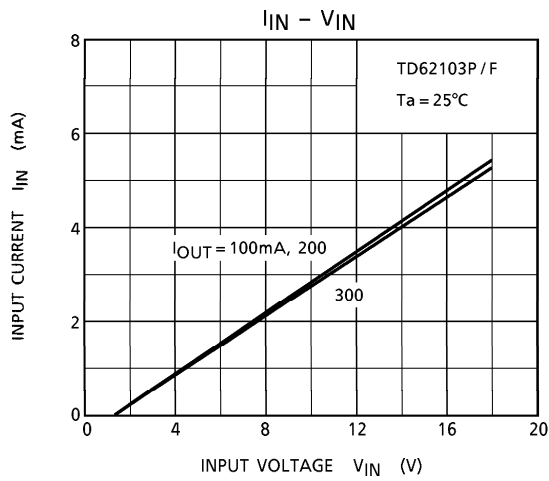
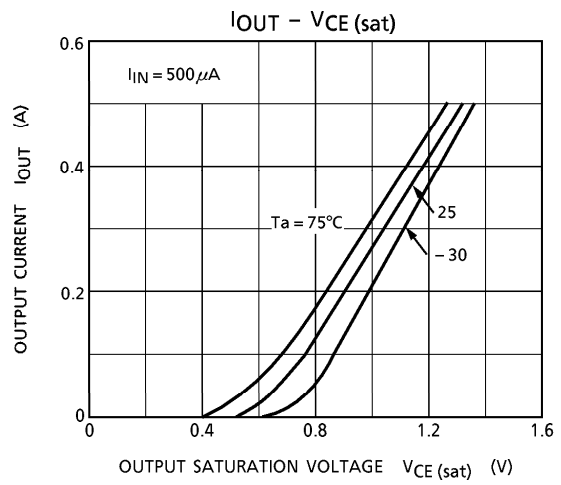
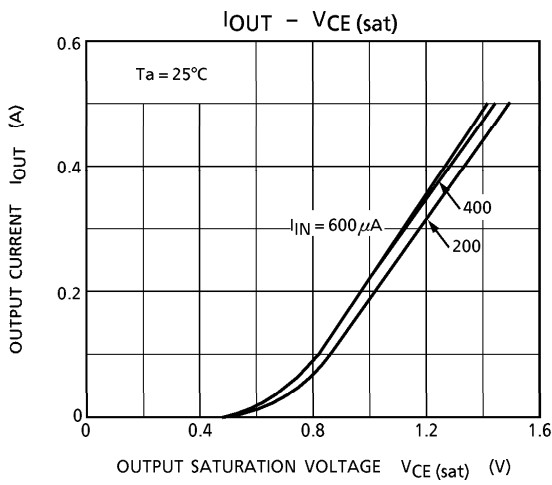
- (Note 1) Pulse Width 50μs, Duty Cycle 10%
Output Impedance 50Ω, $t_r \leq 5ns$, $t_f \leq 10ns$
- (Note 2) See right.
- (Note 3) C_L includes probe and jig capacitance.

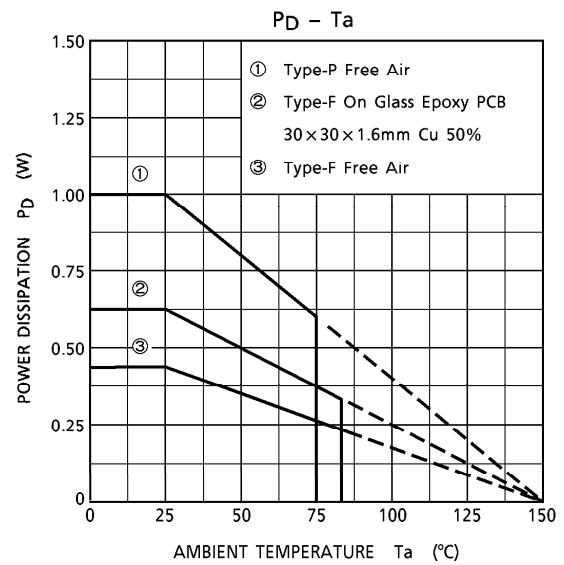
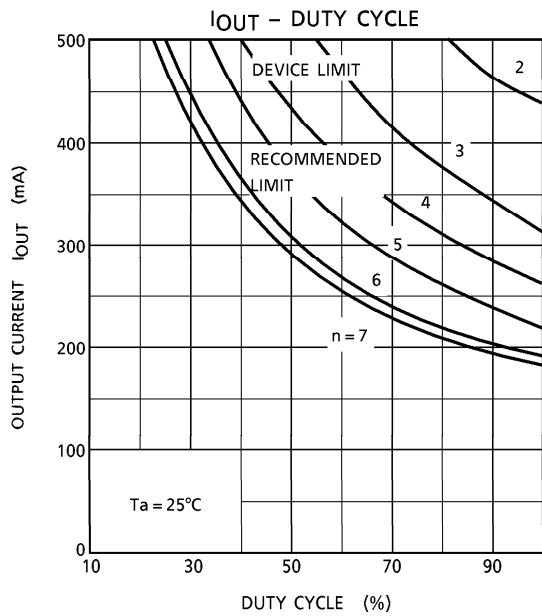
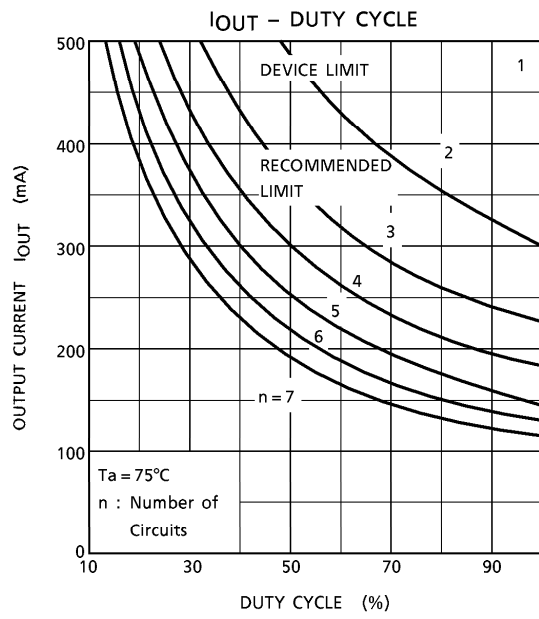
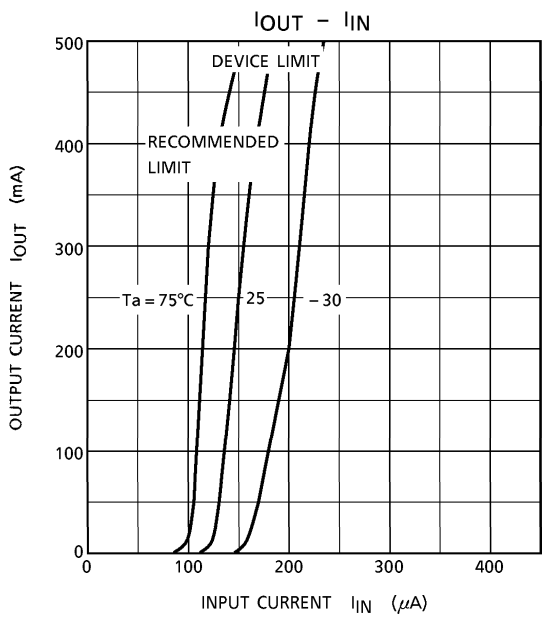
INPUT CONDITION

TYPE NUMBER	R_I	V_{IH}
TD62101P / F	2.7kΩ	3V
TD62103P / F	0Ω	3V
TD62104P / F	0Ω	8V
TD62105P / F	0Ω	15V

PRECAUTIONS for USING

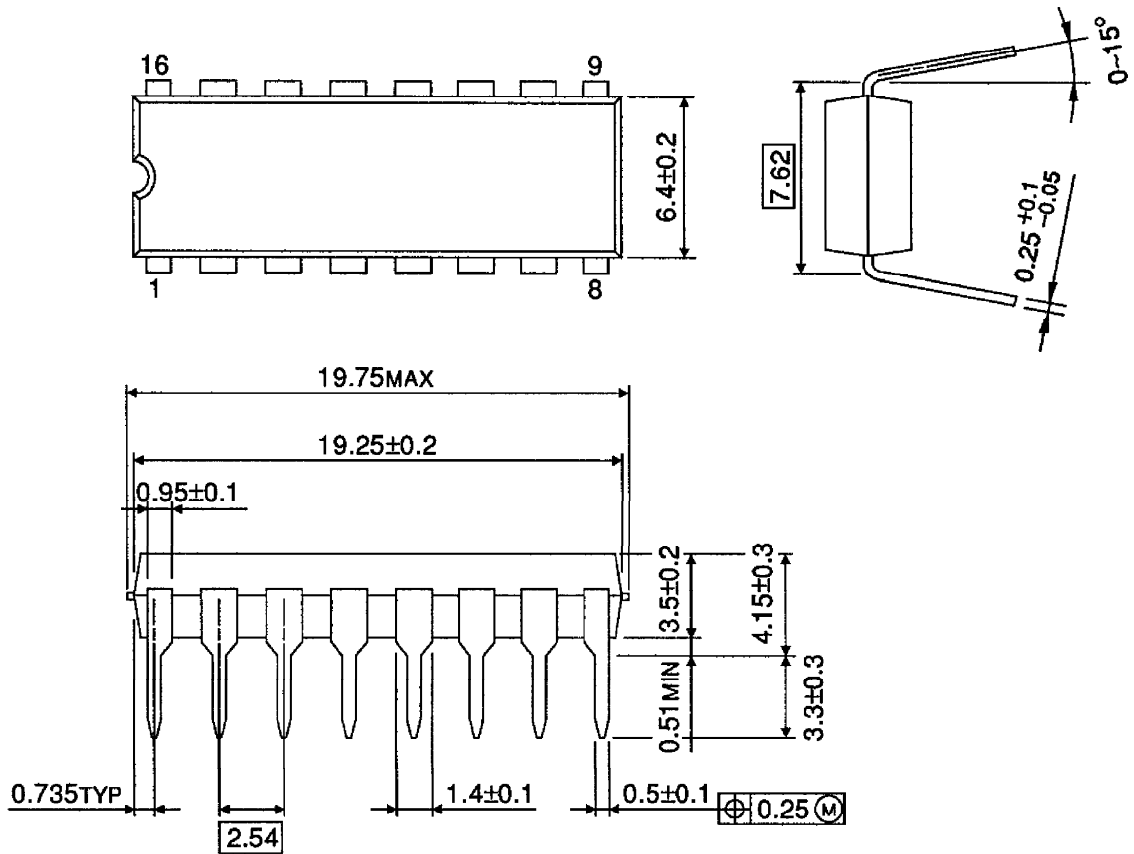
Utmost care is necessary in the design of the output line, GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.





OUTLINE DRAWING
DIP16-P-300-2.54A

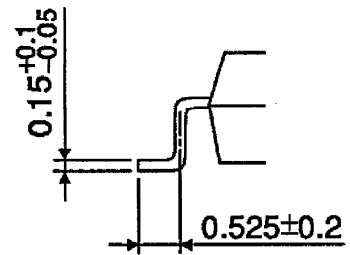
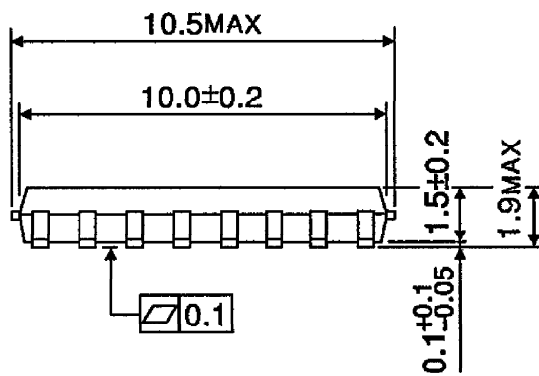
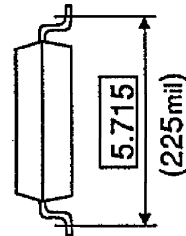
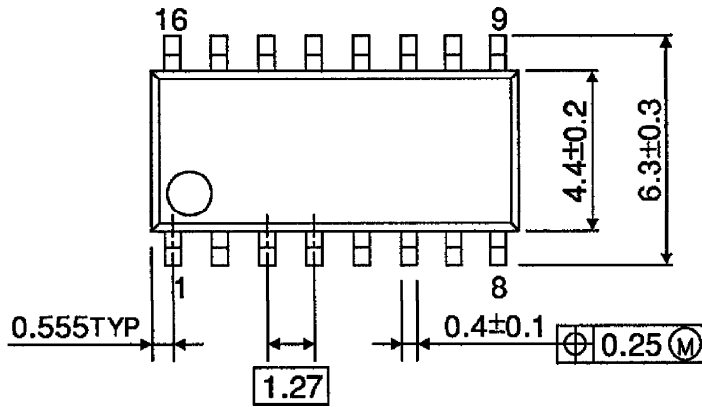
Unit : mm



Weight : 1.11g (Typ.)

OUTLINE DRAWING
SOP16-P-225-1.27

Unit : mm



Weight : 0.16g (Typ.)